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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 ESCC Detail Specification Nos. 3501/001, 3501/008 and 3501/011)

ISSUE 3 March 2010



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DOCUMENTATION CHANGE NOTICE

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DCR No.	CHANGE DESCRIPTION
533, 552	Specification upissued to incorporate technical and editorial changes per DCRs.



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1.1 SCOPE

This specification details the values, physical and electrical characteristics, test and inspection data for Crystal Units in Metal Holder, based on Type T807, Frequency Range 4.0 - 140MHz.

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

This is a follow-up specification to ESCC Detail Specification Nos. 3501/001 and 3501/008. ESCC 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 ESCC Secretariat for a type variant number for each individual crystal unit concerned, by sending a finalised Table 1(a) which shall also be copied to the ESCC Executive.

1.3 MAXIMUM RATINGS

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

1.4 PHYSICAL DIMENSIONS

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

1.5 <u>FUNCTIONAL DIAGRAM</u>

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

<u>N.B.</u> 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 (T _{op} °C)	Intend. Applica- tion	Figure
01	56.307974	œ	+ 60	-20 to +80	осхо	2(a)
02	56.214223	00	+ 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	∞	+ 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	XO	2(b)
13	75.0	12	+ 25	-20 to +80	VCXO	2(b)
14	54.672426	80	+ 60	-20 to +80	OCXO	2(a)
15	53.846315	∞	+60	-20 to +80	OCXO	2(a)
16	31.611111	∞	+ 25	-20 to +80	ХО	
17	4.194304	22	+60	-20 to +70	XO	
18	16.0	30	+ 25	-20 to +90	XO	
19	137.912500	. 00	+ 25	-20 to +60	XO	
20	137.1	∞	+ 25	-20 to +60	ХО	
21	35.5	00	+ 25	-15 to +65	TCXO	2(a)
22	35.85	œ	+ 25	-15 to +65	TCXO	2(a)
23	36.625	00	+ 25	- 15 to +65	TCXO	2(a)
24	36.7	00	+ 25	-15 to +65	TCXO	2(a)
25	49.375	∞	+ 25	- 15 to +65	TCXO	2(a)
26	46.210937	∞	+25	- 15 to +65	TCXO	2(a)
27	55.231250	∞	+ 25	-15 to +65	TCXO	2(a)
28	55.425	∞	+ 25	-15 to +65	TCXO	2(a)
29	55.45	œ	+ 25	- 15 to +65	TCXO	2(a)
30	50.5	∞	+ 25	- 15 to +65	TCXO	2(a)
31	68.75	∞	+ 25	- 15 to +65	TCXO	2(a)
32	70.0	∞	+ 25	-15 to +65	TCXO	2(a)
33	69.531250	∞	+ 25	- 15 to +65	тсхо	2(a)
34	16.0	30	+ 25	-50 to +80	хо	
35	30.0	30	+ 25	-55 to +100	ХО	
36	67.117	∞	+ 25	-30 to +85	ХО	

NOTES: See Page 8.



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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	8	+ 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	∞	+ 25	-5 to +70	TCXO	2(a)
43	123.611111	∞	+ 25	-5 to +70	TCXO	2(a)
44	125.479167	∞	+ 25	-5 to +70	TCXO	2(a)
45	125.5	- ∞	+ 25	-5 to +70	TCXO	2(a)
46	126.041667	∞	+ 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	∞	+ 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	o	+ 25	-55 to +105	TCXO	2(a)
57	62.5	8	+ 25	-55 to +105	TCXO	2(a)
58	64.997	∞	+ 25	-55 to +105	TCXO	2(a)
59	66.916666	00	+ 25	-55 to +105	TCXO	2(a)
60	67.708333	00	+ 25	-55 to +105	TCXO	2(a)
61	67.916666	∞	+ 25	-55 to +105	TCXO	2(a)
62	69.166666	00	+ 25	-55 to +105	TCXO	2(a)
63	87.24	00	+ 25	-55 to +105	TCXO	2(a)
64	87.312	∞	+ 25	-55 to +105	TCXO	2(a)
65	87.375	∞	+ 25	-55 to +105	TCXO	2(a)
66	87.412	∞	+ 25	-55 to +105	TCXO	2(a)
67	87.448	∞	+ 25	-55 to +105	тсхо	2(a)
68	87.485	∞	+ 25	-55 to +105	TCXO	2(a)
69	87.489750	∞	+ 25	-55 to +105	TCXO	2(a)
70	88.743	∞	+25	-55 to +105	TCXO	2(a)
71	88.8	∞	+ 25	-55 to +105	TCXO	2(a)
72	88.86	∞	+ 25	-55 to +105	TCXO	2(a)

NOTES: See Page 8.



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

Variant	Resonance Frequency (MHz)	Load Capacitance (C _L pF)	Reference Temp. (T _o °C)	Operating Temp. Range (T _{op} °C)	Intend. Applica- tion	Figure
73	88.913	8	+25	-55 to +105	TCXO	2(a)
74	44.286060	8	+ 25	-20 to +80	TCXO	2(a)
75	45.056	8	+ 25	-20 to +80	TCXO	2(a)
76	35.5	∞	+ 25	- 15 to +65	TCXO	2(a)
77	50.5	00	+ 25	- 15 to + 65	TCXO	2(a)
78	54.497500	∞	+ 25	- 15 to +65	TCXO	2(a)
79	69.531250	∞	+ 25	-15 to +65	TCXO	2(a)
80	36.625	∞	+ 25	- 15 to +65	TCXO	2(a)
81	42.5	∞	+ 25	-15 to +65	TCXO	2(a)
82	49.375	∞	+ 25	-15 to +65	TCXO	2(a)
83	55.231250	∞	+ 25	-15 to +65	TCXO	2(a)
84	68.75	∞	+ 25	-15 to +65	TCXO	2(a)
85	70.0	∞	+ 25	- 15 to + 65	TCXO	2(a)
86	55.45	∞	+ 25	-15 to +65	TCXO	2(a)
87	128.707627	∞	+ 25	-15 to +75	TCXO	2(a)
88	118.707627	∞	+ 25	-15 to +75	TCXO	2(a)
89	16.0	30	+27	-20 to +70	XO	2(a)
90	123.333333	∞	+81	+76 to +86	OCXO	2(a)
91	126.625	00	+81	+76 to +86	ocxo	2(a)
92	127.08333	∞	+81	+76 to +86	осхо	2(a)
93	127.272727	00	+81	+76 to +86	осхо	2(a)
94	127.777778	∞	+81	+76 to +86	OCXO	2(a)
95	128.75	∞	+81	+76 to +86	осхо	2(a)
96	120.833333	∞	+81	+76 to +86	осхо	2(a)
97	121.212121	∞	+81	+76 to +86	ocxo	2(a)
98	128.571429	∞	+ 81	+76 to +86	осхо	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.

NI.	Observatoristis	Limits		l laik	Remarks	
No.	Characteristic	Symbol	Min.	Max	Unit	nemarks
1	Resonance Frequency	f _r			MHz	AT Cut
2	Reference Temperature	To			°C	
3	Overtone Order	-				
4	Load Capacitance	CL			pF	
5	Rated Drive Level	Po			mW	
6	Frequency Adjustment Tolerance	<u>∆</u>			10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r			Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f			10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> 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 $P_{S1} = 0.5$ mW to $P_{S2} = 0.5$ mW
12	Resistance Variation with Drive Level	<u>Δ R</u> R			%	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.5 \text{mW}$
13	Motional Inductance	L ₁			mH	
14	Motional Capacitance	C ₁			fF	
15	Static Capacitance	Co			pF	
16	Q Factor	Q			-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R				In the frequency range: f _r -10% to f _r +10%
18	Ageing	<u>Δ f</u>			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 f_r.
 - (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 CL

- (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
$$\left(1 + \frac{C_o}{C_L}\right)^2$$

7. Frequency and Resistance Variation with Temperature

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

8. Frequency and Resistance Variation with Drive Level

These limits and the Drive Level range (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 L_1 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 ESCC Generic Specification No. 3501, Para. 3.



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FIGURE 1 - PARAMETER DERATING INFORMATION

Not applicable.

FIGURE 2 - PHYSICAL DIMENSIONS

FIGURE 2(a) - 3-PIN PACKAGE

FIGURE 2(b) - 4-PIN PACKAGE

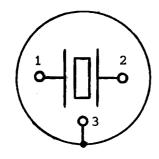
				ØA —					ØA — ØD —
	Millim	netres			Cumbal	Millim	etres	Remarks	<u> </u>
Symbol	Min.	Max.	Remarks C	Symbol	Min.	Max.	Hemaiks	E	
ØA	-	10.70	-		ØA	8.51	10.70	-	
С	-	6.80	-		С	6.10	6.90	-	
Н	4.83	5.33	Pitch		ØD	7.75	8.50	-	
			5.08mm		E	0.25	1.00	-	-н-
ØK	0.41	0.48	-	- H-►	Н	4.93	5.23	-	
L	12.70	-	-	ØK 🗡	ØK	0.41	0.48	-	ØK A
Р	-	0.90	Note 2	1 X X2	L	12.70	_	-	2
Q	-	0.90	Note 2		Р	-	0.90	Note 2	Note
				Note 1	Q	-	0.90	Note 2	
	Î	Y Z	→ X	P					P

NOTES

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

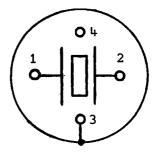
FIGURE 3 - FUNCTIONAL DIAGRAM

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

3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

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

Resonance Frequency $= f_r$ Load Resonance Frequency $= f_L$ $= T_o$ Reference Temperature $= R_r$ Resonance Resistance = R_L Load Resonance Resistance $= P_0$ Rated Drive Level = Co Static Capacitance $= C_L$ Load Capacitance Motional Capacitance $= C_1$ $= L_1$ Motional Inductance $= R_P$ Response Resistance Response Impedance $= |Z_P|$ Insulation Resistance = Ri

4. REQUIREMENTS

4.1 GENERAL

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

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

4.2 DEVIATIONS FROM GENERIC SPECIFICATION

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

None.

4.2.2 Deviations from Final Production Tests (Chart II)

None.

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

None.

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

None.

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

None.



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4.3 MECHANICAL REQUIREMENTS

4.3.1 <u>Dimension Check</u>

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

4.3.2 Weight

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

4.3.3 Robustness of Terminations

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

4.4 MATERIALS AND FINISHES

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

4.4.1 Case

4.4.1.1 Cap

Copper, nickel plated or nickel and gold plated.

4.4.1.2 Base

Kovar, nickel plated and gold plated.

