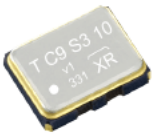
VC-TCXO/TCXO
HIGH STABILITY, CMOS OUTPUT

Pb Free RoHS Compliant

Product Number
TG3225CEN : X1G005101xxxxxx
TG2520CEN : X1G005161xxxxxx

TG3225CEN
TG2520CEN



TG3225CEN
(3.2 × 2.5 × 0.9 mm)

TG2520CEN
(2.5 × 2.0 × 0.8 mm)

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

Specifications (characteristics)

Item	Symbol	VC-TCXO	TCXO	Conditions / Remarks
Output frequency range	f0	12 MHz to 52MHz		
		12MHz, 20MHz, 24MHz, 25MHz, 26MHz, 27MHz, 32MHz, 36MHz, 38.4MHz, 39MHz and 40MHz		Standard frequency
Supply voltage	Vcc	2.8 V ±5 % / 3.0 V ±5 % / 3.3 V ±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	±2.0 × 10^{-6} Max.		After reflow, +25 C
Frequency/temperature characteristics	f0-Tc	F: ±2.0 × 10^{-6} Max. / G: -40 C to +85 C		Standard stability version
Frequency/load coefficient	f0-Load	±0.2 × 10^{-6} Max.		15 pF ±10 %
Frequency/voltage coefficient	f0-Vcc	±0.3 × 10^{-6} Max.		Vcc ± 5 %
Frequency aging	f_age	±1.0 × 10^{-6} Max.		+25 C, First year, 12 MHz≤ f0 ≤20 MHz 24 MHz≤ f0 ≤40 MHz
		±1.5 × 10^{-6} Max.		+25 C ,First year, 20 MHz< f0< 24 MHz 40 MHz< f0 ≤52 MHz
Current consumption	Icc	4.0 mA Max.		12 MHz ≤ f0 ≤ 26 MHz
		6.0 mA Max.		26 MHz <f0 ≤ 39 MHz
		6.5 mA Max.		39 MHz <f0 ≤ 52 MHz
Input resistance	Rin	500 kΩ Min.	-	Vc - GND (DC)
Frequency control range	f_cont	±8.0 × 10^{-6} to ±15.0 × 10^{-6}	-	C: Vc =1.4 V ±1.0 V (Vcc =2.8 V) or D: Vc =1.5 V ±1.0 V (Vcc =3.0 V) or E: Vc =1.65 V ±1.0 V (Vcc =3.3 V)
Frequency change polarity	-	Positive polarity	-	
Symmetry	SYM	45 % to 55 %		50 % Vcc level, L CMOS ≤ 15 pF
Output voltage	VOH	90 % Vcc Min.		
	VOL	10 % Vcc Max.		
Start-up time	t_str	2.0 ms Max.		T=0 at 90% Vcc
Rise time / Fall time	tr/ tf	8.0 ns Max.		10 % Vcc to 90 % Vcc level, Load:15 pF
Output load condition	Load	15 pF		15 pF ±10 %

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

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

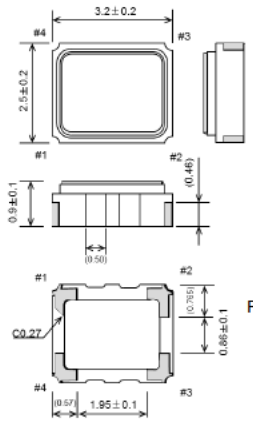
①Model ②Output (C: CMOS)
③Frequency ④Supply voltage (Refer to symbol table)
⑤Frequency / temperature characteristics (F: ±2.0 × 10^{-6} Max.) ⑥Operating temperature (G: -40 C to +85 C)
⑦OE function (N: Non) ⑧Vc function(Refer to symbol table , A: Vc =any) ⑨Internal identification code ("M" is default)

④Supply voltage[Vcc] ,⑧Vc function[Vc] (Symbol table)

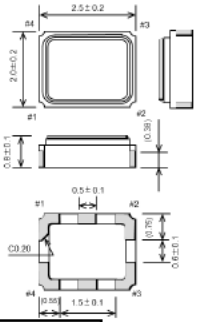
Voltage [V]	TCXO	VC-TCXO		
④Vcc (Typ.)	K: 2.5 to 3.3	K: 2.5 to 3.3	P: 2.6 to 3.3	M: 2.8 to 3.3
⑧Vc (Typ.)	N: Non	C: 1.4	D: 1.5	E: 1.65

External dimensions (Unit:mm)

TG3225CEN



TG2520CEN

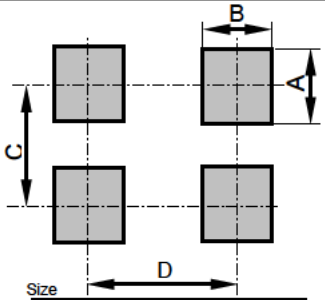


Pin map

Pin	Connection VC-TCXO	Connection TCXO
1	Vc	N.C.*1
2	GND	
3	OUT	
4	Vcc	

*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 Vcc 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.

WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs, Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired IATF 16949 certification that is requested strongly by major automotive manufacturers as standard.

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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