



**CHEQUERS ELECTRONIC (CHINA) LIMITED**

捷嘉電子(中國)有限公司

**SURFACE-MOUNT  
SAW RESONATOR SPECIFICATION**

**PART NO.: SCQ433.920E0SR-53**

**<This product is RoHS-compliant>**

Part no.	:	SCQ433.920E0SR-53
Printed on	:	14-Aug-07
Prepared	:	Nelson
Ver. Ctrl.	:	051606/N
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## 1. Scope

This specification shall cover the characteristics of SCQ433.920E0SR-53 SAW resonator for RF applications.

## 2. Part no.: SCQ433.920E0SR-53

## 3. Maximum ratings

Rating	Value	Units
DC voltage between terminals $V_{DC}$	$\pm 30$	V
Operating temperature range	-40 to +85	$^{\circ}\text{C}$
Storage temperature range	-50 to +95	$^{\circ}\text{C}$
Source power	0	dBm

## 4. Electrical characteristics

Characteristics		Symbol	Minimum	Typical	Maximum	Units
Center frequency		$f_c$	433.845	433.920	433.995	MHz
Tolerance		$\Delta f_c$	-75	-	+75	KHz
Insertion loss		IL	-	1.2	1.8	dB
Quality factor	Unloaded Q	$Q_U$	9200	13500	-	-
	50 $\Omega$ loaded Q	$Q_L$	1200	1760	-	-
Temperature stability	Turnover temperature	$T_o$	5	-	25	$^{\circ}\text{C}$
	Turnover frequency	$f_o$	-	$f_c$	-	MHz
	Frequency temperature coefficient	FTC	-	0.032	-	ppm/ $^{\circ}\text{C}^2$
Frequency aging (absolute value during 1 <sup>st</sup> year)		fA	-	$\leq 10$	-	ppm/yr
DC insulation resistance between any two terminals		-	1.0	-	-	M $\Omega$
RF equivalent RLC model	Motional resistance	$R_M$	-	15	23	$\Omega$
	Motional inductance	$L_M$	-	74.27475	-	$\mu\text{H}$
	Motional capacitance	$C_M$	-	1.8131	-	fF
	Shunt static capacitance	$C_o$	2.4	2.7	2.9	pF

1. The center frequency,  $f_c$ , is measured at the minimum IL point with the resonator in the 50 test system.

2. Unless noted otherwise, case temperature  $T_c = +25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ .

3. Frequency aging is the change in  $f_c$  with time and is specified at  $+65^{\circ}\text{C}$  or less. Aging may exceed the specification for prolonged temperatures above  $+65^{\circ}\text{C}$ . Typically, aging is greatest the first year after manufacture, decreasing in subsequent years.

4. Turnover temperature,  $T_o$ , is the temperature of maximum (or turnover) frequency,  $f_o$ . The nominal frequency at any case temperature,  $T_c$ , may be calculated from:  $f = f_o [1 - \text{FTC} (T_o - T_c)^2]$ .

5. This equivalent RLC model approximates resonator performance near the resonant frequency and is provided for reference only. The capacitance  $C_o$  is the measured static (non-motional) capacitance between the two terminals. The measurement includes case parasitic capacitance.

6. Derived mathematically from one or more of the following directly measured parameters:  $f_c$ , IL, 3 dB bandwidth,  $f_c$  versus  $T_c$ , and  $C_o$ .

## 5. Environmental characteristics

	Test item	Condition of test	Requirements
5-1	Mechanical shock	(a) Drops: 3 times on concrete floor (b) Height: 30cm	The SAW resonator shall remain within the electrical specifications after tests.
5-2	Vibration resistance	(a) Frequency of vibration: 10~55Hz (b) Amplitude: 1.5mm (c) Directions: X,Y and Z (d) Duration: 2 hours	
5-3	Moisture resistance	(a) Condition: $+40^{\circ}\text{C}$ , 95% R.H. (b) Duration: 96 hours (c) Wait 2 hours before measurement	
5-4	High temperature storage	(a) Temperature: $+85^{\circ}\text{C}$ (b) Duration: 96 hours (c) Wait 2 hours before measurement	
5-5	Low temperature storage	(a) Temperature: $-40^{\circ}\text{C}$ (b) Duration: 96 hours (c) Wait 2 hours before measurement	
5-6	Thermal impact	(a) $+85^{\circ}\text{C}$ for 30 minutes $\Rightarrow$ $-40^{\circ}\text{C}$ for 30 minutes (b) Wait 2 hours before measurement	

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## 6. Remarks

### 6-1 Static voltage

Static voltage between signal load & ground may cause deterioration & destruction of the SAW resonator. Please avoid static voltage.

