

Page 1-122

# CRYSTAL UNITS IN METAL HOLDER, BASED ON TYPE 807, FREQUENCY RANGE 4.0 - 140MHZ

ESCC Detail Specification No. 3501/008

(Follow-up specification to ESA/SCC Detail Specification No. 3501/001)

ISSUE 3 July 2008





PAGE

ii

ISSUE 2

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PAGE 2

ISSUE 3

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DCR No.	CHANGE DESCRIPTION
DCR No.	CHANGE DESCRIPTION  Specification upissued to incorporate technical and editorial changes per DCRs.



PAGE 3

ISSUE 3

# **TABLE OF CONTENTS**

		Page
1.	GENERAL	5
1.1	Scope	5
1.2	Component Type Variants	5
1.3	Maximum Ratings	5
1.4	Physical Dimensions	5 5
1.5	Functional Diagram	5
	- Chotonal Diagram	5
2.	APPLICABLE DOCUMENTS	14
3.	TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS	14
4.	REQUIREMENTS	14
4.1	General	14
4.2	Deviations from Generic Specification	14
4.2.1	Deviations from Special In-process Controls	14
4.2.2	Deviations from Final Production Tests	14
4.2.3	Deviations from Burn-in Tests	14
4.2.4	Deviations from Qualification Tests	14
4.2.5	Deviations from Lot Acceptance Tests	14
4.3	Mechanical Requirements	15
4.3.1	Dimension Check	15
4.3.2	Weight	15
4.3.3	Robustness of Terminations	15
4.4	Materials and Finishes	15
4.4.1	Case	15
4.4.2	Lead Material and Finish	15
4.5	Marking	15
4.5.1	General	15
4.5.2	The ESCC Component Number	15
4.5.3	Characteristics	16
4.5.4	Traceability Information	16
4.5.5	Manufacturer's Name, Symbol or Code	16
4.6	Electrical Measurements	16
4.6.1	Electrical Measurements at Reference Temperature	16
4.6.2	Electrical Measurements at High and Low Temperatures	16
4.6.3	Circuits for Electrical Measurements	16
4.7	Burn-in Tests	16
4.7.1	Parameter Drift Values	16
4.7.2	Conditions for Burn-in	16
4.7.3	Electrical Circuits for Burn-in	16
4.8	Environmental and Endurance Tests	19
4.8.1	Measurements and Inspections on Completion of Environmental Tests	19
4.8.2	Measurements and Inspections at Intermediate Points and on Completion of Endurance Tests	19
4.8.3	Conditions for Operating Life Test	10



PAGE 4

ISSUE 3

		Page
TABL	<u>ES</u>	
1(a)	Type Variant Summary	6
	Type Variant Detailed Information	23
1(b)	Maximum Ratings	9
1(c)	Format for Individual Tables 1(a)	10
2	Electrical Measurements at Reference Temperature	17
3	Electrical Measurements at High and Low Temperatures	18
4	Parameter Drift Values	18
5	Conditions for Burn-in and Life Test	18
6	Measurements and Inspections on Completion of Environmental Tests and at Intermediate Points and on Completion of Endurance Testing	20
FIGU	<u>RES</u>	
1	Parameter Derating Information	N/A
2	Physical Dimensions	13
3	Functional Diagram	13
4	Circuits for Electrical Measurements	N/A
5	Electrical Circuit for Burn-in and Life Test	N/A
APPE	NDICES (Applicable to specific Manufacturers only)	
Α	C-MAC Frequency Products (F)	122



PAGE 5

ISSUE 3

#### 1.1 SCOPE

This specification details the values, physical and electrical characteristics, test and inspection data for Crystal Units in Metal Holder, based on Type 807, Frequency Range 4.0 - 140MHz.

It shall be read in conjunction with ESCC Generic Specification No. 3501, the requirements for which are supplemented herein.

This is a follow-up specification to ESCC Detail Specification No. 3501/001. ESCC 3501/001 should also be consulted by:-

- (a) Users seeking information concerning the availability of variants additional to those listed in this specification.
- (b) Manufacturers before requesting the introduction of a new variant in accordance with the requirements of Para. 1.2 of this specification.

#### 1.2 COMPONENT TYPE VARIANTS

A list of the type variants of the crystal units specified herein, which are also covered by this specification, is given in "Table 1(a) - Type Variant Summary".

For each type variant, the full electrical and physical characteristics are given in individual Tables 1(a) - "Type Variant Detailed Information" at the end of this specification.

The contents of the individual Tables 1(a) shall be as shown in Table 1(c) and the characteristics therein listed shall relate to the design parameters of the individual crystal units, optimised for the intended application.

The specific characteristics shall be negotiated between the Manufacturer and the Orderer. The Manufacturer shall then apply to the ESCC Secretariat for a type variant number for each individual crystal unit concerned, by sending a finalised Table 1(a) which shall also be copied to the Qualifying Space Agency (QSA).

#### 1.3 MAXIMUM RATINGS

The maximum ratings, which shall not be exceeded at any time during use or storage, applicable to the crystal units specified herein, are as scheduled in Table 1(b).

#### 1.4 PHYSICAL DIMENSIONS

The physical dimensions of the crystal units specified herein are shown in Figure 2.

#### 1.5 FUNCTIONAL DIAGRAM

The functional diagram showing lead identification of the crystal units specified herein is shown in Figure 3.



PAGE 6

ISSUE 3

# TABLE 1(a) - TYPE VARIANT SUMMARY

N.B. For additional information concerning Type Variants, see Para. 1.1.

Variant	Resonance Frequency	Load Capacitance	Reference Temp.	Operating Temp. Range		Length L mm)
	(MHz)	(C <sub>L</sub> pF)	(T <sub>o</sub> °C)	(T <sub>op</sub> °C)	Min.	Max.
01	83.102493	∞	+ 25	-25 to +70	12.7	-
02	85.412668	∞	+ 25	-20 to +70	12.7	-
03	90.833333	∞	+ 25	-20 to +70	12.7	-
04	90.857143	∞	+ 25	-20 to +70	12.7	-
05	90.880952	∞	+ 25	-20 to +70	12.7	-
06	50.0	00	+ 25	-20 to +70	12.7	-
07	85.412668	∞	+ 65	+59 to +71	12.7	-
08	93.988095	∞	+ 25	-20 to +70	12.7	-
09	94.0	∞	+ 25	-20 to +70	12.7	-
10	94.095238	00	+ 25	-20 to +70	12.7	-
11	94.107143	∞	+ 25	-20 to +70	12.7	-
12	18.8875	32	+25	-20 to +70	12.7	-
13	16.0	∞	+ 25	-40 to +85	12.7	-
14	24.6862	30	+ 25	-20 to +70	12.7	-
15	110.045	∞	+ 25	-25 to +70	12.7	-
16	110.765	∞	+ 25	-25 to +70	12.7	-
17	27.5	30	+ 25	-20 to +50	12.7	-
18	92.852381	∞	+25	-25 to +70	12.7	_
19	92.846032	00	+25	-25 to +70	12.7	-
20	88.134921	∞	+ 25	-25 to +70	12.7	-
21	84.0	∞	+70	-20 to +80	12.7	-
22	15.0	25	+25	-55 to +105	12.7	_
23	40.0	∞	+40	0 to +90	12.7	-
24	29.629	∞	+40	0 to +90	12.7	-
25	32.0	∞	+ 25	-20 to +70	12.7	-
26	14.7456	00	+ 25	-55 to +105	12.7	-
27	12.25	32	+ 25	-30 to +70	12.7	-
28	4.096	25	+ 25	-55 to +100	12.7	-
29	31.999305	∞	+ 25	-20 to +60	12.7	-
30	74.801912	∞	+ 25	-25 to +70	12.7	-
31	78.217213	∞	+ 25	-25 to +70	12.7	-
32	81.66667	∞	+70	-20 to + 70	12.7	-
33	81.00766	∞	+70	-20 to + 80	12.7	-
34	90.869921	∞	+25	-25 to +70	12.7	-
35	85.412668	∞	+ 65	+59 to +71	12.7	-
36	140.0	∞	+ 25	-20 to +70	12.7	-

NOTES: See Page 8.



PAGE 7

ISSUE 3

# TABLE 1(a) - TYPE VARIANT SUMMARY (CONTINUED)

Variant	Resonance Frequency	Load Capacitance	Reference Temp.	Operating Temp. Range	Intend. Applica-		_ength L mm)
	(MHz)	(C <sub>L</sub> pF)	(T <sub>o</sub> °C)	(T <sub>op</sub> °C)	tion	Min.	Max.
37	81.544502	∞	+ 67	-20 to +80	-	12.7	-
38	81.632635	∞	+ 65	-20 to +80	-	12.7	-
39	20.0	32	+ 25	-30 to +70	-	12.7	-
40	83.133333	00	+ 65	-20 to +80	-	12.7	-
41	16.0	30	+ 25	-22 to +90	-	12.7	-
42	20.0	00	+ 25	-30 to +95	-	12.7	-
43	83.312841	∞	+ 25	-25 to +70	-	12.7	-
44	83.316257	00	+ 25	-25 to +70	-	12.7	-
45	83.319672	00	+ 25	-25 to +70	-	12.7	-
46	83.362503	00	+ 25	-25 to +70	-	12.7	-
47	83.340164	∞	+ 25	-25 to +70	-	12.7	-
48	83.346994	00	+ 25	-25 to +70	-	12.7	-
49	83.353825	∞	+ 25	-25 to +70	-	12.7	-
50	83.360656	8	+ 25	-25 to +70	-	12.7	-
51	45.056	∞	+ 25	-25 to +70	-	12.7	-
52	78.247951	∞	+ 25	-25 to +70	-	12.7	-
53	78.213798	∞	+ 25	-25 to +70	-	12.7	-
54	78.227459	∞	+ 25	-25 to +70	-	12.7	-
55	78.220628	∞	+ 25	-25 to +70	-	12.7	-
56	81.666667	∞	+ 67	-20 to +80	_	12.7	-
57	121.714286	80	+ 25	-20 to +70	-	12.7	-
58	116.471429	∞	+ 25	-20 to +70	-	12.7	-
59	4.194304	22	+ 60	-20 to +70	-	12.7	-
60	16.0	30	+ 25	-30 to +70	-	12.7	_
61	10.0	30	+ 30	-30 to +70	-	12.7	-
62	25.0	30	+ 25	-30 to +80	X0	12.7	-
63	90.0	12	+ 25	-20 to +85	-	12.7	-
64	83.366142	∞	+ 67	-20 to +80	-	12.7	-
65	70.975328	∞	+ 25	-25 to +70	-	12.7	-
66	79.93306	<b>∞</b>	+ 65	-20 to +80		12.7	-
67	79.941257	∞	+ 65	-20 to +80	-	12.7	-
68	9.2	30	+ 30	-30 to +70	X0	12.7	-
69	24.0	30	+ 27	-55 to +100	_	12.7	-
70	76.8315	∞	+ 25	-25 to +80	_	12.7	_
71	20.0	30	+ 25	-30 to +80	_	12.7	
72	20.0	30	+ 25	-55 to +105	-	12.7	_

NOTES: See Page 8.



