OSC Type Model name item name use **SEIKO EPSON CORPORATION**

Product name SG7050VAN 155.520000MHz KJGA
Product Number / Ordering code X1G0042810013xx

Please refer to the 9.Packing information about xx (last 2 digits)

Output waveform Output Wave
Pb free / Complies with EU RoHS directive
Reference weight Typ. 149 mg

1.Absolute maximum ratings

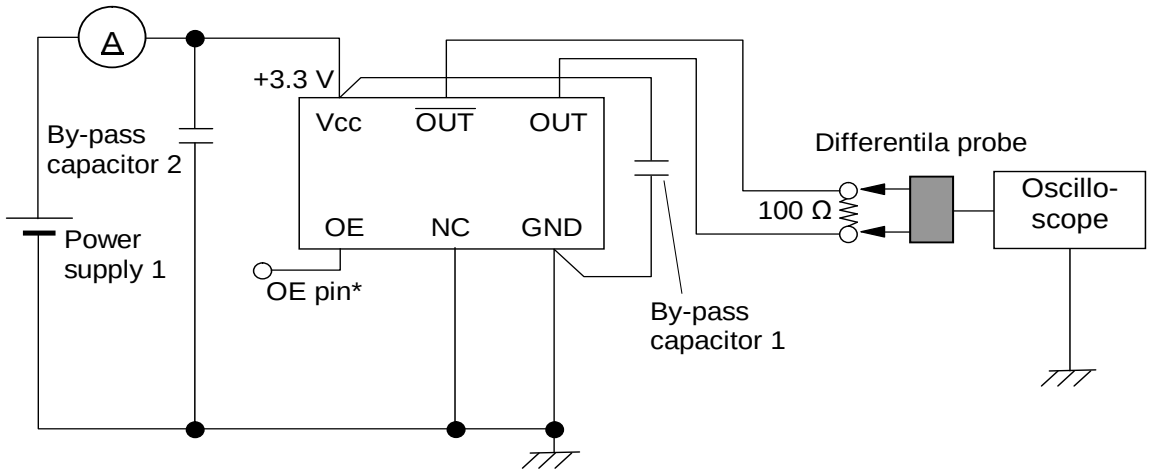
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Maximum supply voltage	Vcc-GND	supply voltag	m supply vo	upply voltag	V	Conditions / Remarks (Maximum
Storage temperature	T_stg	emperature	e temperatu	mperature(	ºC	Conditions / Remarks (Storage te
Input voltage	Vin	voltage(Lo	put voltage[	voltage(Hig	V	Conditions / Remarks (Input volta

