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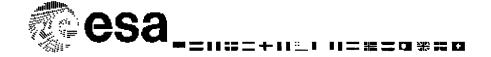
CRYSTAL UNITS IN METAL HOLDER, BASED ON TYPE T807,

FREQUENCY RANGE 4.0 - 140MHZ

ESCC Detail Specification No. 3501/012

(Follow-up specification to ESA/SCC Detail Specification Nos. 3501/001, 3501/008 and 3501/011)

ISSUE 2 April 2007





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DOCUMENTATION CHANGE NOTICE

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DCR No.	CHANGE DESCRIPTION
261, 290	Specification upissued to incorporate technical and editorial changes per DCRs.
ļ	For operational reasons, only the affected pages have the correct issue number and ESCC logo. These are cover page, legal disclaimer, DCN, Table of contents and Appendix. The remainder of the specification is the ESA/SCC version.
·	



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space components coordination group

		Approved by		
Issue/Rev.	Date	SCCG Chairman	ESA Director General or his Deputy	
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APPENDICES (Applicable to specific Manufacturers only)

None.



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11 SCOPE

This specification details the values, physical and electrical characteristics, test and inspection data for Crystal Units in Metal Holder, based on Type T807, Frequency Range 4 0 - 140MHz

It shall be read in conjunction with ESA/SCC Generic Specification No 3501, the requirements for which are supplemented herein

This is a follow-up specification to ESA/SCC Detail Specification Nos 3501/001 and 3501/008 ESA/SCC 3501/001 and 3501/008 should also be consulted by -

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

1 2 COMPONENT TYPE VARIANTS

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

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

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

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

1.3 MAXIMUM RATINGS

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

1 4 PHYSICAL DIMENSIONS

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

1.5 FUNCTIONAL DIAGRAM

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



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TABLE 1(a) - TYPE VARIANT SUMMARY

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

Variant	Resonance Frequency (MHz)	Load Capacitance (C _L pF)	Reference Temp. (T _o °C)	Operating Temp Range (Top °C)	Intend. Applica- tion	Figure
01	56 307974	∞	+ 60	-20 to +80	OCXO	2(a)
02	56 214223	∞	+ 60	-20 to +80	OCXO	2(a)
03	46 286060	00	+ 25	-20 to +80	TCXO	2(a)
04	68.882769	∞	+ 25	-20 to +80	TCXO	2(a)
05	24 686200	30	+ 25	-20 to +70	TCXO	2(a)
06	67 988538	∞	+ 25	-20 to +80	TCXO	2(a)
07	118 689	∞	+25	-20 to +70	TCXO	2(a)
08	128 689	o o	+ 25	-20 to +70	TCXO	2(a)
09	32 0	30	+ 27	-55 to +100	TCXO	2(a)
10	69.081879	∞	+ 25	-20 to +80	TCXO	2(a)
11	69 097030	∞	+ 25	-20 to +80	TCXO	2(a)
12	15 0	∞	+ 25	-30 to +80	хо	2(b)
13	75 0	12	+ 25	-20 to +80	VCXO	2(b)
14	54 672426	∞	+60	-20 to +80	ОСХО	2(a)
15	53 846315	∞	+ 60	-20 to +80	осхо	2(a)
16	31 611111	∞	+ 25	-20 to +80	XO	
17	4 194304	22	+60	-20 to +70	XO	
18	16 0	30	+ 25	-20 to +90	XO	
19	137 912500	∞	+ 25	-20 to +60	XO	
20	137 1	∞	÷ 25	-20 to +60	ХО	
21	35.5	∞	+ 25	- 15 to +65	TCXO	2(a)
22	35.85	∞	+ 25	-15 to +65	TCXO	2(a)
23	36.625	8	+ 25	-15 to +65	TCXO	2(a)
24	36.7	∞	+ 25	-15 to +65	TCXO	2(a)
25	49.375	σ.	+ 25	-15 to +65	TCXO	2(a)
26	46.210937	8	+ 25	- 15 to +65	TCXO	2(a)
27	55 231250	œ	+ 25	15 to +65	TCXO	2(a)
28	55 425	00	+ 25	- 15 to +65	TCXO	2(a)
29	55 45	∞	+ 25	- 15 to +65	TCXO	2(a)
30	50 5	00	+ 25	~15 to +65	TCXO	2(a)
31	68 75	00	+ 25	-15 to +65	TCXO	2(a)
32	70 0	00	+ 25	-15 to +65	TCXO	2(a)
33	69 531250	00	+ 25	-15 to +65	TCXO	2(a)
34	16.0	30	+ 25	-50 to +80	XO	
35	30 0	30	+ 25	-55 to +100	XO	
36	67 117	∞	+ 25	-30 to +85	XO	



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

	Resonance	Load	Reference	Operating	Intend.	
Variant	Frequency	Capacitance	Temp.	Temp Range	Applica-	Figure
	(MHz)	(C _L pF)	(T _o °C)	(T _{op} °C)	tion	
37	37.806667	00	+ 25	-20 to +80	XO	
38	37.933333	∞	+ 25	-20 to +80	XO	
39	8.388608	22	+ 25	-55 to +80	XO	
40	4 8	30	+ 25	-40 to +80	XO	
41	119 875	∞	+ 25	-5 to +70	TCXO	2(a)
42	122 2	တ	+ 25	-5 to +70	TCXO	2(a)
43	123 611111	00	+ 25	-5 to +70	TCXO	2(a)
44	125 479167	00	+ 25	-5 to +70	TCXO	2(a)
45	125.5	x 0	+ 25	-5 to +70	TCXO	2(a)
46	126 041667	00	÷ 25	-5 to +70	TCXO	2(a)
47	126 461538	∞	+ 25	-5 to +70	TCXO	2(a)
48	126.944444	∞	+ 25	-5 to +70	TCXO	2(a)
49	120 104167	00	+ 25	-5 to +70	TCXO	2(a)
50	125 454545	∞	+ 25	-5 to +70	TCXO	2(a)
51	128 625	∞	+ 25	-5 to +70	TCXO	2(a)
52	22 7	30	+ 25	-40 to +80	TCXO	2(a)
53	16 0	30	+ 27	-55 to +100	XO	2(a)
54	30 0	∞	+ 25	-55 to +120	XO	2(a)
55	54 311	∞	+ 25	~55 to +105	TCXO	2(a)
56	62.38	∞	+ 25	-55 to +105	TCXO	2(a)
57	62.5	8	+ 25	~55 to +105	TCXO	2(a)
58	64 997	8	+ 25	-55 to +105	TCXO	2(a)
59	66.916666	∞	+ 25	-55 to +105	TCXO	2(a)
60	67.708333	∞	+ 25	-55 to +105	TCXO	2(a)
61	67 916666	82	+ 25	-55 to +105	TCXO	2(a)
62	69 166666	∞	+ 25	~55 to +105	TCXO	2(a)
63	87 24	oo oo	+ 25	-55 to +105	TCXO	2(a)
64	87 312	oo	+ 25	~55 to +105	TCXO	2(a)
65	87.375	∞	+ 25	-55 to ₹ 105	TCXO	2(a)
66	87.412	œ	+ 25	-55 to +105	TCXO	2(a)
67	87 448	∞	+ 25	~55 to +105	TCXO	2(a)
68	87 485	∞	+ 25	-55 to +105	тсхо	2(a)
69	87 489750	∞	+25	-55 to +105	TCXO	2(a)
70	88 743	œ	+ 25	-55 to +105	TCXO	2(a)
71	88 8	∞	+ 25	~55 to +105	TCXO	2(a)
72	88 86	∞	÷ 25	-55 to +105	тсхо	2(a)

NOTES: See Page 8.



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

			···		}	Γ
1	Resonance	Load	Reference	Operating	Intend	
Variant	Frequency (MHz)	Capacitance	Temp	Temp. Range	Applica-	Figure
	(1013-12)	(C _L pF)	(T₀ °C)	(T _{op} °C)	tion	
73	88.913	∞	+ 25	-55 to +105	TCXO	2(a)
74	44.286060	00	+ 25	~20 to +80	TCXO	2(a)
75	45.056	œ	+ 25	-20 to +80	TCXO	2(a)
76	35 5	∞	+ 25	~15 to +65	TCXO	2(a)
77	50 5	8	+ 25	- 15 to +65	TCXO	2(a)
78	54 497500	8	+ 25	-15 to +65	TCXO	2(a)
79	69 531250	8	+25	15 to +65	TCXO	2(a)
80	36 625	8	+ 25	- 15 to +65	TCXO	2(a)
81	42 5	σ.	+ 25	~ 15 to +65	TCXO	2(a)
82	49 375	8	+ 25	- 15 to +65	TCXO	2(a)
83	55 231250	8	+ 25	-15 to +65	TCXO	2(a)
84	68 75	00	+ 25	- 15 to +65	TCXO	2(a)
85	70 0	00	+ 25	- 15 to +65	TCXO	2(a)
86	55.45	တ	+ 25	- 15 to +65	TCXO	2(a)
87	128.707627	8	+ 25	- 15 to + 75	TCXO	2(a)
88	118.707627	8	+ 25	~15 to +75	TCXO	2(a)
89	16.0	30	+27	-20 to +70	XO	2(a)
90	123 333333	α .	+81	+76 to +86	ocxo	2(a)
91	126 625	∞	+81	+76 to +86	OCXO	2(a)
92	127.08333	∞	+81	+76 to +86	осхо	2(a)
93	127.272727	∞	+81	+76 to +86	ocxo	2(a)
94	127 777778	80	+81	+76 to +86	OCXO	2(a)
95	128 75	œ	+81	+76 to +86	осхо	2(a)
96	120 833333	∞	+81	+76 to +86	OCXO	2(a)
97	121 212121	∞	+ 81	+76 to +86	OCXO	2(a)
98	128 571429	%	+81	+76 to +86	ocxo	2(a)
99	50.0	∞	+ 85	~20 to +80	TCXO	2(a)

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	Note 1
3	Operating Temperature Range	T _{op}		°C	Note 2
4	Storage Temperature Range	T _{stg}	-65 to +125	°C	Note 3
5	Soldering Temperature	T _{sol}	+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.

No	Characteristic	Symbol	Lir	mits	Unit	Remarks
			Min	Max		
1	Resonance Frequency	f _r			MHz	AT Cut
2	Reference Temperature	τ _o			°C	
3	Overtone Order	-				
4	Load Capacitance	CL			ρF	
5	Rated Drive Level	Po			mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f			10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r			Ω	At T₀ °C
8	Frequency Variation with Temperature over Top	∆ f f			10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	ΔR R			% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	Тор			°C	
11	Frequency Variation with Drive Level	Δf f			10-6	From P _{S1} = 0 5mW to P _{S2} = 0 5mW
12	Resistance Variation with Drive Level	<u>Δ R</u> R			%	From P _{S1} = 0 5mW to P _{S2} = 0 5mW
13	Motional Inductance	L ₁			mH	
14	Motional Capacitance	C ₁			fF	
15	Static Capacitance	C _o			pF	
16	Q Factor	Q			-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R				In the frequency range f _r -10% to f _r +10%
18	Ageing	∆ f f	•		10-6	-
19	Physical Dimensions					****
20	Intended Application					



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NOTES TO TABLE 1(c)

- 1 (a) If C_L is not specified, Symbol and measurement shall be fr
 - (b) If C_L is specified, Symbol and measurement shall be f_L.

