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With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

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CRYSTAL OSCILLATOR (SPXO)

OUTPUT: CMOS, TTL

SG-636 series

•Frequency range : 2.21675 MHz to 135 MHz

 Supply voltage : 2.5 V Typ. / 3.3 V Typ. / 5.0 V Typ. Output enable(OE) or Standby(ST) Function •External dimensions : $10.5 \times 5.8 \times 2.7$ mm (t: Max.)



Product Number (please contact us) SG-636 : Q33636xx2xxxx00



Actual size

SG-636 series



Specifications (characteristics)

			2 15 11		
Item			Specifications		
	Symbol	SG-636 PTF	SG-636 PCE	SG-636 PDE	Conditions / Remarks
			SG-636 SCE		
Output frequency range	fo	2.21675 MHz	2.21675 MHz	2.21675 MHz	Please contact us about available frequencies
		to 41.000 MHz	to 40.000 MHz	to 40.000 MHz	
Supply voltage	Vcc	5.0 V ±0.5 V	3.3 V ±0.3 V	2.5 V ±0.25 V	
Storage temperature	T_stg		-55 °C to +100 °C		Storage as single product.
Operating temperature	T_use		-20 °C to +70 °C		
Frequency tolerance	f_tol		C: ±100 × 10 ⁻⁶		-20 °C to +70 °C
Current consumption	Icc	17 mA Max.	9 mA Max.	5 mA Max.	No load condition
Disable current	I_dis	10 mA Max.	5 mA Max.	3 mA Max.	OE=GND
Stand-by current	I_std	_	2 μA Max.	_	ST =GND(SCE)
Cummetry	SYM	40 % to 60 % 45 % to 55 %			CMOS load:50 % Vcc level
Symmetry	STIVI	45 % to 55 %			TTL load: 1.4 V level
Output voltage	Vон	Vcc-0.4 V Min.			IOH=-8 mA(PTF) / -4 mA(SCE,PCE) /
					-3.2 mA(PDE)
	Vol	0.4 V Max.			loL=16 mA(PTF) / 4 mA(SCE,PCE) / 3.2 mA(PDE)
Output load condition (TTL)	L_TTL	10 TTL Max. —		L_CMOS ≤ 15 pF	
Output load condition (CMOS)	L_CMOS	50 pF Max.	30 pF Max.	15 pF Max.	
Input voltage	VIH	2.0 V Min.	80 % Vcc Min.		OE Terminal or ST Terminal (SCE)
	VIL	0.8 V Max.	20 % Vcc Max.		
Rise time / Fall time	tr / tf	7 ns Max.	5 ns Max.		CMOS load:20 % Vcc to 80 % Vcc level
		5 ns Max.	-		TTL load:0.4 V to 2.4 V level
Start-up time	t_str	4 ms Max.	4 ms Max.		Time at minimum supply voltage to be 0 s
Frequency aging	f_aging	$\pm 5 \times 10^{-6}$ / year Max.		+25 °C, Vcc=5.0 V/3.3 V/2.5 V, First year	

Specifications (characteristics)

Specifications (characteristics)					
Item	Symbol	Specifications			
		SG-636 PTG	SG-636 PHG	SG-636 PCG SG-636 SCG	Conditions / Remarks
Output frequency range	fo	2.21675 MHz to 33.000 MHz *1		Please contact us about available frequencies.	
Supply voltage	Vcc	4.5 V to 5.5 V		2.7 V to 3.6 V	
Storage temperature	T_stg	-55 °C to +100 °C		Storage as single product.	
Operating temperature	T_use	-20 °C to +70 °C			
Frequency tolerance	f_tol	B: $\pm 50 \times 10^{-6}$ C: $\pm 100 \times 10^{-6}$		10 ⁻⁶	-20 °C to +70 °C
Current consumption	Icc	25 mA Max.		12 mA Max.	No load condition
Disable curren	I_dis	20 mA Max.		10 mA Max.	OE=GND (PTG,PHG,PCG)
Stand-by current	I_std	_		50 μA Max.	ST =GND (SCG)
Symmetry	SYM	— 45 % to 55 %		50 % Vcc level, L_CMOS=25 pF	
Symmetry	OTIVI	40 % to 60 %		1.4 V level, L_CMOS=25 pF	
	Vон	2.4 V Min.	-	Vcc-0.4 V Min.	IOH=-8 mA
Output voltage		_	Vcc-0.4 V Min.	_	IOH=-16 mA
	Vol	— 0.4 V Max.		loL=8 mA	
		0.4 V Max. —		loL=16 mA	
Output load condition	L_CMOS	25 pF Max.			
Input voltage	VIH	2.0 V Min.		70 % Vcc Min.	OE Terminal or ST Terminal
	VIL	0.8 V Max.		20 % Vcc Max.	
Rise time / Fall time	tr / tr	_	3.4 ns Max.	4 ns Max.	20 % Vcc to 80 % Vcc level, L_CMOS ≤ 25 pF
	ti / ti	2.4 ns Max.			TTL load:0.4 V to 2.4 V level, L_CMOS ≤ 25 pF
Start-up time	t_str	12 ms Max.			t=0 at 90 % Vcc
Frequency aging	f_aging	±5 × 10 ⁻⁶ / year Max.			+25 °C, Vcc=5.0 V/ 3.3 V, First year