4.4.2 <u>Lead Material and Finish</u>

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

4.5 MARKING

4.5.1 General

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

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

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

4.5.2 The ESCC Component Number

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

Detail Specification Number ————————————————————————————————————	
Type Variant, (see Table 1(a))	 ١
Testing Level (B or C, as applicable)	



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4.5.3 Characteristics

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

4.5.4 Traceability Information

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

4.5.5 Manufacturer's Name, Symbol or Code

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

4.6 ELECTRICAL MEASUREMENTS

4.6.1 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 <u>Circuits for Electrical Measurements (Figure 4)</u>

Not applicable.

4.7 BURN-IN TESTS

4.7.1 Parameter Drift Values

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

4.7.2 Conditions for Burn-in

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

4.7.3 Electrical Circuits for Burn-in (Figure 5)

Not applicable.



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TABLE 2 - ELECTRICAL MEASUREMENTS AT REFERENCE TEMPERATURE

No.	Characteristics	Symbol	ESCC 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. 9.2.1.1	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. 9.2.1.1	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	$\frac{\Delta R}{R}$ (T ₀ , ΔP)	Para. 9.2.1.1	Table 1(a), Item 12	%
5	Motional Inductance	L ₁	Para. 9.2.1.3	Table 1(a), Item 13	mH
6	Static Capacitance	Co	Para. 9.2.1.4	Table 1(a), Item 15	pF
7	Unwanted response	R _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	ESCC 3501 Test Method	Limits	Unit
9	Frequency variation with Temperature over Top	$\frac{\Delta f}{f} (\Delta T, P_0)$	Para. 9.2.1.2	Table 1(a) Item 8	10 ⁻⁶
10	Resistance variation with Temperature over Top	$\frac{\Delta R}{R}$ (ΔT , P_0)	Para. 9.2.1.2	Table 1(a) Item 9	%

FIGURE 4 - CIRCUITS FOR ELECTRICAL MEASUREMENTS

Not applicable.

TABLE 4 - PARAMETER DRIFT VALUES

No.	Characteristics	Symbol	Spec. and/or Test Method	Test Conditions	Change Limits (Δ)	Unit
1	Resonance frequency drift	$\frac{\Delta f}{f}$	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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4.8 <u>ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESCC GENERIC SPECIFICATION NO. 3501)</u>

4.8.1 Measurements and Inspections on Completion of Environmental Tests

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

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

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

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

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



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

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

NOTES

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



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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	PEC. NO. 3501	MEASUREMENTS AN	ID INSPECTIONS		LIM		
NO.	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS	SYMBOL	Min.	Max.	UNIT
	Climatic Sequence	Para. 9.14						
08	Dry Heat	Para. 9.14.1	Initial Measurements					ı
			Resonance Frequency	Table 2 Item 1	f f		2 Item 1	
			Resonance Resistance	Table 2 Item 2	R	Table 2	2 Item 2	
			Final Measurements Resonance Frequency	Table 2 Item 1	١ , ,	- 2.0	+ 2.0	10 ⁻⁶
			Drift	Table 2 Hem T	$\frac{\Delta f}{f}$	- 2.0	+ 2.0	10-0
			Resonance Resistance	Table 2 Item 2	ΔR	-10	+10	%
			Drift		R	or (2)		~
					ΔR	-1.0	+ 1.0	Ω
09	Cold	Para. 9.14.3	Initial Measurements					
			Resonance Frequency	Table 2 Item 1	f		9.14.1.3	
			Resonance Resistance	Table 2 Item 2	R	Final Mea	surements	
			Final Measurements Resonance Frequency	Table 2 Item 1	Λ 4	-2.0	+ 2.0	10-6
			Drift	Table 2 Item 1	$\frac{\Delta f}{f}$	-2.0	+ 2.0	10"
			Resonance Resistance	Table 2 Item 2	<u>∆ R</u>	-10	+ 10	%
			Drift		R R	or (2)		
					ΔR	- 1.0	+ 1.0	Ω
10	Damp Heat (Acclerated)	Para. 9.14.4	Initial Measurements					
	Remaining Cycles		Resonance Frequency	Table 2 Item 1	f	1	9.14.3.2	
			Resonance Resistance	Table 2 Item 2	R	Final Mea	asurements	i
			Final Measurements Resonance Frequency	Table 2 Item 1	Λ.	- 2.0	+ 2.0	10-6
			Drift	Table 2 Helli T	$\frac{\Delta f}{f}$		T 2.0	'0"
			Resonance Resistance	Table 2 Item 2	ΔR	-10	+10	%
			Drift		R	or (2)		
					ΔR	-1.0	+1.0	Ω
			Insulation Resistance	Table 2 Item 8	Ri	500	-	ΜΩ
11	Rapid Change of	Para. 9.15	Initial Measurements					
	Temperature		Resonance Frequency	Table 2 Item 1	f	Para.	ı 9.14.4.2	
	, ,		Resonance Resistance	Table 2 Item 2	Ř		surements	
			Final Measurements	After minimum				
		:		Recovery of 2 hours				
			Resonance Frequency	Table 2 Item 1	$\frac{\Delta f}{f}$	- 2.0	+ 2.0	10-6
			Drift Resonance Resistance	Table 2 Ham C	l t			
			Drift	Table 2 Item 2	∆R R	- 10 or (2)	+10	%
					ΔR	-1.0	+ 1.0	Ω
12	Robustness of	Para. 9.16	Tensile Strength	Gen. 3501		1		
	Terminations		Ĭ	Para. 9.16.1				
			Visual Examination	No visible damage				
İ			Bending	Gen. 3501				
1			Visual Examination	Para. 9.16.2				
L		L	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.)

	ESA/SCC GENERIC S	PEC. NO. 3501	MEASUREMENTS AND IN	SPECTIONS	0.44501	LIMI	TS	LINET
NO.	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS	SYMBOL	M in.	Max.	UNIT
13	Life Test	Para. 9.17	Initial Measurements Resonance Frequency Resonance Resistance	Table 2 Item 1 Table 2 Item 2	f R	Table 2 Table 2		
			Intermediate Measurements Resonance Frequency Drift	At 500 hours Table 2 Item 1	<u>Δ f</u>	-2.0	+ 2.0	10-6
			Resonance Resistance Drift	Table 2 Item 2	<u>Δ R</u> R ΔB	-10 or (2) -1.0	+10	% Ω
			Intermediate Measurements (Chart IV) and Final Measurements (Chart V)	At 1000 hours	ΔN	-1.0	+ 1.0	32
			Resonance Frequency Drift	Table 2 Item 1	$\frac{\Delta f}{f}$	- 2.5	+ 2.5	10 ⁻⁶
			Resonance Resitance Drift	Table 2 Item 2	<u>Δ R</u> R ΔR	-10 or (2) -1.0	+10	%
			Final Measurements (Chart IV)	At 2000 hours		1.0	. 1.0	1.
			Resonance Frequency Drift	Table 2 Item 1	<u>Δ f</u> f	-3.0	+3.0	10-6
			Resonance Resistance Drift	Table 2 Item 2	ΔR R	-10 or (2)	+10	%
					ΔR	-1.0	+ 1.0	Ω

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 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lin Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f _r	56.30	7974	MHz	AT Cut
2	Reference Temperature	To	+ 55	+65	°C	
3	Overtone Order	-	,	3	, , , , , , , , , , , , , , , , , , , ,	
4	Load Capacitance	CL	C	χo	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	Δf 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.	<u>∆</u>	- 12 0	+ 12 + 1.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	-20 -2.0	+20 or +2.0	% Ω	From resistance measured at T _o °C
40	over T _{op}	-				
10	Operating Temperature Range	T _{op}	-20	+ 80	°C	
11	Frequency Variation with Drive Level	∆ f f	-0.5	+0.5	10 ⁻⁶	From $P_{S1} = 0.05 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
12	Resistance Variation with Drive Level	<u>ΔR</u> R	-10	+10	%	From $P_{S1} = 0.05 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	_	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpI/R	3:1	-		In the frequency range: f _r - 10% to f _r + 10%
18	Ageing	∆ f 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		0	схо		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			7 11 117 11 11			
No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f _r	56.21	4223	MHz	AT Cut
2	Reference Temperature	То	+ 55	+65	°C	
3	Overtone Order	_	;	3		
4	Load Capacitance	CL	O	×	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	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature. Over Top. At To ± 5°C.	<u>Δ f</u> f	-12 0	+ 12 + 1.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	ΔR R	-20 -2.0	+20 or +2.0	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+80	°C	
11	Frequency Variation with Drive Level	Δf f	-0.5	+0.5	10 ⁻⁶	From P _{S1} = 0.05mW to P _{S2} = 0.25mW
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+10	%	From $P_{S1} = 0.05 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	2.0	_	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpI/R	3:1	-		In the frequency range: f _r - 10% to f _r + 10%
18	Ageing	∆ f f	-3.0	+3.0	10-6	Storage: 5 years. Operating: 15 years. After 500 Hours Burn-in
19	Physical Dimensions		Figu	ıre 2(a)		
20	Intended Application		0	схо		

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f _r	44.28	86060	MHz	AT Cut
2	Reference Temperature	To	+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	$\frac{\Delta f}{f}$	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	Over T _{op}
8	Frequency Variation with Temperature over Top	Δf f	-9.0	+9.0	10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	ΔR R	-20 -2.0	+20 or +2.0	%	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+80	°C	
11	Frequency Variation with Drive Level	Δf f	- 0.5	+ 0.5	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 $P_{S1} = 0.05 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	2.0-		mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpi/R	3:1	-		In the frequency range: f _r - 10% to f _r + 10%
18	Ageing	∆ f f	-3.0	+3.0	10-6	Storage: 5 years. Operating 15 years. After 500 Hours Burn-in
19	Physical Dimensions		Figu	re 2(a)		
20	Intended Application		T	СХО		

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	f _r	68.88	32769	MHz	AT Cut
2	Reference Temperature	To	+ 20	+ 30	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL	C	xo .	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-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	Δf f	-9.0	+9.0	10-6	From frequency measured at T ₀ °C
9	Resistance Variation with Temperature over Top	ΔR R	-20 -2.0	+20 or +2.0	%	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	- 0.5	+ 0.5	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 $P_{S1} = 0.05 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpI/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	∆ f f	-3.0	+3.0	10-6	Storage: 5 years. Operating: 15 years. After 500 Hours Burn-in
19	Physical Dimensions		Figu	re 2(a)		
20	Intended Application		TO	CXO		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Lim Min.	nits Max.	Unit	Remarks
1	Resonance Frequency	fL	24.68	24.686200		AT Cut
2	Reference Temperature	To	+ 23	+27	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	3	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-10	+10	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _L	-	10	Ω	At T _o °C
8	Frequency Variation with Temperature Over Top. At 1.5°C steps over Top.	<u>Δ f</u> f	-8.0 -1.0	+8.0 +1.0	10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature Over Top. At 1.5°C steps over Top.	<u>Δ R</u> R	-1.5 -0.5	+1.5 +0.5	Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	- 20	+70	°C	
11	Frequency Variation with Drive Level	Δf f	Not a	pplicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	2.7	-	mH	
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	4:1 5:1	-		In the frequency range: f _L - 50kHz to f _L + 50kHz (Overtones 3 and 5)
18	Ageing Ageing (Storage) Ageing (Operating) Ageing	∆ f f	-2.9 -3.9 -4.8 -6.0	+2.9 +3.9 +4.8 +6.0	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		Figu	Figure 2(a)		
20	Intended Application		T .	СХО		

