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CRYSTAL UNITS IN METAL HOLDER, BASED ON TYPE T1507, FREQUENCY RANGE 2.5 - 50MHZ

ESCC Detail Specification No. 3501/009

(Follow-up Specification to ESA/SCC Detail Specification No. 3501/002)

ISSUE 3 July 2008





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DOCUMENTATION CHANGE NOTICE

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

| DCR No. | CHANGE DESCRIPTION |
|---------|---|
| 398 | Specification upissued to incorporate technical and editorial changes per DCRs. |
| | |



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1. GENERAL

1.1 SCOPE

This specification details the values, physical and electrical characteristics, test and inspection data for Crystal Units in Metal Holder, based on Type T1507, Frequency Range 2.5 - 50MHz.

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

This is a follow-up specification to ESCC Detail Specification No. 3501/002. ESCC 3501/002 should also be consulted by:-

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

1.2 COMPONENT TYPE VARIANTS

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

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

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

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

1.3 MAXIMUM RATINGS

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

1.4 PHYSICAL DIMENSIONS

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

1.5 FUNCTIONAL DIAGRAM

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



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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) | Intended Application | Lead Finish |
|---------|---------------------------------|--|---|--|-------------------------|----------------|
| 01 | 4.194304 | 30 | + 30 | -10 to +80 - | | 2 |
| 02 | 8.192 | 50 | + 25 | -25 to +80 | - | 3 or 4 |
| 03 | 26.0 | ∞ | + 25 | -25 to +80 | - | 2 |
| 04 | 7.198 | 30 | + 25 | -55 to +105 | - | 2 |
| 05 | 5.0 | 30 | + 25 | -40 to +80 | - | 2 |
| 06 | 18.0 | 30 | + 25 | -45 to +80 | - | 2 |
| 07 | 10.0 | 30 | + 25 | -55 to +125 | - | 2 |
| 08 | 10.0 | 30 | + 25 | -55 to +100 | ХО | 2 |
| 09 | 50.0 | 12 | + 25 | -20 to +80 | VCXO | 2 |
| 10 | 4.0 | 30 | + 25 | -40 to +80 | XO | 2 |
| 11 | 10.0 | 30 | + 25 | -55 to +100 | XO | 2 |
| 12 | 8.0 | ∞ | + 25 | -20 to +80 | XO | 2 |
| 13 | 10.0 | ∞ | + 25 | -20 to +80 | TCXO | 2 |
| 14 | 6.4 | 30 | + 25 | -45 to +80 | XO | 4 |
| 15 | 12.605 | ∞ | + 25 | -20 to +60 | TCXO | 2 |
| 16 | 7.0 | 30 | + 25 | -35 to +70 | TCXO | 2 |
| 17 | 12.665 | ∞ | + 25 | -20 to +80 | TCXO | 2 |
| 18 | 5.760 | 30 | + 25 | -40 to +90 | XO | 2 |
| 19 | 8.602893 | 30 | + 60 | -40 to +85 | XO | 2 |
| 20 | 15.104893 | ∞ | + 25 | -20 to +80 | XO | 2 |
| 21 | 20.0 | 30 | + 25 | -30 to +70 | XO | 2 |
| 22 | 13.0 | 30 | + 25 | -40 to +80 | XO | 2 |
| 23 | 10.0 | 30 | + 25 | -55 to +100 | XO | 2 |
| 24 | 5.242880 | 30 | +60 | -40 to +85 | XO | 2 |
| 25 | 5.625 | 30 | + 25 | -40 to +85 | XO | 2 |
| 26 | 11.250 | 30 | + 25 | -50 to +100 | XO | 2 |
| 27 | 8.0 | | + 25 | -30 to +70 | XO | 2 |
| 28 | 3.494400 | 35 | + 25 | -55 to +100 | XO | 2 |
| 29 | 3.832 | 30 | + 25 | -40 to +80 | XO | 2 |
| 30 | 3.072 | 30 | + 25 | -40 to +80 | XO | 2 |
| 31 | 4.0 | 30 | + 25 | -40 to +80 | ХО | 2 |
| 32 | 16.0 | 30 | + 25 | -55 to +125 | ХО | 2 |
| 33 | 11.059200 | 30 | + 25 | -55 to +100 | XO | 2 |
| 34 | 12.007125 | 30 | + 25 | -40 to +90 | TCXO | 2 |
| 35 | 11.059300 | 50 | + 25 | -55 to +100 | ХО | 2 |
| 36 | | | | | | |

NOTES: See Page 8.



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TABLE 1(a) - TYPE VARIANT SUMMARY CONTINUED

| | | r | | T | | |
|---------|---------------------------------|--|---|--|-------------------------|----------------|
| Variant | Resonance Frequency (MHz) | Load Capacitance (C _L pF) | Reference Temp. (T _o °C) | Operating Temp. Range (T _{op} °C) | Intended Application | Lead Finish |
| 37 | | | | | | |
| 38 | | | | | | |
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| 72 | | | | | | |



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TABLE 1(a) - TYPE VARIANT SUMMARY CONTINUED

| Variant | Resonance Frequency (MHz) | Load Capacitance (C _L pF) | Reference Temp. (T ₀ °C) | Operating Temp. Range (T _{op} °C) | Intended Applicat. | Lead Finish |
|---------|---------------------------------|--|---|--|-----------------------|----------------|
| 73 | | | | | | |
| 74 | | | | | | |
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| 99 | | | | | | |

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 | 2.5 to 20 | MHz | Note 1 |
| 2 | Drive Level Range | Р | 0.01 to 0.2 | mW | |
| 3 | Operating Temperature Range | Тор | - | °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) |
|-----------------------------------|-------------------------------------|
| Fundamental | 2.5 to 20 |
| 3 | 10 to 30 |
| 5 | 15 to 50 |

- 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.

| | | | Lir | nits | | |
|-----|--|--|------|------|------------------|---|
| No. | Characteristic | Symbol | Min. | Max | Unit | Remarks |
| 1 | Resonance Frequency | f _r or f _L | | | MHz | Note 1 |
| 2 | Reference Temperature | To | | | °C | Note 2 |
| 3 | Overtone Order | - | | | | |
| 4 | Load Capacitance | CL | | | pF | Note 3 |
| 5 | Rated Drive Level | Po | | | mW | Note 4 |
| 6 | Frequency Adjustment Tolerance | <u>Δ f</u> f | | | 10 ⁻⁶ | At T _o °C Note 5 |
| 7 | Resonance Resistance | R _r or R _L | | | Ω | At T _o °C Note 6 |
| 8 | Frequency Variation with Temperature over Top | <u>Δ f</u> f | | | 10 ⁻⁹ | From frequency measured at T _o °C Note 7 |
| 9 | Resistance Variation with Temperature over Top | <u>Δ R</u> R | | | % | From resistance measured at T _o °C Note 7 |
| 10 | Operating Temperature Range | T _{op} | | | °C | |
| 11 | Frequency variation with Drive Level | <u>∆ f</u> f | | | 10 ⁻⁶ | $ \begin{array}{cccc} From & P_{S1} = & mW \\ & to & & \\ & P_{S2} = & mW \\ & Note 8 & & \end{array} $ |
| 12 | Resistance variation with Drive Level | ∆R R | | | % | $ \begin{array}{cccc} From & P_{S1} = & mW \\ & to & \\ & P_{S2} = & mW \\ & Note 8 \end{array} $ |
| 13 | Motional Inductance | L ₁ | | | mH | Notes 9 and 10 |
| 14 | Motional Capacitance | C ₁ | | | fF | Note 9 |
| 15 | Static Capacitance | Co | | | pF | Note 9 |
| 16 | Q Factor | Q | | | - | Notes 9 and 11 |
| 17 | Ratio of unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance | R _p /R or ıZ _p //R | | | | In the frequency range: f - kHz to f + kHz |
| 18 | Ageing | <u>Δ f</u> f | | | 10-6 | Note 13 |
| 19 | Lead Finish | - | | | - | |
| 20 | Intended Application | | | | | Note 15 |

NOTES: See Pages 11 and 12.



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NOTES TO TABLE 1(c)

- (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.

