

产品规格书

Product Specification

CUSTOMER 客户: _____

CUSTOMER PN 客户 PN: _____

HANG CRYSTAL P/N 杭晶物料编码: TC53S4-14.7456-28MLDTNG

MODEL 产品型号: TCXO SMD 5.0x3.2, Sine wave, 2.8V

NOMINAL FREQUENCY 频率: 14.7456MHz

ISSUE DATE 日期: 2022 / 09 / 14

CUSTOMER'S APPROVAL

客户确认

(PLEASE RETURN A COPY WITH APPROVAL)
(请将确认的复印件返回我司)

APPROVED

QA

MB

J Jiang

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Revision	Description / ECN	Prepared	Approved	Date
1	Initial release	MB	James Jiang	2022-09-14
2	Not issued			
3	Not issued			
4	Not issued			

1. NOMINAL AND MAXIMUM RATINGS, OPERATING AND STORAGE CONDITIONS

	PARAMETER	SYMB.	MIN	TYP	MAX	Unit	Conditions / Remarks
1	Nominal frequency	F_N	14.7456			MHz	--
2	Maximum supply voltage	V_{MAX}	-0.3		+5.25	V_{DC}	Between V_{CC} and GND
3	Operating supply voltage range	V_{CC}	2.66	2.8	2.94	V_{DC}	Note 1
4	Output load resistance	R_L	9	10	11	k Ω	Clipped sine wave output
5	Output load capacitance	C_L	9	10	11	pF	Clipped sine wave output
6	Operating temperature range	T_{OP}	-40	+25	+85	$^{\circ}C$	Note 1
7	Storage Temperature Range	T_{ST}	-55		105	$^{\circ}C$	--
8	Enable / Disable function	E/D	Not available				Pin 1 N.C.

Note 1: over the whole range, the unit stays within all relevant parameter limits as specified under point 2.

2. ELECTRICAL PARAMETER LIMITS

	PARAMETER	SYMB.	MIN	TYP	MAX	Unit	Conditions / Remarks
1	Frequency calibration	$\Delta f/F_N$	-1.5		+1.5	ppm	Offset from nominal at +25 $^{\circ}C$
2	Frequency stability over T_{OP}	$\Delta f/F_{OP}$	-2.0		+2.0	ppm	Over T_{OP} Note 1
4	Frequency VS voltage changes	$\Delta f/F_V$	-0.2		+0.2	ppm	$V_{CC} \pm 5\%$ at +25 $^{\circ}C$
4	Frequency VS load changes	$\Delta f/F_L$	-0.2		+0.2	ppm	$R_L/C_L \pm 10\%$ at +25 $^{\circ}C$
5	Aging first year	$\Delta f/F_{A1}$	-1.0		+1.0	ppm	at +25 $^{\circ}C$
6	Output amplitude voltage level	V_{P-P}	0.8			V_{AC}	Clipped sine wave
7	Output symmetry (Duty Cycle)	DC	45		55	%	GND level (DC cut)
8	Harmonics	H_3			-10.0	dBc	3 rd harmonics
9	Phase noise	L_{RMS}		-87		dBc/Hz	at 10Hz offset / at +25 $^{\circ}C$
				-114			at 100Hz offset / at +25 $^{\circ}C$
				-133			at 1kHz offset / at +25 $^{\circ}C$
				-148			at 10kHz offset / at +25 $^{\circ}C$
				-150			at 100kHz offset / at +25 $^{\circ}C$
10	Startup time	t_{STRT}			2.0	ms	V_{P-P} reach >90% of amplitude
					2.0	ms	Note 2
11	Current consumption	I_{CC}			2.0	mA	Under load $R_L/C_L \pm 10\%$

Note 1: Referenced to midpoint between minimum and maximum frequency over specified temperature range.