2. Reference Temperature To

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

3. Load Capacitance C

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

N.B

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

4. Rated Drive Level Po

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

- Preferred values: 2mW, 1mW, 0 5mW, 0 2mW, 0.1mW, 0 05mW, 0 02mW, 0 01mW, 0 001mW or 0.0001mW at ±20%.
- Non-preferred values 10mW, 5mW and 4mW all at ±20%.

5 Frequency Adjustment Tolerance

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

6. Resonance Resistance

- (a) Generally, the maximum value only is specified.
- (b) R_L may be calculated by $R_L = R_r \left(1 + \frac{C_o}{C_L} \right)^2$

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 (PS1 to PS2) 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 L₁

Because the inductance value may be restricted by other chosen parameters, the Manufacturer shall propose the value of L₁ 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. Physical Dimensions

The applicable Figure Number is to be specified

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 ESA/SCC Generic Specification No. 3501, Para 3



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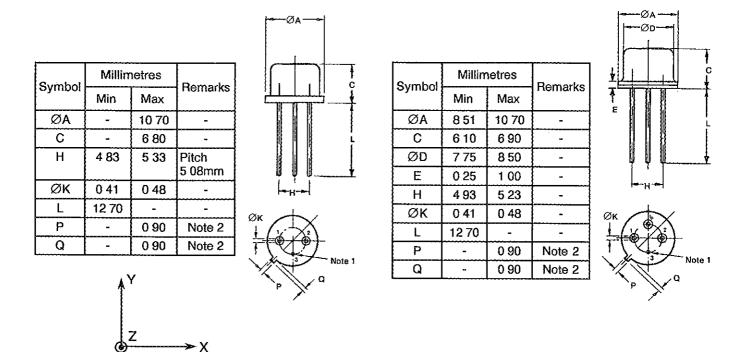
FIGURE 1 - PARAMETER DEPATING INFORMATION

Not applicable.

FIGURE 2 - PHYSICAL DIMENSIONS

FIGURE 2(a) - 3-PIN PACKAGE

FIGURE 2(b) - 4-PIN PACKAGE

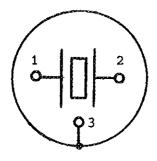


NOTES

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

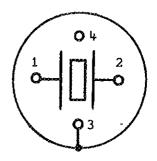
FIGURE 3 - FUNCTIONAL DIAGRAM

FIGURE 3(a) - 3-PIN PACKAGE



(Bottom View)

FIGURE 3(b) - 4-PIN PACKAGE



(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) ESA/SCC 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 ESA/SCC Basic Specification No 21300 shall apply In addition, the following symbols are used -

Resonance Frequency $= f_r$ Load Resonance Frequency $= f_L$ Reference Temperature $= T_o$ Resonance Resistance $\approx R_r$ Load Resonance Resistance $= R_L$ Rated Drive Level $= P_0$ Static Capacitance $= C_0$ $= C_L$ Load Capacitance Motional Capacitance = C₁ Motional Inductance $= L_1$ Response Resistance $= R_P$ Response Impedance $= |Z_P|$ Insulation Resistance = Ri

4. **REQUIREMENTS**

4.1 GENERAL

24

The complete requirements for procurement of the crystal units specified herein shall be as stated in this specification and ESA/SCC Generic Specification No. 3501 for Quartz Crystal Units. Deviations from the Generic Specification applicable to this specification only, are detailed in Para 42

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 ESA/SCC requirements and do not affect the components' reliability, are listed in the appendices attached to this specification

4 2 DEVIATIONS FROM GENERIC SPECIFICATION

4 2.1 <u>Deviations from Special In-process Controls</u>

None.

4 2 2 Deviations from Final Production Tests (Chart II)

None.

4 2 3 Deviations from Burn-in Tests (Chart III)

None

4.2.4 <u>Deviations from Qualification Tests (Chart IV)</u>

None

4 2.5 <u>Deviations from Lot Acceptance Tests (Chart V)</u>

None.



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43 <u>MECHANICAL REQUIREMENTS</u>

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

432 Weight

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

433 Robustness of Terminations

The requirements for robustness of termination testing are specified in Section 9 of ESA/SCC 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

4.4.11 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 ESA/SCC 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 ESA/SCC 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 SCC Component Number
- (b) Characteristics.
- (c) Traceability Information.

4.5 2 The SCC Component Number

Each component shall bear the SCC Component Number, which shall be constituted and marked as follows - 350101101B

Detail Specification Number	- 1	
Type Variant, (see Table 1(a))		
Testing Level (B or C, as applicable)		



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453 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 ESA/SCC 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 ESA/SCC Basic Specification No 21700

4.6 ELECTRICAL MEASUREMENTS

4 6 1 Electrical Measurements at Reference Temperature

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

4.6 2 Electrical Measurements at High and Low Temperatures

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

4.6.3 Circuits for Electrical Measurements (Figure 4)

Not applicable.

47 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 ESA/SCC 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

No	Characteristics	Symbol	ESA/SCC 3501 Test Method	Limits	Unit
1	Resonance frequency at reference temperature and rated drive level - with C _O - with C _L	f _r (T _o , P _o) f _L (T _o , P _o)	Para 92.11	Table 1(a), Item 1 ± Item 6	MHz
2	Resonance resistance at reference temperature and rated drive level - with C _O - with C _L	R _r (T _o , P _o) R _L (T _o , P _o)	Para 921.1	Table 1(a), Item 7	Ω
3	Frequency variation with Drive Level	$\frac{\Delta f}{f}$ (T _o , ΔP)	Para. 9 2 1 1	Table 1(a), Item 11	10 ⁻⁶
4	Resistance variation with Drive Level	<u>Δ R</u> (Τ ₀ , ΔΡ)	Para 9211	Table 1(a), Item 12	%
5	Motional Inductance	L ₁	Para. 9.2.1 3	Table 1(a), Item 13	mH
6	Static Capacitance	Со	Para 9.2 1 4	Table 1(a), Item 15	pF
7	Unwanted response	R _P /R or IZ _P I/R	Para. 9 2 1 5	Table 1(a), Item 17	-
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	ESA/SCC 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 _o)	Para 9.212	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	10-6
2	Resonance resistance drift	ΔR R	As per Table 2	As per Table 2	± 10 or (1) ± 1	% Ω

NOTES 1. Whichever is the highest value.

TABLE 5 - CONDITIONS FOR BURN-IN AND LIFE TEST

No	Characteristics	Symbol	Condition	Unit
1	Ambient Temperature	T _{amb}	+85 ±5	°C

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

Not applicable



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48 <u>ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESA/SCC GENERIC SPECIFICATION NO. 3501)</u>

4 8 1 Measurements and Inspections on Completion of Environmental Tests

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

4 8.2 Measurements and Inspections at Intermediate Points and on Completion of Endurance Tests

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

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

The requirements for the operating life test are specified in Section 9 of ESA/SCC 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

<u> </u>	T		j					
	ESA/SCC GENERIC S	SPEC NO 3501	MEASUREMENTS A	AND INSPECTIONS		LIN	MITS	
NO	-		The state of the s		SYMBOL	Min	Max.	UNIT
01	Electrical Measurements at Reference Temperature	Para 924	Electrical Measurements	Table 2		Tabl	e 1(a)	
02	Shock	Para. 9 3	Initial Measurements Resonance Frequency Resonance Resistance Final Measurements Resonance Frequency Drift Resonance Resistance Drift	Table 2 Item 1 Table 2 Item 2 Table 2 Item 1	f R <u>Δf</u> f <u>ΔR</u> R ΔR		2 Item 1 2 Item 2 +1 0 +10 +10	10 ⁶ % Ω
03	Vibration	Para 94	Initial Measurements Resonance Frequency Resonance Resistance Final Measurements Resonance Frequency Drift Resonance Resistance Drift	Table 2 Item 1 Table 2 Item 2 Table 2 Item 1	f R <u>Δf</u> f <u>ΔR</u> R ΔR	,	2 Item 1 2 Item 2 +1 0 +10 +10	10 ⁶ % Ω
04	Seal Test	Para 95	Fine Leak Gross Leak	Para 951 Para 952			951 952	
05	Permanence of Marking	Para 98	Final Measurements Visual Examination	No corrosion or obliteration of marking	-	-	-	
06	External Visual Inspection	Para. 99	Final Measurements Visual Inspection	ESA/SCC No 20500	_	-	_	-
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.)

	ESA/SCC GENERIC S	SPEC NO 3501	MEASUREMENTS A	ND INSPECTIONS		LIN	AITS	
NO	ENVIRONMENTAL AND TEST METHOD ENDURANCE TESTS (1) AND CONDITIONS		IDENTIFICATION CONDITIONS		SYMBOL	Min	Max	UNIT
	Climatic Sequence	Para 9 14						
08	Dry Heat	Para. 9 14 1	Initial Measurements		_	Ì	l	
			Resonance Frequency Resonance Resistance		f		2 Item 1	
			Final Measurements	Table 2 Item 2	R	l able :	2 Item 2	
			Resonance Frequency	Table 2 Item 1	Δf	-20	+20	106
		ļ	Drift		f f			'
			Resonance Resistance	Table 2 Item 2	<u>Δ R</u>	-10	+10	%
			Drift		R	or (2)		
09	Cold	Para. 9 14 3	Initial Measurements		ΔR	~10	+10	Ω
		1 4.4 5 7 1 5	Resonance Frequency		f	Para 9	9 14 1 3	}
			Resonance Resistance		R		surements	
		İ	Final Measurements				\	
			Resonance Frequency Drift	Table 2 Item 1	∆f	-20	+20	10-6
			Resonance Resistance	Table 2 Item 2	f <u>ΔR</u>	-10	+10	%
			Drift	1 dole 2 henr 2	R 1	or (2)	10	70
					ΔR	-10	+10	Ω
10	Damp Heat (Acclerated)	Para 9 14 4	Initial Measurements	ł .			l] [
	Remaining Cycles		Resonance Frequency	Table 2 Item 1	f		9 14 3 2] [
			Resonance Resistance Final Measurements	Table 2 item 2	R	Final Mea	asurements I	
			Resonance Frequency	Table 2 Item 1	Λf	-20	+20	106
			Drift	1 4 5 6 7 1 1 5 1 1 1	<u>∆ f</u> f			"
			Resonance Resistance	Table 2 Item 2	<u>Δ R</u>	- 10	+10	%
			Drift		R	or (2)		
			Insulation Resistance	Table 2 Item 8	ΔR Ri	-10 500	+10	Ω MΩ
			modicion resistance	rable z itelii d	rti	500		10132
11	Rapid Change of	Para 9.15	Initial Measurements					
	Temperature		Resonance Frequency Resonance Resistance		f		91442	{
			Final Measurements	Table 2 Item 2 After minimum	R	rinal Mea	surements	
				Recovery of 2 hours				
			Resonance Frequency	Table 2 Item 1	<u>∆ f</u>	-20	+20	106
			Drift		f			
			Resonance Resistance	Table 2 Item 2	<u>Δ R</u>	- 10	+ 10	%
			Drift		R ΔR	or (2) -10	+ 1 0	Ω
		_			un .	= 10	T } U	25
12	Robustness of	Para 9.16	Tensile Strength	Gen 3501				
	Terminations		Visual Examination	Para 9161				}
			Bending	No visible damage Gen 3501				
		;		Para 9 16 2			į	
			Visual Examination	No visible damage				

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.)