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limits Min. Max.		Unit	Remarks
1	Resonance Frequency	f _r	67.98	8538	MHz	AT Cut
2	Reference Temperature	T _o	+20	+ 30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	- 10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	Δf f	-9.0	+9.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	ΔR R	-20 -2.0	+20 or +2.0	%	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	+0.5	10-6	From $P_{S1} = 0.05 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-10	+10	%	From $P_{S1} = 0.05 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70 000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpI/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		Figu	re 2(a)		
20	Intended Application		To	СХО		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

			Lim	vite		
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks
1	Resonance Frequency	f _r	118.	118.689		AT Cut
2	Reference Temperature	T _o	+23	+ 27	°C	
3	Overtone Order	-	Ę	5		
4	Load Capacitance	C _L	٥	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10-6	At 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	+8.0	10 ⁻⁶	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 _{op}	-20	+70	°C	
11	Frequency Variation with Drive Level	∆ 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 a	oplicable	mH	
14	Motional Capacitance	C ₁	Not a	oplicable	fF	
15	Static Capacitance	Co	-	3.5	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	3:1	-		In the frequency range: f _r - 5000kHz to f _r + 5000kHz
18	Ageing	<u>Δ f</u> f	-3.0	+3.0	10 ⁻⁶	Storage: 3 years. Operating: 13 years. After 500 Hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	XO		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

		T	Limits				
No.	Characteristics	Symbol	Min.	Max.	Unit	Remarks	
1	Resonance Frequency	f _r	128.	128.689		AT Cut	
2	Reference Temperature	To	+23 +27		°C		
3	Overtone Order	-	Ę	5			
4	Load Capacitance	C _L	0	0	pF		
5	Rated Drive Level	Po	0.	.1	mW		
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-10	+10	10-6	At T _o °C	
7	Resonance Resistance	R _r	-	45	Ω	At To °C	
8	Frequency Variation with Temperature over Top	∆ f f	-8.0	+8.0	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 ₀ °C	
10	Operating Temperature Range	T _{op}	- 20	+70	°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 a	pplicable	%		
13	Motional Inductance	L ₁	Not ap	plicable	mH		
14	Motional Capacitance	C ₁	Not ap	plicable	fF		
15	Static Capacitance	Co	-	3.5	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 !Zpi/R	3:1	-		In the frequency range: f _r - 5000kHz to f _r + 5000kHz	
18	Ageing	<u>Δ f</u> f	-3.0	+3.0	10 ⁻⁶	Storage: 3 years. Operating: 13 years. After 500 Hours Burn-in	
19	Physical Dimensions		Figure 2(a)				
20	Intended Application		TO	СХО			

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

No.	Characteristics	Symbol	Limits Min. Max.		Unit	Remarks			
			IVIIII.	iviax.					
1	Resonance Frequency	fL	32.0		MHz	AT Cut			
2	Reference Temperature	To	+ 25	+ 29	°C				
3	Overtone Order	-	Fundar	nental					
4	Load Capacitance	C _L	30		pF				
5	Rated Drive Level	Po	0.	1	mW				
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	- 10	+10	10 ⁻⁶	At To °C			
7	Resonance Resistance	R_{L}	-	120	Ω	At T _o °C			
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	- 40	+ 40	10 ⁻⁶	From frequency measured at T _o °C			
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20 +20 or -2.0 +2.0		% Ω	From resistance measured at T _o °C			
10	Operating Temperature Range	T _{op}	- 55	+100	°C				
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not applicable		10-6				
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	oplicable	%				
13	Motional Inductance	L ₁	Not app	olicable	mH				
14	Motional Capacitance	C ₁	Not app	olicable	fF				
15	Static Capacitance	Co	-	7.0	pF				
16	Q Factor	Q	60 000	-	-				
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	Rp/R or IZpI/R	2:1	-		In the frequency range: f _L - 200kHz to f _L + 200kHz			
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10-6	Per year after Burn-in			
19	Physical Dimensions		Figure 2(a)						
20	Intended Application		TCXO						



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO. 10

			<u> </u>			
No.	Characteristic	Symbol	Limits		Unit	Remarks
INO.		Symbol	Min.	Max	Offit	Homarks
1	Resonance Frequency	f _r	69.08	1879	MHz	AT Cut
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3	3	, , ,	
4	Load Capacitance	CL	۰	0	pF	
5	Rated Drive Level	P _o	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	∆ f f	-9.0	+9.0	10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ</u> R R	-20 - 0	+ 20 r - -2.0	% 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> ·	-0.5	+0.5	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 $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	∆ f f	-3.0	+3.0	10-6	Storage 5 years, Operation 15 years after 500 hours Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		т	cxo		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO. 11

N	Characteristic	O. mah al	Limits		l lait	Remarks
No.		Symbol	Min.	Мах	Unit	nemarks
1	Resonance Frequency	f _r	69.09	7030	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-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> f f	-9.0	+9.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	ΔR R	-20 -2.0	+20 or - +2.0	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+80	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	-0.5	+0.5	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 $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	∆ f f	-3.0	+3.0	10-6	Storage 5 years, operation 15 years after 500 hours Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		т	СХО		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

	Characteristic	Cumbal	Lim	nits	Unit	Remarks
No.		Symbol	Min.	Max		Hemarks
1	Resonance Frequency	f _r	15	15.0		
2	Reference Temperature	T _o	+22	+ 28	۰C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	CL	,	×	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-10	+ 10	10-6	At T₀ °C
7	Resonance Resistance	R _r	-	75	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-50.0	+50.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	∆R R	Not applicable		%	
10	Operating Temperature Range	T _{op}	-30	+80	°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	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	Not ap	plicable	pF	
16	Q Factor	Q	Not ap	plicable	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	Not applicable			
18	Ageing	∆ f f	-25	+ 25	10-6	Over 5 years after Burn-in
19	Physical Dimensions		Figure 2(b)			
20	Intended Application			хо		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO. 13

N 1-	Characteristic	Correb al	Limits		Unit	Remarks
No.		Symbol	Min.	Мах	Onit	Homarks
1	Resonance Frequency	fL	75	75.0		
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	11.9	12.1	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	Δf f	-2.0	+2.0	10-6	At T _o °C
7	Resonance Resistance	RL	_	25	Ω	Over T _o °C
8	Frequency Variation	<u>∆ f</u>	-5.0	+5.0	10 ⁻⁶	From -20°C to +70°C
	with Temperature over Top	†	-10	+10		From -20°C to +80°C
9	Resistance Variation with Temperature over Top	ΔR R	Not applicable		%	
10	Operating Temperature Range	T _{op}	-20	+80	°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 ap	plicable	mH	
14	Motional Capacitance	C ₁	1.7	-	fF	
15	Static Capacitance	Co	-	6.0	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	2.5:1	-		In the frequency range: f _L -100kHz to f _L +100kHz
18	Ageing	<u>Δ f</u> f	-6.0	+6.0	10-6	Over 5 years at 200 µW drive 22V
19	Physical Dimensions		Figure 2(b)			
20	Intended Application		vcxo			



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO. 14

			···			
No	Characteristic	Symbol	Lim	its	Unit	Remarks
No.		Symbol	Min.	Max		
1	Resonance Frequency	f _r	54.67	54.672426		AT Cut
2	Reference Temperature	T _o	+ 55	+ 65	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<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	<u>∆</u> f f	-12.0	-12.0 1.0	10-6	From frequency measured at T _o °C
	over T _{op}	df/f	-20	+20	%	From resistance
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-2.0 -2.0	or - + 2.0	Ω	measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+80	۰c	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	-0.5	+0.5	10-6	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
12	Resistance Variation with Drive Level	<u>Δ</u> R R	-10	+10	%	From P _{S1} = 0.5mW to P _{S2} = 0.25mW
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/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, operation 15 years after 500 hours Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		0	осхо		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 15

	0	O. mate at	Lim	its	Umit	Remarks
No.	Characteristic	Symbol	Min.	Мах	Unit	Nemarks
1	Resonance Frequency	f _r	53.84	6315	MHz	AT Cut
2	Reference Temperature	T _o	+ 55	+65	°C	•
3	Overtone Order	-	3	} 		
4	Load Capacitance	C _L	α	0	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 T _o °C
8	Frequency Variation with Temperature over Top T0 ± 5°C	<u>Δ f</u> f df/f	-12 0	-12 1.0	10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> R	-20 -2.0	+20 or - +2.0	% Ω	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	+0.5	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 $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	C _o	-	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 ıZ _p i/R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δ f/f	-3.0	+3.0	10-6	Storage 5 years, operation 15 years after 500 hours Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		00	СХО		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 16

Ne	Ohava stavistis	Cumbal	Lim	its	Unit	Remarks
No.	Characteristic	Symbol	Min.	Max	Offit	Tiemarks
1	Resonance Frequency	f _r	31.61	1111	MHz	
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	α		pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-6.0	+6.0	10-6	At T _o °C
7	Resonance Resistance	RL	-	40	Ω	Over T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-9.0	+9.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-2.0	+2.0	%	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	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	-	7.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	2:1	-		In the frequency range: f _r ± 10%
18	Ageing	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	10 Years after Burn-in
19	Physical Dimensions					
20	Intended Application		>	(0		



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			174141 140.			
No.	Characteristic	Symbol	Lim	its	Unit	Remarks
NO.	Official Control	- Cymbol	Min.	Max		
1	Resonance Frequency	fL	4.194	304	MHz	
2	Reference Temperature	To	+ 6	60	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	CL	2:	2	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	Δ f 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	∆ f f	-15	+15	10 ⁻⁶	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	°	
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	2.5	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	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	3:1	-		In the frequency range: f _L -420kHz to f _L + 420kHz
18	Ageing	<u>Δ f</u> f	-3.0	+3.0	10-6	Per Year after Burn-in
19	Physical Dimensions					
20	Intended Application		>	(0		



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			Lim	its	11-9	Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	Hemarks
1	Resonance Frequency	fL	16	.0	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	Fundar	mental		
4	Load Capacitance	CL	3	0	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	RL	-	10	Ω	Over T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-20	+20	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>∆ R</u> 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	∆ 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	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	3:1	-		In the frequency range: f _L -10% to f _L + 10%
18	Ageing	$\frac{\Delta f}{f}$	-3.0	+3.0	10 ⁻⁶	5 years storage and 15 years operation
19	Physical Dimensions					
20	Intended Application		>	(0		



