



TAI-SAW TECHNOLOGY CO., LTD.

No. 3, Industrial 2nd Rd., Ping-Chen Industrial District,
Taoyuan, 324, Taiwan, R.O.C.

TEL: 886-3-4690038 FAX: 886-3-4697532

E-mail: tstsales@mail.taisaw.com Web: www.taisaw.com

Product Specifications Approval Sheet

Product Description: Crystal Unit HC43U 12.8MHz

TST Part No.: TZ1962A

Customer Part No.: _____

Customer signature required
Company: _____
Division: _____
Approved by : _____
Date: _____

Checked by: _____ Ginger Huang *Ginger Huang*

Approved by: _____ Kelly Huang *Kelly Huang*

Date: _____ 04/15/2011

1. Customer signed back is required before TST can proceed with sample build and receive orders.
2. Orders received without customer signed back will be regarded as agreement on the specifications.
3. Any specifications changes must be approved upon by both parties and a new revision of specifications shall be released to reflect the changes.



TAI-SAW TECHNOLOGY CO., LTD.
HC43U 12.8MHz Crystal Unit

MODEL NO.: TZ1962A

REV. NO.: 2.0

Revise:

Rev.	Rev. Page	Rev. Account	Date	Ref. No.	Reviser
1	N/A	Initial release	04/11/11'	N/A	Ginger Huang
2	P5	Marking Change	04/15/11	1.0	Ginger Huang



TAI-SAW TECHNOLOGY CO., LTD.

No. 3, Industrial 2nd Rd., Ping-Chen Industrial District,
Taoyuan, 324, Taiwan, R.O.C.

TEL: 886-3-4690038 FAX: 886-3-4697532

E-mail: tstsales@mail.taisaw.com Web: www.taisaw.com

HC43U DIP 12.8MHz Crystal Unit

MODEL NO.: TZ1962A

REV. NO.: 2.0

Features:

- Good Frequency Perturbation and Stability over temperature

RoHS Compliant
Lead free
Lead-free soldering

Description and Applications:

HC43U crystal unit for use in wireless telecommunications devices

Electrical Specifications:

No	Characteristics	Symbol	Limits		Unit	Remarks
			Min	Max		
1	Load Frequency	F_L	12800.000		kHz	At $T_0^{\circ}\text{C}$
2	Reference Temperature	T_0	+87	+91	$^{\circ}\text{C}$	
3	Overtone Order		3			
4	Load Capacitance	C_L	20		pF	
5	Rated Drive Level	P_0		100	μW	
6	Frequency Adjustment Tolerance	$\Delta f / f$	-3	+3	ppm	At $T_0^{\circ}\text{C}$, with $f=F_L$
7	Resonance Resistance	R_r		100	Ω	At $T_0^{\circ}\text{C}$
8	Turning Point	T_p	+82	+95	$^{\circ}\text{C}$	Lower T_p for SC cut
9	Frequency Variation with Temperature over OTR	$\Delta f / F_L$	NA	NA	ppm	$(F_T - F_L) / (F_L)$ F_T : Freq at $T^{\circ}\text{C}$
10	Resistance Variation with Temperature over OTR	$\Delta R / R_r$		25	%	R_r =Resonance Resistance at $T_0^{\circ}\text{C}$
11	Operating Temperature Range	OTR	60	110	$^{\circ}\text{C}$	
12	Frequency Variation with Drive Level	$\Delta f / f_r$	NA	NA	ppm	f_r = Resonance Frequency at $T_0^{\circ}\text{C}$
13	Resistance Variation with Drive Level	$R_{\text{max}} - R_r$	NA	25	Ω	R_r =Resonance Resistance at $T_0^{\circ}\text{C}$
14	Motional Inductance	L_1	NA	NA	mH	
15	Motional Capacitance	C_1	NA	NA	fF	
16	Static Capacitance	C_0		3	pF	
17	Q Factor	Q	600		K	
18	Ratio of unwanted Response Resistance or Impedance to Resonance Resistance	R_p / R_r or $ Z_p / R_r$		-6	dB	In the frequency range : $f \pm 1 \text{ MHz}$
19	Ageing	$\Delta f / f_r$	± 100		ppb	per year
20	Package		HC-43/U			See page 3
21	Dips activity	$\Delta f / f_r$			%	
22	Pull sensitivity	T_s			ppm/pF	
23	Operatable Temperature Range	T_{stg}	-55	+125	$^{\circ}\text{C}$	
24	Insulation Resistance	R_i	500		$\text{M}\Omega$	
25	Lead Finish		Tinned RoHS			
26	Shocks					(IEC 68-2-6)
27	Vibrations					(IEC 68-2-27)

Additional requirement:

- Pre-ageing process:
 1. 10 times -40 -> 85 deg thermal shock, 30 min soak for each point
 2. 2 times at least IR flow
- Can not be grounded
- Leads should not be bent