2.Specifications(characteristics)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Output frequency	f0	0	Frequency	0	MHz	
Supply voltage	Vcc	y voltage(Lo	voltage (Ty	y voltage(Hi	V	Conditions / Remarks (Supply voltage
Operating temperature	T_use	ng temperat	0	g temperatu	ºC	Conditions / Remarks (Operating tempera
Frequency tolerance	f_tol	ncy tolerand	0	ncy toleranc	x10^{-6}	Conditions / Remarks (frequency toleranc
Current consumption	Icc	0	onsumption	onsumption	mA	Conditions / Remarks (Current consumpti
Stand-by current	I_std	0	0	by current (	mA	Conditions / Remarks (Stand-by current
Disable current	I_dis	0	0	ble current(I	mA	Conditions / Remarks (Disable current
Symmetry	SYM	ymmetry(Mi	0	ymmetry(Ma	%	Conditions / Remarks (Symmetry
Output voltage(LVDS)	V_{OD}	voltage VO	voltage VO	voltage VOI	mV	Conditions / Remarks (Output voltage VO
	dV_{OD}	0	0	voltage dVO	mV	Conditions / Remarks (Output voltage dV
	Vos	voltage VO	voltage VO	voltage VOS	V	Conditions / Remarks (Output voltage VO
	dVos	0	0	voltage dVO	mV	Conditions / Remarks (Output voltage dV
Output load condition(LVDS)	L_LVDS	0	ut load cond	0	Ω	Conditions / Remarks (Output load condit
Input voltage	V_{IH}	oltageVIH	0	0		Conditions / Remarks (Input voltageVIH
	V_{IL}	0	0	oltageVIL （Max）		Conditions / Remarks (Input voltageVIL
Rise time	t_r	0	0	e time （Ma	ps	Conditions / Remarks (Rise time
Fall time	tf	0	0	l time （Ma	ps	Conditions / Remarks (Fall time
Start-up time	t_str	0	0	t-up time (	ms	Conditions / Remarks (Start-up time
Jitter	t_{DJ}	ter TDJ(Lo	er TDJ （Ty	ter TDJ(Hig	ps	Conditions / Remarks (Jitter TDJ
	T_{RJ}	ter TRJ(Lo	er TRJ （Ty	ter TRJ(Hig	ps	Conditions / Remarks (Jitter TRJ
	t_{RMS}	er TRMS(Lo	r TRMS （Te	r TRMS(Hi	ps	Conditions / Remarks (Jitter TRMS
	t_{p-p}	ter Tp-p(Lo	er Tp-p （Ty	er Tp-p(Hig	ps	Conditions / Remarks (Jitter Tp-p
	t_{acc}	ter Tacc(Lo	er Tacc （Ty	er Tacc(Hig	ps	Conditions / Remarks (Jitter Tacc
Phase jitter	t_{PJ}	e jitter TPJ(	jitter TPJ	e jitter TPJ(	ps	Conditions / Remarks (Phase jitter TPJ
Phase noise	L(f)	oise value1	ise value1H	oise value1	dBc/Hz	Conditions / Remarks (Phase noise value1
	Phase noise value1	se value10k	oise value10		dBc/Hz	Conditions / Remarks (Phase noise value1
	Phase noise value10	e value100	ise value10		dBc/Hz	Conditions / Remarks (Phase noise value1
	Phase noise value1	se value1kH	oise value1k		dBc/Hz	Conditions / Remarks (Phase noise value1
	Phase noise value10	e value10kH	ise value10		dBc/Hz	Conditions / Remarks (Phase noise value1
	Phase noise value10	e value100k	se value100		dBc/Hz	Conditions / Remarks (Phase noise value1
	Phase noise value1	se value1MH	oise value1M		dBc/Hz	Conditions / Remarks (Phase noise value1
Frequency aging	f_age	ency aging	0	ency aging	x10^{-6}/Year	Conditions / Remarks (Frequency aging
	Frequency aging 2		0	ncy aging 2 (High)		Conditions / Remarks (Frequency

3.Test circuit

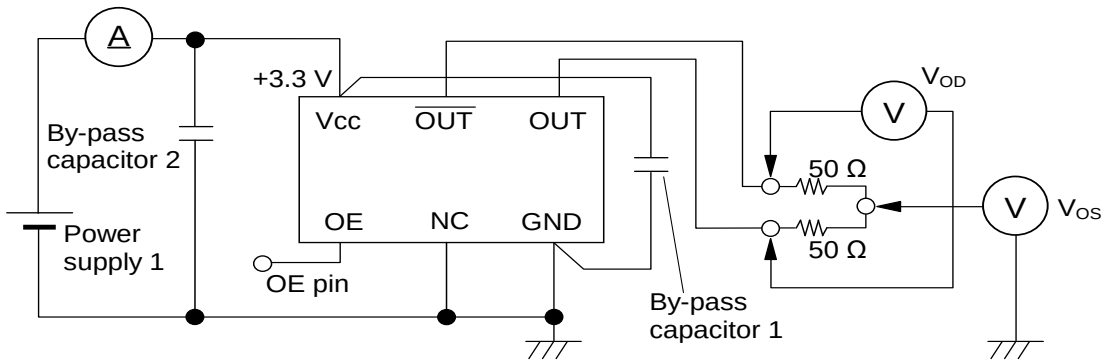
1) To observe waveform and current (case 1)



* The lines from OUT and $\overline{OUT}$ pin are same length.

* To measure the disable current, OE pin is connected to GND

2) To observe waveform and current (case 2)



* The lines from OUT and $\overline{OUT}$ pin are same length.

3) Measurement condition

A) Oscilloscope

•Bandwidth should be 5 times higher than DUT's output frequency (4 GHz).

•Probe ground should be placed closely from test point and lead length should be as short as possible.

B) By-pass capacitor 1 (approx. 0.01 µF to 0.1 µF) places closely between Vcc and GND.

C) By-pass capacitor 2 (approx. 10 µF) places closely between power supply terminals on the board.

D) Use the current meter whose internal impedance value is small.