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			Lim	nits		
No.	Characteristic	Symbol	Min.	Мах	Unit	Remarks
1	Resonance Frequency	f _r	137.91	12500	MHz	
2	Reference Temperature	T _o	+20	+30	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	C _L	٥	0	pF	
5	Rated Drive Level	P _o	0.	.1	mW	Rated 0.1 mW
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10 ⁻⁶	At T₀ °C
7	Resonance Resistance	R _r	-	40	Ω	Over T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-6.0	+6.0	10-6	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-2.0	+ 2.0	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	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	-	7.0	pF	
16	Q Factor	Q	65,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	2:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	∆ f f	-2.5	+ 2.5	10 ⁻⁶	10 years after Burn-in
19	Physical Dimensions			•		
20	Intended Application		×	0		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 20

			Lim	its	l loit	Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	, tomano
1	Resonance Frequency	f _r	137	7.1	MHz	
2	Reference Temperature	T _o	+ 20	+ 30	°C	
3	Overtone Order	-	5	;		
4	Load Capacitance	C _L	α	0	pF	
5	Rated Drive Level	P _o	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 Top	<u>Δ f</u> f	-6.0	+6.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-2.0	+ 2.0	Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+60	°C	
11	Frequency Variation with Drive Level	<u>\(\Delta \) 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	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	65,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	2:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	∆ f f	-2.5	+ 2.5	10-6	10 years after Burn-in
19	Physical Dimensions					
20	Intended Application		;	хо		



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		0	Lim	its	Unit	Remarks
No.	Characteristic	Symbol	Min.	Max	Offic	nemarks
1	Resonance Frequency	f _r	35	.5	MHz	AT Cut
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+ 5.0	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> f	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u> R	-20	+20 or -	%	From resistance
	with Temperature over Top	K	-2.0	+2.0	Ω	measured at T _o °C
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>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	_		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		ТС	ΣΧΟ		



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		Sh.al	Lim	its	Unit	Remarks
No.	Characteristic	Symbol	Min.	Мах	Onit	nemarks
1	Resonance Frequency	f _r	35.	85	MHz	AT Cut
2	Reference Temperature	T _o	+ 20	+30	°C	
3	Overtone Order	-	3	1		
4	Load Capacitance	CL	α)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-5.0	+5.0	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	-7.0	+7.0	10-6	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u>	-20	+20 or-	%	From resistance measured at T _o °C
	with Temperature over T _{op}	l n	-2.0	+ 2.0	Ω	illeasured at 1 ₀ O
10	Operating Temperature Range	T _{op}	-15	+65	°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	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+ 5.0	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		то	CXO		



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	<u>.</u>		Lim	its	11-:4	Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	Hemarks
1	Resonance Frequency	f _r	36.6	25	MHz	AT Cut
2	Reference Temperature	To	+ 20	+ 30	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	α)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	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	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u> R	-20	+20 or -	%	From resistance measured at T _o °C
	with Temperature over Top	H	-2.0	+2.0	Ω	
10	Operating Temperature Range	T _{op}	-15	+ 65	°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	plicable	%	
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	C _o	-	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	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		т	ΧO		



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			Lim	its	115	Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	Tomarko
1	Resonance Frequency	f _r	36	.7	MHz	AT Cut
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	۵	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	ΔR R	-20	+ 20	%	From resistance
	with Temperature over Top	"	-2.0	or - +2.0	Ω	measured at T _o °C
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	2.0	-	mΗ	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p //R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		т	схо		



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			Lim	its	l lait	Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	Tiomano
1	Resonance Frequency	f _r	49.3	375	MHz	AT Cut
2	Reference Temperature	T _o	+20	+ 30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C _L	٥	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-5.0	+ 5.0	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	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u> R	-20	+ 20 or -	%	From resistance
	with Temperature over T _{op}	K	-2.0	+2.0	Ω	measured at T _o °C
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>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+ 5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)		mm	
20	Intended Application		TO	ΧO		



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			Lim	ite		
No.	Characteristic	Symbol	Liiii	113	Unit	Remarks
			Min.	Мах	_	
1	Resonance Frequency	f _r	46.21	0937	MHz	AT Cut
2	Reference Temperature	T _o	+20	+ 30	۰c	
3	Overtone Order	-	3	1		
4	Load Capacitance	CL	α	o	pF	
5	Rated Drive Level	P _o	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-5.0	+ 5.0	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	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>∆</u> R R	-20	+20 or-	%	From resistance measured at T _o °C
	with Temperature over T _{op}	, R	-2.0	+2.0	Ω	measured at 1 ₀ O
10	Operating Temperature Range	Тор	-15	+ 65	°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	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+5.0	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		T	схо		

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		0	Lim	nits	الأصارا	Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	nemaks
1	Resonance Frequency	f _r	55.23	1250	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	•	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-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>∆ f</u> f	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u> R	-20	+ 20	%	From resistance
	with Temperature over Top	K	-2.0	or - +2.0	Ω	measured at T _o °C
10	Operating Temperature Range	T _{op}	-15	+65	۰C	
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	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+ 5.0	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		тсхо			



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			Lim	its	11-4	Remarks	
No.	Characteristic	Symbol	Min.	Max	Unit	Homarks	
1	Resonance Frequency	f _r	55.4	125	MHz	AT Cut	
2	Reference Temperature	To	+20	+30	°C		
3	Overtone Order	-	3	3			
4	Load Capacitance	C _L	α	0	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	-	40	Ω	At T _o °C	
8	Frequency Variation with Temperature over Top	<u>∆ f</u>	-7.0	+70	10 ⁻⁶	From frequency measured at T _o °C	
9	Resistance Variation	<u>∆ R</u> R	-20	+20 or-	%	From resistance measured at T _o °C	
	with Temperature over Top	H H	-2.0	+ 2.0	Ω	measured at 1 ₀ C	
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	2.0	-	mH		
14	Motional Capacitance	C ₁	Not ap	plicable	fF		
15	Static Capacitance	Co	-	5.0	pF		
16	Q Factor	Q	70,000	-	-		
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r + 10%	
18	Ageing	Δ f /f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in	
19	Physical Dimensions		Figure 2(a)				
20	Intended Application		тс	ΧO			

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	<u> </u>		Lim	nits		Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	romano
1	Resonance Frequency	f _r	55.	45	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C _L	٥	o	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>∆ f</u> f	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u> R	-20	+20	%	From resistance
	with Temperature over Top	R	-2.0	or - +2.0	Ω	measured at T _o °C
10	Operating Temperature Range	T _{op}	-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	plicable	%	
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figu	re 2(a)		
20	Intended Application		т	ΧO		



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	Observataristis	Symbol	Lim	its	Unit	Remarks
No.	Characteristic	Symbol	Min.	Max	OIII.	
1	Resonance Frequency	f _r	50	.5	MHz	AT Cut
2	Reference Temperature	T _o	+20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-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	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>∆ R</u> R	-20	+ 20 or -	%	From resistance measured at T _o °C
	with Temperature over Top	H	-2.0	+2.0	Ω	measured at 1 ₀ 0
10	Operating Temperature Range	T _{op}	-15	+ 65	°C	
11	Frequency Variation with Drive Level	∆ f f	Not ap	plicable	10 ⁻⁶	
12	Resistance Variation with Drive Level	∆R R	Not ap	plicable	%	
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	∆f/f	-5.0	+5.0	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		Т	схо		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 31

			Lim	its	11.2	Domayla
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	68.	75	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	α)	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-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	$\frac{\Delta f}{f}$	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20 - (+20 or - +2.0	% 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	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	C _o	-	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 //R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+ 5.0	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		TO	схо		



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	.	O wash at	Lim	its	Linit	Remarks	
No.	Characteristic	Symbol	Min.	Max	Unit	Hemarks	
1	Resonance Frequency	f _r	70	.0	M Hz	AT Cut	
2	Reference Temperature	To	+ 20	+30	°C		
3	Overtone Order	-	3	3			
4	Load Capacitance	CL	٥	0	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	-	40	Ω	At T _o °C	
8	Frequency Variation with Temperature over Top	<u>Δ f</u>	-7.0	+7.0	10-6	From frequency measured at T _o °C	
9	Resistance Variation	<u>∆ R</u> R	-20	+20 or -	%	From resistance	
	with Temperature over Top	, n	-2.0	+2.0	Ω	measured at T _o °C	
10	Operating Temperature Range	Тор	-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>Δ R</u> R	Not ap	plicable	%		
13	Motional Inductance	L ₁	2.0	-	mH		
14	Motional Capacitance	C ₁	Not ap	plicable	fF		
15	Static Capacitance	C _o	-	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 ıZ _p //R	3:1	_		In the frequency range: f _r -10% to f _r +10%	
18	Ageing	Δf/f	-5.0	+5.0	10-6	Over 10 years after Burn-in	
19	Physical Dimensions		Figure 2(a)				
20	Intended Application		TO	CXO			



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			Limi	ts	11	Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	Hemaiks
1	Resonance Frequency	f _r	69.53	1250	MHz	AT Cut
2	Reference Temperature	T _o	+ 20	+30	۰C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	α		pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u> R	-20	+ 20 or -	%	From resistance measured at To °C
	with Temperature over Top	K	-2.0	+ 2.0	Ω	measured at 1 ₀ 0
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>Δ R</u>	Not ap	plicable	%	
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	. C ₁	Not ap	plicable	fF	
15	Static Capacitance	C _o		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 ıZ _p l/R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+5.0	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		T	схо		



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No.	Characteristic	Symbol	Lim	its	Unit	Remarks
No.	Gharacteristic	Cymbol	Min.	Max		
1	Resonance Frequency	fL	16	.0	MHz	AT Cut
2	Reference Temperature	To	+ 22	+ 28	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	CL	25	35	pF	
5	Rated Drive Level	Po	0.	2	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-10	+10	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _L	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-30	+30	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u> R	-10	+ 10	%	From resistance measured at T _o °C
	with Temperature over T _{op}	R	-1.5	or - +1.5	Ω	If R < 15 Ω
10	Operating Temperature Range	T _{op}	-50	+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	-	7.0	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p l/R	3:1	-		In the frequency range: f _L -10% to f _L +10%
18	Ageing	Δ f f	-3.0	+3.0	10-6	Per year
19	Physical Dimensions					
20	Intended Application			ко		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 35

		Limits		Unit	Remarks	
No.	Characteristic	Symbol	Min.	Max	Offit	Hemans
1	Resonance Frequency	fL	30	.0	MHz	AT Cut
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	CL	30	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	R _L	2.5	15	Ω	Over T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-30	+30	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	ΔR R	-10 - c	+ 10 or - + 1.5	% Ω	From resistance measured at T _o °C If R<10Ω
10	Operating Temperature Range	Тор	-55	+100	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	-1.0	+1.0	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	Not ap	plicable	%	
13	Motional Inductance	L ₁	2.8	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	60,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or	R _p /R or	4:1	-		In the frequency range: f _L -10% to f _L +10%
	Response Resistance	R _p	30	-	Ω	Overtone 3
18	Ageing	<u>Δ f</u>	-3.0	+3.0	10-6	Per year after Burn-in
19	Physical Dimensions					
20	Intended Application		,	ко		



