Piezoelectronic Products

Ceramic Resonators
SMD

CCR Series

FEATURES

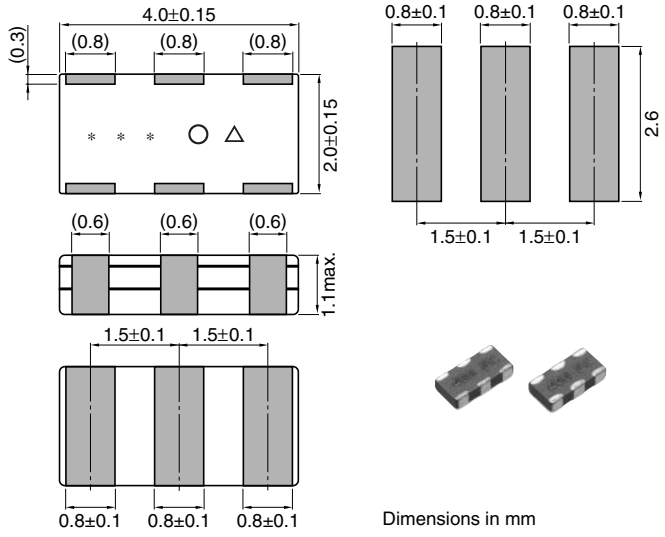
- The CCR series are thin-type ceramic chip resonators. Thickness shear mode or 3rd over-tone thickness expansion mode element are used for both the 4.0 to 11.0MHz band and the 16.0 to 50.0MHz band.
- Products with built-in loading capacitance have piezoelectric elements that are mounted onto a capacity-forming 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

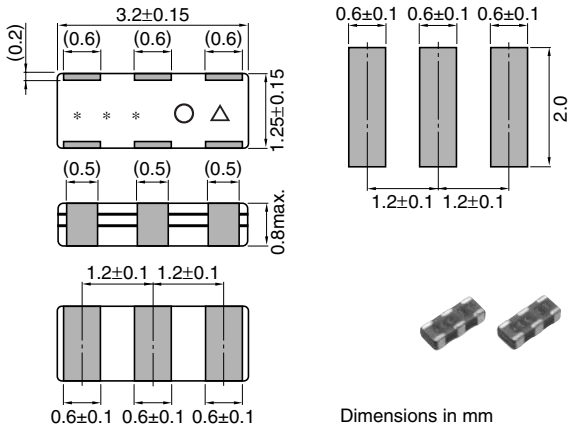
SHAPES AND DIMENSIONS/RECOMMENDED PC BOARD PATTERNS

CCR**.*MUC8T[Fosc=4.00 to 7.99MHz]



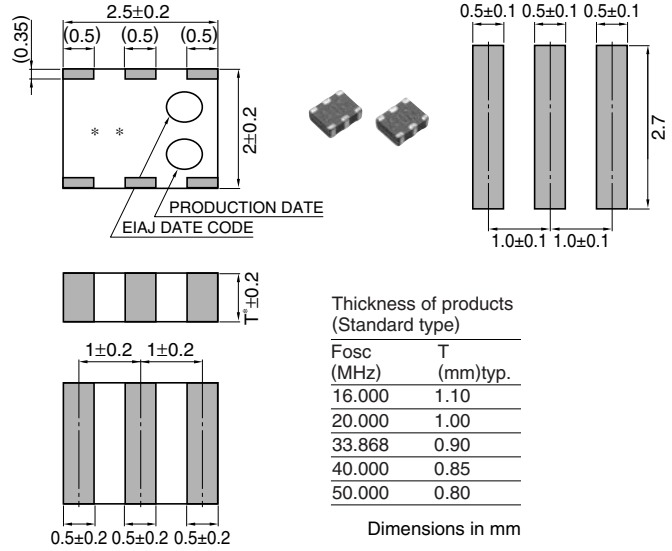
Dimensions in mm

CCR**.*MXC8T[Fosc=8.00 to 11.00MHz]



Dimensions in mm

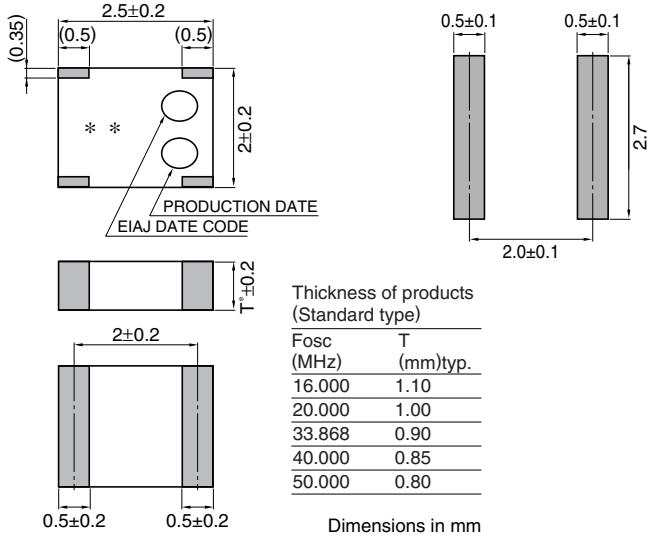
CCR**.*MXC7T[Fosc=16.0 to 50.0MHz]
BUILT-IN LOADING TYPE



