

CRYSTAL OSCILLATOR (SPXO)

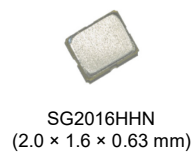
OUTPUT : HCSL



Product Number
 SG2016HHN: X1G006231xxxx15
 SG2520HHN: X1G005931xxxx15

SG2016HHN / SG2520HHN

- Frequency range : 25 MHz to 500 MHz
- Supply voltage : 2.5 V Typ. / 3.3 V Typ.
- Frequency tolerance : $\pm 20 \times 10^{-6}$
- Operating temperature : -40 °C to +85 °C, -40 °C to +105 °C
- Function : Output enable (OE) or Standby (\overline{ST})
- Phase jitter : 90 fs Max. (100 MHz < fo ≤ 156 MHz, Vcc = 2.5 V, 3.3 V)
- PCIe Gen5,6 Jitter specification compliant



Specifications (characteristics)

Item	Symbol	Specifications	Conditions / Remarks
Output frequency range	fo	25 MHz to 500 MHz	Please contact us for available frequencies.
Supply voltage	Vcc	D: 2.5 V ± 5 %, C: 3.3 V ± 5 %	
Storage temperature range	T_stg	-55 °C to +125 °C	
Operating temperature range	T_use	G: -40 °C to +85 °C, H: -40 °C to +105 °C	
Frequency tolerance	f_tol	C: $\pm 20 \times 10^{-6}$ Max.	Includes initial frequency tolerance, frequency / temperature characteristics, frequency / voltage coefficient and 10 years aging (+25 °C)
Current consumption	Icc	35 mA Max. 40 mA Max.	25 MHz ≤ fo < 212 MHz 212 MHz ≤ fo < 500 MHz
Disable current	I_dis	25 mA Max. 30 μA Max.	OE = GND \overline{ST} = GND, T_use Max. = +85 °C
Stand-by current	I_std	60 μA Max.	\overline{ST} = GND, T_use Max. = +105 °C
Symmetry	SYM	45 % to 55 %	At output crossing point
Output voltage	VOH	0.5 V to 0.7 V	25 MHz ≤ fo < 212 MHz
		0.4 V to 0.65 V	212 MHz ≤ fo < 500 MHz
	VOL	0.6 V to 0.8 V	25 MHz ≤ fo < 212 MHz
		0.5 V to 0.75 V	212 MHz ≤ fo < 500 MHz
Differential swing	Vsw	0.7 V to 1.4 V 0.8 V to 1.6 V	Output option: A Output option: B
Crossing voltage	Vcr	0.25 V to 0.55 V	
Rise time / Fall time	tr/tf	0.7 ns Max.	20 % - 80 % (VOH - VOL)
Differential output rise slew rate / fall slew rate	Rr/Rf	2 V/ns to 10 V/ns	Between -0.15 V and 0.15 V of differential output
Output load condition	L_HCSL	50 Ω	
Input voltage	VIH	70 % Vcc Min.	OE or \overline{ST} terminal
	VIL	30 % Vcc Max.	
Output enable time	tsta_oe	500 ns Max.	t = 0 at OE = 70 % Vcc
	tsta_st	10 ms Max.	t = 0 at \overline{ST} = 70 % Vcc
Output disable time	tstp_oe	100 ns Max.	t = 0 at OE = 30 % Vcc
	tstp_st	100 ns Max.	t = 0 at \overline{ST} = 30 % Vcc
Start-up time	t_str	10 ms Max.	t = 0 at 90 % Vcc
Phase jitter	tpj	200 fs Max.	25 MHz ≤ fo < 100 MHz
		90 fs Max.	100 MHz ≤ fo ≤ 156 MHz
		70 fs Max.	156 MHz < fo ≤ 212 MHz
		60 fs Max.	212 MHz < fo ≤ 391 MHz
		50 fs Max.	391 MHz < fo ≤ 500 MHz
Jitter	tc-c	60 ps Max.	Cycle to cycle jitter (Peak to Peak)
PCIe jitter limits for CC architecture	-	0.1 ps Max.	For PCIe Gen5
		0.06 ps Max.	For PCIe Gen6

Product name

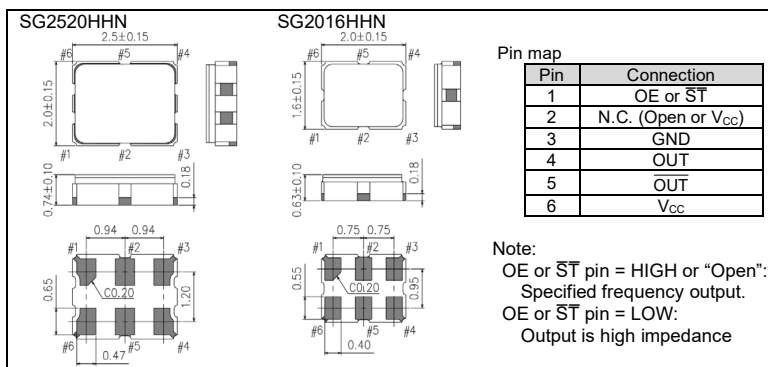
Product Name SG2016HHN 100.000000MHz C C H P Z A
 (Standard form) a b c d e f g h i

- a: Model b: Output (H: HCSL) c: Frequency d: Supply voltage e: Frequency tolerance
 f: Operating temperature g: Function h: Output disable type (Z: High impedance) i: Output option

d: Supply voltage	e: Freq. tolerance	f: Operating temp.	g: Function	i: Output option
C 3.3 V Typ.	C $\pm 20 \times 10^{-6}$	G -40 °C to +85 °C	P OE	A Vsw = 0.7 V to 1.4 V
D 2.5 V Typ.		H -40 °C to +105 °C	S \overline{ST}	B Vsw = 0.8 V to 1.6 V

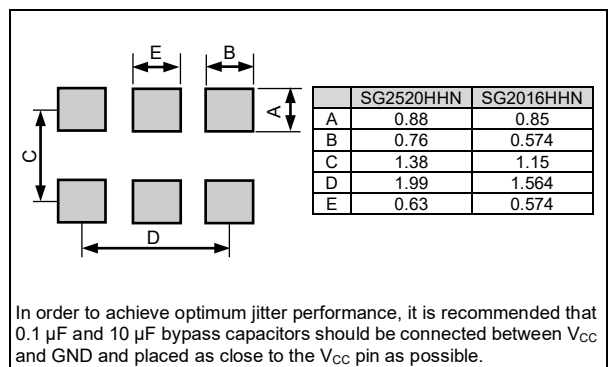
External dimensions

(Unit:mm)



Footprint (Recommended)

(Unit:mm)



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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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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