SPEC. NO.: M118-132

CRYSTAL SPECIFICATION

Customer :

Customer P/N :

Agent :

Agent Code :

SIWARD P/N : XTL5A1100-M118-132

Customer Approval :

希華晶體科技股份有限公司
SIWARD CRYSTAL TECHNOLOGY CO., LTD.

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Address:1-1,LANE 111,JUNG-SHAN RD.,SEC.3, TANTZU HSING,TAICHUNG 427,TAIWAN,R.O.C.

DATE : 2017/11/21

Approved By : Steve Chen

Checked By :

Designer : JoJo Lin

Rev.	Description of Revision History	Date	Designer	Checked By
1	New Publication	2017/11/08	Jo.Jo Lin	Tom Tang

SPEC. NO.: M118-132

CRYSTAL SPECIFICATION

1. Description : Quartz Crystal
2. Nominal Frequency : 26.000000 MHz
3. Center Frequency : 26.000000 MHz
4. Dimension & Drawing No. : SXT-2520 ; SXD-00311
5. Oscillation Mode : Fundamental
6. Cutting Mode : AT cut
7. Packing Style : TP-159
8. Measurement Instrument : S&A 250B(Measured FL)
9. Electrical Characteristics :

[1] Operating Conditions :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Operating Temperature Range	Topt	-30		105	℃	
Storage Temperature Range	Tstg	-40		105	℃	
Load Capacitance	CL		7		pF	
Drive Level	DL	10	50	100	μW	

[2] Frequency Stability :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Tolerance	dF/Fo	-10		10	ppm	Refer to Center Frequency @25℃+/-3℃
Stability Over Temperature	dF/F30.5	-12		10	ppm	@-30℃~85℃
Trim Sensitivity Over Load	TS	13.5	15	16.5	ppm/pF	@CL
Aging	dF/F25	-0.7		0.7	ppm	@ First year ; +/-1.4ppm@ 2 years +/-2.5ppm@5years ; +/-5ppm@10 years
Reflow	dF/F25	-2		2	ppm	After two reflows (0.5hr freq. drift subtract 168hr freq. drift)

dF/Fo: Frequency Deviation Refer to Center Frequency

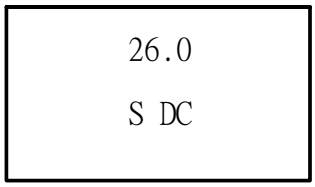
dF/F25: Frequency Deviation Refer to 25 ℃ Frequency

[3] Electrical Performance :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Equivalent Series Resistance	ESR			50	Ω	@Series
Shunt Capacitance	C0			5	pF	
Quality Factor	Q	75			K	
SPUR	SPUR	500				@Fo+/-500 KHz
Insulation Resistance	IR	500			MΩ	@DC 100 Volt
FDLD	dF/F25			3.5	ppm	@0.01~100μW / Step:10
DLD2	ΔR			2.5	Ω	@0.01~100μW / Step:10
FDLDH	dF/F25			0.7	ppm	@0.01~100μW / Step:10
DLDH2	ΔR			1.5	Ω	@0.01~100μW / Step:10

10. Marking : Laser

*MARKING : D ->YEAR C -> MONTH
YEAR : 1 2 3 4 5 6 7 8 9 0
CODE : A B C D E F G H J K
MONTH: 1 2 3 4 5 6 7 8 9 10 11 12
CODE : A B C D E F G H J K L M



11. Remark :

＊The component complies with Moisture Sensitivity Level 1 defined on JEDEC J-STD-020 standard.
＊Compliant with RoHS and Siward QAD-S-116 Standard.

■Note

1.General cleaning solutions or ultrasonic cleaning method may be used to clean our products. However, under certain circumstances, ultrasonic cleaning machine could generate resonance at the oscillaton frequency of our products and thus deteriorate the electrical characteristics in devices, and even damage the overall structure of devices. Therefore, verification test is recommended before cleaning.

2.Avoid mounting and processing by Ultrasonic welding this method has a possibility of an excessive vibration spreading inside the crystal products and becoming the cause of characteristic deterioration and not oscillating.