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			1	 r		
No	Characteristic	Symbol	Lim	nits	Unit	Remarks
No.	Official actions in	Gymbol	Min.	Max	O.I.I.	
1	Resonance Frequency	f _r	67.	117	MHz	
2	Reference Temperature	То	+ 23	+ 27	۰C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	C	ρ.	pF	
5	Rated Drive Level	Po	0	.2	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-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>∆ f</u> f	-10	+10	10 ⁻⁶	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	-30	+ 85	°C	Function must be guaranteed to -50°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	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.5	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	∆ f f	-3.0	+3.0	10-6	15 years operating
19	Physical Dimensions					
20	Intended Application			хо		



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			Lim	its		
No.	Characteristic	Symbol			Unit	Remarks
			Min.	Max		
1	Resonance Frequency	f _r	37.80	6667	MHz	
2	Reference Temperature	To	+ 20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-6.0	+6.0	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>∆ f</u> f	-9.0	+9.0	10 ⁻⁶	
9	Resistance Variation with Temperature over Top	ΔR	-2.0	+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>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	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	70,000		-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	2:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	<u>Δ f</u>	-5.0	+5.0	10-6	Over 10 years after Burn-in
19	Physical Dimensions					
20	Intended Application		Ţ.	хо		

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	2		Lim	its	11.5	Daniella
No.	Characteristic	Symbol	Min.	Мах	Unit	Remarks
1	Resonance Frequency	f _r	37.93	3333	MHz	-
2	Reference Temperature	To	+20	+ 30	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	α	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-6.0	+6.0	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>Δ f</u> f	-9.0	+9.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-2.0	+2.0	Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+ 80	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	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	-	7.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance	R _p /R or ıZ _p i/R	2:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	∆ f f	-5.0	+5.0	10-6	Over 10 years after Burn-in
19	Physical Dimensions				-	
20	Intended Application		хо			



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		Limits				
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	fL	8.38	8608	MHz	
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	C _L	2	2	pF	
5	Rated Drive Level	Po	0	.2	mW	
6	Frequency Adjustment Tolerance	∆ 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 ⁻⁶	
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	∆ 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	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	Not ap	plicable	pF	
16	Q Factor	Q	Not ap	plicable	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	2:1	-		In the frequency range: f _L -500kHz to f _L +500kHz
18	Ageing	∆ f f	-5.0	+5.0	10-6	After Burn-in and per year / life of 10 years
19	Physical Dimensions			•		
20	Intended Application		×	(0		



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	0		Lim	nits	11.9	D d .
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	fL	4.	.8	MHz	
2	Reference Temperature	To	+23	+ 27	۰C	
3	Overtone Order	-	Funda	mental		
4	Load Capacitance	C _L	25	35	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	RL	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆ f f	-20	+20	10 ⁻⁶	From frequency measured at T ₀ °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	Not applicable		%	
10	Operating Temperature Range	T _{op}	-40	+80	°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	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	C _o	Not ap	plicable	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	3:1	-		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		,	(0		



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No.	Characteristic	Symbol	Lin	nits	l lait	Remarks
140.	Onaracteristic	Symbol	Min.	Max	Unit	Homarks
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		×	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ 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	∆ f f	-8.0	+8.0	10 ⁻⁶	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}	-5.0	+ 70	°C	
11	Frequency Variation with Drive Level	Δ f f	Not ap	plicable	10-6	
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	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.5	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	3:1	-		In the frequency range: f _r -5000KHZ to f _r + 5000KHZ
18	Ageing	Δf/f	-3.0	+3.0	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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NI-	Observatorial.		Lin	nits		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	12	2.2	MHz	AT Cut
2	Reference Temperature	T _o	+ 23	+ 27	°C	
3	Overtone Order	_		5		
4	Load Capacitance	CL	c	xo	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	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-8.0	+8.0	10 ⁻⁶	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}	-5.0	+70	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u>	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-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	-	3.5	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 l/R	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-3.0	+3.0	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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5 1 -	Q 1		Lim	nits		_
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	123.61	11111	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	C _L	٥	o	pF	
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	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-8.0	+8.0	10-6	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}	-5.0	+70	°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	-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	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-3.0	+3.0	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. 44

Limits No. Characteristic Symbol Unit Remarks Min. Max 1 Resonance Frequency AT Cut $f_{\mathbf{r}}$ MHz 125.479167 2 Reference Temperature +23 +27 °C T_{o} 3 Overtone Order _ 5 4 Load Capacitance C_L 00 pF 5 Rated Drive Level mW P_o 0.1 6 Frequency Adjustment At To °C Δf 10-6 -10 +10 Tolerance Resonance Resistance 7 At To °C R_r 45 Ω 8 From frequency measured at T_o °C Frequency Variation $\frac{\Delta \ f}{f}$ -8.0 +8.0 10-6 with Temperature over Top 9 Resistance Variation -10 <u>∆ R</u> +10 % From resistance with Temperature measured at To °C over Top 10 Operating Temperature T_{op} -5.0 +70 °C Range 11 Frequency Variation $\frac{\Delta \ f}{f}$ 10-6 Not applicable with Drive Level 12 Resistance Variation $\frac{\Delta R}{R}$ -10 +10 % From $P_{S1} = 0.5 \text{mW}$ with Drive Level $P_{S2} = 0.25 \text{mW}$ 13 Motional Inductance L_1 Not applicable mΗ 14 Motional Capacitance C_1 fF Not applicable 15 Static Capacitance C_{o} 3.5 pF Q Factor 16 Q 60,000 17 Ratio of Unwanted: In the frequency Response Resistance to range: f_r-5000kHz Resonance Resistance R_p/R 3:1 f, +5000kHz or Response Impedance to $|Z_p|/R$ Resonance Resistance 18 Ageing $\Delta f/f$ -3.0 +3.0 10-6 Storage 3 years, operation 15 years after 1060 hours Burn-in 19 Physical Dimensions Figure 2(a) 20 Intended Application **TCXO**



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		<u> </u>	MAINT NO.			
	Characteristic	Symbol	Lim	nits	Unit	Remarks
	Onaracteristic	Symbol	Min.	Max	Offic	Hemaks
1	Resonance Frequency	f _r	12	5.5	MHz	AT Cut
2	Reference Temperature	T _o	+ 23	+ 27	°C	
3	Overtone Order	-	Ę	5		
4	Load Capacitance	CL	٥	o	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 T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-8.0	+8.0	10 ⁻⁶	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	Тор	-5.0	+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 $P_{S1} = 0.5 \text{mW}$ 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	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δ f/ f	-3.0	+3.0	10 ⁻⁶	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	XO		



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		1	1	T		
No.	Characteristic	Symbol	Lim	nits	Unit	Remarks
	on u rasionolio	J	Min.	Мах	5	
1	Resonance Frequency	f _r	126.04	41667	MHz	AT Cut
2	Reference Temperature	T _o	+ 23	+ 27	°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	-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	+8.0	10 ⁻⁶	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 _{op}	-5.0	+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 $P_{S1} = 0.5 \text{mW}$ 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	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-3.0	+3.0	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figu	re 2(a)		
20	Intended Application		ТС	XO		



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		•				
No.	Characteristic	Symbol	Lim	nits	Unit	Remarks
140.	Onal actoristic	Symbol	Min.	Max	Onit	
1	Resonance Frequency	f _r	126.46	61538	MHz	AT Cut
2	Reference Temperature	T _o	+ 23	+ 27	°C	
3	Overtone Order	-		5		
4	Load Capacitance	C _L	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-10	+ 10	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-8.0	+8.0	10 ⁻⁶	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}	-5.0	+ 70	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	olicable	10 ⁻⁶	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-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	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-3.0	+3.0	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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Na	Characteristic	Cumbal	Lim	nits	Unit	Remarks
No.	Characteristic	Symbol	Min.	Max	Onit	Homarks
1	Resonance Frequency	f _r	126.94	14444	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	°C	
3	Overtone Order	-		5	-	
4	Load Capacitance	C _L	٥	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10-6	At T _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	-8.0	+8.0	10 ⁻⁶	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}	-5.0	+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 $P_{S1} = 0.5 \text{mW}$ 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	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-3.0	+3.0	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	XO		

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	Observa adamiatia	Complete al	Lim	its	Unit	Remarks
No.	Characteristic	Symbol	Min.	Max	Onit	Hemains
1	Resonance Frequency	f _r	120.10	04167	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	C _L	٥	0	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>Δ f</u>	-8.0	+ 8.0	10-6	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 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>∆ 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	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-3.0	+3.0	10 ⁻⁶	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figu	re 2(a)		
20	Intended Application		тс	XO		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 50

			Lim	nits		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	125.4	54545	MHz	AT Cut
2	Reference Temperature	T _o	+23	+27	°C	
3	Overtone Order	-	Ę	5		
4	Load Capacitance	C _L	0	o	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+ 10	10-6	At T _o °C
7	Resonance Resistance	R _r	-	45	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-8.0	+8.0	10-6	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}	-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>∆</u> R 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	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-3.0	+3.0	10-6	Storage 3 years, operation 15 years after 1060 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	xo		



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			Lim	nits			
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks	
1	Resonance Frequency	f _r	128.	.625	MHz	AT Cut	
2	Reference Temperature	To	+23	+ 27	۰c		
3	Overtone Order	-		5			
4	Load Capacitance	C _L	0	0	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	-	45	Ω	At T _o °C	
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-8.0	+ 8.0	10 ⁻⁶	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}	-5.0	+ 70	°C		
11	Frequency Variation with Drive Level	∆ f f	Not ap	plicable	10-6		
12	Resistance Variation with Drive Level	<u>Δ</u> R R	-10	+10	%	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.52 \text{mW}$	
13	Motional Inductance	L ₁	Not ap	plicable	mH		
14	Motional Capacitance	C ₁	Not ap	plicable	fF		
15	Static Capacitance	Co		3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz	
18	Ageing	Δf/f	-3.0	+3.0	10 ⁻⁶	Storage 3 years, operation 15 years after 1060 hours Burn-in	
19	Physical Dimensions		Figur	e 2(a)			
20	Intended Application		тс	XO			



