

Product name MG7050EAN 156.253906MHz 4ACJDN

Product Number / Ordering code X1M0004110023xx

Please refer to the 10.Packing information about xx (last 2 digits)

Output waveform LV-PECL

Pb free / Complies with EU RoHS directive

Reference weight Typ. 163 mg

1.Absolute maximum ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Maximum supply voltage	V _{cc-GND}	-0.5	-	4	V	
Storage temperature	T _{stg}	-55	-	125	°C	Storage as single product
Input voltage	V _{in}	-0.5	-	V _{cc} +0.5	V	ST or OE terminal

2.Specifications(characteristics)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Output frequency	f ₀		156.2539		MHz	4 output
Supply voltage	V _{cc}	2.97	3.3	3.63	V	
Operating temperature	T _{use}	-5	-	85	°C	
Frequency tolerance	f _{tol}	-50	-	50	x10 ⁻⁶	T _{use}
Current consumption	I _{cc}	-	130	184	mA	L _{ECL} =50Ω
Stand-by current	I _{std}	-	-	-	mA	-
Disable current	I _{dis}	-	8	20.0	mA	OE=GND
Symmetry	SYM	45	-	55	%	At output crossing point
Output voltage(LV-PECL)	V _{OH}	V _{cc} -1.025	-	V _{cc} -0.88	V	DC characteristics
	V _{OL}	V _{cc} -1.81	-	V _{cc} -1.62	V	
Output load condition(ECL)	L _{ECL}	-	50	-	Ω	Terminated to V _{cc} -2.0V
Input voltage	V _{IH}	70%V _{cc}	-	-		OE ans FAEL terminal
	V _{IL}	-	-	30%V _{cc}		
Rise time	t _r	-	200	400	ps	Between 20% and 80% of (V _{OH} -V _{OL})
Fall time	t _f	-	200	400	ps	Between 20% and 80% of (V _{OH} -V _{OL})
Start-up time	t _{str}	-	5	10	ms	Time at minimum supply voltage to be 0s
Jitter	t _{DJ}	-	-	N/A	ps	Deterministic Jitter
	T _{RJ}	-	-	N/A	ps	Random Jitter
	t _{RMS}	-	-	N/A	ps	σ(RMS of total distribution)
	t _{p-p}	-	-	N/A	ps	Peak to Peak
	t _{acc}	-	-	N/A	ps	Accumulated jitter
Phase jitter	t _{pJ}	-	0.12	0.3	ps	Offset frequency 12 kHz to 20 MHz
Phase noise	L(f)	-	-	-	dBc/Hz	Offset:1 Hz
		-	-47.2	-	dBc/Hz	Offset:10 Hz
		-	-77.1	-	dBc/Hz	Offset:100 Hz
		-	-106.2	-	dBc/Hz	Offset:1 kHz
		-	-141.5	-	dBc/Hz	Offset:10 kHz
		-	-151.2	-	dBc/Hz	Offset:100 kHz
		-	-153.7	-	dBc/Hz	Offset:1 MHz
Skew	t _{skew}	-	-	50	ps	FSEL = H
Frequency aging	f _{age}	-10	-	10	x10 ⁻⁶ /Year	@+25°C first year
		-	-	-		-

3. Test circuit

1) Measurement condition

(1) 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.

(2) By-pass capacitor 1 (approx. 0.01 μF to 0.1 μF) places closely between V_{cc} and GND.