■ ELECTRICAL CHARACTERISTICS (Thermistor)

Items	Electrical specification					Remarks
	SYMB	Min	Typ	Max	Unit	
Resistance	-	-	100k	-	ohm	25°C
B-Constant	-	-	4250	-	K	25°C - 50°C
Tolerance	-	-1	-	1	%	

■ ELECTRICAL CHARACTERISTICS (Hysteresis)

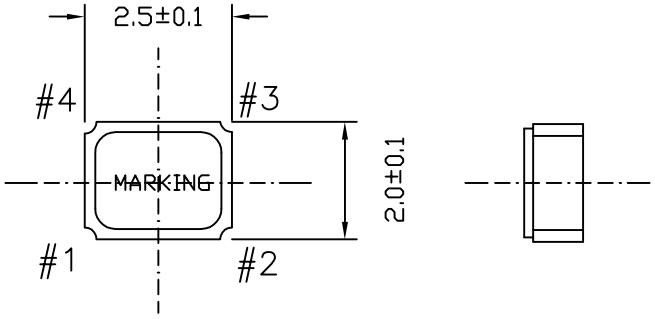
Items	Electrical specification					Test Condition / Remarks
	SYMB	Min	Typ	Max	Unit	
Full Cycle Temperature Hysteresis	-	-0.5	-	0.5	ppm	Temp. range and resolution: -30°C to 85°C per 1°C Temp. rate: ~1.0°C/min Test flow: 25°C(1)->-30°C->85°C ->25°C(2) (25°C(1) freq. drift subtract 25°C(2) freq. drift)
5 deg.C small Cycle Temperature Hysteresis	-	-0.05	-	0.05	ppm	Temp. range and resolution: -30°C to 85°C per 0.5°C Temp. rate: ~1.0°C/min Test flow: any 5°C cycle (ex.25°C(1)->30°C->25°C(2), 25°C(1) freq. drift subtract 25°C(2) freq. drift)
Full Cycle Frequency stability slope		-50		50	ppb/deg.C	Temp. range and resolution:-30°C to 85°C per 1°C Temp. rate: ~1.0°C/min Difference from fifth-order curve fit
5 deg.C Small Cycle Frequency stability slope		-50		50	ppb/deg.C	Temp. range and resolution:-30°C to 85°C per 0.5°C Temp. rate: ~1.0°C/min Difference from fifth-order curve fit

■ ELECTRICAL CHARACTERISTICS (3rd order curve fitting coefficient)

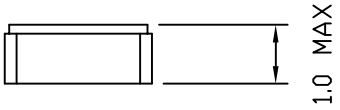
Items	Electrical specification					Test Condition / Remarks
	SYMB	Min	Typ	Max	Unit	
Inflection point	Ti	29	30.5	32	°C	
Room temp	T0	-	30.5	-	°C	
1st order coefficient	C1	-0.4	-0.25	-0.1	ppm/deg.C	Ta=-40°C to 85°C per 1deg.c
2nd order coefficient	C2	-4.5	0	4.5	$x10^{-4}$ ppm/deg.C^2	
3rd order coefficient	C3	8.7	9.85	11	$x10^{-5}$ ppm/deg.C^3	

■ ELECTRICAL CHARACTERISTICS (Freq.slope error)

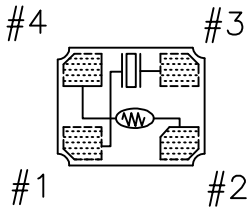
Items	Electrical specification					Test Condition / Remarks
	SYMB	Min	Typ	Max	Unit	
-10°C to 60°C	-	-0.05	-	0.05	ppm/deg.C	
-30°C to 85°C	-	-0.1	-	0.1	ppm/deg.C	
-40°C to 30°C	-	0.15	-	0.15	ppm/deg.C	



