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

SG3225 / 5032 / 7050EEN
SG3225 / 5032 / 7050VEN

- Frequency range : 25 MHz to 500 MHz
- Supply voltage : 2.5 V Typ. / 3.3 V Typ.
- Output : LV-PECL or LVDS
- Function : Output enable (OE)
- Phase jitter : 50 fs Typ. (fo = 156.25 MHz, LV-PECL)
- Operating temperature : -40 °C to +105 °C

Pb Free
RoHS Compliant

Product Number
SG3225EEN: X1G005221xxxx00 (fo ≤ 200 MHz)
X1G005511xxxx00 (fo > 200 MHz)
SG5032EEN: X1G005531xxxx00
SG7050EEN: X1G005131xxxx00 (fo ≤ 200 MHz)
X1G005551xxxx00 (fo > 200 MHz)
SG3225VEN: X1G005351xxxx00 (fo ≤ 200 MHz)
X1G005521xxxx00 (fo > 200 MHz)
SG5032VEN: X1G005541xxxx00
SG7050VEN: X1G005331xxxx00 (fo ≤ 200 MHz)
X1G005561xxxx00 (fo > 200 MHz)

SG3225EEN
SG3225VEN
(3.2 × 2.5 × 1.05 mm)

SG5032EEN
SG5032VEN
(5.0 × 3.2 × 1.3 mm)

SG7050EEN
SG7050VEN
(7.0 × 5.0 × 1.5 mm)

Specifications (characteristics)

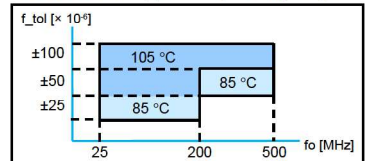| Item	Symbol	Specifications		Conditions / Remarks		
		LV-PECL SG3225EEN / SG5032EEN / SG7050EEN	LVDS SG3225VEN / SG5032VEN / SG7050VEN			
Output frequency range	fo	25 MHz to 500 MHz		Except for SG5032EEN / SG5032VEN	Please contact us for available	
		200.1 MHz to 500 MHz		SG5032EEN / SG5032VEN	frequencies.	
Supply voltage	V_CC	D: 2.5 V ± 0.125 V, C: 3.3 V ± 0.165 V				
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	D: ±25 × 10⁻⁶ Max.		Includes initial frequency tolerance, temperature variation, supply voltage change and 5 years aging (+25 °C)		Refer to figure *1
		J: ±50 × 10⁻⁶ Max.		Includes initial frequency tolerance, temperature variation, supply voltage change and 10 years aging (+25 °C)		
		L: ±100 × 10⁻⁶ Max.				
Current consumption	I_CC	60 mA Max.	25 mA Max.	OE = V_CC, L_ECL = 50 Ω or L_LVDS = 100 Ω		
Disable current	I_dis	25 mA Max.	15 mA Max.	OE = GND		
Symmetry	SYM	45 % to 55 %		At output crossing point		
Output voltage (LV-PECL)	V_OH	V_CC - 1.1 V Min.	–	DC characteristics		
	V_OL	V_CC - 1.5 V Max.	–			
Output voltage (LVDS)	V_OD	–	250 mV to 450 mV	Differential output voltage, V_OD1, V_OD2		
	dV_OD	–	50 mV Max.	dV_OD = ∣ V_OD1 - V_OD2 ∣	DC characteristics	
	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 to OUT̄		
Input voltage	V_IH	70 % V_CC Min.		OE terminal		
	V_IL	30 % V_CC Max.				
Rise/Fall times	tr / tf	0.3 ns Max.	0.3 ns Max.	V_CC = 3.3 V, 25 MHz ≤ fo ≤ 200 MHz	LV-PECL: Between 20 % and 80 % of (V_OH - V_OL)	
		0.35 ns Max.		All other	LVDS: Between 20 % and 80 % of Differential Output peak to peak voltage	
Startup time	t_str	10 ms Max.		Time at minimum supply voltage to be 0 s		

Phase Jitter

Product Name	100 MHz	125 MHz	156.25 MHz	200 MHz	312.5 MHz	491.52 MHz	Conditions
SG3225EEN / SG5032EEN / SG7050EEN	75 fs Typ.	60 fs Typ.	50 fs Typ.	40 fs Typ.	30 fs Typ.	20 fs Typ.	Offset frequency:
SG3225VEN / SG5032VEN / SG7050VEN	90 fs Typ.	70 fs Typ.	60 fs Typ.	50 fs Typ.	40 fs Typ.	30 fs Typ.	12 kHz to 20 MHz

