



PRODUCT SPECIFICATION SHEET



Customer	—		
Customer P/N	TBA		
Product Type	Temperature Compensated Crystal Oscillator		
Part Number	9T19200001-Q	Version	S1
Part Description	SMD TCXO 2.0 x 1.6		
Nominal Frequency	19.200000MHz		

Prepared	Han Shuang
Reviewed	Kuro Peng
Approved	Jay Lee
Date	2021-12-6

Customer's Approval & Date :

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Moisture Sensitivity Level 1

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1. History of Specification Revision

Ver.	Contents	Date	Reviser	Remark
S0	Initial release	2020-6-19	Han Shuang	
S1	Update normal temperature frequency difference	2021-12-6	Han Shuang	

2. Electrical Specifications

2.1 Operation conditions

#	Parameters	Min.	Typ.	Max.	Unit	Remark
1	Nominal frequency	19.200000			MHz	
2	Supply voltage (V_{CC})	1.7	2.8	3.3	V	
3	Current consumption	-	-	2.0	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 K Ω //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. frequency	-	-	2.0	ms	Within ± 0.5 ppm of final frequency
7	Start-up time vs. output level	-	-	2.0	ms	Reach 90% of final Vpp output level

2.3 Frequency characteristics

#	Parameters	Min.	Typ.	Max.	Unit	Remark
1	Nominal frequency	19.200000			MHz	
2	Frequency tolerance	-2.0	-	+2.0	ppm	At $25 \pm 2^\circ\text{C}$, after 2 times of reflow, refer to nominal frequency (See below NOTE 1)
3	Frequency stability vs. temperature	-2.0	-	+2.0	ppm	Refer to frequency at 25°C within operating temperature range
4	Frequency stability vs. supply voltage	-0.1	-	+0.1	ppm	$\pm 5\%$ V_{CC} variation
5	Frequency stability vs. load variation	-0.1	-	+0.1	ppm	$\pm 5\%$ load variation
6	Aging over 1st year	-1.0	-	+1.0	ppm/yr	At room temperature

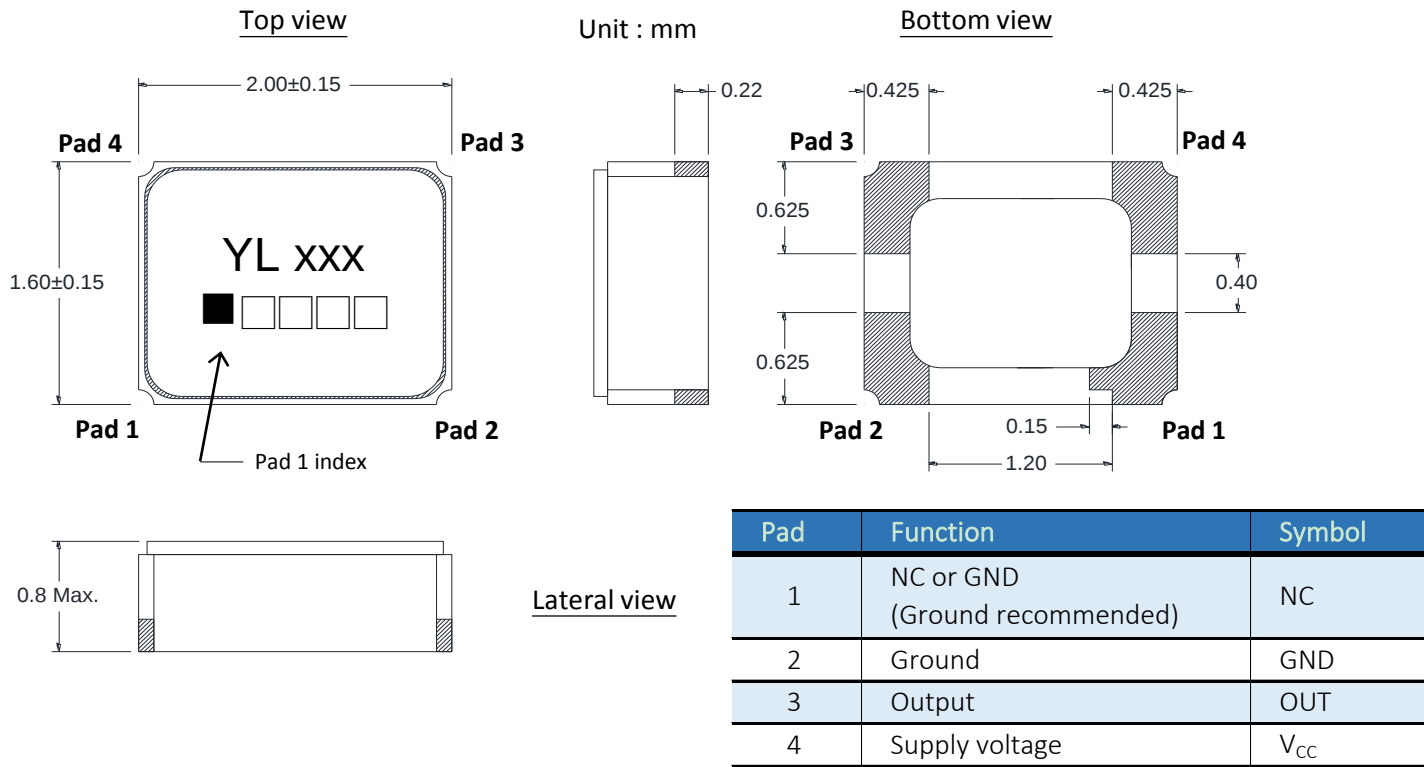
NOTE 1: After reflow, please leave DUT for more than 24 hours at room temperature.