Reference Temperature T_o

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



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NOTES TO TABLE 1(c) (Continued)

7. Frequency and Resistance Variation with Temperature

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

8. Frequency and Resistance Variation with Drive Level

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

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. Not applicable Items

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

15. Intended Application

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



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FIGURE 1 - PARAMETER DERATING INFORMATION

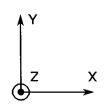
Not applicable.

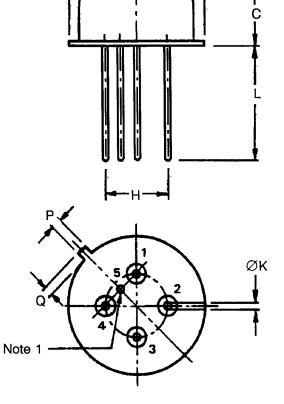
FIGURE 2 - PHYSICAL DIMENSIONS

| SYMBOL | MILLIM | ETRES | REMARKS |
|----------|--------|-------|--------------|
| STIVIBUL | MIN. | MAX. | HEIMARNS |
| ⊘A | _ | 15.75 | |
| С | - | 6.80 | |
| Н | 6.90 | 7.40 | Pitch 7.16mm |
| ⊘K | 0.40 | 0.48 | |
| L | 12.70 | - | |
| Р | _ | 0.90 | Note 2 |
| Q | _ | 0.95 | Note 2 |



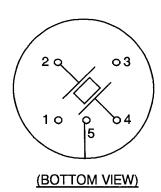
- 1. Lead No. 5 is grounded to case.
- 2. The tag's position or presence is optional.





ØA:

FIGURE 3 - FUNCTIONAL DIAGRAM





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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 Load Resonance Resistance Rated Drive Level $= C_0$ Static Capacitance = C_L Load Capacitance $= C_1$ Motional Capacitance $= L_1$ Motional Inductance $= R_P$ Response Resistance $= |Z_P|$ Response Impedance = Ri Insulation Resistance

4. REQUIREMENTS

4.1 GENERAL

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

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

4.2 DEVIATIONS FROM GENERIC SPECIFICATION

4.2.1 Deviations from Special In-process Controls

None.

4.2.2 Deviations from Final Production Tests (Chart II)

None.

4.2.3 Deviations from Burn-in Tests (Chart III)

None.

4.2.4 Deviations from Qualification Tests (Chart IV)

None.

4.2.5 Deviations from Lot Acceptance Tests (Chart V)

None.



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4.3 MECHANICAL REQUIREMENTS

4.3.1 Dimension Check

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

4.3.2 Weight

The maximum weight of the crystal units specified herein shall be 3.0 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 or nickel and gold plated.

4.4.2 Lead Material and Finish

The lead material shall be Type 'D' with either Type '2' or Type '3 or 4' finish in accordance with the requirements of ESCC Basic Specification No. 23500. (See Tables 1(a) for Type Variants).

4.5 MARKING

4.5.1 General

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

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

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

4.5.2 The ESCC Component Number

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

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



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4.5.3 Characteristics

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

4.5.4 Traceability Information

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

4.5.5 Manufacturer's Name, Symbol or Code

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

4.6 ELECTRICAL MEASUREMENTS

4.6.1 Electrical Measurements at Reference Temperature

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

4.6.2 Electrical Measurements at High and Low Temperatures

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

4.6.3 Circuits for Electrical Measurements (Figure 4)

Not applicable.

4.7 BURN-IN TESTS

4.7.1 Parameter Drift Values

The parameter drift values applicable to burn-in are specified in Table 4 of this specification. Unless otherwise stated, measurements shall be performed at $T_{amb} = T_o \pm 2$ °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

| | 1 | · · · · · · · · · · · · · · · · · · · | | | |
|-----|---|--|--------------------------|-----------------------------------|------------------|
| 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 | $\frac{\Delta f}{f}$ (ΔT , P_0) | Para. 9.2.1.2 | Table 1(a) Item 8 | 10 ⁻⁶ |
| 10 | Resistance variation with Temperature over Top | $\frac{\Delta R}{R} (\Delta T, P_0)$ | 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 | <u>Δ f</u> | As per Table 2 | As per Table 2 | ± 2.0 | 10-6 |
| 2 | Resonance resistance drift | <u>Δ R</u> R | As per Table 2 | As per Table 2 | ± 10 or (1) ± 1.0 | % 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 A | ND INSPECTIONS | | LIM | IITS | |
|-----|--|-------------------------------|---|---|--|----------|---|----------------------------|
| NO. | ENVIRONMENTAL AND ENDURANCE TESTS (1) | TEST METHOD AND CONDITIONS | IDENTIFICATION | CONDITIONS | SYMBOL | Min. | Max. | UNIT |
| 01 | Electrical Measurements at Reference Temperature | Para. 9.2.4 | Electrical Table 2 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 | - | - | - | _ |
| 07 | Solderability | Para. 9.13 | - | - | - | <u> </u> | | - |

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.)

