

# CRYSTAL OSCILLATOR

**SERIES 2N, SEAM SEALED CERAMIC 2.5X2.0MM SURFACE MOUNT PACKAGE**

深圳市晶科鑫实业有限公司

Shenzhen Crystal Technology Industrial Co., Ltd

## APPROVAL SHEET

CUSTOMER P/N:	
TYPE:	SMD CRYSTAL
DESCRIPTION:	SMD2520 OSC 48.000MHZ 1.8V LVCMOS -40~85°C
P N/ SJK:	2N48000G18YC
ENVIRONMENTAL:	<input checked="" type="checkbox"/> RoHS <input checked="" type="checkbox"/> REACH <input checked="" type="checkbox"/> HF <input type="checkbox"/> PAHS <input type="checkbox"/> other
REVISION:	A1    2017-5-10
MSL:	Levels 1

SIGNATURE					
SUPPLIER			CUSTOMER		
Issue	Check	Approve	QA	Check	Approve
SJK			Signature		
FAE_EMAIL			Date		
Date			Approve: <input type="checkbox"/> accept <input type="checkbox"/> unaccepted		
Note:					

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### 1. ELECTRICAL SPECIFICATIONS

#### Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature : 25±5°C

Relative humidity : 40%~70%

If there is any doubt about the results, measurement shall be made within the following limits:

Ambient temperature : 25±3°C

Relative humidity : 40%~70%

#### Measure equipment

Electrical characteristics measured by MD 37WX-05M or equivalent.

#### Crystal cutting type

The crystal is using AT CUT (thickness shear mode).

	Parameters		SYM	Electrical Spec.				Notes
				MIN	TYPE	MAX	UNITS	
1	Nominal Frequency			48.000000			MHZ	
2	Frequency Stability	AT 25°C		±10			PPM	
		Over Operating Temperature range		±20			PPM	
3	Operating Temperature		Topr	-40	25	85	°C	
4	Storage Temperature		Tstg	-55	~	125	°C	
5	Supply Voltage		VDD	1.8 / ±10%			V	1.62~3.63 available
6	Input Current		Icc			10	mA	
7	Enable Control			Yes				Pad1
8	Output Load : CMOS		CL	15			pF	
9	Output Voltage High		VoH	90% Vdd			V	
10	Output Voltage Low		VoL			10% Vdd	V	
11	Rise Time		Tr			5	ns	10%→ 90%VDD Level
12	Fall Time		Tf			5	ns	90%→ 10%VDD Level
13	Symmetry (Duty ratio)		TH/T	45	~	55	%	
14	Start-up Time		Tosc			10	ms	
15	Enable Voltage High		Vhi	70% Vdd			V	
16	Disable Voltage Low		Vlo			30% Vdd	V	
17	Aging			±3			ppm/yr.	1st. Year at 25°C
18	Output Disable Delay Time		T off			150	us	

Tel: 0755-88352810-837(Mr.huang) Fax: 0755-88353718 <http://www.g-crystal.com>

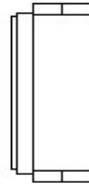
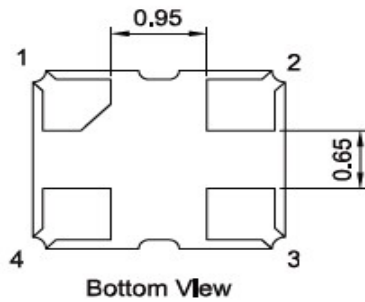
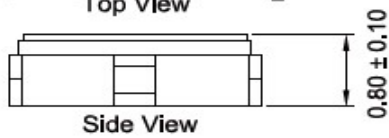
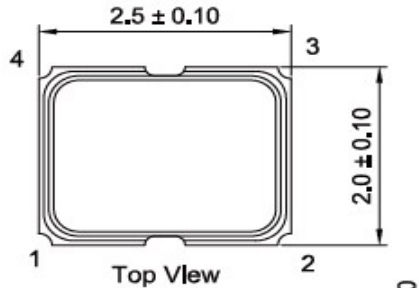
ADD: Room 1204~1206, Building 3C, TianAn Cloud Park Phase 1, Bantian, Longgang District, Shenzhen

