



Multi output SAW Oscillator (MOSO)
OUTPUT : HCSL



Product Number
X1M000431xxxx00

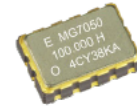
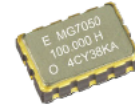
MG7050HAN

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 200 MHz
- Supply voltage : 2.5 V / 3.3 V
- External dimensions : 7.0 × 5.0 × 1.6 mm
- Output : HCSL (2 or 4 outputs)
- Output impedance select by ZSEL

Application

GbE, Fiber Channel, SAS, PCI express



Specifications (characteristics)

Item	Symbol	Specifications	Conditions / Remarks
Output frequency range	fo	100 MHz to 200 MHz	Please contact us about available frequencies.
		100 MHz, 125 MHz, 156.25 MHz, 200 MHz	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}	55 mA Typ., 84 mA Max. 60 mA Typ., 90 mA Max.	2-outputs
		95 mA Typ., 128 mA Max. 100 mA Typ., 136 mA Max.	4-outputs
Disable current	I _{dis}	11 mA Typ., 23 mA Max. 12 mA Typ., 25 mA Max.	2-outputs
		15 mA Typ., 28 mA Max. 16 mA Typ., 30 mA Max.	4-outputs
Symmetry	SYM	45 % to 55 %	At outputs crossing point
Output voltage	V _{OH}	0.66 V to 0.85 V	DC characteristics
	V _{OL}	-0.15 V to 0.15 V	
Output load condition	L _{HCSL}	50 Ω or 42.2 Ω, with C _L =2 pF, R _S =33 Ω or 27 Ω	
Input voltage	V _{IH}	70 % V _{CC} Min.	OE and ZSEL terminals
	V _{IL}	30 % V _{CC} Max.	
Rise / Fall skew rate	R _r / R _f	1 V/ns to 4 V/ns	Between -0.15 V and 0.15 V of differential output.
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
		0.16 ps Typ. 0.13 ps Typ.	fo=156.25 MHz
		0.14 ps Typ. 0.12 ps Typ.	fo=200 MHz
		0.3 ps Max.	
Skew	t _{skew}	20 ps Typ., 50 ps Max.	ZSEL=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 MG7050 H AN 156.250000MHz 4 A C J A N (⑦⑧⑨:JDA, JBA are not available)
(Standard form) ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

- ① Model
② Output (H: HCSL)
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.

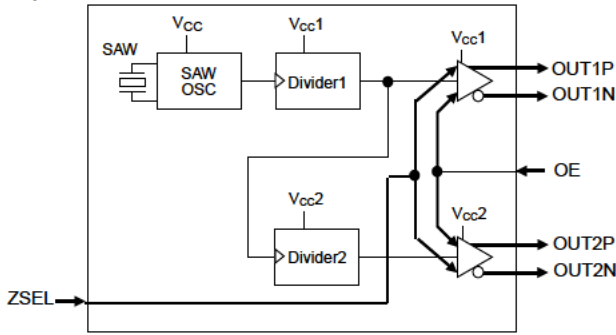
⑦ Frequency tolerance	
J	±50 × 10 ⁻⁶
L	±100 × 10 ⁻⁶

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

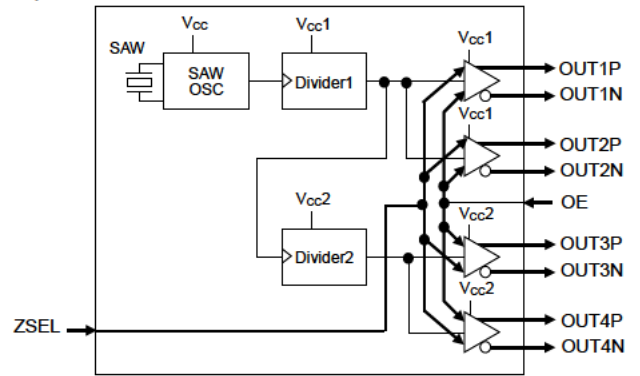
⑨ Frequency aging	
A	Frequency tolerance include aging
N	Frequency tolerance exclude aging

Block diagram

2-outputs



4-outputs



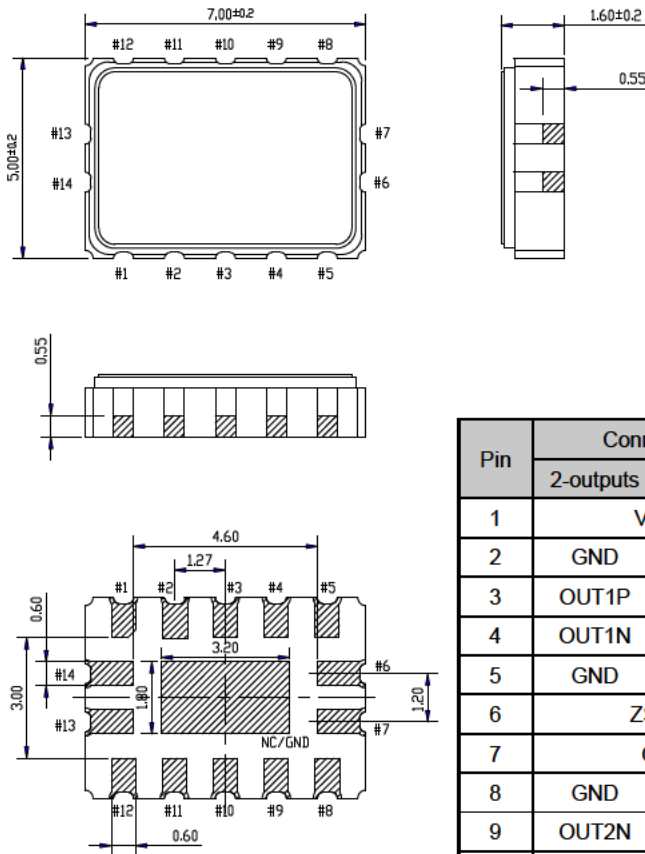
ZSEL function

		Output line Differential Zo	HCSL load L_HCSL	Shunt resistor Rs
ZSEL	H	100 Ω	50 Ω	33 Ω
	L	85 Ω	42.2 Ω	27 Ω

External dimensions

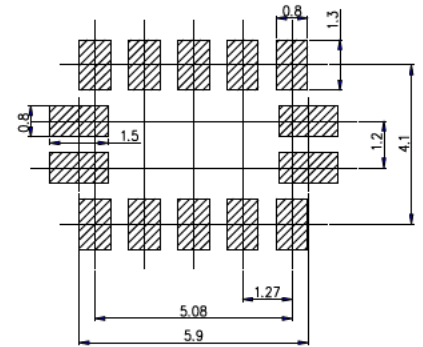
(Unit :mm)

Footprint (Recommended) (Unit :mm)



Pin	Connection	
	2-outputs	4-outputs
1	V _{CC1}	
2	GND	OUT1P
3	OUT1P	OUT1N
4	OUT1N	OUT2P
5	GND	OUT2N
6	ZSEL	
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.



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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► 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.)
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