PRODUCT SPECIFICATION SHEET



Customer			
Customer P/N	TBA		
Product Type	Temperature Compensated Crystal Oscillator		
Part Number	9T26000018	Version	S0
Part Description	SMD TCXO 2.0 x 1.6		
Nominal Frequency	26.000000MHz		

Prepared	Chen Xuanru
Reviewed	Jin Zhe
Approved	Xing Yue
Date	2022-3-28

Customer's Approval & Date：

廣東惠倫晶體科技股份有限公司
中国广东省东莞市黄江镇东环路鸡啼岗段68号
68 Donghuan Road, Jitigang Village, Huangjiang,
Dongguan, Guangdong Province, P. R. China
WEB : http://www.dgylec.com/
TEL : +86 (0) 769 - 38879888
FAX : +86 (0) 769 - 38879889
EMAIL : yl@dgylec.com

RoHS COMPLIANT

Pb Lead-Free

Moisture Sensitivity Level 1

CONTENTS

#	Item	Page
1	History of Specification Revision	3
2	Electrical Specifications	4
	2.1 Operation conditions	4
	2.2 Output characteristics	4
	2.3 Frequency characteristics	4~5
	2.4 Phase noise characteristics	5
3	Product Design	6
	3.1 Package dimensions and pad functions	6
	3.2 Recommended land pattern	6
	3.3 Recommended reflow profile	6
4	Testing Circuit	7
5	**Reliability**	8
	5.1 Mechanical endurance	8
	5.2 Environmental endurance	9
6	**Marking and Packing**	10
	6.1 Marking definition	10
	6.2 Packing	11

1. History of Specification Revision

Ver.	Contents	Date	Reviser	Remark
S0	Initial release	2022-3-28	Chen Xuanru	

2. Electrical Specifications

2.1 Operation conditions

#	Parameters	Min.	Typ.	Max.	Unit	Remark
1	Nominal frequency		26.000000		MHz	
2	Supply voltage (V_{DD})	-	1.8	-	V	
3	Current consumption	-	-	1.5	mA	
4	Operating temperature range	-30	-	+85	°C	
5	Storage temperature range	-40	-	+85	°C	

2.2 Output characteristics

#	Parameters	Min.	Typ.	Max.	Unit	Remark
1	Output type		Clipped sine wave		-	Decoupling capacitor is required in external circuit
2	Standard output Load		10 KΩ//10 pF		-	
3	Output level	0.8	-	-	V_{pp}	
4	Duty cycle	40	50	60	%	Ground level
5	Harmonics	-	-	-5	dBc	
6	Start-up time vs. amplitude	-	-	0.5	ms	Within 90% of the minimum specified output level.
7	Start-up time vs. frequency	-	-	2	ms	Within ±0.5ppm of steady state frequency.

2.3 Frequency characteristics

#	Parameters	Min.	Typ.	Max.	Unit	Remark
1	Nominal frequency		26.000000		MHz	
2	Frequency tolerance after reflow	-2.0	-	+2.0	ppm	At 25±2℃ after 2 times reflow, refer to nominal frequency
3	Frequency stability vs. temperature	-0.5	-	+0.5	ppm	Refer to frequency at 25° C within operating temperature range
4	Frequency slope vs. temperature 1			0.1	ppm/°C	Within -20 to +70°C (See below NOTE 1)
5	Frequency slope vs. temperature 2			0.1	ppm/°C	Within -30 to +85°C (See below NOTE 1)
6	Start-up time frequency drift			100	ppb	Within the first 20 seconds of start-up (TBD)
				2.5	ppb/sec	Maximum frequency slope during 20 to 600 seconds
				120	ppb	(See below NOTE 2)
7	Static temperature hysteresis			0.7	ppm	(See below NOTE 3)

2. Electrical Specifications(Cont.)

2.3 Frequency characteristics(Cont.)

8	Frequency stability vs. supply voltage	-0.1	-	+0.1	ppm	±5% V_{CC} variation
9	Frequency stability vs. load variation	-0.2	-	+0.2	ppm	±10% load variation
10	Long term stability	-1.0	-	+1.0	ppm	Frequency drift over 1 year at 25°C
		-5.0	-	+5.0	ppm	Frequency drift over 10 years at 25°C
11	ESD	HBM＞2000V			-	JESD22-A114-B
12	MSL	1级			-	IPC/JEDEC J-STD-033C

NOTE 1:One frequency reading per 2°C.