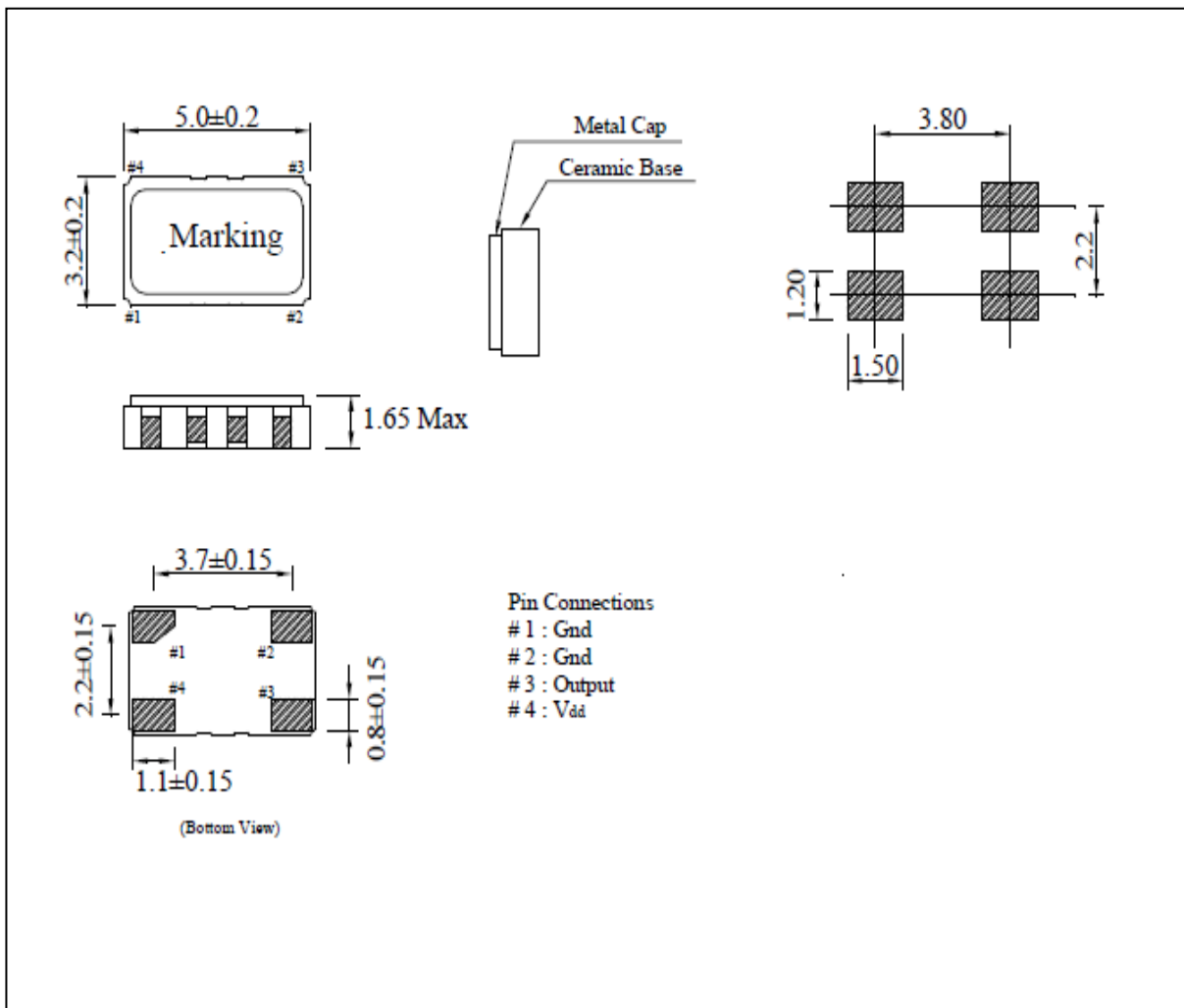
Note 2: Until frequency is within ± 0.5 ppm in reference to nominal frequency.

3. PRODUCT MARKING

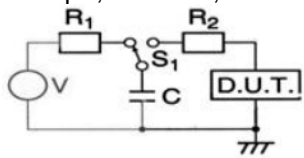
To be defined.

4. OUTLINE DRAWING

	Package description	Package model	Remarks
1	Ceramic seam seal SMD package 5.0x3.2mm with 4 pads	CST5032p4cph16	--