PAGE

ISSUE 3

8

# TABLE 1(a) - TYPE VARIANT SUMMARY (CONTINUED)

Variant	Resonance Frequency	Load Capacitance	Reference Temp.	Operating Temp. Range	Intend. Applica-	Lead I (Dim.	_ength L mm)
	(MHz)	(C <sub>L</sub> pF)	(T <sub>o</sub> °C)	(T <sub>op</sub> °C)	tion	Min.	Max.
73	40.960	<b>∞</b>	+ 25	-25 to +70	-	12.7	-
74	70.965082	00	+ 25	-25 to +70	-	12.7	-
75	79.937158	00	+ 65	-20 to +80	-	12.7	-
76	79.945355	00	+ 65	-20 to +80	-	12.7	-
77	59.356136	∞	+ 25	-25 to +70	-	12.7	-
78	18.0	30	+ 25	-25 to +100	-	12.7	-
79	81.576923	<b>∞</b>	+ 67	-20 to +80	OCXO	12.7	-
80	86.024590	œ	+ 25	-20 to +80	TCXO	12.7	_
81	85.983607	∞	+ 25	-20 to +80	TCXO	12.7	-
82	79.949453	∞	+ 65	-20 to +80	OCXO	12.7	-
83	79.957650	∞	+ 65	-20 to +80	OCXO	12.7	-
84	70.970205	∞	+ 25	-25 to +70	TCXO	12.7	-
85	101.936620	12	+ 25	-20 to +80	VCXO	12.7	-
86	75.0	12	+ 25	-20 to +80	VCXO	12.7	-
87	80.0	12	+ 25	-20 to +80	VCXO	12.7	-
88	74.626318	00	+ 25	-20 to +80	TCXO	12.7	-
89	64.791785	œ	+ 25	-20 to +80	TCXO	12.7	-
90	64.990091	∞	+ 25	-20 to +80	TCXO	12.7	-
91	64.995773	∞	+ 25	-20 to +80	TCXO	12.7	-
92	74.677455	<b>∞</b>	+ 25	-20 to +80	TCXO	12.7	-
93	66.638308	∞	+ 25	-20 to +80	TCXO	12.7	-
94	66.628692	∞	+ 25	-20 to +80	TCXO	12.7	-
95	60.091346	∞	+ 25	-20 to +80	TCXO	12.7	-
96	60.086538	∞	+ 25	-20 to +80	TCXO	12.7	-
97	37.083333	∞	+ 25	-20 to +80	TCXO	12.7	-
98	66.612423	00	+ 25	-25 to +70	TCXO	12.7	-
99	79.924863	00	+ 65	-20 to +80	OCXO	12.7	-

#### **NOTES**

1. Full electrical and physical characteristics are given in the individual Tables 1(a) at the end of this specification.



Rev. 'A'

PAGE 9

ISSUE 3

## **TABLE 1(b) - MAXIMUM RATINGS**

No.	Characteristic	Symbol	Values	Unit	Remarks
1	Nominal Frequency Range	f	4.0 to 140	MHz	Note 1
2	Drive Level Range	Р	Note 1	mW	
3	Operating Temperature Range	T <sub>op</sub>	-	°C	Note 2
4	Storage Temperature Range	T <sub>stg</sub>	-65 to +125	°C	Note 3
5	Soldering Temperature	T <sub>sol</sub>	+ 260	°C	Note 4

# NOTES 1.

Fundamental and Overtone Order	Approx. Frequency Range (MHz)	Drive Level Range (mW)
Fundamental	4 - 35	0.05 to 0.2
3	30 - 100	0.05 to 0.25
5	80 - 140	0.05 to 0.25

- 2. See Table 1(a).
- 3. The duration at maximum storage temperature shall not exceed 16 hours.
- 4. Duration 10 seconds maximum at a distance of not less than 3.0mm from the device body and the same lead shall not be resoldered until 3 minutes have elapsed.



PAGE 10

ISSUE 3

# TABLE 1(c) - FORMAT FOR INDIVIDUAL TABLES 1(a) TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO.

Limits No. Characteristic Symbol Unit Remarks Min. Max Resonance Frequency MHz Note 1 1 fr or fL °C 2 Reference Temperature  $T_{o}$ Note 2 3 Overtone Order 4 Load Capacitance  $C_L$ ρF Note 3 5 Rated Drive Level  $P_o$ mW Note 4 10-6 At To °C Note 5 6 Frequency Adjustment <u>Δ f</u> Tolerance 7 Resonance Resistance  $R_r$  or  $R_l$ Ω At To °C Note 6 From frequency measured at T<sub>o</sub> °C Frequency Variation 10-9 8  $\frac{\Delta f}{f}$ with Temperature over Top Note 7 Resistance Variation 9  $\frac{\Delta R}{R}$ % From resistance with Temperature measured at To °C Note 7 over Top 10 Operating Temperature °C  $T_{op}$ Range 11 Frequency variation 10-6 From  $P_{S1} =$ mW with Drive Level mW  $P_{S2} =$ Note 8 12 Resistance variation % From  $P_{S1} =$ mW <u>∆ R</u> with Drive Level to mW  $P_{S2} =$ Note 8 13 Motional Inductance mΗ Notes 9 and 10  $L_1$ fF 14 Motional Capacitance  $C_1$ Note 9 рF 15 Static Capacitance Note 9  $C_{o}$ Q 16 Q Factor Notes 9 and 11 17 Ratio of unwanted: In the frequency Response Resistance to range: fkHz Resonance Resistance  $R_p/R$ to kHz Response Impedance to  $|Z_p|/R$ Resonance Resistance 18 Ageing  $\Delta f$ 10-6 Note 13 f 19 L Terminal length Note 14 mm Intended Application Note 16

NOTES: See Pages 11 and 12.



PAGE 11

ISSUE 3

#### **NOTES TO TABLE 1(c)**

- 1. (a) If C<sub>L</sub> is not specified, Symbol and measurement shall be f<sub>r</sub>.
  - (b) If C<sub>L</sub> is specified, Symbol and measurement shall be f<sub>L</sub>.

#### 2. Reference Temperature To

- (a) For a crystal unit functioning in a non-controlled temperature environment, the reference temperature is normally +25 ±2 °C.
- (b) For a crystal unit functioning in a controlled temperature environment, the reference temperature shall normally be the mid-point of the temperature range of the controlled environment.

#### 3. Load Capacitance CL

- (a) When a crystal unit must function at its series resonance frequency, C<sub>L</sub> shall be infinite.
- (b) When a crystal must function with a load capacitance, the C<sub>L</sub> value shall be specified. The standard values of load capacitance are as follows:
- Fundamental Frequency Operation: 20pF, 30pF, 50pF and 100pF.
- Overtone Operation: 8pF, 12pF, 15pF, 20pF and 30pF.

#### N.B

The tolerance on the load capacitance shall be that value which results in a frequency change not exceeding 10% of the frequency tolerance at  $T_0$  or 1% of the nominal load capacitance, whichever is smaller.

#### Rated Drive Level Po

The rated drive level shall be selected from the standard drive levels specified below:

- Preferred values: 2mW, 1mW, 0.5mW, 0.2mW, 0.1mW, 0.05mW, 0.02mW, 0.01mW, 0.001mW or 0.0001mW at ±20%.
- Non-preferred values: 10mW, 5mW and 4mW all at ±20%.

#### 5. Frequency Adjustment Tolerance

- (a) When a crystal must function at its series resonance frequency, the standard value of the adjustment tolerance shall be  $\pm 10 \times 10^{-6}$ .
- (b) When a crystal has to function with a load capacitance, the standard value of the adjustment tolerance shall also be ±10 x 10<sup>-6</sup>. However, if the load capacitance is adjustable, it is preferable to specify that the nominal frequency be obtained with a load capacitance value between the minimum and maximum value when the crystal is functioning in its fundamental mode.

#### 6. Resonance Resistance

(a) Generally, the maximum value only is specified.

(b) 
$$R_L$$
 may be calculated by  $R_L = R_r \left( 1 + \frac{C_0}{C_L} \right)^2$ 

#### 7. Frequency and Resistance Variation with Temperature

These values shall be specified such that they are consistent with the operating temperature range.

#### 8. Frequency and Resistance Variation with Drive Level

These limits and the Drive Level range ( $P_{S1}$  to  $P_{S2}$ ) shall be specified for very special crystals only (i.e. crystals used in very high stability oscillators).



PAGE 12

ISSUE 3

#### **NOTES TO TABLE 1(c) (Continued)**

#### 9. Electrical Values

The electrical values shall be specified only when required for the correct functioning of the equipment in which the crystal is used.

#### 10. Motional Inductance L<sub>1</sub>

Because the inductance value may be restricted by other chosen parameters, the Manufacturer shall propose the value of L<sub>1</sub> in accordance with the Customer's requirements.

#### 11. 'Q' Factor

If 'R' and 'L' have been already specified, it will not be necessary to specify the minimum value of the 'Q' factor.

The maximum value of the 'Q' factor is never specified.

#### 12. Ratio of Unwanted Response Resistance to Resonance Resistance

The standard minimum value is 2, but it is possible to obtain higher values.

The frequency range within which the minimum value of the ratio is required shall also be specified.

#### 13. Ageing

Specify limits under appropriate column and ageing period under "Remarks".

#### 14. Terminal Lengths

To be specified if different from Figure 2 dimensions. If dimensions are as per Figure 2 then "Figure 2" to be entered in the Limits column.

#### 15. Not applicable Items

For all items where limits are not specified, "Not applicable" shall be entered in the Limits column.

#### 16. Intended Application

For definitions of the selected symbol to be added, see ESCC Generic Specification No. 3501, Para. 3.



PAGE 13

ISSUE 3

#### **FIGURE 1 - PARAMETER DERATING INFORMATION**

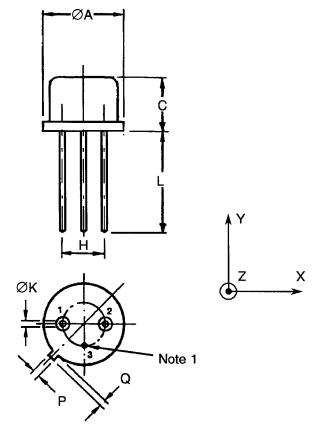
Not applicable.

#### **FIGURE 2 - PHYSICAL DIMENSIONS**

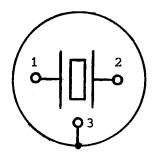
Cumbal	Millim	etres	Remarks	
Symbol	Min.	Max.	Hemarks	
ØA	-	10.70	-	
С	-	6.80	-	
Н	4.83	5.33	Pitch 5.08mm	
ØK	0.40	0.48	- -	
L	12.70	-	-	
Р	_	0.90	Note 2	
Q	-	0.95	Note 2	

#### **NOTES**

- 1. Lead No.3 is grounded to case.
- 2. The tag's position or presence is optional.



## **FIGURE 3 - FUNCTIONAL DIAGRAM**



(Bottom View)



PAGE 14

ISSUE 3

#### 2. APPLICABLE DOCUMENTS

The following documents form part of this specification and shall be read in conjunction with it:-

(a) ESCC Generic Specification No. 3501 for Quartz Crystal Units.

#### 3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESCC Basic Specification No. 21300 shall apply. In addition, the following symbols are used:-

Resonance Frequency  $= f_r$  $= f_L$ Load Resonance Frequency  $= T_o$ Reference Temperature  $= R_r$ Resonance Resistance Load Resonance Resistance  $= R_L$ = Po Rated Drive Level  $= C_0$ Static Capacitance  $= C_L$ Load Capacitance Motional Capacitance = C<sub>1</sub>  $= L_1$ Motional Inductance Response Resistance  $= R_P$ Response Impedance  $= |Z_{P}|$ Insulation Resistance = Ri

#### 4. REQUIREMENTS

#### 4.1 GENERAL

The complete requirements for procurement of the crystal units specified herein shall be as stated in this specification and ESCC Generic Specification No. 3501 for Quartz Crystal Units. Deviations from the Generic Specification applicable to this specification only, are detailed in Para. 4.2.

Deviations from the applicable Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESCC requirements and do not affect the components' reliability, are listed in the appendices attached to this specification.

#### 4.2 DEVIATIONS FROM GENERIC SPECIFICATION

#### 4.2.1 Deviations from Special In-process Controls

None.

#### 4.2.2 <u>Deviations from Final Production Tests (Chart II)</u>

None.

#### 4.2.3 <u>Deviations from Burn-in Tests (Chart III)</u>

None.

#### 4.2.4 Deviations from Qualification Tests (Chart IV)

None.

#### 4.2.5 Deviations from Lot Acceptance Tests (Chart V)

None.



PAGE 15

ISSUE 3

#### 4.3 <u>MECHANICAL REQUIREMENTS</u>

#### 4.3.1 Dimension Check

The dimensions of the crystal units specified herein shall be checked. They shall conform to those shown in Figure 2.

#### 4.3.2 Weight

The maximum weight of the crystal units specified herein shall be 2.0 grammes.

#### 4.3.3 Robustness of Terminations

The requirements for robustness of termination testing are specified in Section 9 of ESCC Generic Specification No. 3501.

#### 4.4 MATERIALS AND FINISHES

The materials and finishes shall be as specified herein. Where a definite material is not specified, a material which will enable the crystal units specified herein to meet the performance requirements of this specification shall be used. Acceptance or approval of any constituent material does not guarantee acceptance of the finished product.

#### 4.4.1 Case

#### 4.4.1.1 Cap

Copper, nickel plated or nickel and gold plated.

