

CRYSTAL OSCILLATOR (SPXO)

OUTPUT: LV-PECL, LVDS



SG3225EEN

SG3225VEN (3.2 × 2.5 × 1.05 mm)



Product Number
SG3225EEN: X1G005221xxxx00 (fo ≤ 200 MHz)
X1G005511xxxx00 (fo > 200 MHz)
SG5032EEN: X1G005531xxxx00
SG7050EEN: X1G005551xxxx00 (fo ≤ 200 MHz)
X1G005551xxxx00 (fo > 200 MHz)

SG3225VEN: X1G005351xxxx00 (fo ≥ 200 MHz)
X1G005521xxxx00 (fo ≥ 200 MHz)
SG5032VEN: X1G005521xxxx00 (fo ≥ 200 MHz)
SG7050VEN: X1G005531xxxx00 (fo ≥ 200 MHz)
X1G005561xxxx00 (fo ≥ 200 MHz)



SG5032EEN

SG5032VEN

 $(5.0 \times 3.2 \times 1.3 \text{ mm})$



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

 Frequency range 25 MHz to 500 MHz 2.5 V Typ. / 3.3 V Typ. Supply voltage Output LV-PECL or LVDS Output enable (OE) Function

 Phase jitter 50 fs Typ. (fo = 156.25 MHz, LV-PECL)

-40 °C to +105 °C Operating temperature :

Specifications (characteristics)

| Opecifications | (O . I d . d . | | | | | | |
|---------------------------|-----------------|---------------------------------|-----------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------|
| | Symbol | Specifications | | | | | |
| Item | | LV-PECL LVDS | | Conditions / Remarks | | | |
| item | | SG3225EEN / SG5032EEN | SG3225VEN / SG5032VEN | N Conditions / Remarks | | aino | |
| | | / SG7050EEN | / SG7050VEN | | | | |
| Output frequency range fo | | 25 MHz to | 500 MHz | Except for SG5032EEN / SG503 | | | or available |
| Output frequency range | | | | SG5032EEN / SG5032VEN | fre | equencies. | |
| Supply voltage | Vcc | 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 | | | | |
| Fraguenay talagana | | D: ±25 × 10 ⁻⁶ Max. | | | des initial frequency tolerance, temperature variation, ly voltage change and 5 years aging (+25 °C) Refer | | Refer to |
| Frequency tolerance | f_tol | J: ±50 × | 10 ⁻⁶ Max. | | | figure *1 | |
| | | L: ±100 × 10 ⁻⁶ Max. | | supply voltage change and 10 years aging (+25 °C) | | | |
| Current consumption | Icc | 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) | VoH | Vcc - 1.1 V Min. | _ | DC characteristics | | | |
| Output Voltage (EV-1 EOE) | Vol | V _{CC} - 1.5 V Max. | _ | | | | |
| | V _{OD} | _ | 250 mV to 450 mV | Differential output voltage, V _{OD1} , | V_{OD2} | | |
| Output voltage (LVDS) | dV_{OD} | _ | 50 mV Max. | $dV_{OD} = V_{OD1} - V_{OD2} $ DC characteris | | tice | |
| Catput Voltage (LVDO) | Vos | _ | 1.15 V to 1.35 V | Offset voltage, Vos1, Vos2 | | DO characteris | 1103 |
| | dVos | _ | 50 mV Max. | $dV_{OS} = V_{OS1} - V_{OS2} $ | | | |
| Output load condition | L_ECL | 50 Ω | _ | Terminated to V _{CC} - 2.0 V | | | |
| Carpar iona containon | L_LVDS | _ | 100 Ω | Connected between OUT to OUT | | | |
| Input voltage | V _{IH} | 70 % V _{CC} Min. | | OE terminal | | | |
| | VIL | 30 % V _{CC} Max. | | | | | |
| Rise/Fall times | es tr/tf | 0.3 ns Max. | 0.3 ns Max. | V _{CC} = 3.3 V, 25 MHz ≤ fo ≤ 200 MHz LVDS: | Between | 20 % and 80 % of (\) 20 % and 80 % of D | |
| | | 0.35 ns Max. | | All other | 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 1 3 (4)(5)(6)(7)

(56: Unavailable code DH, DG and JH at fo > 200 MHz, Refer to figure *1)

*1 : Maximum T_use of operating range ①Model ②Output (E: LV-PECL, V: LVDS) ③Frequency ④Supply voltage

⑤Frequency tolerance ⑥Operating temperature ⑦Internal identification code("A" is default)

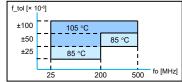
| | © i roquonoy | tororarioo | | operating temperature | |
|-----|----------------|------------|----------------------|------------------------|--|
| 4)8 | Supply voltage | | ⑤Frequency tolerance | | |
| С | 3.3 V Typ. | | D | ±25 × 10 ⁻⁶ | |

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±50 × 10⁻⁶

 $+100 \times 10^{-6}$

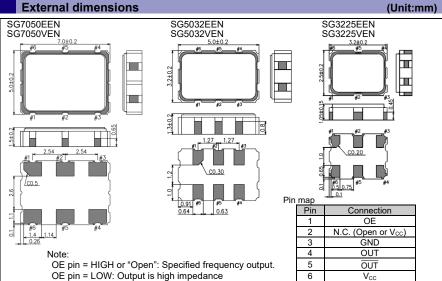
| ⑥Operating temperature | | | | |
|------------------------|----------------|--|--|--|
| G | -40 to +85 °C | | | |
| Н | -40 to +105 °C | | | |



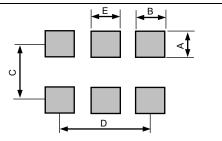
(Unit:mm)

External dimensions

2.5 V Typ.



Footprint (Recommended)



| | SG3225EEN | SG5032EEN | SG7050EEN |
|---|-----------|-----------|-----------|
| | SG3225VEN | SG5032VEN | SG7050VEN |
| Α | 1.05 | 1.60 | 2.00 |
| В | 0.92 | 0.89 | 1.80 |
| С | 1.85 | 2.60 | 4.20 |
| D | 2.58 | 2.54 | 5.08 |
| Е | 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 Vcc 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.

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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.



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