| ENVIRONMENTAL AND ENDURANCE TESTS (1) AND CONDITIONS CONDITIONS Min. Max. Min. Max. | | ESCC GENERIC SP | EC. NO. 3501 | MEASUREMENTS AN | ND INSPECTIONS | | LIM | IITS | |
|---|----------|------------------|--------------|-----------------------|-------------------|------------|-----------|--------------|------|
| Para 9.14.1 | NO. | | | | CONDITIONS | SYMBOL | Min. | Max. | UNIT |
| Resonance Frequency Resonance Resistance Final Measurements Resonance Resistance Para. 9:14.3 Resonance Resistance Para. 9:14.4 Resonance Resistance Para. 9:14.4 Resonance Resistance Para. 9:14.4 Resonance Resistance Para. 9:14.5 Resonance Resistance Para. 9:14.4 Resonance Resistance Para. 9:14.4 Resonance Resistance Para. 9:14.4 Resonance Resistance Para. 9:14.5 Resonance Resistance Para. 9:14.5 Resonance Resistance Para. 9:14.5 Resonance Resistance Para. 9:14.5 Resonance Resistance Para. 9:14.6 Resonance Resistance Para. 9:15 Resonance Resistance Para. 9:16.1 Res | | | Para. 9.14 | | - | | | | |
| Resonance Resistance Final Measurements Resonance Frequency Drift Resonance Frequency Drift Resonance Frequency Drift Resonance Resistance Drift Table 2 Item 1 Table 2 Item 2 Table 2 Item 1 Table 2 Item 2 Table 2 Item 1 Table 2 Item 2 Table 2 Item 1 Table 2 Item 2 Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 Table 2 Item 1 Table 2 I | 08 | Dry Heat | Para. 9.14.1 | | | | 1 | | |
| Para | | | | | | | | | |
| Resonance Frequency Drift Table 2 Item 1 Δf T -2.0 +2.0 10-6 | | | | | Table 2 Item 2 | R | Table a | 2 Item 2 | |
| Drift Resonance Resistance Table 2 Item 2 ΔR -10 +10 Ω Ω Ω Ω Ω Ω Ω Ω Ω | | | | | Table Oliver 4 | | | | 106 |
| Resonance Resistance Table 2 Item 2 ΔR R C C C C C C C C | | | | | Table 2 Item 1 | | - 2.0 | +2.0 | 10.0 |
| Drift Resonance Resistance Para. 9.14.3 Para. 9.14.4 Remaining Cycles Para. 9.14.5 Para. 9.14.4 Para. 9.14.4 Remaining Cycles Para. 9.14.5 Para. 9.14.5 Para. 9.14.6 Para. 9.15 Para. 9.15 Para. 9.15 Para. 9.16 Para. | | | | | Table 2 Item 2 | | -10 | +10 | % |
| Para. 9.14.3 Initial Measurements Resonance Frequency Resonance Frequency Resonance Frequency Para. 9.14.1.3 Final Measurements Final Measurements Resonance Resistance Para. 9.14.4 Remaining Cycles Para. 9.14.4 Initial Measurements Resonance Frequency Drift Para. 9.14.4 Initial Measurements Resonance Frequency Remaining Cycles Para. 9.14.4 Initial Measurements Resonance Frequency Resonance Frequency Resonance Frequency Resonance Frequency Para. 9.14.4 Initial Measurements Resonance Frequency Resonance Frequency Resonance Frequency Para. 9.15 Initial Measurements Table 2 Item 1 Table 2 Item 2 Resonance Frequency Table 2 Item 1 Table 2 Ite | 1 | | | | Table 2 Holli 2 | | | . 10 | ^ |
| Para. 9.14.3 Initial Measurements Resonance Frequency Resonance Frequency Resonance Frequency Para. 9.14.1 Resonance Resistance Final Measurements Resonance Frequency Drift Resonance Resistance Drift Resonance Frequency Resonance Frequency Drift Resonance Frequency Resonance Resistance Drift Resonance Resistance Remaining Cycles Para. 9.14.4 Initial Measurements Resonance Resistance Drift Resonance Resistance Drift Resonance Resistance Resonance Resistance Resonance Resistance Resonance Resistance Resonance Resistance Drift Resonance Resistance Resonance Resistance Resonance Resistance Resonance Resistance Resonance Resistance Drift Drift Resonance Resistance Drift Drif | İ | | | | | | | +1.0 | Ω |
| Resonance Resistance Final Measurements Resonance Frequency Drift | 09 | Cold | Para. 9.14.3 | Initial Measurements | | | | | 1 |
| 10 Damp Heat (Acclerated) Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Resonance Resistance Drift Resonance Frequency Drift Resonance Frequency Drift Resonance Frequency Drift Table 2 Item 2 ΔR -1.0 +1.0 Ω Ω | | | | Resonance Frequency | | | | | |
| Resonance Frequency Drift Table 2 Item 1 Δf f -2.0 +2.0 10.6 10.6 New Para. 9.14.4 Initial Measurements Resonance Frequency Resonance Frequency Resonance Frequency Porit Table 2 Item 2 ΔR -1.0 +1.0 Ω Ω Ω Ω Ω Ω Ω Ω Ω | | | | | Table 2 Item 2 | R | Final Mea | asurements | |
| Drift Resonance Resistance Drift Resonance Resistance Drift Damp Heat (Acclerated) Para. 9.14.4 Initial Measurements Resonance Frequency Remaining Cycles Para. 9.14.4 Initial Measurements Resonance Frequency Resonance Resistance Final Measurements Resonance Resistance Drift Drift Drift Resonance Resistance Drift | | | | | Table Olivers | ١., | | | |
| 10 Damp Heat (Acclerated) Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.16.1 Para. 9.16.1 Para. 9.16.1 Para. 9.16.1 Para. 9.16.1 Para. 9.16.1 Para. 9.16.2 Resonance Resistance Drift Para. 9.16.2 Resonance Prequency Table 2 Resonance Prequency | | | | | Table 2 Item 1 | | -2.0 | + 2.0 | 10-0 |
| Drift Para | | | | | Table 2 Item 2 | | 10 | +10 | 0/4 |
| Damp Heat (Acclerated) Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.14.4 Para. 9.15 Para. 9.16 Para. 9.16.2 Para. 9 | | | | | Table 2 Rolli 2 | | | ' '0 | " |
| Remaining Cycles | | | | | | | 1 | +1.0 | Ω |
| Resonance Resistance Final Measurements Resonance Frequency Drift Resonance Resistance Drift Table 2 Item 2 ΔR -10 +10 % Or (2) ΔR -1.0 +1.0 Ω Resonance Resistance Table 2 Item 2 ΔR Resonance Resistance Table 2 Item 2 ΔR Resonance Resistance Table 2 Item 3 Resonance Resistance Table 2 Item 4 Table 2 Item 5 Resonance Resistance Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 Resonance Resistance Resonance Resistance Table 2 Item 1 Table 2 Item 2 Resonance Resistance Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 2 AR Recovery of 2 hours Table 2 Item 1 Table 2 Item 2 AR Or (2) ΔR Or (2) Or | 10 | | Para. 9.14.4 | Initial Measurements | | | | | |
| Para. 9.15 Initial Measurements Resonance Frequency Drift Table 2 tem 1 Δf f f f f f f f f | 1 | Remaining Cycles | | | | | | | |
| Resonance Frequency Drift Table 2 Item 1 Δf f f Table 2 Item 2 ΔR -1.0 +1.0 Ω Ω Ω Ω Ω Ω Ω Ω Ω | 1 | | | | Table 2 Item 2 | R | Final Mea | surements | |
| Drift Resonance Resistance Table 2 Item 2 ΔR R 0 or (2) ΔR -1.0 +1.0 Ω Ω Ω Ω Ω Ω Ω Ω Ω | | | | | T-61- 0 H 4 | ١., | | | ا ا |
| Resonance Resistance Drift | | | | | l able 2 item 1 | | - 2.0 | +2.0 | 10-0 |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | 1 | Table 2 Item 2 | 1 ' | - 10 | +10 | % |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | Table 2 None | | _ | ' ' | ^ |
| Para. 9.15 Initial Measurements Resonance Frequency Resonance Resistance Final Measurements Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 Hours Table 2 Item 1 Table 2 Item 1 After minimum Recovery of 2 Hours Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 Hours Table 2 Item 2 After minimum Recovery of 2 Hours Table 2 Item 2 After minimum Recovery of 2 Hours Table 2 Item 2 After minimum Recovery of 2 Hours Table 2 Item 2 After minimum Table 2 Item 1 Table 2 Item 2 After minimum Table 2 Item 2 After minimum Recovery of 2 Hours Table 2 Item 1 Table 2 Item 2 After minimum Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 Hours Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 After minimum Table 2 Item 1 Table 2 Item 2 Table 2 Item 1 Table 2 Item 2 Table 2 Item 2 Table 2 Item 2 Table 2 Item 1 Table | | | | | | I | | +1.0 | Ω |
| Temperature Resonance Frequency Resonance Resistance Final Measurements Resonance Frequency Resonance Resistance Final Measurements Resonance Frequency Drift Resonance Frequency Drift Resonance Resistance Drift Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 Aft Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 Aft Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 2 After minimum Recovery Of 2 hours Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 1 Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 2 After minimum Proposed Table 2 Ite | | | | Insulation Resistance | Table 2 Item 8 | Ri | 500 | - | MΩ |
| Temperature Resonance Frequency Resonance Resistance Final Measurements Resonance Frequency Resonance Resistance Final Measurements Resonance Frequency Drift Resonance Frequency Drift Resonance Resistance Drift Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 Aft Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 Aft Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 2 After minimum Recovery Of 2 hours Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 1 Table 2 Item 1 Table 2 Item 1 Table 2 Item 2 After minimum Recovery of 2 hours Table 2 Item 1 Table 2 Item 2 After minimum Proposed Table 2 Ite | 11 | Rapid Change of | Para 0 15 | Initial Magaziromente | | İ | | | |
| Resonance Resistance Final Measurements Resonance Frequency Drift Resonance Resistance Drift Resonance Resistance Drift Resonance Resistance Drift Resonance Resistance Drift Resonance Resistance Drift Resonance Resistance Drift Resonance Resistance Drift Resonance Resistance Drift Resonance Resistance Drift Resonance Resistance Drift Resonance Resistance Table 2 Item 2 Δ f f R Or (2) ΔR -1.0 +1.0 % Or (2) ΔR -1.0 +1.0 Ω 12 Robustness of Terminations Para. 9.16 Visual Examination Bending Resonance Resistance Table 2 Item 1 A f R Or (2) Para. 9.16.1 No visible damage Gen. 3501 Para. 9.16.2 | '' | | 1 414. 3.13 | 1 | | l f | Para | 14 4 2 | |
| Final Measurements After minimum Recovery of 2 hours Table 2 Item 1 Δ f f f | | | | | | | | _ | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 1 | | | | | | | | 1 1 |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 1 | | | | | \$ | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | , , , | Table 2 Item 1 | Δf | - 2.0 | + 2.0 | 10-6 |
| Drift R ΔR or (2) -1.0 +1.0 Ω R AR Or (2) -1.0 +1.0 Ω | | | | | Table 6 " 5 | l f | | | _ |
| Terminations Para. 9.16 Para. 9.16 Para. 9.16 Tensile Strength Visual Examination Bending AR -1.0 +1.0 Ω Gen. 3501 Para. 9.16.1 No visible damage Gen. 3501 Para. 9.16.2 | | | | | Table 2 Item 2 | | I . | +10 | % |
| 12 Robustness of Terminations Para. 9.16 Para. 9.16 Tensile Strength Visual Examination Bending Gen. 3501 Para. 9.16.1 No visible damage Gen. 3501 Para. 9.16.2 | | | | Dist. | | I . | | +1.0 | |
| Terminations Visual Examination Bending Para. 9.16.1 No visible damage Gen. 3501 Para. 9.16.2 | <u> </u> | 5.1 | | | | | | | |
| Visual Examination No visible damage Bending Gen. 3501 Para. 9.16.2 | 12 | | Para. 9.16 | 1 ensile Strength | | | | | |
| Bending Gen. 3501 Para. 9.16.2 | | reminations | | Visual Examination | | | | | |
| Para. 9.16.2 | | | | | | | | | |
| | | | | - Stroning | 1 | 1 | | | |
| I I I I I I I I I I I I I I I I I I I | | | | Visual Examination | No visible damage | ł | | | |