NO			ESA/SCC GENERIC SPEC NO 3501 MEASUREMENTS AND INSPECTIONS		MEASUREMENTS AND INSPECTIONS		LIMITS		
INO	ENVIRONMENTAL AND ENDURANCE TESTS (1)			CONDITIONS	SYMBOL	Min	Max	UNIT	
13	Life Test		Initial Measurements Resonance Frequency Resonance Resistance Intermediate Measurements	Table 2 Item 1 Table 2 Item 2 At 500 hours	f R	Table 2 Table 2			
			Resonance Frequency Drift	Table 2 Item 1	<u>Δ f</u>	-20	+20	106	
		P'	Resonance Resistance Drift	Table 2 Item 2	<u>Δ R</u> R ΔR	-10 or (2) -10	+10 +10	%	
			Intermediate Measurements (Chart IV) and Final Measurements (Chart V)	At 1000 hours					
			Resonance Frequency Drift	Table 2 Item 1	<u>Δ f</u> f	-25	+25	10 ⁶	
)	Resonance Resitance Drift	Table 2 Item 2	<u>Δ R</u> R ΔR	-10 or (2) -10	+10	%	
			Final Measurements (Chart IV)	At 2000 hours	Δħ	-10	+10	Ω	
			Resonance Frequency Drift	Table 2 Item 1	<u>∆ f</u> f	-30	+30	108	
			Resonance Resistance Drift	Table 2 Item 2	ΔR R	-10 or (2)	+ 10	%	
					ΔR	-10	+10	Ω	

NOTES

- 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

No	Characteristics	Symbol	Lir Min	Limits Min Max		Remarks
1	Resonance Frequency	f _r	56 3	07974	MHz	AT Cut
2	Reference Temperature	To	+ 55	+ 65	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL		∞	pF	
5	Rated Drive Level	Po	C) 1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At To °C
8	Frequency Variation with Temperature Over Top At To ±5°C	Δf f	-12 0	+12 +10	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>ΔR</u> R	-20 -20	+20 or +20	% Ω	From resistance measured at T ₀ °C
10	Operating Temperature Range	Тор	-20	+80	°C	
11	Frequency Variation with Drive Level	∆ f f	-05	+05	10-6	From P _{S1} = 0 05mW to P _{S2} = 0 25mW
12	Resistance Variation with Drive Level	<u>ΔR</u> R	10	+10	%	From P _{S1} = 0 05mW to P _{S2} = 0 25mW
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	•	50	рF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpI/R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	<u>∆ f</u> f	-30	+30	10-6	Storage 5 years Operating 15 years After 500 Hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		00	XO		

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limits Min Max		Unit	Remarks
1	Resonance Frequency	fγ	56 2	14223	MHz	AT Cut
2	Reference Temperature	To	+ 55	+ 65	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL		00	pF	
5	Rated Drive Level	Po	C) 1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature Over Top At To±5°C	<u>∆ f</u> f	12 0	+12 +10	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	ΔR R	-20 -20	+20 or +20	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+80	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f	-05	÷05	10 ⁻⁶	From P _{S1} = 0 05mW to P _{S2} = 0 25mW
12	Resistance Variation with Drive Level	<u>ΔR</u> R	-10	+10	%	From $P_{S1} = 0.05$ mW to $P_{S2} = 0.25$ mW
13	Motional Inductance	L ₁	20	_	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	C _o	-	50	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpI/R	31	-		In the frequency range f _r 10% to f _r + 10%
18	Ageing	<u>∆ f</u> f	-30	+30	10 ⁻⁶	Storage 5 years Operating 15 years After 500 Hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		OC	хо		

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	1		····				
No	Characteristics	Symbol		nits	Unit	Remarks	
			Min	Max			
1	Resonance Frequency	f _r	44 2	86060	MHz	AT Cut	
2	Reference Temperature	T _o	+ 20	+30	°C		
3	Overtone Order	-		3			
4	Load Capacitance	CL		xo	pF		
5	Rated Drive Level	Po	0	1	mW		
6	Frequency Adjustment Tolerance	∆ f f	-10	+10	10-6	At To °C	
7	Resonance Resistance	R _r	-	40	Ω	Over T _{op}	
8	Frequency Variation with Temperature over Top	∆f f	-90	+90	10-6	From frequency measured at To °C	
9	Resistance Variation	ΔR	- 20	+20	%	From resistance	
	with Temperature over Top	R	-20	or +20	Ω	measured at T _o °C	
10	Operating Temperature Range	T _{op}	- 20	+80	°C		
11	Frequency Variation with Drive Level	∆ f f	-0.5	+05	10-6	From $P_{S1} = 0.05 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$	
12	Resistance Variation with Drive Level	ΔR R	- 10	+10	%	From $P_{S1} = 0.05$ mW to $P_{S2} = 0.25$ mW	
13	Motional Inductance	L ₁	2 0-		mH		
14	Motional Capacitance	C ₁	Not ap	plicable	fF		
15	Static Capacitance	Co	-	50	ρF		
16	Q Factor	Q	70 000	-	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpi/R	3 1	-		In the frequency range f _r - 10% to f _r + 10%	
18	Ageing	∆ f f	-30	+30	10-6	Storage 5 years Operating 15 years After 500 Hours Burn-in	
19	Physical Dimensions		Figur	e 2(a)			
20	Intended Application		TC	хо			

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			 			
No	Characteristics	Symbol	Lir Min	nits Max	Unit	Remarks
1	Resonance Frequency	f _r	68 88	68 882769		AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	~		3		
4	Load Capacitance	CL	(x	рF	
5	Rated Drive Level	Po	0 1		mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	10	+10	10-6	At To °C
7	Resonance Resistance	R _r	_	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δf</u> f	-90	+90	10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20 -2.0	+20 or +20	%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+80	°C	
11	Frequency Variation with Drive Level	∆ f f	-0.5	+05	10-6	From P _{S1} = 0 05mW to P _{S2} = 0 25mW
12	Resistance Variation with Drive Level	ΔR R	~ 10	+10	%	From $P_{S1} = 0.05 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	ρF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or !Zpi/R	3.1	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf f	-3.0	+3.0	10-6	Storage 5 years Operating 15 years After 500 Hours Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		TCXO			

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No	Characteristics	Symbol	Limits Min Max		Unit	Remarks
1	Resonance Frequency	fL	24 686200		MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	Funda	Fundamental		
4	Load Capacitance	CL	3	30	рF	
5	Rated Drive Level	Po	0 1		mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	~ 10	+10	10-6	At T _o °C
7	Resonance Resistance	RL	-	10	Ω	At To °C
8	Frequency Variation with Temperature Over T _{op} At 1 5°C steps over T _{op}	∆f f	-80 -10	+80 +10	10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature Over T _{op} At 1 5°C steps over T _{op}	<u> А Я</u> В	-15 -05	+15 +05	Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	- 20	+70	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f	Not applicable		10-6	
12	Resistance Variation with Drive Level	ΔR R	Not applicable		%	
13	Motional Inductance	L ₁	27	-	mΗ	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	40 000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpI/R	41	-		In the frequency range f _L - 50kHz to f _L + 50kHz
<u> </u>			5 1	-		(Overtones 3 and 5)
18	Ageing Ageing (Storage) Ageing (Operating) Ageing	<u>Δ f</u> f	-29 -39 -48 -60	+29 +39 +48 +60	10-6	Over 4 years after Burn-in Over 5 years after Burn-in Over 5 yrs incl Rad Effect Over 9 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		тсхо			

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No	Characteristics	Symbol	Lir Min.	nits Max	Unit	Remarks
1	Resonance Frequency	f _r	67.9	88538	MHz	AT Cut
2	Reference Temperature	Т,	+20	+ 30	°C	
3	Overtone Order	-	 	3		
4	Load Capacitance	CL	(x	pF	
5	Rated Drive Level	Po	0	0 1		
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+ 10	10-6	At To °C
7	Resonance Resistance	R _r	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	-90	+90	10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ</u> R R	-20 -20	+20 or +20	%	From resistance measured at T ₀ °C
10	Operating Temperature Range	Тор	- 20	+80	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	-05	+05	10-6	From P _{S1} = 0.05mW to P _{S2} = 0.25mW
12	Resistance Variation with Drive Level	ΔR R	-10	+10	%	From P _{S1} = 0.05mW to P _{S2} = 0.25mW
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70 000	-	=	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZp!/R	3 1	-		In the frequency range: f _r - 10% to f _r + 10%
18	Ageing	Δf f	-30	+30	10 ⁻⁶	Storage 5 years Operating 15 years After 500 Hours Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		TO	XO		

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No	Characteristics	Symbol	Limits Min. Max.		Unit	Remarks
			WIIII.	IVIAX.	· · · · ·	
	Resonance Frequency	f _r	118	689	MHz	AT Cut
2	Reference Temperature	T _o	+ 23	+27	°C	
3	Overtone Order	-	ţ	5		
4	Load Capacitance	CL	C	o	ρF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	- 10	+10	10-6	At To °C
7	Resonance Resistance	R _r	-	45	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆f f	-80	+8.0	10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	AR R	-10	+10	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	-20	+ 70	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not applicable		10-6	
12	Resistance Variation with Drive Level	<u>А R</u> R	Not applicable		%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	35	рF	
16	Q Factor	Q	60 000	-	•	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpI/R	31	-		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	∆f f	-30	+30	10-6	Storage 3 years Operating 13 years After 500 Hours Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		TCXO			

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No	Characteristics		Lin	nits		Remarks
		Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	128 689		MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	_		5	<u> </u>	
4	Load Capacitance	CL	C	0	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	-80	+80	10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	20	+70	°C	
11	Frequency Variation with Drive Level	∆ f f	Not applicable		10-6	
12	Resistance Variation with Drive Level	ΔR R	Not applicable		%	
13	Motional Inductance	L ₁	Not app	olicable	mΗ	
14	Motional Capacitance	C ₁	Not app	olicable	fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60 000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpi/R	31	•		In the frequency range f _r ~ 5000kHz to f _r + 5000kHz
18	Ageing	∆ f f	-30	+30	10-6	Storage 3 years Operating 13 years After 500 Hours Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		TCXO			



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No	Characteristics	Symbol	Limits Min Max		Unit	Remarks
1	Resonance Frequency	f∟	32 0		MHz	AT Cut
2	Reference Temperature	To	+ 25	+ 29	۰C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	C _L	3	0	pF	
5	Rated Drive Level	Po	01		mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	RL	-	120	Ω	At T _o °C
8	Frequency Variation with Temperature over T _{op}	<u>∆ f</u> f	- 40	+ 40	10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-20 -20	+20 or +20	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	- 55	+100	°C	
11	Frequency Variation with Drive Level	Δf f	Not applicable		10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not applicable		%	
13	Motional Inductance	L ₁	Not ap	olicable	mH	
14	Motional Capacitance	C ₁	Not app	olicable	fF	
15	Static Capacitance	C _o	-	70	pF	
16	Q Factor	Q	60 000	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpI/R	21	-		In the frequency range f _L - 200kHz to f _L + 200kHz
18	Ageing	Δf f	-30	+30	10-6	Per year after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		TCXO			•



