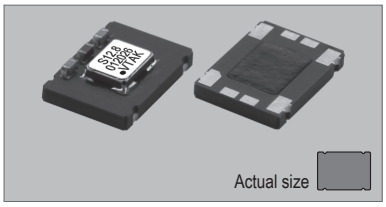
Temperature Compensated Crystal Oscillators

TCXO or VC-TCXO | ±0.1 or ±0.28 ppm | 10 to 40 MHz | 5.0x3.2 & 7.0x5.0 mm | +2.7 to +5.5 V | CMOS or CLIPPED SINE

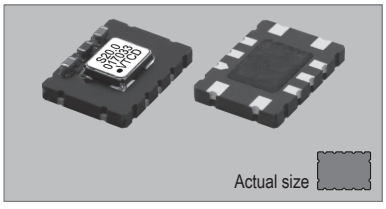
SXO-9000 SERIES (+2.7V to +5.0V FIXED MODELS) 5.0x3.2 mm 7.0x5.0 mm — STANDARD SMD TCXO

SXO-9000C



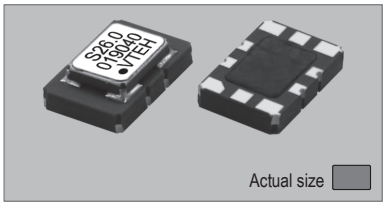
0.125 gm (wt.)

SXO-9000D



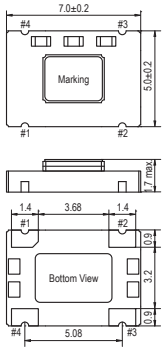
0.125 gm (wt.)

SXO-9000E

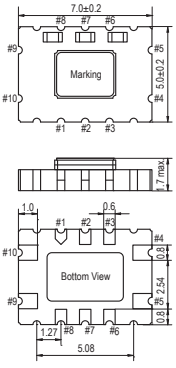


0.07 gm (wt.)

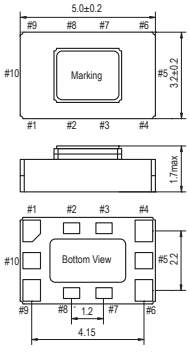
SXO-9000C (4-pads)



SXO-9000D (10-pads)



SXO-9000E (10-pads)



PIN CONNECTION SXO-9000C

PIN	CONNECTION	
	TCXO	VC-TCXO
1	NC or GND	Vcon
2	GND	GND
3	OUTPUT	OUTPUT
4	+V DC	+V DC

SXO-9000D

PIN	CONNECTION	
	TCXO	VC-TCXO
1	NC or GND	NC or GND
2	NC or GND	NC or GND
3	NC or GND	NC or GND
4	GND	GND
5	OUTPUT	OUTPUT
6	NC or GND	NC or GND
7	NC or GND	NC or GND
8	E/D	E/D
9	+V DC	+V DC
10	NC or GND	Vcon

SXO-9000E

PIN	CONNECTION	
	TCXO	VC-TCXO
1	NC or GND	Vcon
2	NC or GND	NC or GND
3	E/D	E/D
4	GND	GND
5	NC or GND	NC or GND
6	OUTPUT	OUTPUT
7	Output, no filter (100Ω to 2pF)	Output, no filter (100Ω to 2pF)
8	NC or GND	NC or GND
9	+V DC	+V DC
10	NC or GND	NC or GND

