



**THE DATASHEET OF
CCR8.0MXC8T**



Ceramic Resonators(SMD)

CCR Series

Conformity to RoHS Directive

FEATURES

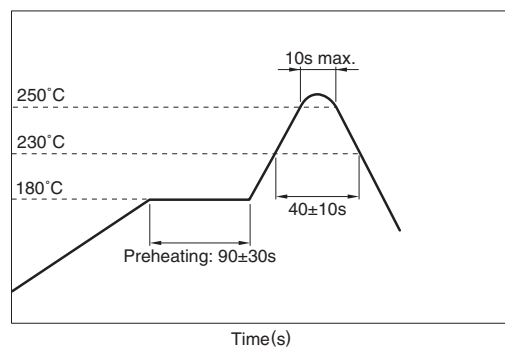
- The CCR series are thin-type ceramic chip resonators. Thickness shear mode or 3rd over-tone thickness expansion mode element are used for both the 4.0 to 11.0MHz band and the 16.0 to 50.0MHz band.
- Products with built-in loading capacitance have piezoelectric elements that are mounted onto a capacity-forming dielectric substrate. This eliminates the need for external capacitors, thus simplifying circuit requirements.
- Optimization of the temperature characteristics of both the piezoelectric element and dielectric materials has resulted in stable oscillating frequency.
- Corresponds to reflow soldering. Moreover, it is possible to correspond Pb-free soldering.(260°C,10sec. max.) Packaging style is emboss taping.
- Setting or matching of oscillating frequency which correspond to new models, application IC or custom IC are also available, please contact TDK.

TEMPERATURE RANGES

| | |
|-------------------|--------------|
| Operating/Storage | -40 to +85°C |
|-------------------|--------------|

RECOMMENDED SOLDERING CONDITIONS

REFLOW SOLDERING



PRODUCT IDENTIFICATIONS

| | | | | | | | |
|-----|------|------|-----|-----|-----|-----|-----|
| CCR | 20.0 | MXC7 | □□□ | □□ | □□ | □□ | T□ |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |

(1) Series name

| | |
|-----|------------------------|
| CCR | Ceramic resonator(SMD) |
|-----|------------------------|

(2) Oscillating frequency

(3) Production type and dimensions

| Symbol | Oscillating frequency range (MHz) | Loading capacitors | Dimensions L×W (mm) |
|--------|-----------------------------------|--------------------|---------------------|
| MUC8 | 4.0 to 7.99 | Internal | 4.0×2.0 |
| MXC8 | 8.0 to 11.0 | Internal | 3.2×1.3 |
| MX7 | 16.0 to 50.0 | External | 2.5×2.0 |
| MXC7 | 16.0 to 50.0 | Internal | 2.5×2.0 |
| MYC7 | 24.0 to 50.0 | Internal | 2.0×1.6 |

(4) Initial oscillating frequency tolerance

| Symbol | MUC8 | MXC8 | MXC7/MX7/MYC7 |
|--------|-------------|-------|---------------|
| Non | ±0.5% | ±0.5% | ±0.5% |
| A | ±0.3% | ±0.3% | ±0.3% |
| A2 | — | — | ±0.2% |
| A15 | — | — | ±0.15% |
| Others | Custom made | | |

(5) Oscillating frequency correlation

| | |
|--------|----------------------------------|
| Non | Non correlation for TDK standard |
| F | Custom made |
| F1 | Custom made |
| F2 | Custom made |
| Others | Custom made |

(6) Built-in loading capacitance

| Symbol | MUC8 | MXC8 | MXC7 |
|--------|----------------|----------------|-----------------|
| Non | Standard(27pF) | Standard(18pF) | Standard(8/9pF) |
| J | — | — | 11.5pF |
| J1 | — | — | 6/4pF |
| J2 | — | — | 2pF |
| Others | Custom made | | |