Thickness of products (Standard type)	
Fosc (MHz)	T (mm)typ.
16.000	1.10
20.000	1.00
33.868	0.90
40.000	0.85
50.000	0.80

Dimensions in mm

CCR**.*MX7T[Fosc=16.0 to 50.0MHz]
EXTERNAL LOADING TYPE



Thickness of products (Standard type)	
Fosc (MHz)	T (mm)typ.
16.000	1.10
20.000	1.00
33.868	0.90
40.000	0.85
50.000	0.80

Dimensions in mm

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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

(4) Initial oscillating frequency tolerance

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

ELECTRICAL CHARACTERISTICS

Part No.	Oscillating frequency Fosc(MHz)	Resonant impedance Ro(Ω)	Initial Fosc tolerance* (%)	Capacitance CL1/CL2 (pF)
CCR**.*MUC8T[Fosc=4.00 to 7.99MHz]				
CCR4.0MUC8T	4.000	40	±0.5/0.3	27pF
CCR4.19MUC8T	4.194	40	±0.5/0.3	27pF
CCR4.91MUC8T	4.915	40	±0.5/0.3	27pF
CCR5.0MUC8T	5.000	40	±0.5/0.3	27pF
CCR6.0MUC8T	6.000	40	±0.5/0.3	27pF
CCR**.*MXC8T[Fosc=8.00 to 11.00MHz]				
CCR8.0MXC8T	16.000	40	±0.5/0.3	18pF
CCR8.38MXC8T	16.934	40	±0.5/0.3	18pF
CCR10.0MXC8T	18.000	40	±0.5/0.3	18pF
CCR11.0MXC8T	20.000	40	±0.5/0.3	18pF
CCR**.*MXC7T[Fosc=16.0 to 50.0MHz, Built-in loading type]				
CCR16.0MXC7T	16.000	70	±0.5/0.3/0.15	10.0/10.0±2.0
CCR16.93MXC7T	16.934	70	±0.5/0.3/0.15	9.0/9.0±2.0
CCR18.0MXC7T	18.000	70	±0.5/0.3/0.15	9.0/9.0±2.0
CCR20.0MXC7T	20.000	40	±0.5/0.3/0.15	9.0/9.0±2.0
CCR22.58MXC7T	22.580	40	±0.5/0.3/0.15	9.0/9.0±2.0
CCR24.0MXC7T	24.000	40	±0.5/0.3/0.15	9.0/9.0±2.0
CCR25.0MXC7T	25.000	40	±0.5/0.3/0.15	9.0/9.0±2.0
CCR27.0MXC7T	27.000	40	±0.5/0.3/0.15	9.0/9.0±2.0
CCR30.0MXC7T	30.000	40	±0.5/0.3/0.15	8.0/8.0±2.0
CCR32.0MXC7T	32.000	40	±0.5/0.3/0.15	8.0/8.0±2.0
CCR33.33MXC7T	33.333	40	±0.5/0.3/0.15	8.0/8.0±2.0
CCR33.86MXC7T	33.868	40	±0.5/0.3/0.15	8.0/8.0±2.0
CCR34.57MXC7T	34.570	40	±0.5/0.3/0.15	8.0/8.0±2.0
CCR40.0MXC7T	40.000	40	±0.5/0.3/0.15	8.0/8.0±2.0
CCR48.0MXC7T	48.000	40	±0.5/0.3/0.15	8.0/8.0±2.0
CCR50.0MXC7T	50.000	40	±0.5/0.3/0.15	8.0/8.0±2.0
CCR**.*MX7T[Fosc=16.0 to 50.0MHz, External loading type]				
CCR16.0MX7T	16.000	70	±0.5/0.3/0.15	
CCR16.93MX7T	16.934	70	±0.5/0.3/0.15	
CCR18.0MX7T	18.000	70	±0.5/0.3/0.15	
CCR20.0MX7T	20.000	40	±0.5/0.3/0.15	
CCR22.58MX7T	22.580	40	±0.5/0.3/0.15	
CCR24.0MX7T	24.000	40	±0.5/0.3/0.15	
CCR25.0MX7T	25.000	40	±0.5/0.3/0.15	
CCR27.0MX7T	27.000	40	±0.5/0.3/0.15	
CCR30.0MX7T	30.000	40	±0.5/0.3/0.15	
CCR32.0MX7T	32.000	40	±0.5/0.3/0.15	
CCR33.33MX7T	33.333	40	±0.5/0.3/0.15	
CCR33.86MX7T	33.868	40	±0.5/0.3/0.15	
CCR34.57MX7T	34.570	40	±0.5/0.3/0.15	
CCR40.0MX7T	40.000	40	±0.5/0.3/0.15	
CCR48.0MX7T	48.000	40	±0.5/0.3/0.15	
CCR50.0MX7T	50.000	40	±0.5/0.3/0.15	

