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# CRYSTAL UNITS IN METAL HOLDER. BASED ON TYPE T807.

ESCC Detail Specification No. 3501/001

FREQUENCY RANGE 4.0 - 140MHZ

## ISSUE 3 March 2010





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## **DOCUMENTATION CHANGE NOTICE**

(Refer to https://escies.org for ESCC DCR content)

DCR No.	CHANGE DESCRIPTION						
552	Specification upissued to incorporate technical and editorial changes per DCRs.						
1) Songwood							



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#### 1. GENERAL

#### 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.

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#### 1.2 <u>TYPE VARIANTS</u>

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 ESCC Executive.

#### 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.

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

Variant	Resonance Load Frequency Capacitance	Reference Temp.	Operating Temp.	Lead Length (Dim. L mm)		
variant	(MHz)		(T <sub>o</sub> °C)	(T <sub>op</sub> °C)	Min.	Max.
01	65.34375	<b>∞</b>	+ 25	-25 to +70	12.7	-
02	68.4373	œ	+ 25	-20 to +70	12.7	-
03	71.9686	00	+ 25	-20 to +70	12.7	-
04	82.53	00	+ 25	-20 to +70	12.7	_
05	83.07	∞	+ 25	-20 to +70	12.7	•
06	83.335	∞	+ 25	-20 to +70	12.7	•
07	84.210526	00	+ 25	-20 to +70	12.7	-
80	84.868421	œ	+ 25	-20 to +70	12.7	<u>-</u>
09	85.087737	∞	+ 25	-20 to +70	12.7	-
10	85.964947	000	+ 25	-20 to +70	12.7	• ***
11	36.866968	∞	+ 25	-20 to +70	12.7	-
12	37.166667	00	+ 25	-20 to +70	12.7	-
13	65.052865	∞	+ 25	-20 to +70	12.7	-
14	70.0	∞	+ 25	-20 to +70	12.7	-
15	102.083333	∞	+ 25	-20 to +50	12.7	-
16	15.0	50	+ 40	-20 to +80	12.7	-
17	16.0	50	+ 60	-30 to +70	12.7	-
18	15.84	50	+ 25	-55 to +105	12.7	-
19	16.0 -16.384	22	+60	-20 to +70	12.7	-
20	16.35	30	+ 25	-20 to +70	12.7	-
21	18.84	∞	+ 25	-20 to +55	12.7	-
22	18.84	32	+ 25	-20 to +55	12.7	-
23	15.0	32	+ 25	-30 to +70	12.7	_
24	20.0	22	+60	-20 to +70	12.7	-
25	36.693333	∞	+ 25	-20 to +70	12.7	-
26	20.8333	10	+ 25	-10 to +60	12.7	-
27	22.841667	30	+ 25	-25 to +65	12.7	-
28	22.856667	44	+ 25	-20 to +50	12.7	-
29	22.861667	30	+ 25	-20 to +65	12.7	-
30	24.184	32	+ 25	-10 to +50	12.7	_
31	24.5	30	+ 25	-20 to +60	12.7	_
32	24.5	32	+ 25	-20 to +55	12.7	-
33	36.666 -38.333	∞	+ 25	-20 to +60	12.7	-
34	38.25618	55	+ 22	0 to +40	12.7	-
35	55.46875	20	+ 45	+43 to +47	12.7	-
36	62.5 - 68.125	10	+ 25	-10 to +60	12.7	-
37	71.859475	57.5	+ 25	-20 to +50	12.7	-
38	75.36015	57.5	+ 25	-20 to +50	12.7	-



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

Variant	Resonance Frequency	Load Capacitance	Reference Temp.	Operating Temp. Range	Lead L (Dim. l	
Variant	(MHz)	(C <sub>L</sub> pF)	(T <sub>o</sub> °C)	(T <sub>op</sub> °C)	Min.	Max.
39	79.516319	26.5	+ 30	-10 to +70	12.7	-
40	80.381944	26.5	+ 25	-25 to +65	12.7	-
41	81.847222	26.5	+ 25	-25 to +65	12.7	-
42	99.1	œ	+ 25	-20 to +60	12.7	-
43	105.0	10	+ 25	-10 to +60	12.7	-
44	120.796	∞	+ 25	-10 to +50	12.7	-
45	61.805555	00	+ 25	-20 to +70	12.7	-
46	62.5	00	+ 25	-20 to +70	12.7	-
47	62.03125	∞	+ 25	-20 to +70	12.7	-
48	62.109375	∞	+ 25	-20 to +70	12.7	-
49	69.559524	∞	+ 25	-20 to +70	12.7	-
50	69.619048	∞	+ 25	-20 to +70	12.7	-
51	24.68617	30	+ 25	-20 to +70	12.7	-
52	82.53	∞	+ 25	-20 to +70	12.7	-
53	83.07	∞	+ 25	-20 to +70	12.7	-
54	37.063617	00	+ 25	-20 to +70	12.7	-
55	37.083333	00	+ 25	-20 to +70	12.7	-
56	61.1875					-
57	65.00311	∞	+ 25	-20 to +70	12.7	-
58	85.48	<b>∞</b>	+ 25	-20 to +70	12.7	-
59	46.08005	12	+ 25	-20 to +70	12.7	
60	16.0	22	+ 60	-20 to +70	12.7	-
61	38.3117284	∞	+ 25	-20 to +60	12.7	-
62	15.0	35	+60	-30 to +70	12.7	-
63	16.0	22	+60	-20 to +70	12.7	-
64	16.384	22	+60	-20 to +70	12.7	-
65	65.0047	∞	+ 25	-20 to +70	12.7	-
66	65.0513	00	+ 25	-20 to +70	12.7	-
67	69.9992	∞	+ 25	-20 to +70	12.7	-
68	85.4792	∞	+ 25	-20 to +70	12.7	-
69	50.0	30	+ 25	-5 to +55	12.7	-
70	20.0	22	+60	-20 to +70	12.7	-
71	8.0	30	+ 25	-35 to +105	12.7	-
72	37.74375	00	+ 25	-20 to +70	12.7	-
73	37.827083	∞	+ 25	-20 to +70	12.7	-
74	5.24288	30	+ 25	-25 to +105	12.7	-
75	4.096	30	+ 25	-25 to +75	12.7	-
76	5.12	30	+ 25	-35 to +105	12.7	-
77	6.5536	30	+ 25	-35 to +105	12.7	-
78	65.04974	∞	+ 25	-20 to +70	12.7	-



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

Variant	Resonance Load Frequency Capacitance	Reference Temp.	Operating Temp. Range	Lead Length (Dim. L mm)		
	(MHz)	(C <sub>L</sub> pF)	(T <sub>o</sub> °C)	(T <sub>op</sub> °C)	Min.	Max.
79	65.005555	00	+ 25	-20 to +70	12.7	-
80	62.5	∞	+ 25	-20 to +70	12.7	-
81	70.0	∞	+ 25	-20 to +70	12.7	-
82	4.1379	30	+ 25	-25 to +75	12.7	-
83	65.03639	∞	+ 25	-20 to +70	12.7	-
84	36.811767	. ∞	+ 25	-25 to +70	12.7	-
85	20.0	∞	+ 25	-30 to +70	12.7	-
86	20.0	32	+ 25	-30 to +70	12.7	-
87	81.506849	· ········· <b>∞</b>	+ 70	-20 to +80	12.7	-
88	121.5	∞	+ 25	-30 to +80	12.7	-
89	50.0	∞	+ 25	-30 to +80	12.7	-
90	37.75625	∞	+ 25	-20 to +70	12.7	-
91	24.6827	80	+ 25	-20 to +70	12.7	-
92	37.839583	∞	+ 25	-20 to +70	12.7	-
93	90.875794	8	+ 25	-20 to +70	12.7	-
94	90.881675	- 00	+ 25	-20 to +70	12.7	-
95	90.88754	8	+ 25	-20 to +70	12.7	-
96	90.893413	∞	+ 25	-20 to +70	12.7	-
97	99.53704	∞	+ 25	-20 to +70	12.7	-
98	20.0	∞	+ 25	-55 to +105	12.7	-
99	24.5	32	+ 25	-20 to +70	12.7	-

#### **NOTES**

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



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#### **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.



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

	Characteristic		Limits		11.2	
No.		Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>			MHz	AT Cut
2	Reference Temperature	To			°C	
3	Overtone Order	-				
4	Load Capacitance	CL			pF	
5	Rated Drive Level	Po			mW	
6	Frequency Adjustment Tolerance	∆ f f			10-6	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>			Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f			10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R			<b>%</b> Ω	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	Тор			°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f			10-6	From P <sub>S1</sub> = 0.5mW to P <sub>S2</sub> = 0.5mW
12	Resistance Variation with Drive Level	<u>Δ R</u> R			%	From P <sub>S1</sub> = 0.5mW to P <sub>S2</sub> = 0.5mW
13	Motional Inductance	L <sub>1</sub>			mH	
14	Motional Capacitance	C <sub>1</sub>			fF	
15	Static Capacitance	C <sub>o</sub>			pF	
16	Q Factor	Q			-	
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				In the frequency range: f <sub>r</sub> -10% to f <sub>r</sub> +10%
18	Ageing	$\frac{\Delta f}{f}$			10 <sup>-6</sup>	
19	Physical Dimensions					
20	Intended Application					



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

- 1. (a) If CL is not specified, Symbol and measurement shall be fr.
  - (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  $+25 \pm 2$  °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.

#### <u>N.B</u>

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 Page

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<sub>L</sub> may be calculated by R<sub>L</sub> = R<sub>r</sub> 
$$\left(1 + \frac{C_0}{C_L}\right)^2$$

#### 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).



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#### **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.



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#### FIGURE 1 - PARAMETER DERATING INFORMATION

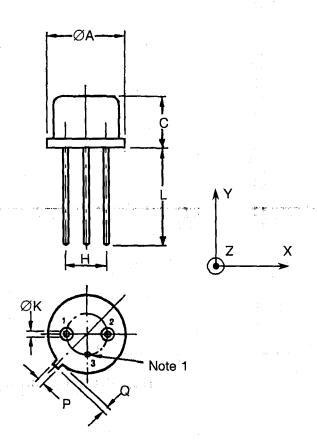
Not applicable.

