

Piezoelectronic Products

Ceramic Resonators

SMD

CCR Series

FEATURES

- The CCR series are thin-type ceramic chip resonators. Thickness shear mode piezoelectric elements are used for the 3.58 to 12MHz band, while 3rd overtone thickness expansion mode elements are used for the 16 to 60MHz band.
- Parts with built-in load 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 the dielectric materials has resulted in stable oscillation frequency. Drift is less than $\pm 0.3\%$.
- Corresponds to reflow soldering(240°C, 10s max.). Packaging style is emboss taping.
- Setting or matching of oscillation frequency which correspond to new models, applications' ICs or custom ICs are also available, please contact TDK.

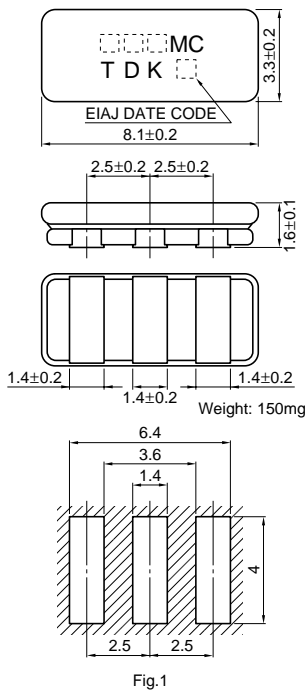
SHAPES AND DIMENSIONS/RECOMMENDED PC BOARD PATTERNS

BUILT-IN LOAD CAPACITANCE TYPE

CCR__MC3 TYPE

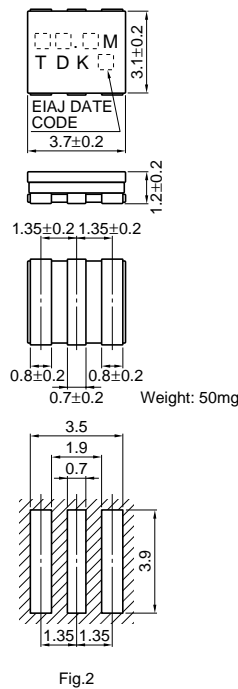
CCR__MC5 TYPE

(3.58 to 12MHz)



CCR__MSC6 TYPE

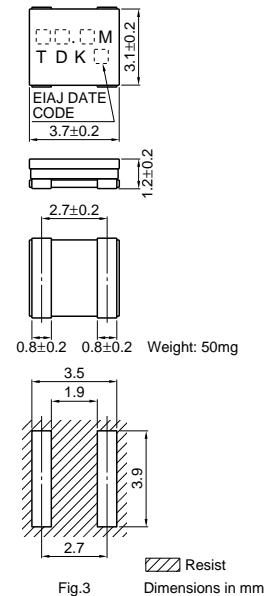
(16 to 60MHz)



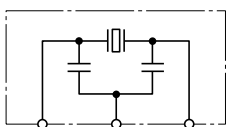
EXTERNAL LOAD CAPACITANCE TYPE

CCR__MS6 TYPE

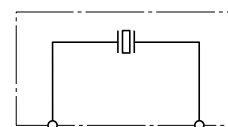
(16 to 60MHz)



CIRCUIT DIAGRAM



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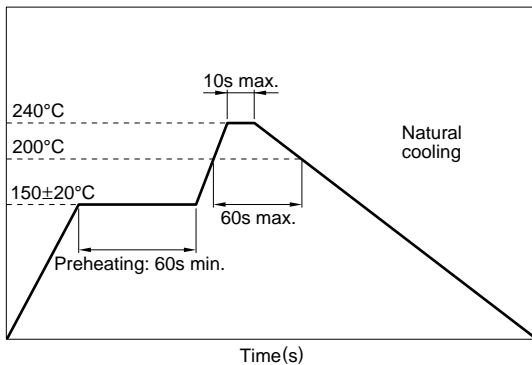
ELECTRICAL CHARACTERISTICS

Type	CCR_ _ _ *1MC3	CCR_ _ _ MC5	CCR_ _ _ MSC6	CCR_ _ _ MS6
Fig.	1	1	2	3
Load capacitance	Built-in	Built-in	Built-in	External
Oscillation frequency (MHz)	3.58 to 6.96	7.37 to 12	16 to 60	16 to 60
Oscillation frequency*2(MHz)	3.58/4/4.19/4.915/5/6/6.29/6.96	8/8.38/10/12	16.93/20/25/33.86/40	16.93/20/25/33.86/40
Initial frequency tolerance (%)	±0.5, ±0.3	±0.5, ±0.3	±0.5, ±0.3	±0.5, ±0.3
Temperature characteristics (%) [-40 to +85°C]	Typical ±0.3	±0.3	±0.3	±0.3
Temperature range (°C)	Operating	-40 to +85	-40 to +85	-40 to +85
	Storage	-40 to +85	-40 to +85	-40 to +85

*1 _ _ _ : Frequency

*2 These values are typical. New models, application ICs or custom ICs are also available, please contact TDK.

RECOMMENDED REFLOW SOLDERING CONDITIONS



RELIABILITY AND TEST CONDITIONS

RELIABILITY TEST STANDARDS

The following test items are satisfied.

- Oscillating frequency change: within±0.25%
- Resonant resistance change: within±10Ω
- Appearance, serious abnormalities not to exist.

Test items	Test conditions
Low temperature storage characteristics	Temperature: -40±3°C Time: 100h
High temperature storage characteristics	Temperature: +85±2°C Time: 100h
Humidity resistance	Humidity: 90 to 95(%)RH Temperature: 60±2°C Time: 100h
Thermal shock	-40°C (30min), 85°C (30min) x 100 cycles
Soldering heat resistance	Solder temperature: peak 240°C, 10s reflow
Drop	Drop 3 times onto a hard wooden board from a height of 1m
10Hz/min vibration	Frequency: 10 ⇒ 55 ⇒ 10Hz/min Amplitude: 1.5mm X, Y and Z direction 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 5s.

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传真：0755-83376182 (0) 13823648918 MSN: SUNS8888@hotmail.com

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西安分公司：西安高新开发区 20 所(中国电子科技集团导航技术研究所)

西安劳动南路 88 号电子商城二楼 D23 号

TEL: 029-81022619 13072977981 FAX:029-88789382