#### 4.4.1.2 Base

Kovar, nickel plated and gold plated.

#### 4.4.2 Lead Material and Finish

The lead material shall be Type 'D' with Type '2' finish in accordance with the requirements of ESCC Basic Specification No. 23500.

#### 4.5 MARKING

#### 4.5.1 General

The marking of all components delivered to this specification shall be in accordance with the requirements of ESCC Basic Specification No. 21700 and the following paragraphs. When the component is too small to accommodate all of the marking specified, as much as space permits shall be marked and the marking information, in full, shall accompany the component in its primary package.

The information to be marked and the order of precedence, shall be as follows:-

- (a) The ESCC Component Number.
- (b) Characteristics.
- (c) Traceability Information.

#### 4.5.2 The ESCC Component Number

Each component shall bear the SCC Component Number, which shall be constituted and marked as follows:
350100801B

Detail Specification Number —	
Type variant, (see Table 1(a))	
Testing level (B or C, as applicable)	



PAGE 16

ISSUE 3

#### 4.5.3 Characteristics

The resonance frequency of the crystal units shall be clearly specified in MHz. Where necessary, it shall be specified to 6 decimal places.

#### 4.5.4 Traceability Information

Each component shall be marked in respect of traceability information in accordance with the requirements of ESCC Basic Specification No. 21700.

#### 4.5.5 Manufacturer's Name, Symbol or Code

The Manufacturer's marking shall be in accordance with the requirements of ESCC Basic Specification No. 21700.

#### 4.6 ELECTRICAL MEASUREMENTS

#### 4.6.1 Electrical Measurements at Reference Temperature

The parameters to be measured in respect of electrical characteristics are scheduled in Table 2. The measurements shall be performed at the temperatures specified in the individual Tables 1(a), Item 2.

#### 4.6.2 Electrical Measurements at High and Low Temperatures

The parameters to be measured at high and low temperatures are scheduled in Table 3. These measurements shall only be performed if values are specified in Table 1(a) Items 8 and/or 9.

#### 4.6.3 Circuits for Electrical Measurements (Figure 4)

Not applicable.

#### 4.7 BURN-IN TESTS

#### 4.7.1 Parameter Drift Values

The parameter drift values applicable to burn-in are specified in Table 4 of this specification. Unless otherwise stated, measurements shall be performed at  $T_{amb} = T_0 \pm 2$  °C. The parameter drift values (Delta) applicable to the scheduled parameters shall not be exceeded. In addition to these drift value requirements for a given parameter, the appropriate limit value specified in Table 2 shall not be exceeded.

#### 4.7.2 Conditions for Burn-in

The requirements for burn-in are specified in Section 7 of ESCC Generic Specification No. 3501. The conditions for burn-in shall be as specified in Table 5 of this specification.

#### 4.7.3 <u>Electrical Circuits for Burn-in (Figure 5)</u>

Not applicable.



PAGE 17

ISSUE 3

# TABLE 2 - ELECTRICAL MEASUREMENTS AT REFERENCE TEMPERATURE

No.	Characteristics	Symbol	ESCC 3501 Test Method	Limits	Unit
1	Resonance frequency at reference temperature and rated drive level - with C <sub>O</sub> - with C <sub>L</sub>	f <sub>r</sub> (T <sub>o</sub> , P <sub>o</sub> ) f <sub>L</sub> (T <sub>o</sub> , P <sub>o</sub> )	Para. 9.2.1.1	Table 1(a), Item 1 ± Item 6	MHz
2	Resonance resistance at reference temperature and rated drive level - with C <sub>O</sub> - with C <sub>L</sub>	R <sub>r</sub> (T <sub>o</sub> , P <sub>o</sub> ) R <sub>L</sub> (T <sub>o</sub> , P <sub>o</sub> )	Para. 9.2.1.1	Table 1(a), Item 7	Ω
3	Frequency variation with Drive Level	$\frac{\Delta f}{f}$ (T <sub>o</sub> , $\Delta P$ )	Para. 9.2.1.1	Table 1(a), Item 11	10 <sup>-6</sup>
4	Resistance variation with Drive Level	$\frac{\Delta R}{R}$ (T <sub>0</sub> , $\Delta P$ )	Para. 9.2.1.1	Table 1(a), Item 12	%
5	Motional Inductance	L <sub>1</sub>	Para. 9.2.1.3	Table 1(a), Item 13	mH
6	Static Capacitance	Co	Para. 9.2.1.4	Table 1(a), Item 15	pF
7	Unwanted response	R <sub>P</sub> /R or IZ <sub>P</sub> I/R	Para. 9.2.1.5	Table 1(a), Item 17	-
8	Insulation Resistance	Ri	Para. 9.2.1.6	500 Min.	МΩ



PAGE 18

ISSUE 3

#### TABLE 3 - ELECTRICAL MEASUREMENTS AT HIGH AND LOW TEMPERATURES

No.	Characteristics	Symbol	ESCC 3501 Test Method	Limits	Unit
9	Frequency variation with Temperature over Top	$\frac{\Delta f}{f}$ ( $\Delta T$ , $P_0$ )	Para. 9.2.1.2	Table 1(a) Item 8	10 <sup>-6</sup>
10	Resistance variation with Temperature over Top	$\frac{\Delta R}{R}$ ( $\Delta T$ , $P_o$ )	Para. 9.2.1.2	Table 1(a) Item 9	%

#### FIGURE 4 - CIRCUITS FOR ELECTRICAL MEASUREMENTS

Not applicable.

#### **TABLE 4 - PARAMETER DRIFT VALUES**

No.	Characteristics	Symbol	Spec. and/or Test Method	Test Conditions	Change Limits (Δ)	Unit
1	Resonance frequency drift	Δf f	As per Table 2	As per Table 2	± 2.0	10 <sup>-6</sup>
2	Resonance resistance drift	ΔR R	As per Table 2	As per Table 2	± 10 or (1) ± 1.0	% Ω

#### **NOTES**

#### TABLE 5 - CONDITIONS FOR BURN-IN AND LIFE TEST

No.	Characteristics	Symbol	Condition	Unit
1	Ambient Temperature	T <sub>amb</sub>	+85 ±5	۰Ĉ

#### FIGURE 5 - ELECTRICAL CIRCUIT FOR BURN-IN AND LIFE TEST

Not applicable.

<sup>1.</sup> Whichever is the highest value.



PAGE 19

ISSUE 3

# 4.8 <u>ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESCC GENERIC SPECIFICATION NO. 3501)</u>

#### 4.8.1 Measurements and Inspections on Completion of Environmental Tests

The parameters to be measured and inspections to be performed on completion of environmental tests are scheduled in Table 6. Unless otherwise stated, the measurements shall be performed at  $T_{amb} = T_0 \pm 2$  °C.

#### 4.8.2 Measurements and Inspections at Intermediate Points and on Completion of Endurance Tests

The parameters to be measured and inspections to be performed at intermediate points and on completion of endurance tests are scheduled in Table 6. Unless otherwise stated, the measurements shall be performed at  $T_{amb} = T_0 \pm 2$  °C.

#### 4.8.3 Conditions for Operating Life Test (Part of Endurance Testing)

The requirements for the operating life test are specified in Section 9 of ESCC Generic Specification No. 3501. The test shall be performed as a high temperature storage test and the temperature to be applied shall be the maximum operating temperature specified in the individual Tables 1(a) given in this specification.



PAGE 20

ISSUE 3

# TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL TESTS AND AT INTERMEDIATE POINTS AND ON COMPLETION OF ENDURANCE TESTING

	ESCC GENERIC SP	EC. NO. 3501	MEASUREMENTS A	ND INSPECTIONS	:	LIM	ITS	
NO.	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS	SYMBOL	Min.	Max.	UNIT
01	Electrical Measurements at Reference Temperature	Para. 9.2.4	Electrical Measurements	Table 2		Table	e 1(a)	
02	Shock	Para. 9.3	Initial Measurements Resonance Frequency Resonance Resistance Final Measurements Resonance Frequency Drift Resonance Resistance Drift	Table 2 Item 1 Table 2 Item 2 Table 2 Item 1 Table 2 Item 2	f R <u>Δf</u> f <u>ΔR</u> R ΔR		2 Item 1 2 Item 2 +1.0 +10 +1.0	10 <sup>-6</sup> % Ω
03	Vibration	Para. 9.4	Initial Measurements Resonance Frequency Resonance Resistance Final Measurements Resonance Frequency Drift Resonance Resistance Drift	Table 2 Item 1 Table 2 Item 2 Table 2 Item 1 Table 2 Item 2	f R Δf f ΔR R ΔR		2 Item 1 2 Item 2 +1.0 +10 +1.0	10 <sup>-6</sup> % Ω
04	Seal Test	Para. 9.5	Fine Leak Gross Leak	Para. 9.5.1 Para. 9.5.2			. 9.5.1 . 9.5.2	
05	Permanence of Marking	Para. 9.8	Final Measurements Visual Examination	No corrosion or obliteration of marking	_	-	-	-
06	External Visual Inspection	Para. 9.9	Final Measurements Visual Inspection	ESCC No. 20500	-		<u>-</u>	
07	Solderability	Para. 9.13	-	-	-	-	-	-

#### **NOTES**

- 1. The tests in this table refer to either Chart IV or V, and shall be used as applicable.
- 2. Whichever is the highest value.



PAGE 21

ISSUE 3

# TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL TESTS AND AT INTERMEDIATE POINTS AND ON COMPLETION OF ENDURANCE TESTING (Cont.)

	ESCC GENERIC SP	EC. NO. 3501	MEASUREMENTS AN	ID INSPECTIONS		LIM	ITS	
NO.	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS	SYMBOL	Min.	Max.	UNIT
	Climatic Sequence	Para. 9.14						
08	Dry Heat	Para. 9.14.1	Initial Measurements					İ
			Resonance Frequency	Table 2 Item 1	f	Table 2		i
			Resonance Resistance	Table 2 Item 2	R	l able 2	! Item 2	
1			Final Measurements	Table 2 Item 1	۸.	- 2.0	+ 2.0	10-6
			Resonance Frequency Drift	Table 2 Helli T	$\frac{\Delta f}{f}$	-2.0	¥ 2.0	10 0
			Resonance Resistance	Table 2 Item 2	ΔR	-10	+10	%
			Drift	Table E Rom E	R	or (2)		,~
İ					ΔR	- 1.0	+ 1.0	Ω
09	Cold	Para. 9.14.3	Initial Measurements		ļ			
1			Resonance Frequency	Table 2 Item 1	f	Para. 9	0.14.1.3	
			Resonance Resistance	Table 2 Item 2	R	Final Mea	surements	
			Final Measurements		1			
			Resonance Frequency	Table 2 Item 1	$\Delta f$	-2.0	+ 2.0	10-6
			Drift	T-61- 0 H 0	l f		. 10	١ ,,
			Resonance Resistance	Table 2 Item 2	ΔR R	-10	+10	%
			Drift		ΔR	or (2) -1.0	+1.0	Ω
10	Damp Heat (Acclerated)	Para. 9.14.4	Initial Measurements		411		. 1.0	32
'0	Remaining Cycles	1 616. 5.14.4	Resonance Frequency	Table 2 Item 1	f	Para. 9	9.14.3.2	
ĺ	Tromaining Cycles		Resonance Resistance	Table 2 Item 2	R	Final Mea	surements	
1			Final Measurements					
ļ			Resonance Frequency	Table 2 Item 1	<u>Δ f</u>	- 2.0	+ 2.0	10 <sup>-6</sup>
			Drift		f f	1		
1			Resonance Resistance	Table 2 Item 2	$\frac{\Delta R}{R}$	-10	+10	%
İ	l		Drift	1	R ∆R	or (2) - 1.0	+ 1.0	Ω
1			Insulation Resistance	Table 2 Item 8	An	500	- 1.0	MΩ
			modiation resistance	Table 2 Rem o	- "	300		10100
11	Rapid Change of	Para. 9.15	Initial Measurements		ļ	ļ.		1
	Temperature		Resonance Frequency		f		9.14.4.2	
			Resonance Resistance	l '	R	Final Mea	asurements	1
			Final Measurements	After minimum				
1			Resonance Frequency	Recovery of 2 hour Table 2 Item 1		-2.0	+ 2.0	10-6
1			Drift	I able 2 Item I	$\frac{\Delta f}{f}$		1 2.0	""
1			Resonance Resistance	Table 2 Item 2	$\Delta R$	-10	+ 10	%
			Drift		R	or (2)		~
		1			ΔR	-1.0	+ 1.0	Ω
12	Debugges of	Para. 9.16	Tongilo Strongth	Gen. 3501				
12	Robustness of Terminations	Para. 9.16	Tensile Strength	Para. 9.16.1		1		
	i eminauons	1	Visual Examination	No visible damage	, [			
		1	Bending	Gen. 3501				
			,	Para. 9.16.2				
ĺ			Visual Examination	No visible damage	9		1	

#### **NOTES**

- 1. The tests in this table refer to either Chart IV or V, and shall be used as applicable.
- 2. Whichever is the highest value.