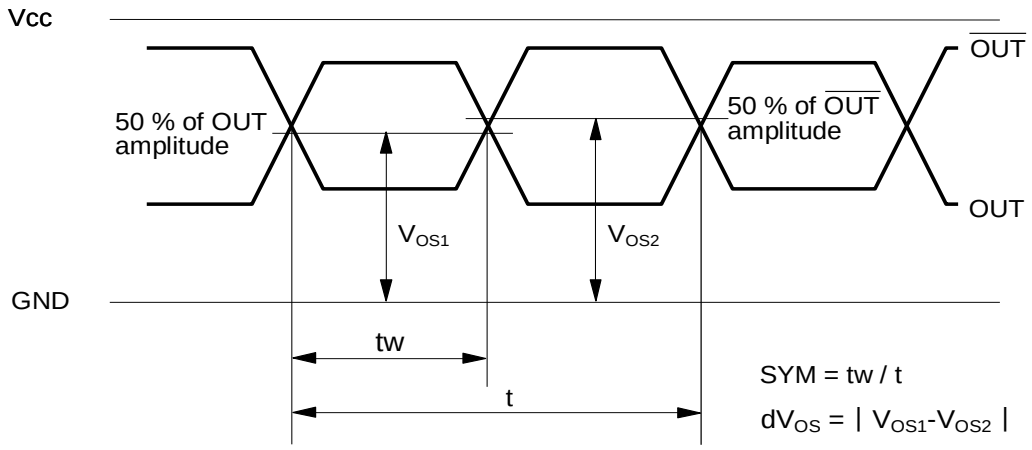
E) Power supply

• Start up time (0 Vg90 %Vcc) of power source should be more than 150 µs and slew rate should be less than 19.8 mV/µs.

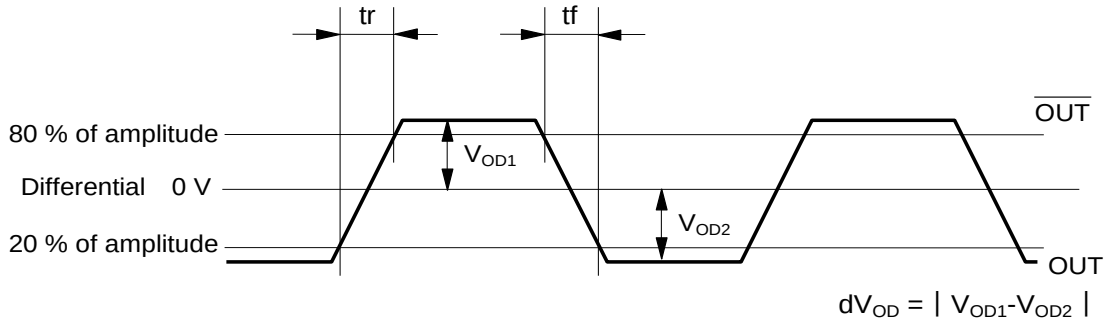
• Impedance of power supply should be as low as possible.

4.Timing chart

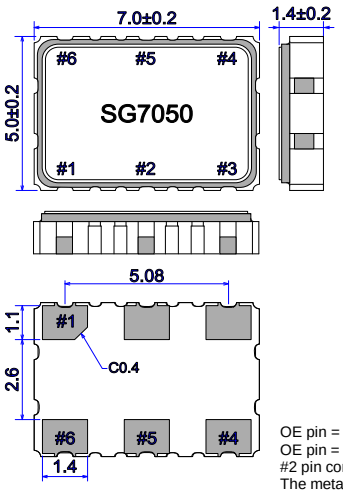
Each output waveform (OUT, and $\overline{OUT}$)



Differential output waveform (OUT – $\overline{OUT}$)



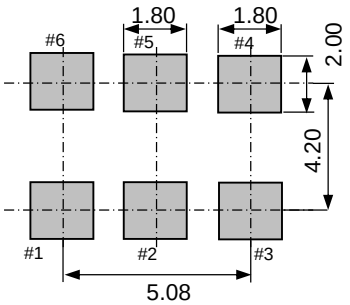
5.External dimensions (Unit: mm)



Pin	Connection
1	OE
2	N.C.
3	GND
4	OUT
5	$\overline{OUT}$
6	VCC

OE pin = "H" or "open" : Specified frequency output.
OE pin = "L" : Output is high impedance.
#2 pin connection = GND is acceptable.
The metal cap is connected to #3 pin.

