

深圳市维拓精电科技有限公司

WTL International Limited

APPROVAL SHEET

DESCRIPTION :	2.0*1.6mm 4 Pads SMD Quartz Crystal			
NOMINAL FREQ.:	38.400000MHz			
WTL P/N:	WTL1M27635CH			
VERSION:	1			
DATE:	2019.02.21			
Customer	Customer P/N			
IBS Electronics Inc.	/			
Customer Signature	WTL			
	Approved by: <i>Xo Xo Lee</i>			
	Checked by: <i>Susan He</i>			
	Issued by: <i>Shengbia</i>			
REVISION HISTORY				
Revised Page	Revision Content	Date	Ref. No.	Reviser



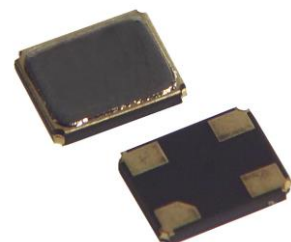
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Attachment(s):

- 1.Product Specification Sheet
- 2.Electrical Testing Report
- 3.Reliability Report
- 4.ICP Test Report (SGS)

FEATURE



- High precision and high frequency stability
- Excellent heat resistance and environmental characteristics.
- Extremely small SMD type crystal

APPLICATIONS

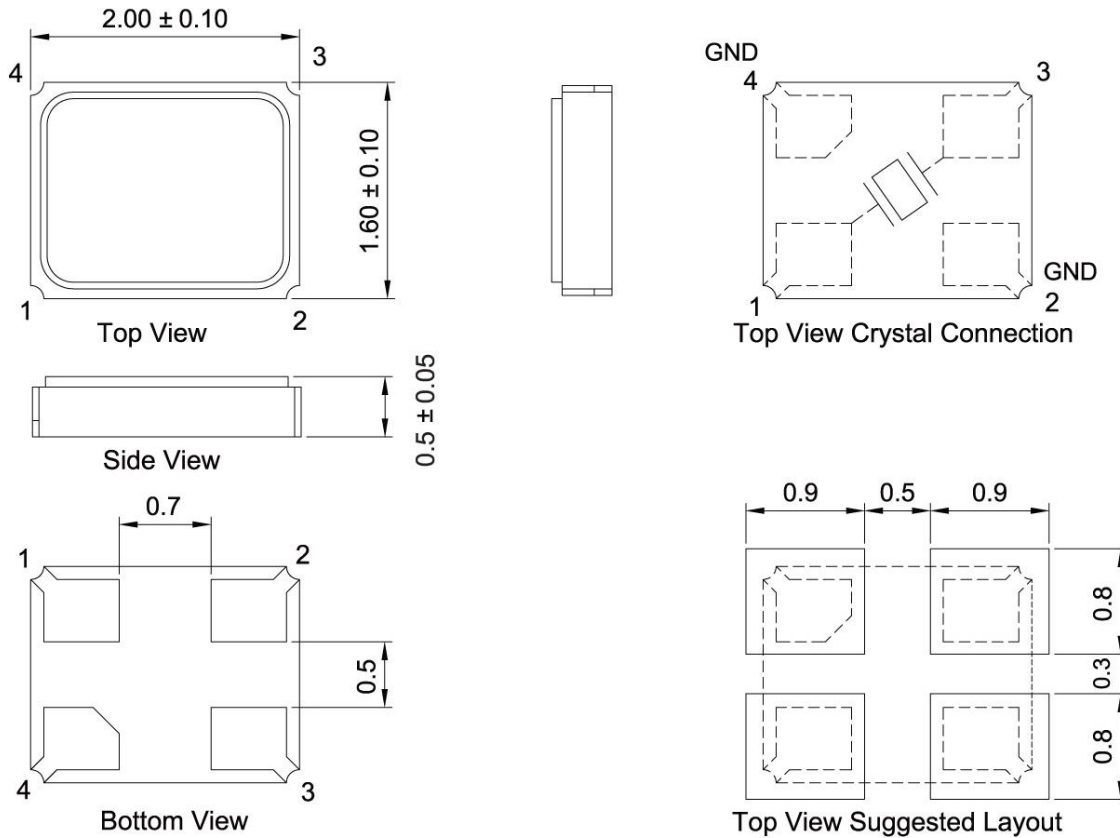
- Applications in PDA,DSC,.DVC,PC,etc.

