



E45

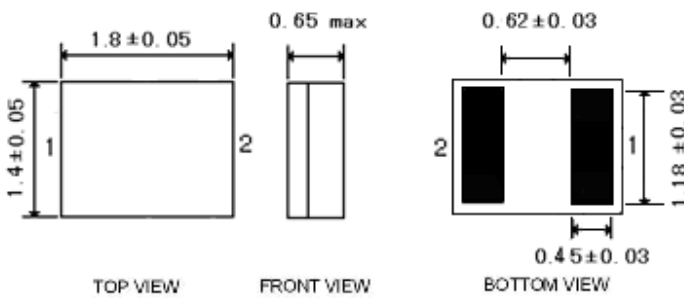
— SAW Resonator 433.92MHZ

E45 Features

- 1-port Resonator
- Provides reliable, fundamental mode, quartz frequency stabilization i.e. in transmitters or local oscillators
- Package size 1.8*1.4 mm
- Lead-free production and RoHS compliance

E45 Package Dimensions

Ceramic Package(Unit: mm):



Pin Configuration

1	Input
2	Output

E45 Marking



TOP VIEW

Top View, Laser Marking

“E45” Part number

1,2 Terminal1, Terminal2

The first “*”: Month Code (The code shown below varies in a 4-year cycle)



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E45 Maximum Ratings

Rating		Value	Unit
CW RF power dissipation	P	10	dBm
DC voltage between any terminals	V_{DC}	± 30	V
Operating temperature range	T_A	-40 ~ +85	°C
Storage temperature range	T_{stg}	-40 ~ +85	°C

E45 Electrical Characteristics

Characteristic		Sym	Minimum	Typical	Maximum	Unit
Center Frequency (+25°C)	Absolute Frequency	f_c	433.82		434.02	MHz
	Tolerance from 433.920 MHz	Δf_c			± 100	kHz
Insertion Loss		IL		1.6	2	dB
Quality Factor	Unloaded Q	Q_U		9510		
	50 Ω Loaded Q	Q_L		1600		
Temperature Stability	Turnover Temperature	T_o	5	20	35	°C
	Turnover Frequency	f_o		f_c		kHz
	Frequency Temperature Coefficient	FTC		-0.016		ppm/°C ²
Frequency Aging	Absolute Value during the First Year	$ f_A $		≤ 10		ppm/yr
DC Insulation Resistance Between Any Two Terminals			1.0			M Ω
RF Equivalent RLC Model	Motional Resistance	R_M		20.23	25	Ω
	Motional Inductance	L_M		70.591		nH
	Motional Capacitance	C_M		1.908		fF
	Shunt Static Capacitance	C_o	1.8	2	2.2	pF

RoHS Compliant

Electrostatic Sensitive Device

E45 NOTE:

1. Unless noted otherwise, case temperature $T_c = +25^\circ\text{C} \pm 2^\circ\text{C}$.
2. The center frequency, f_c , is measured at the minimum insertion loss point with the resonator in the 50 Ω test system.
3. Frequency aging is the change in f_c with time and is specified at +65°C or less. Aging may exceed the specification for prolonged temperatures above +65°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 static capacitance between the two terminals measured at low frequency (10MHz) with a capacitance meter. The measurement includes case parasitic capacitance.