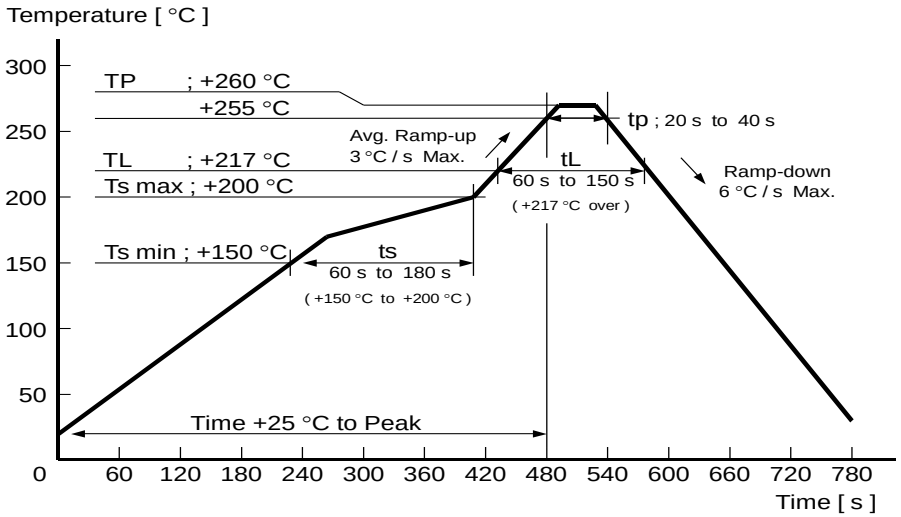
6.Footprint(Recommended) (Unit: mm)



To maintain stable operation, provide a 0.01uF to 0.1uF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between Vcc - GND).

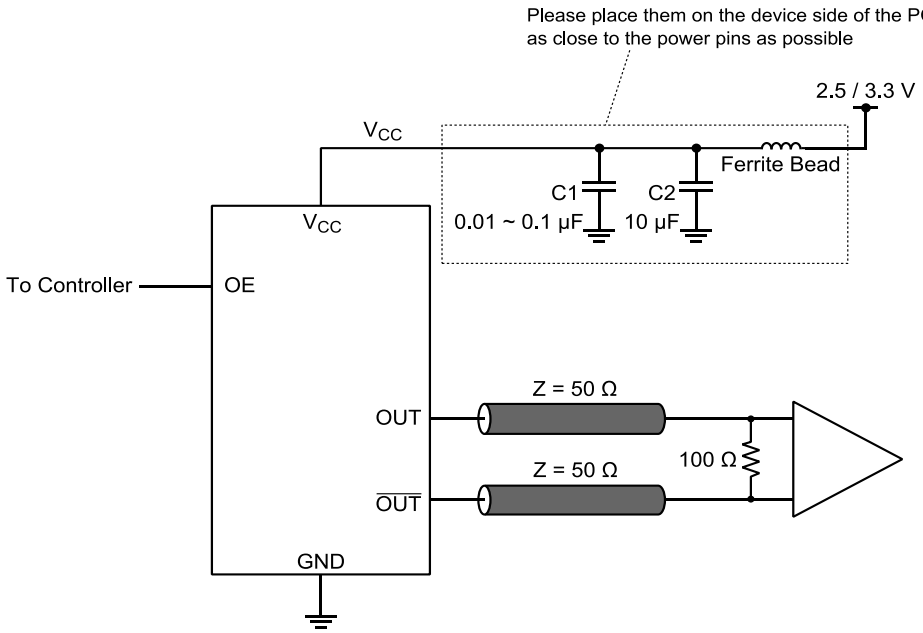
7.Reflow profile

Reflow condition (Follow of JEDEC STD-020D.01)



8.Example of schematic layout

This figure shows an example of this product's application schematic.
As with any high speed analog circuitry, the power supply pins for this device are vulnerable to noise. In order to achieve optimum jitter performance, power isolation with filter device is required for power supply pins.
In order to achieve best performance of the power isolation filter, it is recommended that the filter composing devices is placed on the device side of the PCB as close to the power pins as possible.
The component value of this filter is just an example, it may have to be adjusted.



* By-pass capacitor (approx. 0.01 µF to 0.1 µF) places closely between Vcc and GND.
* By-pass capacitor (approx. 10 µF) places closely between power supply terminals on the board.
* Please design the two output lines by characteristic impedance 100 Ω and same length, and try to make the output lines as short as possible.