(7) Product's thickness

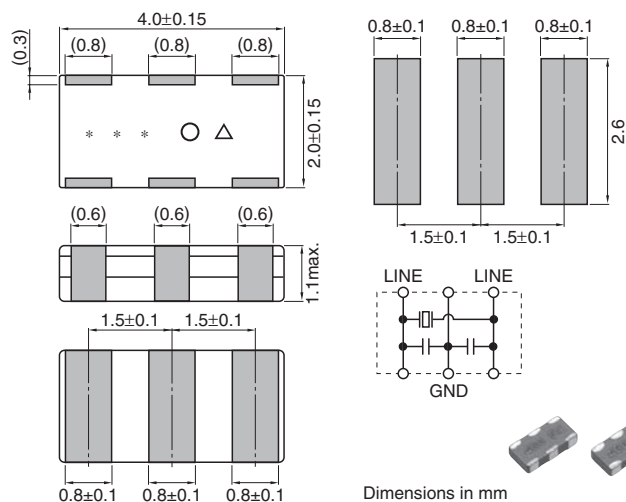
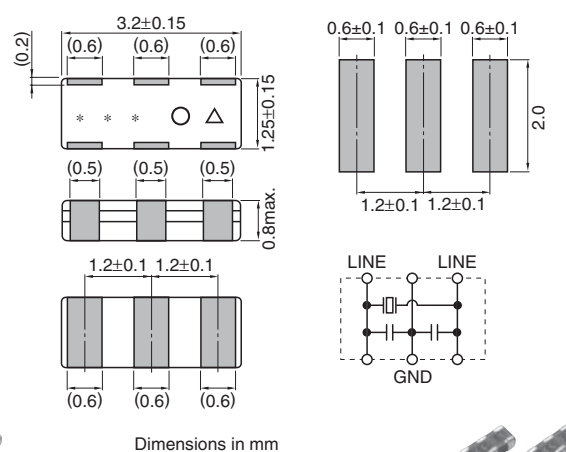
| | |
|--------|-------------|
| Non | Standard |
| N | Custom made |
| N1 | Custom made |
| N2 | Custom made |
| Others | Custom made |

(8) Taping style

| Symbol | MUC8 | MXC8 | MXC7/MX7 | MYC7 |
|--------|----------------------------------|----------------------------------|-----------------------------------|----------------------------------|
| T | 2,000pieces/ reel (ø180mm) | 2,000pieces/ reel (ø180mm) | 2,000pieces/ reel (ø180mm) | — |
| T1 | — | — | 3,000pieces/ reel (ø180mm) | 3,000pieces/ reel (ø180mm) |
| T2 | — | — | 4,000pieces/ reel (ø180mm) | — |
| T3 | — | — | 10,000pieces/ reel (ø330mm) | — |

- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

- All specifications are subject to change without notice.

SHAPES AND DIMENSIONS/RECOMMENDED PC BOARD PATTERNS
MUC8 TYPE
FUNDAMENTAL WAVE MODE: 4.0 to 7.99MHz/
BUILT-IN LOAD CAPACITY

MXC8 TYPE
FUNDAMENTAL WAVE MODE: 8.0 to 11.00MHz/
BUILT-IN LOAD CAPACITY

MUC8 TYPE

| Part No. | Oscillating frequency Fosc (MHz) | Resonant impedance Z ₀ (Ω)max. | Initial Fosc tolerance* (%max.) | Built-in load capacity(pF) | | T (mm)max. |
|--------------|----------------------------------|---|---------------------------------|----------------------------|-----------------|------------|
| | | | | CL ₁ | CL ₂ | |
| CCR4.0MUC8T | 4.000 | 40 | ±0.5/0.3 | 27 | 27 | 1.1 |
| CCR4.19MUC8T | 4.194 | 40 | ±0.5/0.3 | 27 | 27 | 1.1 |
| CCR4.91MUC8T | 4.915 | 40 | ±0.5/0.3 | 27 | 27 | 1.1 |
| CCR5.0MUC8T | 5.000 | 40 | ±0.5/0.3 | 27 | 27 | 1.1 |
| CCR6.0MUC8T | 6.000 | 40 | ±0.5/0.3 | 27 | 27 | 1.1 |

• These are representative characteristics. Oscillating frequencies and built-in load capacity values other than these shown here can be supported.