PAGE 22

ISSUE 3

#### TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL TESTS AND AT INTERMEDIATE POINTS AND ON COMPLETION OF ENDURANCE TESTING (Cont.)

	ESCC GENERIC SP	EC. NO. 3501	MEASUREMENTS AND IN	SPECTIONS	OVALDO!	LIM	ITS	UNIT
NO.	ENVIRONMENTAL AND TEST METHOD ENDURANCE TESTS (1) AND CONDITIONS		IDENTIFICATION	CONDITIONS	SYMBOL	Min.	Max.	UNIT
13	Life Test	Para. 9.17	Initial Measurements					
			Resonance Frequency	Table 2 Item 1	f	Table 2	Item 1	
			Resonance Resistance	Table 2 Item 2	R	Table 2	Item 2	
			Intermediate Measurements	At 500 hours		,	i	
			Resonance Frequency Drift	Table 2 Item 1	<u>Δ f</u> f	- 2.0	+ 2.0	10 <sup>-6</sup>
1			Resonance Resistance	Table 2 Item 2	<u>Δ R</u>	-10	+10	%
			Drift		R	or (2)		
1					ΔR	<del>-</del> 1.0	+1.0	Ω
			Intermediate Measurements (Chart IV) and Final	At 1000 hours				
1			Measurements (Chart V)					l
			Resonance Frequency Drift	Table 2 Item 1	$\frac{\Delta f}{f}$	- 2.5	+ 2.5	10-6
			Resonance Resitance Drift	Table 2 Item 2	<u>Δ R</u> R	-10 or (2)	+10	%
		İ			ΔR	- ì.ó	+1.0	Ω
			Final Measurements (Chart IV)	At 2000 hours				
			Resonance Frequency Drift	Table 2 Item 1	Δf f	-3.0	+3.0	10-6
			Resonance Resistance	Table 2 Item 2	Δ <u>R</u> R	-10 or (2)	+10	%
			Sinc.		ΔR	- 1.0	+1.0	Ω

- The tests in this table refer to either Chart IV or V, and shall be used as applicable.
   Whichever is the highest value.



PAGE 23

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	83.10	2493	MHz	Swept
2	Reference Temperature	To	+ 24	+ 26	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	Δf f	-5.0	+5.0	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-9.0	+ 9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not ap	plicable	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R	Not applicable			
18	Ageing	$\frac{\Delta f}{f}$	-3.0 -5.0	+3.0 +5.0	10 <sup>-6</sup>	After burn-in, first year. Over 10 years.
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 24

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	iits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	84.41	2668	MHz	Swept
2	Reference Temperature	To	+ 24	+26	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	o	<b>o</b>	рF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-5.0	+5.0	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u>	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u>	Not app	olicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not ap	olicable	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R	2:1	_		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0 -5.0	+3.0 +5.0	10-6	After burn-in, first year. Over 10 years.
19	Terminal Length	L	Figu	ire 2	mm	



PAGE 25

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	90.83	3333	MHz	Swept
2	Reference Temperature	To	+ 24	+ 26	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	٥	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+ 5.0	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	19	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	Тор	-20	+ 70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L <sub>1</sub>	2.3	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	70 000		-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	_		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0 -5.0	+ 3.0 + 5.0	10 <sup>-6</sup>	After burn-in, first year. Over 10 years.
19	Terminal Length	L	Figu	ire 2	mm	



PAGE 26

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	90.85	7143	MHz	Swept
2	Reference Temperature	T <sub>o</sub>	+24	+ 26	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	٥	o	рF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5.0	+ 5.0	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	19	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	-9.0	+ 9.0	10 <sup>-6</sup>	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-20	+ 20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	Δf f	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.3	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0 -5.0	+3.0 +5.0	10-6	After burn-in, first year. Over 10 years.
19	Terminal Length	L	Figu	ire 2	mm	



PAGE 27

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	90.88	0952	MHz	Swept
2	Reference Temperature	To	+ 24	+26	ô	
3	Overtone Order	•		3		
4	Load Capacitance	CL	o	o	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5.0	+ 5.0	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	•	19	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.3	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0 -5.0	+3.0 +5.0	10-6	After burn-in, first year. Over 10 years.
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 28

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	50	.0	MHz	Swept
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	•	3	3		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	23	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	Тор	-20	+ 70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	olicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	8.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	110 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R	2:1	-		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10 <sup>-6</sup>	After burn-in and per year
19	Terminal Length	L	Figu	ire 2	mm	



PAGE 29

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	85.41	2668	MHz	Swept, AT cut
2	Reference Temperature	To	+ 59	+71	°C	
3	Overtone Order	-	5			
4	Load Capacitance	C <sub>L</sub>	00		pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+ 5.0	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	R <sub>r</sub>		50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-2.0	+ 2.0	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	+ 59	+ 71	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not app	olicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	olicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	70 000	-	_	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	$\frac{\Delta f}{f}$	-1.0	+ 1.0	10-6	After burn-in and over 10 years
19	Terminal Length	L	Figu	ire 2	mm	



PAGE 30

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	93.988095		MHz	Swept
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	•	3			
4	Load Capacitance	CL	<b>∞</b>		pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5.0	+ 5.0	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	17	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	<u>∆ f</u> f	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not applicable		%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	•	3.0	pF	
16	Q Factor	Q	70 000	_	_	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	<u>∆</u> f	-3.0 -5.0	1	10-6	After burn-in, first year. Over 10 years.
19	Terminal Length	L	Figure 2		mm	

PAGE 31

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	94	.0	MHz	Swept
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	∞		pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5.0	+5.0	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	17	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u>	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not applicable		%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R	2:1	-		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> +50kHz
18	Ageing	∆ f f	-3.0 -5.0	+3.0 +5.0	10-6	After burn-in, first year. Over 10 years.
19	Terminal Length	L	Figu	Figure 2		

PAGE 32

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limits		Unit	Remarks
140.	Onaraciensucs	Symbol	Min.	Max.	O	Tomano
1	Resonance Frequency	f <sub>r</sub>	94.095238		MHz	Swept
2	Reference Temperature	T <sub>o</sub>	+23	+ 27	°C	
3	Overtone Order	-	3	3		·
4	Load Capacitance	CL	∞		pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+5.0	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	4	17	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not applicable		%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0 -5.0	+3.0 +5.0	10-6	After burn-in, first year. Over 10 years.
19	Terminal Length	L	Figure 2		mm	

PAGE 33

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limits Min. Max.		Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	94.107143		MHz	Swept
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	ω		pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5.0	+ 5.0	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	17	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.5	pF	
16	Q Factor	Q	70 000	_	_	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> +50kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0 -5.0	+3.0 +5.0	10-6	After burn-in. Over 10 years
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 34

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f∟	18.8875		MHz	
2	Reference Temperature	T <sub>o</sub>	+ 2	25	°C	
3	Overtone Order	-	Fundamental			
4	Load Capacitance	CL	32		pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-5.0	+5.0	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	$R_{L}$	-	21	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-7.0	+ 7.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	∆R R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	Δf f	Not applicable		10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not applicable		%	
13	Motional Inductance	L <sub>1</sub>	-	6.93	mH	
14	Motional Capacitance	C <sub>1</sub>	Not app	olicable	fF	
15	Static Capacitance	Co	-	3.0	pF	
16	Q Factor	Q	60 000		-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	3:1	-		In the frequency range: f <sub>L</sub> -200kHz to f <sub>L</sub> + 200kHz
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+ 5.0	10-6	After burn-in, per year
19	Terminal Length	L	Figure 2		mm	

PAGE 35

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	16.0		MHz	
2	Reference Temperature	T <sub>o</sub>	+ 23	+ 27	°C	
3	Overtone Order	_	Fundamental			
4	Load Capacitance	C <sub>L</sub>	∞		pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+10	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	18	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	-15	+15	10 <sup>-6</sup>	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-10 c -1.5	+ 10 or + 1.5	% Ω	From resistance measured at T <sub>0</sub> °C If R<10Ω
10	Operating Temperature Range	T <sub>op</sub>	-40	+ 85	°C	
11	Frequency variation with Drive Level	∆ f f	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	7.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	60 000		-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R	2:1	-		In the frequency range: f <sub>r</sub> -200kHz to f <sub>r</sub> + 200kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	After burn-in, per year
19	Terminal Length	L	Figure 2		mm	



PAGE 36

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	Max.	Unit	Remarks
1	Resonance Frequency	f∟	24.6	24.6862		
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Fundai	mental		
4	Load Capacitance	CĹ	3	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-10	+10	10-6	At To °C
7	Resonance Resistance	RL	-	10	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	-10	+10	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u>	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.7	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	40 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R	4:1 5:1	-		In the frequency range: fL -50kHz to fL + 50kHz  Overtones 3 and 5
18	Ageing	Δf f	-2.9	+2.9	10-6	After burn-in, over 4 years
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 37

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	110.	110.045		Swept.
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	5	5		AT cut.
4	Load Capacitance	CL	0	Ô	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5.0	+ 5.0	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	45	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-10	+10	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+ 10	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-25	+ 70	ပိ	
11	Frequency variation with Drive Level	<u>Δ f</u>	Not ap	olicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L <sub>1</sub>	4.5	5.5	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.0	pF	
16	Q Factor	Q	80 000	•	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	Δf f	-0.5 -1.0	+ 0.5 + 1.0	10-6	First year after burn-in. Over 5 years
19	Terminal Length	L	Figu	ıre 2	mm	

PAGE 38

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	fL	110.	110.765		Swept
2	Reference Temperature	T <sub>o</sub>	+ 23	+ 27	°C	
3	Overtone Order	-	5	5		AT cut
4	Load Capacitance	C <sub>L</sub>	٥	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-5.0	+ 5.0	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	45	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-10	+10	10-6	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	4.5	5.5	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.0	pF	
16	Q Factor	Q	80 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	<u>Δ f</u> f	-0.5 -1.0	+ 0.5 + 1.0	10-6	First year after burn-in. Over 5 years
19	Terminal Length	L	Figu	ıre 2	mm	

PAGE 39

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	fL	27.5		MHz	
2	Reference Temperature	T <sub>o</sub>	+ 23	+27	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	3	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+ 10	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	20	Ω	At To °C
8	Frequency Variation with Temperature over Top	$\frac{\Delta f}{f}$	-10	+10	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-10	+10	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+50	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	80 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>L</sub> -10% to f <sub>L</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-10	+10	10 <sup>-6</sup>	Over 10 years
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 40

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lin Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	98.85	98.852381		
2	Reference Temperature	T <sub>o</sub>	+ 20	+30	°C	
3	Overtone Order	-	Ę	5		
4	Load Capacitance	CL	C	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+ 5.0	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-25	+70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	90 000	•	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -10% to f <sub>r</sub> + 10%
18	Ageing	∆ f f	-3.0 -5.0	+3.0 +5.0	10 <sup>-6</sup>	After burn-in, first year. Over 10 years
19	Terminal Length	L	Figu	ire 2	mm	



PAGE 41

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	92.84	92.846032		
2	Reference Temperature	T <sub>o</sub>	+20	+30	°C	
3	Overtone Order	•	5	5		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5.0	+5.0	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	•	50	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	∆R R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	90 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	_		In the frequency range: f <sub>r</sub> -10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0 -5.0	+3.0 +5.0	10-6	After burn-in, first year. Over 10 years
19	Terminal Length	L	Figu	ure 2	mm	