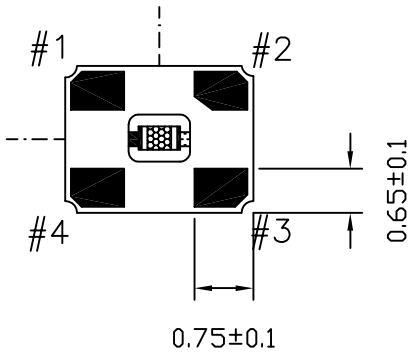
PIN NO.	PIN LAYOUT
#1	Crystal
#2	GND
#3	Crystal
#4	SENSOR

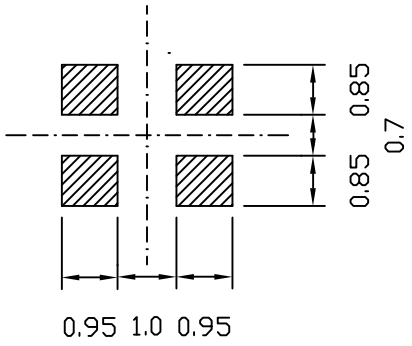


TOP VIEW



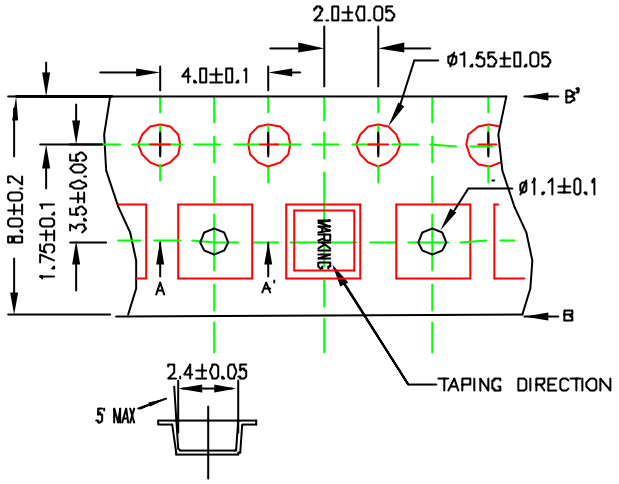
LAND PATTERN (REFERENCE)



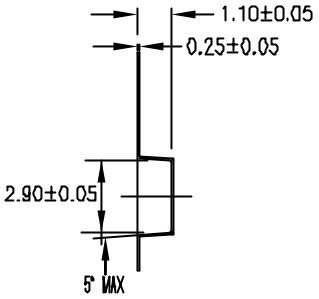


			DRAWING NAME	SXT-2520		
			DRAWING NO.	SXD-00311		
1	NEW EDITION	'11.05.20	SCALE		UNIT	mm
NO.	MODIFY CONTENTS	DATE	APPROVE	Jason	DESIGNER	Edward