1、 ELECTRICAL SPECIFICATIONS

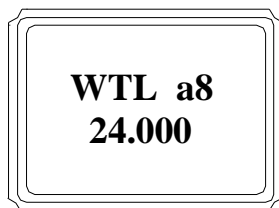
Hold Style	2016 Seam
Nominal Frequency	38.400000MHz
Mode	Fundamental / AT
Frequency Tolerance (at 25°C)	±10ppm
Frequency Stability Over Operating Temperature Characteristics	±15ppm
Operating Temperature Range	-30°C ~ +85°C
Storage Temperature Range	-55°C ~ +125°C
Shunt Capacitance (C ₀)	5.0pF Max
Driver Level (Typical)	100μW Max
Load Capacitance(C _L)	8pF
ESR	80Ω Max
Insulation Resistance	More than 500Mohms at DC100V
Aging @25°C 1 st year (Max)	±3ppm/year

REMARK: SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. PLEASE CONFIRM WITH OUR SALES ENGINEER.

2、DIMENSIONS (Unit: mm)



3、MARKING

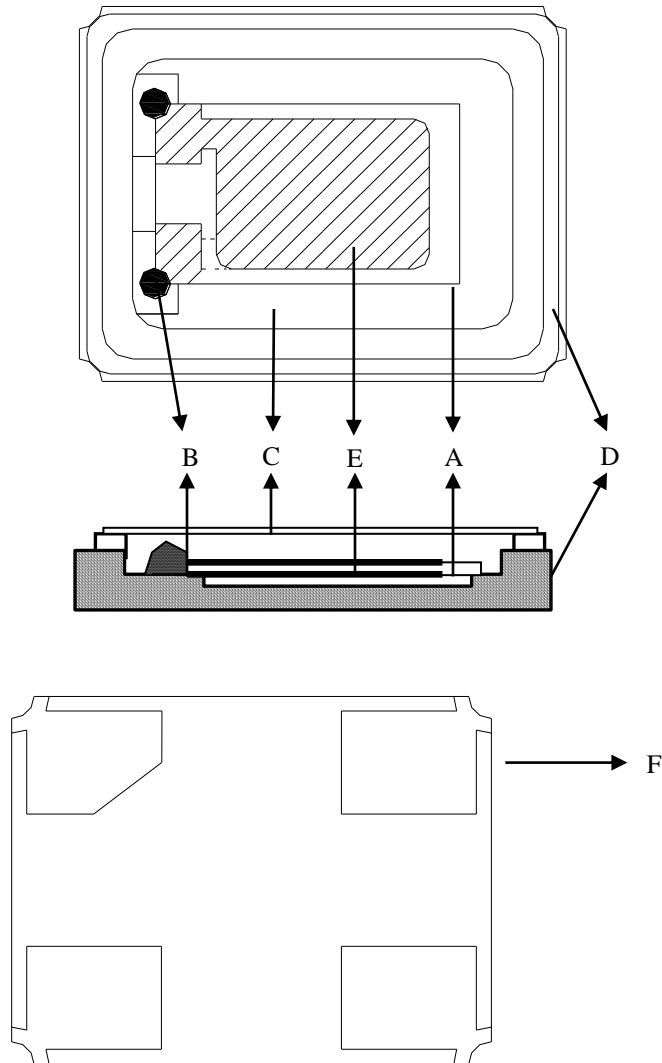


- WTL → Brand Logo
- 24.000 → Frequency (MHz)
- a → Week (a、 b、 c...z、 A、 B、 C...Y、 Z ,from 1 to 52week)
- 8 → YEAR (8=2018year, 9=2019year, 0=2020year....)

Marking Instruction :

The date code was marked on the crystal body, which will be easily traced back in case of quality issue.