No	Characteristics	Symbol	Note	Unit	Limits
0	Xtal SN	SN	A		Xtal's series No.
1	Turning Point	Tp	A	°C	Table 1 Item 8
2	Load Frequency	FL (To , Po)	A	ppm	Table 1 Item 1 & 6
3	Series resonant Frequency	FR (To , Po)	B	kHz	As reference
4	Resonance Resistance	Rr (To , Po)	A	Ω	Table 1 Item 7
5	Motional Inductance	L1	B	mH	Table 1 Item 14
6	Motional Capacitance	C1	A	fF	Table 1 Item 15
7	Static Capacitance	C0	A	pF	Table 1 Item 16
8	Q factor	Q	A		Table 1 Item 17
9	Unwanted Response *1	Rp/Rr or Zp /Rr	B	dB	Table 1 Item 18
10	Rated Drive Level	Po	B	uW	Table 1 Item 5
11	Frequency Variation with Drive Level *2	Δf / fr	B		Table 1 Item 12
12	Resistance Variation with Drive Level *3	Rmax - Rr	A	Ω	Table 1 Item 13
13	Pull sensitivity	Ts	B	ppm/pF	Table 1 Item 22

Note A: test on 100% of each lot at To °C

Note B: test on sample stage at To °C

DLD sweep: 10uW~200uW, 10 points

Sampling for hermeticity testing (20 pieces)

*1: SPDB test

*2: FDL D test

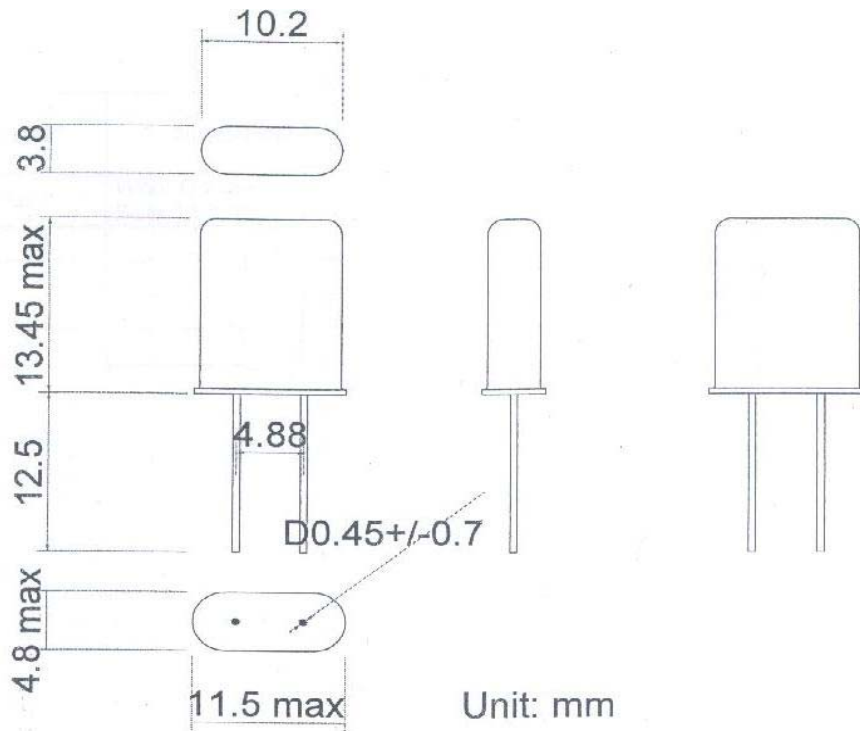
*3: DLD2 test

No	Characteristic	Symbol	Note	Unit	Limits
0	Xtal SN	SN	A		Xtal's series No.
1	Temperature Point	Ta	A	°C	Table 1 Item 8
2	Load Frequency Variation with temperature over OTR	FL (Ta , Po)	A	ppm	Table 1 Item 9
3	Resonance Resistance Variation with temperature over OTR	Rr	A	Ω	Table 1 Item 7&10
4	Motional Capacitance	C1	A	fF	Table 1 Item 15
5	Static Capacitance	C0	A	pF	Table 1 Item 16
	Q factor	Q	A		Table 1 Item 17
6	Dips activity	Δf / fr	B	%	Table 1 Item 21

Note A: test on 100% of each lot, less than 3°C step at ambient temperature around TP+/-10°C

Note B: test on sample stage per 2°C step over OTR

Mechanical Dimensions (mm):



Marking:

A side

Line 1: TS1013 A0

Line 2: Frequency (12.800MHz)

Line 3: Year code + Week code (YYWW)

TS1013 A0
12.800MHz
YYWW

B side

Line 1: Temperature of turning point

Line 2: Lot number of crystal