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N I-	Q		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	69 08	31879	MHz	AT Cut
2	Reference Temperature	То	+20	+30	°C	
3	Overtone Order	-		3		
4	Load Capacitance	C _L	(xo	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	∆ f f	-90	+90	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over T _{op}	<u>∆ R</u> R	-20 - 0 -2 0	+ 20 r - -2 0	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	-20	+80	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f	-0 5	+05	10-6	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
12	Resistance Variation with Drive Level	<u>∆ R</u> R	-10	+10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	_	50	pF	
16	Q Factor	Q	70,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31			In the frequency range f _r -10% to f _r + 10%
18	Ageing	<u>∆</u> f f	-30	+30	10 ⁻⁶	Storage 5 years, Operation 15 years after 500 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		·····
20	Intended Application		тс	хо		



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 			Lin	nits		
No	Characteristic	Symbol	L))	1	Unit	Remarks
			Min	Max		
1	Resonance Frequency	f _r	69 09	7030	MHz	AT Cut
2	Reference Temperature	To	+20	+ 30	۰C	
3	Overtone Order	_		3		
4	Load Capacitance	CL		×o	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆ f f	-90	+90	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	AR R	-20 -20	+20 or- +20	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	-20	+80	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	-0 5	+05	10-6	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+ 10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
13	Motional Inductance	L ₁	20	~	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	50	рF	
16	Q Factor	Q	70,000		2	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ≀Z _p l/R	31	~		In the frequency range f _r -10% to f _r +10%
18	Ageing	<u>Δ f</u> f	-30	+30	10-8	Storage 5 years, operation 15 years after 500 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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			Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	15	5 0	MHz	
2	Reference Temperature	To	+22	+28	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	C _L	,	×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-10	+10	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	75	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-50 0	+500	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	Not applicable		%	
10	Operating Temperature Range	Тор	-30	+80	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	Notap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	Not ap	olicable	mH	
14	Motional Capacitance	C ₁	Notap	olicable	fF	
15	Static Capacitance	Co	Notap	olicable	pF	
16	Q Factor	Q	Notap	olicable		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	Not applicable			
18	Ageing	<u>∆ f</u> f	-25	+ 25	10-6	Over 5 years after Burn-in
19	Physical Dimensions		Figure	e 2(b)		
20	Intended Application		Х	0		



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KI.	2		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f∟	75	0	MHz	
2	Reference Temperature	То	+23	+27	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	C _L	119	121	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-20	+20	10-6	At T _o °C
7	Resonance Resistance	RL	-	25	Ω	Over T _o °C
8	Frequency Variation with Temperature over T _{op}	<u>∆ f</u> f	-50	+50	10-9	From -20°C to +70°C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10 +10 Not applicable		%	From -20°C to +80°C
10	Operating Temperature Range	T _{op}	-20	+80	°C	
11	Frequency Variation with Drive Level	∆ f f	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	Notap	olicable	mH	
14	Motional Capacitance	C ₁	17		fF	
15	Static Capacitance	Co	-	60	рF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p l/R	251	-		In the frequency range f _L -100kHz to f _L +100kHz
18	Ageing	<u>∆ f</u>	-60	+60	10-6	Over 5 years at 200 µW drive 22V
19	Physical Dimensions		Figur	e 2(b)		-
20	Intended Application		VC	хо		



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· · · · · · · · · · · · · · · · · · ·	T						
No	Characteristic	Symbol	Lin	nits	فاحلا	Pomarko	
NO	Onaraciensuc	Symbol	Min	Max	Unit	Remarks	
1	Resonance Frequency	f _r	54 67	72426	MHz	AT Cut	
2	Reference Temperature	To	+ 55	+ 65	۰c		
3	Overtone Order	-		3	-		
4	Load Capacitance	CL	(×	pF		
5	Rated Drive Level	Po	0	1	mW		
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10-6	At T _o °C	
7	Resonance Resistance	R _r	_	40	Ω	At T _o °C	
8	Frequency Variation with Temperature over Top	<u>∆</u>	-12 0 0	-12 0 1 0	10 ⁻⁹	From frequency measured at T _o °C	
9	Resistance Variation with Temperature	ΔR R	1	+ 20 or -	%	From resistance measured at T ₀ °C	
	over T _{op}		-20	+20	Ω	· · · · · · · · · · · · · · · · · · ·	
10	Operating Temperature Range	T _{op}	-20	+80	°C		
11	Frequency Variation with Drive Level	<u>Δ f</u> f	-0 5	+05	10-6	From P _{S1} = 0 5mW to P _{S2} = 0 25mW	
12	Resistance Variation with Drive Level	ΔR R	-10	+ 10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW	
13	Motional Inductance	L ₁	20	-	mH		
14	Motional Capacitance	C ₁	Not ap	plicable	fF		
15	Static Capacitance	Co	-	50	pF		
16	Q Factor	Q	70,000	-	ų.		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or !Z _p l/R	31	-		In the frequency range f _r -10% to f _r + 10%	
18	Ageing	Δf/f	-30	+30	10-6	Storage 5 years, operation 15 years after 500 hours Burn-in	
19	Physical Dimensions		Figur	e 2(a)			
20	Intended Application		ОС	хо			



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	T					
No	Characteristic	Symbol	Lin	nits	Unit	Remarks
	Sharadondio	- Symbol	Min	Max	Oint	nemains
1	Resonance Frequency	f _r	53 84	46315	MHz	AT Cut
2	Reference Temperature	T _o	+55	+65	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL	(∞	pF	
5	Rated Drive Level	Po	0 05	0 25	mW	Rated D level 1
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r		40	Ω	At To °C
8	Frequency Variation with Temperature over Top T0±5°C	<u>Δ f</u> f df/f	-12 0	-12 1 0	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	ΔR R	1	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-20	+80	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	-05	+05	10-6	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
12	Resistance Variation with Drive Level	<u> </u>	-10	⁺ 10	%	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	Ĺ ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	<u> </u>	50	ρF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p //R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δ f/f	-30	+30	10-6	Storage 5 years, operation 15 years after 500 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		~
20	Intended Application		ОС	хо	····	



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No	Characteristic	Complete	Lin	nits		
NO	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	31 61	1111	MHz	
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	C _L	c	×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-60	+60	10-6	At T _o °C
7	Resonance Resistance	RL	-	40	Ω	Over T _o °C
8	Frequency Variation with Temperature over Top	<u>A</u> f	-90	+90	10-9	From frequency measured at T ₀ °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+80	°C	
11	Frequency Variation with Drive Level	∆ f f	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	Not ap	olicable	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	70	pF	
16	Q Factor	Q	70,000	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	21	-		In the frequency range f _r ±10%
18	Ageing	Δf f	-50	+50	10 ⁻⁶	10 Years after Burn-in
19	Physical Dimensions					*
20	Intended Application		х	0		



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N.C.	Characteristic		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _L ,	4 19	4304	MHz	
2	Reference Temperature	То	+	60	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	2	2	ρF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	RL	-	75	Ω	Over T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-15	+ 15	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	
10	Operating Temperature Range	T _{op}	-20	+70	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	Notap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Notapp	olicable	%	
13	Motional Inductance	L ₁	25	. .	mH	
14	Motional Capacitance	C ₁	Notap	olicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	100,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _L -420kHz to f _L + 420kHz
18	Ageing	∆ f f	-30	+30	10-6	Per Year after Burn-in
19	Physical Dimensions					-
20	Intended Application		X	0		



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No	Characteristic	0	Lir	nits		
No	Unaracteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	fL	16	60	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	3	10	pF	
5	Rated Drive Level	Po	0	2	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-10	+10	10-6	At T₀ °C
7	Resonance Resistance	RL	-	10	Ω	Over T _o °C
8	Frequency Variation with Temperature over Top	∆f f	-20	+20	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-40	+90	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	Not ap	olicable	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	Not ap	olicable	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or {Z _p //R	3 1	-		In the frequency range f _L -10% to f _L +10%
18	Ageing	∆ f f	-30	+30	10-6	5 years storage and 15 years operation
19	Physical Dimensions					-
20	Intended Application		X	0		



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			Lin	nits		
No	Characteristic	Symbol			Unit	Remarks
			Min	Max		
1	Resonance Frequency	f _r	137 9	12500	MHz	
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-		5		
4	Load Capacitance	C _L	(20	pF	
5	Rated Drive Level	Po	0	1	mW	Rated 0 1 mW
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	Over T _o °C
8	Frequency Variation with Temperature over Top	∆f f	-60	+60	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	Ω	From resistance measured at T ₀ °C
10	Operating Temperature Range	T _{op}	-20	+60	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u>	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	70	pF	
16	Q Factor	Q	65,000	-	•	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R oi iZ _p i/R	21	-		In the frequency range f, -10% to f, +10%
18	Ageing	∆ f f	-25	+25	10-6	10 years after Burn-in
19	Physical Dimensions				······································	
20	Intended Application		х	0	· · · · · · · · · · · · · · · · · · ·	



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	Q1		Lin	nits		Remarks
No	Characteristic	Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	13	7 1	MHz	
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	!	5		
4	Load Capacitance	CL	,	×	рF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	Over T _o °C
8	Frequency Variation with Temperature over T _{op}	<u>∆</u> f f	-60	+60	10- ⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20	+20	Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+60	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not ap	olicable	10 ⁻⁶	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Notap	olicable	%	
13	Motional Inductance	L ₁	Not ap	olicable	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	70	рF	
16	Q Factor	Q	65,000	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	21	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	∆ f f	-25	+25	10-6	10 years after Burn-in
19	Physical Dimensions			(*
20	Intended Application		х	0		



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A 1.	Characteristic		Lin	nits		_
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	35	5 5	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL	,	χο	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-50	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-70	+70	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	-20	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	∆ f f	Notap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	20	~	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	50	рF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or !Z _p l/R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		тс	xo		



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	•		T			
No	Characteristic	Symbol	Lin	nits	Unit	Domada
140	Gharacteristic	Symbol	Min	Max	Orac	Remarks
1	Resonance Frequency	f _r	35	85	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL	,	xo	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-50	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At To °C
8	Frequency Variation with Temperature over T _{op}	<u>∆</u> f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-20 -20	+20 or - +20	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	-15	+ 65	°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	olicable	%	
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		тс	хо		
	· · · · · · · · · · · · · · · · · · ·					



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NI.	Ohamadada		Lin	nits	44.	
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	36	625	MHz	AT Cut
2	Reference Temperature	To	+20	+30	۰c	
3	Overtone Order	-		3		
4	Load Capacitance	C _L	d	×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-50	+50	10-6	At T₀ °C
7	Resonance Resistance	R _r	-	40	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f f	-70	+70	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>∆ R</u> R	1	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f	Notap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not app	olicable	fF	
15	Static Capacitance	Co	-	50	ρF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or iZ _p i/R	31	~		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-50	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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NI -	Characteristic		Lin	nits		Remarks
No		Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	36	6 7	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	;	3	,	
4	Load Capacitance	C _L		20	рF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	-20	+20 or -	%	From resistance measured at T ₀ °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	*	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δ f /f	-50	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		TC	хо		



