



VC-TCXO/TCXO

HIGH STABILITY, CMOS OUTPUT

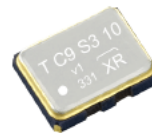


Product Number
 TG3225CEN : X1G005101xxxxxx
 TG2520CEN : X1G005161xxxxxx

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
Output frequency range	f_0	12 MHz to 52MHz 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 ₀ -T _c	F: $\pm 2.0 \times 10^{-6}$ Max. / G: -40 °C to +85 °C		Standard stability version
Frequency/load coefficient	f ₀ -Load	$\pm 0.2 \times 10^{-6}$ Max.		15 pF $\pm 10\%$
Frequency/voltage coefficient	f ₀ -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 $\leq f_0 \leq 20$ MHz 24 MHz $\leq f_0 \leq 40$ MHz
		$\pm 1.5 \times 10^{-6}$ Max.		+25 °C, First year, 20 MHz $< f_0 < 24$ MHz 40 MHz $< f_0 \leq 52$ MHz
Current consumption	I _{CC}	4.0 mA Max.		12 MHz $\leq f_0 \leq 26$ MHz
		6.0 mA Max.		26 MHz $< f_0 \leq 39$ MHz
		6.5 mA Max.		39 MHz $< f_0 \leq 52$ 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 ≤ 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

① Model ② Output (C: CMOS)

③ Frequency ④ Supply voltage (Refer to symbol table)

⑤ Frequency / temperature characteristics (F: $\pm 2.0 \times 10^{-6}$ Max.) ⑥ Operating temperature (G: -40 °C to +85 °C)

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

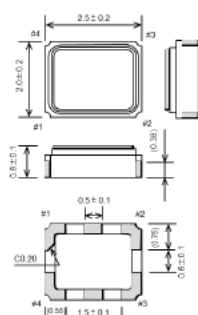
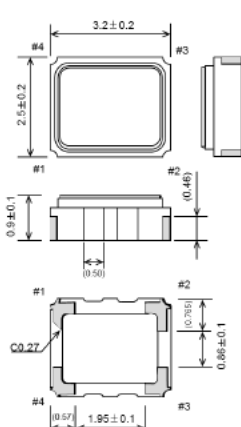
④ Supply voltage[V _{CC}] , ⑧ V _C function[V _C] (Symbol table)		⑨ Internal identification code ("M" is default)			
Voltage [V]	TCXO	VC-TCXO			
④ V _{CC} (Typ.)	K: 2.5 to 3.3	K: 2.5 to 3.3	P: 2.6 to 3.3	M: 2.8 to 3.3	
⑧ V _C (Typ.)	N: Non	C: 1.4	D: 1.5	E: 1.65	

External dimensions

(Unit:mm)

TG3225CEN

TG2520CEN



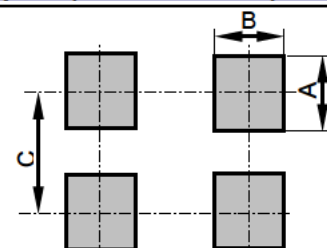
Pin map

Pin	Connection
1	V _C
2	GND
3	OUT
4	V _{CC}

*1) Please keep "N.C." pin OPEN condition or GND connection. "N.C." pin doesn't work as a ground pin.

Footprint (Recommended)

(Unit:mm)



Size	TG3225CEN (3.2x2.5mm)	TG2520CEN (2.5x2.0mm)
A	1.15	1.0
B	0.85	0.8
C	1.6	1.4
D	2.6	2.1

For stable operation, please add a bypass capacitor (0.01uF to 0.1uF) between V_{CC} and GND. Please place it as close to TCXO as possible.

PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

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.

All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

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

► 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 applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).

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