STANDARD SPECIFICATIONS

- FEMTOCELL APPLICATION
- CMOS or CLIPPED SINE WAVEFORM
- PACKAGE SIZE 5.0x3.2 mm or 7.0x5.0 mm

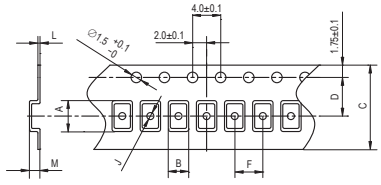
Item		Specifications			
General part number		SXO-9000C-CS*1 SXO-9000D-CS SXO-9000E-CS	SXO-9000C-CSV*1 SXO-9000D-CSV SXO-9000E-CSV	SXO-9000C-CM*1 SXO-9000D-CM SXO-9000E-CM	SXO-9000C-CMV*1 SXO-9000D-CMV SXO-9000E-CMV
Frequency range		10.000 MHz to 40.000 MHz			
Initial frequnecy tolerance at +25°C ±2°C		±1.5 ppm max. (after 2 times of reflow soldering)			
Output waveform		Clipped Sine OUTPUT		CMOS OUTPUT	
TCXO or VC-TCXO		TCXO	VC-TCXO	TCXO	VC-TCXO
Frequency Stability	Temperature range	KK2 : ±0.1 ppm max. over −10°C to +70°C (referred to +25°C)*2			
		QQ2 : ±0.28 ppm max. over −40°C to +85°C (referred to +25°C)*2			
	Input voltage change	±0.2 ppm max. at V_{DD} ±5% DC			
	Output load change	±0.1 ppm max. at load ±10%			
	Aging (Stratum 3)	±4.6 ppm max. at +40°C for 20 years including overall freq. stability			
Operating Conditions	Operating temperature	−10°C to +70°C (S1 = Standard 1) −40°C to +85°C (S2 = Standard 2)			
	Supply voltage (V_{DD})	+2.7V to +5.5V DC ±5%			
	Control voltage (Vcon)	n.a.	+1.65V ± 1.65V	n.a.	+1.65V ± 1.65V
Absolute Max. Ratings	Supply voltage	−0.6V to +6.0V DC			
	Vcontrol voltage (Vcon)	n.a.	−0.6V to V_{DD} +0.6V DC	n.a.	−0.6V to V_{DD} +0.6V DC
	Storage temperature	−40°C to +85°C			
Input current		3 mA max.		5 mA max.	
Output (−40°C to +85°)	Symmetry	n.a.		45% to 55% at 1/2 V_{DD} level	
	Rise and fall times	n.a.		5 ns max. (10% to 90% V_{DD} level)	
	Level	0.8 Vp-p min.		V_{OL} = 10% V_{DD} max. V_{OH} = 90% V_{DD} min.	
	Load	10 kΩ // 10 pF		15 pF max.	
	Waveform	Clipped sine wave*3		CMOS	
Frequency adjustment voltage control (1/2 V_{DD} ±1/2 V_{DD})		n.a.	±5 ppm to ±20 ppm	n.a.	±5 ppm to ±15 ppm
Holdover		±5 ppb / day, ±20 ppb / 168 hours (7 days)			
Frequency slope		n.a.	Positive	n.a.	Positive
Harmonic distortion		−5 dBc max.			
Start-up time		3.5 ms max.			
SSB phase noise (20.000 MHz)		−140 dBc / Hz, Typical at 1 kHz offset			
Vcon input impedance		n.a.	100 kΩ min.	n.a.	100 kΩ min.
Short-term frequency stability		±1 ppb max. (Allan variance Tau = 0.1 sec.)			
IR reflow resistance		±1 ppm max. (referred to frequency before reflow)			
Reflow condition		+250°C ±10°C for 10 seconds +170°C ±10°C for 1 to 2 minutes (preheating)			
Standard frequencies (MHz)		10.000, 12.800, 19.200, 19.440, 20.000, 20.480, 24.576, 26.000, 30.720			
Optional Operating Temperature*4	Low limit / Symbol	−10°C / g	−15°C / h	−20°C / i	−25°C / j	−30°C / k	−35°C / l	−40°C / m
	High limit / Symbol	+55°C / ff	+60°C / gg	+65°C / hh	+70°C / ii	+75°C / jj	+80°C / kk	+85°C / ll

(*1) Final part number to be assigned with package type, TCXO or VC-TCXO, frequency stability, input voltage and frequency.
e.g. SXO-9000CMV-QQ2-3.3V-26MHz
(*2) V_{con} = 1/2V_{DD} DC for SXO-9000C/D/E-CSV & CMV.
(*3) DC-cut for SXO-9000C & SXO-9000D. DC coupling for SXO-9000E.
(*4) Select "low limit" and "high limit" for new operating temperature combination from the lists.

PACKAGE DATA

Item \ Package	SXO-9000
Lid	Metal
Base	Ceramic
Sealing	Seam
Terminal	Tungsten (metalized)
Terminal plating	Gold / Nickel (surface) / (under)
RoHS	Compliant (Pb-free)

TAPE SPECIFICATIONS



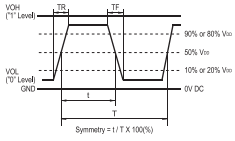
SXO-9000C & SXO-9000D

A	B	C	D	F	J	L	M	Reel Dia.	Qty/Reel
8.2	5.8	16.0	7.5	8.0	1.6	0.3	2.16	254	1000pcs (100pcs)

SXO-9000E

A	B	C	D	F	J	L	M	Reel Dia.	Qty/Reel
5.9	3.7	12.0	5.5	8.0	1.6	0.3	2.00	254	1000pcs (100pcs)

OUTPUT WAVEFORM

Clipped Sine Output

CMOS Output