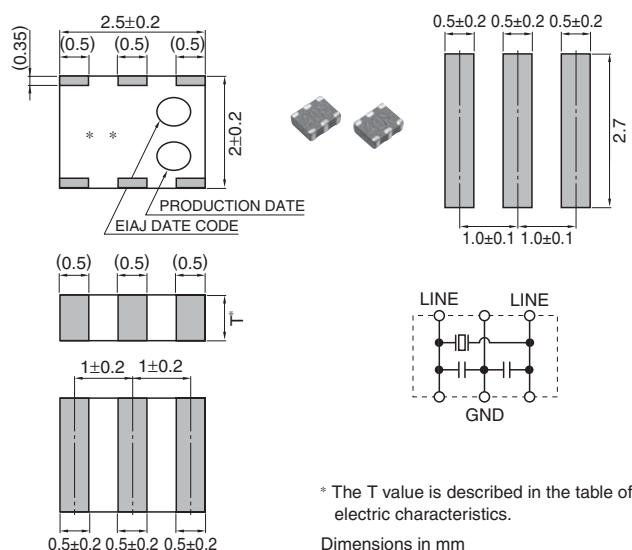
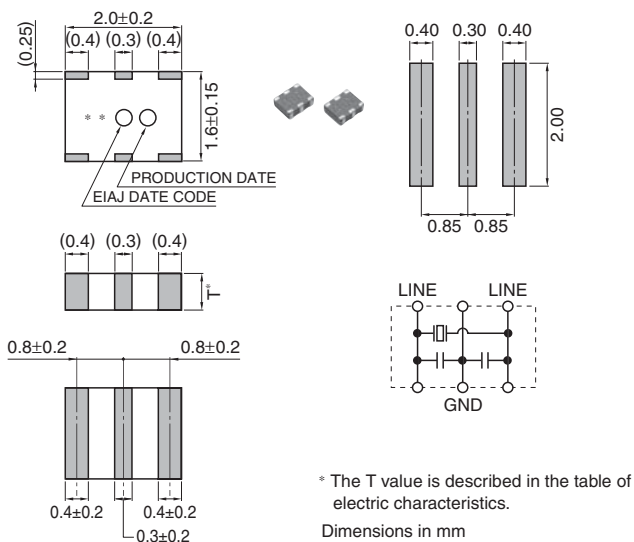
* ±0.5% is standard. Also available for custom made, please contact TDK.

MXC8 TYPE

| Part No. | Oscillating frequency Fosc (MHz) | Resonant impedance Z ₀ (Ω)max. | Initial Fosc tolerance* (%max.) | Built-in load capacity(pF) | | T (mm)max. |
|--------------|----------------------------------|---|---------------------------------|----------------------------|-----------------|------------|
| | | | | CL ₁ | CL ₂ | |
| CCR8.0MXC8T | 8.000 | 40 | ±0.5/0.3 | 18 | 18 | 0.8 |
| CCR8.38MXC8T | 8.380 | 40 | ±0.5/0.3 | 18 | 18 | 0.8 |
| CCR10.0MXC8T | 10.000 | 40 | ±0.5/0.3 | 18 | 18 | 0.8 |
| CCR11.0MXC8T | 11.000 | 40 | ±0.5/0.3 | 18 | 18 | 0.8 |

• These are representative characteristics. Oscillating frequencies and built-in load capacity values other than these shown here can be supported.

* ±0.5% is standard. Also available for custom made, please contact TDK.