NOTE 2:Total clock deviation (maximum frequency – minimum frequency) over the first 600 secon.

NOTE 3:Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C.

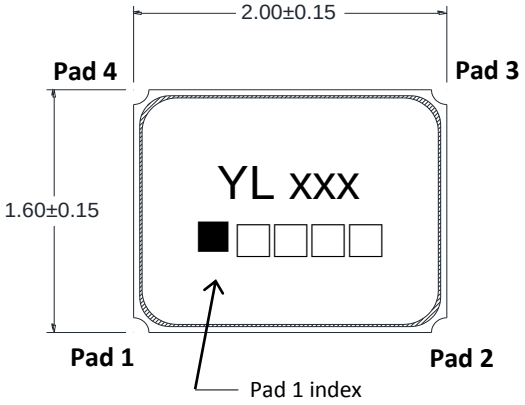
2.4 Phase noise characteristics

#	Parameters	Min.	Typ.	Max.	Unit	Remark
1	Phase noise at 1Hz offset	-	-60	-	dBc/Hz	
2	Phase noise at 10Hz offset	-	-90	-	dBc/Hz	
3	Phase noise at 100Hz offset	-	-116	-	dBc/Hz	
4	Phase noise at 1kHz offset	-	-139	-	dBc/Hz	
5	Phase noise at 10kHz offset	-	-154	-	dBc/Hz	
5	Phase noise at 100kHz offset	-	-154	-	dBc/Hz	

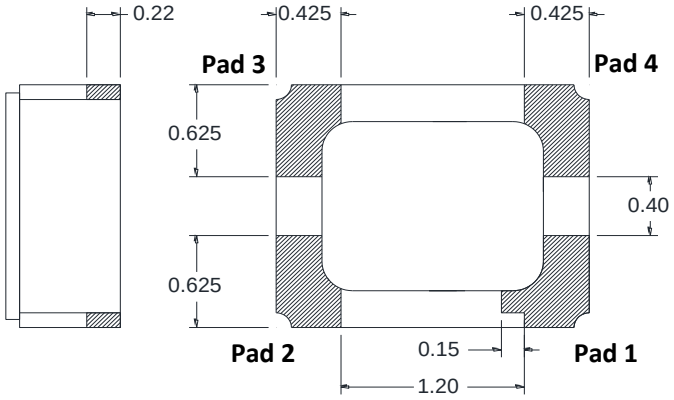
3. Product Design

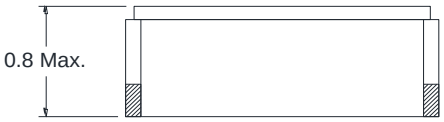
3.1 Package dimensions and pad functions