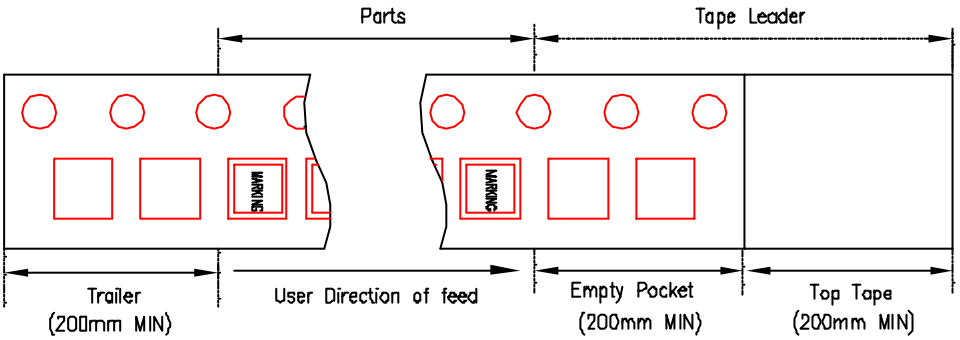
1.CARRIER TYPE



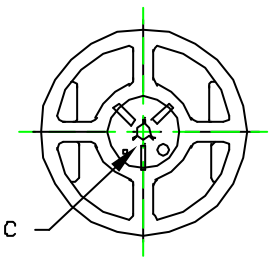
A–A' Cutaway View

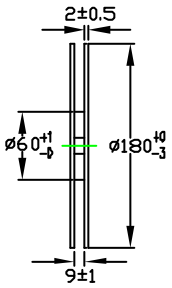


B–B' Cutaway View

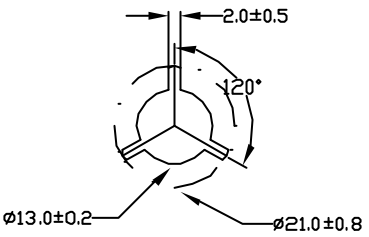


2.REEL : 3000PCS





C.ENLARGE



			DRAWING NAME	SXT-2520 REEL PACKING		
2	DELETE DOT	'15.01.05	DRAWING NO.	TP-159		
1	NEW EDITION	'11.05.31	SCALE		UNIT	mm
NO.	MODIFY CONTENTS	DATE	APPROVE	Edward	DESIGNER	PENG

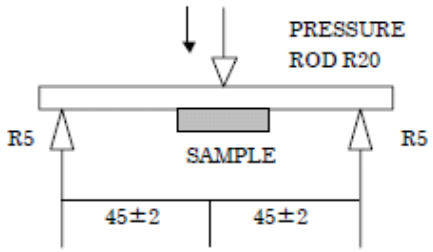
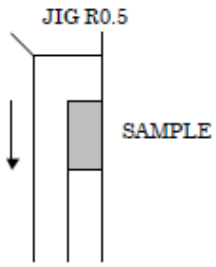
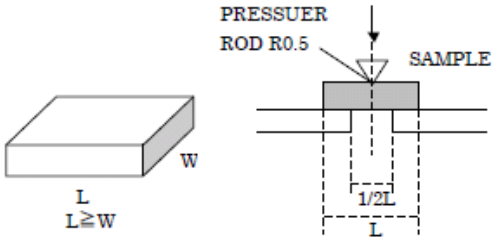
X'TAL	RELIABILITY SPECIFICATION
REFER TO	JIS C 6701
APPLICATION	SMD TYPE

ENVIRONMENTAL PERFORMANCE

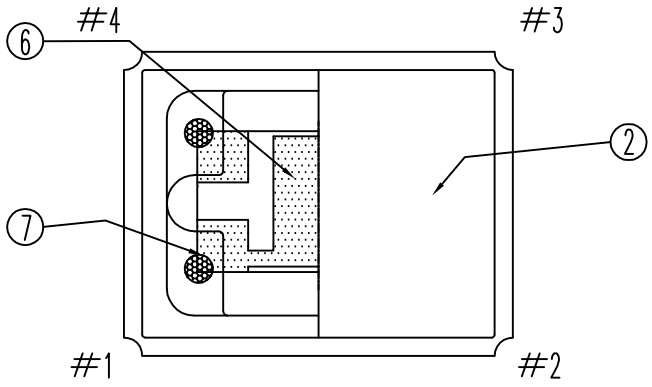
ITEM	CONDITION	SPECIFICATIONS
1. HIGH TEMPERATURE STORAGE	STORED AT 125±2℃ FOR 500±12H. THEN 25±2℃ OVER 2H BEFORE TESTING.	A
2. LOW TEMPERATURE STORAGE	STORED AT –40±2℃ FOR 500±12H. THEN 25±2℃ OVER 2H BEFORE TESTING.	A
3. HIGH TEMP. & HUMIDITY	STORED AT 85±2℃ AND HUMIDITY 85% FOR 500±12 H. THEN 25±2℃ OVER 2H BEFORE TESTING.	A,C
4. TEMPERATURE CYCLE	THE CRYSTAL UNIT SHALL BE SUBJECTED TO 100 SUCCESSIVE CHANGE OF TEMPERATURE CYCLES, THEN 25 ±2℃ OVER 2 H BEFORE TESTING, EACH CYCLE AS BELLOW： TEMPERATURE — DURATION 1. -55+0/-6℃ — 30±3 MINUTES 2. 25℃±2℃ — 2～3 MINUTES 3. 125+4/-0℃ — 30 ±3 MINUTES 4. 25℃±2℃ — 2～3 MINUTES	A