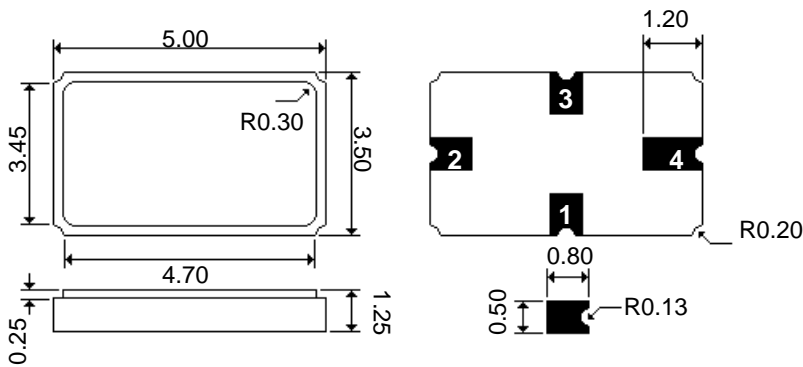
### 6-2 Ultrasonic cleaning

Ultrasonic vibration may cause deterioration & destruction of the SAW resonator. Please avoid ultrasonic cleaning.

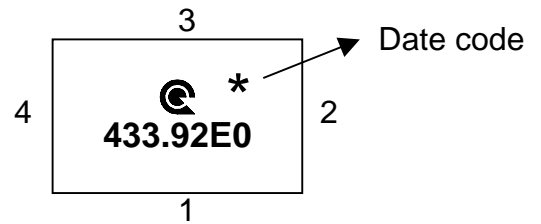
### 6-3 Soldering

Only terminals of the SAW resonator may be soldered. Please avoid soldering other parts of the SAW resonator.

## 7. Dimension of SR-53 package



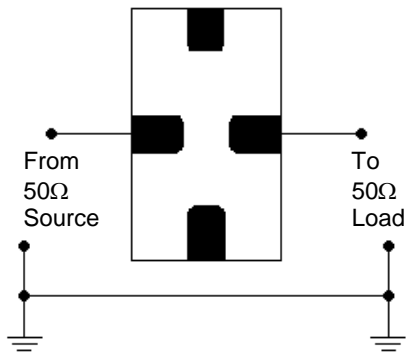
## 8. Marking



Pin	Function
1	Input
2	Ground (case)
3	Output
4	Ground (case)

Unit: mm

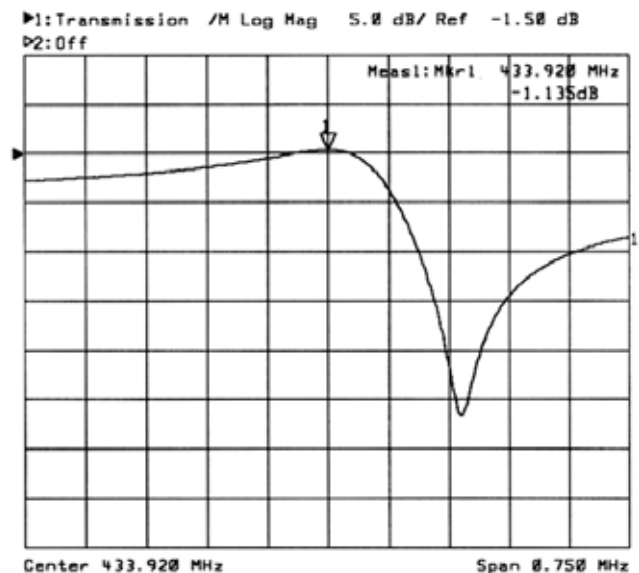
## 9. Equivalent LC model and test circuit



