

SAW Resonator

TEMEXPRESS

FR FT05

SAW Resonator – Wireless Remote Control
Specification (Rev 1)

▣ Features	P01
▣ Package Drawing & Pin out	P01
▣ Technical Characteristics	P02
▣ Equivalent LC Model	P02
▣ Maximum Ratings	P03
▣ Test Circuit	P03
▣ Marking.....	P03
▣ Packaging.....	P04 &P05
▣ Reliability	P06

FR FT05

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Dec 11th, 2012

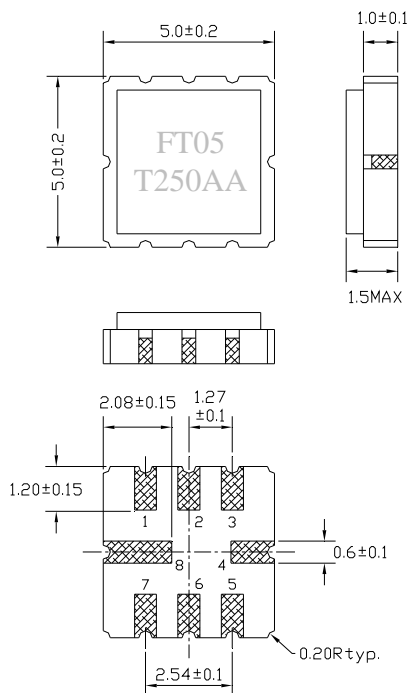
Features

- ❑ SAW Resonator
- ❑ 1-port resonator
- ❑ Provides reliable, fundamental mode, quartz frequency stabilization
- ❑ Tolerance $\pm 75\text{kHz}$
- ❑ Ceramic package for Surface Mounted Technology

Package Drawing & Pin out

The product is in conformance with the European RoHs Regulation 2002/95.

[Unit: mm]



Pin Configuration	
1	Ground
2	Input
3	Ground
4	Ground
5	Ground
6	Output
7	Ground
8	Ground

FR FT05

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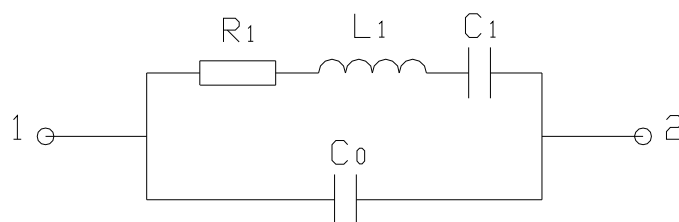
Technical Characteristics

Reference Temperature : $T_A = +25^\circ\text{C}$

Electrical Parameters	Unit	Minimum	Typical	Maximum
Center Frequency f_c	MHz	433.345	433.42	433.495
Tolerance from f_c	kHz	-	-	± 75
Insertion Loss	dB	-	1.3	2.5
Quality Factor				
Unloaded Q (Q_U)		-	11 000	-
50 Ω Loaded Q (Q_L)		-	2 000	-
Temperature Stability				
Temperature coefficient of frequency ⁽¹⁾ (TC_f)	ppm/K ²	-	0.032	-
Turnover temperature (T_0)	$^\circ\text{C}$	-	39	-
Frequency Aging	ppm/year	-	$< \pm 10$	-
DC Insulation Resistance between any two pins	M Ω	1.0	-	-
RF Equivalent RLC Model				
Motional Resistance (R_1)	Ω	-	18	26
Motional Inductance (L_1)	μH	-	86	-
Motional Capacitance (C_1)	fF	-	1.56	-
Shunt Static Capacitance (C_0)	pF	1.7	2.0	2.3

