Multi output SAW Oscillator (MOSO)
OUTPUT : LV-PECL

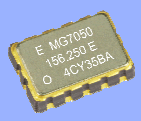
MG7050EAN

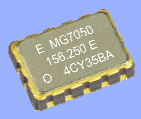
Feature
- •Ultra Low jitter : 0.3 ps Max.
- •2 or 4 outputs and it is able to reduce fan-out buffers
- •Frequency range : 100 MHz to 700 MHz
- •Supply voltage : 2.5 V / 3.3 V
- •External dimensions : 7.0 × 5.0 × 1.6 mm
- •Output : LV-PECL (2 or 4 outputs)

Application
GbE, Fiber Channel, SAS, PCI express
Server, Storage, Router/Switch, Networking, OTN

Pb Free RoHS Compliant

Product Number (please contact us)
X1M000411xxxx00





Actual size

Specifications (characteristics)

Item	Symbol	Specifications		Conditions / Remarks	
Output frequency range	f_0	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	Vcc, Vcc1 and Vcc2 need same voltage	
Storage temperature	T_stg	-55 ºC to +125 ºC		Store as bare product after packing	
Operating temperature	T_use	A: 0 ºC to +70 ºC, B: -20 ºC to +70 ºC D: -5 ºC to +85 ºC			
Frequency tolerance *1	f_tol	J: ±50 × 10^{-6}, L: ±100 × 10^{-6}			
Current consumption	I_{CC}	75 mA Typ., 94 mA Max.	80 mA Typ., 102 mA Max.	2-outputs	OE=Vcc L_ECL=50 Ω
		125 mA Typ., 170 mA Max.	130 mA Typ., 184 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_{OH}	Vcc-1.025 V to Vcc-0.88 V		DC characteristics	
	V_{OL}	Vcc-1.81 V to Vcc-1.62 V			
Output load condition	L_ECL	50 Ω		Termination to Vcc-2.0 V	
Input voltage	V_{IH}	70% Vcc Min.		OE and FSEL terminals	
	V_{IL}	30% Vcc Max.			
Rise time / Fall time	tr/tf	200 ps Typ., 400 ps Max.		Between 20% and 80% of (V_{OH}-V_{OL})	
Start-up time	t_str	5 ms Typ., 10 ms Max.		Time at minimum supply voltage to be 0 s	
Phase Jitter	t_{PJ}	0.17 ps Typ.	0.14 ps Typ.	fo=100 MHz	Offset frequency: 12 kHz to 20 MHz
		0.16 ps Typ.	0.13 ps Typ.	fo=125 MHz	
		0.15 ps Typ.	0.12 ps Typ.	fo=156.25 MHz	
		0.13 ps Typ.	0.11 ps Typ.	fo=212.5 MHz	
		0.11 ps Typ.	0.10 ps Typ.	fo=312.5 MHz	
		0.05 ps Typ.	0.05 ps Typ.	fo=700 MHz	
		0.3 ps Max.			
Skew	t_skew	20 ps Typ., 50 ps Max.		FSEL=H	
Aging	f_age	N: ±10 × 10^{-6}/ year Max.		First year	+25 °C, Vcc=2.5 V, 3.3 V
		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 E AN 156.250000MHz 4 A C J A N (⑦⑧⑨:JDA, JBA are not available)
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①Model
②Output (E: LV-PECL)
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.

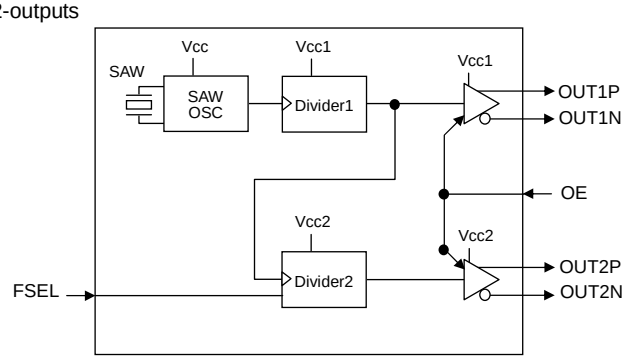
⑦Frequency tolerance	
J	±50 × 10^{-6}
L	±100 × 10^{-6}

⑧Operating temp.	
A	0 to +70℃
B	-20 to +70℃

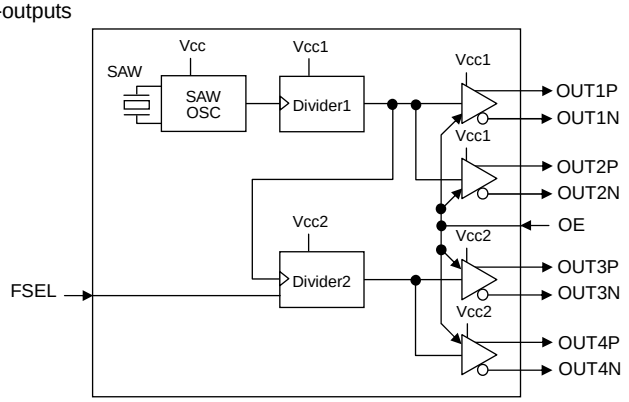
⑨Frequency aging	
A	Frequency tolerance include aging
N	Frequency tolerance exclude aging

Block diagram

2-outputs



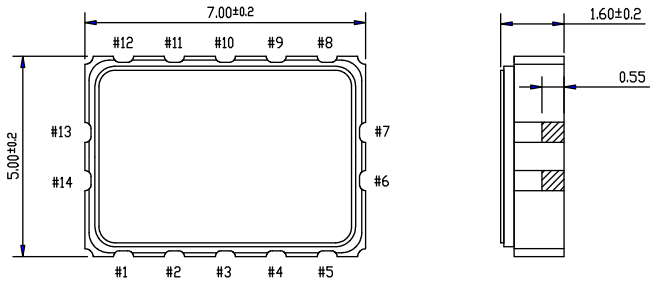
4-outputs

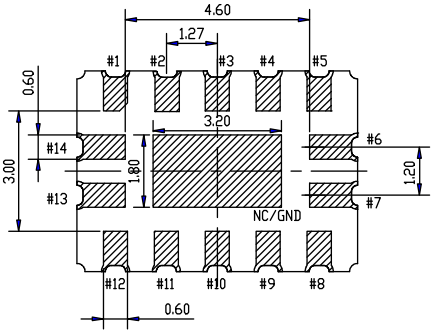


FSEL function

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

External dimensions (Unit :mm)

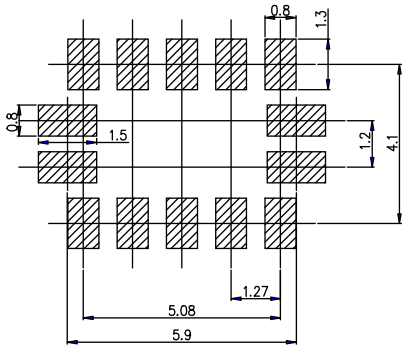




OE pin = “H” : Specified frequency output.
OE pin = “L” : Output is high impedance
#14 is connected to the cover.

Pin	Connections	
	2-outputs	4-outputs
1	Vcc1	
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	Vcc2	
13	Vcc	
14	GND	

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}, $V_{CC}1$, $V_{CC}2$ - 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,

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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	►Pb free.
RoHS Compliant	►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.)
For Automotive	►Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
Automotive Safety	►Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).

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