1.ELECTRICAL SPECIFICATIONS

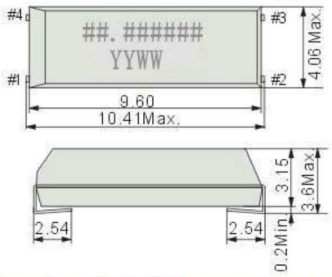
1.1

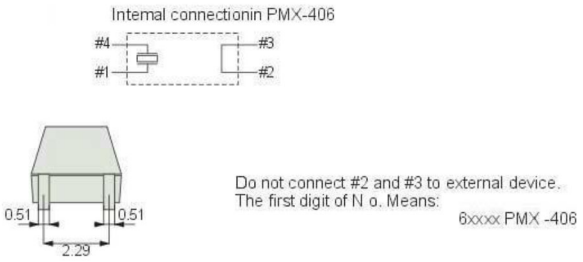
Parameter	Symb	Value	Condition
Frequency Range	F_O	**32.768Khz**	
Frequency Tolerance	△f/fo	**±20PPM**	REF TO 25℃
Temperature Coefficient	△f/fo	**-0.034±0.006ppm/(℃)^2**	
Turnover temperature	Tm	**25±5℃**	
Operating Temperature Range	T_{OPR}	**-40℃ to 85℃**	
Storage Temperature Range	T_{STG}	**-55℃ to 125℃**	
Quality factor		**500000TYP**	
Series resistance	R_1	**65 KΩ**	REF TO 25℃
Shunt Capacitance	C_O	**1.65PF TYP**	0.9~2.0PF
Motional Capacitance	C_1	**1.8TYP**	
Load Capacitance	C_L	**12.5pF**	
Insulator Resistance	IR	**500 MΩ**	DC100V±15V
Drive Level	DL	**1μ W**	
Capacitance ratio	r	**450TYP**	
Aging	△f o	**±5PPM**	at 25℃±3℃
Lead Free	ROHS WITH EXEMPT PER ROHS 2011/65/EU ANNEX(7a)		

1.2.DIMENSION

Unit:mm

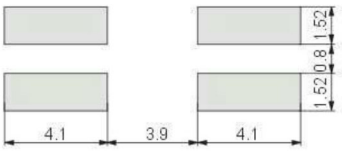
• **PMX-406**



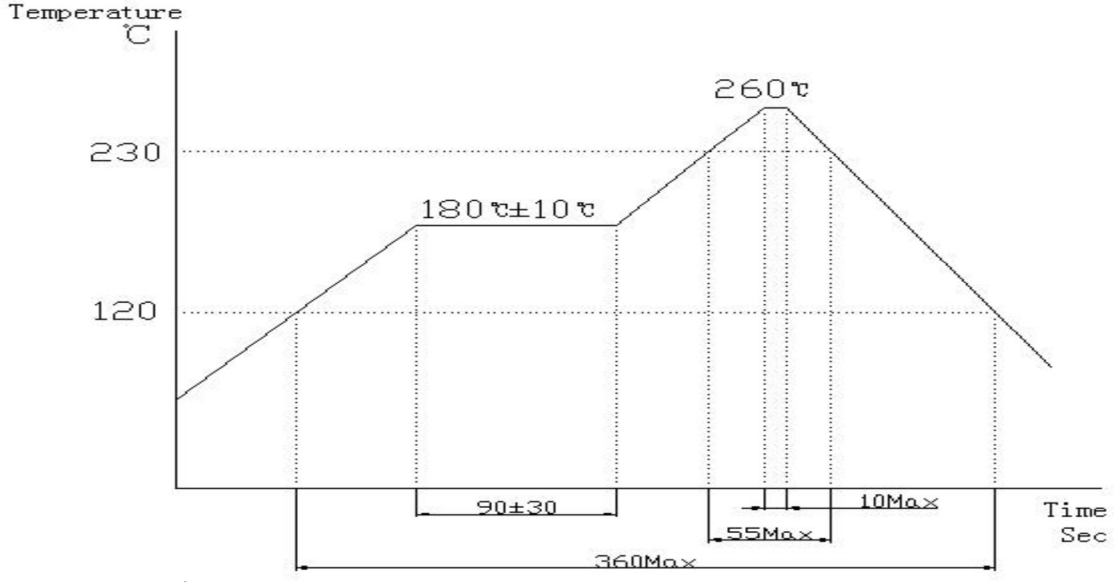


Footprint(Recommended) (Unit:mm)