MXC7 TYPE
**THIRD HARMONIC MODE: 16.0 to 50.0MHz/
BUILT-IN LOAD CAPACITY**
**MYC7 TYPE**
**THIRD HARMONIC MODE: 24.0 to 50.0MHz/
BUILT-IN LOAD CAPACITY**
**MXC7 TYPE**

| Part No. | Oscillating frequency Fosc (MHz) | Resonant impedance Zo (Ω)max. | Initial Fosc tolerance* (%max.) | Built-in load capacity(pF) | | T (mm) |
|---------------|----------------------------------|-------------------------------|---------------------------------|----------------------------|------|---------|
| | | | | CL1 | CL2 | |
| CCR16.0MXC7T | 16.000 | 70 | ±0.5/0.3/0.15 | 10.0 | 10.0 | 1.1±0.2 |
| CCR16.93MXC7T | 16.934 | 70 | ±0.5/0.3/0.15 | 9.0 | 9.0 | 1.1±0.2 |
| CCR18.0MXC7T | 18.000 | 70 | ±0.5/0.3/0.15 | 9.0 | 9.0 | 1±0.2 |
| CCR20.0MXC7T | 20.000 | 40 | ±0.5/0.3/0.15 | 9.0 | 9.0 | 1±0.2 |
| CCR22.58MXC7T | 22.580 | 40 | ±0.5/0.3/0.15 | 9.0 | 9.0 | 1±0.2 |
| CCR24.0MXC7T | 24.000 | 40 | ±0.5/0.3/0.15 | 9.0 | 9.0 | 1±0.2 |
| CCR25.0MXC7T | 25.000 | 40 | ±0.5/0.3/0.15 | 8.0 | 8.0 | 0.9±0.2 |
| CCR30.0MXC7T | 30.000 | 40 | ±0.5/0.3/0.15 | 8.0 | 8.0 | 0.9±0.2 |
| CCR32.0MXC7T | 32.000 | 40 | ±0.5/0.3/0.15 | 8.0 | 8.0 | 0.8±0.2 |
| CCR33.33MXC7T | 33.333 | 40 | ±0.5/0.3/0.15 | 8.0 | 8.0 | 0.8±0.2 |
| CCR33.86MXC7T | 33.868 | 40 | ±0.5/0.3/0.15 | 8.0 | 8.0 | 0.8±0.2 |
| CCR34.57MXC7T | 34.570 | 40 | ±0.5/0.3/0.15 | 8.0 | 8.0 | 0.8±0.2 |
| CCR40.0MXC7T | 40.000 | 40 | ±0.5/0.3/0.15 | 8.0 | 8.0 | 0.8±0.2 |
| CCR48.0MXC7T | 48.000 | 40 | ±0.5/0.3/0.15 | 8.0 | 8.0 | 0.8±0.2 |
| CCR50.0MXC7T | 50.000 | 40 | ±0.5/0.3/0.15 | 8.0 | 8.0 | 0.8±0.2 |

• These are representative characteristics. Oscillating frequencies and built-in load capacity values other than these shown here can be supported.

* ±0.5% is standard. Also available for custom made, please contact TDK.