#### FIGURE 2 - PHYSICAL DIMENSIONS

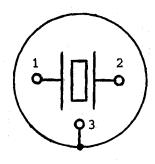
Cumbal	Millim	Remarks	
Symbol	Min.	Max.	nemarks
ØA	-	10.70	•
С	-	6.80	
Н	4.83	5.33	Pitch 5.08mm
Øĸ	0.40	0.48	- -
L	12.70	-	-
<b>P</b> , 1917, 1917	-	0.90	Note 2
Q	1 .	0.95	Note 2

#### NOTES

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



#### **FIGURE 3 - FUNCTIONAL DIAGRAM**



(Bottom View)



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#### 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:-

 $= f_r$ Resonance Frequency Load Resonance Frequency  $= f_L$ Reference Temperature Resonance Resistance  $= R_r$ Load Resonance Resistance = RL Rated Drive Level  $= C_o$ Static Capacitance Load Capacitance  $= C_{i}$ Motional Capacitance = C<sub>1</sub>  $= L_1$ Motional Inductance  $= R_P$ Response Resistance  $= |Z_P|$ Response Impedance 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 <u>DEVIATIONS FROM GENERIC SPECIFICATION</u>

#### 4.2.1 <u>Deviations from Special In-process Controls</u>

None.

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

None.

#### 4.2.3 Deviations from Burn-in Tests (Chart III)

None.

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

None.

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

None.



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#### 4.3 MECHANICAL REQUIREMENTS

#### 4.3.1 <u>Dimension Check</u>

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 ESCC Component Number, which shall be constituted and marked as follows:-

Detail Specification Number	en e		
Type Variant (See Table 1(a))		 	
Testing Level (B or C, as applicable)		 	 



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#### 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 <u>Electrical Measurements at Reference Temperature</u>

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 Electrical Circuits for Burn-in (Figure 5)

Not applicable.



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TABLE 2 - ELECTRICAL MEASUREMENTS AT REFERENCE TEMPERATURE

	TABLE 2 - ELECTRICAL MI	EASUREMENTS	AI REFERENCE	IEMPERATU	KE
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	10-6
4	Resistance variation with Drive Level	<u>Δ R</u> (T <sub>o</sub> , ΔP)	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	<u>-</u>
8	Insulation Resistance	Ri	Para. 9.2.1.6	500 Min.	МΩ



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#### 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	10-6
10	Resistance variation with Temperature over Top	Δ R (ΔT, P <sub>o</sub> )	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	∆ f f	As per Table 2	As per Table 2	± 2.0	10-6
2	Resonance resistance drift	<u>ΔR</u> R	As per Table 2	As per Table 2	± 10 or (1) ± 1.0	%

**NOTES** 1. Whichever is the highest value.

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

No	Characteristics	Characteristics Symbol		Unit
1	Ambient Temperature	Tamb	+85 ±5	°C

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

Not applicable:



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## 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 <u>Measurements and Inspections at Intermediate Points and on Completion of Endurance Tests</u>

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.



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

49.0	* _	<u> </u>	\$	f <u>30 - 5 (111)</u> t	1	1.4		
American management of the	ESCC GENERIC SP	EC. NO. 3501	MEASUREMENTS A	ND INSPECTIONS	1	LIV	штѕ	·
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	et, ruigin	Table	∋ 1(a)	
02	Shock	Para. 9.3	Initial Measurements Resonance Frequency Resonance Resistance	Table 2 Item 1 Table 2 Item 2	f R		2 Item 1 2 Item 2	
4. * * *			Final Measurements Resonance Frequency Drift	Table 2 Item 1	<u>Δ f</u> f	- 1.0	+1.0	10-6
			Resonance Resistance Drift	Table 2 Item 2	<u>Δ R</u> R ΔR	- 10 or (2) - 1.0	+10 +1.0	%
03	Vibration	Para. 9.4	Initial Measurements Resonance Frequency Resonance Resistance Final Measurements	Table 2 Item 1 Table 2 Item 2	f R		2 Item 1 2 Item 2	19. 19. 19. 19. 19. 19. 19. 19. 19. 19.
			Resonance Frequency Drift Resonance Resistance Drift	Table 2 Item 1 Table 2 Item 2	<u>Δ f</u> f <u>Δ R</u> R ΔR	-1.0 -10 or (2) -1.0	+1.0 +10 +1.0	10 <sup>-6</sup> %
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	i nata Tagi Aribi			-
06	External Visual Inspection	Para. 9.9	Final Measurements Visual Inspection	ESCC No. 20500			\. <del>-</del>	-
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.



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

			<del></del>					
	ESCC GENERIC SP	EC. NO. 3501	MEASUREMENTS AN	ND INSPECTIONS		LIM	IITS	
NO.	ENIVIDONIMENTAL AND	TEST METHOD	IDENTIFICATION	CONDITIONS	SYMBOL		<u> </u>	UNIT
1	ENVIRONMENTAL AND ENDURANCE TESTS (1)	AND CONDITIONS	IDENTIFICATION	CONDITIONS		Min.	Max.	
	ENDONANCE TEORO (1)	AND CONDITIONS						İ
	Climatic Sequence	Para. 9.14						
08	Dry Heat	Para. 9.14.1	Initial Measurements			i .		
{	!		Resonance Frequency	Table 2 Item 1	f		2 Item 1	
1 1			Resonance Resistance	Table 2 Item 2	R	Table :	2 Item 2	
} }			Final Measurements	**************************************				
1 1		:	Resonance Frequency Drift	Table 2 Item 1	∆f f	- 2.0	+ 2.0	10-6
1			Resonance Resistance	Table 2 Item 2	ΔR	-10	+10	%
1 1			Drift	Table 2 Item 2	R	or (2)	7 10	70
[			J	!	ΔR	-1.0	+1.0	Ω
09	Cold	Para. 9.14.3	Initial Measurements		ļ			"
			Resonance Frequency	Table 2 Item 1	f	Para.	9.14.1.3	<u> </u>
500.00	للتقريف ويوليون والمستهدي والمستهدي والمستهدي والمستهدي والمستهدين	بيهم ويوميهم ربي بالتاكات المواجان فاستستبط	Resonance Resistance	Table 2 Item 2	Book	Final Mea	surements	Name of the State
1 1		,	Final Measurements				1	}
	ı		Resonance Frequency	Table 2 Item 1	Δt	- 2.0	+ 2.0	10-6
j j			Drift Resonance Resistance	Table 2 Item 2	l f	10		
			Drift	rable 2 item 2	∆R R	-10	+10	%
1	Sample of the second	Jak 4	Dill	'	ΔR	or (2) - 1.0	+1.0	Ω
10	Damp Heat (Accierated)	Para. 9.14.4	Initial Measurements		]	'."		3"
	Remaining Cycles		Resonance Frequency	Table 2 Item 1	f	Para.	9.14.3.2	1 1
1 11/11			Resonance Resistance	Table 2 Item 2	R		surements	
'			Final Measurements	;		ĺ	1	
] ]	·		Resonance Frequency	Table 2 Item 1	<u>Δ f</u>	-2.0	+ 2.0	10-6
			Drift	la <u>s battiras est</u>	f_	l i i a	1 200	
}			Resonance Resistance	1. ( ) )	<u>Δ R</u>	-10	+10	%
1			Drift		R ΔR	or (2)		
1		1	Insulation Resistance	Table 2 Item 8	Ri	- 1.0 500	+1.0	$\Omega$ M $\Omega$
ļ		ļ	Insulation resistance	Table 2 Rent 6	ni ni	300		14175
11	Rapid Change of	Para. 9.15	Initial Measurements			}		
}	Temperature		Resonance Frequency	Table 2 Item 1	f		9.14.4.2	}
1		1	Resonance Resistance		R	Final Mea	asurements	
		1	Final Measurements	After minimum	1			1
		j	Possesses Erecuestes	Recovery of 2 hours Table 2 Item 1		}	100	10.8
			Resonance Frequency Drift	1 able 2 item 1	$\Delta f$	- 2.0	+ 2.0	10-6
1		· ·	Resonance Resistance	Table 2 Item 2	ΔR	-10	+10	%
1			Drift	I dolo z nom z	R	or (2)	''	"
					ΔR	-1.0	+1.0	Ω
12	Robustness of	Para. 9.16	Tensile Strength	Gen. 3501				
-	Terminations	1		Para. 9.16.1			*	ł
			Visual Examination	No visible damage	1			Ì
1		[	Bending	Gen. 3501	1	5		ļ
1				Para. 9.16.2		]		]
			Visual Examination	No visible damage				
				<del></del>	, , , , , , , , , , , , , , , , , , , ,			

#### 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.



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#### 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		LIM	ITS	
NO.	ENVIRONMENTAL AND ENDURANCE TESTS (1)			CONDITIONS	SYMBOL	Min.	Max.	UNIT
13	Life Test	Para. 9.17	Initial Measurements					
		(a) ( ) ( )	Resonance Frequency	Table 2 Item 1	f	Table 2	Item 1	
			Resonance Resistance	Table 2 Item 2	R	Table 2	item 2	
	in .		Intermediate Measurements	At 500 hours	)		) ·	1
	file end		Resonance Frequency	Table 2 Item 1	∆ f f	-2.0	+ 2.0	10-6
·			Drift					ł
100			Resonance Resistance	Table 2 Item 2	ΔR	10	+10	%
			Drift		R	or (2)		1
		1.00	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		ΔR	- 1.0	+1.0	Ω
		<b>(</b>	Intermediate Measurements	At 1000 hours			1	l
1			(Chart IV) and Final					ł
	1000		Measurements (Chart V)	ا دیده درست			1	
	The state of the s	film de l'est est est è le réceptifies	Resonance Frequency Drift	Table 2 Item 1	<u>∆ f</u> f	- 2.5	+2.5	10-6
		{	Resonance Resitance	Table 2 Item 2	ΔR R	-10	+10	%
		ĺ	Drift			or (2)		ſ
		[	<b>f</b>		ΔR	-1.0	+1.0	Ω
	a filitifica e	$\mathcal{M}_{\mathcal{F}}$	Final Measurements (Chart IV)	At 2000 hours	-			
		a feeth	Resonance Frequency Drift	Table 2 Item 1	<u>∆ f</u> f	-3.0	+3.0	10-6
	<b>经制制</b> 学的		Resonance Resistance	Table 2 Item 2	ΔR	-10	+10	%
			Drift	,	R ΔR	or (2) -1.0	+1.0	Ω

#### **NOTES**

- The Beautiful Art of the Beautiful Commence of the Commence of 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.