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

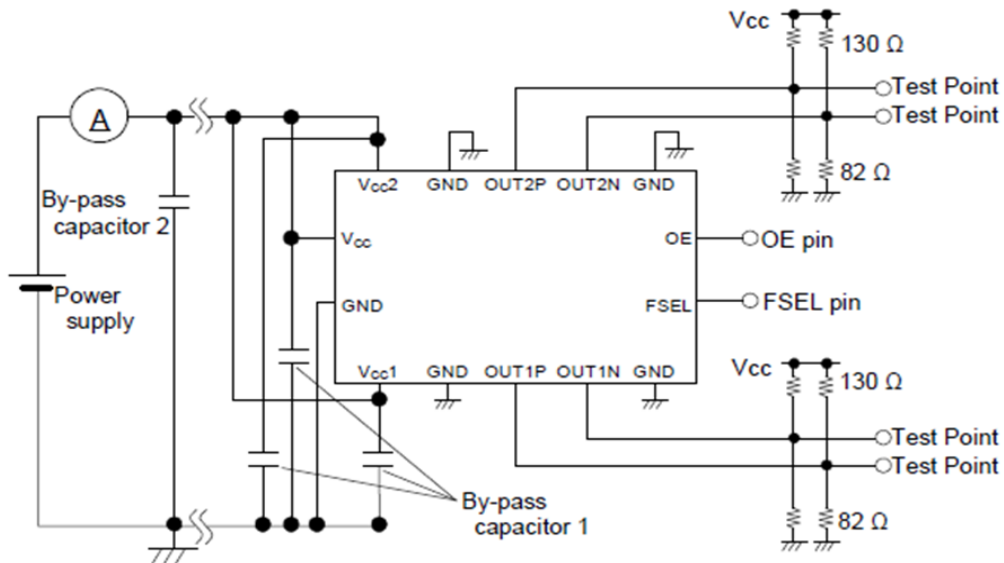
(4) Use the current meter whose internal impedance value is small.

(5) Power supply

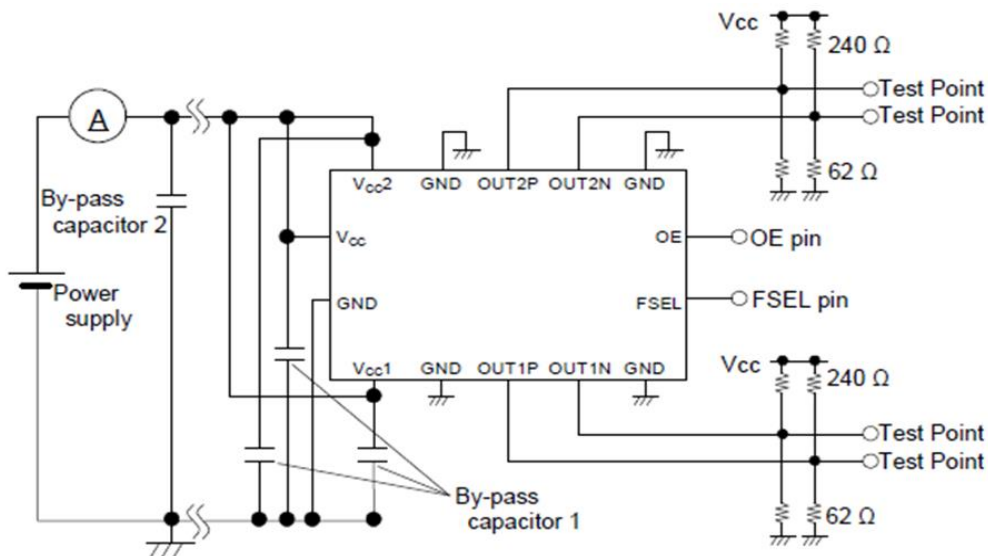
- Start up time (0 V \rightarrow 90 % V_{cc}) of power source should be more than 150 μs and slew rate should be less than 19.8 mV/ μs .
- Impedance of power supply should be as low as possible.

