☑	Taiwan Plant	NO. 31,Ting-Ping Rd., Shui-Fong Ind. Park, Shui-Fong , District , New Taipei City 224012 Taiwan
		TEL: 886-2-2406-2779 FAX: 886-2-2496-0769 E-Mail : sales-tw @mercury-crystal.com
☐	China Office	Room 401 Dongan Building Chunxu Road 258, Development Zone Kunshan City, Jiangsu Province, China
		TEL: 86-512-5763-8100 FAX: 86-512-5763-8103 E-Mail : sales-cn @mercury-crystal.com
☐	U.S.A. Plant	Unit 603, 9804 Crescent Center Dr., Rancho Cucamonga,California 91730-5782 USA
		TEL: 1-909-466-0427 FAX: 1-909-466-0762 E-Mail : sales-us @mercury-crystal.com

Specification Sheet For Approval	Series No: LC20241024A01
	Date : 2023/10/25

☐ Quartz Crystal ☑ Quartz Crystal Oscillator ☐ OCXO ☐ VCXO
☐ M.C.F ☐ TCXO / VCTCXO ☐ Others _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Customer	雍智科技股份有限公司
Customer P/N	
Product Type	Differential HCSL Crystal Clock Oscillator --- HCK5761 (7.0 * 5.0 * 1.7 mm)
Nominal Frequency	48.000 MHz
Mercury P/N	3HCK5761-E-48.000

Customer	Vender
Approved By	Confirmed By
Customer Engineer :	Mercury Engineer : *Auden Wu*
Date :	Date : 2023/10/25
Customer QC :	Mercury QC : *Andy Tsai*
Date :	Date : 2023/10/25

Specification Sheet Contents :

☑ Specifications Sheet
☑ Package Dimension
☑ Crystal / Oscillator Introduction
☑ MSL level1
☐ FQC Test Report
☐ Temperature Stability Test Report
☑ Test Data Of Reliability
☑ Lead Free Approved

Mercury Electronic Industrial Co., Ltd.

Linus Chiu

Authorized Signature

Electrical Specification

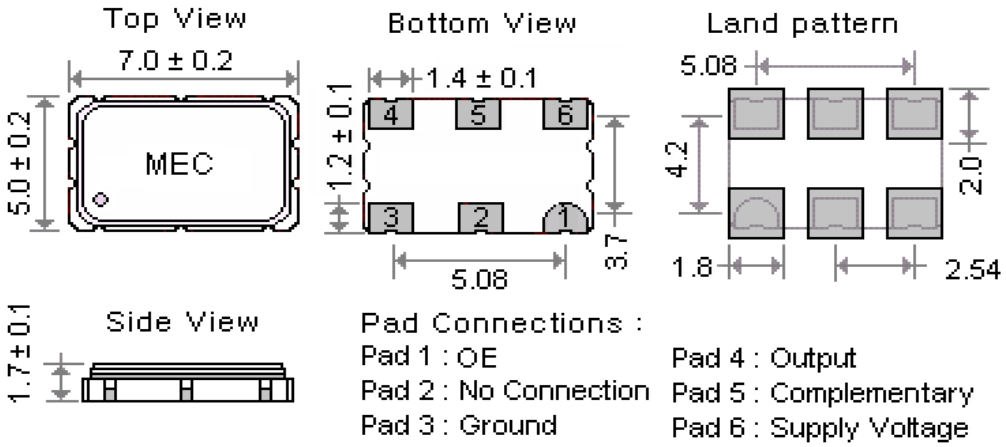
Series No. : LC20241024A01
Date : 2023/10/25

	Parameters	SYM.	Electrical Spec.				Notes
			Min.	Typical	Max.	Unit	
1	Mercury Part No.			-			3HCK5761-E-48.000
2	Nominal Frequency	FL		48.000000		MHz	
3	Output Waveform			-			HCSL Differential output
4	Holder Type			-			7.0 * 5.0 * 1.7 mm , 6pads , SMD Type
5	Input Voltage	V_{DD}		3.3		V	D.C ± 10 %
6	Output Voltage High " 1 "	Voh	550		850	mV	RL = 50 ohms to ground on each output
7	Output Voltage Low " 0 "	VoL	-150		150	mV	
8	Output Swing	Vos	600			mV	
9	Frequency Stability	△f / fo	-50		50	ppm	Over Operating Temperature
10	Current Consumption	I_{DD}			27	mA	measured with terminating resistors
11	Rise Time & Fall Time	Tr , Tf		0.3	0.5	n Sec.	20% ⟷ 80 % of waveform
12	Duty Cycle	tw / t	45		55	%	at 50 % waveform± 5 %
13	Start-up Time	ST		5	10	m Sec.	
14	Output Load	RL		50		Ω	50 ohms to ground on each output
15	Operating Temperature	T_opr	-40		85	°C	
16	Storage Temperature	T_stg	-55		125	°C	
17	Aging	fa	-3		3	ppm	first year
18	Integrated Phase Jitter	Jrms		0.2		pS	12 KHz to 20 MHz integrated