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## TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO. 01

	TYPE VARIANT NO. 01										
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks					
1	Resonance Frequency	f <sub>r</sub>	65.34	65.34375		Swept					
2	Reference Temperature	To	+23	+27	°C						
3	Overtone Order	_	3								
4	Load Capacitance	CL	8	)	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	∆ f f	-7.5	+ 7.5	10-6	From frequency measured at T <sub>o</sub> °C					
9	Resistance Variation with Temperature over Top	<u>∆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 app	olicable	10 <sup>-6</sup>						
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not app	plicable	%						
13	Motional Inductance	L <sub>1</sub>	3.2	4.8	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	<b>-</b>						
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	+3.0	10-6	After burn-in and per year					
19	Terminal Length	L	Figu	ıre 2	mm						



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	68.4	68.4373		Swept
2	Reference Temperature	To	+ 23	+ 27	°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>	•	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆f f	-7.5	+ 7.5	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	+10	%	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 app	olicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	3.2	4.8	mH	
14	Motional Capacitance	C <sub>1</sub>	Not app	olicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not app	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	+3.0	10 <sup>-6</sup>	After burn-in, and per year
19	Terminal Length	L	Figu	re 2	mm	



No.

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

Resonance Frequency

Reference Temperature

Overtone Order

Load Capacitance

Rated Drive Level

Tolerance

over Top

over Top

Range

Frequency Adjustment

Resonance Resistance

Frequency Variation

Resistance Variation

Operating Temperature

Frequency variation

Resistance variation with Drive Level

Motional Inductance

Motional Capacitance

Static Capacitance

Ratio of Unwanted:

Response Resistance to

Response Impedance to Resonance Resistance

Resonance Resistance

Q Factor

Ageing

Terminal Length

with Drive Level

with Temperature

with Temperature

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Remarks

Swept

At To °C

At To °C

From frequency

From resistance

measured at To °C

In the frequency

to

After burn-in, and per

range:

year

f<sub>r</sub> -50kHz

 $f_r + 50kHz$ 

measured at To °C

MHz

°C

рF

mW

10-6

Ω

10-6

%

°C

10-6

%

mH

fF

pF

10-6

mm

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

+23

-10

-7.5

-10

-20

71.9686

3

00

0.1

+27

+10

40

+7.5

+ 10

+70

4.8

7.0

+3.0

Not applicable

Not applicable

Not applicable

Not applicable

2:1

-3.0

Figure 2

3.2

•	TYPE \	VARIANT	NO. 03	
Characteristics	Symbol	Li Min.	mits Max.	Unit

 $f_r$ 

 $T_0$ 

 $\mathsf{C}_\mathsf{L}$ 

 $P_o$ 

<u>Δ f</u>

f

 $R_{r}$ 

 $\Delta f$ 

 $\Delta R$ 

 $T_{op}$ 

<u>Δ f</u>

 $\Delta R$ 

R

 $L_1$ 

 $C_1$ 

 $C_{o}$ 

Q

Rp/R

IZpI/R

<u>Δ f</u>

L



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

			VADIANI	110.0.		
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	82	82.53		Swept
2	Reference Temperature	То	+ 23	+ 27	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	C <sub>L</sub>		0	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 <sub>r</sub>	_	40	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-10	+ 10	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>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>	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 a	pplicable	-	
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	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ıre 2	mm	



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

	TYPE VARIANT NO. 05									
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks				
1	Resonance Frequency	f <sub>r</sub>	83.	83.07		Swept				
2	Reference Temperature	T <sub>o</sub>	+23	+27	°C					
3	Overtone Order	-	3							
4	Load Capacitance	CL	α		pF					
5	Rated Drive Level	Po	0.	1	mW					
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+5.0	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	∆ f f	-10	+10	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>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 <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> -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	Figure 2		mm					



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

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	83.	83.335		Swept
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Ę	5		
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>	-	60	Ω	At To °C
8	Frequency Variation with Temperature over Top	$\frac{\Delta f}{f}$	-7.0	+ 7.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<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>	10.8	13.2	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not a	pplicable	_	
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	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ure 2	mm	



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

		<u> </u>	VARIAIVI	140. 07		
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	84.21	84.210526		Swept
2	Reference Temperature	To	+ 24	+ 26	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	α	∞		
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>	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	-8.0	+ 8.0	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	$\frac{\Delta f}{f}$	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>	Not app	olicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	olicable	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> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	∆ f f	-3.0	+ 3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	re 2	mm	
	·					

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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	84.868421		MHz	Swept
2	Reference Temperature	To	+ 24	+ 26	°C	
3	Overtone Order	-	8	3		
4	Load Capacitance	CL	α	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>	-	40	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	-8.0	+8.0	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	<u>Δ f</u>	Not applicable		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 a	pplicable	_	
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	-3.0	+3.0	10-6	After burn-in, over 10 years
19	Terminal Length	L	Figi	ure 2	mm	
L	1	1	1			<u> </u>



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

,						
No.	Characteristics	Symbol	Lim Min.	Limits Min. Max.		Remarks
1	Resonance Frequency	f <sub>r</sub>	85.087737		MHz	Swept
2	Reference Temperature	To	+24	+26	°C	
3	Overtone Order	-	3			
4	Load Capacitance	C <sub>L</sub>	α	00		
5	Rated Drive Level	Po	0.	0.1		
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+ 5.0	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>∆ f</u> f	-8.0	+ 8.0	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	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not applicable		%	
13	Motional Inductance	L <sub>1</sub>	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 a	pplicable	-	
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>∆ f</u>	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figi	ure 2	mm	



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

		111 - 1				
No.	Characteristics	Symbol	Limits Min. Max.		Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	85.964947		MHz	Swept
2	Reference Temperature	To	+ 24	+ 26	°C	
3	Overtone Order	-	3			
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	10-6	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>	-8.0	+8.0	10 <sup>-6</sup>	From frequency measured at To °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	$\frac{\Delta f}{f}$	Not applicable		10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not applicable		%	
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 applicable		-	
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
1	8 Ageing	∆ f f	-3.0	+3.0	10-6	After burn-in, and per year
1	9 Terminal Length	L	Figure 2		mm	



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

			744 444 444 444			
No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	36.866968		MHz	Swept
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	∞		pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	∆ f f	-10	+ 10	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	∆ 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	<u>Δ R</u> R	-10	+10	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	Тор	-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	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	17.7	21.7	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not a	pplicable	-	
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>∆ f</u>	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	37.166667		MHz	Swept
2	Reference Temperature	T <sub>o</sub>	+23	+27	°C	
3	Overtone Order	<u>-</u>	3			
4	Load Capacitance	C <sub>L</sub>	00		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 To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> 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	<u>∆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	Δf f	Not applicable		10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not applicable		%	
13	Motional Inductance	L <sub>1</sub>	17.3	21.3	mΗ	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not a	oplicable	-	
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	+3.0	10 <sup>-6</sup>	After burn-in, and per year
19	Terminal Length	L	Figu	ire 2	mm	
			_1			



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

				<del></del>		r
No.	Characteristics	Symbol	Limits Min. Max.		Unit	Remarks
1	Resonance Frequency	fr	62.052865		MHz	Swept
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	•	3			
4	Load Capacitance	CL	∞		рF	
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>		40	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	-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	10-6	
12	Resistance variation with Drive Level	ΔR R	Not applicable		%	
13	Motional Inductance	L <sub>1</sub>	3.2	4.8	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co		7.0	pF	
16	Q Factor	Q	30 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R	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	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	



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

No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	70.0		MHz	
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	<u>-</u>	3			
4	Load Capacitance	$C_L$	∞		pF	
5	Rated Drive Level	P <sub>0</sub>	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 To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-9.0	+9.0	10-6	From frequency measured at To °C
9	Resistance Variation with Temperature over Top	<u>∆ 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	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	3.2	4.8	mH	·
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	35 000			
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	+3.0	10 <sup>-6</sup>	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	102.0833333		MHz	
2	Reference Temperature	То	+ 22	+ 28	°C	
3	Overtone Order	-	5			
4	Load Capacitance	CL	11.9	12.1	рF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	10-6	At To °C
7	Resonance Resistance	$R_{L}$	-	70	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f f	-5.0	+5.0	10 <sup>-6</sup>	From frequency measured at To °C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+50	°C	
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	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	-	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> -100kHz to f <sub>L</sub> + 100kHz
18	Ageing	<u>Δ f</u>	-10	+ 10	10-6	After burn-in, over 10 years
19	Terminal Length	L	Fig	ure 2	mm	



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

No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fL	15.	0	MHz	
2	Reference Temperature	To	+4	0	°C	
3	Overtone Order	-	Fundam	nental		
4	Load Capacitance	CL	50	)	pF	
5	Rated Drive Level	Po	0		mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+10	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	$R_L$	-	13	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	-15	+15	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>	-20	+ 80	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	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>	Not app	olicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not app	olicable	fF	
15	Static Capacitance	Co	Not app	olicable	pF	
16	Q Factor	Q	50 000		•	
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	∆ f f	-3.0	+3.0	10-6	
19	Terminal Length	L	Figu	ıre 2	mm	



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

No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fL	16.	0	MHz	
2	Reference Temperature	To	+6	0	°C	
3	Overtone Order	-	Fundan	nental		
4	Load Capacitance	CL	20	50	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	-	20	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> 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	-10 +10 or -1.5 +1.5		% Ω	From resistance measured at $T_0$ °C If R < 10 $\Omega$
10	Operating Temperature Range	T <sub>op</sub>	-30	+ 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	ΔR R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>		9.5	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 IZpI/R	2:1	-		In the frequency range: f <sub>L</sub> -200kHz to f <sub>L</sub> +200kHz
18	Ageing	Δf f	-10	+10	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ure 2	mm	



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

No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fL	15.84		MHz	
2	Reference Temperature	То	+	25	°C	
3	Overtone Order	-	Fundan	nental		
4	Load Capacitance	CL	50	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-20	+20	10-6	At To °C
7	Resonance Resistance	$R_L$	-	20	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	∆f f	-30	+30	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>	-55	+ 105	°C	
11	Frequency variation with Drive Level	<u>Δ f</u> f	Not app	olicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	12.24	16.56	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	Rp/R IZpl/R	3:1	-		In the frequency range: f <sub>L</sub> -1.0MHz to f <sub>L</sub> + 1.0MHz
18	Ageing	<u>∆</u> f	-7.5	+ 7.5	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ure 2	mm	