Product Name (Standard form)
SG3225 EEN 156.250000MHz C D G A (⑤⑥: Unavailable code DH, DG and JH at fo > 200 MHz, Refer to figure *1)
① ② ③ ④⑤⑥⑦
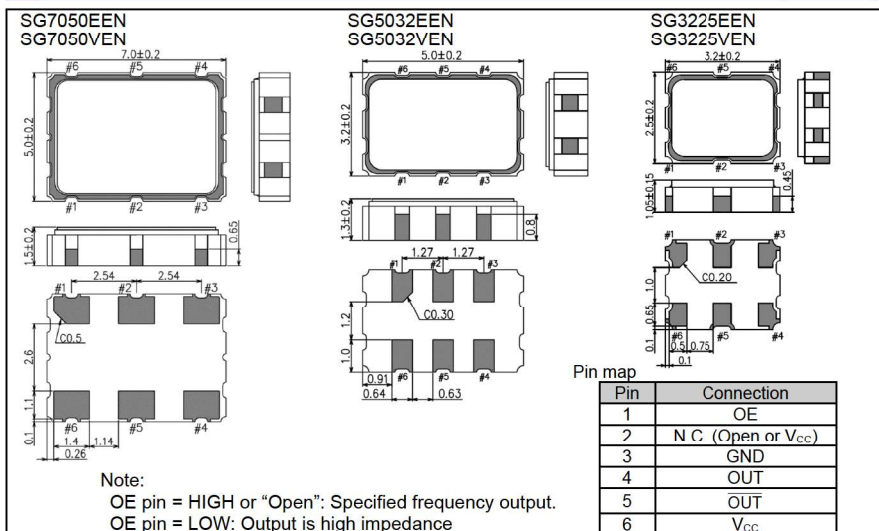
①Model ②Output (E: LV-PECL, V: LVDS) ③Frequency ④Supply voltage
⑤Frequency tolerance ⑥Operating temperature ⑦Internal identification code("A" is default)

④Supply voltage	
C	3.3 V Typ.
D	2.5 V Typ.

⑤Frequency tolerance	
D	±25 × 10⁻⁶
J	±50 × 10⁻⁶
L	±100 × 10⁻⁶

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

*1 : Maximum T_use of operating range

External dimensions (Unit:mm)

SG7050EEN SG7050VEN
7.0±0.2
5.0±0.2
1.5±0.2
0.65
2.54 2.54
C0.5
2.6

SG5032EEN SG5032VEN
5.0±0.2
3.2±0.2
1.3±0.2
0.8
0.45
1.27 1.27
C0.30
1.2

SG3225EEN SG3225VEN
3.2±0.2
2.5±0.2
1.05±0.15
0.45
C0.20
0.65
0.1 0.75

Pin map

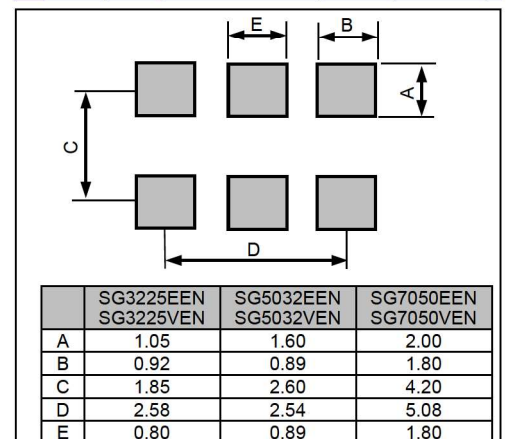| Pin	Connection
1	OE
2	N.C (Open or V_CC)
3	GND
4	OUT
5	OUT̄
6	V_CC

Note:
OE pin = HIGH or "Open": Specified frequency output.
OE pin = LOW: Output is high impedance

Footprint (Recommended) (Unit:mm)

	SG3225EEN SG3225VEN	SG5032EEN SG5032VEN	SG7050EEN SG7050VEN
A	1.05	1.60	2.00
B	0.92	0.89	1.80
C	1.85	2.60	4.20
D	2.58	2.54	5.08
E	0.80	0.89	1.80

In order to achieve optimum jitter performance, it is recommended that 0.1 µF and 10 µF bypass capacitors should be connected between V_CC and GND and placed as close to the V_CC pin as possible.

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 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	► Pb free.

RoHS Compliant	► 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.)

For Automotive	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
Automotive Safety	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).