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No	Characteristic	Symbol	Lin	nits	Unit	Remarks
	Onaracteristic	Symbol	Min	Max	Otat	
1	Resonance Frequency	f _r	49	375	MHz	AT Cut
2	Reference Temperature	Тo	+20	+30	°C	
3	Overtone Order	•		3		
4	Load Capacitance	C _L	(x	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-50	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>∆ R</u> R	-20	+ 20 or -	%	From resistance measured at T _o °C
******	over T _{op}		-2 0	+20	Ω	moustated at 1 ₀ O
10	Operating Temperature Range	T _{op}	-15	+ 65	۰C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10 ⁻⁶	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	20	_	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co		50	pF	
16	Q Factor	Q	70,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δ f /f	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)	mm	-
20	Intended Application		TC	хо		



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N 1-			Lin	nits		
No	Characteristic	Symbol	Min	Мах	Unit	Remarks
1	Resonance Frequency	f _r	46 21	10937	MHz	AT Cut
2	Reference Temperature	Τ _o	+20	+30	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL	G	×	pF	
5	Rated Drive Level	₽٥	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-50	+50	10-6	At T _o °C
7	Resonance Resistance	R _r		40	Ω	At T _o °C
8	Frequency Variation with Temperature over T _{op}	<u>∆ f</u> f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>∆ R</u> R	{	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	۰C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	ΔR R	Notap	plicable	%	
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p //R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5 0	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		ТС	хо		



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	Q1		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	55 23	31250	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	C _L	,	x 0	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10-6	At T₀ °C
7	Resonance Resistance	R _r	~	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R		+20 or-	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u>	Not ap	plicable	10 ⁻⁶	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	рF	
16	Q Factor	Q	70,000	-	~	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p //R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			-
20	Intended Application		ТС	хо		



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No	Characteristic	Symbol	Lin	nits	Unit	Domarka
	Onal actionatic	Зунтьог	Min	Max	Om	Remarks
1	Resonance Frequency	f _r	55	425	MHz	AT Cut
2	Reference Temperature	T _o	+20	+ 30	°C	
3	Overtone Order	•		3		
4	Load Capacitance	CL	c	×	рF	
5	Rated Drive Level	P_{o}	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10-6	At T₀ °C
7	Resonance Resistance	R_r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over T _{op}	<u>Δ f</u> f	-70	÷7 0	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation	<u>∆ R</u> R	-20	+20 or -	%	From resistance
	with Temperature over T _{op}	r r	-20	+20	Ω	measured at To °C
10	Operating Temperature Range	T _{op}	-15	+ 65	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not applicable		10-6	
12	Resistance Variation with Drive Level	<u>д R</u> R	Notap	olicable	%	
13	Motional Inductance	L ₁	20	~	mН	
14	Motional Capacitance	C ₁	Not app	olicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	~	~	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5 0	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figure	e 2(a)		-
20	Intended Application		TC	хо		



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NI-			Lin	nits		Domovko
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	55	45	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	,	3		
4	Load Capacitance	CL	c	ю	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 _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f f	-70	+70	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>∆ R</u> R	-20	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	AR R	Notap	olicable	%	
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not app	olicable	fF	
15	Static Capacitance	Co	-	50	ρF	
16	Q Factor	Q	70,000	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-50	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figure	e 2(a)		-
20	Intended Application		TC	ко		



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No	Characteristic	Symbol	Lin	Limits		Remarks
	Characteristic	Зушьог	Min	Max	Unit	Homarks
1	Resonance Frequency	f,	5(5	MHz	AT Cut
2	Reference Temperature	To	+20	+ 30	۰c	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL		×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	Δf f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>∆ R</u> R	•	+20 or -	%	From resistance measured at T ₀ °C
	over T _{op}	·	-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	∆ f f	Not applicable		10-6	
12	Resistance Variation with Drive Level	<u>∆</u> R R	Not ap	plicable	%	
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	рF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		TC	хо		



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Na	Charatariatia	0	Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	68	75	MHz	AT Cut
2	Reference Temperature	To	+20	+30	۰c	
3	Overtone Order	~	;	3	·	
4	Load Capacitance	CL	d	×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u>	-10	+10	10-6	At T₀ °C
7	Resonance Resistance	R _r	-	40	Ω	At To °C
8	Frequency Variation with Temperature over T _{op}	<u>∆ f</u> f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	∆R R		+20 or -	%	From resistance measured at T _o °C
40	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°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 ₁	20	-	mH	
14	Motional Capacitance	C ₁	Notap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	=	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or :Z _p //R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		TC	хо		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO. 32

Limits No Characteristic Symbol Unit Remarks Min Max 1 Resonance Frequency $f_{\mathbf{r}}$ MHz AT Cut 700 Reference Temperature 2 +20 +30 ٥C T_{o} 3 Overtone Order _ 3 4 Load Capacitance рF C_L 00 5 Rated Drive Level P_0 mW 01 6 Frequency Adjustment Δf -10 +10 10-6 At To °C Tolerance f R_{r} 7 Resonance Resistance 40 Ω At To °C 8 Frequency Variation -70 +70 10-9 From frequency measured at T_o °C <u>∆ f</u> with Temperature over Top 9 Resistance Variation -20 <u>∆ R</u> +20 % From resistance with Temperature - or measured at To °C over Top -20 +20 Ω Operating Temperature 10 T_{op} -15 +65 °C Range 11 Frequency Variation 10-6 Not applicable with Drive Level 12 Resistance Variation <u>Δ R</u> % Not applicable with Drive Level R 13 Motional Inductance 20 L_1 mΗ 14 Motional Capacitance C_1 fF Not applicable 15 Static Capacitance C_{o} 50 pF 16 Q Factor Q 70,000 -17 Ratio of Unwanted In the frequency Response Resistance to range f_r -10% Resonance Resistance R_p/R 31 to or f, +10% Response Impedance to $|Z_p|/R$ Resonance Resistance 18 Ageing Over 10 years after $\Delta f/f$ -50 +50 10-6 Burn-in 19 Physical Dimensions Figure 2(a) 20 Intended Application **TCXO**



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A1.	0		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	69 53	31250	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	:	3		
4	Load Capacitance	C _L	,	xo	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u> </u>	-70	+70	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	1	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°С	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Notap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or iZ _p i/R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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			Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	fL	16	30	MHz	AT Cut
2	Reference Temperature	T _o	+ 22	+28	°C	
3	Overtone Order	-	Funda	mental	·	
4	Load Capacitance	CL	25	35	pF	
5	Rated Drive Level	Po	0	2	mW	
6	Frequency Adjustment Tolerance	<u>∆</u> f f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	RL	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-30	+30	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10 -15	+10 or -	%	From resistance measured at T ₀ °C If R< 15Ω
10	Operating Temperature Range	Тор	-50	+80	°C	
11	Frequency Variation with Drive Level	Δf f	Notap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	olicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	ŧF	
15	Static Capacitance	Co	-	70	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31	-		In the frequency range f _L -10% to f _L +10%
18	Ageing	∆ f f	-30	+30	10 ⁻⁶	Per year
19	Physical Dimensions				***	•
20	Intended Application		х	0		



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 -						
No	Characteristic	Commission of	Lin	nits	110.	
INO	Onaraciensiic	Symbol	Min	Мах	Unit	Remarks
1	Resonance Frequency	fL	30	0	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	C _L	3	10	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	₽L	25	15	Ω	Over T _o °C
8	Frequency Variation with Temperature over Top	∆f f	-30	+30	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over T _{op}	<u>Δ R</u> R	-10 -15	+10 or - +15	%	From resistance measured at T _o °C If R<10Ω
10	Operating Temperature Range	T _{op}	-55	+100	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	-10	+10	10-6	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
12	Resistance Variation with Drive Level	Δ <u>R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	28	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	₹F	
15	Static Capacitance	Co	-	50	рF	
16	Q Factor	Q	60,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or	R _p /R or	41	•		In the frequency range f _L -10% to f _L + 10%
	Response Resistance	R_{p}	30	-	Ω	Overtone 3
18	Ageing	<u>∆ f</u> f	-30	+30	10-6	Per year after Burn-in
19	Physical Dimensions					
20	Intended Application		X	0	<u> </u>	·



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			Lin	nits	,	
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	67	117	MHz	
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL	C	хо	pF	
5	Rated Drive Level	Po	0	2	mW	
6	Frequency Adjustment Tolerance	∆ f f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-10	+ 10	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-10	+ 10	%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-30	+85	°C	Function must be guaranteed to -50°C
11	Frequency Variation with Drive Level	<u>∆ f</u> f	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	₫F	
15	Static Capacitance	Co	-	35	рF	
16	Q Factor	Q	50,000	-	÷	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31	~		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	∆ f f	-30	+30	10 ⁻⁶	15 years operating
19	Physical Dimensions					
20	Intended Application		X	0	• • • • • • • • • • • • • • • • • • • •	



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No	Characteristic	Complete	Lin	nits	Uniŧ	Remarks
INU	Characteristic	Symbol	Min	Max		Hemarks
1	Resonance Frequency	f _r	37 80	06667	MHz	
2	Reference Temperature	To	+20	+ 30	°C	
3	Overtone Order	*		3		
4	Load Capacitance	CL	,	×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-60	+60	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	Over T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-90	+90	10 ⁻⁹	
9	Resistance Variation with Temperature over Top	ΔR	-20	+20	Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+ 80	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	Not ap	olicable	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	70	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or :Z _p i/R	21	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	$\frac{\Delta f}{f}$	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions					
20	Intended Application		Х	0	····	



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No	Characterístic	Symbol	Lìn	nits	l lašt	Remarks
	Onaraciensiic	Symbol	Min	Max	Unit	Homano
1	Resonance Frequency	f _r	37 93	33333	MHz	
2	Reference Temperature	T _o	+20	+30	°C	
3	Overtone Order	•		3		
4	Load Capacitance	CL	c	×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-6 0	+60	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	~	40	Ω	Over T _o °C
8	Frequency Variation with Temperature over Top	∆f f	-9 O	+90	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-2 0	+20	Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+80	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Notap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	olicable	mΗ	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	_	70	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance	R _p /R or ¡Z _p //R	21	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	<u>∆ f</u>	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions					
20	Intended Application		хо		· · · · · · · · · · · · · · · · · · ·	-



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No	Characteristic	Combal	Lir	nits	11	
NU	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	fL	8 38	8608	MHz	
2	Reference Temperature	То	+ 23	+27	۰c	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	2	22	рF	
5	Rated Drive Level	Po	0	2	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-50	+50	10-6	
7	Resonance Resistance	RL	-	40	Ω	
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-50	+ 50	10 ⁻⁹	
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-25	+ 25	%	
10	Operating Temperature Range	T _{op}	-55	+80	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	Not ap	plicable	рF	
16	Q Factor	Q	Not ap	plicable	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or (Z _p //R	21	-		In the frequency range f _L -500kHz to f _L +500kHz
18	Ageing	∆ f f	-50	+50	10-6	After Burn-in and per year / life of 10 years
19	Physical Dimensions					_
20	Intended Application		Х	0	******	·



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No	Oh aya akayinkin	0	Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	fL	4	8	MHz	
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	25	35	pF	
5	Rated Drive Level	Po	0	2	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10 ⁻⁶	At To °C
7	Resonance Resistance	RL	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-20	+20	10 ⁻⁹	From frequency measured at T ₀ °C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	
10	Operating Temperature Range	Тор	-40	+80	°C	
11	Frequency Variation with Drive Level	<u>A f</u> f	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	Not ap	olicable	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	Not ap	olicable	pF	
16	Q Factor	Q	58,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	31	-		In the frequency range f _L -500kHz to f _L +500kHz
18	Ageing	∆ f f	-10	+ 10	10-6	15 years operation
19	Physical Dimensions					
20	Intended Application		X	0	,,,,	