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

No.	Characteristics	Symbol	Limit Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fL	16.0 -16.384		MHz	
2	Reference Temperature	To	+6	0	°C	
3	Overtone Order	-	Fundam	nental		
4	Load Capacitance	CL	22		pF	
5	Rated Drive Level	Po	0.1	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-10	+10	10-6	At T <sub>o</sub> °C
7	Resonance Resistance	RL	-	20	Ω	Over T <sub>op</sub> °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	<u>Δ R</u> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not app	olicable	10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not app	olicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	Not a	oplicable	-	
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	∆ f f	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

					<del></del>	
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>L</sub>	16.35		MHz	
2	Reference Temperature	To	+ 2	25	°C	
3	Overtone Order	_	Fundar	nental		
4	Load Capacitance	CL	3	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-15	+ 15	10-6	At To °C
7	Resonance Resistance	RL		30	Ω	Over Top °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u>	-15	+15	10-6	From frequency measured at To °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	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not a	oplicable	mH	
14	Motional Capacitance	. C <sub>1</sub>	Not a	oplicable	fF	
15	Static Capacitance	Co	-	4.0	pF	
16	Q Factor	Q	Not	applicable	-	_
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> -1.0MHz to f <sub>L</sub> + 1.0MHz
18	Ageing	$\frac{\Delta f}{f}$	-5.	0 +5.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fi	gure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol -	Limit Min.	s Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	18.84		MHz	
2	Reference Temperature	To	+ 25	5	°C	
3	Overtone Order	~	Fundam	ental		
4	Load Capacitance	CL	8		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>	-	17.5	Ω	At To °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	ΔR	-2.0	+2.0	Ω	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 55	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not app	licable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	8.1	9.9	mH	
14	Motional Capacitance	C <sub>1</sub>	Not app	olicable	fF	
15	Static Capacitance	Co	-	4.0	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	3:1	-		In the frequency range: f <sub>r</sub> -200kHz to f <sub>r</sub> + 200kHz
18	Ageing	∆ f f	-5.0	+5.0	10-6	After burn-in, and over 3 years
19	Terminal Length	L	Figi	ure 2	mm	



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	18.	84	MHz	
2	Reference Temperature	То	+2	25	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	C <sub>L</sub>	33	2	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-5.0	+ 5.0	10-6	At To °C
7	Resonance Resistance	$R_L$		26	Ω	At To °C
8	Frequency Variation with Temperature over Top	Δf 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	ΔR	-2.0	+2.0	Ω	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 55	°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>	13.68	16.72	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	•	-	<u> </u>
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> -500kHz to f <sub>L</sub> + 500kHz
18	Ageing	∆ f f	-5.0	+ 5.0	10-6	
19	Terminal Length	L	Fig	ure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

					T	
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f_	15	.0	MHz	
2	Reference Temperature	То	+	25	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	C <sub>L</sub>	31	33	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	At To °C
8	Frequency Variation with Temperature over Top	$\frac{\Delta f}{f}$	-20	+20	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-10 +10 or -1.5 +1.5		% Ω	From resistance measured at $T_0$ °C If R<10 $\Omega$
10	Operating Temperature Range	T <sub>op</sub>	-30	+70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	oplicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not a	oplicable	%	
13	Motional Inductance	L <sub>1</sub>	8.8	12	mH	
14	Motional Capacitance	C <sub>1</sub>	Not a	pplicable	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	Not applicable			
18	Ageing	$\frac{\Delta f}{f}$	-10	+ 10	10-6	After burn-in, and per year
19	Terminal Length	L	Fi	gure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fL	20.0		MHz	
2	Reference Temperature	То	+ 59	+ 61	°C	
3	Overtone Order	-	Fundan	nental		
4	Load Capacitance	C <sub>L</sub>	22	2	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+ 10	10-6	At To °C
7	Resonance Resistance	RL	_	20	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-15	+15	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>	-20	+70	°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>	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	-	<u>-</u>	
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	3 Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fiç	gure 2	mm	



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

		———				
No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	36.69	3333	MHz	
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	00		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	-9.0	+ 9.0	10-6	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	Тор	-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	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	17.7	21.7	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	19 000		-	
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	Δf f	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	



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

No.	Characteristics	Symbol -	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	20.8	333	MHz	
2	Reference Temperature	To	+2	25	°C	
3	Overtone Order	-	Fundar	mental		
4	Load Capacitance	CL	1	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+10	10-6	At To °C
7	Resonance Resistance	RL	-	20	Ω	Over Top °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-10	+ 10	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>	-10	+60	°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 a	pplicable	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	Rp/R IZpI/R	4:1	-		In the frequency range: f <sub>L</sub> -10% to f <sub>L</sub> + 10%
18	Ageing	$\frac{\Delta f}{f}$	Not a	pplicable	10-6	
19	Terminal Length	L	Fig	jure 2	mm	



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

					<del> </del>	
No.	Characteristics	Symbol	Limi Min.	Max.	Unit	Remarks
1	Resonance Frequency	fL	22.841	1667	MHz	
2	Reference Temperature	To	+2	5	°C	
3	Overtone Order	•	Fundan	nental		
4	Load Capacitance	CL	30	)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-10	+10	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	$R_L$	-	15	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	<u>Δ R</u> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-25	+ 65	°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 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	-	3.0	pF	
16	Q Factor	Q	Not a	pplicable	-	_
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	<u>∆</u> f	Not ap	plicable	10 <sup>-6</sup>	
19	Terminal Length	L	Fig	ure 2	mm	



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

No.	Characteristics	Symbol	Limit Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fL	22.856	667	MHz	
2	Reference Temperature	To	+2	5	°C	
3	Overtone Order	-	Fundam	nental		
4	Load Capacitance	CL	22	56	pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	Not app	licable	10-6	
7	Resonance Resistance	RL	-	40	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	∆f 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	<u>∆ R</u> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+50	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not app	olicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not app	olicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	olicable	fF	
15	Static Capacitance	Co	Not ap	olicable	pF	
16	Q Factor	Q	80 000	-	-	-
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R	3:1	-		In the frequency range: f <sub>L</sub> -200kHz to f <sub>L</sub> + 200kHz
18	Ageing	$\frac{\Delta f}{f}$	-10	+10	10-6	After burn-in, over 8 years
19	Terminal Length	L	Figu	ıre 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	22.86	1667	MHz	
2	Reference Temperature	То	+ 2	25	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	C <sub>L</sub>	3	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δ f f	-10	+10	10-6	At To °C
7	Resonance Resistance	R <sub>L</sub>	-	15	Ω	Over T <sub>op</sub> °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	ΔR R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 65	°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 a	pplicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	oplicable	fF	
15	Static Capacitance	Co		4.0	pF	
16	Q Factor	Q	Not a	applicable	-	
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	$\frac{\Delta f}{f}$	Not a	pplicable	10 <sup>-6</sup>	
19	Terminal Length	L	Fig	gure 2	mm	



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

No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fL	24.1	84	MHz	
2	Reference Temperature	To	+2	5	°C	
3	Overtone Order	•	Fundan	nental		
4	Load Capacitance	C <sub>L</sub>	32	2	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆f f	-5.0	+ 5.0	10-6	At To °C
7	Resonance Resistance	$R_L$	-	26	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 To °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-10	+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	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	Not a	pplicable	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	Rp/R IZpI/R	10:1	-		In the frequency range: f <sub>L</sub> -2.0MHz to f <sub>L</sub> + 2.0MHz
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+5.0	10 <sup>-6</sup>	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			4 10 4 1 1 1			
No.	Characteristics	Symbol	Limit Min.	s Max.	Unit	Remarks
1	Resonance Frequency	fL	24.5	5	MHz	
2	Reference Temperature	To	+ 2	5	°C	
3	Overtone Order	-	Fundam	ental		
4	Load Capacitance	C <sub>L</sub>	30		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	RL	-	25	Ω	Over Top °C
8	Frequency Variation with Temperature over Top	Δf 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	<u>∆</u> R R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+60	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not app	licable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not app	olicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not app	olicable	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	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 <sup>-6</sup>	After burn-in, and per year
19	Terminal Length	L	Figu	ıre 2	mm	



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

No.	Characteristics	Symbol	Limi Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	24.	5	MHz	
2	Reference Temperature	To	+2	25	°C	
3	Overtone Order	•	Fundan	nental		
4	Load Capacitance	C <sub>L</sub>	32	2	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	RL	-	21	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆ f 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	ΔR	-2.0	+2.0	Ω	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 55	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not app	olicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	6.23	7.62	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	3:1	-		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	After burn-in, and over 3 years
19	Terminal Length	L	Fig	ure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	36.666 -3	38.333	MHz	
2	Reference Temperature	To	+2	5	°C	
3	Overtone Order	-	3			
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	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	-	40	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆</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	ΔR R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-20	+60	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not app	olicable	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	-	5.0	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	3:1			In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	∆ f f	-3.0	+3.0	10 <sup>-6</sup>	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	



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

No.	Characteristics	Symbol -	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fL	38.25	618	MHz	
2	Reference Temperature	То	+2	22	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	10	100	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆f f	-8.0	+ 8.0	10-6	At To °C
7	Resonance Resistance	$R_{L}$	-	75	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	-4.0	+ 4.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	∆R R	Not app	olicable	%	
10	Operating Temperature Range	Тор	0	+ 40	°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	-	2.0	pF	
16	Q Factor	Q	200 000	-	-	
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> -1.0MHz to f <sub>L</sub> + 1.0MHz
18	Ageing	∆ f f	-2.0	+2.0	10 <sup>-6</sup>	Per year
19	Terminal Length	L	Fig	ure 2	mm	



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f∟	55.46	875	MHz	
2	Reference Temperature	To	+ 4	15	°C	
3	Overtone Order		3			
4	Load Capacitance	CL	20	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 To °C
7	Resonance Resistance	RL	-	40	Ω	Over Top °C
8	Frequency Variation with Temperature over Top	∆f f	-0.4	+ 0.4	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>	-43	+ 47	°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	2.5	3.5	pF	
16	Q Factor	Q	100 000	-	-	
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> -50kHz to f <sub>L</sub> + 50kHz
18	Ageing	<u>∆</u> f	-1.5	+ 1.5	10-6	Per year after burn-in
19	Terminal Length	L	Fig	jure 2	mm	



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

				γ		
No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fL	62.5 -6	8.125	MHz	
2	Reference Temperature	To	+2	5	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	10	,	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	RL	-	40	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-10	+10	10 <sup>-6</sup>	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-10	+60	°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 a	oplicable	%	
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	plicable	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	4:1	-		In the frequency range: f <sub>L</sub> -10% to f <sub>L</sub> + 10%
18	Ageing	∆ f f	Not ap	plicable	10-6	
19	Terminal Length	L	Fig	ure 2	mm	