(1) Temperature dependence of f_c : $f_c(T_A) = f_c(T_0)(1 + TC_f(T_A - T_0)^2)$

Equivalent LC Model



FR FT05

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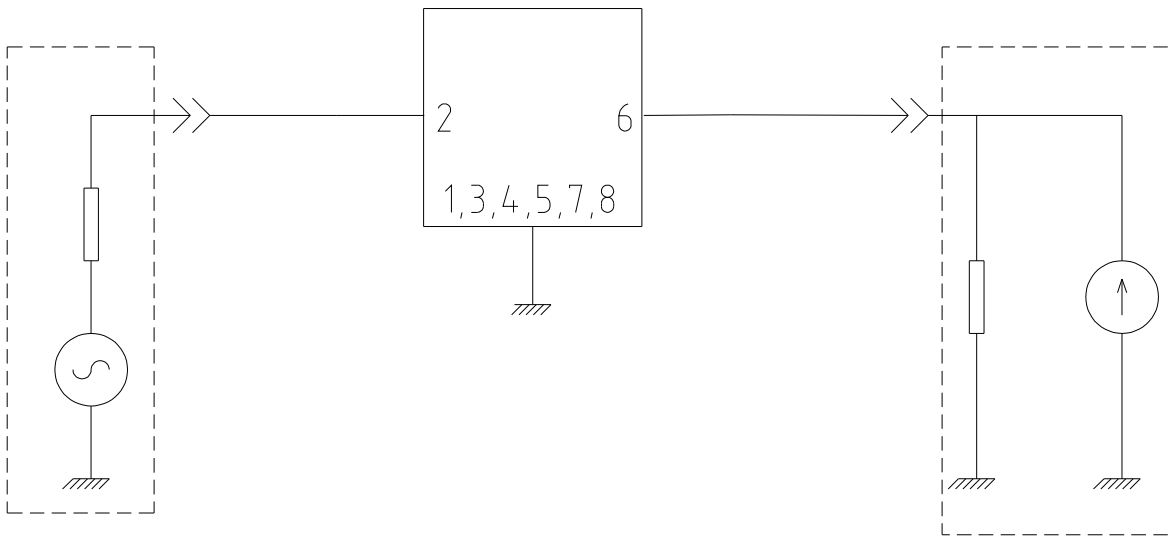
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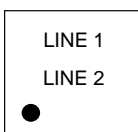
Maximum Ratings

Storage Temperature Range	°C	[-40°C ; +85°C]
Operating temperature	°C	[-40°C ; +85°C]
DC voltage between any two pins	V	10
CW RF Power Dissipation	dBm	0

Test Circuit



Marking



Line 1: "NNNN" is the reference to Temexpress Part number with only the last 4 digits

Line 2: TYWWZZ is the date code as:

T: Partner identifier.

Y: last digit of the year.

WW: number of week in the year

ZZ: Lot number in the week (from AA to ZZ).

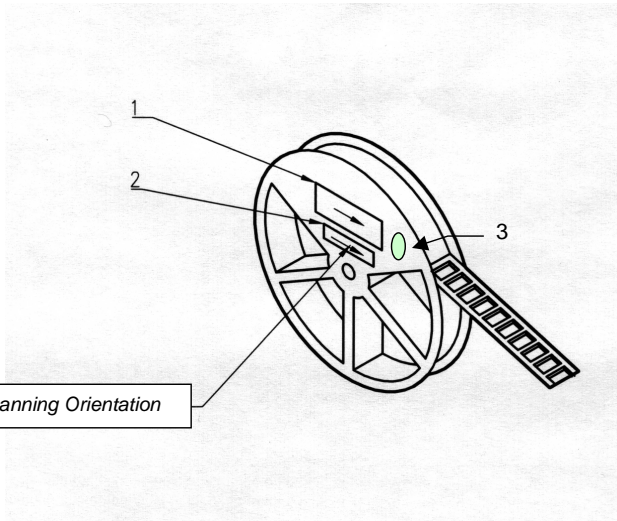
FR FT05

SAW Resonator – Wireless Remote Control

Specification (Rev 1)

Dec 11th, 2012

Packaging

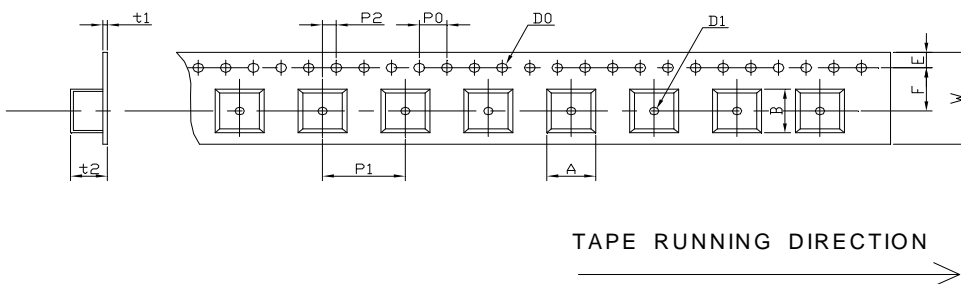


1Kpcs/reel

- 1 – TEMEXPRESS Label
- 2 – ESD Prevention Label
- 3 – Pb Free Label

Carrier Tape Dimension

[Unit: mm]



W	F	E	P0	P1	P2	D0	D1	t1	t2	A	B
12.0 ±0.3	5.5 ±0.1	1.75 ±0.1	4.0 ±0.2	8.0 ±0.1	2.0 ±0.2	Φ1.5 ±0.1	Φ1.5 ±0.25	0.31 max	1.95 max	5.5 max	5.5 max