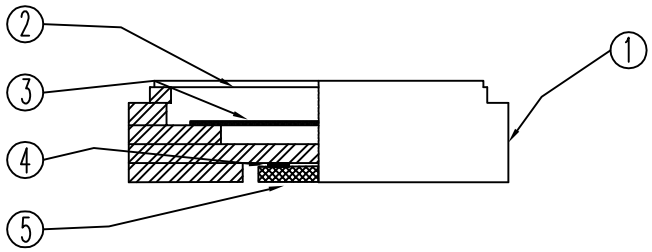
MECHANICAL PERFORMANCE

ITEM	CONDITIONS	SPECIFICATIONS
5. SOLDERABILITY	THE LEAD IS IMMERSED IN A 260±5℃ SOLDER BATH WITHIN 2±0.6 SECONDS.	A NEW UNIFORM COATING OF SOLDER SHALL COVER A MINIMUM 95% OF THE SURFACE
6. RESISTANCE TO SOLDERING HEAT	REFLOW CHART AS ATTACH SHEET. TWICE PASS.	B
7. FREE FALL	FREE DROPPING FROM 150 cm HEIGHT, 3 TIMES ON CONCRETE PLANE.	B
8. VIBRATION	FREQUENCY：10～55Hz AMPLITUDE：1.5mm FREQUENCY：55~2000Hz PEAK VALUE：20G DIRECTION TIME：(X, Y, Z) EACH FOR 4 Hrs. TOTAL:12Hrs	B
9.MECHANICAL SHOCK	TEST CONDITION — TEST METHOD HALF SINE WAVE — IN ACCORDANCE WITH PEAK VALUE：1000G,0.5ms X,Y,Z EACH DIRECTION 1TIME	B
10. GROSS LEAK	STANDARD SAMPLE FOR AUTOMATIC GROSS LEAK DETECTOR, TEST PRESSURE: 0.2 Mpa	D
11. FINE LEAK	HELIUM BOMBING 5.0～5.5 Kgf / cm² FOR 2 HOURS	E

X'TAL	RELIABILITY SPECIFICATION	
REFER TO	JIS C 6701	
APPLICATION	SMD TYPE	
MECHANICAL PERFORMANCE		
ITEM	CONDITIONS	SPECIFICATIONS
12. TERMINAL STRENGTH	SHALL BE PRESSURIZED AT A SPEED OF APPROX.0.5mm/sec IN THE DIRECTION INDICATED BY THE ARROW UNTIL THE BENDING WIDTH REACHES 3mm AND HELD FOR 5 SECONDS. 	B
13. STICKING TENDENCY	A R0.5 JIG SHALL BE USED TO APPLY A 10N DEAD LOAD IN THE DIRECTION INDICATED BY THE ARROW TO THE ELEMENT AND RETAIN IT FOR 10 SECONDS. 	B
14. ELEMENT ASSEMBLY STRENGTH	A R0.5 PRESSURIZED BAR SHALL BE USED TO APPLY A 10N LOAD IN THE CENTER OF ELEMENT AND RETAIN IT FOR 10 SECONDS. 	B

X'TAL	RELIABILITY SPECIFICATION	
REFER TO	JIS C 6701	
APPLICATION	SMD TYPE	
SPECIFICATIONS		
SYMBOL	STANDARD	NOTE
A	1. FREQUENCY CHANGE PERMITTED. △F≦±10ppm. 2. EQUIVALENT SERIES RESISTANCE CHANGE PERMITTED. △CI≦±10Ω or ±15% WHICHEVER IS THE LARGE.	
B	1. FREQUENCY CHANGE PERMITTED. △F≦±5ppm. 2. EQUIVALENT SERIES RESISTANCE CHANGE PERMITTED. △CI≦±10Ω or ±15% WHICHEVER IS THE LARGE.	
C	INSULATION RESISTANCE 500MΩ MIN.	
D	PRESSURE GAP LESS THAN 1*1E-4 Pa・m³/sec	
E	LEAK RATE LESS THAN 1*1E-9 Pa・m³/sec	