5. RELIABILITY TEST INFORMATION

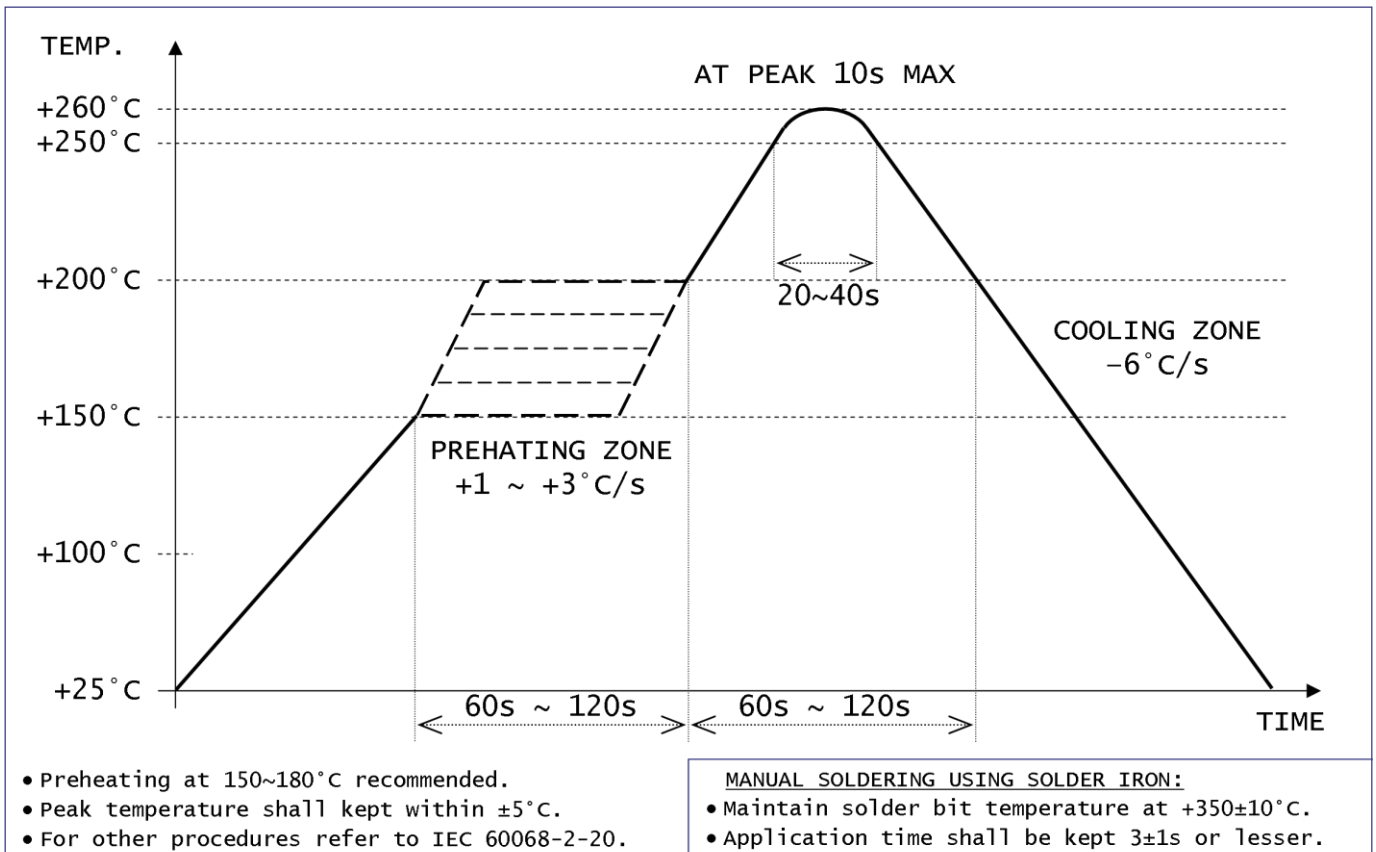
	Test item	Test conditions	Criteria
1	High temperature storage	Temperature: +125°C ±5°C Time: 240 ±4 Hours Tested after 4 to 12h at room temperature.	±1.0ppm
2	Low temperature storage	Temperature: -55°C ±5°C Time: 240 ±4 Hours Tested after 4 to 12h at room temperature.	±1.0ppm
3	Temperature humidity bias THB	Temperature: +85°C ±5°C Humidity: 85% ±5% RH Time: 240 ±4 Hours BIAS: Supply Voltage Tested after 4 to 12h at room temperature.	±1.0ppm
4	Temperature cycling	Low Temp. cycle: -55°C ±2°C High Temp. cycle: +85°C ±5°C Time: 30min each cycle Number of cycles: 1,000 Tested after 4 to 12h at room temperature.	±1.0ppm
5	Aging	Temperature: +85°C ±5°C Time: 30d Tested after 4 to 12h at room temperature.	±1.0ppm
6	Resistance to solder heat	Reflow peak temp.: +260°C ±5°C (refer to rec. profile) Number of cycles: 3 times Tested after 4 to 12h at room temperature.	±1.0ppm
7	Solderability (MIL-STD-883E)	Dip in flux: 5~10 Seconds Temperature: 230°C ±10°C Time: 5 Seconds Tested after 4 to 12h at room temperature.	>95% cover.
8	Drop test	Drop height: 120cm Number of cycles: 12 times Drop height: 150cm Number of cycles: 9 times With jig (120~150g) onto iron plate Tested after 24h at room temperature.	±1.0ppm
9	Vibration	Frequency Range: 20~2000Hz PSD: 0.053g ² Time: 40min each direction (X,Y,Z) Tested after 4 to 12h at room temperature.	±1.0ppm
10	ESD-HBM	HBM, V=±1KV, C=100pF, R1=10M, R2=1.5K, 3times 	±1.0ppm