MYC7 TYPE

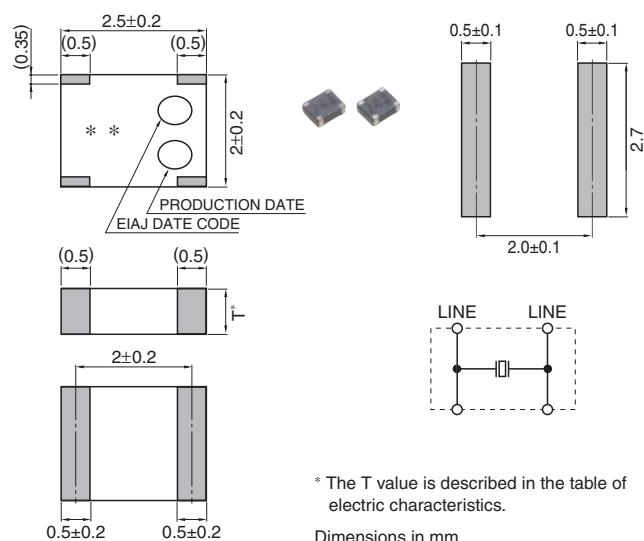
| Part No. | Oscillating frequency Fosc (MHz) | Resonant impedance Zo (Ω)max. | Initial Fosc tolerance* (%max.) | Built-in load capacity(pF) | | T (mm) |
|----------------|----------------------------------|-------------------------------|---------------------------------|----------------------------|-----|----------|
| | | | | CL1 | CL2 | |
| CCR24.0MYC7T1 | 24.000 | 40 | ±0.5/0.3/0.15 | 7.0 | 7.0 | 0.9±0.1 |
| CCR25.0MYC7T1 | 25.000 | 40 | ±0.5/0.3/0.15 | 7.0 | 7.0 | 0.9±0.1 |
| CCR27.12MYC7T1 | 27.120 | 40 | ±0.5/0.3/0.15 | 7.0 | 7.0 | 0.85±0.1 |
| CCR30.0MYC7T1 | 30.000 | 40 | ±0.5/0.3/0.15 | 7.0 | 7.0 | 0.85±0.1 |
| CCR33.33MYC7T1 | 33.333 | 40 | ±0.5/0.3/0.15 | 7.0 | 7.0 | 0.85±0.1 |
| CCR33.86MYC7T1 | 33.868 | 40 | ±0.5/0.3/0.15 | 7.0 | 7.0 | 0.85±0.1 |
| CCR40.0MYC7T1 | 40.000 | 40 | ±0.5/0.3/0.15 | 7.0 | 7.0 | 0.8±0.1 |
| CCR48.0MYC7T1 | 48.000 | 40 | ±0.5/0.3/0.15 | 7.0 | 7.0 | 0.8±0.1 |

• These are representative characteristics. Oscillating frequencies and built-in load capacity values other than these shown here can be supported.

* ±0.5% is standard. Also available for custom made, please contact TDK.

MX7 TYPE

THIRD HARMONIC MODE: 16.0 to 50.0MHz/EXTERNAL LOAD CAPACITY



MX7 TYPE

| Part No. | Oscillating frequency Fosc (MHz) | Resonant impedance Zo (Ω)max. | Initial Fosc tolerance* (%)max. | Built-in load capacity(pF) | | T (mm) |
|--------------|----------------------------------|-------------------------------|----------------------------------|----------------------------|-----------------|---------|
| | | | | CL ₁ | CL ₂ | |
| CCR16.0MX7T | 16.000 | 70 | ±0.5/0.3/0.15 | — | — | 1.1±0.2 |
| CCR16.93MX7T | 16.934 | 70 | ±0.5/0.3/0.15 | — | — | 1.1±0.2 |
| CCR18.0MX7T | 18.000 | 70 | ±0.5/0.3/0.15 | — | — | 1±0.2 |
| CCR20.0MX7T | 20.000 | 40 | ±0.5/0.3/0.15 | — | — | 1±0.2 |
| CCR22.58MX7T | 22.580 | 40 | ±0.5/0.3/0.15 | — | — | 1±0.2 |
| CCR24.0MX7T | 24.000 | 40 | ±0.5/0.3/0.15 | — | — | 1±0.2 |
| CCR25.0MX7T | 25.000 | 40 | ±0.5/0.3/0.15 | — | — | 0.9±0.2 |
| CCR30.0MX7T | 30.000 | 40 | ±0.5/0.3/0.15 | — | — | 0.9±0.2 |
| CCR32.0MX7T | 32.000 | 40 | ±0.5/0.3/0.15 | — | — | 0.8±0.2 |
| CCR33.33MX7T | 33.333 | 40 | ±0.5/0.3/0.15 | — | — | 0.8±0.2 |
| CCR33.86MX7T | 33.868 | 40 | ±0.5/0.3/0.15 | — | — | 0.8±0.2 |
| CCR34.57MX7T | 34.570 | 40 | ±0.5/0.3/0.15 | — | — | 0.8±0.2 |
| CCR40.0MX7T | 40.000 | 40 | ±0.5/0.3/0.15 | — | — | 0.8±0.2 |
| CCR48.0MX7T | 48.000 | 40 | ±0.5/0.3/0.15 | — | — | 0.8±0.2 |
| CCR50.0MX7T | 50.000 | 40 | ±0.5/0.3/0.15 | — | — | 0.8±0.2 |