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			Lim	its		B	
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks	
1	Resonance Frequency	f∟	22	.7	MHz	AT Cut	
2	Reference Temperature	T _o	+ 20	+30	°C		
3	Overtone Order	-	Fundar	nental			
4	Load Capacitance	CL	30)	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_L	-	25	Ω	At T _o °C	
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-14	+14	10 ⁻⁶	From frequency measured at T _o °C	
9	Resistance Variation	<u>Δ R</u> R	-20 - 0	+20	%	From resistance	
	with Temperature over Top		-2.0	+ 2.0	Ω	measured at T _o °C	
10	Operating Temperature Range	T _{op}	-40	+ 85	°C		
11	Frequency Variation with Drive Level	∆ f f	-0.5	+ 0.5	10-6	From P _{S1} = 0.5mW to P _{S2} = 0.25mW	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	-20	+ 20	%	From P _{S1} = 0.5mW to P _{S2} = 0.25mW	
13	Motional Inductance	L ₁	2.0	-	mH		
14	Motional Capacitance	C ₁	Not ap	plicable	fF		
15	Static Capacitance	Co	-	5.0	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 !Z _p l/R	3:1	-		In the frequency range: f _L -10% to f _L +10%	
18	Ageing	Δf/f	-5.0	+ 5.0	10-6	Over 10 years after Burn-in	
19	Physical Dimensions		Figur	e 2(a)			
20	Intended Application		ТС	xo			



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	Characteristic		Lim	its		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f∟	16	.0	MHz	AT Cut
2	Reference Temperature	To	+ 25	+ 29	°C	
3	Overtone Order	-	Fundar	nental		
4	Load Capacitance	C _L	30	0	pF	
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	RL	-	100	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u> f	-40	+ 40	10 ⁻⁶	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 ₀ °C
	over T _{op}		-2.0	+2.0	Ω	
10	Operating Temperature Range	T _{op}	-55	+ 100	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not app	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	7.0	pF	
16	Q Factor	Q	60,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	2:1	-		In the frequency range: f _L -200kHz to f _L + 200kHz
18	Ageing	Δf/f	-3.0	+3.0	10-6	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		Х	(O		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 54

			Lim	nits		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	30	.0	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	Fundar	mental		
4	Load Capacitance	CL	۰	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-10	+10	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	40	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	$\frac{\Delta f}{f}$	-50	+50	10 ⁻⁶	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}		-2.0	+2.0	Ω	
10	Operating Temperature Range	T _{op}	-55	+ 125	۰C	
11	Frequency Variation with Drive Level	<u>Δ f</u>	Not ap	olicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not app	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	2:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-1.0	+1.0	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		X	0	<u></u> , <u>w.</u>	



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No.	Characteristic	Symbol	Lim	its	Hait	Pomerko
INO.	Gildiaciensiic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	54.31	1000	MHz	AT Cut
2	Reference Temperature	T _o	+ 23	+27	°C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	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>Δ f</u> f	-40	+ 40	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>∆ R</u> R	-20 - c	+20	%	From resistance
	with Temperature over Top	R	-2.0	+2.0	Ω	measured at T _o °C
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	3.4	5.15	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 Z _p /R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		тс	хо		



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						4
No.	Characteristic	Sumb al	Lim	nits	Unit	Remarks
110.	Gharacteristic	Symbol	Min.	Max	Oill	, contains
1	Resonance Frequency	f _r	62.	38	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C _L	0	o	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-5.0	+5.0	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 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	-20 - c	+ 20 or -	%	From resistance measured at T _o °C
	over T _{op}		-2.0	+2.0	Ω	<u> </u>
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10 ⁻⁶	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	2.6	3.9	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+ 5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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			Lim	nits			
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks	
1	Resonance Frequency	f _r	62	.5	MHz	AT Cut	
2	Reference Temperature	T _o	+23	+ 27	°C		
3	Overtone Order	-	3	3	i		
4	Load Capacitance	C _L	٥	0	рF		
5	Rated Drive Level	Po	0.	.1	mW		
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+ 5.0	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>	-40	+ 40	10 ⁻⁶	From frequency measured at T _o °C	
9	Resistance Variation with Temperature	<u>Δ R</u> R	-20 - 0	+ 20 or -	%	From resistance measured at T _o °C	
	over T _{op}		-2.0	+2.0	Ω		
10	Operating Temperature Range	T _{op}	-55	+ 105	۰C		
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not app	plicable	10 ⁻⁶		
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%		
13	Motional Inductance	L ₁	2.6	3.9	mH		
14	Motional Capacitance	C ₁	Not ap	plicable	fF		
15	Static Capacitance	Co	-	5.0	pF		
16	Q Factor	Q	70,000	-	_		
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r +10%	
18	Ageing	Δf/f	-5.0	+ 5.0	10-6	Over 10 years after Burn-in	
19	Physical Dimensions		Figur	e 2(a)			
20	Intended Application		ТС	хо			



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	0		Lim	nits		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	64.9	997	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	рF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-5.0	+5.0	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>Δ f</u> f	-40	+40	10-6	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}		-2.0	+2.0	Ω	
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
11	Frequency Variation with Drive Level	∆ f f	Not apı	plicable	10-6	
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	2.4	3.6	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p //R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+5.0	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.	Ohamada dari	0.50	Lim	nits	11.9	B. mada
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	3		
4	Load Capacitance	C _L	٥	О	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	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	10-6	From frequency measured at T _o °C
9	Resistance Variation	ΔR R	-20	+20 or -	%	From resistance measured at T ₀ °C
	with Temperature over Top	H	-2.0	+2.0	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	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L ₁	2.3	3.4	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	<u>Δ f</u> f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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	O		Lim	nits			
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks	
1	Resonance Frequency	f _r	67.70	8333	MHz	AT Cut	
2	Reference Temperature	T _o	+23	+ 27	°C		
3	Overtone Order	-	3	3			
4	Load Capacitance	CL	٥	0	pF		
5	Rated Drive Level	Po	0.	.1	mW		
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	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 ⁻⁶	From frequency measured at T _o °C	
9	Resistance Variation	<u>∆ R</u> R	-20	+20	%	From resistance	
	with Temperature over Top	"	-2.0	or - +2.0	Ω	measured at T _o °C	
10	Operating Temperature Range	T _{op}	-55	+105	°C		
11	Frequency Variation with Drive Level	∆ f f	Not app	plicable	10-6		
12	Resistance Variation with Drive Level	<u>∆ R</u> R	Not ap	plicable	%		
13	Motional Inductance	L ₁	2.3	3.4	mH		
14	Motional Capacitance	C ₁	Not ap	plicable	fF		
15	Static Capacitance	Co	-	5.0	pF		
16	Q Factor	Q	70,000	-	-		
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r +10%	
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in	
19	Physical Dimensions		Figur	e 2(a)			
20	Intended Application		тс	хо			



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	Q 1		Lim	its	11. 11	D
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	67.91	6666	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C _L	٥	0	рF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	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>Δ f</u> f	-40	+ 40	10 ⁻⁶	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}		-2.0	+2.0	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	2.3	3.4	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	C _o	-	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 Z _p /R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		тс	хо		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 62

NI.	Chaus stanistic	Overhal	Lim	nits	11.9	
No.	Characteristic	Symbol	Min.	Мах	Unit	Remarks
1	Resonance Frequency	f _r	69.16	6666	MHz	AT Cut
2	Reference Temperature	T _o	+ 23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	o	ρF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-5.0	+5.0	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>Δ f</u>	-40	+ 40	10-6	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}		-2.0	+2.0	Ω	
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
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 app	plicable	%	
13	Motional Inductance	L ₁	2.1	3.2	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+ 5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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N.	Olassa karisti		Lim	nits		
No.	Characteristic	Symbol	Min.	Мах	Unit	Remarks
1	Resonance Frequency	f _r	87.	24	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	۰C	
3	Overtone Order	•	3	3		
4	Load Capacitance	CL		0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-5.0	+5.0	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	10-6	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}		-2.0	+ 2.0	Ω	
10	Operating Temperature Range	T _{op}	-55	+105	°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	1.3	2.0	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after 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. 64

No.	Characteristic	Symbol	Lim	iits	Unit	Remarks
140.	Onaracteristic	Symbol	Min.	Max	Offit	nemarks
1	Resonance Frequency	f _r	87.3	312	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	•c	
3	Overtone Order	-	3	3		
4	Load Capacitance	C _L	0	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-5.0	+5.0	10 ⁻⁶	At 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 ⁻⁶	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}		-2.0	+2.0	Ω	
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
11	Frequency Variation with Drive Level	<u>∆ 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	1.3	2.0	mH	
14	Motional Capacitance	C ₁	Not ap	olicable	fF	
15	Static Capacitance	C _o	-	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 ıZ _p i/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тсхо			



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NI-	Chausatariatia	O. wash al	Lim	iits	11-2	Remarks
No.	Characteristic	Symbol	Min.	Мах	Unit	Tomaks
1	Resonance Frequency	f _r	87.3	375	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C _L	٥	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-5.0	+5.0	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>	-40	+ 40	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u> R	-20	+20 or -	%	From resistance
	with Temperature over Top	l ^R	-2.0	+ 2.0	Ω	measured at T _o °C
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	Not ap	olicable	10 ⁻⁶	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not app	olicable	%	
13	Motional Inductance	L ₁	1.3	2.0	mH	
14	Motional Capacitance	C ₁	Not app	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 ıZ _p i/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+ 5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		тсхо			



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NI.	Oha mata isti		Lim	nits		Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	
1	Resonance Frequency	f _r	87.4	412	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	o	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	Δ f f	-5.0	+5.0	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	10-6	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}		-2.0	+2.0	Ω	
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not ap	plicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	1.3	2.0	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	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	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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•	Q 1		Lim	nits		
No.	Characteristic	Symbol	Min.	Мах	Unit	Remarks
1	Resonance Frequency	f _r	87.	44	MHz	AT Cut
2	Reference Temperature	T _o	+23	+27	°C	
3	Overtone Order	_	3	3		
4	Load Capacitance	C _L	۰	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	Δ f f	-5.0	+5.0	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 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u>	-20 - (-2.0	+20 or - I +2.0	% Ω	From resistance measured at T _o °C
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	ΔR R	Not ap	plicable	%	
13	Motional Inductance	L ₁	1.3	2.0	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+5.0	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.	Characteristic	Symbol	Lim	nits	Unit	Remarks
INU.	Gharacteristic	Зупьы	Min.	Max	Om	Tioma no
1	Resonance Frequency	f _r	87.4	485	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL		0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+ 5.0	10 - 6	At T _o °C
7	Resonance Resistance	R _r	-	50	Ω	At To °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-40	+40	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>∆ R</u> R	-20	+20	%	From resistance
	with Temperature over T _{op}	"	-2.0	or - +2.0	Ω	measured at T _o °C
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	1.3	2.0	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		тс	хо		