9.Packing information

[1]Product number last 2 digits code(xx) description The recommended code is "00"

X1G0042810013xx

Code	Condition	Code	Condition
01	Any Q'ty vinyl bag(Tape cut)	13	500pcs / Reel
11	Any Q'ty / Reel	00	1000pcs / Reel
12	250pcs / Reel		

[2] Taping specification

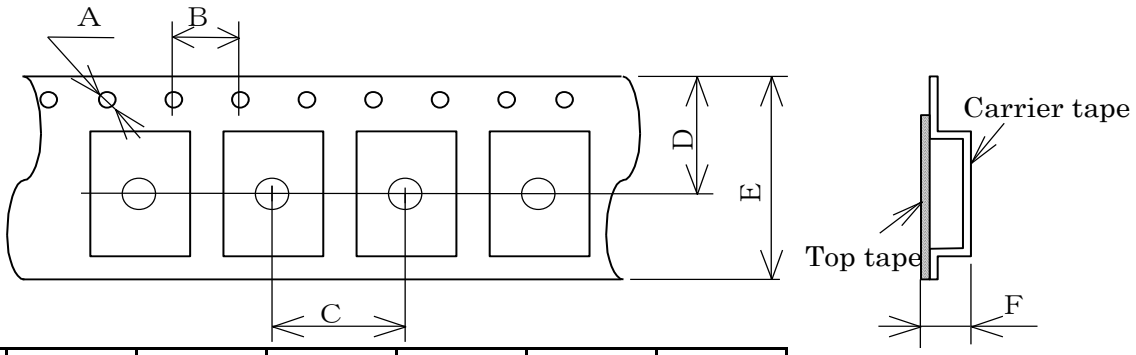
Subject to EIA-481 & IEC-60286

(1) Tape dimensions

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

Unit: mm

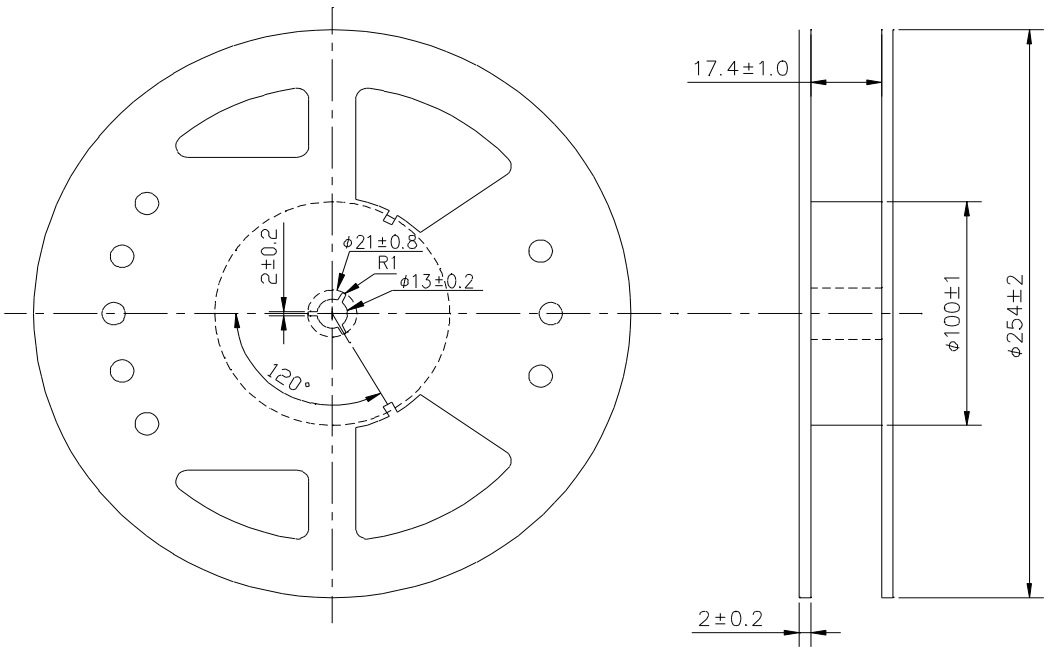


Symbol	A	B	C	D	E	F
Value	φ1.5	4	8	9.25	16	2.3

(2) Reel dimensions

Center material : PS

Material of the Reel : PS



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