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No	Characteristic	Symbol	Lin	nits	Unit	Remarks
		J,50.	Min	Max	Viii.	Tomako
1	Resonance Frequency	f _r	119	875	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	C _L	c	xo	ρF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T₀ °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-80	+80	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-50	+70	°C	
11	Frequency Variation with Drive Level	<u>A f</u> f	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	ΔR Ř	-10	+10	%	From $P_{S1} = 0.5$ mW to $P_{S2} = 0.25$ mW
13	Motional Inductance	L-1	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not app	plicable	fF	
15	Static Capacitance	Co	-	35	рF	
16	Q Factor	Q	60,000	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p //R	31	-		In the frequency range f _r -5000KHZ to f _r +5000KHZ
18	Ageing	Δf/f	-30	+30	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		***************************************
20	Intended Application		TC	хо		



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			Lir	nits		
No	Characteristic	Symbol	}		Unit	Remarks
			Min	Max		
1	Resonance Frequency	f _r	12	22	MHz	AT Cut
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	CL		x	рF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-80	+80	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T ₀ °C
10	Operating Temperature Range	Тор	-5 0	+ 70	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f	Not ap	plicable	10 ⁻⁶	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+ 10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co		35	pF	
16	Q Factor	Q	60,000	•	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ≀Z _p //R	31	-		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-30	+30	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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Nia	Observato /all		Lir	nits		
Νο	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	t _r	123 6	31111	MHz	AT Cut
2	Reference Temperature	То	+ 23	+27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	CL	,	∞	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆ f f	-8 0	+80	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	AR R	-10	+10	%	From resistance measured at T ₀ °C
10	Operating Temperature Range	T _{op}	-50	+70	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u>	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	ΔR R	-10	+ 10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
13	Motional Inductance	Ł ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	•	35	рF	
16	Q Factor	Q	60,000	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	~		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-3 0	+30	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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					.	
No	Characteristic	Symbol		nits	Unit	Remarks
			Min	Max		
1	Resonance Frequency	f _r	125 4	79167	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	۰c	
3	Overtone Order	-		5		
4	Load Capacitance	CL		x 0	pF	
5	Rated Drive Level	₽ ₀	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-80	+80	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	-5 0	+70	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	31	~		In the frequency range f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-30	+30	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figure	e 2(a)		
20	Intended Application		TC	хо		



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			Lir	nits	·	
	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	12	5 5	MHz	AT Cut
2	Reference Temperature	То	+23	+ 27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	CL	,	20	рF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10-6	At T₀ °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f f	-80	+80	10 ⁻⁹	From frequency measured at T ₀ °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	Top	-5 0	+70	°C	
11	Frequency Variation with Drive Level	∆ f f	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> Ř	-10	÷ 10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	35	рF	
16	Q Factor	Q	60,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31	-		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-30	+30	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		ТС	хо		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 46

No	Characteristic	Symbol	Lin	Limits		Remarks
	Onaractensuc	Зуппын	Min	Max	Unit	Homaiks
1	Resonance Frequency	f _r	126 0	41667	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	CL	,	_∞	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u> </u>	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over T _{op}	∆f f	-80	+80	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-50	+70	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+10	%	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31	-		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-30	+30	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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No	Chaupatoviotia	0	Lin	nits	4.	
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	126 4	61538	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	CL		×	ρF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>A</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-8 0	+80	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	-50	+70	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+10	%	From P _{S1} =0 5mW to P _{S2} =0 25mW
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Notap	plicable	fF	
15	Static Capacitance	Co	_	35	pF	
16	Q Factor	Q	60,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-3 0	+30	10-6	Storage 3 years, operation 15 years after 1060-hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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No	Characteristic	Symbol	Lir	nits	11-:4	Remarks
	Onalacteristic	Symbol	Min	Max	Unit	Hemars
1	Resonance Frequency	f _r	126 9	44444	MHz	AT Cut
2	Reference Temperature	Τ _ο	+23	+27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	CL	,	x o	ρF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T₀ °C
8	Frequency Variation with Temperature over Top	Δf f	-8 0	+80	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	ΔR R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	T_{ap}	-50	+70	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f	Notap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	-10	+10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
13	Motional Inductance	L ₁	Not ap	olicable	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	~		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-30	+30	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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Nia	Observations		Lin	nits		Remarks
No	Characteristic	Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	120 1	04167	MHz	AT Cut
2	Reference Temperature	T _o	+23	+27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	CL	c	×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-80	+80	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+ 10	%	From resistance measured at T ₀ °C
10	Operating Temperature Range	Тор	-5 0	+70	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
13	Motional Inductance	L ₁	Not ap	plicable	mН	
14	Motional Capacitance	C ₁	Not app	plicable	fF	
15	Static Capacitance	Co	-	35	ρF	
16	Q Factor	Q	60,000	-	<u>-</u>	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ;Z _p //R	31	-		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-30	+30	10 ⁻⁶	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figure	e 2(a)		
20	Intended Application		TC	хо		···



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No	Characteristic	Symbol	Lin	nits	l l=ta	7
	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	125 4	54545	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	CL	(20	ρF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-10	+10	10-6	At T₀ °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-80	+80	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-50	+70	°C	
11	Frequency Variation with Drive Level	∆ f f	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	35	рF	
16	Q Factor	Q	60,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31	-		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-30	+30	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		***************************************
20	Intended Application		тс	хо		



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No	Characterístic	Symbol	Lin	nits	l loit	Daniel
140	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	128	625	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-		5	***	
4	Load Capacitance	CL		20	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10-6	At T₀ °C
7	Resonance Resistance	R,	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆f f	-80	+80	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over T _{op}	ΔR R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	Top	-50	+70	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+10	%	From P _{S1} = 0 5mW to P _{S2} = 0 52mW
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	₫F	
15	Static Capacitance	Co	-	35	рF	
16	Q Factor	Q	60,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	31	-		In the frequency range f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-30	+30	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)	· · · · · · · · · · · · · · · · · · ·	
20	Intended Application		тс	хо		



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**** *** * * * * * * * * * * * * * * * *			Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _L	22	.7	MHz	AT Cut
2	Reference Temperature	T _o	+20	+30	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	3	0	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-10	+10	10-6	At T _o °C
7	Resonance Resistance	RL	*	25	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-14	+14	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20 - c	+20 r - +20	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-40	+85	°C	
11	Frequency Variation with Drive Level	∆ f f	-0 5	+05	10-6	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
12	Resistance Variation with Drive Level	<u>∆ R</u> R	-20	+20	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Notap	olicable	fF	
15	Static Capacitance	Co	-	50	рF	
16	Q Factor	Q	100,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _L -10% to f _L +10%
18	Ageing	Δ†/f	-5 0	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figure	e 2(a)		
20	Intended Application		TC	ко		



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No	Characteristic	Ob-I	Lin	nits		
140	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _L	16	30	MHz	AT Cut
2	Reference Temperature	To	+ 25	+29	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	3	10	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-10	+10	10-6	At T _o °C
7	Resonance Resistance	RL	-	100	Ω	At To °C
8	Frequency Variation with Temperature over T _{op}	<u>∆ f</u> f	-40	+ 40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	-20	-20 +20 - or -		From resistance measured at T ₀ °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-55	+100	°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 ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	70	рF	
16	Q Factor	Q	60,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	21	-		In the frequency range f _L -200kHz to f _L + 200kHz
18	Ageing	Δf/f	-30	+30	10-6	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application			0		



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No	Chaustavistis	O()	Lir	nits		
NO	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	30	30	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	(xo	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆ f f	-50	+50	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	-20	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	· ·
10	Operating Temperature Range	Тор	-55	* 125	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	Not ap	plicable	10-8	
12	Resistance Variation with Drive Level	<u> </u>	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ¡Z _p l/R	21	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-1 0	+10	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)	,	_
20	Intended Application		Х	0		



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A 1-			Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	54 31	1000	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	C _L	(x	ρF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-50	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	ΔR R		+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-55	+105	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	3 4	5 15	mН	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	fl _p /R or {Z _p //R	31	<u>-</u>		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-5 0	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		1
20	Intended Application		TC	хо	·	



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Nla	Characteristic	O mital	Lin	nits	11.16	
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	t _r	62	38	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	•	;	3		
4	Load Capacitance	CL	(xo	pF	
5	Rated Drive Level	Po	0	1	mW	~
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	-20	+20 or -	%	From resistance measured at To °C
	over T _{op}		-20	+20	Ω	<u> </u>
10	Operating Temperature Range	T _{op}	-55	+105	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not ap	olicable	10-8	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	olicable	%	
13	Motional Inductance	<u>L</u> 1	26	39	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	C _o	_	50	pF	
16	Q Factor	Q	70,000	-	•	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or iZ _p l/R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-5 0	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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NI.	0		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	62	5	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL	c	0	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T₀ °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-40	+ 40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R)	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
11	Frequency Variation with Drive Level	<u>∆</u>	Notap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Notap	olicable	%	
13	Motional Inductance	L ₁	26	39	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	50	рF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-5 0	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	ко	··········	



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NI-	01		Lir	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	64	997	MHz	AT Cut
2	Reference Temperature	Τ _ο	+23	+ 27	°C	
3	Overtone Order	-	:	3		
4	Load Capacitance	CL	,	xo	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-50	+50	10-8	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆ f f	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R		+20 or -	%	From resistance measured at To °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	AR R	Not ap	olicable	%	
13	Motional Inductance	L ₁	24	36	mH	***************************************
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		TC	хо		



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NI-	01		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	66 91	6666	MHz	AT Cut
2	Reference Temperature	T _o	+23	+27	°C	
3	Overtone Order	-	:	3		
4	Load Capacitance	CL	,	×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u>	-5 0	+50	10-6	At To °C
7	Resonance Resistance	R _r	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	1	+ 20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	· ·
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	23	34	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	C _o	-	50	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p //R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	<u> </u>	-5 0	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		TC	хо		



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NI-	01		Lin	nits		Remarks
No	Characteristic	Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	67 70	8333	MHz	AT Cut
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order	-	:	3		
4	Load Capacitance	CL	c	×	рF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u>	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-40	+ 40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	∆R R		+20 or -	%	From resistance measured at T ₀ °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	23	3.4	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	рϜ	
16	Q Factor	Q	70,000	-	*	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or :Z _p //R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-5 0	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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NI-	01		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	67 91	16666	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL	(∞	ρF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-20 - 0	+20 or - 1 +20	%	From resistance measured at T _o °C
10	Operating Temperature Range	Top	-55	+105	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	23	34	mH	
14	Motional Capacitance	Ci	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-50	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 62

No.	Clares de vietie	0	Lin	nits		Remarks
No	Characteristic	Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	69 16	66666	MHz	AT Cut
2	Reference Temperature	T _o	+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	$\frac{\Delta f}{f}$	~5 0	+50	10-8	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	l ·	+ 20 or -	%	From resistance measured at T ₀ °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
11	Frequency Variation with Drive Level	<u>∆</u>	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	21	32	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p ł/R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-5 0	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		тс	хо		



