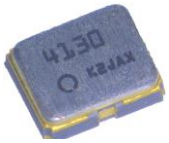
TCXO / VC-TCXO / TCXO-Standby For Automotive 105 ºC High temperature range

Product Number (Please contact us)
TG2016SKA : X1G005371xxxx16

TG2016SKA

- Output frequency : 13 MHz to 55 MHz
- Supply voltage : 1.8 V Typ. / 3.3 V Typ.
- Frequency / temperature characteristics : ±0.5 × 10^{-6} Max. (-40 °C to +105 °C)
- External dimensions : 2.0 × 1.6 × 0.7 mm Max.
- Applications : GNSS for Automotive, V2X (TCU, DSRC)*
- Features : Low noise, 105 ºC High temp, Stand-by function ($\overline{ST}$)
- AEC-Q100 compliant



TG2016SKA

(2.0 × 1.6 × 0.7 mm)

* GNSS: Global Navigation Satellite System V2X: Vehicle to Everything TCU: Telematics control unit DSRC: Dedicated Short Range Communication

Specifications (characteristics)

Item	Symbol	TCXO	VC-TCXO	TCXO-Standby	Conditions / Remarks
Output frequency range	fo	13 MHz to 55 MHz			
		26 MHz, 49.58 MHz			Standard frequency
Supply voltage	V_{CC}	1.8 V ± 0.1 V / 3.3 V ± 5 %			Supply voltage range: 1.7 V to 3.63 V
Storage temperature range	T_stg	-55 °C to +125 °C			Storage as single product.
Operating temperature range	T_use	H: -40 °C to +105 °C			Standard
Frequency tolerance	f_tol	±2.0 × 10^{-6} Max.			After 3 times reflow, +25 °C
Frequency/temperature Characteristics	fo-Tc	C: ±0.5 × 10^{-6} Max.			Standard stability version
Frequency/load coefficient	fo-Load	±0.2 × 10^{-6} Max.			10 kΩ // 10 pF ± 10 %
Frequency/voltage coefficient	fo-V_{CC}	±0.2 × 10^{-6} Max.			V_{CC} ± 5 %
Frequency aging	f_age	±1.0 × 10^{-6} Max.			+25 °C, First year, 13 MHz ≤ fo ≤ 20 MHz, 26 MHz ≤ fo ≤ 40 MHz
		±1.5 × 10^{-6} Max.			+25 °C, First year, 20 MHz < fo < 26 MHz 40 MHz < fo ≤ 55 MHz
Current consumption	I_{CC}	2.0 mA Max.			13 MHz ≤ fo ≤ 40 MHz
		2.5 mA Max.			40 MHz < fo ≤ 55 MHz
Input resistance	Zin	-	500 kΩ Min.	-	Vc - GND (DC)
Frequency control range	f_cont	-	±5.0 × 10^{-6} Min.	-	B: Vc = 0.9 V ± 0.6 V (V_{CC} = 1.8 V) or E: Vc = 1.65 V ± 1.0 V (V_{CC} = 3.3 V)
Frequency change polarity	f_cp	-	Positive polarity	-	
Stand-by current	I_std	-		10 µA Max.	$\overline{ST}$ = GND
Input voltage	V_{IH}	-		80 % V_{CC} Min.	$\overline{ST}$ terminal
	V_{IL}	-		20 % V_{CC} Max.	
Symmetry	SYM	40 % to 60 %			GND level (DC cut)
Output voltage	Vpp	0.8 V Min.			Peak to Peak
Start-up time	t_str	2.0 ms Max.			t = 0 at 90 % V_{CC}
Output load	Load_R	10 kΩ			DC cut capacitor = 0.01 µF
	Load_C	10 pF			
G-sensitivity	Gs	1.5 × 10^{-9} / G Max.			30 Hz to 3 kHz, sinewave, 3axes

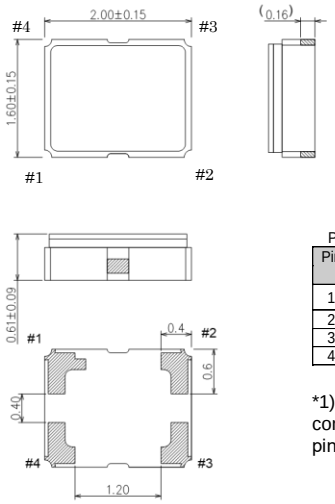
* Note : Please contact us for requirements not listed in this specification.

Product Name (Standard form): TG2016 SKA 26.000000MHz E C H N N M
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①Model (TG2016) ②Output (S: Clipped sine wave)
③Frequency ④Supply voltage (Refer to symbol table)
⑤Frequency / temperature characteristics (C: ±0.5 × 10^{-6} Max.)
⑥Operating temperature (H: -40 °C to +105 °C) ⑦ST function (N: Non, S: Standby)
⑧Vc function (Refer to symbol table) ⑨Internal identification code

④Supply voltage[V_{CC}] ⑧Vc function[Vc] (Symbol table)			
Voltage [V]	TCXO	VC-TCXO	
④V_{CC} (Typ.)	E: 1.8 C: 3.3	E: 1.8	C: 3.3
⑧Vc (Typ.)	N: Non	B: 0.9	E: 1.65

External dimensions (Unit: mm)

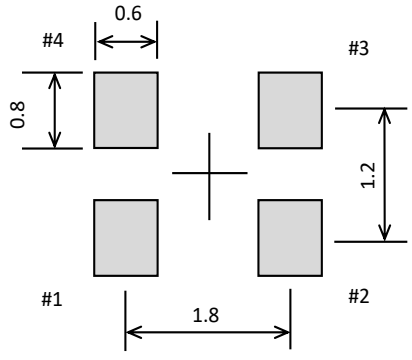


Pin map

Pin	Connection		
	TCXO	VC-TCXO	TCXO-Standby
1	N.C.*1	Vc	$\overline{ST}$
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)



To maintain stable operation, provide a 0.01 µF to 0.1 µF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between V_{CC} - GND).

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).