



Multi output SAW Oscillator (MOSO)

OUTPUT : HCSL

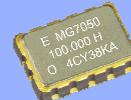
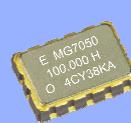
MG7050HAN

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

Product Number (please contact us)
X1M000431xxxx00

Actual size

**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	Vcc	D: 2.5 V ± 0.125 V C: 3.3 V ± 0.33 V	Vcc,Vcc1 and Vcc2 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	Icc	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	VOH	0.66 V to 0.85 V	DC characteristics
	VOL	-0.15 V to 0.15 V	
Output load condition	L_HCSL	50 Ω or 42.2 Ω, with CL=2 pF, Rs=33 Ω or 27 Ω	
Input voltage	VIH	70% Vcc Min.	OE and ZSEL terminals
	UIL	30% Vcc Max.	
Rise / Fall skew rate	Rr/Rf	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	tpj	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.	Offset frequency: 12 kHz to 20 MHz
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 HAN 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

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

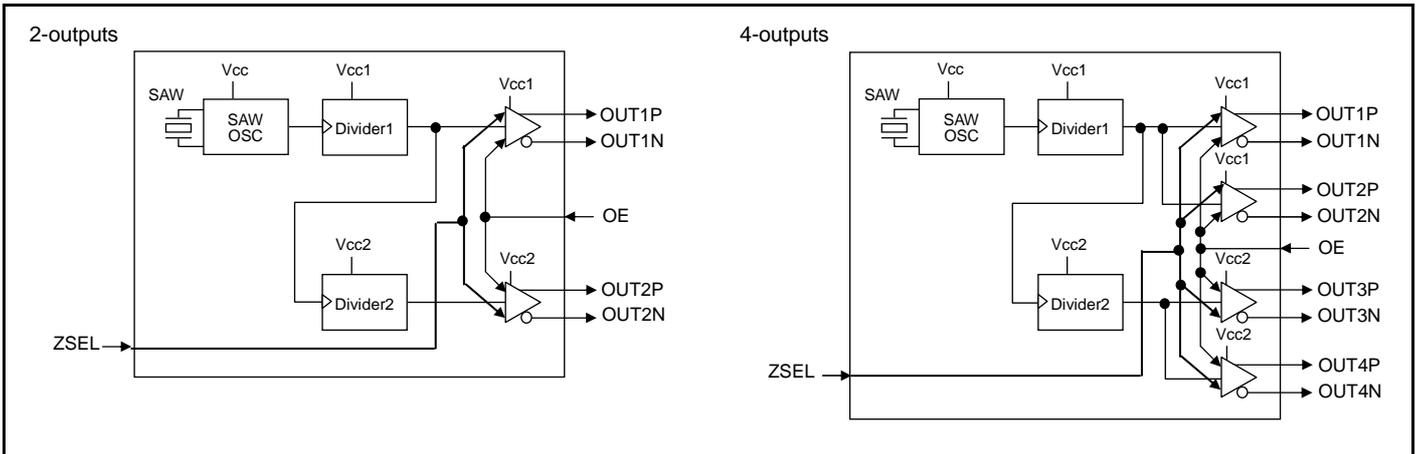
⑥Supply voltage	
C	3.3 V Typ.
D	2.5 V Typ.

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

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

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

Block diagram



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)

Pin	Connection	
	2-outputs	4-outputs
1	Vcc1	
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	Vcc2	
13	Vcc	
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 Vcc, Vcc1, Vcc2 - 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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ISO/TS16949 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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