

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: 8111H-32K768MGWVDTL

MODEL 产品型号: TCXO SMD 1.6x1.2, LVCMOS, 1.8~3.3V

NOMINAL FREQUENCY 频率: 32.768kHz

ISSUE DATE 日期: 2022 / 12 / 19

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.

James Jiang

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Revision	Description / ECN	Prepared	Approved	Date
1	Initial release	<i>MB</i>	<i>James Jiang</i>	2022-12-19
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	32.768			kHz	--
2	Maximum voltage range	V_{MAX}	-0.5		+4.6	V_{DC}	Between V_{CC} and GND
3	Nominal supply voltage	V_{CC}	1.5	1.8	3.465	V_{DC}	$V_{CC} \pm 5\%$
4	Output load capacitance	CL		15		pF	LVC MOS
5	Operating temperature range	T_{OP}	-40	+25	+85	°C	--
6	Storage temperature range	T_{ST}	-40		+90	°C	--
7	Enable / Disable function	E/D	NA				

Note 1: The operating temperature range over which the frequency stability is measured

2. ELECTRICAL PARAMETER LIMITS

	PARAMETER	SYMB.	MIN	TYP	MAX	Unit	Conditions / Remarks
1	Frequency calibration	$\Delta f/F_N$	-1.0		+1.0	ppm	Offset from nominal at +25°C
2	Frequency stability over all	$\Delta f/F_N$	-5.0		+5.0	ppm	Note 1
3	Frequency VS voltage changes	$\Delta f/F_V$	-0.2		+0.2	ppm	$V_{CC} \pm 5\%$ at +25°C
4	Frequency VS load changes	$\Delta f/F_L$	-0.2		+0.2	ppm	15pF at +25°C
5	Aging first year	$\Delta f/F_{A1}$	-0.5		+0.5	ppm	at +25°C
6	Output voltage level HIGH	V_{OH}	90% V_{CC}			V_{DC}	LVC MOS level 90% V_{CC} MIN
7	Output voltage level LOW	V_{OL}			10% V_{CC}	V_{DC}	LVC MOS level 10% V_{CC} MAX
8	Output amplitude rise time	t_R			50.0	ns	At 20~80% V_{CC} / 15pF / +25°C
9	Output amplitude fall time	t_F			50.0	ns	At 80~20% V_{CC} / 15pF / +25°C
10	Output symmetry (Duty Cycle)	DC	40		60	%	GND level (DC cut)
11	Pulling range					ppm	NA
12	Startup time	t_{STRT}			1.0	s	V_{P-P} reach >90% of amplitude
13	Current consumption	I_{CC}			3.0	μA	No Load

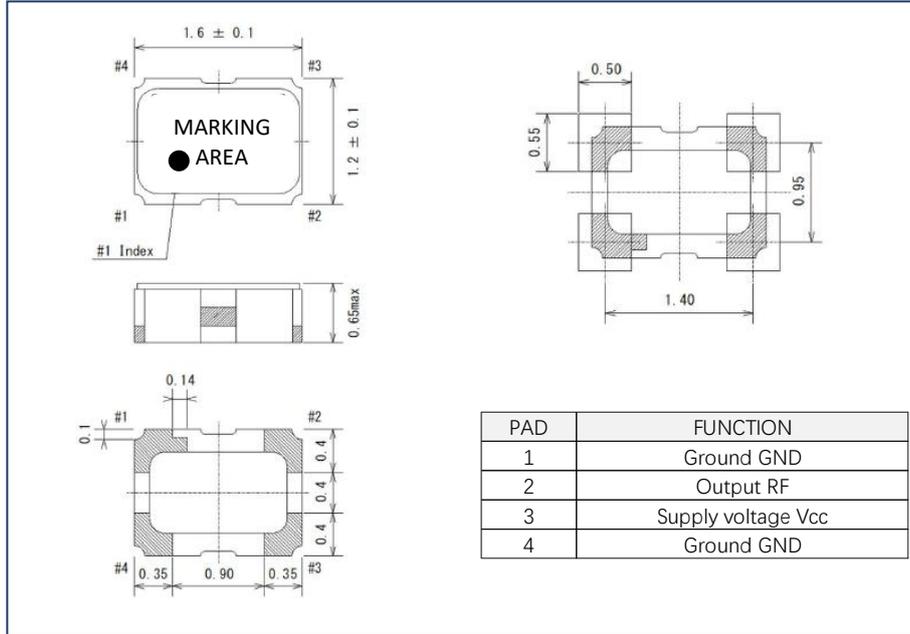
Note 1: Including tolerance at +25°C, deviations over operating temperature range, input voltage changes, output load changes, shock and vibration.

3. PRODUCT MARKING

To be defined.