PART NAME		MATERIAL	PART NAME		MATERIAL	PART NAME		MATERIAL
1	BASE	CERAMIC	4	SOLDER	Sn	7	ADHESIVES	SILVER GLUE
2	LID	KOVAR	5	THERMISTOR	Al_2O_3+Ag+Ni			
3	BLANK	QUARTZ	6	ELECTRODE	Metal			

			DRAWING NAME	2.5X2.0 X'TAL WITH THERMISTOR CUTAWAY VIEW		
2	ADD PIN INFORMATION	'17.11.10	DRAWING NO.	CUT-X-035		
1	NEW EDITION	'12.10.01	SCALE		UNIT	
NO.	MODIFY CONTENTS	DATE	APPROVE	Jason	DESIGNER	Edward

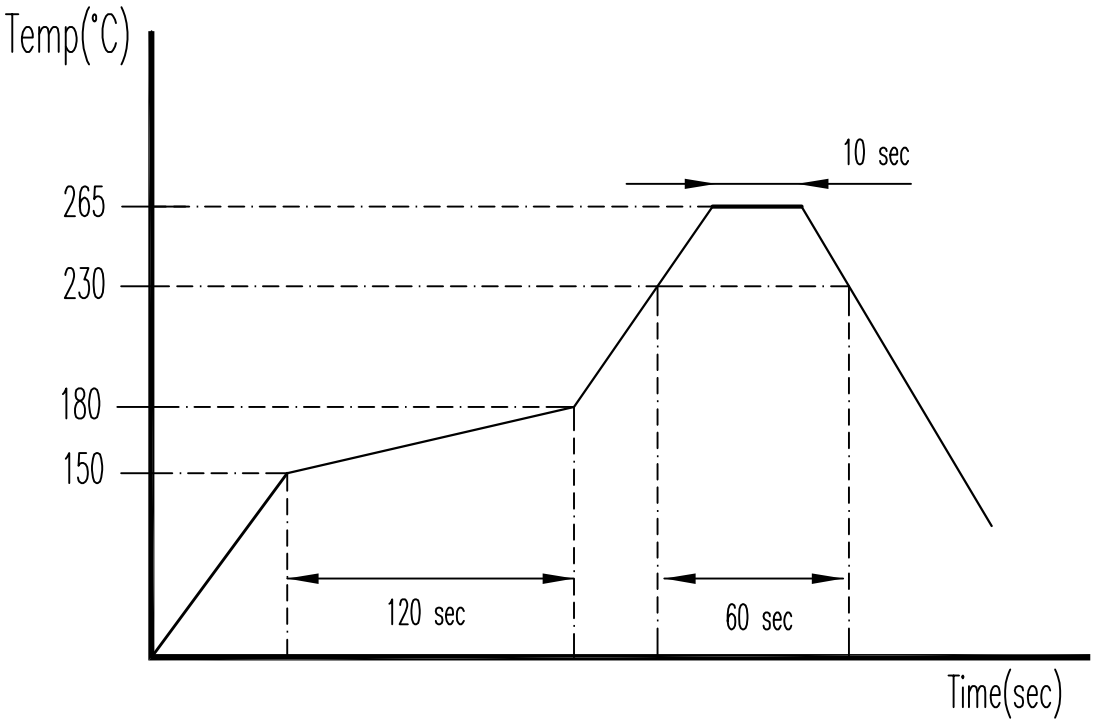
Please follow below reflow definition:

1. Reflow soldering heat resistance

Peak temperature: 265 deg.C, 10 sec
Heating: 230 deg.C or higher, 60 sec
Preheating: 150 deg.C to 180 deg.C, 120 sec
Reflow passage times: twice

2. Manual soldering heat resistance

Pressing a soldering iron of 400 deg.C on the terminal electrode for four seconds (twice).



			DRAWING NAME	QUARTZ DEVICE SMD REFLOW CHART		
			DRAWING NO.	FLOW-030		
1	NEW ISSUANCE	17.11.10	SCALE		UNIT	
NO.	MODIFY CONTENTS	DATE	APPROVE	Edward	DESIGNER	Kevin