PAGE 42

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lin Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	88.13	34921	MHz	PQ swept
2	Reference Temperature	To	+ 20	+ 30	°C	
3	Overtone Order	-	;	5		
4	Load Capacitance	C <sub>L</sub>	c	<b>x</b> 0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-5.0	+ 5.0	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	_	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	_	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	70 000	-	_	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R	2:1	_		In the frequency range: f <sub>r</sub> -8 000kHz to f <sub>r</sub> +8 000kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0 -5.0	+3.0 +5.0	10 <sup>-6</sup>	After burn-in, first year. Over 10 years
19	Terminal Length	L	Figu	ire 2	mm	



PAGE 43

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lin Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	84	84.0		
2	Reference Temperature	T <sub>o</sub>	+ 65	+ 75	°C	Turn-on Point
3	Overtone Order	-	**	3		
4	Load Capacitance	C <sub>L</sub>	o	o	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5.0	+ 5.0	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	Not ap	oplicable	10 <sup>-6</sup>	
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	Тор	-20	+80	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -8 000kHz to f <sub>r</sub> +8 000kHz
18	Ageing	<u>∆ f</u> f	-5.0	+ 5.0	10 <sup>-6</sup>	After burn-in and over 10 years
19	Terminal Length	L	Figu	ire 2	mm	



PAGE 44

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lin Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	fL	15	15.0		
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	18	32	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	Not ap	olicable	10 <sup>-6</sup>	
7	Resonance Resistance	R <sub>r</sub>	-	100	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-40	+ 40	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-55	+ 105	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	80 000	•	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>L</sub> -200kHz to f <sub>L</sub> + 200kHz
18	Ageing	∆ f f	-2.0	+2.0	10 <sup>-6</sup>	After burn-in, per year
19	Terminal Length	L	Figu	ire 2	mm	



PAGE 45

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Limits			
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	40.	40.0		Swept
2	Reference Temperature	T <sub>o</sub>	+36	+ 44	°C	
3	Overtone Order		3			
4	Load Capacitance	CL	α	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	R <sub>r</sub>	10	25	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	-15	+ 15	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	0	+90	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	-1.0	+ 1.0	10 <sup>-6</sup>	From $P_{S1} = 0.05 \text{mW}$ to $P_{S2} = 0.2 \text{mW}$
12	Resistance variation with Drive Level	ΔR R	Not ap	olicable	%	
13	Motional Inductance	L <sub>1</sub>	5.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	50 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or	Rp/R	4:1	-	-	In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> +50kHz
	Response Resistance Response Resistance	Rp Rp	2.5 25	-	Ω Ω	Fundamental Overtone 5
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+5.0	10 <sup>-6</sup>	After burn-in over 5 years
19	Terminal Length	L	Figi	ıre 2	mm	

PAGE 46

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

						T
	Charactoristics	Symbol	Lim	its	Unit	Remarks
No.	Characteristics	Symbol	Min.	Max.	Offic	Remarks
1	Resonance Frequency	f <sub>r</sub>	29.6296		MHz	
2	Reference Temperature	To	+ 36	+ 44	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	C <sub>L</sub>	0		pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	2.5	15	Ω	Over T <sub>op</sub> °C and drive level
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-30	+30	10 <sup>-6</sup>	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-10 c -1.5	+10 or +1.5	% Ω	From resistance measured at $T_0$ °C If R < $10\Omega$
10	Operating Temperature Range	T <sub>op</sub>	0	+ 90	°C	
11	Frequency variation with Drive Level	Δf f	-1.0	+ 1.0	10-6	From $P_{S1} = 0.025 \text{mW}$ to $P_{S2} = 0.2 \text{mW}$
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.8	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	60 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or	Rp/R	4:1	-	-	In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
	Response Resistance	Rp	30	-	Ω	Overtone 3
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	Per year after burn-in
19	Terminal Length	L	Fig	ure 2	mm	

PAGE 47

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	32	32.0		Synthetic swept, Premium Q
2	Reference Temperature	To	+ 23	+ 27	°C	Inflection temp. point
3	Overtone Order	-	3	3		A/T cut
4	Load Capacitance	CL	٥	0	рF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	30	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-10	+10	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C One measurement each 2.5°C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not ap	plicable	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	After burn-in and per year
19	Terminal Length	L	Figi	ure 2	mm	



PAGE 48

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	14.7	14.7456		
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	<u>.</u>	Fundar	mental		A/T cut
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+ 10	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	3.0	15	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	-25	+ 25	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-1.0	+1.0	Ω	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-55	+ 105	°C	
11	Frequency variation with Drive Level	<u>Δ f</u>	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	C <sub>o</sub>	-	7.0	pF	
16	Q Factor	Q	80 000	_	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -200kHz to f <sub>r</sub> + 200kHz
18	Ageing	$\frac{\Delta f}{f}$	-2.0	+2.0	10 <sup>-6</sup>	Per year after burn-in
19	Terminal Length	L	Figi	ure 2	mm	

PAGE 49

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks			
1	Resonance Frequency	fL	12.	12.25		Parallel resonance			
2	Reference Temperature	To	+ 23	+ 27	°C				
3	Overtone Order	-	Fundar	nental		A/T cut			
4	Load Capacitance	C <sub>L</sub>	3:	2	pF				
5	Rated Drive Level	Po	0.	5	mW				
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+ 10	10 <sup>-6</sup>	At T <sub>o</sub> °C			
7	Resonance Resistance	R <sub>r</sub>	-	25	Ω	At To °C			
8	Frequency Variation with Temperature over Top	Δf f	-10	+10	10-6	From frequency measured at T <sub>o</sub> °C			
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-50	+50	%	From resistance measured at T <sub>o</sub> °C			
10	Operating Temperature Range	Тор	-30	+ 70	°C				
11	Frequency variation with Drive Level	Δf f	Not ap	olicable	10 <sup>-6</sup>				
12	Resistance variation with Drive Level	ΔR R	-25	+ 25	%	From $P_{S1} = 0.05$ mW to $P_{S2} = 0.2$ mW			
13	Motional Inductance	L <sub>1</sub>	27	33	mH				
14	Motional Capacitance	C <sub>1</sub>	5.04	6.16	fF				
15	Static Capacitance	Co	-	4.0	pF				
16	Q Factor	Q	30 000	-	-				
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>L</sub> -500kHz to f <sub>L</sub> + 500kHz			
18	Ageing	$\frac{\Delta f}{f}$	-10	+ 10	10 <sup>-6</sup>	After burn-in over 10 years			
19	Terminal Length	L	Figu	ıre 2	mm				



PAGE 50

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	fL	4.096		MHz	
2	Reference Temperature	T <sub>o</sub>	+ 22	+ 28	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	2	5	pF	
5	Rated Drive Level	Po	0.	2	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+10	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	75	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	-50	+50	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-55	+ 100	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	313	348	mH	
14	Motional Capacitance	C <sub>1</sub>	4.34	4.82	fF	
15	Static Capacitance	Co	1.5	2.0	pF	
16	Q Factor	Q	130 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	10:1	-		In the frequency range: f <sub>L</sub> -100kHz to f <sub>L</sub> + 100kHz
18	Ageing	$\frac{\Delta f}{f}$	-10	+10	10 <sup>-6</sup>	2 years at rated drive level
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 51

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	31.99	31.999305		
2	Reference Temperature	T <sub>o</sub>	+ 23	+27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	۵	o	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+ 10	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-10	+10	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-10	+ 10	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+60	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	50 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R	2:1	-		In the frequency range: f <sub>r</sub> -200kHz to f <sub>r</sub> + 200kHz
18	Ageing	$\frac{\Delta f}{f}$	-1.0	+1.0	10-6	After burn-in per year.
19	Terminal Length	L	Figu	ıre 2	mm	

PAGE 52

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Lim	::-		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	74.80	74.801912		
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	•	3	3		
4	Load Capacitance	C <sub>L</sub>	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+ 10	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-25	+ 70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	90 000	-	_	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -7482kHz to f <sub>r</sub> + 7482kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0 -5.0	+3.0 +5.0	10-6	After burn-in, first year. Over 10 years
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 53

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	iits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	78.21	78.217213		
2	Reference Temperature	T <sub>o</sub>	+20	+30	°C	
3	Overtone Order	•	3	3		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	_	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	90 000	_	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -7822kHz to f <sub>r</sub> + 7822kHz
18	Ageing	<u>∆</u> f	-3.0 -5.0	4	10 <sup>-6</sup>	After burn-in, first year. Over 10 years
19	Terminal Length	L	Fig	ure 2	mm	

PAGE 54

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	iits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	81.66	81.66667		
2	Reference Temperature	To	+ 65	+ 75	°C	
3	Overtone Order	-	3	}		
4	Load Capacitance	CL	8	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+10	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	Not app	olicable	10 <sup>-6</sup>	
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not app	olicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	_	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000		-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -8166kHz to f <sub>r</sub> +8166kHz
18	Ageing	∆ f f	-3.0 -5.0	+3.0 +5.0	10-6	After burn-in, first year. Over 10 years
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 55

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	81.80	0766	MHz	
2	Reference Temperature	To	+ 65	+ 75	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	α	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	Not app	olicable	10 <sup>-6</sup>	
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+ 20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+80	°C	
11	Frequency variation with Drive Level	Δf f	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -8180kHz to f <sub>r</sub> + 8180kHz
18	Ageing	<u>∆</u> f	-3.0 -5.0	+3.0 +5.0	10-6	After burn-in, first year. Over 10 years
19	Terminal Length	L	Figu	ire 2	mm	



PAGE 56

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			·			
No.	Characteristics	Symbol	Lim		Unit	Remarks
		- ,	Min.	Max.		
1	Resonance Frequency	f <sub>r</sub>	90.86	9921	MHz	
2	Reference Temperature	T <sub>o</sub>	+20	+30	°C	
3	Overtone Order	•	5	5		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>		50	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	-9.0	+9.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-25	+70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.0	pF	
16	Q Factor	Q	90 000	-	-	_
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	_		In the frequency range: f <sub>r</sub> -9000kHz to f <sub>r</sub> + 9000kHz
18	Ageing	∆ f f	-5.0	+5.0	10 <sup>-6</sup>	After burn-in and 10 years
19	Terminal Length	L	Figi	ure 2	mm	

PAGE 57

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	85.41	85.412668		
2	Reference Temperature	То	+ 59	+71	۰C	
3	Overtone Order	-	5	5		
4	Load Capacitance	C <sub>L</sub>	0	ø	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+5.0	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	45	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-2.0	+2.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-59	+71	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	Not applicable		
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		
18	Ageing	$\frac{\Delta f}{f}$	-1.0	+1.0	10-6	After burn-in and 10 years
19	Terminal Length	L	Figu	ıre 2	mm	

PAGE 58

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		-		— Т		
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	140	140.0		
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	0	70	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-15	+15	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	0	7.0	pF	
16	Q Factor	Q	70 000	-	ŧ	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -200kHz to f <sub>r</sub> + 200kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10 <sup>-6</sup>	After burn-in, per year
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 59

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	81.544502		MHz	
2	Reference Temperature	T <sub>o</sub>	+62	+72	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+ 10	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	Not app	Not applicable		
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20 +20 or -2.0 +2.0		% Ω	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+80	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	0	5.0	pF	
16	Q Factor	Q	70 000	-	_	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -8100kHz to f <sub>r</sub> +8100kHz
18	Ageing	<u>∆ f</u>	-3.0	+3.0	10 <sup>-6</sup>	After burn-in, over 10 years
19	Terminal Length	L	Fig	ure 2	mm	



PAGE 60

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	Limits Min. Max.		Remarks
1	Resonance Frequency	f <sub>r</sub>	81.63	81.632653		
2	Reference Temperature	T <sub>o</sub>	+60	+ 70	°C	
3	Overtone Order	-	3	,	<u></u>	
4	Load Capacitance	C <sub>L</sub>	ο	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+ 10	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	Not applicable		10 <sup>-6</sup>	
9	Resistance Variation with Temperature over Top	ΔR R	-20 c -2.0	+20 or +2.0	% Ω	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	0	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	2:1	-		In the frequency range: f <sub>r</sub> -8163kHz to f <sub>r</sub> + 8163kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0 -5.0	+3.0 +5.0	10 <sup>-6</sup>	After burn-in, first year. Over 10 years
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 61