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

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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

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No.	Characteristics	Symbol	Limit Min.	s Max.	Unit	Remarks
1	Resonance Frequency	fL	75.360	)15	MHz	
2	Reference Temperature	To	+ 25	5	°C	
3	Overtone Order	-	5			
4	Load Capacitance	CL	15	100	pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-2.0	+2.0	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	RL	70	130	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	-7.0	+ 7.0	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	Тор	-20	+50	°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>	Not app	olicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	olicable	fF	
15	Static Capacitance	Co	10.	2.0	pF	
16	Q Factor	Q	100 000	_	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R	3:1	-		In the frequency range: f <sub>L</sub> -50kHz to f <sub>L</sub> + 50kHz
18	Ageing	$\frac{\Delta f}{f}$	-2.0	+2.0	10 <sup>-6</sup>	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	



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

No.	Characteristics	Symbol	Limit Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fL	79.516	319	MHz	
2	Reference Temperature	To	+3	0	°C	
3	Overtone Order	-	3			
4	Load Capacitance	C <sub>L</sub>	20	33	pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	∆ f f	Not app	licable	10 <sup>-6</sup>	
7	Resonance Resistance	RL	-	50	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-10	+10	10-6	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	<u>∆</u> R R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-10	+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	ΔR R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not app	olicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not app	plicable	fF	
15	Static Capacitance	Co	-	4.0	pF	
16	Q Factor	Q	Not ap	oplicable	_	
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> -50kHz to f <sub>L</sub> + 50kHz
18	Ageing	<u>∆</u> f	-5.0	+5.0	10-6	After burn-in, over 3 years
19	Terminal Length	L	Figu	ure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	80.381944		MHz	
2	Reference Temperature	To	+ 2	25	°C	
3	Overtone Order	•	3			
4	Load Capacitance	CL	21.6	31.4	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	Not app	olicable	10-6	
7	Resonance Resistance	RL	-	50	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆</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>∆R</u> R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-25	+65	°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	oplicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not a	oplicable	fF	
15	Static Capacitance	Co	-3.6	4.4	pF	
16	Q Factor	Q	Not a	applicable	•	
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> -50kHz to f <sub>L</sub> + 50kHz
18	Ageing	$\frac{\Delta f}{f}$	Not a	pplicable	10-6	
19	Terminal Length	L	Fig	gure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	fL	81.847222		MHz	
2	Reference Temperature	To	+;	25	°C	
3	Overtone Order	-	(	3		
4	Load Capacitance	C <sub>L</sub>	20	33	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	Δf f	Not ap	plicable	10-6	
7	Resonance Resistance	RL	Not ap	plicable	Ω	
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	ΔR R	Not applicable		%	
10	Operating Temperature Range	Тор	-25	+ 65	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	oplicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not a	oplicable	%	
13	Motional Inductance	L <sub>1</sub>	Not a	pplicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not a	pplicable	fF	
15	Static Capacitance	Co	Not a	pplicable	pF	
16	Q Factor	Q	Not	applicable	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	Not applicable			
18	Ageing	∆ f f	Not a	applicable	10 <sup>-6</sup>	
19	Terminal Length	L	Fi	gure 2	mm	



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	99.1		MHz	
2	Reference Temperature	To	+ 2	25	°C	
3	Overtone Order	-	5			
4	Load Capacitance	C <sub>L</sub>	90		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>	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u>	-5.0	+ 5.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	AR 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	Δf f	Not app	olicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	Not ap	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mΗ	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.5	pF	
16	Q Factor	Q	Not a	oplicable	-	
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>r</sub> -20% to f <sub>r</sub> + 20%
18	Ageing	<u>∆</u> f	-3.0	+3.0	10-6	After burn-in, over 3 years
19	Terminal Length	L	Figu	ıre 2	mm	



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	105	5.0	MHz	
2	Reference Temperature	T <sub>o</sub>	+2	25	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	C <sub>L</sub>	1	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+10	10-6	At To °C
7	Resonance Resistance	$R_{L}$	-	60	Ω	Over Top °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-10	+10	10 <sup>-6</sup>	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	
10	Operating Temperature Range	Тор	-10	+60	°C	
11	Frequency variation with Drive Level	Δf 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	Not ap	plicable	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	3:1	_		in the frequency range: f <sub>L</sub> -10% to f <sub>L</sub> +10%
18	Ageing	$\frac{\Delta f}{f}$	Not applicable		10-6	
19	Terminal Length	L	Fig	ure 2	mm	



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

No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	120.7	96	MHz	
2	Reference Temperature	То	+2	5	°C	
3	Overtone Order	-	5			
4	Load Capacitance	CL	00		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>	-	55	Ω	Over T <sub>op</sub> °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	ΔR R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-10	+ 50	°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>	Not app	olicable	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	Not applicable			
18	Ageing	Δf f	-5.0	+5.0	10 <sup>-6</sup>	After burn-in, per year
19	Terminal Length	L	Figi	ure 2	mm	



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	61.80	5555	MHz	f <sub>s</sub> = 61.8047MHz
2	Reference Temperature	То	+ 23	+ 27	°C	
3	Overtone Order	•	3			
4	Load Capacitance	CL	α	)	рF	
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	∆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	-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	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	Not a	pplicable	_	
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> -60kHz to f <sub>r</sub> + 60kHz
18	Ageing	∆ f f	-3.0	+3.0	10 <sup>-6</sup>	
19	Terminal Length	L	Fig	ure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit -	Remarks
1	Resonance Frequency	f <sub>r</sub>	62.5		MHz	f <sub>s</sub> = 62.4992MHz
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	B		
4	Load Capacitance	C <sub>L</sub>	α	,	рF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f 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	∆ 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	-20	+20	%	From resistance measured at T <sub>0</sub> °C
10	Operating Temperature Range	Top	-20	+70	°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>	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> -60kHz to f <sub>r</sub> +60kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10 <sup>-6</sup>	After burn-in, and per year
19	Terminal Length	L	Fig	jure 2	mm	



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

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No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	62.03125		MHz	f <sub>s</sub> = 62.03045MHz
2	Reference Temperature	To	+ 23	+27	°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	-5.0	+5.0	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	-10	+10	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	$\frac{\Delta f}{f}$	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	рF	
16	Q Factor	Q	Not a	pplicable	-	
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> -60kHz to f <sub>r</sub> +60kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	62.10	9375	MHz	$f_s = 62.108575MHz$
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	Δf f	-5.0	+ 5.0	10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>	<u>-</u>	40	Ω	At To °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	-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	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	oplicable	%	
13	Motional Inductance	L <sub>1</sub>	Not a	oplicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not a	pplicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not a	pplicable	-	
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> -60kHz to f <sub>r</sub> +60kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.	0 +3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fi	gure 2	mm	



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	69.559524		MHz	$f_s = 69.5587MHz$
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	00		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>		40	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	-10	+10	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	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>	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> -60kHz to f <sub>r</sub> + 60kHz
18	Ageing	∆ f f	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	
1	-1					



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fr	69.619048		MHz	f <sub>s</sub> = 69.6182MHz
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	٥	•	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 To °C
7	Resonance Resistance	R <sub>r</sub>	•	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	-10	+ 10	10 <sup>-6</sup>	From frequency measured at To °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	Δf 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	oplicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	oplicable	fF	
15	Static Capacitance	Co	•	7.0	pF	
16	Q Factor	Q	Not a	applicable	-	
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> -60kHz to f <sub>r</sub> + 60kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fiç	gure 2	mm	



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	24.68617		MHz	
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	C <sub>L</sub>	30	)	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	$R_{L}$	-	25	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-6.0	+6.0	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	Тор	-20	+ 70	°C	
11	Frequency variation with Drive Level	Δf f	Not ap	plicable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	∆R 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>L</sub> -200kHz to f <sub>L</sub> + 200kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

				······································		
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	82.53		MHz	f <sub>s</sub> = 82.5292MHz
2	Reference Temperature	To	+23	+ 27	°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	Δf f	-5.0	+ 5.0	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	-10	+10	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	$\frac{\Delta f}{f}$	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	oplicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not a	oplicable	fF	
15	Static Capacitance	Co		7.0	pF	
16	Q Factor	Q	Not a	applicable	-	
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> -70kHz to f <sub>r</sub> + 70kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fiç	gure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limi Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	83.07		MHz	f <sub>s</sub> = 83.0692MHz
2	Reference Temperature	To	+ 23	+ 27	°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	<u>∆</u> 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>∆</u> f	-10	+10	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	Тор	-20	+70	°C	
11	Frequency variation with Drive Level	Δf 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	•	7.0	pF	
16	Q Factor	Q	Not ap	oplicable		
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> -70kHz to f <sub>r</sub> +70kHz
18	Ageing	∆ f f	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	gure 2	mm	



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

No.	Characteristics	Symbol	Limit Min.	s Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	37.063617		MHz	Swept
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3			
4	Load Capacitance	C <sub>L</sub>	00		pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	Δf 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	-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	-10	+10	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	Тор	-20	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not app	olicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	17.3	21.3	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co		7.0	pF	
16	Q Factor	Q	19 000		-	
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	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	37.083333		MHz	
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C <sub>L</sub>	٥		pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f 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	∆ 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	-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	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	17.3	21.3	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	19 000		-	
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	∆ f	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	61.1	875	MHz	
2	Reference Temperature	То			°C	
3	Overtone Order	-				
4	Load Capacitance	CL			pF	
5	Rated Drive Level	Po			mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$			10-6	At To °C
7	Resonance Resistance	R <sub>r</sub>			Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u>			10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R			%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>			°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$			10-6	From $P_{S1} = mW$ to $P_{S2} = mW$
12	Resistance variation with Drive Level	ΔR R			%	From $P_{S1} = mW$ to $P_{S2} = mW$
13	Motional Inductance	L <sub>1</sub>			mH	
14	Motional Capacitance	C <sub>1</sub>			fF	
15	Static Capacitance	Co	-		pF	
16	Q Factor	Q		-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R				In the frequency range: f <sub>r</sub> - kHz to f <sub>r</sub> + kHz
18	Ageing	Δf f			10-6	
19	Terminal Length	L			mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

