

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



**Product Number**  
**SG2016EGN: X1G006131xxxx15**  
**SG2016VGN: X1G006111xxxx15**  
**SG2520EGN: X1G005881xxxx15**  
**SG2520VGN: X1G005901xxxx15**

**SG2016EGN / VGN**  
**SG2520EGN / VGN**

- 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 :  $\pm 25 \times 10^{-6}$ ,  $\pm 50 \times 10^{-6}$
- 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, Vcc = 2.5 V, 3.3 V)



**Specifications (characteristics)**

Item	Symbol	Specifications		Conditions / Remarks	
		LV-PECL SG2016EGN / SG2520EGN	LVDS SG2016VGN / SG2520VGN		
Output frequency range	fo	25 MHz to 500 MHz		Please contact us for available frequencies.	
Supply voltage	Vcc	C: 3.3 V ± 5 % D: 2.5 V ± 5 %	E: 1.8 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	D: $\pm 25 \times 10^{-6}$ Max. J: $\pm 50 \times 10^{-6}$ Max.		Includes initial frequency tolerance, frequency / temperature characteristics, frequency / voltage coefficient and 10 years aging (+25 °C)	
Current consumption	Icc	60 mA Max.	-	OE or $\overline{ST}$ = Vcc, 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)	VOH VOL	Vcc - 1.1 V Min.	-	Output option: A, DC characteristic	
		Vcc - 1.5 V Max.	-		
Differential swing	Vsw	0.8 V to 2.0 V	500 mV to 900 mV	500 mV to 900 mV	
		-	800 mV to 1 600 mV	-	
Output voltage (LVDS)	VOD	-	250 mV to 450 mV	250 mV to 450 mV	
		-	400 mV to 800 mV	-	
	-	300 mV to 600 mV	300 mV to 600 mV	Differential output voltage, VOD1, VOD2	
	dVOD	-	50 mV Max.	dVOD =  VOD1 - VOD2	
	VOs	-	1.15 V to 1.35 V	0.65 V to 0.85 V	Offset voltage, VOS1, VOS2
	dVOS	-	50 mV Max.	dVOS =  VOS1 - VOS2	
Output load condition	L ECL	50 Ω	-	Terminated to Vcc - 2.0 V	
	L LVDS	-	100 Ω	Connected between OUT and $\overline{OUT}$	
Input voltage	VIH	70 % Vcc Min.		OE or $\overline{ST}$ terminal	
	VIL	30 % Vcc Max.			
Rise/Fall times	tr/tf	0.35 ns Max.		LV-PECL: 20 % - 80 % (VOH - VOL) LVDS: 20 % - 80 % differential output peak to peak	
Start-up time	t_str	10 ms Max.		t = 0 at 90 % Vcc	
Phase jitter	tpj	250 fs Max.	250 fs Max.	400 fs Max.	Offset frequency fo < 50 MHz: 12 kHz to 5 MHz fo ≥ 50 MHz: 12 kHz to 20 MHz
		90 fs Max.	100 fs Max.	130 fs Max.	
		70 fs Max.	60 fs Max.	70 fs Max.	
		60 fs Max.	-	212 MHz < fo ≤ 391 MHz	
		50 fs Max.	50 fs Max.	391 MHz < fo ≤ 500 MHz	

Product Name **SG2016 EGN 156.250000MHz C D 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

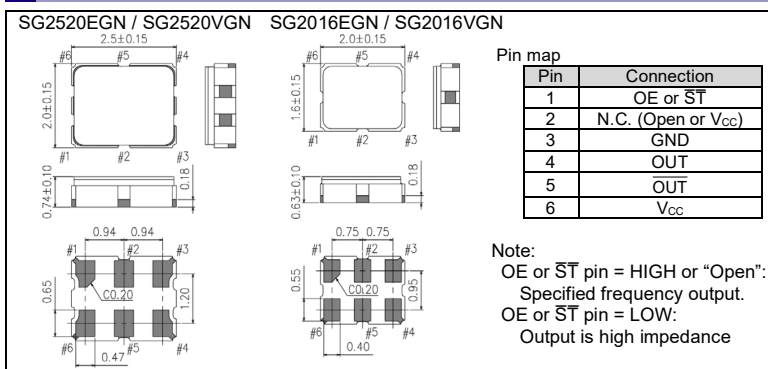
④Supply voltage	⑤Freq. tolerance	⑥Operating temp.	⑦Function	⑨Output option
C 3.3 V Typ.	D $\pm 25 \times 10^{-6}$	G -40 °C to +85 °C	P OE	SG2016EGN / SG2520EGN
D 2.5 V Typ.	J $\pm 50 \times 10^{-6}$	H -40 °C to +105 °C	S $\overline{ST}$	SG2016VGN / SG2520VGN
E* 1.8 V Typ.				A Default B* - C -

\*E\* is only for SG2016VGN and SG2520VGN

\*Not available for Vcc = 1.8 V Typ.

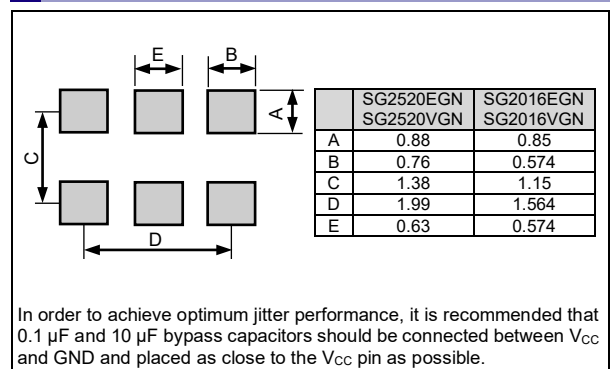
**External dimensions**

(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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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 ).

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