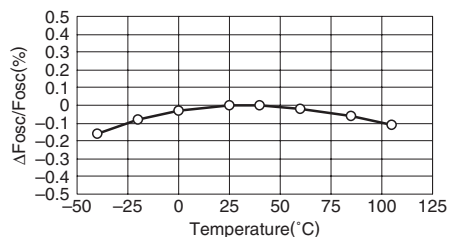
• These are representative characteristics. Oscillating frequencies and built-in load capacity values other than these shown here can be supported.

* ±0.5% is standard. Also available for custom made, please contact TDK.

TYPICAL ELECTRICAL CHARACTERISTICS OSCILLATING FREQUENCY DRIFT OVER TEMPERATURE

MUC8/MXC8: $\pm 0.3\%$ / -40 to +85°C (Standard)

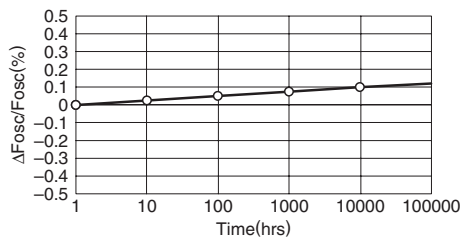
CCR8.0MXC8



OSCILLATING FREQUENCY AGING

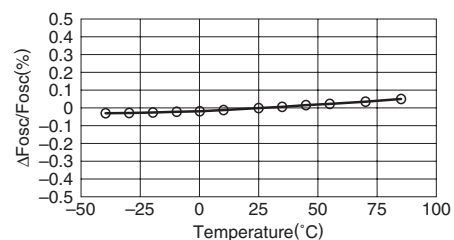
MUC8/MXC8: $\pm 0.2\%$ / 10 years (Standard)

CCR8.0MXC8



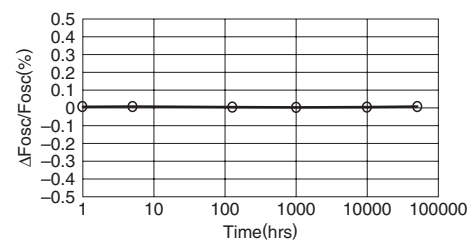
MXC7: $\pm 0.2\%$ / -40 to +85°C (Standard)

CCR48.0MXC7



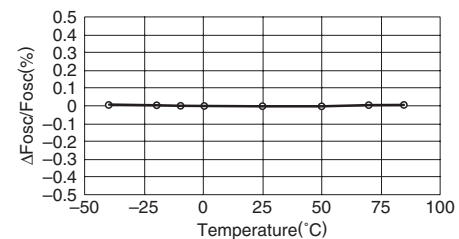
MXC7: $\pm 0.1\%$ / 10 years (Standard)

CCR48.0MXC7



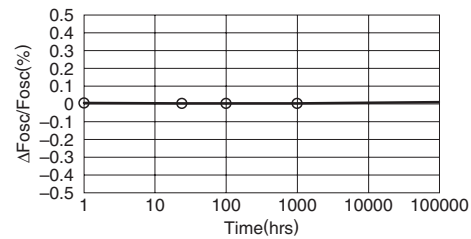
MYC7: $\pm 0.2\%$ / -40 to +85°C (Standard)

