



Multi output SAW Oscillator (MOSO)
OUTPUT : LVDS



Product Number
X1M000421xxxx00

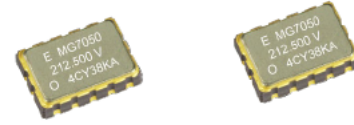
MG7050VAN

Feature

- Ultra Low jitter : 0.3 ps Max.
- 2 or 4 outputs and it is able to reduce fan-out buffers
- Frequency range : 100 MHz to 700 MHz
- Supply voltage : 2.5 V / 3.3 V
- External dimensions : 7.0 × 5.0 × 1.6 mm
- Output : LVDS (2 or 4 outputs)

Application

Server, Storage, Network Instrument.



Specifications (characteristics)

| Item | Symbol | Specifications | Conditions / Remarks |
|------------------------|-------------------|--|---|
| Output frequency range | fo | 100 MHz to 700 MHz | Please contact us about available frequencies. |
| | | 100MHz, 106.25MHz, 125MHz, 150MHz, 156.25MHz, 200MHz, 212.5MHz, 250MHz, 300MHz, 312.5MHz | Standard frequency |
| Supply voltage | V _{CC} | D: 2.5 V ± 0.125 V C: 3.3 V ± 0.33 V | V _{CC} , V _{CC1} and V _{CC2} need same voltage |
| Storage temperature | T _{stg} | -55 °C to +125 °C | Store as bare product after packing |
| Operating temperature | T _{use} | A: 0 °C to +70 °C, B: -20 °C to +70 °C D: -5 °C to +85 °C | |
| Frequency tolerance *1 | f _{tol} | J: ±50 × 10 ⁻⁶ , L: ±100 × 10 ⁻⁶ | |
| Current consumption | I _{CC} | 35 mA Typ., 50 mA Max. 45 mA Typ., 56 mA Max. | 2-outputs |
| | | 40 mA Typ., 66 mA Max. 50 mA Typ., 72 mA Max. | 4-outputs |
| Disable current | I _{dis} | 7 mA Typ., 18 mA Max. 8 mA Typ., 20 mA Max. | OE=GND |
| Symmetry | SYM | 45 % to 55 % | At outputs crossing point |
| Output voltage | V _{OD} | 247 mV to 454 mV | DC characteristics |
| | V _{OS} | 1.125 V to 1.375 V | |
| Output load condition | L _{LVDS} | 100 Ω | Connected between OUTnP and OUTnN |
| Input voltage | V _{IH} | 70 % V _{CC} Min. | OE and FSEL terminals |
| | V _{IL} | 30 % V _{CC} Max. | |
| Rise time / Fall time | tr / tf | 200 ps Typ., 400 ps Max. | Between 20 % and 80 % of differential output peak to peak voltage |
| Start-up time | t _{str} | 5 ms Typ., 10 ms Max. | Time at minimum supply voltage to be 0 s |
| Phase Jitter | t _{pj} | 0.19 ps Typ. 0.16 ps Typ. | fo=100 MHz |
| | | 0.18 ps Typ. 0.15 ps Typ. | fo=125 MHz |
| | | 0.17 ps Typ. 0.14 ps Typ. | fo=156.25 MHz |
| | | 0.15 ps Typ. 0.13 ps Typ. | fo=212.5 MHz |
| | | 0.12 ps Typ. 0.11 ps Typ. | fo=312.5 MHz |
| | | 0.06 ps Typ. 0.05 ps Typ. | fo=700 MHz |
| | | 0.3 ps Max. | Offset frequency: 12 kHz to 20 MHz |
| Skew | t _{skew} | 20 ps Typ., 50 ps Max. | FSEL=H |
| Aging | f _{age} | N: ±10 × 10 ⁻⁶ /year Max. | First year |
| | | A: Included in Frequency tolerance *2 | 10 years |

*1 Frequency tolerance includes initial frequency tolerance, temperature variation, supply voltage change and reflow drift.

*2 "A" is not acceptable when Frequency tolerance is "J" and Operating temperature is "B" or "D".