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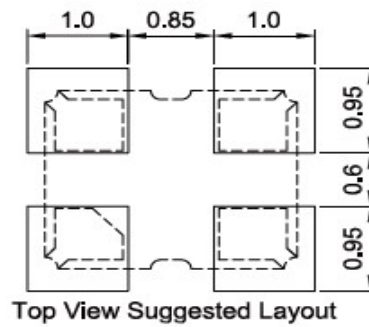
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19	Output Enable Delay Time	T on		150	us	
20	Phase Jitter (12KHZ~20MHZ)		0.5	1.0	ps	

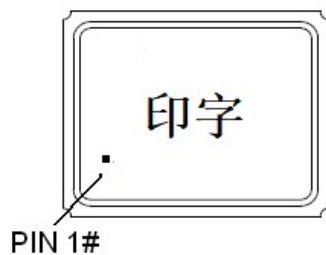
### 2. DIMENSIONS (Units :mm)



PAD FUNCTION:  
 1: ENABLE CONTROL  
 2: GND  
 3: OUT  
 4: VDD



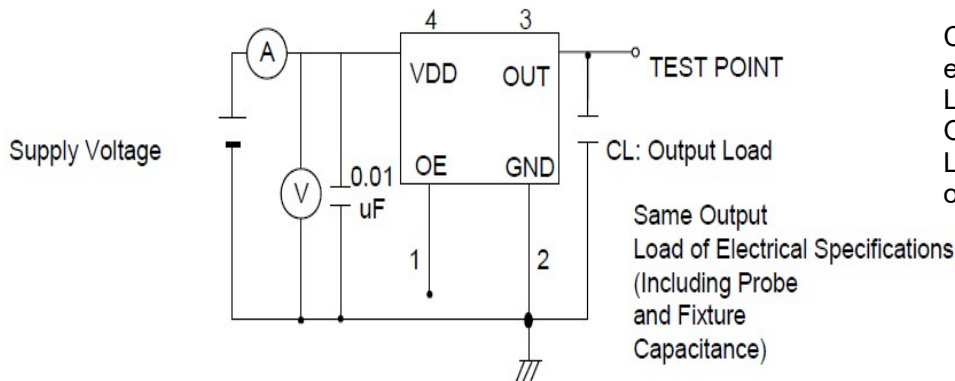
### 3. MARKING



### 4. TEST CIRCUIT

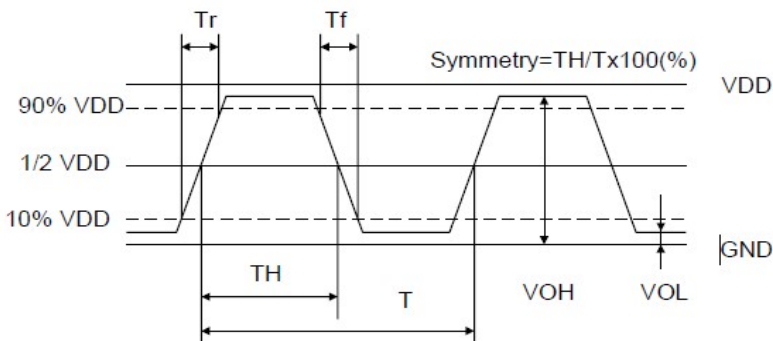
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Control input (output enable/disable)  
 Logic 1 or open on pad 1: Oscillator output  
 Logic 0 on pad 1 : Disable output to high impedance