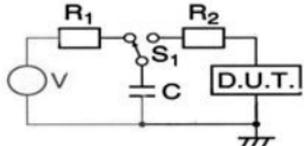
4. OUTLINE DRAWING

	Package description	Package model	Remarks
1	Ceramic seam seal SMD package 1.6x1.2mm with 4 pads	T1612p4	--



5. RELIABILITY TEST INFORMATION

	Test item	Test conditions	Criteria
1	High temperature storage	Temperature: +90°C ±5°C Time: 240 ±4 Hours Tested after 4 to 12h at room temperature.	±1.0ppm
2	Low temperature storage	Temperature: -40°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: -40°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.

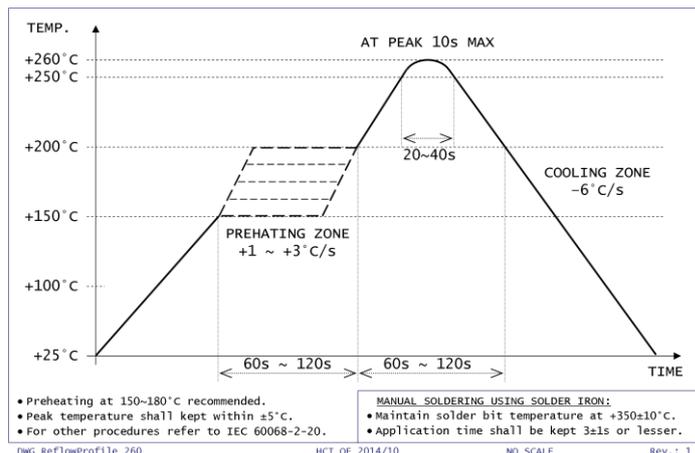
8	Drop test	Drop height: 120cm Number of cycles: 12 times Drop height: 150cm Number of cycles: 9 times With jig (120~150g) onto iron plate Tested after 24h at room temperature.	±1.0ppm
9	Vibration	Frequency Range: 20~2000Hz PSD: 0.053g ² Time: 40min each direction (X,Y,Z) Tested after 4 to 12h at room 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

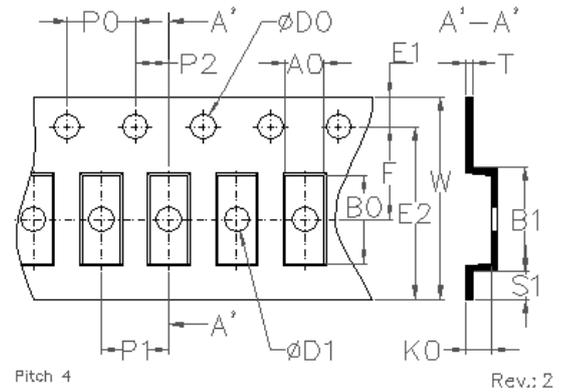
RECOMMENDED REFLOW SOLDER PROFILE - PEAK TEMPERATURE UP TO +260°C



8. PACKAGING

Carrier

Parameter	STANDARD PACKAGING	ALTERNATE PACKAGING
1 A0	1.4±0.1	
2 B0	1.8±0.1	
3 K0	1.15±0.1	
4 B1	3.4±0.1	
5 P0	4.0±0.1	
6 P1	4.0±0.1	
7 T	0.3±0.05	
8 W	8.0±0.2	



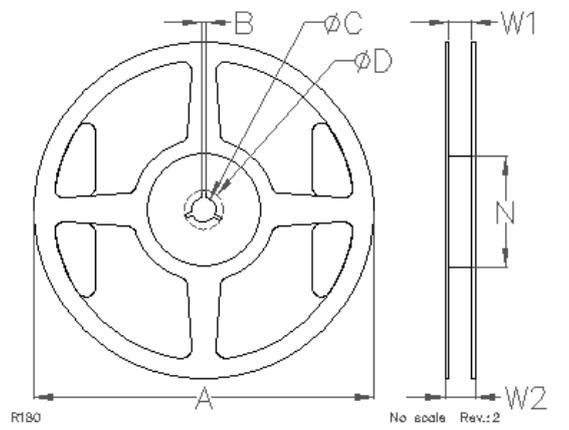
Note 1: All dimensions in [mm].

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

Reel

QTY per reel: 3,000pcs MAX

Parameter	STANDARD PACKAGING	ALTERNATE PACKAGING
9 A	180 ⁺⁰ _{-1.5}	
10 B	2.0±0.5	
11 ØC	13±0.2	
12 ØD	21±0.8	
13 N	60±2	
14 W1	8.0 ^{+2.0} ₋₀	
15 W2	11.4 ^{+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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