



TCXO / VC-TCXO

HIGH STABILITY, CMOS OUTPUT



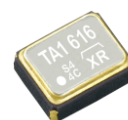
Product Number
TG3225CEN : X1G005101xxxxxx
TG2520CEN : X1G005161xxxxxx

TG3225CEN / TG2520CEN

- Output frequency : 12 MHz to 52 MHz
- 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 : $3.2 \times 2.5 \times 0.9$ mm / $2.5 \times 2.0 \times 0.8$ mm
- Applications : Reference clock for measurement machine
Wireless communication devices
(Smart meter, Telemeter, other)
- Features : High stability, CMOS output



TG3225CEN
($3.2 \times 2.5 \times 0.9$ mm)



TG2520CEN
($2.5 \times 2.0 \times 0.8$ mm)

Specifications (characteristics)

Item	Symbol	TCXO	VC-TCXO	Conditions / Remarks
Output frequency range	f_o	12 MHz to 52 MHz 12 MHz, 20 MHz, 24 MHz, 25 MHz, 26 MHz, 27 MHz, 32 MHz, 36 MHz, 38.4 MHz, 39 MHz and 40 MHz		Standard frequency
Supply voltage	V_{CC}	$2.8 \text{ V} \pm 5\%$ / $3.0 \text{ V} \pm 5\%$ / $3.3 \text{ V} \pm 5\%$		Supply voltage range: 2.375 V to 3.63 V
Storage temperature range	T_{stg}	-40°C to $+90^\circ\text{C}$		Storage as single product.
Operating temperature range	T_{use}	G: -40°C to $+85^\circ\text{C}$		
Frequency tolerance	f_{tol}	$\pm 2.0 \times 10^{-6}$ Max.		After reflow, $+25^\circ\text{C}$
Frequency/temperature characteristics	$f_o\text{-}T_c$	F: $\pm 2.0 \times 10^{-6}$ Max. / -40°C to $+85^\circ\text{C}$		Standard stability version
Frequency/load coefficient	$f_o\text{-}Load$	$\pm 0.2 \times 10^{-6}$ Max.		$15 \text{ pF} \pm 10\%$
Frequency/voltage coefficient	$f_o\text{-}V_{CC}$	$\pm 0.3 \times 10^{-6}$ Max.		$V_{CC} \pm 5\%$
Frequency aging	f_{age}	$\pm 1.0 \times 10^{-6}$ Max.		$+25^\circ\text{C}$, First year, $12 \text{ MHz} \leq f_o \leq 20 \text{ MHz}$, $24 \text{ MHz} \leq f_o \leq 40 \text{ MHz}$
		$\pm 1.5 \times 10^{-6}$ Max.		$+25^\circ\text{C}$, First year, $20 \text{ MHz} < f_o < 24 \text{ MHz}$, $40 \text{ MHz} < f_o \leq 52 \text{ MHz}$
Current consumption	I_{CC}	4.0 mA Max.		$12 \text{ MHz} \leq f_o \leq 26 \text{ MHz}$
		6.0 mA Max.		$26 \text{ MHz} < f_o \leq 39 \text{ MHz}$
		6.5 mA Max.		$39 \text{ MHz} < f_o \leq 52 \text{ MHz}$
Input impedance	Z_{in}	-	500 k Ω Min.	V_c - GND (DC)
Frequency control range	f_{cont}	-	$\pm 5.0 \times 10^{-6}$ Min.	C: $V_c = 1.4 \text{ V} \pm 1.0 \text{ V}$ ($V_{CC} = 2.8 \text{ V}$) or D: $V_c = 1.5 \text{ V} \pm 1.0 \text{ V}$ ($V_{CC} = 3.0 \text{ V}$) or E: $V_c = 1.65 \text{ V} \pm 1.0 \text{ V}$ ($V_{CC} = 3.3 \text{ V}$)
Frequency change polarity	f_{cp}	-	Positive polarity	
Symmetry	SYM	45 % to 55 %		50 % V_{CC} level, $L_{CMOS} \leq 15 \text{ pF}$
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/tf	8.0 ns Max.		10 % V_{CC} to 90 % V_{CC} level, Load: 15 pF
CMOS load condition	L_{CMOS}	15 pF		$15 \text{ pF} \pm 10\%$

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

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

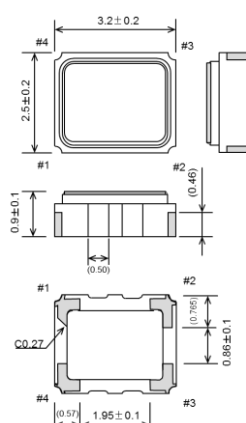
- ① Model ② Output (C: CMOS)
 ③ Frequency ④ Supply voltage (Refer to symbol table)
 ⑤ Frequency / temperature characteristics (F: $\pm 2.0 \times 10^{-6}$ Max.)
 ⑥ Operating temperature (G: -40°C to $+85^\circ\text{C}$)
 ⑦ OE function (N: Non) ⑧ Vc function (Refer to symbol table, A: $V_c = \text{any}$) ⑨ Internal identification code ("M" is default)

④ Supply voltage [V_{CC}] , ⑧ Vc function [V_c] (Symbol table)					
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	

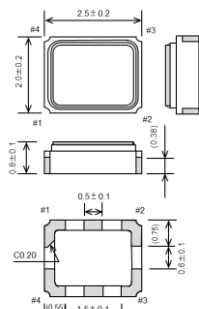
External dimensions

(Unit: mm)

TG3225CEN



TG2520CEN



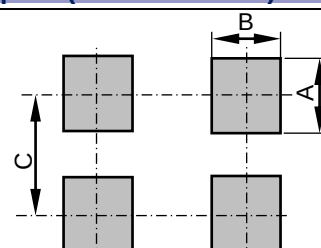
Pin map

Pin	Connection	
	TCXO	VC-TCXO
1	N.C.*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 ($3.2 \times 2.5 \text{ mm}$)	TG2520CEN ($2.5 \times 2.0 \text{ mm}$)
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 (0.01 μF to 0.1 μF) 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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	► 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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