Limits Unit Remarks									
No.	Characteristics	Symbol	Min. Max.		Unit	Remarks			
1	Resonance Frequency	fr	65.00311		MHz	Swept			
2	Reference Temperature	To	+23	+ 27	°C				
3	Overtone Order	-	3						
4	Load Capacitance	C <sub>L</sub>	00		pF				
5	Rated Drive Level	Po	0.	1	mW				
6	Frequency Adjustment Tolerance	<u>∆</u> 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>Δ f</u>	-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	+70	°C				
11	Frequency variation with Drive Level	∆ 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>	3.2	4.8	mH				
14	Motional Capacitance	C <sub>1</sub>	Not a	pplicable	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> -50kHz to f <sub>r</sub> +50kHz			
1	8 Ageing	Δ f	-3.	0 +3.	0 10-6	After burn-in, and per year			
1	9 Terminal Length	L	Fi	gure 2	mm				



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

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No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks				
1	Resonance Frequency	f <sub>r</sub>	85.48		MHz	Swept				
2	Reference Temperature	To	+ 23	+ 27	°C					
3	Overtone Order	-	5							
4	Load Capacitance	CL	α	)	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>	-	60	Ω	At To °C				
8	Frequency Variation with Temperature over Top	∆ f f	-7.5	+ 7.5	10 <sup>-6</sup>	From frequency measured at T <sub>0</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	Тор	-20	+ 70	°C					
11	Frequency variation with Drive Level	<u>∆</u> f	Not ap	plicable	10-6					
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%					
13	Motional Inductance	L <sub>1</sub>	12	-	mH					
14	Motional Capacitance	C <sub>1</sub>	Not ap	oplicable	fF					
15	Static Capacitance	Co	-	7.0	pF					
16	Q Factor	Q	Not a	oplicable						
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	3 Ageing	$\frac{\Delta f}{f}$	-2.0	+2.0	10-6	After burn-in, and per year				
19	Terminal Length	L	Fiç	gure 2	mm					



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	46.08005		MHz	Swept
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	_	3			
4	Load Capacitance	C <sub>L</sub>	1:	2	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	RL		40	Ω	At To °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	-10	+ 10	%	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	ΔR R	Not ap	plicable	%	·
13	Motional Inductance	L <sub>1</sub>	17.42	23.57	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 IZpI/R	2:1	-		In the frequency range: f <sub>L</sub> -50kHz to f <sub>L</sub> +50kHz
18	Ageing	<u>∆ f</u>	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	gure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f_	16	.0	MHz	
2	Reference Temperature	To	+ (	80	°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	Δf f	-10	+ 10	10-6	At To °C
7	Resonance Resistance	RL	-	13	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	-15	+ 15	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	Тор	-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		5.0	pF	
16	Q Factor	Q	50 000		-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/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	After burn-in, and per year
19	Terminal Length	L	Fig	gure 2	mm	



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

No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fr	38.3117284		MHz	
2	Reference Temperature	To	+2	5	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	∞		pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	Δf f	-5.0	+5.0	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	+ 7.0	-7.0	10-6	From frequency measured at T <sub>0</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>	-20	+60	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not app	licable	10 <sup>-6</sup>	
12	Resistance variation with Drive Level	∆R R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not app	olicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not app	olicable	fF	
15	Static Capacitance	Co	_	5.0	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 IZpI/R	3:1	-		In the frequency range: f <sub>r</sub> -60kHz to f <sub>r</sub> +60kHz
18	Ageing	Δf f	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ıre 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	fL	15.	0	MHz	
2	Reference Temperature	To	+ 6	0	°C	
3	Overtone Order	-	Fundan	nental		
4	Load Capacitance	C <sub>L</sub>	20	50	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-10	+ 10	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	RL	•	20	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	Δf f	-10	+10	10 <sup>-6</sup>	From frequency measured at To °C
9	Resistance Variation with Temperature over Top	ΔR R	-10 +10 or -1.5 +1.5		% Ω	From resistance measured at $T_0$ °C If R < $10\Omega$
10	Operating Temperature Range	Top	-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	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	10.2	13.8	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>L</sub> -200kHz to f <sub>L</sub> + 200kHz
18	Ageing	∆ f f	-5.0	+ 5.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	ure 2	mm	
I	the state of the s					



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limits Min. Max.		Unit	Remarks
1	Resonance Frequency	fL	16.0		MHz	
2	Reference Temperature	To	+ 59	+61	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	C <sub>L</sub>	2:	2	рF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+10	10-6	At To °C
7	Resonance Resistance	RL	-	13	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	-15	+ 15	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-10 ( -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>	-20	+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>	Not ap	oplicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	oplicable	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	Rp/R IZpI/R	3:1	-		In the frequency range: f <sub>L</sub> -200kHz to f <sub>L</sub> + 200kHz
18	3 Ageing	∆ f f	-3.0	+3.0	10-6	After burn-in and per year
19	3 Terminal Length	L	Fig	gure 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TTE VARIANT NO. 04										
Characteristics	Symbol			Unit	Remarks					
Resonance Frequency	fL	16.384		MHz	Swept					
Reference Temperature	To	+ 59	+61	°C						
Overtone Order	-	Fundam	nental							
Load Capacitance	CL	22	2	pF						
Rated Drive Level	Po	0.	1	mW						
Frequency Adjustment Tolerance	Δf f	-10	+10	10-6	At To °C					
Resonance Resistance	$R_L$	-	13	Ω	At To °C					
Frequency Variation with Temperature over Top	<u>Δ f</u> f	-15	+ 15	10-6	From frequency measured at To °C					
Resistance Variation with Temperature over Top	ΔR R	-10 o -1.5	+10 r +1.5	% Ω	From resistance measured at $T_0$ °C If $R < 10\Omega$					
Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C						
Frequency variation with Drive Level	<u>∆ f</u> <b>f</b>	Not app	olicable	10 <sup>-6</sup>						
Resistance variation with Drive Level	ΔR R	Not ap	plicable	%						
Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH						
Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF						
Static Capacitance	Co	-	5.0	pF						
Q Factor	Q	50 000	-	-						
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					
Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	After burn-in and per year					
Terminal Length	L	Fig	ure 2	mm						
	Resonance Frequency Reference Temperature Overtone Order Load Capacitance Rated Drive Level Frequency Adjustment Tolerance Resonance Resistance Frequency Variation with Temperature over Top Resistance Variation with Temperature over Top Operating Temperature Range Frequency variation with Drive Level Resistance variation with Drive Level Motional Inductance Motional Capacitance Static Capacitance Q Factor Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance Ageing	Resonance Frequency  Reference Temperature  Overtone Order  Load Capacitance  CL  Rated Drive Level  Frequency Adjustment Tolerance  Resonance Resistance  Frequency Variation with Temperature over Top  Resistance Variation with Temperature over Top  Operating Temperature Range  Frequency variation with Drive Level  Resistance Variation With Temperature Over Top  Operating Temperature  Co  Resistance Variation With Temperature Over Top  Operating Temperature  Co  Resistance Variation With Temperature Over Top  Operating Temperature  A R  R  R  R  R  R  R  R  R  R  R  R  R	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Resonance Frequency         f <sub>L</sub> 16.384           Reference Temperature         T <sub>o</sub> +59         +61           Overtone Order         -         Fundamental           Load Capacitance         C <sub>L</sub> 22           Rated Drive Level         P <sub>o</sub> 0.1           Frequency Adjustment Tolerance         Δ f f         -10         + 10           Resonance Resistance         R <sub>L</sub> -         13           Frequency Variation with Temperature over T <sub>op</sub> Δ f f         -15         + 15           Resistance Variation with Temperature Range         T <sub>op</sub> -20         + 70           Prequency variation with Drive Level         Δ f f         Not applicable           Resistance variation with Drive Level         Δ R R         Not applicable           Motional Inductance         L <sub>1</sub> Not applicable           Motional Capacitance         C <sub>1</sub> Not applicable           Static Capacitance         C <sub>1</sub> Not applicable           Ratio of Unwanted: Response Resistance or Resistance to Resonance Resistance or Resonance Resistance Resistance Or Resonance Resista	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	65.0047		MHz	Swept
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order	<u>-</u>	3	3		
4	Load Capacitance	C <sub>L</sub>	o	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	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>∆ f</u>	-10	+10	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>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	ΔR R	Not ap	oplicable	%	
13	Motional Inductance	L <sub>1</sub>	Not a	oplicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not a	pplicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not a	pplicable	-	
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> -60kHz to f <sub>r</sub> +60kHz
18	Ageing	∆ f f	-3.0	0 +3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	gure 2	mm	



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

No.	Characteristics	Symbol	Limi Min.	ts Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	65.0513		MHz	
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	00		pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf 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	∆ f 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	-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 app	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	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> -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	ıre 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limi Min.	Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	69.9992		MHz	
2	Reference Temperature	To	+23	+27	°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	<b>-</b> 5.0	+5.0	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	-10	+10	10 <sup>-6</sup>	From frequency measured at To °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	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>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	<u>.</u>	7.0	pF	
16	Q Factor	Q	Not ap	plicable	<u> </u>	
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> -60kHz to f <sub>r</sub> + 60kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Fig	jure 2	mm	



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

No.	Characteristics	Symbol	Limit Min.	s Max.	Unit	Remarks				
1	Resonance Frequency	f <sub>r</sub>	85.4792		MHz					
2	Reference Temperature	То	+23	+ 27	°C					
3	Overtone Order	-	3							
4	Load Capacitance	CL	∞		pF					
5	Rated Drive Level	Po	0.1		mW					
6	Frequency Adjustment Tolerance	Δf f	-5.0	+ 5.0	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	+10	-10	10-6	From frequency measured at To °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	Тор	-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	ΔR R	Not app	olicable	%					
13	Motional Inductance	L <sub>1</sub>	Not app	olicable	mH					
14	Motional Capacitance	C <sub>1</sub>	Not ap	olicable	fF					
15	Static Capacitance	Co	-	7.0	рF					
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> -60kHz to f <sub>r</sub> +60kHz				
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	After burn-in, and per year				
19	Terminal Length	L	Fig	ure 2	mm					