Top view



Unit : mm

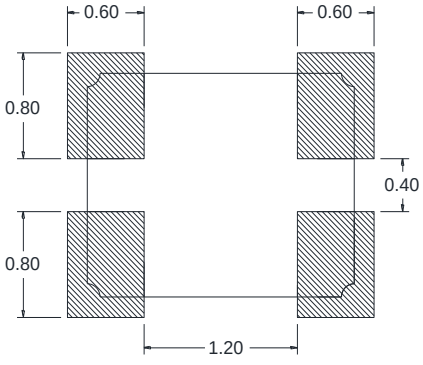




Lateral view

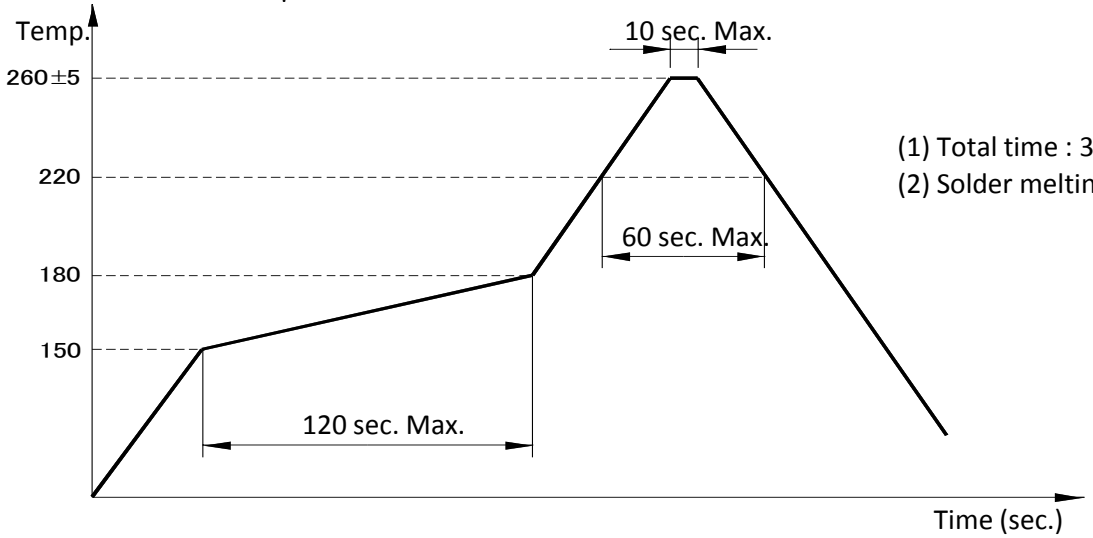
Pad	Function	Symbol
1	NC or GND (Ground recommended)	NC
2	Ground	GND
3	Output	OUT
4	Supply voltage	V_{DD}

3.2 Recommended land pattern



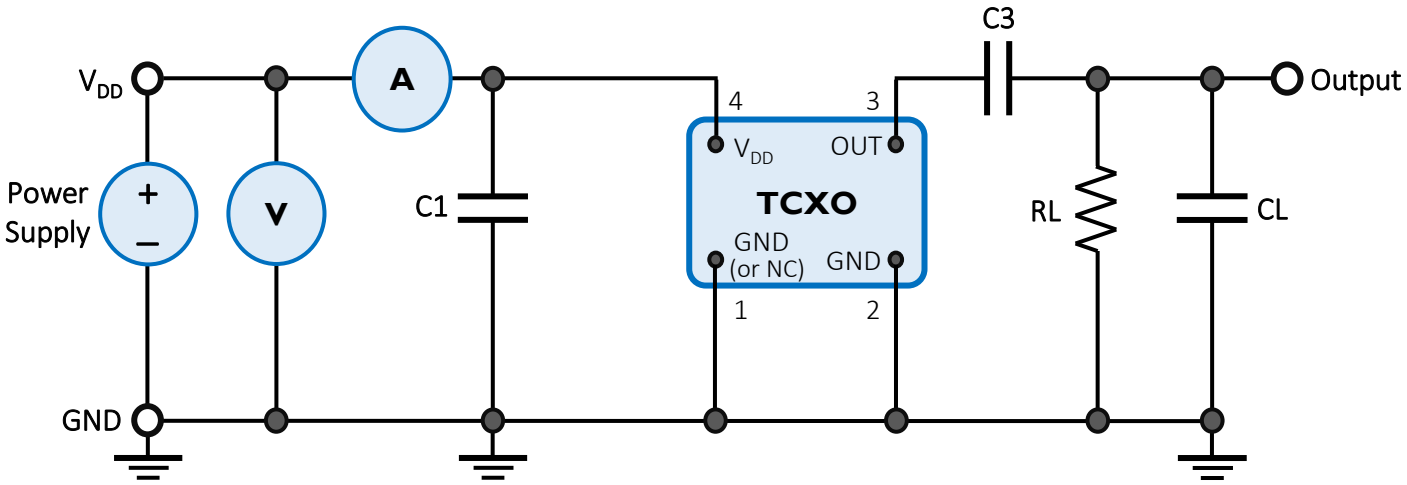
Unit : mm

3.3 Recommended reflow profile



(1) Total time : 360 sec. Max.
(2) Solder melting point : 225℃

4. Testing Circuit



External Components:

Parts	Function	Recommended
C1	AC noise bypass for V_{DD}	10nF
C3	DC block for output	10nF
RL	Load resistance	10KΩ
CL	Load capacitance	10pF

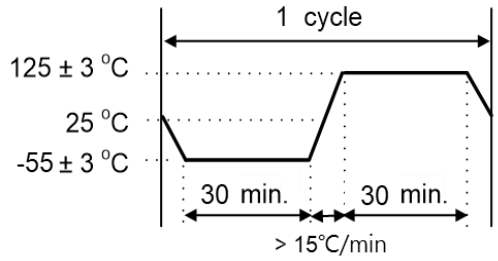
5. Reliability

5.1 Mechanical endurance

#	Item	Test Condition	Reference
1	Drop test	Height : 150 cm height Direction : X, Y, Z, 6 directions Test cycles : 3 cycles Concrete floor Mounting on test fixture (total weight=150 g)	IEC-68-02-27
2	Mechanical shock	Acceleration : 100 g Duration : 6.0 ms half sine shock pulse Test cycles : 3 times for all 3 directions	JESD47F_JEDECB
3	Vibration	Acceleration : 20 g Duration : 4 hours/each direction Frequency range : 10 ~ 55 Hz and 55 ~ 2,000 Hz Amplitude : 0.75 mm (for 10 ~ 55 Hz) Direction : X, Y, Z, 3 directions	JESD47F_JEDECB
4	Gross leak	Standard Sample For Automatic Gross Leak Detector. Test Pressure: 2kg /cm^2	MIL-STD-883E
5	Fine leak	Helium bombing 4.5 kgf / cm^2 for 2 hours	MIL-STD-883E

5. Reliability (Cont.)

5.2 Environmental endurance

#	Item	Test Condition	Reference
1	High temperature storage	Temperature : +125°C ± 3°C Duration : 1,000 hours	JESD47F_JEDECB
2	Low temperature storage	Temperature : -40°C ± 3°C Duration : 1,000 hours	JESD47F_JEDECB
3	High temperature & humidity	Temperature : 85°C ± 3°C Humidity : RH 85% Duration : 1,000 hours	JESD47F_JEDECB
4	Thermal shock (air to air)	Total 500 cycles of the following temperature cycle 	JESD47F_JEDECB
5	Highly accelerated stress test (un-bias)	Temperature : 130°C ± 3°C Humidity : RH 85% Pressure : 2 atms Duration : 96 hours	JESD47F_JEDECB
6	Aging	Temperature : 105°C ± 3°C Duration : 1,000 hours Voltage input by specification	JESD47F_JEDECB