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	20	20		
2	Reference Temperature	T <sub>o</sub>	+23	+27	°C	
3	Overtone Order	-	Fundar	mental		
4	Load Capacitance	C <sub>L</sub>	3	2	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	RL	-	30	Ω	Over T <sub>op</sub>
8	Frequency Variation with Temperature over Top	∆ f f	-20	+20	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10 or -20	+ 10 or + 20	% Ω	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-30	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	80 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>L</sub> -200kHz to f <sub>L</sub> + 200kHz
18	Ageing	<u>∆ f</u>	-2.0	+2.0	10-6	Per year after Burn-in.
19	Terminal Length	L	Figi	ıre 2	mm	

PAGE 62

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		··· <u> </u>		I		T T
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	83.133333		MHz	
2	Reference Temperature	T <sub>o</sub>	+60	+ 70	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	Not applicable		10 <sup>-6</sup>	
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-25	+80	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> -500kHz to f <sub>r</sub> + 500kHz
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+ 5.0	10-6	13 years after Burn-in - Exterpolated
19	Terminal Length	L	Figu	ure 2	mm	



PAGE 63

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	fL	16.0		MHz	
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order	<u>-</u>	Funda	mental		
4	Load Capacitance	C <sub>L</sub>	3	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	RL	-	20	Ω	Over Top
8	Frequency Variation with Temperature over Top	<u>∆ f</u>	-30	+30	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-22	+90	°C	
11	Frequency variation with Drive Level	<u>∆ f</u>	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	Not ap	oplicable	pF	
16	Q Factor	Q	Not a	applicable	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	Not applicable			
18	Ageing	<u>Δ f</u>	-30	+ 30	10-6	Per year after Burn-in
19	Terminal Length	L	Fig	jure 2	mm	

PAGE 64

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		_	Lim	its		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	20.0		MHz	
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Fundar	nental		:
4	Load Capacitance	CL	œ	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	30	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	- 100	+ 100	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	- 20 or - 2.0	+ 20 or + 2.0	% Ω	From resistance measured at $T_0$ °C If $R \le 10\Omega$
10	Operating Temperature Range	T <sub>op</sub>	-30	+ 95	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	100 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 200kHz to f <sub>r</sub> + 200kHz
18	Ageing	$\frac{\Delta f}{f}$	-2.0	+2.0	10-6	Per year after Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 65

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	01	0	Lim	its	F I in	Damada
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	83.31	83.312841		
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	α		pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	Δf f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	<u>∆ f</u>	Not ap	olicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 8331kHz to f <sub>r</sub> + 8331kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	10 years after Burn-in + Ageing of 720 hours
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 66

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

N1-	Characteristics	Cumbal	Lim	iits	Unit	Remarks
No.	Characteristics	Symbol	Min.	Max.	Onit	Hemarks
1	Resonance Frequency	f <sub>r</sub>	83.31	83.316257		
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	α	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T - 25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	∆R R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 8331kHz to f <sub>r</sub> + 8331kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	10 years after Burn-in + Ageing of 720 hours
19	Terminal Length	L	Figu	ure 2	mm	



PAGE 67

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol -	Lim	its	Unit	Remarks
1.0.	On all additional additional and all additional additio		Min.	Max.		
1	Resonance Frequency	f <sub>r</sub>	83.31	83.319672		
2	Reference Temperature	To	+ 20	+ 30	°C	
3	Overtone Order	-	3			
4	Load Capacitance	C <sub>L</sub>	α		pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆f f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T - 25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	Тор	- 25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 8331kHz to f <sub>r</sub> + 8331kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	10 years after Burn-in + Ageing of 720 hours
19	Terminal Length	L	Fig	ure 2	mm	
'3	Terrima Length		l ''9'	ui 0 2	1 11111	



PAGE 68

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Lim	its		Describe
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	83.32	6503	MHz	
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3	}		
4	Load Capacitance	CL	α	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	<del>-</del> 10	+ 10	10-6	At T <sub>0</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	Δf f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T - 25 to + 10 °C From T + 10 to + 50 °C From T + 50 to + 70 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u>	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 8332kHz to f <sub>r</sub> + 8332kHz
18	Ageing	∆ f f	-3.0	+3.0	10-6	10 years after Burn-in + Ageing of 720 hours
19	Terminal Length	L	Fig	ure 2	mm	



PAGE 69

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			1 :	: I		
No.	Characteristics	Symbol	Lim		Unit	Remarks
			Min.	Max.		
1	Resonance Frequency	f <sub>r</sub>	83.34	0164	MHz	
2	Reference Temperature	T <sub>o</sub>	+20	+30	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	α	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	0 -9.0 -9.0	+ 9.0 + 9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	_	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 8334kHz to f <sub>r</sub> + 8334kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	10 years after Burn-in + Ageing of 720 hours
19	Terminal Length	L	Figi	ıre 2	mm	
		-	•			



PAGE 70

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			- 77 11 11 11 11			
		Courab al	Lim	its	Unit	Remarks
No.	Characteristics	Symbol	Min.	Max.	Offic	riomano
1	Resonance Frequency	f <sub>r</sub>	83.34	6994	MHz	
2	Reference Temperature	To	+ 20	+ 30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	0	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u> f	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	0 -9.0 -9.0	+ 9.0 + 9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at To °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 8334kHz to f <sub>r</sub> + 8334kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	10 years after Burn-in + Ageing of 720 hours
19	Terminal Length	L	Fig	jure 2	mm	
1						



PAGE 71

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Lim	its	11-2	Demode
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	83.35	3825	MHz	
2	Reference Temperature	T <sub>o</sub>	+ 20	+30	°C	
3	Overtone Order	-	3			
4	Load Capacitance	C <sub>L</sub>	α	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u>	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	_	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 8335kHz to f <sub>r</sub> + 8335kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	10 years after Burn-in + Ageing of 720 hours
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 72

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

Ma	Characteristics	Symbol	Lim	nits	Unit	Remarks
No.	Characteristics	Symbol	Min.	Max.	Omt	Hemans
1	Resonance Frequency	f <sub>r</sub>	83.36	0656	MHz	
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	C	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆f f	0 - 9.0 - 9.0	+9.0 +9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	ΔR R	- 20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	·
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 8336kHz to f <sub>r</sub> + 8336kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	10 years after Burn-in + Ageing of 720 hours
19	Terminal Length	L	Fig	ure 2	mm	



PAGE 73

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Lim	its		Describe
No.	Characteristics	Symbol -	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	45.056		MHz	
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	α	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-10	+10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	23	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	<u>∆</u> R R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not app	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	8.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	110 000	_	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or iZ <sub>p</sub> l/R	2:1	-		In the frequency range: f <sub>r</sub> - 4500kHz to f <sub>r</sub> + 4500kHz
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	10 years after Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 74

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim	its	Unit	Remarks
		,	Min.	Max.		
1	Resonance Frequency	f <sub>r</sub>	78.24	7951	MHz	
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3			
4	Load Capacitance	C <sub>L</sub>	α	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	Δf f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+ 20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	<del>-</del> 25	+ 70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 7824kHz to f <sub>r</sub> + 7824kHz
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	10 years after Burn-in
19	Terminal Length	L	Figi	ure 2	mm	



PAGE 75

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Lim	nits		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	78.213798		MHz	
2	Reference Temperature	T <sub>o</sub>	+20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	٥	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	1	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	0 - 9.0 - 9.0	+9.0 +9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+ 20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or iZ <sub>p</sub> l/R	2:1	-		In the frequency range: f <sub>r</sub> - 7821kHz to f <sub>r</sub> + 7821kHz
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	10 years after Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 76

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		0	Lim	nits	Unit	Remarks
No.	Characteristics	Symbol	Min.	Max.	Onit	Hemains
1	Resonance Frequency	f <sub>r</sub>	78.22	78.227459		
2	Reference Temperature	To	+ 20	+ 30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	Δf f	<del>-</del> 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	0 - 9.0 - 9.0	+9.0 +9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	_	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 7822kHz to f <sub>r</sub> + 7822kHz
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	10 years after Burn-in
19	Terminal Length	L	Fig	ure 2	mm	



PAGE 77

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		Comple ed	Lim	nits	Unit	Remarks
No.	Characteristics	Symbol	Min.	Max.	Offic	,
1	Resonance Frequency	fr	78.22	78.220628		
2	Reference Temperature	To	+20	+ 30	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL	C	xo	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u> f	- 10	+10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	$\frac{\Delta f}{f}$	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not a	oplicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not a	oplicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not a	pplicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 7822kHz to f <sub>r</sub> + 7822kHz
18	Ageing	∆ f	-5.0	+5.0	10-6	10 years after Burn-in
19	Terminal Length	L	Fi	gure 2	mm	



PAGE 78

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			_ V/\\ (I/\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
Ne	Characteristics	Symbol	Lim	its	Unit	Remarks
No.	Characteristics	Symbol	Min.	Max.	Onit	Tiomano
1	Resonance Frequency	f <sub>r</sub>	81.666667		MHz	
2	Reference Temperature	T <sub>o</sub>	+ 62	+ 72	°C	
3	Overtone Order	-	5	j		
4	Load Capacitance	C <sub>L</sub>	α	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	45	Ω	At To °C
8	Frequency Variation with Temperature over Top	Δf f	Not ap	plicable	10-6	
9	Resistance Variation with Temperature over Top	Δ <mark>R</mark> R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 20	+80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	8.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 8166kHz to f <sub>r</sub> + 8166kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	10 years after Burn-in + Ageing of 500 hours
19	Terminal Length	L	Fig	ure 2	mm	



PAGE 79

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Lim	its		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	121.714286		MHz	
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	5	;		
4	Load Capacitance	CL	O.	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	- 8.0	+ 8.0	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	∆R R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.5	pF	
16	Q Factor	Q	50 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	3:1	-		In the frequency range: f <sub>r</sub> = 500kHz to f <sub>r</sub> + 500kHz
18	Ageing	$\frac{\Delta f}{f}$	-1.0	+1.0	10-6	Over 5 years after Burn-in
19	Terminal Length	L	Fig	ure 2	mm	



PAGE 80

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Lim	its	11-:4	Remarks
No.	Characteristics	Symbol -	Min.	Max.	Unit	Hemarks
1	Resonance Frequency	fr	116.47	116.471429		
2	Reference Temperature	T <sub>o</sub>	+ 23	+ 27	°C	
3	Overtone Order	-	5			
4	Load Capacitance	C <sub>L</sub>	α		pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	- 8.0	+8.0	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 20	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.5	pF	
16	Q Factor	Q	50 000	-		
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	3:1	-		In the frequency range: f <sub>r</sub> = 500kHz to f <sub>r</sub> + 500kHz
18	Ageing	$\frac{\Delta f}{f}$	-1.0	+1.0	10-6	Over 5 years after Burn-in
19	Terminal Length	L	Fig	ure 2	mm	



PAGE 81

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	Characteristics Country Limits		its		Domorko	
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	fL	4.194304		MHz	
2	Reference Temperature	T <sub>o</sub>	+ (	50	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	C <sub>L</sub>	2:	2	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	RL	-	75	Ω	Over T <sub>op</sub>
8	Frequency Variation with Temperature over Top	∆ f f	<del>-</del> 15	+ 15	10-6	From frequency measured at +25 °C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u>	Not app	olicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	25	_	mH	
14	Motional Capacitance	C <sub>1</sub>	Not app	olicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	1 000 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	3:1	-		In the frequency range: f <sub>L</sub> - 420kHz to f <sub>L</sub> + 420kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	Per year after Burn-in
19	Terminal Length	L	Figu	re 2	mm	



PAGE 82

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	<b>a</b>		Lim	nits		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	fլ	16.0		MHz	
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	3	0	рF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+ 10	10-6	At To °C
7	Resonance Resistance	RL	-	30	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	<del>-</del> 15	+ 15	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-20 or 1.0	+ 20 or 1.0	% Ω	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-30	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	olicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	olicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	65 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> l/R	2:1	-		In the frequency range: f <sub>L</sub> - 200kHz to f <sub>L</sub> + 200kHz
18	Ageing	<u>∆ f</u>	- 1.0	+1.0	10-6	Per year after Burn-in
19	Terminal Length	L	Figu	re 2	mm	



PAGE 83

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

NI.	Observatoristics	Complete	Lim	nits	l lais	Damada
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	fL	10.0		MHz	
2	Reference Temperature	T <sub>o</sub>	+27	+ 33	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	C <sub>L</sub>	25	35	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	RL	-	30	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> <del>f</del> f	<del>-</del> 15	+ 15	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	∆R R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	- 30	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not ap	plicable	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	Not applicable			
18	Ageing	$\frac{\Delta f}{f}$	-1.0	+1.0	10-6	Per year after Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	