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No	Characteristic	O had	Lin	nits		Remarks
INO	Onditationship	Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	87	24	MHz	AT Cut
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL	,	xo	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆ f f	-40	+ 40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	ΔR R	1	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	Top	-55	+ 105	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	13	20	mH	······································
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	50	рF	
16	Q Factor	Q	70,000	-	•	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	fl _p /R or ¡Z _p //R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-5 0	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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A1_	Ohanaka iti		Lin	nits		Barrada
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	t _r	87	312	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°С	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL	(x	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5 0	+50	10-8	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R		+20 or -	%	From resistance measured at T ₀ °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T_{op}	-55	+105	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	13	20	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co		5.0	pF	
16	Q Factor	Q	70,000	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	31	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-5 0	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		TC	хо		



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NI-			Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	87	375	MHz	AT Cut
2	Reference Temperature	То	+23	+27	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL	,	20	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	-20	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	measured at 1 ₀ °C
10	Operating Temperature Range	Тор	-55	+ 105	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	Lt	13	20	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5 0	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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	Q		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	87	412	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-		3		
4	Load Capacitance	C _L	(×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-50	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	∆R R	1	+20 or -	%	From resistance measured at T _o °C
10			-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-55	+105	۰C	
11	Frequency Variation with Drive Level	Δf f	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆</u> R R	Not ap	plicable	%	
13	Motional Inductance	L ₁	13	20	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or iZ _p i/R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δ†/f	-5 0	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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No	Chanadaviatia	Complete	Lin	nits		Remarks
INO	Characteristic	Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	87	44	MHz	AT Cut
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	<u>Δ f</u>	-5 0	+50	10 ⁻⁶	At To °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-40	+40	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R		+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-55	+105	°C	
11	Frequency Variation with Drive Level	∆ 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 ₁	13	20	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31			In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		тс	хо		



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NI-	0		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	87	485	MHz	AT Cut
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL	(хо	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-50	+50	10-6	At To °C
7	Resonance Resistance	R _r	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>∆ R</u> R		+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-55	105	°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 ₁	13	20	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co		50	ρF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δ f /f	-50	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)	******	
20	Intended Application		тс	хо		



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NI.			Lìn	nits		
No	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	t _r	87 48	39750	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	C _L		×	pF	
5	Rated Drive Level	Pa	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-50	+50	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T₀ °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20 -20	+20 or - +20	%	From resistance measured at T _o °C
10		-		}	Ω	
10	Operating Temperature Range	T _{op}	-65	+105	°C	
11	Frequency Variation with Drive Level	∆ f f	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	13	20	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	3 1	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-50	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		TC	хо		



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- •			Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	88	743	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL	(0	ρF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-50	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-40	+40	10 ⁻⁹	From frequency measured at T ₀ °C
9	Resistance Variation with Temperature	<u>∆ R</u> R		+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-55	+105	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	13	20	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	ſF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	*	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5 0	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	ко		



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	~		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	88	38	MHz	AT Cut
2	Reference Temperature	To	+23	+27	•c	
3	Overtone Order	-	;	3		
4	Load Capacitance	C _L	(20	pF	
5	Rated Drive Level	Po	0	1	mW	***
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-50	+50	10-8	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over T _{op}	<u>∆</u>	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R		+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-55	+105	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	Not ap	plicable	10 - 6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	13	20	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	<u>-</u>	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ;Z _p //R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5 0	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		тс	хо	····	



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Na	Ofer was a darke		Lin	nits		Remarks
No	Characteristic	Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	88	86	MHz	AT Cut
2	Reference Temperature	T _o	+23	+27	°C	
3	Overtone Order	•		3		
4	Load Capacitance	CL	C	×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆.R</u> R	-20 - 0	+20 or -	%	From resistance measured at T _o °C
10	Operating Temperature	-	-55	+105	°C	
10	Range	T _{op}	*55	7 105	•0	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	13	20	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5 0	+50	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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No	Observantovintin	O week at	Lir	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	88	918	MHz	AT Cut
2	Reference Temperature	T _o	+23	+27	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL	,	×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-5 0	+50	10-6	At T₀ °C
7	Resonance Resistance	R _r	-	50	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆ f f	-40	+40	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	1	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T_{op}	-55	+105	°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 ₁	13	20	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	50	ρF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31			In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-50	+50	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо	·····	



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No	Characteristic	Comphal	Limits		11.77	Samuela	
NO		Symbol	Min	Мах	Unit	Remarks	
1	Resonance Frequency	₹r	44 28	36060	MHz	AT Cut	
2	Reference Temperature	T _o	+ 20	+ 30	°C	····	
3	Overtone Order	-	;	3			
4	Load Capacitance	CL	(×	ρF		
5	Rated Drive Level	Po	0	1	mW		
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-10	+10	10-6	At T _o °C	
7	Resonance Resistance	R _r	-	40	Ω	At T₀ °C	
8	Frequency Variation with Temperature over T _{op}	<u>Δ f</u> f	-9 0	+90	10 ⁻⁹	From frequency measured at T _o °C	
9	Resistance Variation with Temperature	<u>∆ R</u> R	-20	+ 20 or -	%	From resistance measured at T _o °C	
	over T _{op}	13	-20	+20	Ω		
10	Operating Temperature Range	Тор	-20	+80	°C		
11	Frequency Variation with Drive Level	Δf f	-0 5	+05	10-6	From P _{S1} = 0 5mW to P _{S2} = 0 25mW	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	-10	+10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW	
13	Motional Inductance	L ₁	20		mH		
14	Motional Capacitance	C ₁	Not ap	plicable	fF		
15	Static Capacitance	Co	-	50	рF		
16	Q Factor	Q	70,000	-	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range f _r -10% to f _r +10%	
18	Ageing	Δf/f	-30	+30	10-6	Storage 5 years, operation 15 years after 500 hours Burn-in	
19	Physical Dimensions		Figur	e 2(a)			
20	Intended Application		TC	хо			



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No	Characteristic	Sumbal	Lir	nits	l b-de	Remarks
	Onalacteristic	Symbol	Min	Max	Unit	Hemarks
1	Resonance Frequency	f _r	45	056	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	***************************************
3	Overtone Order	-		3		
4	Load Capacitance	CL	(∞	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-90	+90	10 ⁻⁹	From frequency measured at T ₀ °C
9	Resistance Variation with Temperature	AR R	•	+20 or -	%	From resistance measured at T _o °C
10	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-20	+80	۰C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	-0 5	+05	10-6	From P _{S1} = 0.5mW to P _{S2} = 0.25mW
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+10	%	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
13	Motional Inductance	L ₁	20	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range. f _r -10% to f _r + 10%
18	Ageing	Δf/f	-30	+30	10-6	Storage 5 years, operation 15 years after 500 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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NI.			Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	35	5 5	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-	:	3		
4	Load Capacitance	CL	,	xo	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>A R</u> R	5	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u>	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	18	24	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	C _o	-	55	рF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or íZ _p i/R	2 1			In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-1 0	+10	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		тс	хо		



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Ma	Characteristic		Lin	nits		Remarks
No		Symbol	Min	Max	Unit	
1	Resonance Frequency	fr	50	5	MHz	AT Cut
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	$\frac{\Delta f}{f}$	-5 0	+50	10-8	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-70	+70	10- ⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>ΔR</u> R		+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆</u> R R	Not ap	olicable	%	
13	Motional Inductance	L ₁	60	80	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	5 5	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	21	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-10	+10	10-6	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	тсхо		



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No	Characterístic	Symbol	Lin	nits	Unit	Remarks
110	onaractoristic	Joynnbol	Min	Max	Onic	nemarks
1	Resonance Frequency	f,	58 4	1975	MHz	AT Cut
2	Reference Temperature	τ _o	+23	+ 27	۰C	
3	Overtone Order			3		
4	Load Capacitance	CL		×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-50	+50	10-6	At T₀ °C
7	Resonance Resistance	R _r	-	30	Ω	At T₀ °C
8	Frequency Variation with Temperature over Top	Δf f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	1	+20 or -	%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-2 0 -15	+20	°C	
11	Frequency Variation with Drive Level	∆ f f	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	40	55	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	55	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	21	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-1 0	+10	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		· · · · · · · · · · · · · · · · · · ·



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No	Characteristic	Symbol	Lin	nits	Unit	Domestra
.,0	Statustonolis	Gymbol	Min	Max	Oint	Remarks
1	Resonance Frequency	f _r	69 5	3125	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	77.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.
3	Overtone Order	-	;	3		
4	Load Capacitance	CL	(xo	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-50	+50	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R_r	-	30	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20 -20	+20 or - +20	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	∆ f f	Notapı	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Notap	plicable	%	
13	Motional Inductance	L ₁	25	37	mH	
14	Motional Capacitance	C ₁	Not apı	olicable	fF	
15	Static Capacitance	C _o	-	55	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	21	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δ f /f	-1 0	+10	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figure	e 2(a)	****	
20	Intended Application		TC	хо		

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NI-	Ohamata forta		Lin	nits		Remarks
No	Characteristic	Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	36	625	MHz	AT Cut
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL	(xo x	pF	
5	Rated Drive Level	Po	0	1	mW	······································
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r		30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	ΔR R	1	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	· ·
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	18	24	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	55	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p //R	21			In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-1 0	+10	10-6	Per year after Burn-in
19	Physical Dimensions	· · · · · · · · · · · · · · · · · · ·	Figur	e 2(a)		*
20	Intended Application			xo		

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NI-	0		Lin	nits		
No	Characteristic	Symbol	Min	Мах	Unit	Remarks
1	Resonance Frequency	f _r	42	25	MHz	AT Cut
2	Reference Temperature	T _o	+23	+27	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL		×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-50	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-70	+70	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature	ΔR R	1	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	Top	-15	+65	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u>	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	ΔR R	Not ap	olicable	%	
13	Motional Inductance	L ₁	96	144	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	55	pF	
16	Q Factor	Q	50,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or Z _p /R	21	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-10	+10	10-6	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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	Characteristic		Lin	nits		Remarks
No		Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	49	375	MHz	AT Cut
2	Reference Temperature	T _a	+23	+27	°C	
3	Overtone Order	-	;	3		***************************************
4	Load Capacitance	CL		0	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	Δf f	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-70	+70	10 ⁻⁹	From frequency measured at T ₀ °C
9	Resistance Variation with Temperature	<u>Δ R</u> R		+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T_{op}	-15	+65	۰C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Notap	olicable	10-6	1
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Notap	olicable	%	
13	Motional Inductance	L ₁	60	80	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	55	pF	
16	Q Factor	Q	50,000	-	=	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	21	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-1 0	+10	10-6	Per year after Burn-in
19	Physical Dimensions		Figure	e 2(a)		•
20	Intended Application		TC			

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.	Characteristic		Lin	nits		Remarks
No	Characteristic	Symbol	Min	Max	Unit	
1	Resonance Frequency	f _r	55 23	31250	MHz	AT Cut
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order	-	;	3		
4	Load Capacitance	CL	C	хо .	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-50	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over T _{op}	<u>∆ f</u> f	-70	+70	10 ⁻⁹	From frequency measured at T ₀ °C
9	Resistance Variation with Temperature	<u>∆ R</u> R)	+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°С	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	4 5	65	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	55	рF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or 3Z _p //R	21	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-10	+10	10-6	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)	+++++	
20	Intended Application		тс	хо	······································	