6. Marking and Packing

6.1 Marking definition

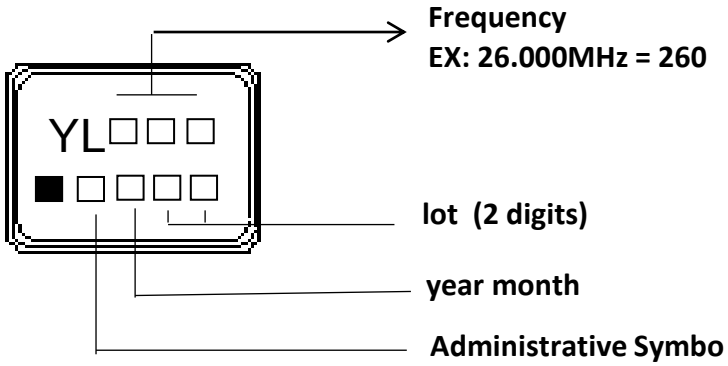
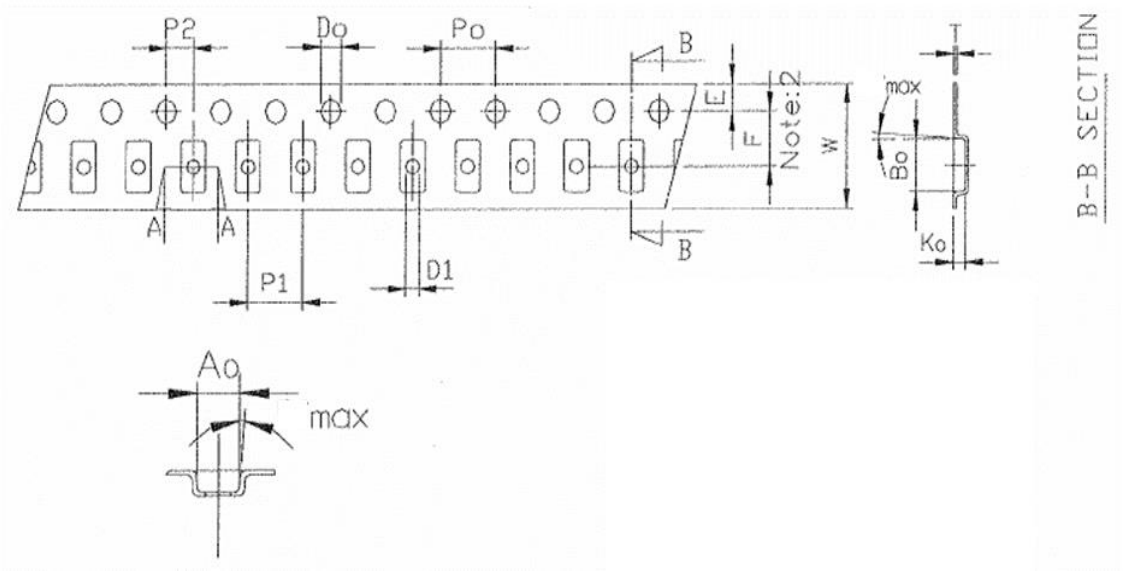


Table of Year and Month code

Year \ Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2017	2021	A	B	C	D	E	F	G	H	J	K	L	M
2018	2022	N	P	Q	R	S	T	U	V	W	X	Y	Z
2019	2023	a	b	c	d	e	f	g	h	j	k	l	m
2020	2024	n	p	q	r	s	t	u	v	w	x	y	z

6.2 Packing (EIA-481-2)



PKG Type	Dimension (Unit : mm)						
2016 (8mm)	A_0	B_0	K_0	T	W	E	F
	1.90±0.1	2.30±0.1	1.25±0.1	0.25±0.05	8.00±0.3	1.75±0.2	3.50±0.1
	P1	P2	D1	D_0	P_0		
	4.00±0.1	2.00±0.1	1.00±0.1	1.55±0.05	4.00±0.1		

Standard Reel Quantity is 3000 pcs per reel.

6. Marking and Packing (Cont.)

6.2 Packing (EIA-481-2) (Cont.)

The inspection standard of tape tension

Item		Defect	Method
Appearance	All	1. The tape is not coincidence 2. The bubble	Visual inspection
Tape tension	8045, 7050 6035-12mm 5032-12mm 3225-12mm	Overstep 61±5g (55 to 67g)	Pull test
	3225-8mm	Overstep 40±5g (35 to 45g)	
	2520-8mm	Overstep 55±6g (49 to 61g)	
	2016-8mm	Overstep 34±6g (28 to 40g)	
	1612-8mm	Overstep 34±6g (28 to 40g)	
	6035-16mm 5032-16mm	Overstep 60±6g (54 to 66g)	