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			1			
No.	Characteristic	Symbol	Lim	IITS	Unit	Remarks
,,,,,	ona actoricus	Jyboi	Min.	Max	Onit	
1	Resonance Frequency	f _r	87.48	9750	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C _L	٥	o	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	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>Δ f</u> f	-40	+ 40	10 ⁻⁶	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	+2.0	Ω	illeasuled at 1 ₀ C
10	Operating Temperature Range	T _{op}	-65	+ 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	1.3	2.0	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	3:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δ f /f	-5.0	+ 5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		TC	хо		



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No.	Characteristic	Comphal	Lin	nits	11-9	Remarks
INU.	Characteristic	Symbol	Min.	Мах	Unit	
1	Resonance Frequency	f _r	88.	743	MHz	AT Cut
2	Reference Temperature	To	+23	+27	°C	
3	Overtone Order	-		3		
4	Load Capacitance	C _L	c	x o	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	At T _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 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20 - 0	+20 or - +2.0	%	From resistance measured at T _o °C
10	Operating Temperature	T		 	Ω	
10	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	1.3	2.0	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+5.0	10-6	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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			Lim	its		Demode	
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks	
1	Resonance Frequency	f _r	88	.8	MHz	AT Cut	
2	Reference Temperature	To	+23	+ 27	°C		
3	Overtone Order	-	3				
4	Load Capacitance	CL	α)	pF		
5	Rated Drive Level	Po	0.	1	mW		
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+ 5.0	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 ⁻⁶	From frequency measured at T _o °C	
9	Resistance Variation	<u>Δ R</u> R	-20	+20 or-	%	From resistance measured at T _o °C	
	with Temperature over T _{op}	K	-2.0	+2.0	Ω	illeasured at 1 ₀ O	
10	Operating Temperature Range	Тор	-55	+105	°C		
11	Frequency Variation with Drive Level	$\frac{\Delta f}{f}$	Not applicable		10 ⁻⁶		
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%		
13	Motional Inductance	L ₁	1.3	2.0	mH		
14	Motional Capacitance	C ₁	Not ap	plicable	fF		
15	Static Capacitance	Co	-	5.0	pF		
16	Q Factor	Q	70,000	-	-		
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	3:1	_		In the frequency range: f _r -10% to f _r + 10%	
18	Ageing	Δf/f	-5.0	+ 5.0	10-6	Over 10 years after Burn-in	
19	Physical Dimensions		Figu	re 2(a)			
20	Intended Application		т	CXO		·	



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NI-	Ohamata i ii		Lim	nits		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	88	.86	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	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 ⁻⁶	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}		-2.0	+2.0	Ω	
10	Operating Temperature Range	T _{op}	-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	1.3	2.0	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or ıZ _p i/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Over 10 years after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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			1			T
No.	Characteristic	Symbol	Lim	nits	Unit	Remarks
	one dottonous	- Cymbol	Min.	Мах	O.I.I.	Thomas is
1	Resonance Frequency	f _r	88.9	918	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-5.0	+5.0	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 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	∆R R	-20 - (+20 or - +2.0	% Ω	From resistance measured at T _o °C
10	Operating Temperature Range	T _{op}	-55	+ 105	°C	
11	Frequency Variation with Drive Level	Δ f f	Not app	olicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not app	plicable	%	
13	Motional Inductance	L ₁	1.3	2.0	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	3:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-5.0	+5.0	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	Lim	nits	Unit	Domorko
140.	Characteristic	Symbol	Min.	Мах	Onit	Remarks
1	Resonance Frequency	f _r	44.28	6060	MHz	AT Cut
2	Reference Temperature	To	+20	+30	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C _L	٥	o	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-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>Δ f</u> f	-9.0	+9.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	-20	+20 or-	%	From resistance
	over T _{op}	n n	-2.0	+2.0	Ω	measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+80	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f	-0.5	+ 0.5	10 ⁻⁶	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
12	Resistance Variation with Drive Level	<u>Δ</u> R R	-10	+10	%	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	2.0	-	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 ıZ _p ı/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, operation 15 years after 500 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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			Lim	nits		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	45.0	056	MHz	AT Cut
2	Reference Temperature	T _o	+ 20	+30	۰C	
3	Overtone Order	-	3	3	-	
4	Load Capacitance	C _L	۰	0	рF	
5	Rated Drive Level	P _o	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	-9.0	+9.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>Δ R</u> R	-20 - c	+ 20 or -	%	From resistance
	over T _{op}		-2.0	+ 2.0	Ω	measured at T _o °C
10	Operating Temperature Range	T _{op}	-20	+80	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u> f	-0.5	+0.5	10-6	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
12	Resistance Variation with Drive Level	<u>∆</u> R R	-10	+10	%	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
13	Motional Inductance	L ₁	2.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	_	5.0	pF	
16	Q Factor	Q	70,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/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, operation 15 years after 500 hours Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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			Lim	its		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	35	.5	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C _L	α	o l	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-5.0	+5.0	10 ⁻⁶	At T₀ °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ</u> f	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u> R	-20 - 0	+20	%	From resistance
	with Temperature over T _{op}	K	-2.0	+ 2.0	Ω	measured at T _o °C
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>∆ R</u> R	Not app	olicable	%	
13	Motional Inductance	L ₁	18	24	mH	
14	Motional Capacitance	C ₁	Not app	olicable	fF	
15	Static Capacitance	C _o	-	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 ıZ _p l/R	2:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-1.0	+1.0	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		TC	хо		



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NI.	Characteristic	0	Lim	nits		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	50).5	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	0	×	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	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>	-7.0	+7.0	10 ⁻⁶	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 _o °C
	over T _{op}		-2.0	+2.0	Ω	measured at 1 ₀ O
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>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	6.0	8.0	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	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 ıZ _p i/R	2:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-1.0	+1.0	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)	·	
20	Intended Application		тс	хо		

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. .			Lim	nits		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	58.4	975	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	°C	
3	Overtone Order	-		3		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-5.0	+5.0	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>	-7.0	+ 7.0	10 ⁻⁶	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}		-2.0	+2.0	Ω	
10	Operating Temperature Range	T _{op}	-15	+65	°C	
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	olicable	%	
13	Motional Inductance	L ₁	4.0	5.5	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	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 Z _p /R	2:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-1.0	+1.0	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		- 	хо	4	



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No.	Characteristic	Symbol	Lim	nits	Unit	Remarks
110.	Characteristic	Oymbol	Min.	Max	Onit	nemarks
1	Resonance Frequency	f _r	69.5	3125	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL		o	pF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-5.0	+5.0	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>	-7.0	+7.0	10 ⁻⁶	From frequency measured at T ₀ °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20 -2.0	+20 or - +2.0	% Ω	From resistance measured at T ₀ °C
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	<u>∆ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	2.5	3.7	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	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 ıZ _p i/R	2:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-1.0	+1.0	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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NI.	Observatorialis	O maked	Lim	nits	11-4	Barrela
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	36.6	625	MHz	AT Cut
2	Reference Temperature	To	+23	+27	۰C	
3	Overtone Order	-	3	3		
4	Load Capacitance	C _L	٥	0	рF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆</u>	-5.0	+5.0	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	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature	<u>∆ R</u> R	-20	+20 or -	%	From resistance measured at T ₀ °C
	over T _{op}		-2.0	+ 2.0	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	18	24	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	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	2:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-1.0	+1.0	10-6	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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Nie	Observation in the		Lim	nits		
No.	Characteristic	Symbol	Min.	Мах	Unit	Remarks
1	Resonance Frequency	f _r	55.23	1250	MHz	AT Cut
2	Reference Temperature	To	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	0	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	Δf f	-5.0	+ 5.0	10-6	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆ f f	-7.0	+7.0	10-6	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}		-2.0	+2.0	Ω	
10	Operating Temperature Range	T _{op}	-15	+ 65	°C	
11	Frequency Variation with Drive Level	∆ f f	Not ap	olicable	10 ⁻⁶	
12	Resistance Variation with Drive Level	ΔR R	Not ap	olicable	%	
13	Motional Inductance	L ₁	4.5	6.5	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	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	2:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-1.0	+1.0	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	Symbol	Lim	its	Unit	Remarks
110.	onaracionosio	- Cymbon	Min.	Max	Onic	i iomano
1	Resonance Frequency	f _r	42	.5	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	0	рF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-5.0	+ 5.0	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	-7.0	+ 7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u> R	-20	-20 +20 - or -		From resistance
	with Temperature over Top	n	-2.0	+2.0	Ω	measured at T _o °C
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>∆ R</u> R	Not ap	olicable	%	
13	Motional Inductance	L ₁	9.6	14.4	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	2:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-1.0	+1.0	10 ⁻⁶	Per year after 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. 82

No.	Characteristic	Symbol	Lim	its	Unit	Remarks
NO.	Gharacteristic	Symbol	Min.	Max	Onic	Tomarks
1	Resonance Frequency	f,	49.3	375	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	۰C	
3	Overtone Order	-	3			
4	Load Capacitance	CL	α	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+5.0	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T₀ °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-7.0	+ 7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	<u>Δ R</u> R	-20 - 0	+ 20	%	From resistance measured at T _o °C
	with Temperature over Top	K	-2.0	+2.0	Ω	illeasured at 1 ₀ C
10	Operating Temperature Range	T _{op}	-15	+65	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	Not app	olicable	10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not app	plicable	%	
13	Motional Inductance	L ₁	6.0	8.0	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	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 ıZ _p i/R	2:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-1.0	+1.0	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	XO		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 84

			Lim	ite		
No.	Characteristic	Symbol	Lim	into	Unit	Remarks
			Min.	Max		
1	Resonance Frequency	f _r	68.	75	MHz	AT Cut
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	α	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	$\frac{\Delta f}{f}$	-5.0	+5.0	10-6	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	∆ f f	-7.0	+7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation	ΔR -20 +2 R - or -		+20	%	From resistance
	with Temperature over Top	K	-2.0	+ 2.0	Ω	measured at T _o °C
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	2.5	3.7	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	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	2:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-1.0	+1.0	10 ⁻⁶ .	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	xo		



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No	Characteristic	Symbol	Lim	its	Unit	Remarks
No.	Characteristic	Зупьы	Min.	Max	Oilit	nemarks
1	Resonance Frequency	f _r	70	o	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	•	рF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-5.0	+5.0	10 ⁻⁶	At T _o °C
7	Resonance Resistance	R _r	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	$\frac{\Delta f}{f}$	-7.0	+7.0	10 ⁻⁶	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}		-2.0	+2.0	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	2.5	3.7	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	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 Z _p /R	2:1	-		In the frequency range: f _r -10% to f _r + 10%
18	Ageing	Δf/f	-1.0	+1.0	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	XO		



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No.	Characteristic	Symbol	Lim	nits	Unit	Remarks
140.	Characteristic	Oymbor	Min.	Max	Offic	Tierrarks
1	Resonance Frequency	f _r	55.	45	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	°C	
3	Overtone Order	-	3	3		
4	Load Capacitance	CL	٥	•	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-5.0	+ 5.0	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	-7.0	+ 7.0	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	-20 - 0 -2.0	+20 or - +2.0	% Ω	From resistance measured at T ₀ °C
10	Operating Temperature Range	Тор	-15	+ 65	°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	4.5	6.5	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	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 ıZ _p i/R	2:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-1.0	+1.0	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figur	e 2(a)		
20	Intended Application		тс	хо		



