MHz RANGE CRYSTAL UNIT

FA-238V
FA-238
TSX-3225

Pb Free
RoHS Compliant

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

- •Frequency range : 12 MHz to 50 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

FA-238V/ FA-238

TSX-3225

Specifications (characteristics)

Item	Symbol	For Clock		For RF Reference	Conditions / Remarks
		FA-238V	FA-238	TSX-3225	
Nominal frequency range	f_nom	12 MHz to 15.999 MHz	16 MHz to 50 MHz	16 MHz to 48 MHz	Fundamental *1 Please contact us about available frequencies.
Storage temperature range	T_stg	-40 °C to +125 °C			Storage as single product.
Operating temperature range	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: 10 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 below table1.		As per below table2.	-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.

Table 1. FA-238V / FA-238 Motional resistance (ESR) R1

(FA-238V / FA-238) Frequency	Motional resistance
12 MHz ≤ f_nom ≤ 13 MHz	100 Ω Max.
13 MHz < f_nom < 20 MHz	80 Ω Max.
20 MHz ≤ f_nom < 25 MHz	60 Ω Max.
25 MHz ≤ f_nom < 30 MHz	50 Ω Max.
30 MHz ≤ f_nom ≤ 50 MHz	40 Ω Max.

Table 2. TSX-3225 Motional resistance (ESR) R1

(TSX-3225) Frequency	Motional resistance
16 MHz ≤ f_nom < 21 MHz	60 Ω Max.
21 MHz ≤ f_nom ≤ 48 MHz	40 Ω Max.

Product name

Product name (Standard form)

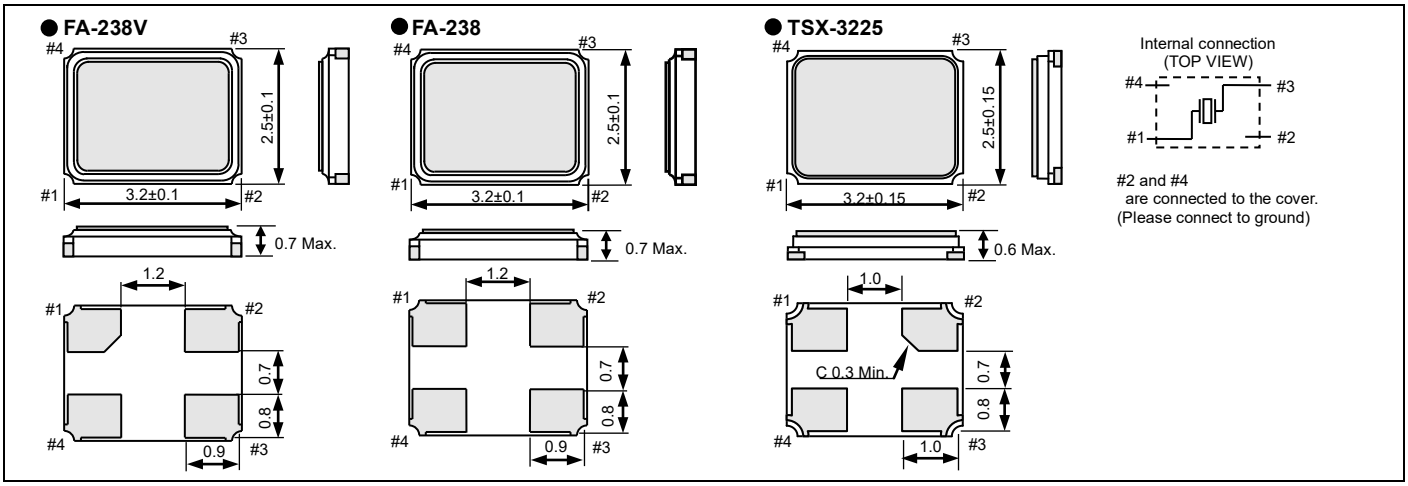
FA-238V ① 12.000000MHz ② 12.0 ③ +15.0-15.0 ④

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.

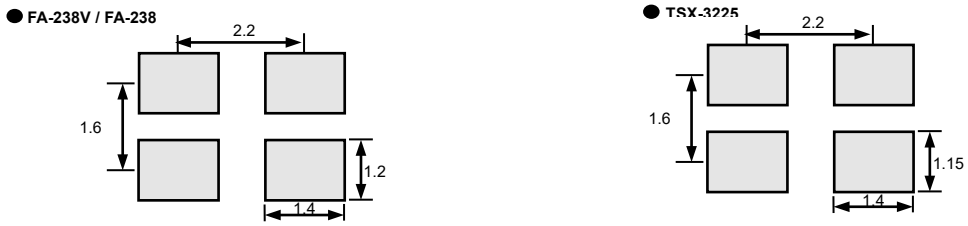
External dimensions

(Unit:mm)



Footprint (Recommended)

(Unit:mm)



►Explanation of the mark that are using it for the catalog

	►Pb free.
	►Complies with EU RoHS directive. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (Contains Pb in sealing glass, high melting temperature type solder or other.)
	►Designed for automotive general equipment.
	►Designed for automotive applications related to driving and safety.

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