• **PMX-406**



1.3 Reflow solder



2. TEST STANDARD

2.1 GENERAL ELECTRICAL CHARACTERISTICS AND VISUAL TESTING

2.1.1 LOT CLASSIFICATION : If the quantity is 1,000 pcs or more, 1,000 pcs is one lot.

2.1.2 SAMPLING TEST METHOD : MIL-STD-105E G-II

2.1.3 TEST LEVEL

A] HIGH LEVEL DEFECT : AQL 0.065% [200 PCS]

B] MEDIUM LEVEL DEFECT : AQL 0.25% [50 PCS]

C] LOW LEVEL DEFECT : AQL 0.4% [32 PCS]

2.1.4 DEFECT CLASSIFICATION

A] HIGH LEVEL

@NO FREQUENCY

@MIXING

@LEAK DEFECT

B] MEDIUM LEVEL – ELECTRICAL CHARACTERISTIC DEFECT

@FREQUENCY

@OSCILLATION

@ELECTRICAL CURRENT

@OTHER ELECTRICAL CHARACTERISTICS DEFECT

C] VISUAL

@MARKING

@WELDING

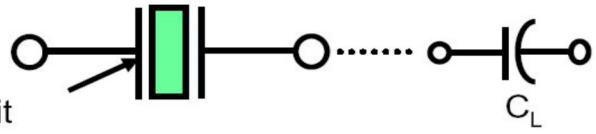
@LEADS

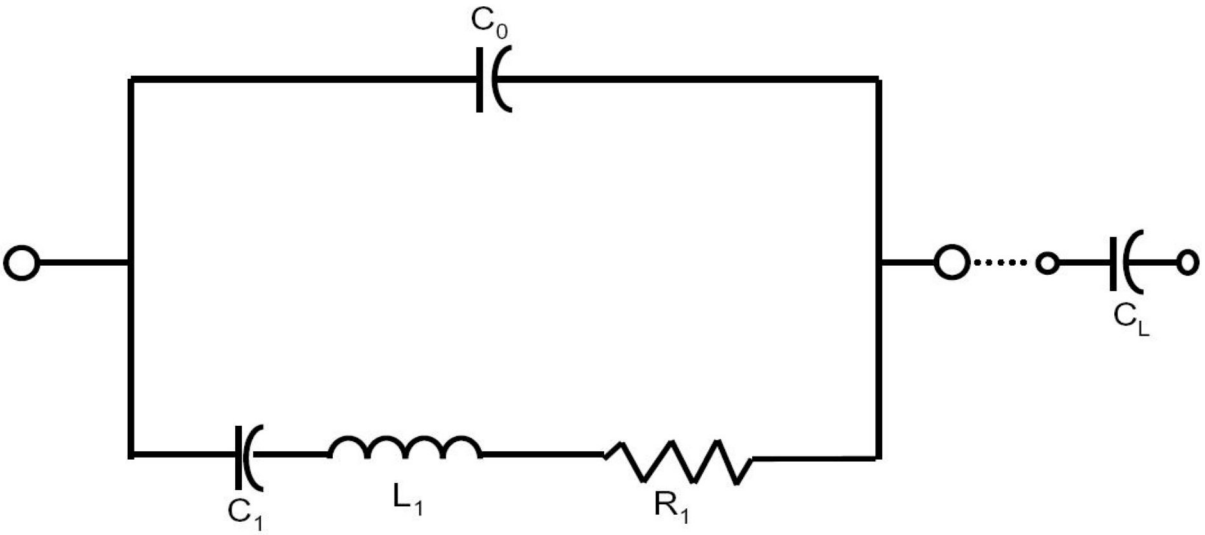
@OTHER VISUAL DEFECT

TESTING METHOD AND ITS STANDARD CAN BE MODIFIED DEPENDING ON THE CUSTOMER'S REQUEST.