4、STRUCTURE ILLUSTRATION

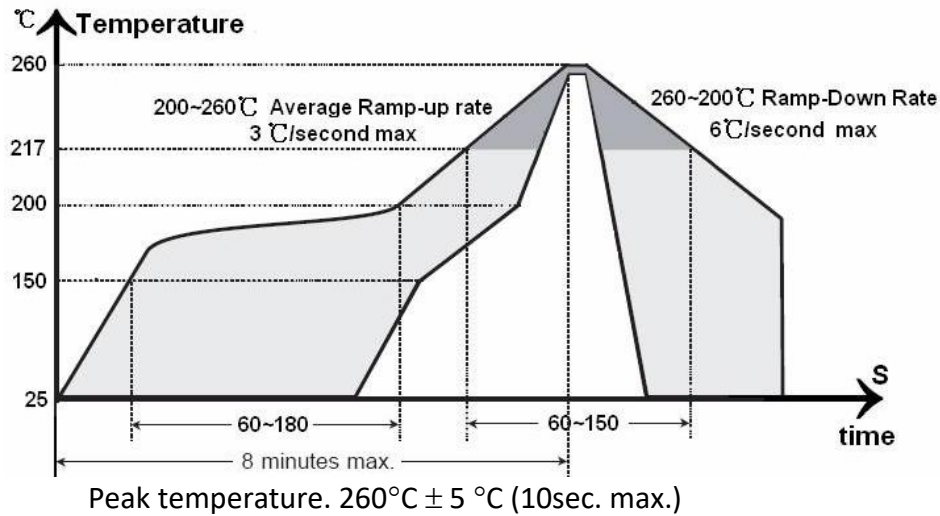


Parts		Material	QTY	COLOR	SUPPLIER
A	Blank	Mostly SiO ₂	1	White	Russia Ural
B	Conductive paste	Ag:80%, silicone resin 10%	2	Greyish	Japan Three Bond
C	Lid	Fe:52~56%,Ni:16~18%,Co:28~30%	1	Silvery	Japan Yoshikawa
D	Package	Ceramic	1	Brown	Japan NTK/SMI
E	Plating(blank)	Ag:99.99%	2	Silvery	Shanghai Yisheng
F	Pad	Cu:6.6%,Au:0.2%,Fe:56%,Ni:18%	4	Golden	Japan NTK/SMI

5、RELIABILITY SPECIFICATIONS

Item	Conditions	Result
Low Temp. Storage (MIL-STD-883)	Put the crystal into the $-40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ constant temperature box for 500 ± 2 H , Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
High Temp. Storage (MIL-STD-883)	Put the crystal into the $+100^{\circ}\text{C}\pm 2^{\circ}\text{C}$ constant temperature box for 500 ± 2 H, Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
High Temp & Humidity (JIS C5023)	Put the crystal into the constant temperature & humid with the temperatures $85^{\circ}\text{C}\pm 3^{\circ}\text{C}$ and the humidity 98% for 500 ± 2 H. Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Thermal Shock (MIL-STD-883)	Put the crystal into the constant temperature $-55^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 30 ± 1 M, then change the temperature to $+85^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 30 ± 1 M, the total is 100times. Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Resistance To Soldering Heat (MIL-STD-202)	Passed through the re-flow oven under the following condition. Preheat to $150^{\circ}\text{C}\pm 5^{\circ}\text{C}$ for 60 to 120sec, and peak $265^{\circ}\text{C}\pm 5^{\circ}\text{C}$ for $10\text{s}\pm 3\text{sec}$. Measurement taken after DUT being left at room temperature for at 24 ± 2 hours	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Drop Test (JIS C6701)	The crystal fall off the cement floor with the height $100\text{cm}\pm 5\text{cm}$ for 3 times . Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Vibration Test (MIL-STD-883)	Apply 0.75mm vibration at sweep frequency 10~500 Hz, for 2h. 10 cycles in each direction of 3 axis. Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Shock MIL-STD-202F	Peak 1000m/s^2 , normal width 6ms half sine wave form, 3.7m/s , 3 perpendicular axis of samples, 3 cycles / direction, total 18 cycles. Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Fine Leak (MIL-STD-883)	Helium Bombing 4.5kgf/cm^2 for 2 hr	Less than $1*10^{-8}\text{atm.c.c./sec}$, Helium
Solderability	In $245 \pm 5^{\circ}\text{C}$ solder bath for 2 ± 0.5 seconds. 8-12X magnifier.	Terminals shall be covered more then 95% with solder.