2) 2 outputs type

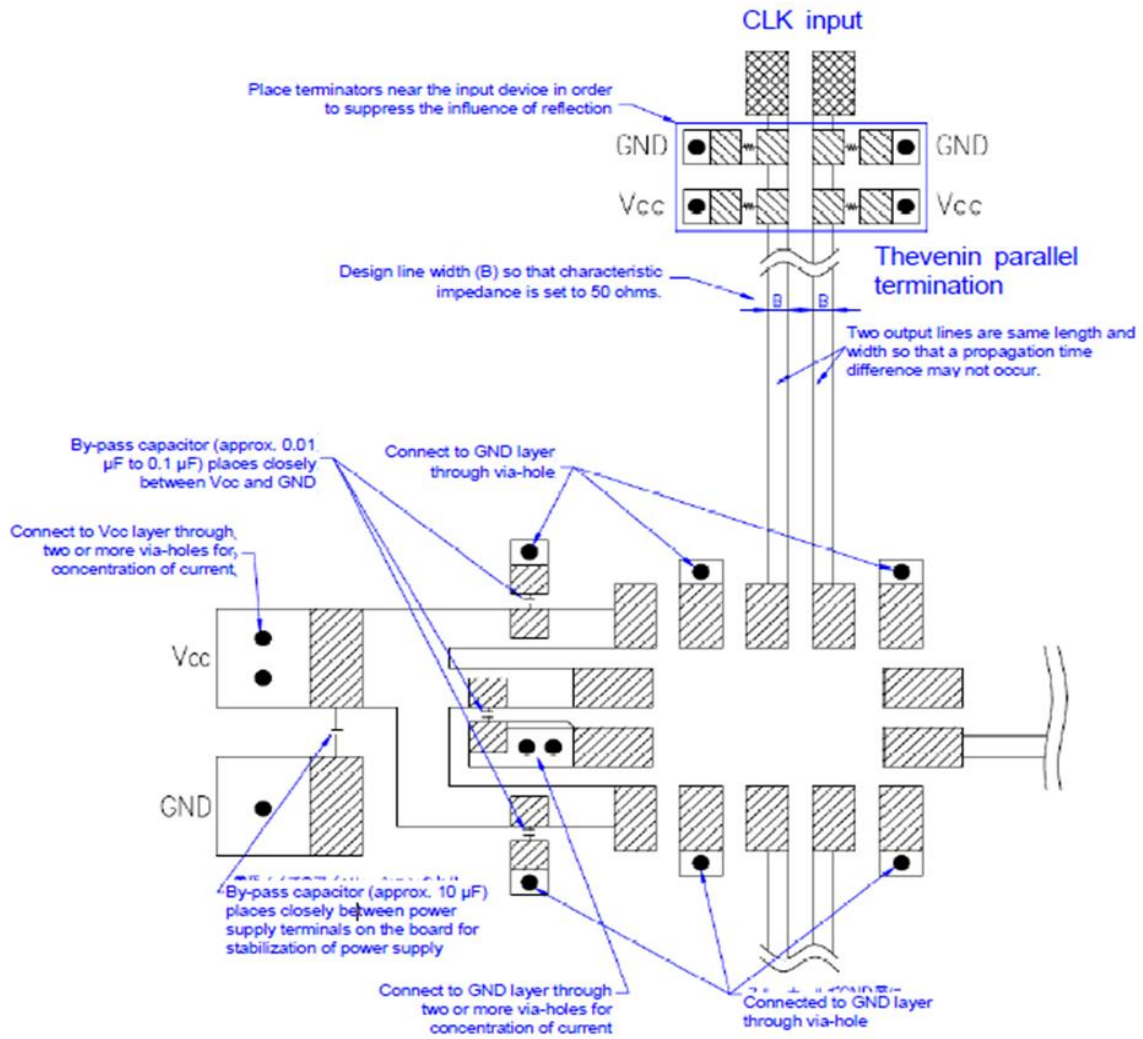
(1) To observe waveform and current $V_{\text{cc}} = 3.3\text{V}$