NOTES

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



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

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

| | TIPE VARIANT NO. 01 | | | | | | | | | |
|-----|--|----------------------|-------------|-------------------|------------------|---|--|--|--|--|
| No. | Characteristics | Symbol | Lim Min. | iits Max. | Unit | Remarks | | | | |
| 1 | Resonance Frequency | fL | 4.194 | 1304 | MHz | | | | | |
| 2 | Reference Temperature | To | + 28 | + 32 | °C | | | | | |
| 3 | Overtone Order | - | Fundar | nental | - | | | | | |
| 4 | Load Capacitance | CL | _ | 30 | 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_L | - | 10 | Ω | Over T _{op} °C | | | | |
| 8 | Frequency Variation with Temperature over Top | Δf f | -10 | + 10 | 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 | If R ≤ 10Ω | | | | |
| 10 | Operating Temperature Range | T _{op} | -10 | +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 | 0 | 4.0 | pF | | | | | |
| 16 | Q Factor | Q | 200 000 | - | - | | | | | |
| 17 | Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance | Rp/R or IZpI/R | 2:1 | - | | In the frequency range: f _L -200kHz to f _L +200kHz | | | | |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -10 | + 10 | 10-6 | 5 years after Burn-in | | | | |
| 19 | Lead Finish | | Type 2 | | | | | | | |
| 20 | Intended Application | | Not ap | plicable | | | | | | |
| | | | | | | | | | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | nits Max. | Unit | Remarks |
|-----|--|--|----------------|--------------|------------------|--|
| 1 | Resonance Frequency | f∟ | 8.1 | 92 | MHz | |
| 2 | Reference Temperature | To | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Funda | mental | - | |
| 4 | Load Capacitance | CL | 5 | 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_{L} | - | 13 | Ω | At To °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 | Тор | -25 | +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 | 36.5 | 49.5 | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | Co | 0 | 4.0 | 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 | 3:1 | - | | In the frequency range: f _L -100kHz to f _L +100kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -30 | +30 | 10-6 | |
| 19 | Lead Finish | | Type '3 or 4' | | | |
| 20 | Intended Application | | Not ap | plicable | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-----------------|-------------------|------------------|--|
| 1 | Resonance Frequency | f _r | 26. | .0 | MHz | |
| 2 | Reference Temperature | To | +20 | +30 | °C | |
| 3 | Overtone Order | - | 3 | | - | |
| 4 | Load Capacitance | C _L | α |) | pF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | -10 | + 10 | 10-6 | At To °C |
| 7 | Resonance Resistance | R _r | - | 40 | Ω | At T _o °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | 0 -10 -10 | + 10 + 10 0 | 10 ⁻⁶ | From T -20 to +10 °C From T +10 to +50 °C From T +50 to +80 °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | -20 | +20 | % | |
| 10 | Operating Temperature Range | T _{op} | -25 | + 80 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | 0.5 | 0.5 | 10-6 | From P _{S1} = 0mW to P _{S2} = 0.1mW |
| 12 | Resistance Variation with Drive Level | ΔR R | -10 | +10 | % | From P _{S1} = 0mW to P _{S2} = 0.1mW |
| 13 | Motional Inductance | L ₁ | 20 | - | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | Co | 0 | 7.0 | pF | |
| 16 | Q Factor | Q | 100 000 | - | - | |
| 17 | Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance | R _p /R or IZ _p I/R | 10:1 | - | | In the frequency range: f _r -2600kHz to f _r +2600kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -2.0 | +2.0 | 10 ⁻⁶ | 10 years after Burn-in and ageing |
| 19 | Lead Finish | | Тур | Type 2 | | |
| 20 | Intended Application | | Not ap | plicable | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | nits Max. | Unit | Remarks |
|-----|--|--|-------------|----------------|------------------|---|
| 1 | Resonance Frequency | fL | 7.1 | | MHz | |
| 2 | Reference Temperature | To | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundai | mental | - | |
| 4 | Load Capacitance | CL | 29.7 | 30.3 | pF | |
| 5 | Rated Drive Level | Po | 0. | .1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | -50 | + 50 | 10 ⁻⁶ | At T _o °C |
| 7 | Resonance Resistance | RL | - | 30 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | -50 | + 50 | 10 ⁻⁶ | From frequency measured at T ₀ °C |
| 9 | Resistance Variation with Temperature over Top | <u>Δ R</u> R | Not ap | Not applicable | | |
| 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 | ∆R R | Not ap | plicable | % | |
| 13 | Motional Inductance | L ₁ | Not ap | plicable | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | Co | 0 | 7.0 | pF | |
| 16 | Q Factor | Q | Not ap | plicable | - | |
| 17 | Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance | R _p /R or IZ _p I/R | 7:1 | - | | In the frequency range: f _L -500kHz to f _L +500kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -7.5 | + 7.5 | 10-6 | Over 5 years after Burn-in |
| 19 | Lead Finish | | Ту | Type 2 | | |
| 20 | Intended Application | | Not ap | plicable | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | nits Max. | Unit | Remarks |
|-----|--|--|----------------|----------------|------------------|--|
| 1 | Resonance Frequency | f∟ | 5. | 0 | MHz | |
| 2 | Reference Temperature | To | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | mental | - | |
| 4 | Load Capacitance | С | 29.7 | 30.3 | 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} | - | 100 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | -40 | + 40 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature over Top | <u>Δ R</u> R | Not applicable | | % | |
| 10 | Operating Temperature Range | T _{op} | -40 | +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 | 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 | 4:1 | - | | In the frequency range: f _L -500kHz to f _L +500kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | Not ap | Not applicable | | |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | Not ap | plicable | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| | TYPE VARIANT NO. 06 | | | | | | | | | |
|-----|--|--|------------------|-----------------------|------------------|--|--|--|--|--|
| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks | | | | |
| 1 | Resonance Frequency | f∟ | 18 | .0 | MHz | | | | | |
| 2 | Reference Temperature | To | + 23 | + 27 | °C | | | | | |
| 3 | Overtone Order | - | Fundar | mental | - | | | | | |
| 4 | Load Capacitance | CL | 29.7 | 30.3 | pF | | | | | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | | | | | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | -10 | + 10 | 10-6 | At T _o °C | | | | |
| 7 | Resonance Resistance | R_{L} | - | 20 | Ω | At To °C | | | | |
| 8 | Frequency Variation with Temperature over Top | Δf f | -20 | + 20 | 10 ⁻⁶ | From frequency measured at T _o °C | | | | |
| 9 | Resistance Variation with Temperature over Top | ΔR R | -20 c -2.0 | + 20 or + 2.0 | % Ω | From resistance measured at T_0 °C If $R \le 10\Omega$ | | | | |
| 10 | Operating Temperature Range | T _{op} | -45 | + 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 | 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: fL -200kHz to fL +200kHz | | | | |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -3.0 | +3.0 | 10 ⁻⁶ | Over 5 years after Burn-in | | | | |
| 19 | Lead Finish | | Type 2 | | | | | | | |
| 20 | Intended Application | | Not ap | plicable | | | | | | |
| | | | | | | | | | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | iits Max. | Unit | Remarks |
|-----|--|--|----------------|----------------|------------------|--|
| 1 | Resonance Frequency | f∟ | 1(| 10 | | |
| 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. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | -10 | +10 | 10-6 | At To °C |
| 7 | Resonance Resistance | RL | - | 20 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | -25 | + 25 | 10 ⁻⁶ | From frequency measured at T ₀ °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | Not app | Not applicable | | |
| 10 | Operating Temperature Range | T _{op} | -55 | + 100 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | Not applicable | | 10-6 | |
| 12 | Resistance Variation with Drive Level | ΔR R | Not ap | Not applicable | | |
| 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 | 80 000 | - | - | |
| 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: fL -500kHz to fL +500kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -5.0 | + 5.0 | 10 ⁻⁶ | Over 5 years after Burn-in |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | Not ap | Not applicable | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | Max. | Unit | Remarks |
|-----|--|--|------------------|--------------------|------------------|--|
| 1 | Resonance Frequency | f∟ | 10.0 | | MHz | |
| 2 | Reference Temperature | To | +23 | + 27 | °C | |
| 3 | Overtone Order | _ | Funda | mental | - | |
| 4 | Load Capacitance | C _L | 3 | 0 | pF | |
| 5 | Rated Drive Level | Po | 0. | .1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | -10 | + 10 | 10-6 | At To °C |
| 7 | Resonance Resistance | RL | - | 30 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | ∆ f f | -30 | + 30 | 10 ⁻⁶ | From frequency measured at T ₀ °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | -10 o -2.0 | + 10 r + 2.0 | % Ω | From resistance measured at T _o °C If R<10Ω |
| 10 | Operating Temperature Range | T _{op} | -55 | + 100 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | 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 | - | 7.0 | pF | |
| 16 | Q Factor | Q | 100 000 | • | - | |
| 17 | Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance | R _p /R or IZ _p I/R | 2:1 | - | | In the frequency range: fL -200kHz to fL +200kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -2.0 | + 2.0 | 10-6 | Per year after Burn-in |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | X | ХО | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | Limits Min. Max. | | Remarks |
|-----|--|----------------------|----------------|------------------|------------------|---|
| 1 | Resonance Frequency | fL | 50 | 50 | | |
| 2 | Reference Temperature | To | +23 | + 27 | °C | |
| 3 | Overtone Order | - | 3 | 3 | - | |
| 4 | Load Capacitance | C _L | 11.9 | 12.1 | pF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | -5.0 | + 5.0 | 10-6 | At T _o °C |
| 7 | Resonance Resistance | R_{L} | - | 40 | Ω | Over T _{op} °C |
| 8 | Frequency Variation with Temperature over Top | <u>Δ f</u> f | -5.0 -10 | + 5.0 + 10 | 10 ⁻⁶ | From T -20°C to +70°C From T -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 | $\frac{\Delta f}{f}$ | Not applicable | | 10-6 | |
| 12 | Resistance Variation with Drive Level | $\frac{\Delta R}{R}$ | Not ap | plicable | % | |
| 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 | Rp/R or IZpI/R | 2.5:1 | - | | In the frequency range: fL -200kHz to fL +200kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -6.0 | + 6.0 | 10-6 | Over 5 years |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | VC | XO | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | iits Max. | Unit | Remarks |
|-----|--|--|----------------|----------------|------------------|---|