CCR48.0MYC7T1



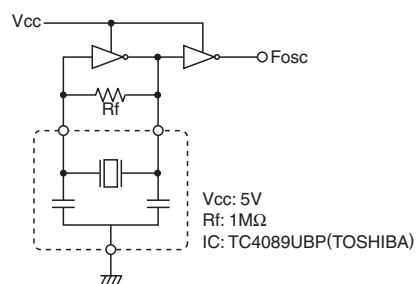
MYC7: $\pm 0.1\%$ / 10 years (Standard)

CCR48.0MYC7T1

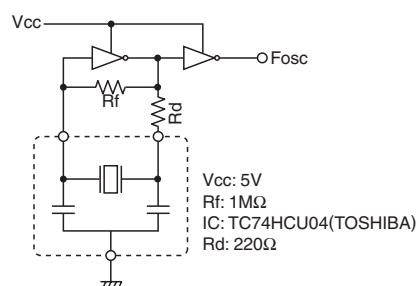


OSCILLATING FREQUENCY-TEMPERATURE CHARACTERISTIC MEASURING CIRCUIT

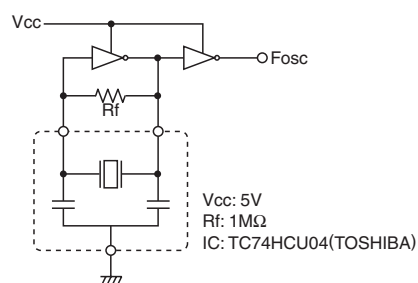
MUC8/MXC8 TYPE 4.0 to 9.99MHz



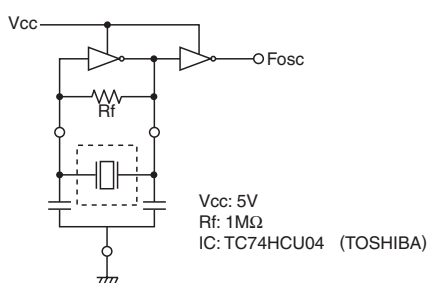
MXC8 TYPE 10.0 to 11.0MHz



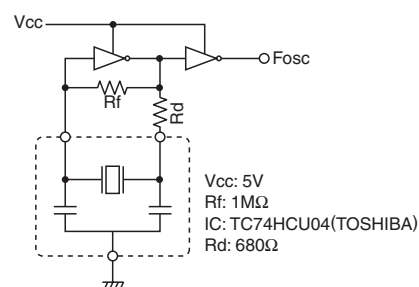
MXC7 TYPE 16.0 to 50.0MHz



MX7 TYPE 16.0 to 50.0MHz



MYC7 TYPE 24.0 to 50.0MHz



RELIABILITY AND TEST CONDITIONS

The following test items are satisfied.

- (1) Oscillating frequency change: Within $\pm 0.25\%$
- (2) Resonant resistance change: Within $\pm 10\Omega$
- (3) Appearance; serious abnormalities not to exist.

| Test items | Test conditions |
|-----------------------------|---|
| Low temperature storage | Temperature: $-40\pm 3^\circ\text{C}$ Time: 1000h |
| High temperature storage | Temperature: $+85\pm 2^\circ\text{C}$ Time: 1000h |
| Loading humidity resistance | Humidity: 90 to 95(%)RH Temperature: $60\pm 2^\circ\text{C}$ Time: 1000h |
| Thermal shock | -40°C (30min), 85°C (30min) x 100 cycles |
| Soldering heat resistance | Solder temperature: peak 260°C , 10s reflow |
| Drop | Drop 3 times onto the concrete from a height of 1m |
| Vibration | Frequency: $10 \leftrightarrow 55 \leftrightarrow 10\text{Hz/min}$ Amplitude: 1.5mm X, Y and Z directions for 2h each |
| Board bend test | Solder this product onto a glass epoxy board (L100×W40×T1.6mm), press it by up to 1mm in 1mm/s and keep it for 5sec. |

Looking for pricing, stock, or lifecycle information?

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-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management