(2) To observe waveform and current $V_{\text{cc}} = 2.5\text{V}$

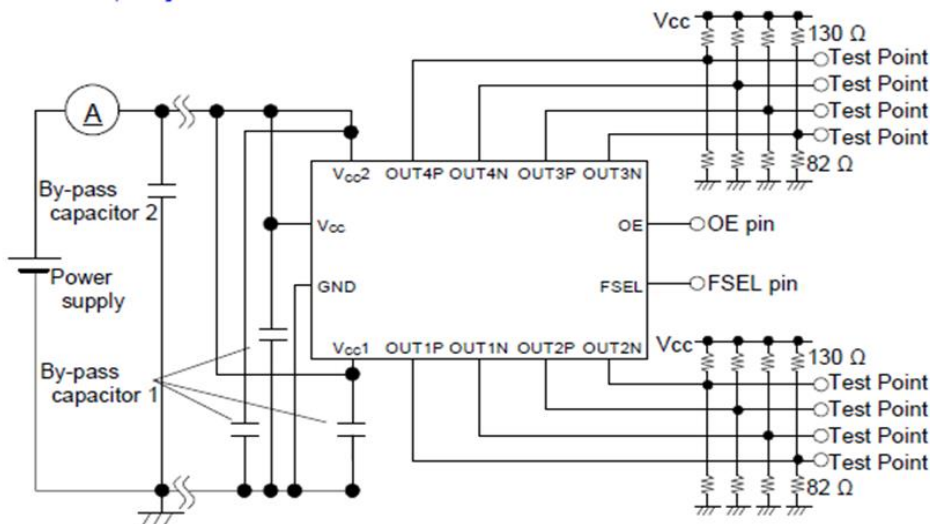


(3)PCB layout (multilayers, with Vcc and GND layer inside)