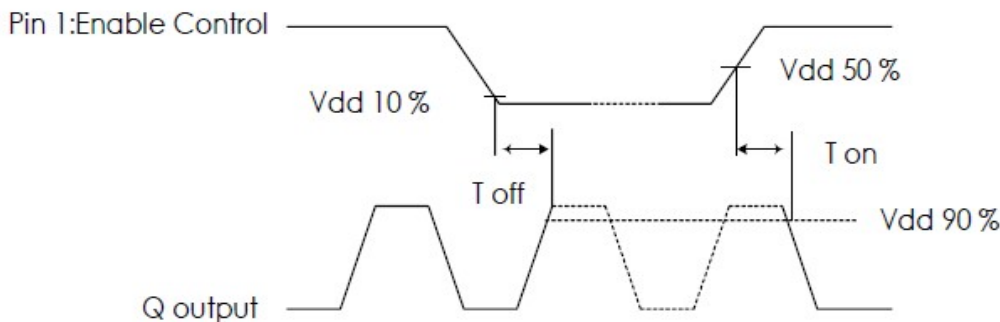
## 5. WAVEFORM CONDITIONS



Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

## 6. OUTPUT ENABLE / DISABLE DELAY

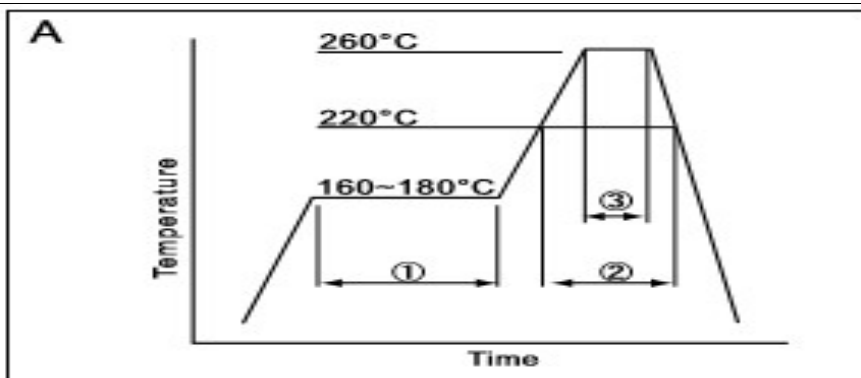
The following figure shows the oscillator timing during normal operation . Note that when the device is in standby, the oscillator stops. When standby is released, the oscillator starts and stable oscillator output occurs after a short delay



## 7. SUGGESTED REFLOW PROFILE

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①	Preheat	160~180°C	120sec.
②	Primary heat	220°C	60sec.
③	Peak	260°C	10sec. max

Total time : 200 sec. Max / Solder melting point :220 °C

## 8. RELIABILITY TEST SPECIFICATION

### 1.Mechanical Endurance

No.	Test Item	Test Methods	REF. DOC
1	Drop Test	75 cm height,3 times on concrete floor .	JIS C6701
2	Mechanical Shock	Device are shocked to half sine wave ( 1000 G ) three mutually perpendicular axes each 3 times. 0.5m sec. duration time	MIL-STD-202F
3	Vibration	Frequency range 10 ~ 2000 Hz Amplitude 1.52 mm/20G Sweep time 20 minutes Perpendicular axes each test time 4 Hrs (Total test time 12 Hrs)	MIL-STD-883E
4	Gross Leak	Standard Sample For Automatic Gross Leak Detector, Test Pressure: 2kg / cm <sup>2</sup>	MIL-STD-883E
5	Fine Leak	Helium Bomging 4.5 kgf / cm <sup>2</sup> for 2 Hrs	
6	Solderability	Temperature 245 °C ± 5°C Immersing depth 0.5 mm minimum Immersion time 5 ± 1 seconds Flux Rosin resin methyl alcohol solvent ( 1 : 4 )	MIL-STD-883E

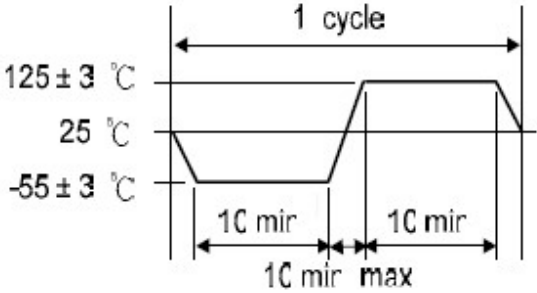
### 2.Environmental Endurance

No.	Test Item	Test Methods	REF. DOC
1	Resistance To Soldering Heat	Pre-heat temperature 125 °C Pre-heat time 60 ~ 120 sec. Test temperature 260 ± 5 °C Test time 10 ± 1 sec.	MIL-STD-202F
2	High Temp. Storage	+ 125 °C ± 3 °C for 1000 ± 12 Hrs	MIL-STD-883E
3	Low Temp. Storage	- 40 °C ± 3 °C for 1000 ± 12 Hrs	

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4	Thermal Shock	<p>Total 100 cycles of the following temperature cycle</p>  <p>125 ± 3 °C 25 °C -55 ± 3 °C</p> <p>1 cycle</p> <p>10 min 10 min 10 min max</p>	MIL-STD-883E
5	Pressure Cooker Storage	121 ± 3°C , RH100% , 2 bar , 240 Hrs	JIS C6701
6	High Temp & Humidity	85°C ± 3°C, RH 85% , 1000 Hrs	JIS C5023
备注			