

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



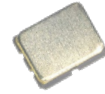
Product Number
SG2016EGN: X1G006131xxxx15
SG2016VGN: X1G006111xxxx15
SG2520EGN: X1G005881xxxx15
SG2520VGN: X1G005901xxxx15

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, V_{CC} = 2.5 V, 3.3 V)



SG2016EGN
 SG2016VGN
 (2.0 × 1.6 × 0.63 mm)



SG2520EGN
 SG2520VGN
 (2.5 × 2.0 × 0.74 mm)

Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Remarks
		LV-PECL	LVDS		
		SG2016EGN / SG2520EGN	SG2016VGN / SG2520VGN		
Output frequency range	fo	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 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	I _{CC}	60 mA Max.	-		OE or \overline{ST} = V _{CC} , L ECL = 50 Ω
		-	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.	25 MHz ≤ fo < 212 MHz 212 MHz ≤ fo < 392 MHz 392 MHz ≤ fo ≤ 500 MHz
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
		60 μA Max.			\overline{ST} = GND, T _{use} Max. = +105 °C
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
		V _{CC} - 1.5 V Max.	-		
Differential swing	V _{SW}	0.8 V to 2.0 V	500 mV to 900 mV	500 mV to 900 mV	Output option: A
		-	800 mV to 1 600 mV	-	Output option: B
		-	600 mV to 1 200 mV	600 mV to 1 200 mV	Output option: C
Output voltage (LVDS)	V _{OD} dV _{OD} V _{OS} dV _{OS}	-	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
		-	50 mV Max.		dV _{OD} = V _{OD1} - V _{OD2}
		-	1.15 V to 1.35 V	0.65 V to 0.85 V	Offset voltage, V _{OS1} , V _{OS2}
Output load condition	L _{ECL} L _{LVDS}	50 Ω	-		Terminated to V _{CC} - 2.0 V
		-	100 Ω		Connected between OUT and \overline{OUT}
Input voltage	V _{IH} V _{IL}	70 % V _{CC} Min.			OE or \overline{ST} terminal
		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.	50 fs Max.	60 fs Max.	212 MHz < fo ≤ 391 MHz
		50 fs Max.			391 MHz < fo ≤ 500 MHz
				Offset frequency fo < 50 MHz: 12 kHz to 5 MHz fo ≥ 50 MHz: 12 kHz to 20 MHz	

Product Name **SG2016 EGN 156.250000MHz C D H P Z A**
 (Standard form) ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

- 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
D $\pm 25 \times 10^{-6}$
J $\pm 50 \times 10^{-6}$

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

⑦Function
P OE
S \overline{ST}

⑨Output option		
	SG2016EGN / SG2520EGN	SG2016VGN / SG2520VGN
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 SG2016VGN and SG2520VGN

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

External dimensions

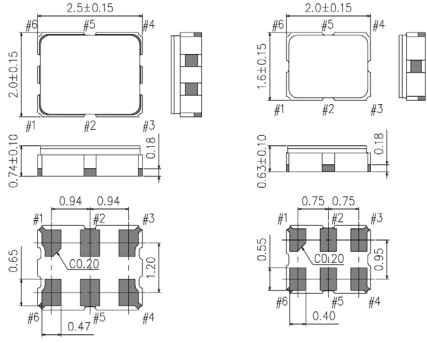
(Unit:mm)

Footprint (Recommended)

(Unit:mm)



SG2520EGN / SG2520VGN SG2016EGN / SG2016VGN



Pin map

Pin	Connection
1	OE or \overline{ST}
2	N.C. (Open or V_{CC})
3	GND
4	OUT
5	\overline{OUT}
6	V_{CC}

Note:
 OE or \overline{ST} pin = HIGH or "Open":
 Specified frequency output.
 OE or \overline{ST} pin = LOW:
 Output is high impedance

	SG2520EGN SG2520VGN	SG2016EGN SG2016VGN
A	0.88	0.85
B	0.76	0.574
C	1.38	1.15
D	1.99	1.564
E	0.63	0.574

In order to achieve optimum jitter performance, it is recommended that 0.1 μ F and 10 μ F bypass capacitors should be connected between V_{CC} and GND and placed as close to the V_{CC} pin as possible.

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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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