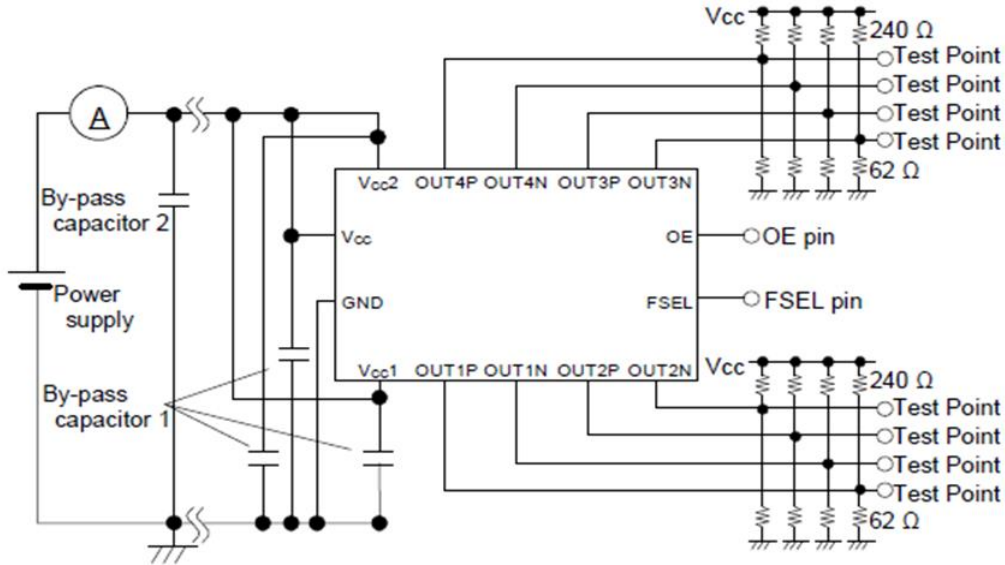


3) 4 outputs type

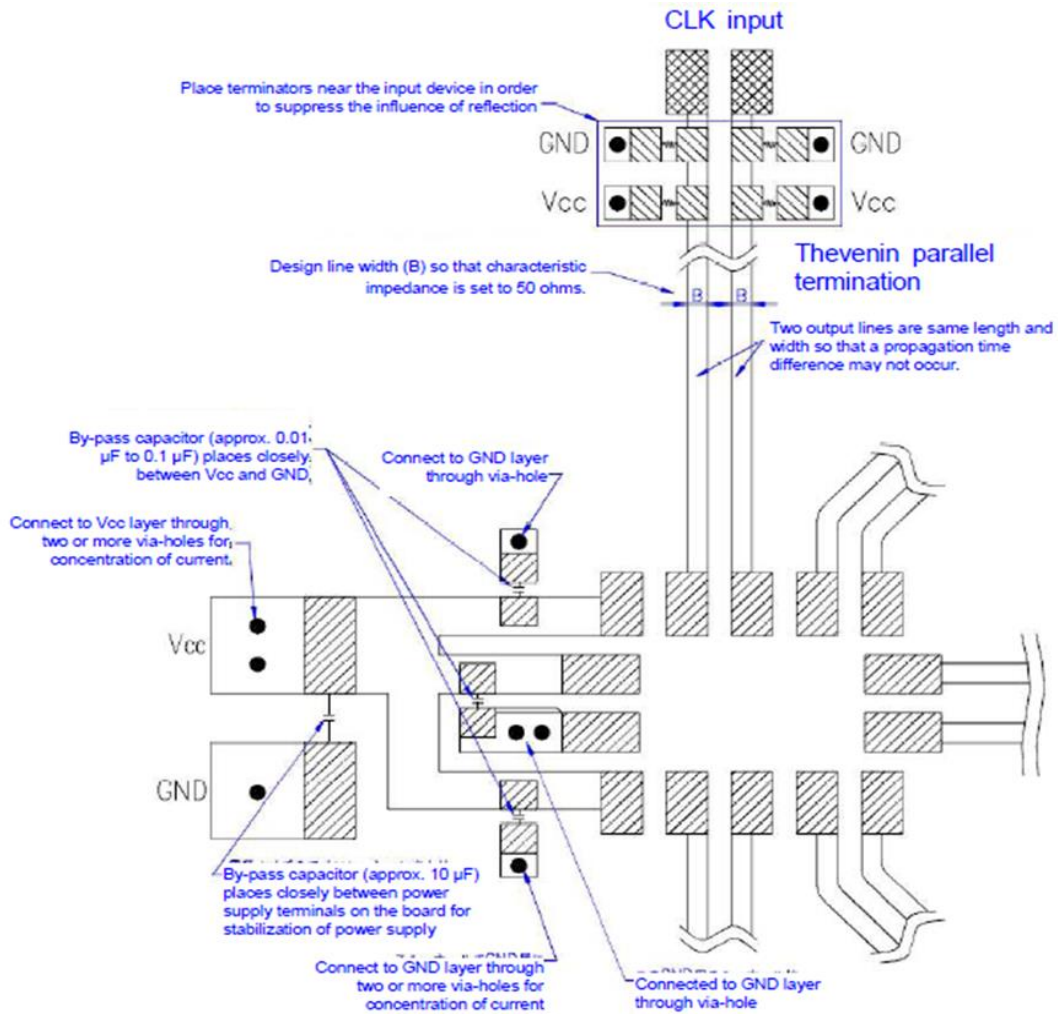
(1)To observe waveform and current Vcc = 3.3V