2.2 EQUIVALENT CIRCUITS

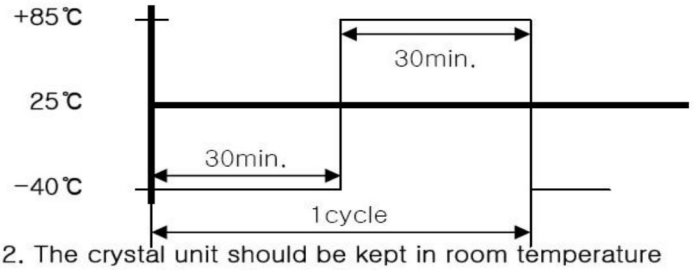
Symbol for crystal unit





3. RELIABILITY TEST STANDARD

3.1 ENVIRONMENTAL

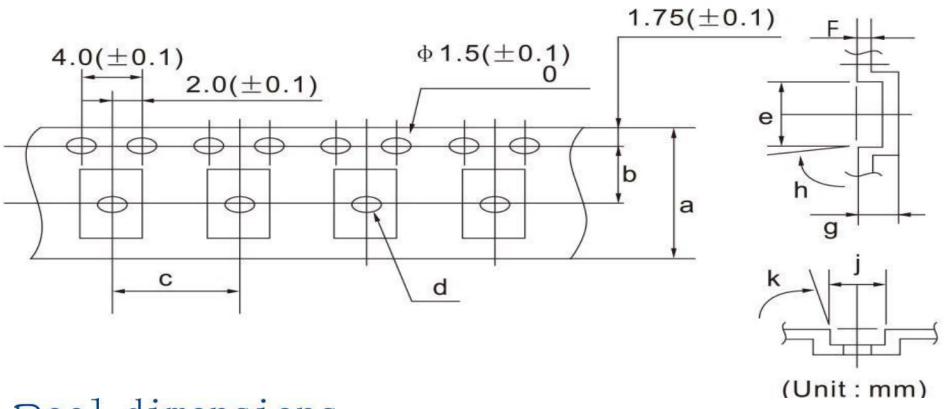
TEST ITEM	TESTING PROCEDURE & CONDITIONS	EVALUATION
1. THERMAL SHOCK TEST	1. The test should be performed in accordance with the following condition for 10 cycle.  2. The crystal unit should be kept in room temperature for 1 hour then tested.	The crystal unit should fulfill the specified requirements of the electrical characteristics and appearance.
2. HUMIDITY	1.temperature : +40℃±2℃ RELATIVE HUMIDITY : 90~95% TEST PERIOD : 48 HOURS 2. The crystal unit should be kept in room temperature for 1 hour then tested.	The crystal unit should fulfill the specified requirements of the electrical characteristics and appearance.
3. COLD TEMPERATURE TEST	1. TEMPERATURE : -40℃±2℃ TEST PERIOD : 2 HOURS 2. The crystal unit should be kept in room temperature for 1 hour then tested.	The crystal unit should fulfill the specified requirements of the electrical characteristics and appearance.
4. THERMAL TEST	1. TEMPERATURE : +85℃±2℃ TEST PERIOD : 24 HOURS 2. The crystal unit should be kept in room temperature for 1 hour then tested.	The crystal unit should fulfill the specified requirements of the electrical characteristics and appearance.
5. RAPID CHANGE IN TEMPERATURE	1. TEMPERATURE : +85℃±2℃ TEST PERIOD : 120 HOURS 2. The crystal unit should be kept in room temperature for 1 hour then tested.	The crystal unit should fulfill the specified requirements of the electrical characteristics and appearance.