19	Phase Noise (dBc / Hz) [typical]	Offset	10 Hz	100 Hz	1k Hz	10k Hz	100k Hz	1M Hz	10M Hz
	For reference only	100.000 MHz	-81	-105	-130	-141	-147	-151	-156

20	OE Control on Pad 1	If V_{DD} * 70% (min.) is applied : Output. Enable Oscillation enable time : 10 ms (max.)
		If V_{DD} * 30% (max.) is applied : Output Disable Oscillation disable time : 0.2 us (max.) Current consumption is 10 uA max. (OE≦0.3V)

Package Dimension (Unit : mm)



Marking

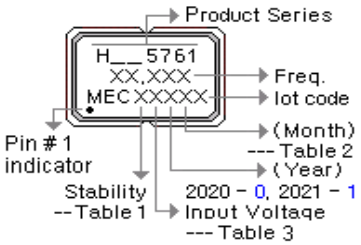


Table 1

-10°C ~ 70 °C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ;
	If non-standard please enter the desired stability after " C " , for example " C10 " : ± 10ppm
-40°C ~ 85 °C	" D " ± 25ppm ; " E " ± 50ppm ; " F " ± 100ppm ;
	If non-standard please enter the desired stability after " I " , for example " I10 " : ± 10ppm

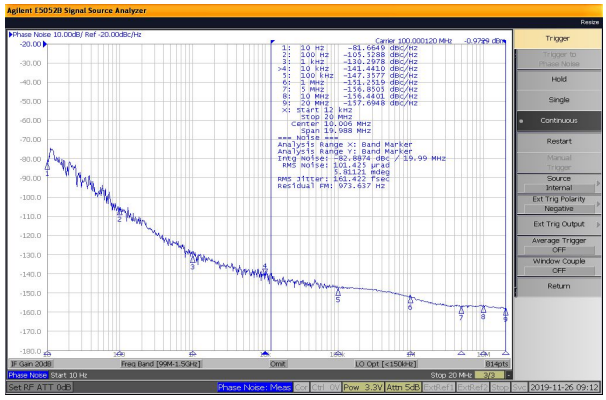
Table 2

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Code	A	B	C	D	E	F	G	H	I	J	K	L

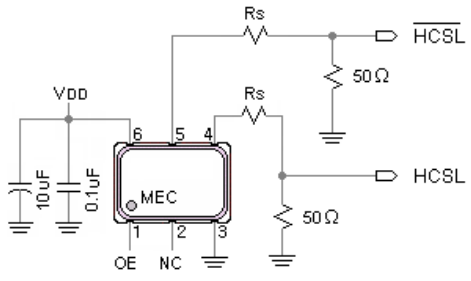
Table 3

Input Voltage	5.0 V	3.3 V	2.8 V	2.5 V	1.8 V	1.5 V	1.2 V	1.0 V
Enable / Disable	B	D	F	H	J	L	N	P

Phase Noise and Jitter test report (For reference only)

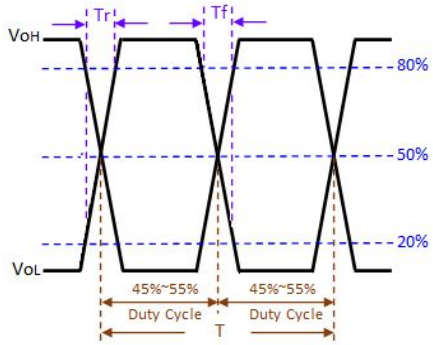


HCSL Square Wave Test Circuit

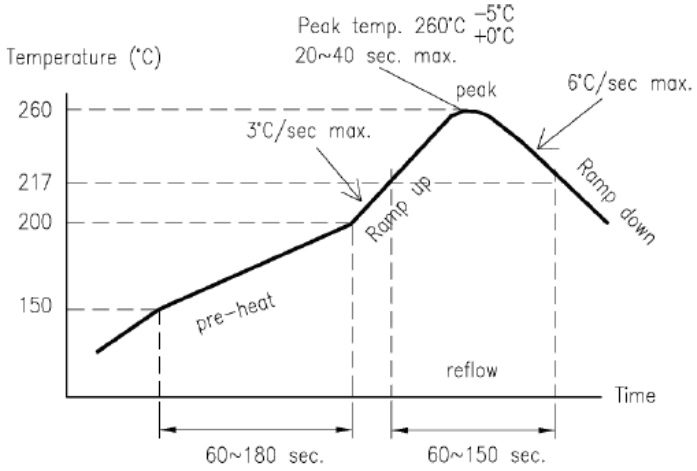


Rs = 0 to 33Ω to minmize ringing in application.