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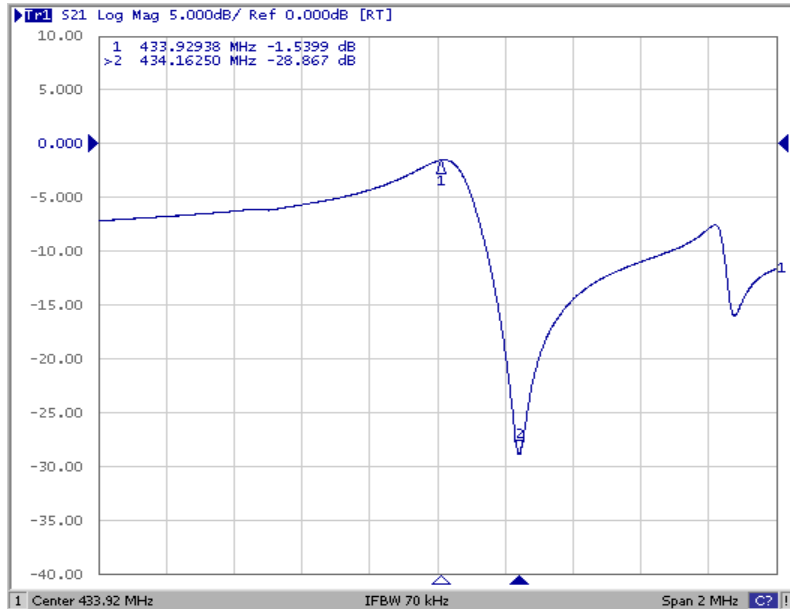
TEL: 86-755-88291843

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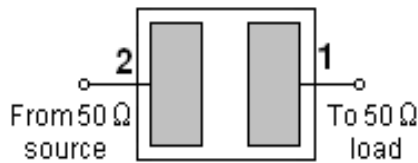
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E45 Typical Frequency Response

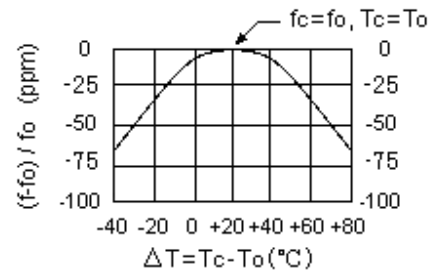
S21



E45 Test Circuit



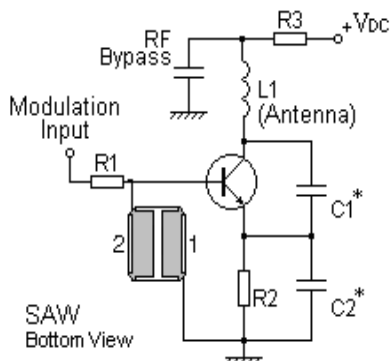
Temperature Characteristics



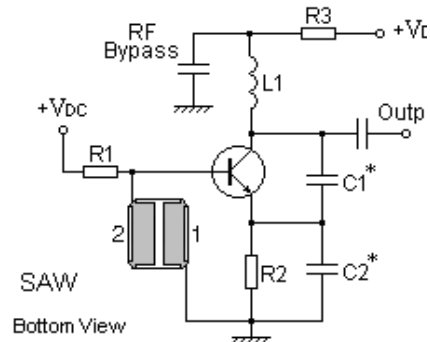
The curve shown above accounts for resonator contribution only.

E45 Typical Application Circuits

1) Low-Power Transmitter Application



2) Local Oscillator Application





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E45 Stability Characteristics

Item No.	Test Item	STD Reference	Test Conditions	per lot
	Preconditioning	JESD22-A113	1) Temperature Cycling, 5 cycles -40°C to 85°C 2) Bake, 24 hrs @125±5°C; 3) Reflow, 3 reflow cycles using profiles per IPC/JEDEC J-STD-020, SnPb or Pb-free profile based on device end use process 4) Drying, Room ambient temperature	177
1	Temperature Cycling	JESD22-A104	-40°C / +85°C, 40min dwell, <1 min transfer time, 500cycles	23
2	High Temperature Storage	JESD22-A103	85°C, 240hr	23
3	Low Temperature Storage	JESD22-A119	-40°C, 240hr	23
4	High Temp. High Humidity Storage	JESD22-A106B	85°C, 85%RH, 240hr	23
5	High Temperature Operating	JESD22-A102C	+121°C 100%RH 96hr	23
6	Human Body Mode ESD	JESD22-A114	Measure to get the ESD limits level or margin beyond specification	5
7	Drop Test	IEC 68-2-32	100 cm 3times Steel floor JIG(110g~150g)	6
8	Solder ability	JESD22-B102	Characterization per JESD22-B102	5
9	Vibration, Variable Frequency	JESD22-B103	20 Hz to 2 kHz (log variation) in > 4 minutes, 4X in each orientation, 50g peak acceleration	23
10	Mechanical Shock	JESD22-B104	Y1 plane only, 5 pulses, 0.5 ms duration, 1500 g peak acceleration	23

Requirements: The SAW filer shall remain within the electrical specifications after tests.