6. ENVIRONMENTAL COMPLIANCE INFORMATION

		Compliance information
1	RoHS	This product is fully RoHS compliant, 6/6 compliant per EU legislation.
2	RoHS 2	In regards of RoHS 2, CE marking directive for finished products, we can provide RoHS test reports and MDS to show compliance, but since our product is not a final application we have no CE mark.
3	Lead-Free	This product is considered Lead-Free, Lead (Pb) contamination is controlled to be below 200ppm.
4	Halogen-Free	This product is compliant to IEC 61249-2-21:2003 (Br<800ppm / Cl<800ppm).
5	REACH (SVHC)	This product does not contain substances (SVHC) listed by REACH, we continuously monitor updates of the list of SVHC's
6	PFOS / PFOA Free	This product is free of any PFOS / PFOA.
7	Electrostatic Discharge (ESD) sensitivity	This product is ESD sensitive and requires precautions for handling and storage. Follow JEITA EIAJ ED-4701 or JSD22 or ANSI-ESD-S20-20 or IEC 61000-4-2.
8	Moisture Sensitivity	This product is hermetically sealed and does NOT fall under the classification of moisture sensitivity per J-STD-020C (Standard is for non-hermetically sealed components). If required we suggest to use LEVEL 1

7. RECOMMENDED SOLDERING INFORMATION

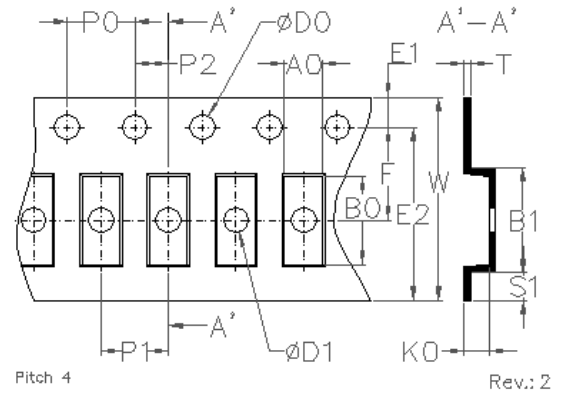
RECOMMENDED REFLOW SOLDER PROFILE – PEAK TEMPERATURE UP TO +260°C



8. PACKAGING

Carrier

Parameter	STANDARD PACKAGING	ALTERNATE PACKAGING
1 A0	3.6±0.1	
2 B0	5.4±0.1	
3 K0	1.6±0.1	
4 B1	6.0±0.1	
5 P0	4.0±0.1	
6 P1	8.0±0.1	
7 T	0.3±0.05	
8 W	12.0±0.2	



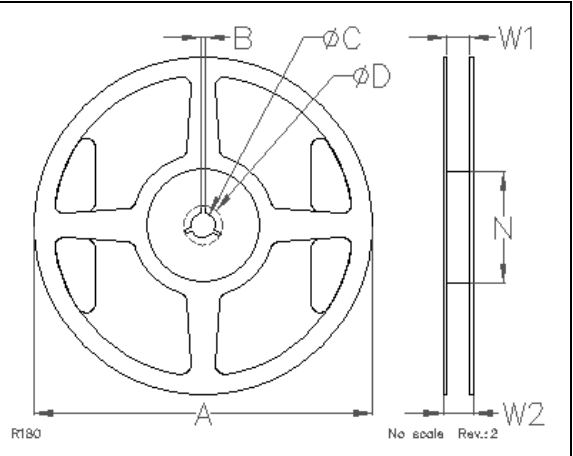
Note 1: All dimensions in [mm].

Note 2: All dimensions not specified or not being shown follow EIA-481 standard.

Reel

QTY per reel: 1,000pcs MAX

Parameter	STANDARD PACKAGING	ALTERNATE PACKAGING
9 A	178 ⁺⁰ _{-1.5}	
10 B	2.0±0.5	
11 ØC	13.2±0.2	
12 ØD	21±0.8	
13 N	62±2.0	
14 W1	12.4 ^{+2.0} ₋₀	
15 W2	16.4 ^{+2.0} ₋₀	



Note 1: All dimensions in [mm]. Dimension W1 is measured near the Hub (N).

Note 2: All dimensions not specified or not being shown follow EIA-481 standard.

Unreeling information

Oscillator product's orientation

16	This product is a polarized component which requires a certain orientation; Pin 1 is identified on top side marking with a DOT. In the carrier tape is the component oriented with pin 1 towards the sprocket holes. (per EIA-481)
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