| 1 | Resonance Frequency | fL | 4. | 4.0 | | |
| 2 | Reference Temperature | To | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | nental | - | |
| 4 | Load Capacitance | CL | 3 | 0 | pF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | -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 | $\frac{\Delta f}{f}$ | -30 | +30 | 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} | -40 | + 80 | ů | |
| 11 | Frequency variation with Drive Level | $\frac{\Delta f}{f}$ | Not ap | Not applicable | | |
| 12 | Resistance variation with Drive Level | <u>Δ R</u> R | Not ap | plicable | % | |
| 13 | Motional Inductance | L1 | Not ap | plicable | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | Co | Not ap | plicable | рF | |
| 16 | Q Factor | Q | 125 000 | - | - | |
| 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 -500kHz to f _L +500kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -3.0 | +3.0 | 10-6 | 1 year after Burn-in |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | × | хо | | With 54HC04 |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| | | 111 - | | | | |
|-----|--|--|----------------|----------------|------------------|---|
| No. | Characteristics | Symbol | Lim Min. | nits Max. | Unit | Remarks |
| 1 | Resonance Frequency | fL | 10 | 10.0 | | |
| 2 | Reference Temperature | T _o | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | mental | - | |
| 4 | Load Capacitance | C _L | 3 | 0 | рF | |
| 5 | Rated Drive Level | Po | 0. | .1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | -10 | + 10 | 10 ⁻⁶ | At To °C |
| 7 | Resonance Resistance | RL | - | 30 | Ω | At T _o °C |
| 8 | Frequency Variation with Temperature over Top | ∆ f f | -30 | +30 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature over Top | ∆R R | -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 | Not applicable | | |
| 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 | 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 _L -200kHz to f _L +200kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -2.0 | +2.0 | 10-6 | Per year after Burn-in at To |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | > | XO | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | Limits Min. Max. | | Remarks |
|-----|--|--|---------------------|--------------------|------------------|--|
| 1 | Resonance Frequency | f _r | 8.0 | | MHz | |
| 2 | Reference Temperature | T _o | + 20 | +30 | °C | |
| 3 | Overtone Order | - | Fundar | nental | _ | |
| 4 | Load Capacitance | C _L | α | | pF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | -10 | +10 | 10 ⁻⁶ | At T _o °C |
| 7 | Resonance Resistance | R _r | - | 40 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | <u>∆</u> f | 0 - 9.0 - 9.0 | +9.0 +9.0 0 | 10 ⁻⁶ | From T - 20 to + 10 °C From T + 10 to + 50 °C From T + 50 to + 80 °C |
| 9 | Resistance Variation with Temperature over Top | ΔR 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 applicable | | 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 | 2:1 | - | | In the frequency range: f _r -10% to f _r +10% |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -5.0 | +5.0 | 10 ⁻⁶ | 12 years after Burn-in |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | XO | | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-------------|-------------|------------------|---|
| 1 | Resonance Frequency | f _r | 10.0 | | 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>∆ f</u> f | -10 | + 10 | 10 ⁻⁶ | At To °C |
| 7 | Resonance Resistance | R _r | - | 40 | Ω | At T _o °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | -2.0 | + 2.0 | Ω | From resistance measured at T ₀ °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 $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.1 \text{mW}$ |
| 12 | Resistance Variation with Drive Level | ΔR R | -20 | +20 | % | From $P_{S1} = 0.01 \text{mW}$ to $P_{S2} = 0.1 \text{mW}$ |
| 13 | Motional Inductance | L ₁ | 3.0 | - | 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 | $\frac{\Delta f}{f}$ | - 10 | +10 | 10 ⁻⁶ | 12 years after Burn-in |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | TC | TCXO | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-------------|-------------|------------------|---|
| 1 | Resonance Frequency | f∟ | 6. | 6.4 | | |
| 2 | Reference Temperature | To | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | nental | - | |
| 4 | Load Capacitance | CL | 30 |) | pF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | -10 | + 10 | 10 ⁻⁶ | At T _o °C |
| 7 | Resonance Resistance | RL | - | 20 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | -20 | + 20 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature | ΔR R | -20 c | + 20 | % | From resistance measured at T _o °C |
| | over T _{op} | `` | - 2.0 | + 2.0 | Ω | If R<10Ω |
| 10 | Operating Temperature Range | Тор | -45 | + 80 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | Not ap | plicable | 10 ⁻⁶ | |
| 12 | Resistance Variation with Drive Level | ΔR R | Not ap | plicable | % | |
| 13 | Motional Inductance | L 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 _L -200kHz to f _L +200kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -3.0 | +3.0 | 10 ⁻⁶ | Per year after Burn-in |
| 19 | Lead Finish | | Ty | pe 4 | | |
| 20 | Intended Application | | > | O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-----------------|-------------|------------------|---|
| 1 | Resonance Frequency | f _r | 12.6 | 12.605 | | AT cut |
| 2 | Reference Temperature | To | + 20 | +30 | °C | |
| 3 | Overtone Order | - | Fundar | nental | - | |
| 4 | Load Capacitance | C_L | α | 0 | pF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10 ⁻⁶ | At To °C |
| 7 | Resonance Resistance | R _r | - | 40 | Ω | At T _o °C |
| 8 | Frequency Variation with Temperature over Top | ∆ f f | - 10 | + 10 | 10 ⁻⁶ | From frequency measured at T ₀ °C |
| 9 | Resistance Variation with Temperature | ΔR R | -20 | + 20 or | % | From resistance measured at T _o °C |
| | over T _{op} | 1 | -2.0 | + 2.0 | Ω | |
| 10 | Operating Temperature Range | T _{op} | -20 | +60 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | Not ap | plicable | 10-6 | |
| 12 | Resistance Variation with Drive Level | ΔR R | Not ap | plicable | % | |
| 13 | Motional Inductance | L ₁ | 2.0 | _ | 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 | $\frac{\Delta f}{f}$ | -5.0 | +5.0 | 10-6 | Operation 12 years |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | ТС | CXO | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-------------|-------------|------------------|---|
| 1 | Resonance Frequency | f∟ | 7. | 7.0 | | AT cut |
| 2 | Reference Temperature | To | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | nental | - | |
| 4 | Load Capacitance | C _L | 3 | 0 | рF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10 ⁻⁶ | At T _o °C |
| 7 | Resonance Resistance | RL | - | 20 | Ω | At T _o °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | - 12 | + 12 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature | <u>Δ R</u> R | -20 o | | % | From resistance measured at T _o °C |
| ļ | over T _{op} | | -2.0 | + 2.0 | Ω | |
| 10 | Operating Temperature Range | T _{op} | -35 | + 70 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | Not ap | plicable | 10 ⁻⁶ | |
| 12 | Resistance Variation with Drive Level | ΔR R | Not ap | plicable | % | |
| 13 | Motional Inductance | L ₁ | 40 | - | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | Co | - | 7.0 | pF | |
| 16 | Q Factor | Q | 100 000 | - | - | |
| 17 | Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance | R _p /R or IZ _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 | Per year after Burn-in |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | > | O | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| | | | AUANT | | | |
|-----|--|--|------------------|----------------------|------------------|---|
| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
| 1 | Resonance Frequency | f _r | 12.6 | 12.665 | | AT cut |
| 2 | Reference Temperature | To | +20 | +30 | °C | |
| 3 | Overtone Order | - | Fundar | mental | - | |
| 4 | Load Capacitance | C _L | ٥ | 0 | pF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | Δf f | -10 | +10 | 10 ⁻⁶ | At To °C |
| 7 | Resonance Resistance | R _r | - | 40 | Ω | At T _o °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | - 12 | + 12 | 10-6 | From frequency measured at T ₀ °C |
| 9 | Resistance Variation with Temperature over Top | <u>Δ R</u> R | -20 0 -2.0 | + 20 r + 2.0 | % | 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 | plicable | 10-6 | |
| 12 | Resistance variation with Drive Level | ΔR 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 | - | 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 | $\frac{\Delta f}{f}$ | -5.0 | + 5.0 | 10-6 | Over 12 years after 240 hours Burn-in |
| 19 | Lead Finish | | Ту | pe 2 | | |
| 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 | 5.7 | 5.760 | | AT cut |
| 2 | Reference Temperature | T _o | +23 | + 27 | °C | |
| 3 | Overtone Order | - | Funda | mental | - | |
| 4 | Load Capacitance | CL | 29.5 | 30.5 | 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} | 4.0 | 15 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | ∆ f f | -15 | + 15 | 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 | +90 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | Not ap | plicable | 10-6 | |
| 12 | Resistance Variation with Drive Level | Δ <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 | C _o | - | 7.0 | pF | |
| 16 | Q Factor | Q | 100 000 | - | - | |
| 17 | Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance | Rp/R or IZpI/R | 3:1 | - | | In the frequency range: f _L -200kHz to f _L +200kHz |
| 18 | Ageing | <u>Δ f</u> | -15 | + 15 | 10-6 | Over 10 years after 240 hours Burn-in |
| 19 | Lead Finish | | Ty | Type 2 | | |
| 20 | Intended Application | | > | (O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | nits Max. | Unit | Remarks |
|-----|--|--|-------------|--------------|------------------|--|
| 1 | Resonance Frequency | fL | 8.602 | 8.602893 | | AT cut |
| 2 | Reference Temperature | To | + 55 | + 65 | °C | |
| 3 | Overtone Order | _ | Fundar | mental | - | |
| 4 | Load Capacitance | CL | 3 | 0 | pF | |
| 5 | Rated Drive Level | Po | 0. | .1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | -10 | + 10 | 10 ⁻⁶ | At To °C |
| 7 | Resonance Resistance | RL | - | 30 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | ∆ f f | -12 | + 12 | 10-6 | From frequency measured at T ₀ °C |
| 9 | Resistance Variation | ΔR R | -20 | +20 | % | From resistance |
| | with Temperature over Top | K | -2.0 | or +2.0 | Ω | measured at To °C |
| 10 | Operating Temperature Range | T _{op} | -40 | + 85 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | Not ap | plicable | 10 ⁻⁶ | |
| 12 | Resistance Variation with Drive Level | ΔR R | -20 | +20 | % | From P _{S1} = 0.01mW to P _{S2} = 0.1mW |
| 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 IZ _p I/R | 2:1 | - | | In the frequency range: fL -10% to fL +10% |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -5.0 | + 5.0 | 10-6 | Over 10 years after 240 hours Burn-in |
| 19 | Lead Finish | | Тур | pe 2 | | |
| 20 | Intended Application | | × | O | | |