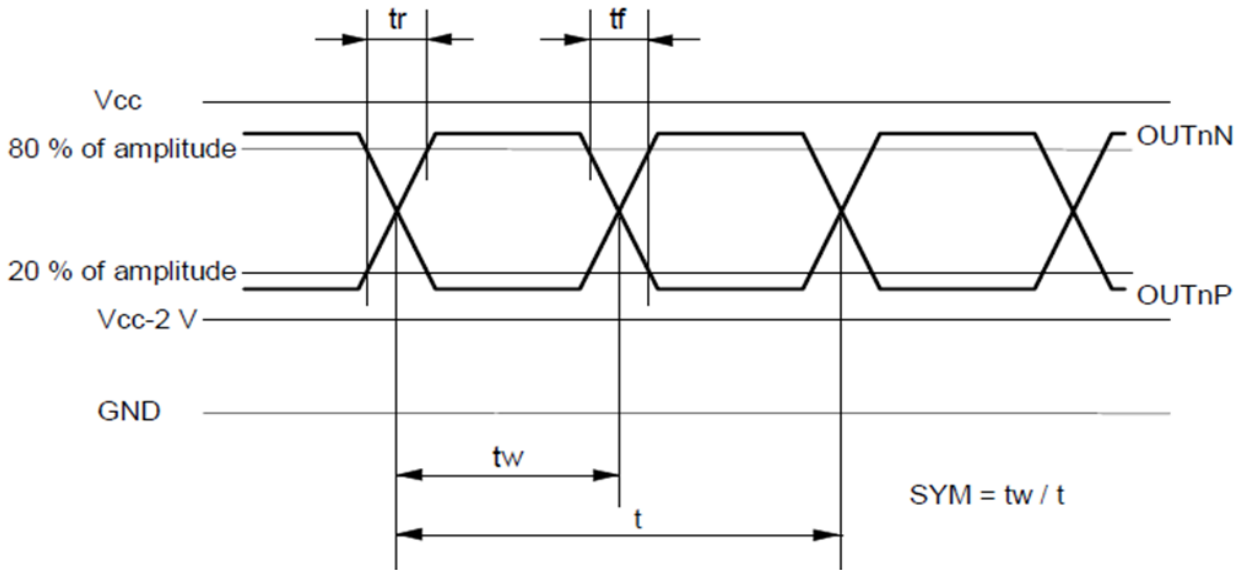
(2) To observe waveform and current $V_{cc} = 2.5V$



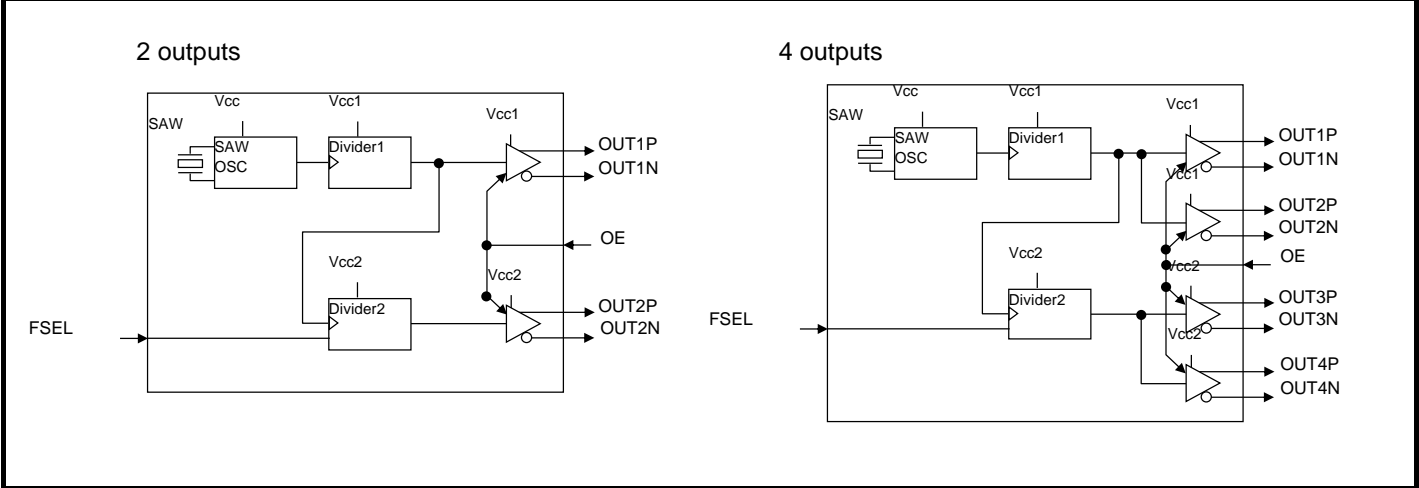
(3) PCB layout (multilayers, with V_{cc} and GND layer inside)



