

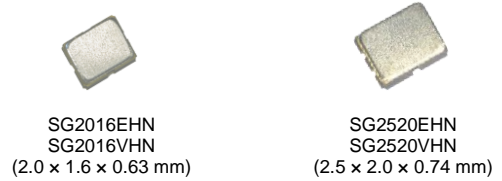
CRYSTAL OSCILLATOR (SPXO)
OUTPUT : LV-PECL, LVDS



Product Number
SG2016EHN: X1G006141xxxx15
SG2016VHN: X1G006121xxxx15
SG2520EHN: X1G005921xxxx15
SG2520VHN: X1G005941xxxx15

SG2016EHN/VHN
SG2520EHN/VHN

- Frequency range : 25 MHz to 500 MHz
- Supply voltage : 1.8 V Typ. (LVDS only) / 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 : 50 fs Max. (391 MHz < fo ≤ 500 MHz, V_{CC} = 2.5 V, 3.3 V)



Specifications (characteristics)

Item	Symbol	Specifications		Conditions / Remarks	
		LV-PECL SG2016EHN / SG2520EHN	LVDS SG2016VHN / SG2520VHN		
Output frequency range	f _o	25 MHz to 500 MHz		Please contact us for available frequencies.	
Supply voltage	V _{CC}	C: 3.3 V ± 5 % D: 2.5 V ± 5 %	E: 1.8 V ± 5 %		
Storage temperature	T _{stg}	-55 °C to +125 °C			
Operating temperature	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	I _{CC}	60 mA Max.	-	OE or \overline{ST} = V _{CC} , L _{ECL} = 50 Ω 25 MHz ≤ fo < 212 MHz 212 MHz ≤ fo < 392 MHz 392 MHz ≤ fo ≤ 500 MHz Output option: A / B / C	
		-	25 mA / 30 mA / 25 mA Max. 28 mA / 35 mA / 28 mA Max. 28 mA / 35 mA / 30 mA Max.		25 mA / - / 25 mA Max.
Disable current	I _{dis}	35 mA Max.	20 mA Max.	OE = GND	
Stand-by current	I _{std}	30 μA Max.		\overline{ST} = GND, T _{use} Max. = +85 °C \overline{ST} = GND, T _{use} Max. = +105 °C	
		60 μA Max.			
Symmetry	SYM	45 % to 55 %		At output crossing point	
Output voltage (LV-PECL)	V _{OH} V _{OL}	V _{CC} - 1.1 V Min.	-	Output option: A, DC characteristic	
		0.8 V to 2.0 V	-		
Differential swing	V _{sw}	500 mV to 900 mV	500 mV to 900 mV	Output option: A	
		800 mV to 1 600 mV	-	Output option: B	
Output voltage (LVDS)	V _{OD}	600 mV to 1 200 mV	600 mV to 1 200 mV	Output option: C	
		250 mV to 450 mV	250 mV to 450 mV	Output option: A	
	400 mV to 800 mV	-	Output option: B		
	300 mV to 600 mV	300 mV to 600 mV	Output option: C		
	dV _{OD}	-	50 mV Max.	dV _{OD} = V _{OD1} - V _{OD2}	
	V _{OS}	-	1.15 V to 1.35 V	Offset voltage, V _{OS1} , V _{OS2}	
dV _{OS}	-	50 mV Max.	dV _{OS} = V _{OS1} - V _{OS2}		
Output load condition	L _{ECL}	50 Ω	-	Terminated to V _{CC} - 2.0 V	
	L _{LVDS}	-	100 Ω	Connected between OUT and \overline{OUT}	
Input voltage	V _{IH}	70 % V _{CC} Min.		OE or \overline{ST} terminal	
	V _{IL}	30 % V _{CC} Max.			
Rise/Fall times	tr/tf	0.35 ns Max.		LV-PECL: 20 % - 80 % (V _{OH} - V _{OL}) LVDS: 20 % - 80 % differential output peak to peak	
Start-up time	t _{str}	10 ms Max.		t = 0 at 90 % V _{CC}	
Phase jitter	t _{pj}	250 fs Max.	250 fs Max.	400 fs Max.	25 MHz ≤ fo < 100 MHz
		90 fs Max.	100 fs Max.	130 fs Max.	100 MHz ≤ fo ≤ 156 MHz
		70 fs Max.	60 fs Max.	70 fs Max.	156 MHz < fo ≤ 212 MHz
		60 fs Max.	-	-	212 MHz < fo ≤ 391 MHz
		50 fs Max.	50 fs Max.	60 fs Max.	391 MHz < fo ≤ 500 MHz

Product Name **SG2016 EHN 156.250000MHz C C H P Z A**

(Standard form) ① ② ③ ④⑤⑥⑦⑧⑨

- ①Model ②Output (E: LV-PECL, V: LVDS) ③Frequency ④Supply voltage ⑤Frequency tolerance
 ⑥Operating temperature ⑦Function ⑧Output disable type (Z: High impedance) ⑨Output option

④Supply voltage	
C	3.3 V Typ.
D	2.5 V Typ.
E*	1.8 V Typ.

⑤Freq. tolerance	
C	$\pm 20 \times 10^{-6}$

⑥Operating temp.	
G	-40 °C to +85 °C
H	-40 °C to +105 °C

⑦Function	
P	OE
S	\overline{ST}

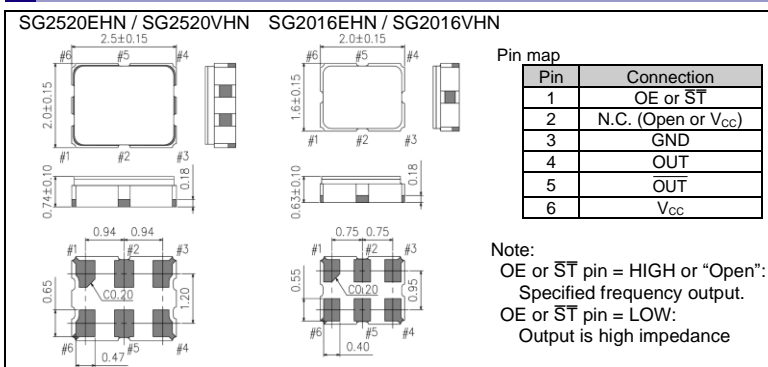
⑨Output option		
	SG2016EHN / SG2520EHN	SG2016VHN / SG2520VHN
A	Default	V _{OD} = 250 mV to 450 mV
B*	-	V _{OD} = 400 mV to 800 mV
C	-	V _{OD} = 300 mV to 600 mV

E is only for SG2016VHN and SG2520VHN

*Not available for V_{CC} = 1.8 V Typ.

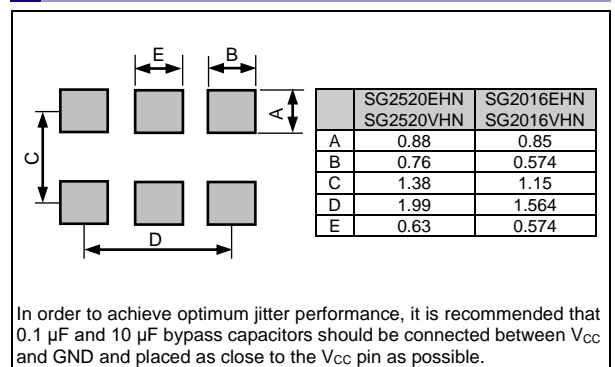
External dimensions

(Unit:mm)



Footprint (Recommended)

(Unit:mm)



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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.

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	► 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.
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