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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 | 15.10 | 15.104893 | | AT cut |
| 2 | Reference Temperature | To | + 20 | + 30 | °C | |
| 3 | Overtone Order | - | Fundai | mental | . • | |
| 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 To °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | -10 | + 10 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | -20 o -2.0 | +20 r +2.0 | % | From resistance measured at T ₀ °C |
| 10 | Operating Temperature Range | T _{op} | -20 | +80 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | 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 | - | 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 | $\frac{\Delta f}{f}$ | - 5.0 | +5.0 | 10-6 | Over 12 years after 240 hours Burn-in |
| 19 | Lead Finish | | Тур | pe 2 | | |
| 20 | Intended Application | | X | (O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|------------------|------------------|------------------|---|
| 1 | Resonance Frequency | f∟ | 20.0 | | MHz | AT cut |
| 2 | Reference Temperature | To | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | nental | - | |
| 4 | Load Capacitance | C _L | 3(| 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_{L} | - | 30 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | <u>Δ f</u> f | - 15 | + 15 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature over Top | <u>Δ R</u> R | -20 o -2.0 | +20 r +2.0 | % | From resistance measured at T _o °C |
| 10 | Operating Temperature Range | T _{op} | -30 | + 70 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | Not app | olicable | 10-6 | |
| 12 | Resistance Variation with Drive Level | <u>Δ R</u> R | Not app | olicable | % | |
| 13 | Motional Inductance | L ₁ | Not app | olicable | mH | |
| 14 | Motional Capacitance | C ₁ | Not app | olicable | fF | |
| 15 | Static Capacitance | C _o | - | 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 _L -200kHz to f _L +200kHz |
| 18 | Ageing | <u>∆ f</u> | -1.0 | + 1.0 | 10-6 | Per year after Burn-in |
| 19 | Lead Finish | | Тур | Type 2 | | |
| 20 | Intended Application | | X | 0 | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | nits Max. | Unit | Remarks |
|-----|--|--|-------------|---------------------|------------------|---|
| 1 | Resonance Frequency | fL | 13 | 13.0 | | AT cut |
| 2 | Reference Temperature | To | +23 | + 27 | °C | |
| 3 | Overtone Order | - | Funda | mental | - | |
| 4 | Load Capacitance | C_L | 3 | 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 | RL | - | 20 | Ω | At To °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 | ΔR R | -20 -2.0 | +20 or +2.0 | % Ω | From resistance measured at T _o °C |
| 10 | Operating Temperature Range | T _{op} | -40 | +80 | °C | |
| 11 | Frequency Variation with Drive Level | <u>∆</u> f | Not ap | plicable | 10 ⁻⁶ | |
| 12 | Resistance Variation with Drive Level | <u>Δ R</u> R | Not ap | plicable | % | |
| 13 | Motional Inductance | L ₁ | Not ap | plicable | mΗ | |
| 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: fL -200kHz to fL +200kHz |
| 18 | Ageing | <u>∆</u> f | -2.0 | +2.0 | 10-6 | Per year after Burn-in |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | Х | O. | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lin Min. | nits Max. | Unit | Remarks |
|-----|--|--|-------------|--------------|------------------|---|
| 1 | Resonance Frequency | fL | 10 | 10.0 | | 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 | $\frac{\Delta f}{f}$ | -10 | + 10 | 10-6 | At T _o °C |
| 7 | Resonance Resistance | RL | - | 30 | Ω | At T _o °C |
| 8 | Frequency Variation with Temperature over Top | <u>∆</u> f f | -30 | +30 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature | <u>Δ R</u> R | -20 o | | % | From resistance measured at T ₀ °C |
| | over T _{op} | | -2.0 | +2.0 | Ω | |
| 10 | Operating Temperature Range | T _{op} | -55 | + 100 | ပ္ | |
| 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 | 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 _L -200kHz to f _L +200kHz |
| 18 | Ageing | <u>∆ f</u> f | -2.0 | + 2.0 | 10-6 | Per year after Burn-in |
| 19 | Lead Finish | | Type 2 | | | |
| 20 | Intended Application | | Х | 0 | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | nits Max. | Unit | Remarks |
|-----|--|--|-----------------|--------------|------------------|---|
| 1 | Resonance Frequency | fL | 5.242 | 5.242880 | | AT cut |
| 2 | Reference Temperature | To | +60 | + 60 | °C | |
| 3 | Overtone Order | - | Fundar | mental | - | |
| 4 | Load Capacitance | CL | 3 | 0 | рF | |
| 5 | Rated Drive Level | Po | 0. | .1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10-6 | At T _o °C |
| 7 | Resonance Resistance | RL | - | 13 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | - 15 | + 15 | 10 ⁻⁶ | From frequency measured at T ₀ °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | Not applicable | | % | |
| 10 | Operating Temperature Range | T _{op} | -40 | + 85 | °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 | 20 | _ | 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 | 3:1 | - | | In the frequency range: f _L - 525kHz to f _L + 525kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -3.0 | +3.0 | 10-6 | Per year after Burn-in |
| 19 | Lead Finish | | Тур | pe 2 | | |
| 20 | Intended Application | | × | O | | |

