



VC-TCXO/TCXO

HIGH STABILITY, CMOS OUTPUT



Product Number
 TG3225CEN : X1G005101xxxxxx
 TG2520CEN : X1G005161xxxxxx

TG3225CEN

TG2520CEN

- Output frequency : 12 MHz to 52MHz
- Supply voltage : 2.8 V Typ / 3.0 V Typ / 3.3 V Typ.
- Frequency / temperature characteristics : $\pm 2.0 \times 10^{-6}$ Max.
- External dimensions: 3.2 x 2.5 x 0.9 mm / 2.5 x 2.0 x 0.8 mm
- Applications : Reference clock for measurement machine
Wireless communication devices
(Smart meter, Telemeter, other)
- Features : High stability, CMOS output



TG3225CEN
(3.2 x 2.5 x 0.9 mm)



TG2520CEN
(2.5 x 2.0 x 0.8 mm)

Specifications (characteristics)

Item	Symbol	VC-TCXO	TCXO	Conditions / Remarks
		12 MHz to 52MHz		
Output frequency range	f _o	12MHz, 20MHz, 24MHz, 25MHz, 26MHz, 27MHz, 32MHz, 36MHz, 38.4MHz, 39MHz and 40MHz		Standard frequency
Supply voltage	V _{cc}	2.8 V $\pm 5\%$ / 3.0 V $\pm 5\%$ / 3.3 V $\pm 5\%$		Supply voltage range :2.375 V to 3.63 V
Storage temperature	T _{stg}	-40 °C to +90 °C		Storage as single product.
Operating temperature	T _{use}	G: -40 °C to +85 °C		
Frequency tolerance	f _{tol}	$\pm 2.0 \times 10^{-6}$ Max.		After reflow, +25 °C
Frequency/temperature characteristics	f _o -T _c	F: $\pm 2.0 \times 10^{-6}$ Max. / G: -40 °C to +85 °C		Standard stability version
Frequency/load coefficient	f _o -Load	$\pm 0.2 \times 10^{-6}$ Max.		15 pF $\pm 10\%$
Frequency/voltage coefficient	f _o -V _{cc}	$\pm 0.3 \times 10^{-6}$ Max.		V _{cc} $\pm 5\%$
Frequency aging	f _{age}	$\pm 1.0 \times 10^{-6}$ Max.		+25 °C, First year, 12 MHz \leq f _o \leq 20 MHz 24 MHz \leq f _o \leq 40 MHz
		$\pm 1.5 \times 10^{-6}$ Max.		+25 °C, First year, 20 MHz < f _o < 24 MHz 40 MHz < f _o \leq 52 MHz
Current consumption	I _{cc}	4.0 mA Max.		12 MHz \leq f _o \leq 26 MHz
		6.0 mA Max.		26 MHz < f _o \leq 39 MHz
		6.5 mA Max.		39 MHz < f _o \leq 52 MHz
Input resistance	R _{in}	500 k Ω Min.	-	V _c - GND (DC)
Frequency control range	f _{cont}	$\pm 8.0 \times 10^{-6}$ to $\pm 15.0 \times 10^{-6}$	-	C: V _c = 1.4 V ± 1.0 V (V _{cc} = 2.8 V) or D: V _c = 1.5 V ± 1.0 V (V _{cc} = 3.0 V) or E: V _c = 1.65 V ± 1.0 V (V _{cc} = 3.3 V)
Frequency change polarity	-	Positive polarity		-
Symmetry	SYM	45 % to 55 %		50 % V _{cc} level, L CMOS \leq 15 pF
Output voltage	V _{OH}	90 % V _{cc} Min.		
	V _{OL}	10 % V _{cc} Max.		
Start-up time	t _{str}	2.0 ms Max.		T=0 at 90% V _{cc}
Rise time / Fall time	tr/ tr	8.0 ns Max.		10 % V _{cc} to 90 % V _{cc} level, Load:15 pF
Output load condition	Load	15 pF		15 pF $\pm 10\%$

* Note : Please contact us for requirements not listed in this specification.

Product Name TG3225 CEN 39.000000MHz K E G N N M
 (Standard form) ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①Model ②Output (C: CMOS)

③Frequency ④Supply voltage (Refer to symbol table)

⑤Frequency / temperature characteristics (F: $\pm 2.0 \times 10^{-6}$ Max.)

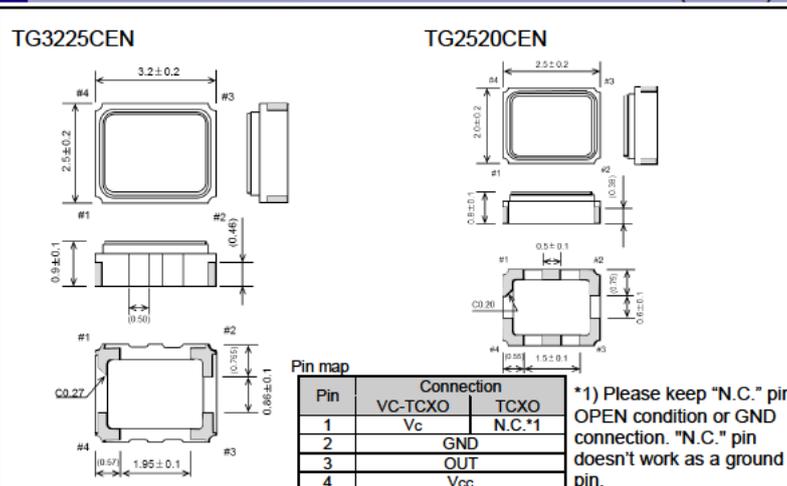
⑥Operating temperature (G: -40 °C to +85 °C)

⑦OE function (N: Non) ⑧V_c function (Refer to symbol table, A: V_c = any) ⑨Internal identification code ("M" is default)

④Supply voltage[V _{cc}] , ⑧V _c function[V _c] (Symbol table)	
Voltage [V]	V _c function [V _c] (Symbol table)
④V _{cc} (Typ.)	K: 2.5 to 3.3 C: 2.5 to 3.3 P: 2.6 to 3.3 M: 2.8 to 3.3
⑧V _c (Typ.)	N: Non C: 1.4 D: 1.5 E: 1.65

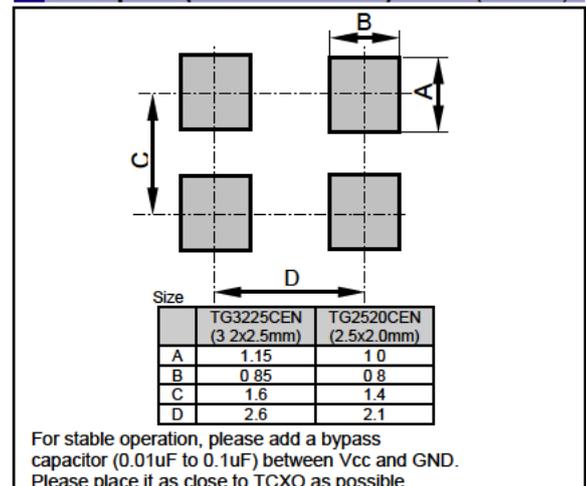
External dimensions

(Unit:mm)



Footprint (Recommended)

(Unit:mm)



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At Seiko Epson, all environmental initiatives operate under the Plan-Do-Check-Action (PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard.

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IATF 16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

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	► 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 applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
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