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.	Oha sa ata data	O. was bash	Lim	nits	l lais	Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	nemarks
1	Resonance Frequency	f _r	128.70	7627	MHz	AT Cut
2	Reference Temperature	T _o	+23	+ 27	°C	
3	Overtone Order	_	Ę	5		
4	Load Capacitance	C _L	٥	o	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>∆ f</u> f	-10	+10	10 ⁻⁶	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	<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	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	C _o	-	3.5	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	3:1	-		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		Figure 2(a)			
20	Intended Application		тс	XO		



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NI-	Chavaataviatia	Cumbal	Lim	its	Unit	Remarks
No.	Characteristic	Symbol	Min.	Max	Onn	nemarks
1	Resonance Frequency	f _r	118.70	7627	MHz	AT Cut
2	Reference Temperature	To	+ 23	+ 27	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	CL	٥	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u> f	-10	+10	10 ⁻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>	-9.0	+9.0	10 ⁻⁶	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	-15	+ 75	°C	
11	Frequency Variation with Drive Level	<u>Δ f</u> f	Not app	olicable	10 ⁻⁶	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	_	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-3.0	+3.0	10-6	Storage 5 years, operation 13 years
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		тсхо			



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 89

.	Oh ava ataviatia	Combal	Lim	its	Unit	Remarks
No.	Characteristic	Symbol	Min.	Max	Onit	Homars
1	Resonance Frequency	fL	16	.0	MHz	AT Cut
2	Reference Temperature	T _o	+ 25	+ 29	۰C	
3	Overtone Order	-	Fundar	mental		
4	Load Capacitance	CL	3	0	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 _L	-	30	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>∆ f</u> f	-10	+10	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 - +2.0	% 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 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	-	7.0	pF	
16	Q Factor	Q	50,000	-	-	
17	Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance	R _p /R or IZ _p I/R	2:1	-		In the frequency range: f _L -200kHz to f _L +200kHz
18	Ageing	Δf/f	-3.0	+3.0	10 ⁻⁶	Per year after Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		>	(0		



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	Q 1		Lim	iits	11.9	Barrada
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	123.33	33333	MHz	AT Cut
2	Reference Temperature	T _o	+ 78	+84	۰C	
3	Overtone Order	-	5	5		
4	Load Capacitance	CL	۰	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-7.0	+7.0	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	-0.15	+0.15	10 ⁻⁶	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	$\frac{\Delta f}{f}$	Not applicable		10-6	
12	Resistance Variation with Drive Level	<u>Δ R</u> R	Not ap	plicable	%	
13	Motional Inductance	L ₁	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-1.5	+1.5	10 ⁻⁶	Storage 5 years, operation 13 years after Ageing in an oscillator
19	Physical Dimensions		Figur	re 2(a)		
20	Intended Application		00	CXO		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 91

			Lim	its		Barrela
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	126.	126.625		AT Cut
2	Reference Temperature	T _o	+78	+84	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	CL	•	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>Δ f</u>	-7.0	+ 7.0	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	-0.15	+0.15	10 ⁻⁶	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	T _{op}	+76	+86	°C	
11	Frequency Variation with Drive Level	<u>∆</u>	Not ap	Not applicable		
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			fF	
15	Static Capacitance	Co	-	3.5	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	3:1	-		In the frequency range: f _r -5000khz to f _r + 5000khz
18	Ageing	Δf/f	-1.5	+1.5	10 ⁻⁶	Storage 5 years, operation 1 years after Ageing in an oscillator
19	Physical Dimensions		Figu	re 2(a)		
20	Intended Application		00	cxo		



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N	Ohayaakayistia	Chal	Lim	its	Unit	Remarks
No.	Characteristic	Symbol	Min.	Max	Offic	Hemarks
1	Resonance Frequency	f _r	127.08	33333	MHz	AT Cut
2	Reference Temperature	T _o	+78	+84	°C	
3	Overtone Order	-	Ę	5		
4	Load Capacitance	CL	, a	0	рF	
5	Rated Drive Level	Po	0	.1	mW	
6	Frequency Adjustment Tolerance	Δf f	-7.0	+7.0	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	-0.15	+0.15	10 ⁻⁶	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 _{op}	+76	+86	°C	
11	Frequency Variation with Drive Level	<u>∆ f</u>	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	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Storage 5 years, operation 13 years after 500 hours Burn-in
19	Physical Dimensions		Figu	re 2(a)		
20	Intended Application		0	схо		



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			Lim	nits		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	127.27	72727	MHz	AT Cut
2	Reference Temperature	To	+78	+84	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	C _L	٥	0	рF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	∆ f f	-7.0	+7.0	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>	-0.15	+0.15	10-6	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	T _{op}	+ 76	+86	°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	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.5	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	3:1	_		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-5.0	+5.0	10 ⁻⁶	Storage 5 years, operation 13 years after 750 hours Burn-in
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		00	CXO		



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nite		·
Limits		Remarks
Max	Offit	nemarks
77778	MHz	AT Cut
+84	°C	
5		
∞	pF	
).1	mW	
+7.0	10-6	At T _o °C
45	Ω	At To °C
+0.15	10-6	From frequency measured at T _o °C
+10	%	From resistance measured at T _o °C
+86	۰c	
pplicable	10-6	
plicable	%	
plicable	mH	
plicable	fF	
3.5	рF	
-	_	
-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
+5.0	10 ⁻⁶	Storage 5 years, operation 13 years after 750 hours Burn-in
ıre 2(a)		
схо		
	777778 +84 5 0.1 +7.0 45 +0.15 +10 +86 pplicable pplicable pplicable pplicable pplicable - - -	Head C S F O.1 mW Head T T T T T T T T T



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		O was ball	Lim	its	Unit	Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	nemarks
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	۰	0	pF	
5	Rated Drive Level	P _o	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-7.0	+7.0	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	+0.15	10-6	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	<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	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	C _o	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r +5000kHz
18	Ageing	Δf/f	-1.5	+1.5	10 ⁻⁶	Storage 5 years, operation 13 years after Ageing in an oscillator
19	Physical Dimensions		Figu	re 2(a)		
20	Intended Application		00	СХО		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

TYPE VARIANT NO. 96

			Lim	its	11-2	Remarks
No.	Characteristic	Symbol	Min.	Max	Unit	Hemarks
1	Resonance Frequency	f _r	120.83	33333	MHz	AT Cut
2	Reference Temperature	T _o	+78	+84	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	C _L	α	0	pF	
5	Rated Drive Level	Po	0.	1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u> f	-7.0	+7.0	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	-0.15	+0.15	10 ⁻⁶	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	<u>Δ f</u> f	Not applicable		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	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-3.0	+3.0	10-6	Storage 5 years, operation 13 years afte Ageing in an oscillator
19	Physical Dimensions		Figu	re 2(a)		
20	Intended Application		00	осхо		



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			Lim	iits		
No.	Characteristic	Symbol	Min.	Max	Unit	Remarks
1	Resonance Frequency	f _r	121.21	12121	MHz	AT Cut
2	Reference Temperature	To	+78	+84	°C	
3	Overtone Order	-	5	5		
4	Load Capacitance	CL	۰	0	pF	
5	Rated Drive Level	Po	0.	.1	mW	
6	Frequency Adjustment Tolerance	<u>∆ f</u>	-7.0	+ 7.0	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	-0.15	+0.15	10-6	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>∆ 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	Not ap	plicable	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	3.5	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	3:1	-		In the frequency range: f _r -5000kHz to f _r + 5000kHz
18	Ageing	Δf/f	-1.5	+1.5	10-6	Storage 5 years, operation 13 years after Ageing in an oscillator
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		00	cxo		



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION TYPE VARIANT NO. 98

Limits No. Characteristic Symbol Unit Remarks Min. Max AT Cut MHz Resonance Frequency f_r 1 128.571429 °C 2 Reference Temperature T_{o} +78 +84 3 Overtone Order 5 C_{L} 4 **Load Capacitance** 00 pF Rated Drive Level mW 5 P_{o} 0.1 At T_o °C 6 Frequency Adjustment +7.0 10-6 Δf -7.0 Tolerance 7 Resonance Resistance 45 At To °C R_r Ω -10⁻⁶ From frequency measured at T_o °C $\frac{\Delta f}{f}$ 8 Frequency Variation -0.15+0.15with Temperature over T_{op} Resistance Variation 9 -10 +10 % From resistance with Temperature measured at To °C over Top T_{op} °C 10 Operating Temperature +76 +86 Range 11 Frequency Variation 10-6 Not applicable with Drive Level <u>∆ R</u> R 12 Resistance Variation Not applicable with Drive Level 13 Motional Inductance L_1 mH Not applicable 14 **Motional Capacitance** C_1 fF Not applicable 15 Static Capacitance C_{o} 3.5 pF 16 Q Factor Q 60.000 17 Ratio of Unwanted: In the frequency range: f_r-5000kHz Response Resistance to Resonance Resistance 3:1 R_p/R to f_r + 5000kHz Response Impedance to $|Z_p|/R$ Resonance Resistance Storage 5 years, operation 13 years after 18 $\Delta f/f$ -5.0 +5.0 10-6 Ageing 750 hours Burn-in 19 **Physical Dimensions** Figure 2(a) 20 Intended Application ocxo



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		Combal	Lim	its	Unit	Remarks
No.	Characteristic	Symbol	Min.	Max	Omt	Homans
1	Resonance Frequency	f _r	50.0		MHz	AT Cut
2	Reference Temperature	T _o	+70	+80	°C	
3	Overtone Order	-	5			
4	Load Capacitance	CL	α)	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	-	80	Ω	At T _o °C
8	Frequency Variation with Temperature over Top	<u>Δ f</u>	Not app	olicable	10 ⁻⁶	From frequency measured at T _o °C
9	Resistance Variation with Temperature over Top	<u>Δ R</u> R	Not applicable		% 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>	-0.5	+0.5	10-6	From $P_{S1} = 0.5 \text{mW}$ to $P_{S2} = 0.25 \text{mW}$
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	6.0	-	mH	
14	Motional Capacitance	C ₁	Not ap	plicable	fF	
15	Static Capacitance	Co	-	5.0	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	2:1	-		In the frequency range: f _r -10% to f _r +10%
18	Ageing	Δf/f	-3.0	+3.0	10-6	Storage 5 years, operation 15 years
19	Physical Dimensions		Figure 2(a)			
20	Intended Application		т	cxo		



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APPENDIX 'A'

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AGREED DEVIATIONS FOR RAKON (F)

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