3.2 MECHANICAL

TEST ITEM	TESTING PROCEDURE & CONDITIONS	EVALUATION
1.LEAD TENSILITY	1. FIX THE UNIT. 2. APPLY 2LB OF WEIGHT AXIS TO THE LEADS. 3. TIME : 5 SECONDS	SHOULD PASS SEALING AND VISUAL TEST
2. LEAD BENDING	1. ATTACH 1 LB OF WEIGHT TO EACH OF THE LEADS. 2. BENDING ANGLE : 90° (FROM THE NORMAL POSITION TO 45° OPPOSITE DIRECTION) 3. BENDING TIME : 3 SECONDS(EACH DIRECTION) 4. NUMBER OF BENDING : 2 TIMES	SHOULD PASS SEALING AND VISUAL TEST
3. LEADS SOLDERABILITY	1. DIP THE LEADS INTO FLUX(ROJIN METHANOL) FOR 5 SECONDS 2. DIP THE LEADS INTO 250±5℃ 99% Sn DIPPING SOLUTION FOR 5 SECONDS.	THE DIPPED PART OF THE LEADS SHOULD HAVE 90~95% Sn COATING.
4. SOLDERING HEAT RESISTANCE TEST	1. PERFORM ELECTRICAL CHARACTERISTICS TEST BEFORE STARTING THIS PROCEDURE. 2. DIP THE LEADS INTO FLUX(ROJIN METHANOL) FOR 5 SECONDS. 3. DIP THE LEADS INTO 260±5℃ 99% Sn DIPPING SOLUTION FOR 5 SECONDS. 4. TAKE THE UNIT OUT, STORE AT ROOM TEMPERATURE FOR 30 SECONDS THEN MEASURE THE ELCTRICAL CHARACTERISTICS.	SHOULD PASS SEALING AND VISUAL TEST
5. VIBRATION	1. PERFORM ELECTRICAL CHARACTERISTICS TEST BEFORE STARTING THIS PROCEDURE. 2. THE UNIT SHOULD BE FIXED ONTO A VIBRATING MACHINE AND THEN SHAKEN X.Y.Z DIRECTIONS. VIBRATING FREQUENCY : 10 ~ 55 Hz AMPLITUDE : 0.03 Inch FACTOR TIME : 1 MINUTES TESTING TIME : 30 MINUTES EACH FOR X, Y, Z DIRECTIONS	SHOULD PASS SEALING AND VISUAL TEST
6. DROP TEST	1. PERFORM ELECTRICAL CHARACTERISTICS TEST BEFORE STARTING THIS PROCEDURE. 2. FROM THE HEIGHT OF 500mm DROP THE UNIT 3 TIMES ONTO A HARD RUBBER SURFACE.	SHOULD PASS SEALING AND VISUAL TEST
7. LEAK TEST	USE Helium Leak Detector. Bombing PRESSURE : 5kg/㎠ Bombing TIME : 2 HOURS LEAK SHOULD BE LESS THAN 1E-8 atm.cc/sec.	GAS OR AIR SHOULD NOT BE DETECTED.
8. MARKING ERASE	SUBMERGE THE UNIT INTO IPA[ISOPROPYL ALCOHOL] SOLUTION FOR 10 MINUTES AND BRUSH THE MARKING 10 TIMES WITH A TOOTH BRUSH.	MARKING SHOULD NOT BE ERASED.