Product Name
(Standard form)

MG7050 V AN 156.25000MHz 4 A C J A N (⑦⑧⑨:JDA, JBA are not available)
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

- ① Model
② Output (L: LVDS)
③ Frequency
④ Number of outputs (2: 2-outputs, 4: 4-outputs)
⑤ "A": Fixed
⑥ Supply voltage
⑦ Frequency tolerance
⑧ Operating temperature
⑨ Frequency aging

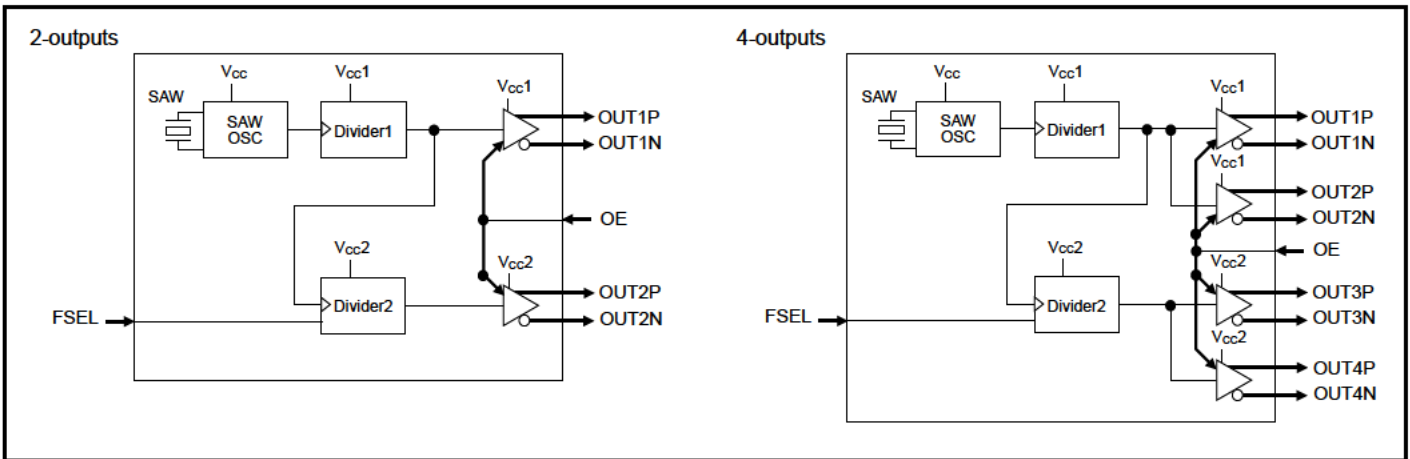
| ⑥ Supply voltage |
|------------------|
| C 3.3 V Typ. |
| D 2.5 V Typ. |

| ⑦ Frequency tolerance |
|---------------------------|
| J ±50 × 10 ⁻⁶ |
| L ±100 × 10 ⁻⁶ |

| ⑧ Operating temp. |
|--------------------|
| A 0 °C to +70 °C |
| B -20 °C to +70 °C |
| D -5 °C to +85 °C |

| ⑨ Frequency aging |
|-------------------------------------|
| A Frequency tolerance include aging |
| N Frequency tolerance exclude aging |

Block diagram



FSEL function

| 2-outputs | | OUT1 | OUT2 |
|-----------|---|-------------|-------------|
| 4-outputs | | OUT1 / OUT2 | OUT3 / OUT4 |
| FSEL | H | fo | fo |
| | L | fo | fo/2 |

External dimensions

(Unit :mm)

| Pin | Connection | |
|-----|------------------|-----------|
| | 2-outputs | 4-outputs |
| 1 | V _{cc1} | |
| 2 | GND | OUT1P |
| 3 | OUT1P | OUT1N |
| 4 | OUT1N | OUT2P |
| 5 | GND | OUT2N |
| 6 | FSEL | |
| 7 | OE | |
| 8 | GND | OUT3N |
| 9 | OUT2N | OUT3P |
| 10 | OUT2P | OUT4N |
| 11 | GND | OUT4P |
| 12 | V _{cc2} | |
| 13 | V _{cc} | |
| 14 | GND | |

OE pin = "H" : Specified frequency output.
 OE pin = "L" : Output is high impedance
 #14 is connected to the cover.

Footprint (Recommended) (Unit :mm)

To maintain stable operation, provide a 0.01 μF to 0.1 μF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between V_{cc}, V_{cc1}, V_{cc2} - GND).

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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