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO. 69

	TYPE VARIANT NO. 69									
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks				
1	Resonance Frequency	fL	50.	0	MHz					
2	Reference Temperature	To	+ 24.9	+ 25.1	· °C					
3	Overtone Order	-	3							
4	Load Capacitance	CL	30	)	pF					
5	Rated Drive Level	Po	1.1	0	mW					
6	Frequency Adjustment Tolerance	Δf f	-5.0	+5.0	10-6	At T <sub>o</sub> °C				
7	Resonance Resistance	$R_{L}$	-	50	Ω	Over T <sub>op</sub> °C				
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-5.0	+ 5.0	10-6	From frequency measured at T <sub>0</sub> °C				
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	1.				
10	Operating Temperature Range	T <sub>op</sub>	-5	+ 55	°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>	Not app	olicable	mH					
14	Motional Capacitance	C <sub>1</sub>	0.7	0.86	fF					
15	Static Capacitance	Co		3.0	pF					
16	Q Factor	Q	100 000	-	-					
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	8:1	-		In the frequency range: f <sub>L</sub> - 10MHz to f <sub>L</sub> + 10MHz				
18	Ageing	<u>Δ f</u>	-10	+10	10-6	After a run-in time of 680 hours, over 7 years				
19	Terminal Length	L	Figu	ire 2	mm					
	I in the second		<u> </u>		1	<u> </u>				



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

	<del></del>	1 1 1 1 1 1 1	VACIAINII	10. 70		
No.	Characteristics	Symbol	Lim Min.	iits Max.	Unit	Remarks
1	Resonance Frequency	fL	20.0		MHz	
2	Reference Temperature	To	+ 59	+ 61	۰C	
3	Overtone Order	•	Fundar	nental		
4	Load Capacitance	C <sub>L</sub>	2:	2	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	$R_{L}$	-	13	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	-15	+15	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10 o -1.5	+10 r +1.5	% Ω	From resistance measured at T <sub>0</sub> °C If R<10Ω
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 app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not app	olicable	mH	
14	Motional Capacitance	C <sub>1</sub>	Not app	olicable	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	Rp/R	3:1	-		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	After burn-in and per year
19	Terminal Length	L	Figu	re 2	mm	



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

			7741 117 31 4 1	1		T
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	fL	8.	8.0		
2	Reference Temperature	T <sub>o</sub>	+ 23	+ 27	°C	
3	Overtone Order	-	Fundai	mental	-	
4	Load Capacitance	CL	29.7	30.3	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	$R_L$	-	30	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-30	+30	10-6	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>o</sub> °C If R<10Ω
10	Operating Temperature Range	T <sub>op</sub>	-35	+ 105	°C	
11	Frequency variation with Drive Level	∆ f f	-2.0	+2.0	10 <sup>-6</sup>	From $P_{S1} = 20$ nW to $P_{S2} = 0.2$ mW
12	Resistance variation with Drive Level	ΔR R	-25	+ 25	%	From $P_{S1} = 20$ nW to $P_{S2} = 0.2$ mW
13	Motional Inductance	L <sub>1</sub>	45	55	mH	
14	Motional Capacitance	C <sub>1</sub>	7.2	8.8	fF	
15	Static Capacitance	Co	2.75	3.75	pF	
16	Q Factor	Q	92 100	_	-	
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	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	After burn-in, over 10 years
19	Terminal Length	L	Figu	re 2	mm	



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

		I YPE \	<u>/ARIANT I</u>	VO. 72		
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	32.74	1375	MHz	
2	Reference Temperature	To	+24	+26	°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	-5.0	+ 5.0	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 f</u> f	-9.0	+ 9.0	10-6	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>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 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>	15	22	mH	
14	Motional Capacitance	C <sub>1</sub>	Not app	olicable	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	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	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ire 2	mm	



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

		ITE	VARIANT	10. 73		
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	37.82	7083	MHz	
2	Reference Temperature	To	+ 24	+ 26	°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	-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	∆ f f	-9.0	+ 9.0	10-6	From frequency measured at T <sub>0</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	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	olicable	%	
13	Motional Inductance	L <sub>1</sub>	15	22	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	olicable	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	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>	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ire 2	mm	



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

			/ALMAINE			
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	5.24	5.24288		
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Fundar	mental		
4	Load Capacitance	C <sub>L</sub>	29.7	30.3	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	RL		110	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	+30	-30	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-25	+ 25	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-25	+ 105	°C	
11	Frequency variation with Drive Level	∆ f f	-2.0	+2.0	10 <sup>-6</sup>	From $P_{S1} = 20$ nW to $P_{S2} = 0.2$ mW
12	Resistance variation with Drive Level	ΔR R	-25	+ 25	%	From $P_{S1} = 20nW$ to $P_{S2} = 0.2mW$
13	Motional Inductance	L <sub>1</sub>	138	168	mH	
14	Motional Capacitance	C <sub>1</sub>	5.42	6.62	fF	
15	Static Capacitance	Co	1.84	2.24	pF	
16	Q Factor	Q	41 300	-	-	
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>L</sub> -500kHz to f <sub>L</sub> +500kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	After burn-in, over 10 years
19	Terminal Length	L	Figu	ure 2	mm	



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

	TYPE VARIANT NO. 75								
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks			
1	Resonance Frequency	fL	4.096		MHz				
2	Reference Temperature	T <sub>o</sub>	+ 23	+27	°C				
3	Overtone Order	-	Fundar	mental					
4	Load Capacitance	C <sub>L</sub>	29.7	30.3	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	$R_{L}$	-	75	Ω	At To °C			
8	Frequency Variation with Temperature over Top	<u>Δ f</u>	-25	+ 25	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C			
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-25	+ 25	%	From resistance measured at T <sub>0</sub> °C			
10	Operating Temperature Range	T <sub>op</sub>	-25	+ 75	°C				
11	Frequency variation with Drive Level	<u>∆</u> f	-2.0	+2.0	10 <sup>-6</sup>	From $P_{S1} = 20$ nW to $P_{S2} = 0.2$ mW			
12	Resistance variation with Drive Level	ΔR R	-25	+ 25	%	From $P_{S1} = 20$ nW to $P_{S2} = 0.2$ mW			
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	1.66	2.04	pF				
16	Q Factor	Q	107 000	-	-				
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	<u>∆ f</u> f	-5.0	+5.0	10-6	After burn-in, over 10 years			
19	Terminal Length	L	Figu	ıre 2	mm				



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

			A CALL TALL S			
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	fL	5.1	5.12		
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	Fundar	mental		
4	Load Capacitance	C <sub>L</sub>	29.7	30.3	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>L</sub>	-	110	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-30	+30	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-25	+25	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	Тор	-35	+ 105	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	-2.0	+2.0	10 <sup>-6</sup>	From $P_{S1} = 20$ nW to $P_{S2} = 0.2$ mW
12	Resistance variation with Drive Level	ΔR R	-25	+ 25	%	From $P_{S1} = 20$ nW to $P_{S2} = 0.2$ mW
13	Motional Inductance	L <sub>1</sub>	146.7	179.3	mH	
14	Motional Capacitance	C <sub>1</sub>	5.3	6.5	fF	
15	Static Capacitance	Co	1.8	2.2	pF	
16	Q Factor	Q	47 896		-	
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	∆ f f	-5.0	+5.0	10-6	After burn-in, over 10 years
19	Terminal Length	L	Figu	ire 2	mm	

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

No.	Characteristics	Symbol	Lim		Unit	Remarks
1	Resonance Frequency	f∟	6.55	536	MHz	
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Fundar	mental		
4	Load Capacitance	CL	29.7	30.3	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-10	+ 10	10-6	At To °C
7	Resonance Resistance	$R_{L}$	-	70	Ω	At To °C
8	Frequency Variation with Temperature over Top	$\frac{\Delta f}{f}$	-30	+30	10-6	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-25	+ 25	% !	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-35	+ 105	°C	
11	Frequency variation with Drive Level	<u>∆ f</u> f	-2.0	+2.0	10-6	From $P_{S1} = ?mW$ to $P_{S2} = ?mW$
12	Resistance variation with Drive Level	ΔR R	-25	+ 25	%	From $P_{S1} = ?mW$ to $P_{S2} = ?mW$
13	Motional Inductance	L <sub>1</sub>	64.6	79.0	mH	
14	Motional Capacitance	C <sub>1</sub>	7.47	9.13	fF	
15	Static Capacitance	Co	2.28	2.78	pF	·
16	Q Factor	Q	48 860	_	-	
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	∆ f f	-5.0	+5.0	10-6	After burn-in, over 10 years
19	Terminal Length	L	Figu	ıre 2	mm	

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

No.	Characteristics	Symbol	Lim		Unit	Remarks
		_ <b>,</b>	Min.	Max.		
1	Resonance Frequency	f <sub>r</sub>	65.04	1974	MHz	Swept
2	Reference Temperature	T <sub>o</sub>	+ 23	+ 27	°C	
3	Overtone Order	•	3	}		
4	Load Capacitance	CL	٥	5	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	∆ 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>Δ R</u> R	-10	+10	%	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	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	3.2	4.8	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	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	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ıre 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO. 79

			V / LI LI / LI LI LI			
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	65.00	65.005555		Swept
2	Reference Temperature	T <sub>o</sub>	+ 23	+ 27	°C	
3	Overtone Order	•		3		
4	Load Capacitance	C <sub>L</sub>	0	o	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	+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	-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	10-6	
12	Resistance variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	3.2	4.8	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> -50kHz to f <sub>r</sub> +50kHz
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ire 2	mm	



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

		111 -	ARIANTI	10.00		
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	62.	62.5		Swept
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	3			
4	Load Capacitance	$C_L$	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>	-	40	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>∆ R</u> R	-10	+10	%	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 app	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>	3.2	4.8	mH	
14	Motional Capacitance	C <sub>1</sub>	1.5 T	ypical	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 IZpl/R	2:1	-		In the frequency range: f <sub>r</sub> -50kHz to f <sub>r</sub> +50kHz
18	Ageing	Δf f	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ıre 2	mm	



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

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No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	70	70.0		Swept
2	Reference Temperature	T <sub>o</sub>	+ 23	+ 27	°C	
3	Overtone Order	-	**	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> f	-10	+ 10	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>∆ 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	-10	+10	%	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	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	3.2	4.8	mH	
14	Motional Capacitance	C <sub>1</sub>	1.5 T	ypical	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> -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	
			-			

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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	4.13	4.1379		
2	Reference Temperature	T <sub>o</sub>	+23	+ 27	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	C <sub>L</sub>	29.7	30.3	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	RL	-	75	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-25	+ 25	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-50	+50	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-25	+ 75	°C	
11	Frequency variation with Drive Level	<u>∆</u> f	-2.0	+2.0	10 <sup>-6</sup>	From $P_{S1} = 20$ nW to $P_{S2} = 0.2$ mW
12	Resistance variation with Drive Level	ΔR R	-40	+ 40	%	From $P_{S1} = 20$ nW to $P_{S2} = 0.2$ mW
13	Motional Inductance	L <sub>1</sub>	310	345	mH	
14	Motional Capacitance	C <sub>1</sub>	4.39	4.87	fF	
15	Static Capacitance	Co	1.67	2.06	pF	
16	Q Factor	Q	105 000	_	-	
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	$\frac{\Delta f}{f}$	-5.0	+ 5.0	10-6	After burn-in, over 10 years
19	Terminal Length	L	Figu	ıre 2	mm	