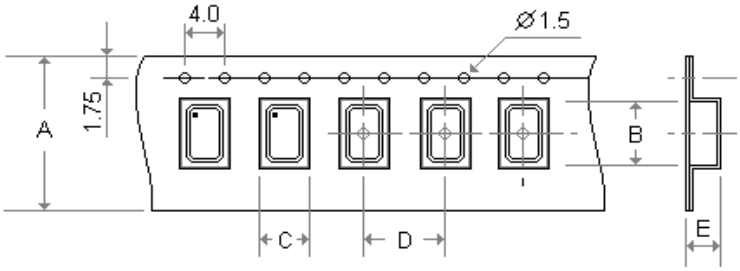
HCSL Square Wave Output Waveform

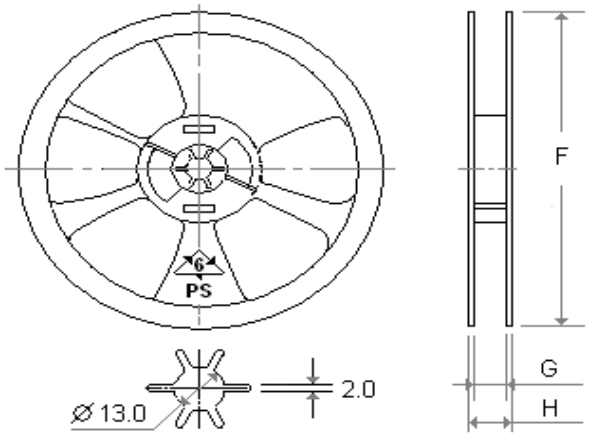


Recommended Temperature Profile For Reflow Process :



Emboss Taping & Reel Specification :





Dimensions : (Unit : mm) ±0.3mm

A	B	C	D	E
16.0	7.3	5.3	8.0	1.9

F	G	H
180	17.2	19.3

Remark : 1. Standard reel quantity is 1000 pcs per reel.

2. 10 sprocket hold pitch cumulative tolerance is ± 0.1 mm.

3. E measured from a place on the inside bottom of the pocket to the top surface of the carrier.

Environmental Specification

1.Temperature Test			
*Temperature Cycling Test			
Conditions:	Steps of cycle	(1)Extreme Cold Temp: -55℃(+0/-10℃)/ 15±3min	
		(2)Extreme Hot Temp: +125℃(+15/-0℃)/ 15±3min	
	Number of	10 cycles min	
Results:	Frequency and wave form of tested products must remain within specifications.		
*Thermal Shock Test			
Conditions:	Temperature -55(+0/-10)℃ to 125(+10/-0)℃		Duration of cycle 15 times(min)
	ExTotal Transfer Time < 10 seconds		
	Total Dwell time > 2minutes		
	Specified Temp reached in < 5 minutes		
Results:	Frequency and wave form of tested products must remain within specifications.		
*Low Temperature Test			
Conditions:	Temperature -50℃±5℃		Duration of test 168hours(min)
Results:	Frequency and wave form of tested products must remain within specifications.		

2.Accelerated Life Test(Aging Biased)		
Conditions:	Temperature +85°C±5°C	Duration of test 168hours±6hours
Results:	DC Power supply	
	Frequency and wave form of tested products must remain within specifications.	

3.Salt Spray Test		
Conditions	Temperature 35°C	Duration of test 24 hours
	NaCl 5%	
Results:	There Should be no rust on surface of products	

4.Humidity Test			
Conditions:	Temperature: 85℃±5℃	Relative humidity:85%±5℃	Duration of test:168 hours(min)
Results:	Frequency and wave form of tested products must remain within specifications.		

Mechanical Specification Sheet		
1.Vibration Test		
Conditions:	Freq. range: 20~2000Hz Peak to Peak	
	amplitude:1.52mm Peak acceleration:20G(98m/s2)	
	3direction(X,Y,Z),each 20min, 4cycles	
Results:	Frequency and wave form of tested products must remain within specifications.	
2.Drop Test		
Conditions:	Method of drop	Free drop
	Dropping floor	Hard wood board
	Height	75 cm +1/-0cm
	Number of drops	3 times
Results:	Frequency and wave form of tested products must remain within specifications.	

Notice :

1 Mercury requires the copy of this specification returned with approved.
2 Any change to these specification have to be agreed by both parties and new revision of the specification will be issued .