6、 SUGGESTED REFLOW PROFILE



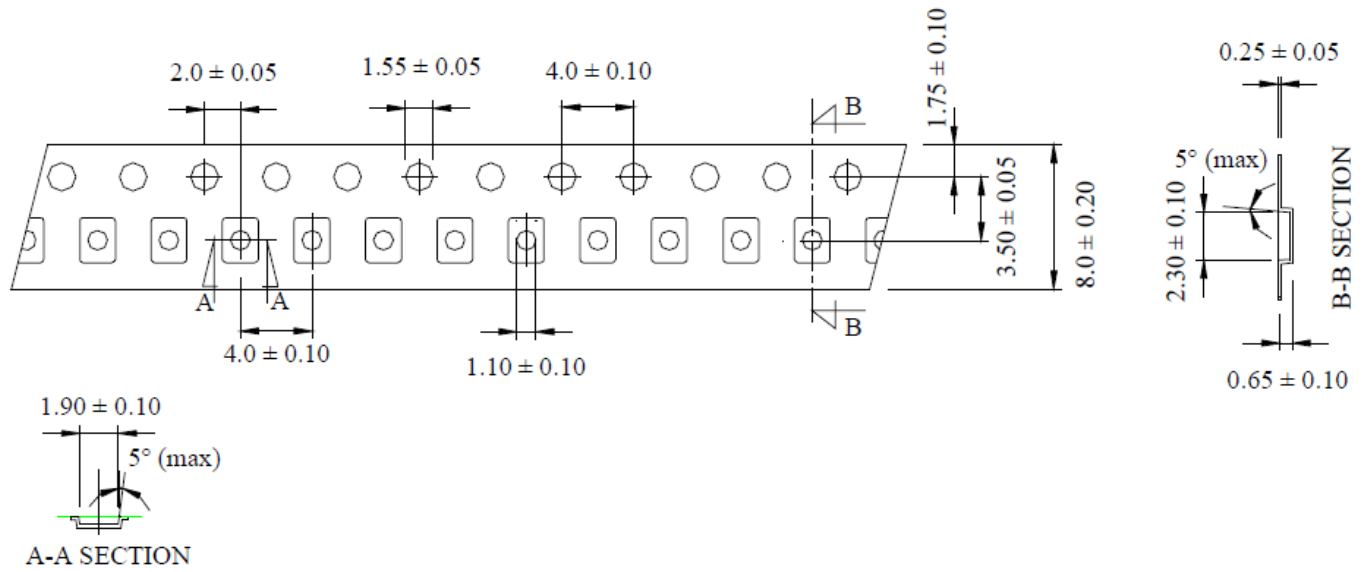
7、 SUBSTANCES IN PRODUCT

Drawing number	Disassembly Unit/component description	Homogeneous Material Name.	Substance Name	CAS No.	Substance Mass. (mg)	Content Rate(%)per
SMD2016	Crystal blank	Quartz	SiO ₂	14808-60-7	0.1852	100.00%
	Electrode	Electrode-Ag	Ag	7440-22-4	0.0426	100.00%
	Package	Ceramics	Al ₂ O ₃	1344-28-1	5.9718	90.00%
			Mn ₂ O ₃	1317-34-6	0.2654	4.00%
			SiO ₂	7631-86-9	0.2654	4.00%
			MoO ₃	1313-27-5	0.0664	1.00%
			MgO	1309-48-4	0.0664	1.00%
		Kovar ring	Fe	7439-89-6	0.0773	53.00%
			Ni	7440-02-0	0.0423	29.00%
			Co	7440-48-4	0.0262	18.00%
		Plate	Au	7440-57-5	0.0416	19.00%
			Ni	7440-02-0	0.1772	81.00%
	Metallizing	Mo	7439-98-7	0.0729	100.00%	
	Solder	Ag	7440-22-4	0.1553	71.00%	
		Cu	7440-50-8	0.0634	29.00%	
	Lid	Kovar	Fe	7439-89-6	2.4834	48.50%
			Ni	7440-02-0	1.7921	35.00%
			Co	7440-48-4	0.8193	16.00%
			Mn	7439-96-5	0.0256	0.50%
	Conduct Adhesive	silver adhesive	Ag	7440-22-4	0.1122	70.00%
Pd			7440-05-3	0.0080	5.00%	
C ₁₁ H ₂₄			1120-21-4	0.0160	10.00%	
C ₁₂ H ₂₆			112-40-3	0.0080	5.00%	
SiO ₂			7631-86-9	0.0160	10.00%	