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No	Characteristic	O mbal	Lin	nits		
NU	Onuracionstic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	fr	68	75	MHz	AT Cut
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL	c	x	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u>	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R		+20 or -	%	From resistance measured at T _o °C
	over T _{op}		-20	+20	Ω	<u></u>
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	∆ f f	Notap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	25	37	mH	
14	Motional Capacitance	C ₁	Not app	olicable	fF	
15	Static Capacitance	Co	-	55	pF	
16	Q Factor	Q	50,000	*	~	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	21	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-1 0	+10	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)	······································	
20	Intended Application		TC	TCXO		

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No	Characteristic		Lin	nits		Romovico
NU	Situationisis	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	7	О	MHz	AT Cut
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order		4	3		
4	Load Capacitance	CL	C	×	рF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ</u> f f	-50	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature	AR R	•	+20 or -	%	From resistance measured at To °C
	over T _{op}		-20	+20	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	۰C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆</u> R R	Not ap	olicable	%	
13	Motional Inductance	L ₁	25	37	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	_	55	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p //R	21	-		In the frequency range f _r -10% to f _r +10%
18	Ageing	Δf/f	-1 0	+10	10-6	Per year after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		тсхо			



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No	Characteristic	Symbol	Lin	nits	l tais	Daniella
	Onaracionsiic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	55	45	MHz	AT Cut
2	Reference Temperature	Τ _σ	+ 23	+27	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL		×	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5 0	+50	10-6	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over T _{op}	<u>Δ f</u> f	-70	+70	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-20 -20	+20 or - +20	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	-15	+ 65	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u>	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	45	65	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	55	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p //R	21	~		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-10	+10	10-6	Per year after Burn-in
19	Physical Dimensions		Figure	e 2(a)		-
20	Intended Application		TC	хо		······································

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	<u> </u>		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	128 7	07627	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	CL	,	xo	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-10	+10	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-15	+ 75	°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	Notap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60,000	-	Pa .	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	31	-		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-10	+ 10	10-6	Storage 5 years, operation 13 years
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		TC	хо	<u></u>	

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B.1 -	Q		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	1187	07627	MHz	AT Cut
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	CL	(20	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-90	+90	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-15	+75	°C	
11	Frequency Variation with Drive Level	∆ f f	Notap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	***************************************
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	35	pF	***************************************
16	Q Factor	Q	60,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	31	-		in the frequency range f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-3 0	+30	10-6	Storage 5 years, operation 13 years
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		

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81a	Ch and deviation		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	fL	16	30	MHz	AT Cut
2	Reference Temperature	To	+ 25	+ 29	°C	
3	Overtone Order	-	Funda	mental	•	
4	Load Capacitance	CL	3	0	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10-6	At T _o °C
7	Resonance Resistance	RL	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-10	+10	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20 -2 0	+20 or - +20	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-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 ₁	Not ap	olicable	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	Co	-	70	pF	
16	Q Factor	Q	50,000		*	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or iZ _p i/R	2 1	-		In the frequency range f _L -200kHz to f _L + 200kHz
18	Ageing	Δf/f	-30	+30	10-6	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		-
20	Intended Application		×	0		



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No	Characteristic	0 1	Lir	Limits		
NO	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	123 3	33333	MHz	AT Cut
2	Reference Temperature	To	+78	+84	°C	
3	Overtone Order	-	-	5		
4	Load Capacitance	CL	,	20	ρF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-70	+70	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆</u> f	-0 15	+015	10- ⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	+76	+86	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u>	Not applicable		10-6	
12	Resistance Variation with Drive Level	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Notap	plicable	fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60,000	-	₩	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p //R	31	-		In the frequency range f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-15	+15	10 ⁻⁶	Storage 5 years, operation 13 years after Ageing in an oscillator
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		oc	хо		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO. 91

Limits No Characteristic Symbol Unit Remarks Min Max 1 Resonance Frequency 126 625 f_t MHz AT Cut 2 Reference Temperature +78 To +84 ۰C 3 Overtone Order -5 4 Load Capacitance C_{L} ∞ рF 5 Rated Drive Level P_0 mW 01 6 Frequency Adjustment -70 Δf +70 10-6 At To °C Tolerance f 7 Resonance Resistance R_{r} 45 Ω At To °C 8 Frequency Variation From frequency measured at T_o °C -0 15 +015 10-9 <u>Δ</u> f with Temperature over Top 9 Resistance Variation <u>Δ R</u> R -10 +10 % From resistance with Temperature measured at Tn °C over Top 10 Operating Temperature T_{op} +76 +86 ٥C Range Frequency Variation with Drive Level 11 $\frac{\Delta f}{f}$ Not applicable 10-6 12 Resistance Variation <u>Δ R</u> % Not applicable with Drive Level R 13 Motional Inductance L_1 Not applicable mΗ 14 Motional Capacitance C_1 fF 15 Static Capacitance C_{o} 35 pF 16 Q Factor Q 60,000 Ratio of Unwanted 17 In the frequency Response Resistance to f, -5000khz range Resonance Resistance R_p/R 31 or f_r +5000khz Response Impedance to $|Z_p|/R$ Resonance Resistance 18 Ageing 10-6 $\Delta f/f$ -15 +15 Storage 5 years, operation 1 years after Ageing in an oscillator 19 Physical Dimensions Figure 2(a) 20 Intended Application ocxo



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***	~		Lin	nits		
No	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	127 0	83333	MHz	AT Cut
2	Reference Temperature	To	+78	+84	°C	
3	Overtone Order	-	!	5		
4	Load Capacitance	C _L		»	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-70	+70	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆ f f	-0 15	+015	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T ₀ °C
10	Operating Temperature Range	Тор	+76	+86	°C	
11	Frequency Variation with Drive Level	∆ 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 ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60,000	-		
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31	-		In the frequency range f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δ f/f	-50	+50	10-6	Storage 5 years, operation 13 years after 500 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		oc	хо		

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No	Characteristic	Comple al	Lir	nits	11.11	Demosite
INO	Characteristic	Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	127 2	72727	MHz	AT Cut
2	Reference Temperature	To	+78	+84	°C	
3	Overtone Order	•	!	5		
4	Load Capacitance	CL		00	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-70	+70	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R,	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆ f f	-0 15	+015	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	Top	+76	+86	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not applicable		10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ;Z _p //R	31	-		In the frequency range f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-50	+50	10 ⁻⁶	Storage 5 years, operation 13 years after 750 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)	- 	
20	Intended Application		oc	хо		



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No	Ohavaskavistia	0	Lin	nits		<u> </u>
INU	Characteristic	Symbol	Min	Мах	Unit	Remarks
1	Resonance Frequency	f _r	127 7	77778	MHz	AT Cut
2	Reference Temperature	To	+78	+84	°C	
3	Overtone Order			5		
4	Load Capacitance	CL	,	20	ρF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-70	+70	10-6	At T₀ °C
7	Resonance Resistance	R _r	-	45	Ω	At T₀ °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-0 15	+015	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	ΔR R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	+76	+86	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance Variation with Drive Level	∆R R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p //R	31	-		In the frequency range f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-5 0	+50	10 ⁻⁶	Storage 5 years, operation 13 years after 750 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		oc	хо		

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No	Characteristic	0	Limits			
No		Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	128 75		MHz	AT Cut
2	Reference Temperature	T _o	+ 78	+84	°C	
3	Overtone Order			5		
4	Load Capacitance	CL	∞		ρF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-70	+70	10-6	At To °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-0 15	+015	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	+76	+86	°C	
11	Frequency Variation with Drive Level	∆ f f	Not applicable		10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not applicable		%	
13	Motional Inductance	L ₁	Not applicable		mН	
14	Motional Capacitance	C ₁	Not applicable		fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60,000	-	-	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	31	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-15	+15	10 ⁻⁶	Storage 5 years, operation 13 years after Ageing in an oscillator
19	Physical Dimensions		Figure 2(a)			·
20	Intended Application		ОС	хо		

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No	Characteristic	Symbol	Limits		Unit	
			Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	120 8	33333	MHz	AT Cut
2	Reference Temperature	To	+ 78	+84	°C	
3	Overtone Order			5		
4	Load Capacitance	C _L	,	xo	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-70	+70	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆</u>	-0 15	+015	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-10	+10	%	From resistance measured at T ₀ °C
10	Operating Temperature Range	Тор	+ 76	+86	°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 ₁	Not ap	olicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p i/R	31	•		In the frequency range f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-30	₹30	10 ⁻⁶	Storage 5 years, operation 13 years after Ageing in an oscillator
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		oc	хо		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 97

No	Characteristic		Limits			
140		Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	121 212121		MHz	AT Cut
2	Reference Temperature	To	+78	+84	°C	
3	Overtone Order	~		5		
4	Load Capacitance	CL	(_∞	pF	
5	Rated Drive Level	Po	0	1	mW	***
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-70	+70	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T₀ °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-0 15	+015	10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-10	+10	%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	+76	+86	°C	
11	Frequency Variation with Drive Level	∆ f f	Not applicable		10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not applicable		%	
13	Motional Inductance	L ₁	Not applicable		mH	
14	Motional Capacitance	C ₁	Not applicable		fF	
15	Static Capacitance	Co	-	35	рF	
16	Q Factor	Q	60,000	-	<u> </u>	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31	-		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-1 5	+15	10 ⁻⁶	Storage 5 years, operation 13 years after Ageing in an oscillator
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		oc	хо		



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N/-	Characteristic		Limits			
No		Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	128 571429		MHz	AT Cut
2	Reference Temperature	T _o	+78	+84	°C	
3	Overtone Order	-		5		
4	Load Capacitance	CL	(00	pF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-70	+70	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆f f	-0 15	+015	10-9	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-10	+10	%	From resistance measured at T ₀ °C
10	Operating Temperature Range	Тор	+76	+86	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f	Not applicable		10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not applicable		%	
13	Motional Inductance	L ₁	Not applicable		mH	
14	Motional Capacitance	C ₁	Not applicable		fF	
15	Static Capacitance	Co	-	35	pF	
16	Q Factor	Q	60,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	31	-		In the frequency range f _r -5000kHz to f _r +5000kHz
18	Ageing	Δ f /f	-5 0	÷50	10 ⁻⁶	Storage 5 years, operation 13 years after 750 hours Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		oc	хо		



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No	Characteristic		Limits			
No		Symbol	Min	Max	Unit	Remarks
1	Resonance Frequency	f _r	50	0	MHz	AT Cut
2	Reference Temperature	To	+70	+80	°C	
3	Overtone Order	-	į	5		
4	Load Capacitance	CL	c	0	рF	
5	Rated Drive Level	Po	0	1	mW	
6	Frequency Adjustment Tolerance	<u> </u>	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	80	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	Not applicable		10 ⁻⁹	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	Not applicable		% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	Тор	-20	+80	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f	-0 5	+05	10-6	From P _{S1} = 0 5mW to P _{S2} = 0 25mW
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+ 10	%	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	60	-	mH	
14	Motional Capacitance	C ₁	Notap	olicable	fF	
15	Static Capacitance	Co	-	50	pF	
16	Q Factor	Q	100,000	-	_	
17	Ratio of Unwanted Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	21	-		In the frequency range f _r -10% to f _r + 10%
18	Ageing	Δf/f	-30	+30	10-6	Storage 5 years, operation 15 years
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		TC	(0	-	



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APPENDIX 'A'

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AGREED DEVIATIONS FOR C-MAC FREQUENCY PRODUCTS (F)

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