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

- These values are typical. Application frequency are also available. Please contact TDK.

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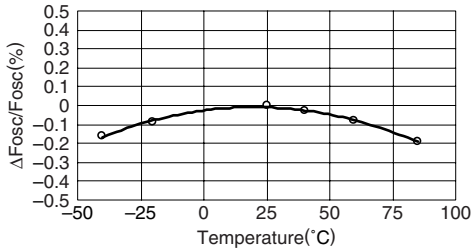
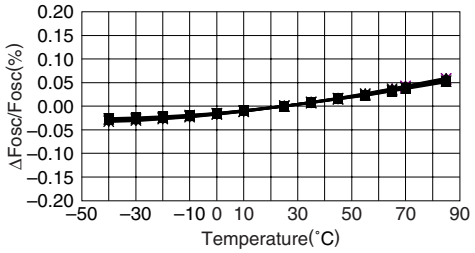
TYPICAL ELECTRICAL CHARACTERISTICS

OSCILLATING FREQUENCY DRIFT OVER TEMPERATURE

MUC8/MXC8: ±0.3%/–40 to +85°C(Standard)
CCR8.0MXC8

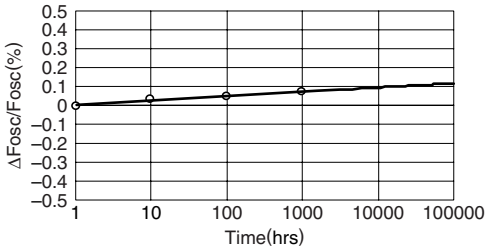


MXC7: ±0.2%/–40 to +85°C(Standard)
CCR48.0MXC7

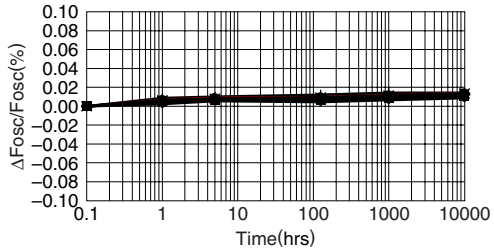


OSCILLATING FREQUENCY AGING

MUC8/MXC8: ±0.3%/10years(Standard)
CCR8.0MXC8

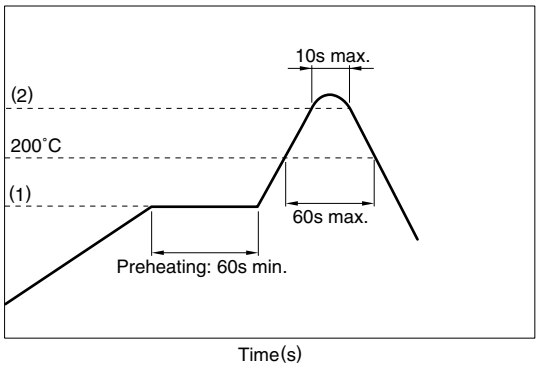


MXC7: ±0.1%/10years(Standard)
CCR48.0MXC7



RECOMMENDED SOLDERING CONDITIONS

REFLOW SOLDERING



- Sn-Pb soldering

(1) Preheat: 150 to 170°C
(2) Mainheat: 220 to 240°C

- Pb-free soldering

(1) Preheat: 180 to 200°C
(2) Mainheat: 240 to 260°C

RELIABILITY AND TEST CONDITIONS

The following test items are satisfied.
(1) Oscillating frequency change: Within ±0.25%
(2) Resonant resistance change: Within ±10Ω
(3) Appearance; serious abnormalities not to exist.

Test items	Test conditions
Low temperature storage	Temperature: –40±3°C Time: 1000h
High temperature storage	Temperature: +85±2°C Time: 1000h
Loading humidity resistance	Humidity: 90 to 95(%)RH Temperature: 60±2°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 ⟺ 55 ⟺ 10Hz/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.