PAGE 84

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	Characteristics		Lim	nits		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	fL	25.0		MHz	
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	_	Funda	mental		
4	Load Capacitance	CL	3	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+10	10-6	At To °C
7	Resonance Resistance	RL	-	10	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	- 10	+ 10	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-30	+ 80	°C	
11	Frequency variation with Drive Level	<u>∆</u> f	Not applicable		10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.7	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	40 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to	R <sub>p</sub> /R or	4:1 5:1	-		In the frequency range: f <sub>L</sub> = 50kHz to f <sub>L</sub> + 50kHz
	Resonance Resistance	IZ <sub>p</sub> I/R	5.1	_		Overtones 3 and 5
18	Ageing	$\frac{\Delta f}{f}$	-2.0	+2.0	10-6	1 year after Burn-in at T <sub>o</sub>
19	Terminal Length	L	Figu	re 2	mm	
20	Intended Application		×	O		



PAGE 85

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Cumbal	Lim	nits	I I - i -	D I
INO.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>L</sub>	90.0		MHz	
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	11.9	12.1	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u> f	-5.0	+5.0	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	RL	-	20	Ω	At To °C
8	Frequency Variation with Temperature	∆ f f	-5.0	+ 5.0	10-6	At $T_{op} = -20 \text{ to } +70 \text{ °C}$
	over T <sub>op</sub>		<del>-</del> 10	+ 10		At $T_{op} = -20 \text{ to } +85 \text{ °C}$
9	Resistance Variation with Temperature over Top	Δ <mark>R</mark> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 85	°C	
11	Frequency variation with Drive Level	<u>∆</u> f	Not ap	olicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	-	-	mH	
14	Motional Capacitance	C <sub>1</sub>	1.7	-	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	50 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	3.16:1	-		In the frequency range: f <sub>L</sub> - 100kHz to f <sub>L</sub> + 100kHz
18	Ageing	$\frac{\Delta f}{f}$	-6.0	+ 6.0	10-6	Over 20 years at rated drive level
19	Terminal Length	L	Figu	re 2	mm	
20	Intended Application			-		



PAGE 86

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim	nits	l leit	Domarko
INO.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	83.366142		MHz	
2	Reference Temperature	To	+ 62	+ 72	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	Not app	olicable	10-6	
9	Resistance Variation with Temperature over Top	ΔR R	- 20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 80	°C	
11	Frequency variation with Drive Level	<u>∆ f</u>	Not ap	olicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	olicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	olicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or iZ <sub>p</sub> l/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	Δf f	-3.0	+3.0	10-6	10 years after Burn-in + Ageing of 500 hours
19	Terminal Length	L	Figu	re 2	mm	
20	Intended Application			-		



PAGE 87

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	01		Lim	nits		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	70.97	5328	MHz	
2	Reference Temperature	T <sub>o</sub>	+ 20	+ 30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	0	0	pF	
5	Rated Drive Level	Po	0.	.2	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	0 - 9.0 - 9.0	+9.0 +9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	- 20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	<del>-</del> 25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	80 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 7100kHz to f <sub>r</sub> + 7100kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+ 3.0	10-6	12 years after Burn-in + Ageing of 500 hours
19	Terminal Length	L	Figu	ire 2	mm	
20	Intended Application			_		



PAGE 88

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

NI-	Observatoristica	0	Lim	nits	1.1-24	Danada
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	79.9	79.93306		
2	Reference Temperature	To	+60	+ 70	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	0	o	рF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	Not applicable		10-6	
9	Resistance Variation with Temperature over Top	<u>∆</u> R R	- 20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 80	°C	
11	Frequency variation with Drive Level	<u>∆ f</u> f	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 8000kHz to f <sub>r</sub> + 8000kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after Burn-in + Ageing of 500 hours
19	Terminal Length	L	Figure 2		mm	
20	Intended Application			-		



PAGE 89

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

NIa	Oh ava ataviatia a	Ob. a.l	Lim	nits	1.6	D
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	79.941257		MHz	
2	Reference Temperature	To	+ 60	+ 70	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	Δf f	Not ap	olicable	10-6	
9	Resistance Variation with Temperature over Top	ΔR R	- 20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-		
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 8000kHz to f <sub>r</sub> + 8000kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after Burn-in + Ageing of 500 hours
19	Terminal Length	L	Figure 2		mm	
20	Intended Application			_		



PAGE 90

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

NI-	Ohava ata viatia a	Obl	Lin	nits	1.19	
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	fL	9.	9.2		
2	Reference Temperature	To	+ 27	+ 33	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	25	35	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+ 10	10-6	At To °C
7	Resonance Resistance	RL	-	30	Ω	At To °C
8	Frequency Variation with Temperature over Top	Δf f	<del>-</del> 15	+ 15	10-6	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-20 or -2.0	+ 20 or + 2.0	% Ω	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-30	+ 70	°C	
11	Frequency variation with Drive Level	<u>∆</u>	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not ap	plicable	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	Not applicable			
18	Ageing	$\frac{\Delta f}{f}$	- 1.0	+ 1.0	10-6	Per year after Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		>	<b>(</b> 0		



PAGE 91

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	G		Lim	its		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	fL	24	24.0		
2	Reference Temperature	To	+ 25	+ 29	°C	
3	Overtone Order	-	Fundar	mental		
4	Load Capacitance	C <sub>L</sub>	3	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u> f	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>L</sub>	-	120	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	- 40	+ 40	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	+20 or -2.0	+ 20 or + 2.0	% Ω	From resistance measured at $T_0$ °C If $R \le 10\Omega$
10	Operating Temperature Range	T <sub>op</sub>	<del>-</del> 55	+ 100	°C	
11	Frequency variation with Drive Level	<u>∆ f</u>	Not ap	olicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	60 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>L</sub> - 200kHz to f <sub>L</sub> + 200kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+ 3.0	10-6	Per year after Burn-in
19	Terminal Length	L	Figu	ire 2	mm	
20	Intended Application			-		



PAGE 92

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	Ohanadariatia	0	Lim	its	1.1-2	Damada
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	76.8315		MHz	
2	Reference Temperature	T <sub>o</sub>	+ 23	+ 27	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	α	)	рF	
5	Rated Drive Level	Po	0.	2	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	- 10	+10	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>∆</u> R R	+20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	<del>-</del> 25	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	olicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not app	olicable	fF	
15	Static Capacitance	Co	i	3.5	pF	
16	Q Factor	Q	50 000	•	•	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	3:1	-		In the frequency range: f <sub>r</sub> - 5000kHz to f <sub>r</sub> + 5000kHz
18	Ageing	Δf f	-2.0	+2.0	10-6	Over 5 years after Burn-in
19	Terminal Length	L	Figu	ire 2	mm	
20	Intended Application			-		



PAGE 93

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

A1-	Ob support of all an	0	Lim	nits	11-2	D
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	fL	20	.0	MHz	
2	Reference Temperature	To	+24	+ 26	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	3	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-20	+20	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	RL	=	20	Ω	At To °C
8	Frequency Variation with Temperature over Top	Δf f	<del>-</del> 50	+50	10-6	From frequency measured at T <sub>o</sub> °C
Ø	Resistance Variation with Temperature over Top	<u>∆</u> R R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-30	+80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	•	4.5	pF	
16	Q Factor	Q	50 000	-	•	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	3:1	-		In the frequency range: f <sub>L</sub> - 200kHz to f <sub>L</sub> + 200kHz
18	Ageing	∆ f f	-3.0	+3.0	10-6	Per year after Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application			-		



PAGE 94

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim	iits	Unit	Remarks
INO.	Characteristics	Symbol	Min.	Max.	Offic	Hemarks
1	Resonance Frequency	fL	20	.0	MHz	
2	Reference Temperature	T <sub>o</sub>	+ 23	+ 27	°C	
3	Overtone Order	-	Fundai	mental		
4	Load Capacitance	C <sub>L</sub>	29.7	30.3	pF	
5	Rated Drive Level	Po	0.	2	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 50	+ 50	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	$R_L$	-	20	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	<del>-</del> 50	+50	10-6	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	<del>-</del> 55	+ 105	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	50 000	_	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	7:1	-		In the frequency range: f <sub>L</sub> - 500kHz to f <sub>L</sub> + 500kHz
18	Ageing	$\frac{\Delta f}{f}$	- 15	+ 15	10-6	After Burn-in over 5 years
19	Terminal Length	L	Figu	ire 2	mm	
20	Intended Application			_		



PAGE 95

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Oh avanta viation	Combal	Lim	nits	l l=is	Remarks	
INO.	Characteristics	Symbol	Min.	Max.	Unit	Hemaiks	
1	Resonance Frequency	f <sub>r</sub>	40.9	40.960			
2	Reference Temperature	To	+20	+ 30	°C		
3	Overtone Order	-	3	3			
4	Load Capacitance	C <sub>L</sub>	٥	o	pF		
5	Rated Drive Level	Po	0.	.1	mW		
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	<del>-</del> 10	+ 10	10-6	At T <sub>o</sub> °C	
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C	
8	Frequency Variation with Temperature over Top	Δf f	0 - 9.0 - 9.0	+9.0 +9.0 0	10-6	From T - 25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C	
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C	
10	Operating Temperature Range	T <sub>op</sub>	<del>-</del> 25	+ 70	°C		
11	Frequency variation with Drive Level	Δf f	- 0.5	+ 0.5	10-6	From $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.1 \text{mW}$	
12	Resistance variation with Drive Level	ΔR R	- 20	+20	%	From $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.1 \text{mW}$	
13	Motional Inductance	L <sub>1</sub>	5.0	-	mH		
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF		
15	Static Capacitance	Co	-	5.0	pF		
16	Q Factor	Q	70 000	-			
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	4:1	-		In the frequency range: f <sub>r</sub> = 4000kHz to f <sub>r</sub> + 4000kHz	
18	Ageing	$\frac{\Delta f}{f}$	- 10	+10	10-6	10 years after Burn-in	
19	Terminal Length	L	Figu	ıre 2	mm		
20	Intended Application			-			



PAGE 96

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Lim	nits		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	70.965082		MHz	
2	Reference Temperature	T <sub>o</sub>	+20	+ 30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	0 -9.0 -9.0	+ 9.0 + 9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	4.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 7000kHz to f <sub>r</sub> + 7000kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	10 years after Burn-in + Ageing of 500 hours
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application			-		



PAGE 97

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

NI-	Ob and a trained a	0	Lim	nits	11-2	
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	79.937158		MHz	
2	Reference Temperature	To	+60	+ 70	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	- 10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	Not applicable		10-6	
9	Resistance Variation with Temperature over Top	ΔR R	-20	+ 20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 7993kHz to f <sub>r</sub> + 7993kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after Burn-in + Ageing of 500 hours
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application			-		



PAGE 98

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	Observatorial		Lim	nits		Damadia
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	fr	79.745355		MHz	
2	Reference Temperature	To	+ 60	+ 70	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	G	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u> f	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	Not ap	plicable	10-6	
9	Resistance Variation with Temperature over Top	ΔR R	-20	+ 20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	Тор	- 20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 7994kHz to f <sub>r</sub> + 7994kHz
18	Ageing	Δf f	-3.0	+3.0	10-6	12 years after Burn-in + Ageing of 500 hours
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application			-		



PAGE 99

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	Q		Lim	its		D I .
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	59.35	59.356136		
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	α	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ</u> f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	ΔR R	- 20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	<u>∆</u> f	- 0.5	+ 0.5	10-6	From $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.1 \text{mW}$
12	Resistance variation with Drive Level	ΔR R	-20	+20	%	From $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.1 \text{mW}$
13	Motional Inductance	L <sub>1</sub>	3.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	4:1	-		In the frequency range: f <sub>r</sub> - 5800kHz to f <sub>r</sub> + 5800kHz
18	Ageing	$\frac{\Delta f}{f}$	- 10	+10	10-6	10 years after Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application			-		



PAGE 100

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

NI-	Observator dell'es	0	Lin	nits		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	fL	18.0		MHz	
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	3	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+ 10	10-6	At To °C
7	Resonance Resistance	RL	-	20	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	<del>-</del> 25	+25	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	<del>-</del> 55	+ 100	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	90 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>L</sub> - 500kHz to f <sub>L</sub> + 500kHz
18	Ageing	$\frac{\Delta f}{f}$	- 5.0	+ 5.0	10-6	Per year after Burn-in
19	Terminal Length	L	Figu	re 2	mm	
20	Intended Application					



