

MHz RANGE CRYSTAL UNIT



FA-238V
FA-238
TSX-3225

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Product Number
FA-238V : Q22FA23V0xxxx17
FA-238 : Q22FA2380xxxx17
TSX-3225 : X1E000021xxxx17



FA-238V/FA-238



TSX-3225

- Frequency range : 12 MHz to 60 MHz(FA-238,FA-238V)
- External dimensions : 3.2 × 2.5 × 0.6 mm ---TSX-3225
: 3.2 × 2.5 × 0.7 mm ---FA-238V / FA-238
- Overtone order : Fundamental
- Applications : Mobile phone, Bluetooth, W-LAN
ISM band radio, Clock for MPU

Specifications (characteristics)

Item	Symbol	For Clock		For RF Reference	Conditions / Remarks
		FA-238V	FA-238	TSX-3225	
Nominal frequency range	f _{nom}	12.000 MHz to 15.999 MHz	16.000 MHz to 60.000 MHz	16.000 MHz to 48.000 MHz	Fundamental *1 Please contact us about available frequencies.
Storage temperature	T _{stg}	-40 C to +125 C			Storage as single product.
Operating temperature	T _{use}	-40 C to +85 C (+105 C)			Please contact us about +85 C < T _{use}
Level of drive	DL	200 μW Max.			Recommended: 1 to 100 μW
Frequency tolerance	f _{tol}	±50 × 10 ⁻⁶ (standard), (±15 × 10 ⁻⁶ to ±50 × 10 ⁻⁶ is available)		±10 × 10 ⁻⁶	+25 C Please contact us for requirements not listed in this specifications. *1
Frequency versus temperature characteristics	f _{tem}	±30 × 10 ⁻⁶ /20 C to +70 C		±10 × 10 ⁻⁶ /20 C to +75 C	Please contact us for requirements not listed in this specifications. *1
Load capacitance	CL	7 pF to ∞			Please specify.
Motional resistance (ESR)	R1	As per table below			-40 C to +85 C, DL = 100 μW
Frequency aging	f _{age}	±5 × 10 ⁻⁶ / year Max.		±1 × 10 ⁻⁶ / year Max.*2	+25 C, First year

*1 FA-238: For over 40 MHz, only the standard specification applies. *2 40 MHz ≤ f_{nom} : ±2 × 10⁻⁶ / year Max.

Motional resistance (ESR)

(FA-238V / FA-238) Frequency	Motional resistance
12.0 MHz ≤ f _{nom} ≤ 13.0 MHz	100 Ω Max.
13.0 MHz < f _{nom} < 20.0 MHz	80 Ω Max.
20.0 MHz ≤ f _{nom} < 25.0 MHz	60 Ω Max.
25.0 MHz ≤ f _{nom} < 30.0 MHz	50 Ω Max.
30.0 MHz ≤ f _{nom} ≤ 60.0 MHz	40 Ω Max.

(TSX-3225) Frequency	Motional resistance
16.0 MHz ≤ f _{nom} < 21.0 MHz	60 Ω Max.
21.0 MHz ≤ f _{nom} ≤ 48.0 MHz	40 Ω Max.

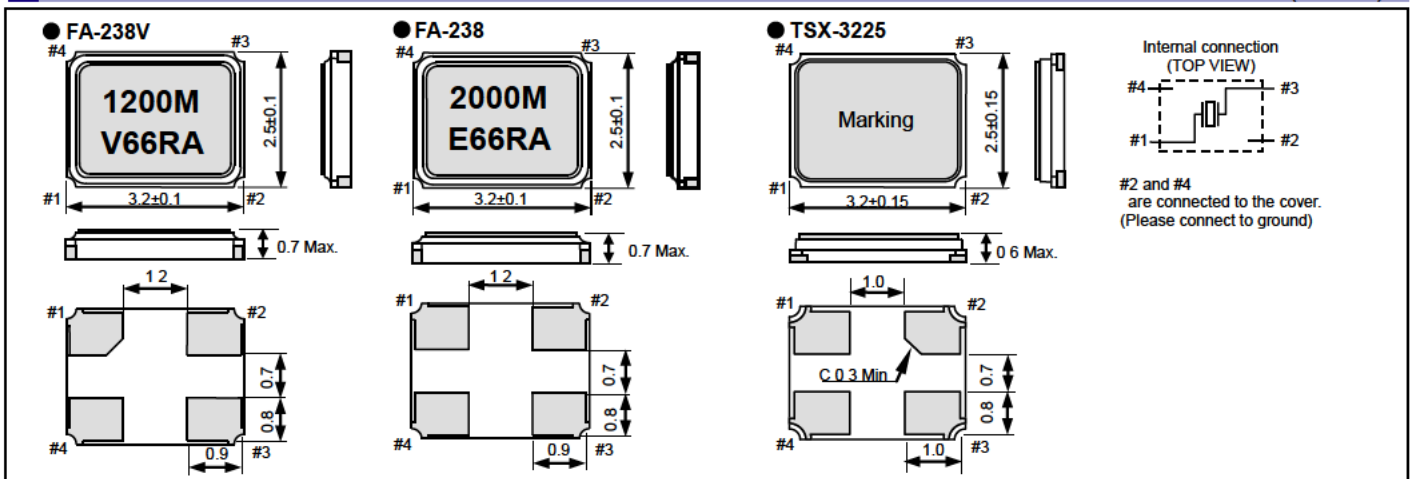
Product name FA-238V 12.000000MHz 12.0 +15.0-15.0
(Standard form) ① ② ③ ④

①Model ②Frequency ③Load capacitance(pF) ④Frequency tolerance(× 10⁻⁶, +25 C)

In addition to the above mentioned specification item, please specify frequency temperature characteristics and operating temperature range in case of inquiry.

External dimensions

(Unit:mm)



Footprint (Recommended)

(Unit:mm)