4. Timing chart



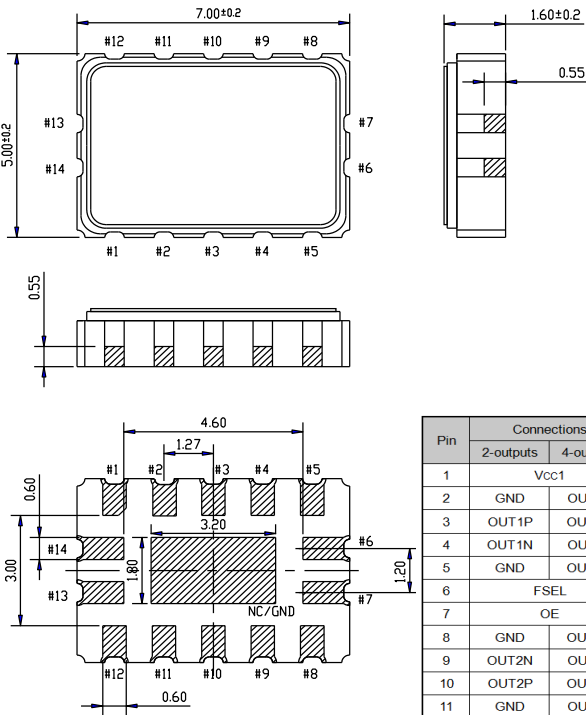
5. Block diagram



6. FSEL function

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

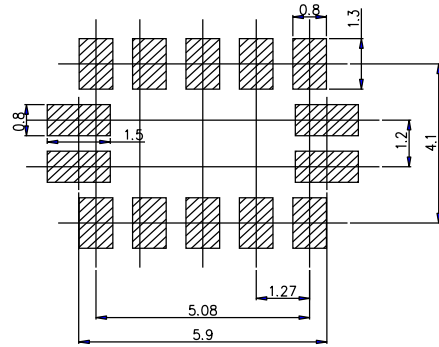
7.External dimensions (Unit: mm)



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	

OE pin = "H" : Specified frequency output.
 OE pin = "L" : Output is high impedance

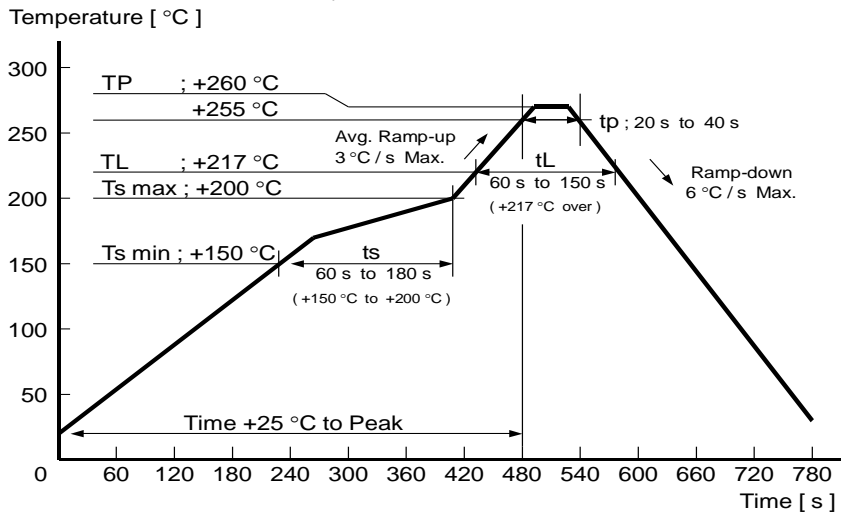
8.Footprint(Recommended) (Unit: mm)



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).