PAGE 101 ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim	nits	Unit	Remarks
140.	Onditactoristics	Cymoon	Min.	Max.	Orne	Homano
1	Resonance Frequency	f <sub>r</sub>	81.57	81.576923		
2	Reference Temperature	To	+ 62	+ 72	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	o	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	Not applicable		10-6	
9	Resistance Variation with Temperature over Top	∆R R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 20	+80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> ∕R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	10 years after 500 hours Burn-in
19	Terminal Length	L	Figu	ire 2	mm	
20	Intended Application		oc	XO		



PAGE 102

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Cumbal	Lim	nits	l lait	Domodeo
NO.	Characteristics	Symbol	Min.	Мах.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	86.024590		MHz	
2	Reference Temperature	To	+20	+ 30	°C	
3	Overtone Order	_	3	3		
4	Load Capacitance	CL		0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	- 10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ</u> f	0 - 9.0 - 9.0	+9.0 +9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	<u>∆</u> R R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	_	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	Δf f	-5.0	+ 5.0	10-6	Over 12 years after Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		ТС	XO		



PAGE 103

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	<b>a</b>		Lim	nits		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	85.983607		MHz	
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	C	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u> f	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	0 -9.0 -9.0	+9.0 +9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	Тор	- 20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	Over 12 years after Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		ТС	XO		



PAGE 104

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim	nits	Unit	Domorko
INO.	Gnaracteristics	Symbol	Min.	Max.	Onit	Remarks
1	Resonance Frequency	f <sub>r</sub>	79.94	79.949453		
2	Reference Temperature	To	+ 60	+ 70	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	o	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	Not applicable		10-6	
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	Тор	-20	+ 80	°C	
11	Frequency variation with Drive Level	<u>∆ f</u>	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	_	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	Over 12 years after 500 hours Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		00	XO		



PAGE 105

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		Limits				
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	79.95		MHz	
2	Reference Temperature	To	+60	+ 70	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	C	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	- 10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	Not ap	plicable	10-6	
9	Resistance Variation with Temperature over Top	ΔR R	-20	+ 20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	Тор	- 20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	_	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-		
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	Over 12 years after 500 hours Burn-in
19	Terminal Length	L	Figu	ure 2	mm	
20	Intended Application		00	CXO		



PAGE 106

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Lim	nits		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	70.970205		MHz	
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u> f	<del>-</del> 10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	$\frac{\Delta f}{f}$	0 - 9.0 - 9.0	+9.0 +9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	4.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	Over 12 years after 500 hours Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		тс	XO		



PAGE 107

ISSUE 3

# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim	iits	Unit	Remarks
140.	Officialition	Cymbo.	Min.	Max.	0	1.0.110.110
1	Resonance Frequency	fL	101.93	36620	MHz	
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	CL	11.9	12.1	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 5.0	+5.0	10-4	At T <sub>o</sub> °C
7	Resonance Resistance	$R_L$	-	70	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-5.0 -10	+5.0 +10	10-4	From T-20°C to +70°C From T-20°C to +80°C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	- 20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-4	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	0.37	-	fF	
15	Static Capacitance	Co	_	5.0	pF	
16	Q Factor	Q	60 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2.5:1	-		In the frequency range: f <sub>L</sub> - 100kHz to f <sub>L</sub> + 100kHz
18	Ageing	$\frac{\Delta f}{f}$	-6.0	+6.0	10-4	Over 5 years
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		VC	OXO		



PAGE 108

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim	nits	Unit	Remarks
140.	Ondidotoriotios	Cynnoor	Min.	Max.	01111	Homans
1	Resonance Frequency	fL	75	5.0	MHz	
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	11.9	12.1	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-2.0	+2.0	10-4	At T <sub>o</sub> °C
7	Resonance Resistance	$R_{L}$	_	25	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	-5.0 -10	+ 5.0 + 10	10-4	From T - 20°C to +70°C From T - 20°C to +80°C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-4	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	1.7	-	fF	
15	Static Capacitance	Co	-	6.0	pF	
16	Q Factor	Q	50 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> l/R	2.5:1	-		In the frequency range: f <sub>L</sub> - 100kHz to f <sub>L</sub> + 100kHz
18	Ageing	Δf f	-6.0	+6.0	10-4	Over 5 years
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		VC	XO		



PAGE 109

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Limits			
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	fL	80.0		MHz	
2	Reference Temperature	T <sub>o</sub>	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	11.9	12.1	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-2.0	+ 2.0	10-4	At T <sub>o</sub> °C
7	Resonance Resistance	RL	-	25	Ω	Over Top °C
8	Frequency Variation with Temperature over Top	∆ f f	-5.0 -10	+ 5.0 + 10	10-4	From T = 20°C to +70°C From T = 20°C to +80°C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-4	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	1.7	-	fF	
15	Static Capacitance	Co	-	6.0	pF	
16	Q Factor	Q	50 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2.5:1	-		In the frequency range: f <sub>L</sub> - 100kHz to f <sub>L</sub> + 100kHz
18	Ageing	$\frac{\Delta f}{f}$	-6.0	+6.0	10-4	Over 5 years
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		VC	VCXO		



PAGE 110

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	Ohana da Zalia a	0 5 1	Lim	its	11-4	Domada
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	74.62	6318	MHz	
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	Δf f	0 -9.0 -9.0	+ 9.0 + 9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	<u>∆</u> R R	-20	+ 20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> l/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after 500 hours Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		ТС	XO		



PAGE 111

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	Characteristics	0	Lim	its	I I-is	Remarks
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	64.79	64.791785		
2	Reference Temperature	To	+20	+ 30	°C	
3	Overtone Order	-	3	B		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u> f	- 10	+10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	0 -9.0 -9.0	+ 9.0 + 9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	<u>-</u>	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after 500 hours Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		тс	XO		



PAGE 112

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	Ob and a single-	O. mah al	Lim	nits	Unit	Domado
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	64.99	0091	MHz	
2	Reference Temperature	To	+20	+ 30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	Δf f	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	0 - 9.0 - 9.0	+9.0 +9.0 0	10-6	From T - 20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-20	+ 20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> l/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	Over 12 years after 500 hours Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		TC	XO		



PAGE 113

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Chavastavistica	Complete	Lim	nits	1 1	D
INO.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	64.995773		MHz	
2	Reference Temperature	T <sub>o</sub>	+ 20	+ 30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	∆R R	- 20	+ 20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+80	°C	
11	Frequency variation with Drive Level	<u>Δ f</u>	Not applicable		10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	olicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	•	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after 500 hours Burn-in
19	Terminal Length	L	Figu	ire 2	mm	
20	Intended Application		то	XO		



PAGE 114

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	acteristics Symbol Limits		nits	Unit	Remarks
INO.	Characteristics	Syllibol	Min.	Max.	Offic	nemarks
1	Resonance Frequency	f <sub>r</sub>	74.67	74.677455		
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	α	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	ΔR R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	2.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after 500 hours Burn-in
19	Terminal Length	L	Figu	Figure 2		
20	Intended Application		TC	XO		



PAGE 115

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Cymbal	Lim	nits	Unit	Domesto
INO.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	66.638308		MHz	
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	0	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	<del>-</del> 10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	_	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	90 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after 500 hours Burn-in
19	Terminal Length	L	Figu	ire 2	mm	
20	Intended Application		ТС	XO		



PAGE 116

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Cymphol	Lim	nits	11	Domestic .
INO.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	66.628692		MHz	
2	Reference Temperature	To	+20	+ 30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	90 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> l/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after 500 hours Burn-in
19	Terminal Length	L	Figu	ire 2	mm	
20	Intended Application		TC	XO		



PAGE 117

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim	nits	Unit	Remarks
140.	Ondiacteristics	Cyrribor	Min.	Max.	Onic	remarks
1	Resonance Frequency	f <sub>r</sub>	60.09	60.091346		
2	Reference Temperature	To	+20	+ 30	ô	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	٥	0	рF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u> f	- 10	+10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	Δf f	0 - 9.0 - 9.0	+ 9.0 + 9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	ΔR R	-2.0	+2.0	Ω	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	- 0.5	+ 0.5	10-6	From $P_{S1} = 0.01$ mW to $P_{S2} = 0.1$ mW
12	Resistance variation with Drive Level	ΔR R	-20	+20	%	From $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.1 \text{mW}$
13	Motional Inductance	L <sub>1</sub>	3.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	3:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	Δ f f	-3.0	+3.0	10-6	12 years after 500 hours Burn-in
19	Terminal Length	L	Figu	ıre 2	mm	
20	Intended Application		тс	XO		



PAGE 118

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Limits			
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	60.086538		MHz	
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3	}		
4	Load Capacitance	CL	α	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ</u> f f	0 - 9.0 - 9.0	+9.0 +9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	ΔR R	-2.0	+2.0	Ω	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	Тор	- 20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	- 0.5	+ 0.5	10-6	From $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.1 \text{mW}$
12	Resistance variation with Drive Level	ΔR R	- 20	+20	%	From $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.1 \text{mW}$
13	Motional Inductance	L <sub>1</sub>	3.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	_	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	3:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after 500 hours Burn-in
19	Terminal Length	L	Figure 2		mm	
20	Intended Application		то	XO		



PAGE 119

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Cumbal	Limits		11-11	Domesto
		Symbol -	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	37.083333		MHz	
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3			
4	Load Capacitance	C <sub>L</sub>	∞		рF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	Δf f	0 -9.0 -9.0	+ 9.0 + 9.0 0	10-6	From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C
9	Resistance Variation with Temperature over Top	ΔR R	-2.0	+ 2.0	Ω	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 80	°C	
11	Frequency variation with Drive Level	Δf f	- 0.5	+ 0.5	10-6	From $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.1 \text{mW}$
12	Resistance variation with Drive Level	ΔR R	- 20	+20	%	From $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.1 \text{mW}$
13	Motional Inductance	L <sub>1</sub>	3.0	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	70 000	-	_	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	12 years after Burn-in
19	Terminal Length	L	Figure 2		mm	
20	Intended Application		тсхо			



PAGE 120

ISSUE 3

#### TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics		Limits			
		Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	66.612423		MHz	
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3			
4	Load Capacitance	C <sub>L</sub>	∞		pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	<u>∆</u> f	- 10	+ 10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	0 - 9.0 - 9.0	+9.0 +9.0 0	10-6	From T -25 to +10 °C From T +10 to +50 °C From T +50 to +70 °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-20 -2.0	+20 r +2.0	% Ω	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	Тор	- 25	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not applicable		%	
13	Motional Inductance	L <sub>1</sub>	6.5	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not applicable		fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	90 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> - 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after 500 hours Burn-in
19	Terminal Length	L	Figure 2		mm	
20	Intended Application		тсхо			



PAGE 121

ISSUE 3

## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limits		1 1,-14	D1-
			Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	79.924863		MHz	
2	Reference Temperature	To	+ 60	+ 70	°C	
3	Overtone Order	-	3			
4	Load Capacitance	C <sub>L</sub>	∞		pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	<u>Δ</u> f	- 10	+ 10	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	Not applicable		10-6	
9	Resistance Variation	<u>Δ R</u> R	-20	+ 20	%	From resistance
	with Temperature over Top	H	- 2.0	+ 2.0	Ω	measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	- 20	+ 80	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not applicable		%	
13	Motional Inductance	L <sub>1</sub>	2.0	_	mH	
14	Motional Capacitance	C <sub>1</sub>	Not applicable		fF	
15	Static Capacitance	Co	_	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R <sub>p</sub> /R or IZ <sub>p</sub> I/R	2:1	-		In the frequency range: f <sub>r</sub> = 10% to f <sub>r</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	12 years after 500 hours Burn-in
19	Terminal Length	L	Figure 2		mm	
20	Intended Application		ocxo			



PAGE 122

ISSUE 2

#### **APPENDIX 'A'**

Page 1 of 1

#### AGREED DEVIATIONS FOR C-MAC FREQUENCY PRODUCTS (F)

ITEMS AFFECTED	DESCRIPTION OF DEVIATION				
Para. 4.2.2	Para. 9.3, Shock: Shall not be performed.				
Para. 4.2.3	Para. 9.11, Radiographic Inspection: Shall not be performed.				