FR FT05

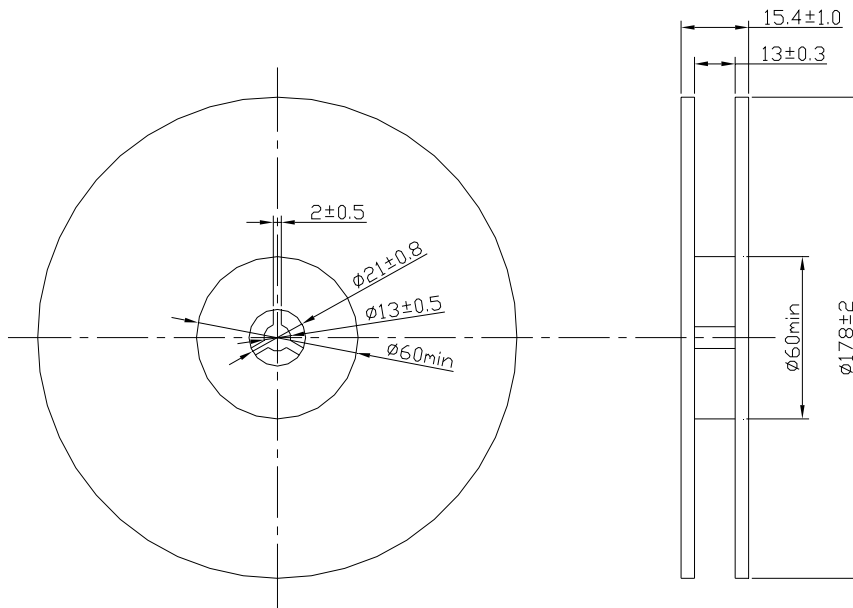
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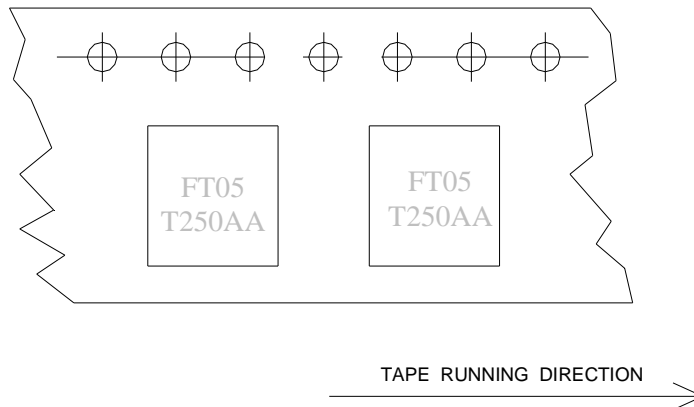
Dec 11th, 2012

Reel Dimensions

[Unit: mm]



Part Direction



FR FT05

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Dec 11th, 2012

Reliability

Resistance to soldering heat:

The components shall remain within the electrical specifications after it soldered on the 1mm-thickness PCB board and dipped in the solder at $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 10 ± 1 seconds.

The components shall remain within the electrical specifications after it soldered by electric iron, solder at $350^{\circ}\text{C} \pm 10^{\circ}\text{C}$ for 3~4 seconds, recovery time: $2\text{h} \pm 0.5\text{h}$.

Thermal Shock:

The components shall remain within the electrical specifications after being kept at the condition of heat cycle conditions: $T_A = -40^{\circ}\text{C} \pm 3^{\circ}\text{C}$, $T_B = 85^{\circ}\text{C} \pm 2^{\circ}\text{C}$, $t_1 = t_2 = 30\text{min}$, switch time $\leq 3\text{min}$ & cycle time: 100 times, recovery time: $2\text{h} \pm 0.5\text{h}$.

Temperature Storage:

High Temperature Storage: The components shall remain within the electrical specifications after being kept at the $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 500 hours, recovery time: $2\text{h} \pm 0.5\text{h}$.

Low Temperature Storage: The components shall remain within the electrical specifications after being kept at the $-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ for 500 hours, recovery time : $2\text{h} \pm 0.5\text{h}$.

Humidity test:

The components shall remain within the electrical specifications after being kept at the condition of ambient temperature $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$, and 90~95% RH for 500 hours.

Drop test:

The components shall remain within the electrical specifications after random free drops 10 times from height of 1.0 meter onto concrete floor, and the specimens shall meet the electrical specifications in table 5, external visual inspection.

Solderability test:

At the condition of temperature $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Depth: DIP 2/3, SMD 1/5, time: 3.0s-5.0s, 80% or more of the immersed surface shall be covered with solder and well-proportioned.

Vibration Fatigue:

The components shall remain within the electrical specifications after loaded vibration at 10~55Hz, amplitude 1.5mm, X, Y, Z, direction, for 2 hours.

Terminal Strength:

The force 10 ± 1 seconds of 19.6N is applied to each terminal, and 45° in the same direction 2 times with 2N bending force (Exception: SMD)

Mechanical Shock:

The components shall remain within the electrical specifications after 1000 shocks, acceleration 392 m/s^2 , duration 6ms.

Note: As a result of the particularity of inner structure of SAW products, it easy to be breakdown by electrostatic, so we should pay attention to ESD protect in the test.