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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-------------|-------------|------------------|---|
| 1 | Resonance Frequency | f∟ | 5.62 | 50 | 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 | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10-6 | At T _o °C |
| 7 | Resonance Resistance | RL | - | 25 | Ω | At T _o °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | - 14 | + 14 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation | ΔR R | -20 | +20 | % | From resistance |
| | with Temperature over Top | " | - 2.0 | r +2.0 | Ω | measured at To °C |
| 10 | Operating Temperature Range | Тор | -40 | + 85 | °C | |
| 11 | Frequency variation with Drive Level | $\frac{\Delta f}{f}$ | - 0.5 | + 0.5 | 10-6 | From P _{S1} = .01mW to P _{S2} = 0.1mW |
| 12 | Resistance variation with Drive Level | ΔR R | -20 | +20 | % | From P _{S1} = .01mW to P _{S2} = 0.1mW |
| 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 | 10 000 | - | - | |
| 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 -10% to f _L +10% |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -5.0 | +5.0 | 10 ⁻⁶ | Over 10 years after Burn-in |
| 19 | Lead Finish | | Ту | oe 2 | | |
| 20 | Intended Application | | × | O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|----------------|-------------|------------------|---|
| 1 | Resonance Frequency | f∟ | 11.2 | 250 | MHz | AT cut |
| 2 | Reference Temperature | T _o | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | nental | • | |
| 4 | Load Capacitance | CL | 29.7 | 30.3 | 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 | RL | - | 20 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | -20 | + 20 | 10 ⁻⁶ | From frequency measured at T ₀ °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | Not applicable | | % | |
| 10 | Operating Temperature Range | Тор | -50 | + 100 | °C | |
| 11 | Frequency variation with Drive Level | $\frac{\Delta f}{f}$ | Not ap | plicable | 10 ⁻⁶ | |
| 12 | Resistance variation with Drive Level | <u>Δ R</u> R | Not ap | plicable | % | |
| 13 | Motional Inductance | L ₁ | Not ap | plicable | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | 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 | 7:1 | - | | In the frequency range: f _L -200kHz to f _L +200kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -20 | + 20 | 10 ⁻⁶ | Over 15 years after 240 hours Burn-in |
| 19 | Lead Finish | | Ty | oe 2 | | |
| 20 | Intended Application | | × | O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-------------|------------------|------------------|---|
| 1 | Resonance Frequency | f _r | 8. | 0 | MHz | AT cut |
| 2 | Reference Temperature | To | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | nental | - | |
| 4 | Load Capacitance | C _L | α |) | рF | |
| 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 | - | 30 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | -20 -1.0 | +20 r +1.0 | % Ω | From resistance measured at T ₀ °C |
| 10 | Operating Temperature Range | T _{op} | -30 | +70 | ô | |
| 11 | Frequency variation with Drive Level | $\frac{\Delta f}{f}$ | Not app | olicable | 10 ⁻⁶ | |
| 12 | Resistance variation with Drive Level | ΔR R | Not ap | olicable | % | |
| 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 | 80 000 | - | - | |
| 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 -200kHz to f _r +200kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -3.0 | +3.0 | 10-6 | Per year after Burn-in |
| 19 | Lead Finish | | Ту | pe 2 | | |
| 20 | Intended Application | | × | O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | nits Max. | Unit | Remarks |
|-----|--|--|-------------|----------------|------------------|---|
| 1 | Resonance Frequency | fL | 3.494 | 1400 | MHz | AT cut |
| 2 | Reference Temperature | To | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | mental | - | |
| 4 | Load Capacitance | CL | 20 | 50 | pF | |
| 5 | Rated Drive Level | Po | 0. | .1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10 ⁻⁶ | At T _o °C |
| 7 | Resonance Resistance | RL | - | 12 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | ∆ f f | -20 | + 20 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | Not ap | Not applicable | | |
| 10 | Operating Temperature Range | T _{op} | - 55 | + 100 | °C | |
| 11 | Frequency variation with Drive Level | $\frac{\Delta f}{f}$ | Not ap | plicable | 10 ⁻⁶ | |
| 12 | Resistance variation with Drive Level | <u>Δ R</u> R | Not ap | plicable | % | |
| 13 | Motional Inductance | L ₁ | 200 | - | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | Co | - | 2.7 | pF | |
| 16 | Q Factor | Q | 400 000 | - | - | |
| 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: fL -300kHz to fL +300kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | - 5.0 | + 5.0 | 10-6 | Per year after Burn-in |
| 19 | Lead Finish | | Тур | pe 2 | | |
| 20 | Intended Application | | × | O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | nits Max. | Unit | Remarks |
|-----|--|--|-------------|----------------|------------------|---|
| 1 | Resonance Frequency | fL | 3.8 | 32 | MHz | |
| 2 | Reference Temperature | T _o | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundai | mental | - | |
| 4 | Load Capacitance | CL | 3 | 0 | pF | |
| 5 | Rated Drive Level | Po | 0. | .1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10 ⁻⁶ | At T _o °C |
| 7 | Resonance Resistance | RL | - | 45 | Ω | Over T _{op} °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | - 17 | + 17 | 10 ⁻⁶ | From frequency measured at T ₀ °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | Not ap | Not applicable | | |
| 10 | Operating Temperature Range | T _{op} | - 40 | +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 | 230 | - | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | Co | - | 5.0 | pF | |
| 16 | Q Factor | Q | 125 000 | - | - | |
| 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 -500kHz to f _L +500kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -3.0 | +3.0 | 10-6 | Per year after Burn-in |
| 19 | Lead Finish | | Туј | pe 2 | | |
| 20 | Intended Application | | × | O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-----------------|-------------|------------------|---|
| 1 | Resonance Frequency | fL | 3.0 | 3.072 | | |
| 2 | Reference Temperature | T _o | + 23 | +27 | °C | |
| 3 | Overtone Order | - | Fundar | mental | - | |
| 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} | - | 50 | Ω | Over T _{op} °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | - 20 | + 20 | 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} | - 40 | +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 | 230 | - | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | C _o | | 5.0 | pF | |
| 16 | Q Factor | Q | 125 000 | - | _ | |
| 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 -500kHz to f _L +500kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -3.0 | + 3.0 | 10-6 | Per year after Burn-in |
| 19 | Lead Finish | | Туј | pe 2 | | |
| 20 | Intended Application | | > | O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-----------------|-------------|------------------|---|
| 1 | Resonance Frequency | fL | 4. | 0 | MHz | |
| 2 | Reference Temperature | T _o | + 23 | + 27 | °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>∆ f</u> | - 10 | +10 | 10 ⁻⁶ | At T _o °C |
| 7 | Resonance Resistance | R_L | - | 25 | Ω | Over T _{op} °C |
| 8 | Frequency Variation with Temperature over Top | ∆ f f | - 17 | + 17 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature over Top | <u>Δ R</u> R | Not applicable | | % | |
| 10 | Operating Temperature Range | T _{op} | - 40 | +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 | 230 | - | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | Co | - | 5.0 | pF | |
| 16 | Q Factor | Q | 125 000 | - | _ | |
| 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 -500kHz to f _L +500kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -3.0 | +3.0 | 10-6 | Per year after Burn-in |
| 19 | Lead Finish | | Ту | pe 2 | | |
| 20 | Intended Application | | > | O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-------------|----------------|------------------|---|
| 1 | Resonance Frequency | fL | 16 | .0 | MHz | AT cut |
| 2 | Reference Temperature | T _o | +23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | nental | - | |
| 4 | Load Capacitance | C _L | 3 | 0 | рF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10-6 | At T _o °C |
| 7 | Resonance Resistance | RL | - | 30 | Ω | At T _o °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | - 50 | + 50 | 10 ⁻⁶ | From frequency measured at T ₀ °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | Not ap | Not applicable | | |
| 10 | Operating Temperature Range | T _{op} | - 55 | + 125 | ô | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | Not ap | olicable | 10 ⁻⁶ | |
| 12 | Resistance Variation with Drive Level | ΔR R | Not ap | olicable | % | |
| 13 | Motional Inductance | L ₁ | Not ap | plicable | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | Co | - | 7.0 | pF | |
| 16 | Q Factor | Q | 50 000 | <u>-</u> | _ | |
| 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 - 100kHz to f _L + 200kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -3.0 | +3.0 | 10 ⁻⁶ | Per year after Burn-in |
| 19 | Lead Finish | | Ту | pe 2 | | |
| 20 | Intended Application | | > | O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-----------------|---------------------|------------------|---|
| 1 | Resonance Frequency | f∟ | 11.05 | 9200 | MHz | AT cut |
| 2 | Reference Temperature | То | + 23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | nental | - | |
| 4 | Load Capacitance | C _L | 3 | 0 | pF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10-6 | At T _o °C |
| 7 | Resonance Resistance | R_{L} | - | 15 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | ∆ f f | - 25 | + 25 | 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 ₀ °C |
| 10 | Operating Temperature Range | T _{op} | - 55 | + 100 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | Not ap | plicable | 10-6 | |
| 12 | Resistance Variation with Drive Level | <u>Δ R</u> R | Not ap | plicable | % | |
| 13 | Motional Inductance | L ₁ | Not ap | plicable | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | 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: fL -200kHz to fL +200kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | - 1.0 | + 1.0 | 10-6 | Per year after Burn-in |
| 19 | Lead Finish | | Ту | pe 2 | | |
| 20 | Intended Application | | > | O | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| | | | 7.4.67.441.1 | | | |
|-----|--|--|--------------|---------------------|------------------|---|
| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
| 1 | Resonance Frequency | fL | 12.00 | 7125 | MHz | AT cut |
| 2 | Reference Temperature | To | +20 | +30 | °C | |
| 3 | Overtone Order | - | Fundar | mental | - | |
| 4 | Load Capacitance | C _L | 3 | 0 | рF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10 ⁻⁶ | At To °C |
| 7 | Resonance Resistance | RL | - | 15 | Ω | At To °C |
| 8 | Frequency Variation with Temperature over Top | $\frac{\Delta f}{f}$ | - 20 | + 20 | 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} | - 40 | +90 | °C | |
| 11 | Frequency Variation with Drive Level | <u>Δ f</u> | - 0.5 | + 0.5 | 10-6 | |
| 12 | Resistance Variation with Drive Level | <u>Δ R</u> R | - 10 | + 10 | % | |
| 13 | Motional Inductance | L ₁ | 5.0 | - | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | Co | - | 5.5 | 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 _L -10% to f _L +10% |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -5.0 | + 5.0 | 10-6 | Over 10 years after Burn-in |
| 19 | Lead Finish | | Туј | pe 2 | | |
| 20 | Intended Application | | TC | CXO | | |