9.Reflow profile

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



10.Packing information

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

X1M0004110023xx

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

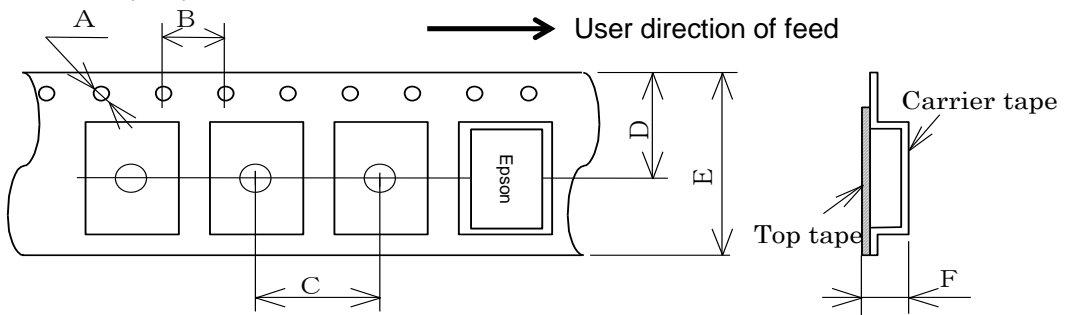
Subject to EIA-481 & IEC-60286

(1) Tape dimensions

Material of the Carrier Tape : PS

Material of the Top Tape : PET+PE

Unit: mm

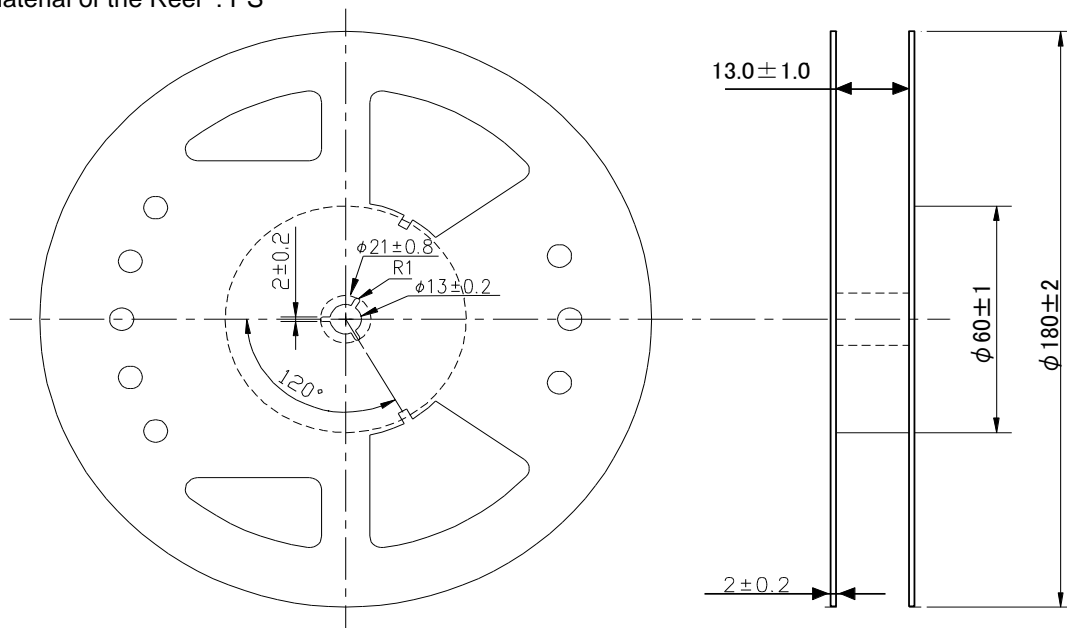


Symbol	A	B	C	D	E	F
Value	Φ1.5	4	8	9.25	16	2.3

(2) Reel dimensions

Center material : PS

Material of the Reel : PS



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