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

			VARIAIVI			
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	65.03	65.03639		Swept
2	Reference Temperature	To	+ 23	+ 27	°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 <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	<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	-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	<u>Δ</u> f	Not app	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>	3.2	4.8	mH	
14	Motional Capacitance	C <sub>1</sub>	1.5 T	ypical	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> -50kHz to f <sub>r</sub> + 50kHz
18	Ageing	∆ f f	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ire 2	mm	
		<del></del>	<del></del>			



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

		1111		10.0.		
No.	Characteristics	Symbol	Lim Min.	iits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	36.81	36.811767		
2	Reference Temperature	T <sub>o</sub>	+ ;	25	°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	-5.0	+ 5.0	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	•	40	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆ 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	ΔR R	Not applicable		%	
10	Operating Temperature Range	T <sub>op</sub>	-25	+ 70	°C	
11	Frequency variation with Drive Level	Δf f	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>	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	Not ap	plicable	-	
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>r</sub> -60kHz to f <sub>r</sub> +60kHz
18	Ageing	$\frac{\Delta f}{f}$	-7.0	+ 7.0	10-6	After burn-in, over 7 years
19	Terminal Length	L	Figu	ıre 2	mm	
		-	-		•	··



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

	,	· · · · · · · · · · · · · · · · · · ·	VALUAINI	. 10. 00		,
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	20	20.0		
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	۰	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>		30	Ω	Over T <sub>op</sub> °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-20	+20	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-10 or -2	+10 or +2	% 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	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	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	+2	10-6	After burn-in per year
19	Terminal Length	L	Figu	ire 2	mm	



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

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	fL	20	.0	MHz	
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	$C_{L}$	3	2	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>	-	30	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆f f	-20	+20	10 <sup>-6</sup>	From frequency measured at T <sub>0</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-10 or -2.0	+ 10 or + 2.0	% 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	Δf f	Not ap	Not applicable		
12	Resistance variation with Drive Level	ΔR R	Not app	olicable	%	
13	Motional Inductance	L <sub>1</sub>	Not ap	plicable	mH	
14	Motional Capacitance	C <sub>1</sub>	-	7.0	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	2:1	_		In the frequency range: f <sub>L</sub> - 200kHz to f <sub>L</sub> + 200kHz
18	Ageing	$\frac{\Delta f}{f}$	-2.0	+2.0	10-6	After burn-in and per year
19	Terminal Length	L	Figu	ire 2	mm	

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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	81.50	6849	MHz	PQ. Swept
2	Reference Temperature	To	+ 65	+ 75	°C	Turn-on Point
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	Δf f	-50	+ 50	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	<u>Δ f</u> f	Not applicable		10 <sup>-6</sup>	
9	Resistance Variation with Temperature over Top	<u>∆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	Δf 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	-	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	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	After burn-in and over 10 years
19	Terminal Length	L	Figu	ıre 2	mm	

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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	12 <sup>-</sup>	121.5		
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	•	5	5		
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>	-	60	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-20	+20	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation with Temperature over Top	ΔR R	-25	+ 25	%	From resistance measured at T <sub>o</sub> °C
10	Operating Temperature Range	T <sub>op</sub>	-30	+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	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L <sub>1</sub>	1.44	2.16	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	-	6.0	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> -500kHz to f <sub>r</sub> +500kHz
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	After burn-in, over 10 years
19	Terminal Length	L	Figu	ıre 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO. 89

TYPE VARIANT NO. 89									
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks			
1	Resonance Frequency	f <sub>r</sub>	50	50.0					
2	Reference Temperature	To	+ 23	+ 27	°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> 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	-20	+20	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>	-30	+ 80	°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>	2.97	4.45	mH				
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF				
15	Static Capacitance	Co	-	6.0	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> -500kHz to f <sub>r</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				



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		111 -	/ARIANT	10. 00		
No.	Characteristics	Symbol	Lim Min.	iits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	37.75	37.75625		Swept
2	Reference Temperature	T <sub>o</sub>	+ 24	+ 26	°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	$\frac{\Delta f}{f}$	-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	∆ 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	ΔR R	-10	+10	%	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	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>	15	22	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	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	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ıre 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TIFE VARIANT NO. 91									
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks			
1	Resonance Frequency	f <sub>r</sub>	24.6827		MHz	Swept			
2	Reference Temperature	To	+24	+26	°C				
3	Overtone Order	-	Fundan	nental					
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>	-	10	Ω	At T <sub>o</sub> °C			
8	Frequency Variation with Temperature over Top	<u>∆</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	<u>Δ R</u> R	-10 o -1.5	+10 r +1.5	% Ω	From resistance measured at $T_0$ °C If R < 10 $\Omega$			
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C				
11	Frequency variation with Drive Level	Δf 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>	Not app	olicable	mH				
14	Motional Capacitance	C <sub>1</sub>	Not app	olicable	fF				
15	Static Capacitance	Co	-	5.0	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	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, and per year			
19	Terminal Length	L	Figu	ire 2	mm				



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

		ITPE	/ARIANT	NO. 92		
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	37.83	9583	MHz	Swept
2	Reference Temperature	To	+24	+ 26	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	α	D .	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	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	+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	-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	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>	15	22	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	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	+3.0	10 <sup>-6</sup>	After burn-in, and per year
19	Terminal Length	L	Figu	ıre 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		ITPE	<u>/ARIANT I</u>	<u>10. 93</u>		
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	90.87	90.875794		Swept
2	Reference Temperature	T <sub>o</sub>	+24	+26	°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	Δf 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	∆ 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	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	Δf 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>	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	105 000	•	•	
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	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ıre 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		1111	41/11/11/11/41			
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	90.88	1675	MHz	Swept
2	Reference Temperature	To	+ 24	+26	°C	
3	Overtone Order	-	Ę	5		
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 <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	∆ 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	Тор	-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>	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	105 000	-	-	
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	∆ f f	-3.0	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ire 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		111 -	MANIANII	10. 33		
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	90.88	90.88754		Swept
2	Reference Temperature	T <sub>o</sub>	+24	+ 26	°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	<u>Δ f</u>	-5.0	+5.0	10 <sup>-6</sup>	At T <sub>o</sub> °C
7	Resonance Resistance	R <sub>r</sub>	-	45	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>0</sub> °C
9	Resistance Variation with Temperature over Top	<u>∆ 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> f	Not app	olicable	10-6	
12	Resistance variation with Drive Level	ΔR R	Not app	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	105 000	-	-	
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	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ire 2	mm	
						<del></del>



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	90.89	90.893413		Swept
2	Reference Temperature	T <sub>o</sub>	+ 24	+26	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	C <sub>L</sub>	0	0	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 <sub>r</sub>	-	45	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	<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	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	105 000	-	_	
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	∆ f f	-3.0	+3.0	10 <sup>-6</sup>	After burn-in, and per year
19	Terminal Length	L	Figu	re 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		ITPEV	ARIANT	VO. 37		
No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	99.53	99.53704		Swept
2	Reference Temperature	То	+ 24	+ 26	°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	<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	$\frac{\Delta f}{f}$	+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>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	Δf 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>	4.9	-	mH	
14	Motional Capacitance	C <sub>1</sub>	Not ap	plicable	fF	
15	Static Capacitance	Co	•	3.0	pF	
16	Q Factor	Q	95 000	-	-	
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	+3.0	10-6	After burn-in, and per year
19	Terminal Length	L	Figu	ıre 2	mm	



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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f <sub>r</sub>	20.0		MHz	
2	Reference Temperature	To	+ 25		°C	
3	Overtone Order	ŧ	Fundamental			
4	Load Capacitance	C <sub>L</sub>	8		pF	
5	Rated Drive Level	Po	0.1		mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-50	+ 50	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	∆ f f	-50	+50	10 <sup>-6</sup>	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	<u>Δ f</u>	Not applicable		10-6	
12	Resistance variation with Drive Level	<u>Δ R</u> R	Not applicable		%	
13	Motional Inductance	L <sub>1</sub>	Not applicable		mH	
14	Motional Capacitance	C <sub>1</sub>	Not applicable		fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	Not applicable		-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R IZpI/R	7:1	-		In the frequency range: f <sub>r</sub> -1.0MHz to f <sub>r</sub> +1.0MHz
18	Ageing	$\frac{\Delta f}{f}$	-7.5	+ 7.5	10-6	After burn-in, per year
19	Terminal Length	L	Figu	ıre 2	mm	

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# TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	its Max.	Unit	Remarks
1	Resonance Frequency	f∟	24.5		MHz	
2	Reference Temperature	To	+20	+ 30	°C	
3	Overtone Order	-	Fundamental			
4	Load Capacitance	CL	32		pF	
5	Rated Drive Level	Po	0.2		mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+5.0	10 <sup>-6</sup>	At To °C
7	Resonance Resistance	$R_{L}$	-	21	Ω	At T <sub>o</sub> °C
8	Frequency Variation with Temperature over Top	∆ f f	-7.0	+ 7.0	10 <sup>-6</sup>	From frequency measured at T <sub>o</sub> °C
9	Resistance Variation	ΔR R	-10	+ 10	%	From resistance measured at To °C
	with Temperature over T <sub>op</sub>	"	-1.5	+ 1.5	Ω	If R<10Ω
10	Operating Temperature Range	T <sub>op</sub>	-20	+ 70	°C	
11	Frequency variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10 <sup>-6</sup>	
12	Resistance variation with Drive Level	ΔR R	-10	+10	%	From $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.5 \text{mW}$
13	Motional Inductance	L <sub>1</sub>	-	6.93	mH	
14	Motional Capacitance	C <sub>1</sub>	Not applicable		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> -500kHz to f <sub>L</sub> +500kHz
18	Ageing	$\frac{\Delta f}{f}$	-50	+5.0	10-6	After burn-in, over 10 years
19	Terminal Length	L	Figi	ure 2	mm	•



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## **APPENDIX 'A'**

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# AGREED DEVIATIONS FOR RAKON (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.