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TABLE 1(a) - TYPE VARIANT DETAILED INFORMATION

| No. | Characteristics | Symbol | Lim Min. | its Max. | Unit | Remarks |
|-----|--|--|-------------|------------------|------------------|---|
| 1 | Resonance Frequency | fL | 11.0 | 592 | MHz | AT cut |
| 2 | Reference Temperature | T _o | +23 | + 27 | °C | |
| 3 | Overtone Order | - | Fundar | nental | - | |
| 4 | Load Capacitance | CL | 50 |) | pF | |
| 5 | Rated Drive Level | Po | 0. | 1 | mW | |
| 6 | Frequency Adjustment Tolerance | $\frac{\Delta f}{f}$ | - 10 | + 10 | 10-6 | At T _o °C |
| 7 | Resonance Resistance | RL | - | 20 | Ω | At T _o °C |
| 8 | Frequency Variation with Temperature over Top | ∆ f f | -30 | +30 | 10 ⁻⁶ | From frequency measured at T _o °C |
| 9 | Resistance Variation with Temperature over Top | ΔR R | -20 -2.0 | +20 r +2.0 | % Ω | From resistance measured at T_0 °C If $R < 10\Omega$ |
| 10 | Operating Temperature Range | T _{op} | - 55 | + 100 | °C | |
| 11 | Frequency Variation with Drive Level | $\frac{\Delta f}{f}$ | Not ap | olicable | 10 ⁻⁶ | |
| 12 | Resistance Variation with Drive Level | <u>Δ R</u> R | Not ap | plicable | % | |
| 13 | Motional Inductance | L ₁ | 7.0 | - | mH | |
| 14 | Motional Capacitance | C ₁ | Not ap | plicable | fF | |
| 15 | Static Capacitance | Co | - | 7.0 | pF | |
| 16 | Q Factor | Q | 100 000 | | - | |
| 17 | Ratio of Unwanted: Response Resistance to Resonance Resistance or Response Impedance to Resonance Resistance | R _p /R or IZ _p I/R | 2:1 | - | | In the frequency range: f _L -200kHz to f _L +200kHz |
| 18 | Ageing | $\frac{\Delta f}{f}$ | -5.0 | + 5.0 | 10-6 | Per year after 240 Hour Burn-in |
| 19 | Lead Finish | | Ту | pe 2 | | |
| 20 | Intended Application | | X | O | | |



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APPENDIX 'A'

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AGREED DEVIATIONS FOR C-MAC FREQUENCY PRODUCTS (F)

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