



Multi output SAW Oscillator (MOSO)  
OUTPUT : HCSL



Product Number  
X1M000431xxxx00

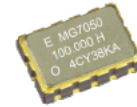
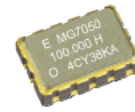
# MG7050HAN

## 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 <sub>CC</sub>	D: 2.5 V ± 0.125 V      C: 3.3 V ± 0.33 V	V <sub>CC</sub> , V <sub>CC1</sub> and V <sub>CC2</sub> need same voltage
Storage temperature	T <sub>stg</sub>	-55 °C to +125 °C	Store as bare product after packing
Operating temperature	T <sub>use</sub>	A: 0 °C to +70 °C,    B: -20 °C to +70 °C D: -5 °C to +85 °C	
Frequency tolerance *1	f <sub>tol</sub>	J: ±50 × 10 <sup>-6</sup> , L: ±100 × 10 <sup>-6</sup>	
Current consumption	I <sub>CC</sub>	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 <sub>dis</sub>	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 <sub>OH</sub>	0.66 V to 0.85 V	DC characteristics
	V <sub>OL</sub>	-0.15 V to 0.15 V	
Output load condition	L <sub>HCSL</sub>	50 Ω or 42.2 Ω, with C <sub>L</sub> =2 pF, R <sub>S</sub> =33 Ω or 27 Ω	
Input voltage	V <sub>IH</sub>	70 % V <sub>CC</sub> Min.	OE and ZSEL terminals
	V <sub>IL</sub>	30 % V <sub>CC</sub> Max.	
Rise / Fall skew rate	R <sub>r</sub> / R <sub>f</sub>	1 V/ns to 4 V/ns	Between -0.15 V and 0.15 V of differential output.
Start-up time	t <sub>str</sub>	5 ms Typ., 10 ms Max.	Time at minimum supply voltage to be 0 s
Phase Jitter	t <sub>PJ</sub>	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 <sub>skew</sub>	20 ps Typ., 50 ps Max.	ZSEL=H
Aging	f <sub>age</sub>	N: ±10 × 10 <sup>-6</sup> /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 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.

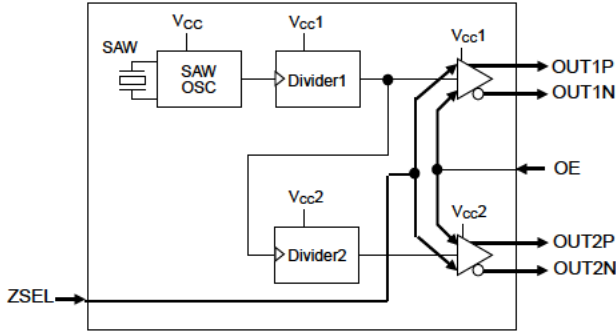
⑦ Frequency tolerance	
J	±50 × 10 <sup>-6</sup>
L	±100 × 10 <sup>-6</sup>

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

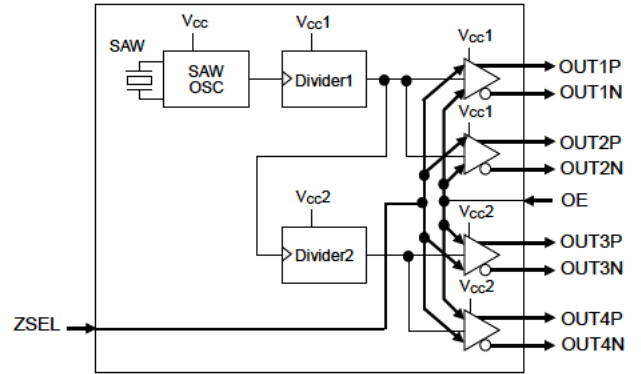
⑨ Frequency aging	
A	Frequency tolerance include aging
N	Frequency tolerance exclude aging

Block diagram

2-outputs



4-outputs



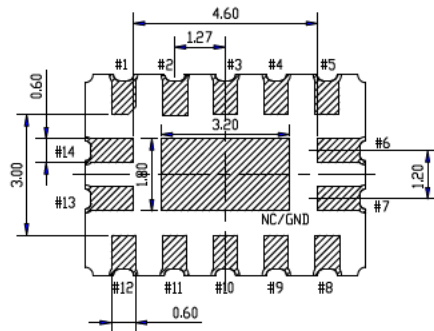
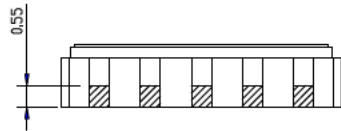
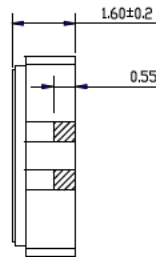
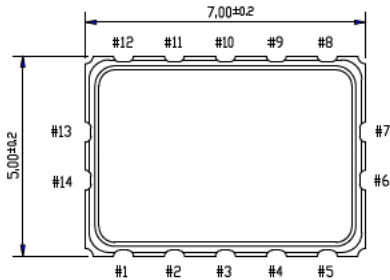
ZSEL function

ZSEL		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

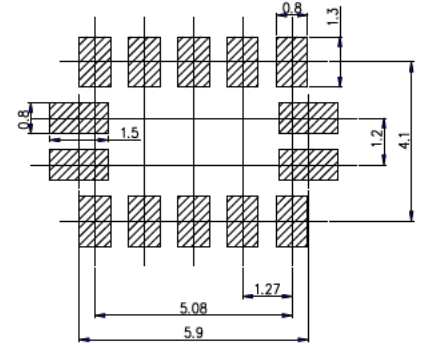
(Unit :mm)

Footprint (Recommended) (Unit :mm)



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

Pin	Connection	
	2-outputs	4-outputs
1	V <sub>cc1</sub>	
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 <sub>cc2</sub>	
13	V <sub>cc</sub>	
14	GND	



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<sub>cc</sub>, V<sub>cc1</sub>, V<sub>cc2</sub> - GND).

## PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

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