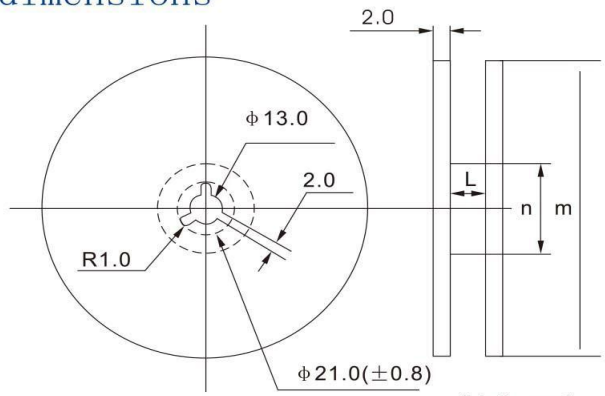
4. Packing

Taping dimensions



(Unit : mm)

Reel dimensions



(Unit : mm)

Model Region	Quantity (pcs / reel)	a	b	c	d (Φ)	e	f	h (Max.)	j	k (Max.)	L	m (Φ)	n (Φ)
PMX-206F	3,000	16.0	7.5	8.0	-	9.7	2.15	3°	5.0	-	17.5	330	100
PMX-206F(AT)	3,000	16.0	7.5	8.0	-	9.7	2.15	3°	5.0	-	17.5	330	100
PMX-206FA	3,000	16.0	9.2	8.0	-	9.5	2.1	-	3.0	5°	17.5	330	100
PMX-206FA(AT)	3,000	16.0	9.2	8.0	-	9.5	2.1	-	3.0	5°	17.5	330	100
PMX-206	3,000	16.0	7.5	8.0	1.6	8.3	2.7	3°	4.05	3°	17.5	330	100
PMX-206(AT)	3,000	16.0	7.5	8.0	1.6	8.3	2.7	3°	4.05	3°	17.5	330	100
PMX-145	3,000	16.0	7.5	8.0	1.0	7.2	1.7	5°	1.7	5°	17.5	300	100
PMX-145(AT)	3,000	16.0	7.5	8.0	1.0	7.2	1.7	5°	1.7	5°	17.5	300	100
PSX-415	3,000	12.0	5.5	4.0	1.0	4.5	1.0	5°	1.9	5°	13.0	180	60
PSX-315	3,000	12.0	5.5	4.0	1.0	3.6	1.0	5°	1.9	5°	13.0	180	60
PMX-308F	1,000	24.0	11.5	12.0	2.05	13.2	3.5	3°	6.0	-	25.5	330	100
PMX-308F(AT)	1,000	24.0	11.5	12.0	2.05	13.2	3.5	3°	6.0	-	25.5	330	100
■ PMX-406	2,000	16.0	7.5	8.0	2.2	10.5	3.7	3°	4.3	3°	25.5	330	100
PMX-308(AT)	1,000	24.0	11.5	12.0	2.2	12.8	3.9	3°	4.8	3°	25.5	330	100
PMX-145FA	3,000	16.0	8.6	8.0	-	5.5	1.8	10°	1.95	10°	17.5	330	100

4.2 PACKAGING METHOD

4.2.1 TAPE & REEL AS SHOWN IN ABOVE DIMENSION,

4.2.2 INSERT 2,000 PCS OF TAPE & REEL COVERED WITH SHOCK ABSORBANT PAD INTO THE INNER BOX(INNER BOX SHOULD HAVE DESCRIPTION OF THE PART CONTAINED) AS SHOWN IN PICTURE1.

INNER-BOX CAN ACCOMODATE UPTO 2,000PCS.[PICTURE2]

4.2.3 INSERT SHOCK-ABSORBANT PAD ON ALL SIDES(INCLUDING TOP), AND THEN INSERT UPTO 5 INNER BOXES INTO THE OUTER BOX. [PICTURE3]

4.2.4 ON THE INNER-BOX COVER, LABEL CONTENTS OF THE BOX(FREQUENCY, LOAD CAPACITANCE, AND QUANTITY).

4.2.5 TO PREVENT INNER-BOX COVER OPENING DUE TO SHOCK, FASTEN THE COVER WITH A CLEAR TAPE AS SHOWN IN PICTURE4.

PICTURE1

PICTURE2

PICTURE3

PICTURE4

5.WTL PART NUMBER SYSTEM :

For example: WTL6Q23118PZ

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

WTL - 6Q - 23118 - PZ

WTL : Brand

6Q : Package Code

23118: Serial number , flow code , without any rules

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