Remarks

- SAW devices should not be used in any type of fluid such as water, oil, organic solvent, etc.
- Be certain not to apply voltage exceeding the rated voltage of components.
- Do not operate outside the recommended operating temperature range of components.
- Sudden change of temperature shall be avoided, deterioration of the characteristics can occur.
- Be careful of soldering temperature and duration of components when soldering.
- Do not place soldering iron on the body of components.
- Be careful not to subject the terminals or leads of components to excessive force.
- SAW devices are electrostatic sensitive. Please avoid static voltage during operation and storage.
- Ultrasonic cleaning shall be avoided. Ultrasonic vibration may cause destruction of components.

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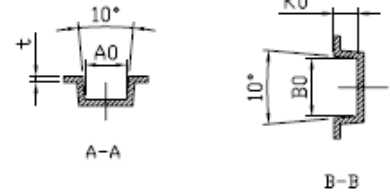
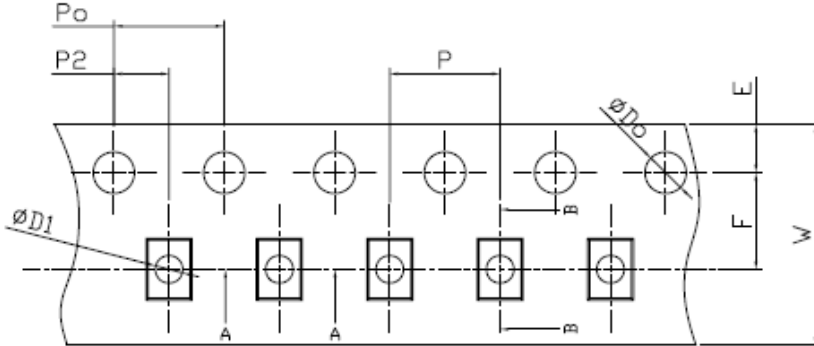


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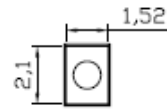
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E45 Packing Information

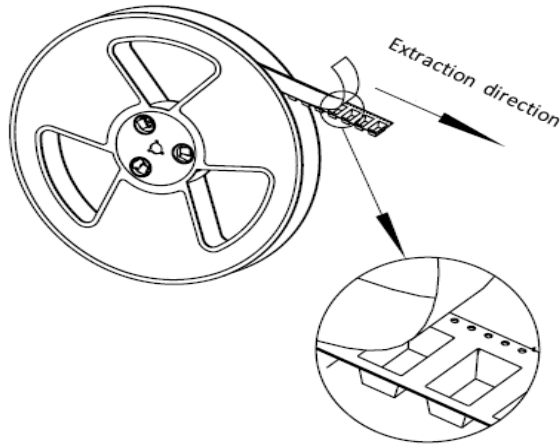
Carrier Tape



SYMBOL	E	F	P2	D0	D1	P0
SPEC	1.75±0.10	3.50±0.05	2.00±0.05	1.55±0.05	0.60±0.05	4.00±0.10
SYMBOL	W	P	A0	B0	K0	t
SPEC	8.00±0.10	4.00±0.10	1.60±0.05	2.10±0.10	0.80±0.05	0.30±0.10



Reel Dimensions



Material	PS
Unit	mm
Tolerance	±0.20 mm
Quantity	3000/reel

Outer Packing

Type	Quantity	Dimension	Description	Weight
Carton Box I	15000	190×190×95	anti-static plastic bag & carton box 1 reel / bag	0.85
Carton Box II	30000	190×190×190	5 bags / box (15000 pcs) 10 bags / box (30000 pcs)	1.80

Unit: mm

Unit: kg

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E45 Recommended Soldering Profile