 $^{^{*}1}$ 4.1250 MHz < fo < 4.4336 MHz, 8.2500 MHz < fo < 8.8672 MHz, 16.500 MHz < fo < 17.7344 MHz : Unavailable



Specifications (characteristics)

ltem	Cumbal	Specifications			Conditions / Remarks
	Symbol	SG-636 PTW / STW	SG-636 PHW / SHW	SG-636 PCW / SCW	Conditions / Hemarks
Output frequency range	fo	32.001 MHz to 135.000 MHz			Please contact us about available frequencies.
Supply voltage	Vcc	5.0 V	±0.5 V	3.3 V ±0.3 V	
Storage temperature	T_stg		-55 °C to +100 °C		Storage as single product.
Operating temperature	T_use	-20 °C to +70 °C			
Frequency tolerance	f_tol	B: ±50 × 10 ° C : ±100 × 10 ° (40 MHz < f ₀ ≤ 135 MHz)			-20 °C to +70 °C
Current consumption	Icc	45 mA Max.		28 mA Max.	No load condition(Max. frequency range)
Disable current	I_dis	30 mA Max.		16 mA Max.	OE=GND (PTW,PHW,PCW)
Stand-by current	I_std	50 μA Max.		ST =GND (STW,SHW,SCW)	
Cummetry	SYM	— 40 % to 60 %		50 % Vcc level, L_CMOS=Max.	
Symmetry	STIVI	40 % to 60 %			1.4 V level, L_CMOS=Max.
Output voltage	Vон	Vcc-0.4 V Min.			IOH=-16 mA(PTW, STW, PHW, SHW) /-8 mA(PCW, SCW)
	Vol	0.4 V Max.			loL= 16 mA(PTW , STW , PHW , SHW) /8 mA(PCW , SCW)
Output load condition (TTL)	L_TTL	5 TTL Max.	_	_	f₀ ≤ 90 MHz, Max. Supply voltage.
Output load condition (CMOS)	L_CMOS	15 pF Max.			Max. frequency, Max. Supply voltage.
Input voltage	VIH	2.0 V Min. 70 % Vcc Min.		OE Terminal or \$\overline{87}\$ Terminal	
	VIL	0.8 V Max. 20 % Vcc Max.			
Rise time / Fall time	tr / tr	— 4 ns Max.			20 % Vcc to 80 % Vcc level, L_CMOS ≤ Max.
	tr / ti	4 ns Max.	_	_	0.4 V to 2.4 V level
Start-up time	t str	10 ms Max.			Time at minimum supply voltage to be 0 s
Frequency aging	f aging	$\pm 5 \times 10^{-6}$ / year Max.			+25 °C, Vcc=5.0 V / 3.3 V, First year

^{*2} SG-636 series "C" tolerance : 40 MHz<fo≤135 MHz

Product Name (Standard form) SG-636 P T W 135.000000MHz B <u> 2</u>3 4

①Model ②Function (P: Output enable, S:Standby)

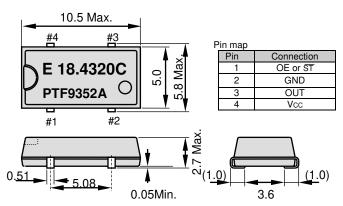
⑤Frequency tolerance

③Supply voltage		
D	2.5 V Typ.	
С	3.3 V Typ.	
T,H	5.0 V Typ.	

⑤Frequency tolerance		
В	±50 × 10 ⁻⁶ / -20 to +70°C	
С	±100 × 10 ⁻⁶ / -20 to +70°C	

External dimensions



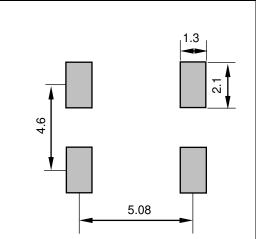


The metal case inside of the molding compound may be exposed on the top or bottom of this product. This purely cosmetic and does not have any effect on quality, reliability or electrical specs. Note.

- OE pin (PTF,PCE,PDE,PTW,PHW,PCW,PTG,PHG,PCG)
- OE pin = "H" or "open": Specified frequency output.
 OE pin = "L": Output is high impedance.

- ST pin (STW, SHW, SCW,SCG)
 ST pin = "H" or "open" : Specified frequency output.
 ST pin = "L" : Output is low level (weak pull down),oscillation stops.
- \$\overline{ST} \text{ pin (SCE)} \\
 \overline{ST} \text{ pin = "H" or "open" : Specified frequency output.} \\
 ST \text{ pin = "L" : Output is low level ,oscillation stops.}
 \end{align*

Footprint (Recommended)



To maintain stable operation, provide a 0.01uF to 0.1uF by-pass capacitor at a location as near as $\frac{1}{2}$ possible to the power source terminal of the crystal product (between Vcc - 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 ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

ISO/TS16949 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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