Date code table

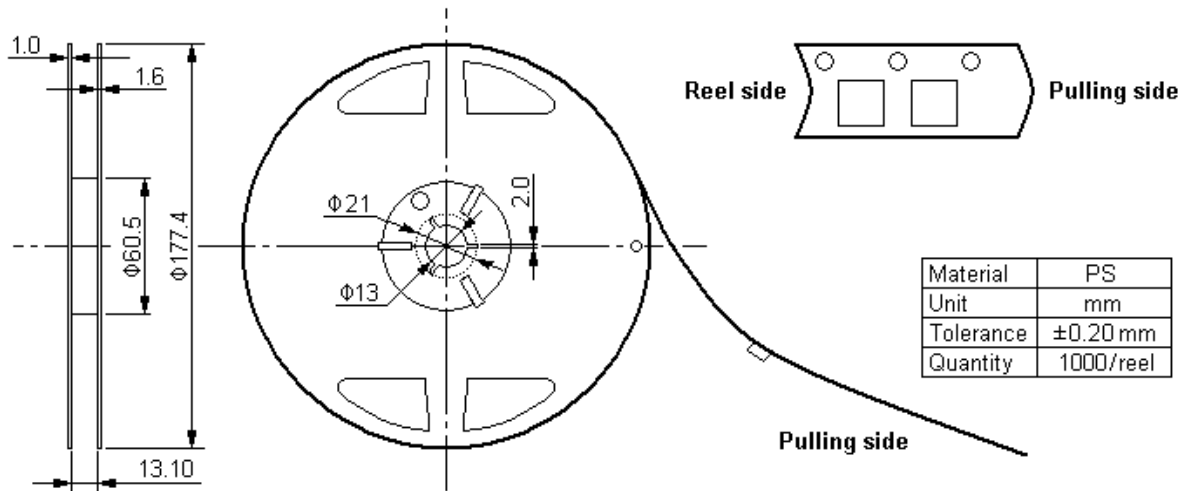
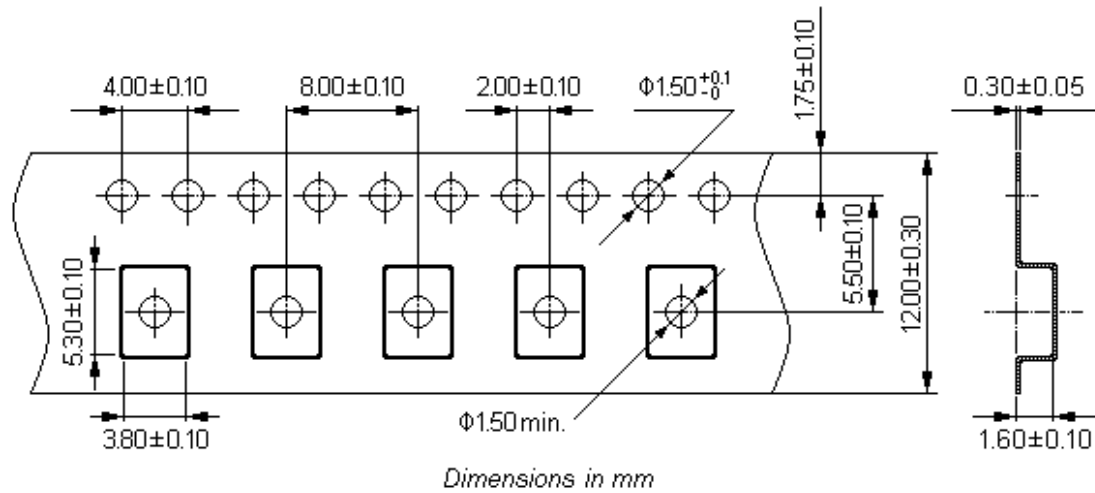
Year	2005	2006	2007	2008
Month				
January	A	N	a	n
February	B	P	b	p
March	C	Q	c	q
April	D	R	d	r
May	E	S	e	s
June	F	T	f	t
July	G	U	g	u
August	H	V	h	v
September	J	W	j	w
October	K	X	k	x
November	L	Y	l	y
December	M	Z	m	z

## 10. Typical frequency response

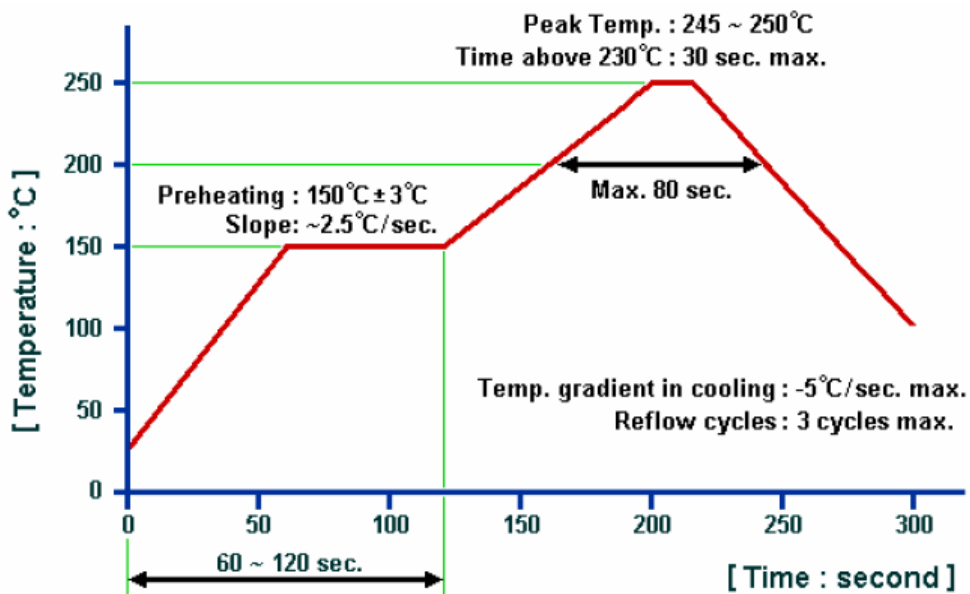


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## 11. Packing information



## 12. Recommended reflow soldering temperature



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