2.4 Phase noise characteristics

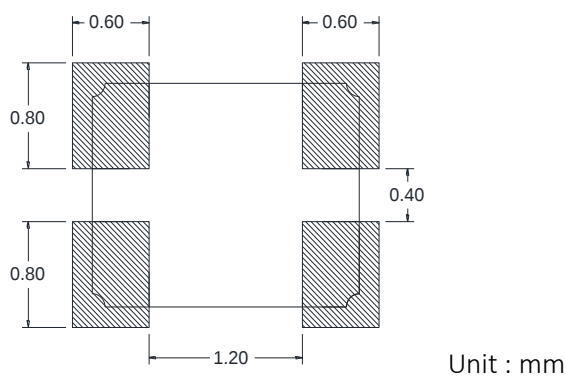
#	Parameters	Min.	Typ.	Max.	Unit	Remark
1	Phase noise at 1kHz offset	-	-130	-	dBc/Hz	
2	Phase noise at 100kHz offset	-	-152	-	dBc/Hz	

3. Product Design

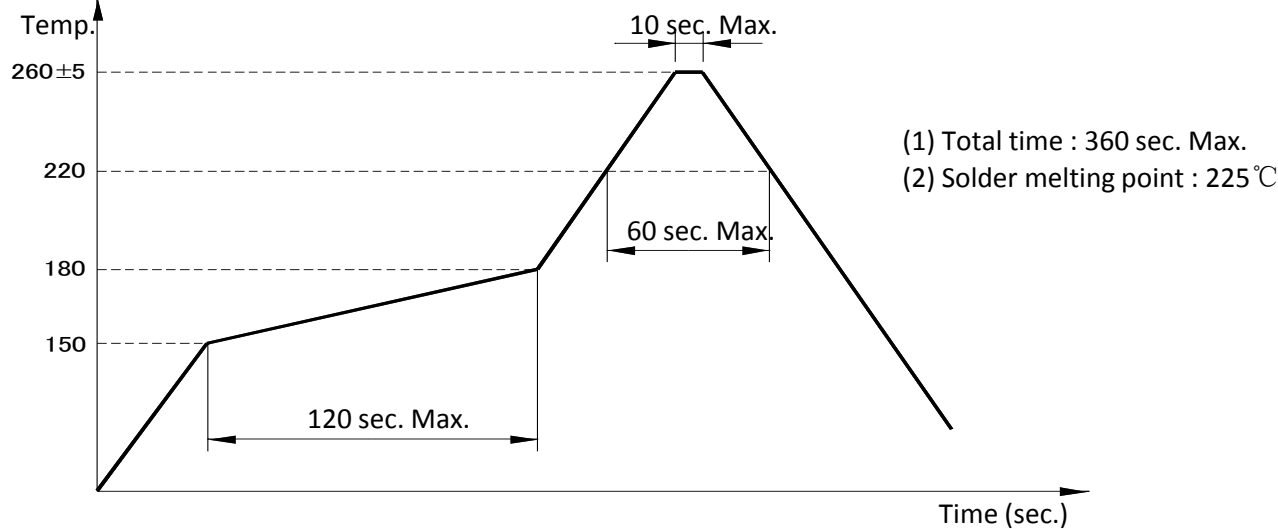
3.1 Package dimensions and pad functions



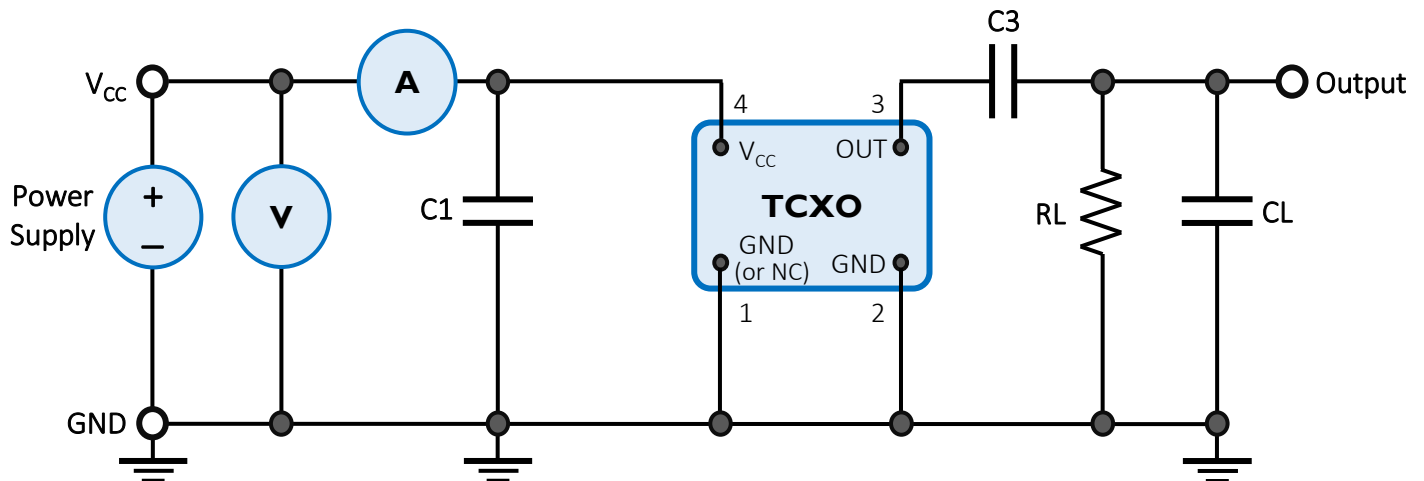
3.2 Recommended land pattern



3.3 Recommended reflow profile



4. Testing Circuit



External Components:

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