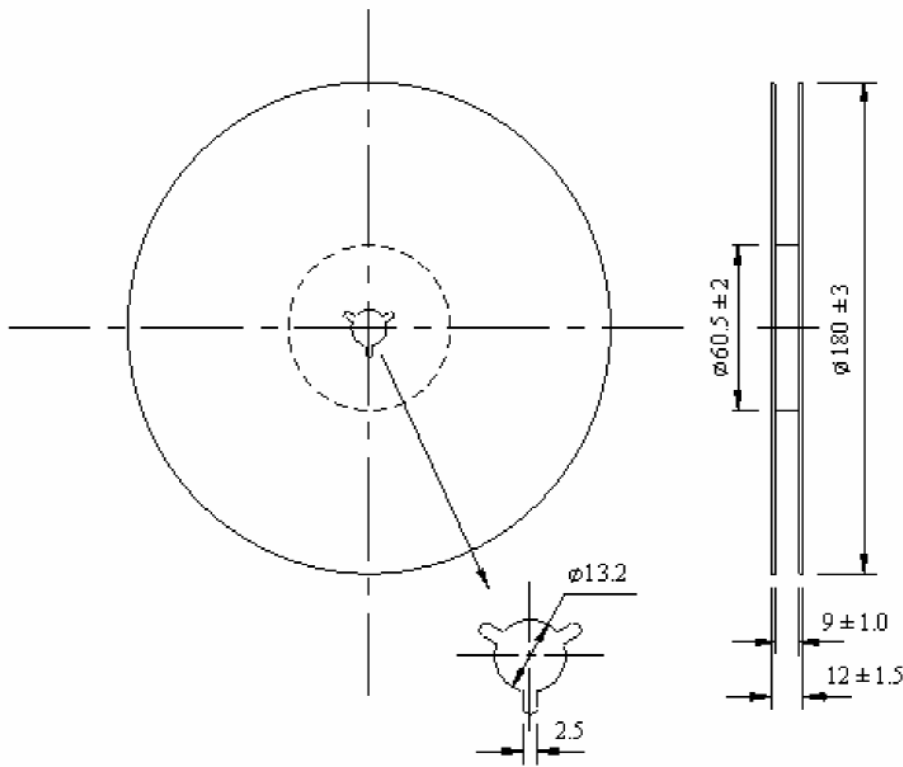
All the products we provide meet the requirements of RoHS and Reach regulations, and we send SGS for ICP test every year.

8、PACKING SPECIFICATIONS (Unit: mm)

TAPE SPECIFICATION:



OUTLINE DIMENSION:



Q'ty: 3000pcs/Reel

9、WTL PART NUMBER SYSTEM :

For example: WTL1M25212CH

[Instructions: for project management, WTL will trace back the part number to developer wherever it goes]

WTL - 1M - 25212 - CH

WTL: Brand

1M : Package Code , please see Table 1

25212: Serial number , flow code , without any rules

CH: WTL Developer Code, for example: VH,CH,PZ,RZ,ML

Table1

Type	SMD Seam Crystal							
Series	TX1	TX2	TX3	TX4	TX5	TX6	TX7	TX8
Package Code	1M	2M	3M	4M	5M	6M	7M	8M
Size(mm)	2.0*1.6	2.5*2.0	3.2*2.5	4.0*2.5	5.0*3.2	6.0*3.5	7.0*5.0	1.6*1.2
	4PAD	4PAD	4PAD	4PAD	4PAD	4PAD	4PAD	4PAD
Type	DIP Crystal							
Series	WX6	WX7	WX5	WZ7	WM1	WM5	WA2	WA3
Package Code	9S	9M	9U	9L	1U	5U	2A	3A
Size(mm)	11.0*4.7	11.4*4.7	13.5*4.7	7.0*4.1	7.8*3.2	6.0*3.2	φ2*6	φ3*8
	2PIN	2PIN	2PIN	2PIN	2PIN	2PIN	2PIN	2PIN
Type	SMD Glass Crystal							
Series	TG3	TG5	TG6	TG8	TG9			
Package Code	3G	5G	6G	8G	5A			
Size(mm)	3.2*2.5	5.0*3.2	6.0*3.5	8.0*4.5	5.0*3.2			
	4PAD	2PAD	2PAD	2PAD	4PAD			

*The above are conventional products. If you have special specifications, please contact our sales for confirmation.