



2 Lead Plastic Package



ZTB Series

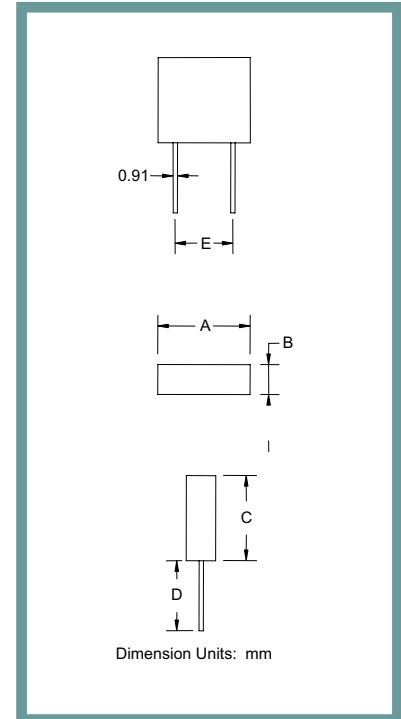
**Product Features:**

Low Cost  
Compatible with Leadfree Processing

**Applications:**

Storage Media  
Home Appliance  
Microprocessors  
Office Automation

<b>Frequency</b>	190 kHz to 1600 kHz
<b>ESR (Equivalent Series Resistance)</b>	See Table Below
<b>Frequency Tolerance @ 25° C</b>	±0.3%
<b>Frequency Stability over Temperature</b>	±0.3%
<b>Aging</b>	±0.3% Max. for 10 Years
<b>Temperature</b>	
<b>Operating</b>	-40° C to +85° C
<b>Storage</b>	-40° C to +85° C Standard



Part Code	Frequency (KHz)	Tolerance	ESR (Ω Max.)	C1 (pF)	C2 (pF)	"A" * (mm)	"B" * (mm)	"C" * (mm)	"D" * (mm)	"E" * (mm)
ZTB-A	190 to 249	±1 kHz	20	330*	470*	13.5	3.8	14.7	8.0	10.0
ZTB-B	250 to 374	±1 kHz	20	220*	470*	11.0	3.8	9.3	7.0	7.7
ZTB-C	375 to 429	±2 kHz	20	120*	470*	7.9	3.6	9.3	7.0	5.0
ZTB-D	430 to 519	±2 kHz	20	100*	100*	7.0	3.5	9.0	**	5.0
ZTB-E	520 to 699	±2 kHz	30	100*	100*	7.0	3.5	9.0	**	5.0
ZTB-F	700 to 999	±0.5%	30	100*	100*	5.2	2.8	6.8	3.5	2.5
ZTB-G	1000 to 1600	±0.5%	50	100*	100*	5.2	2.8	6.8	3.5	2.5

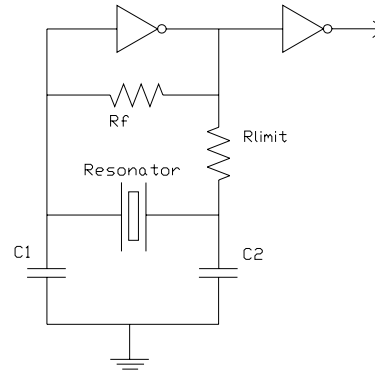
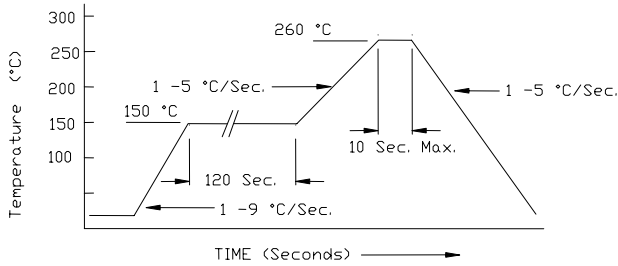
\* Recommended external C1 and C2 values. \*\* 4.0 mm or 6.0 mm, contact ILSI America.

The terminations of the ZTB series ceramic resonator are Pb free. Pb may be contained in the ceramic resonator element of this device and is exempted via item 7 of the RoHS annex. This ceramic resonator series is considered RoHS compliant.

Part Number Guide	Sample Part Number:	ZTB - G - 1000
Part Series	Part Code	Frequency
ZTB -	A B C D E F G	- 1000 kHz

**Pb Free Solder Reflow Profile:**

**Typical Circuit:**



\*Units are backward compatible with 240C reflow processes

**Package Information:**

MSL = 1  
Termination = e1 (Sn / Cu / Ag).

**Environmental Specifications**

Thermal Shock	MIL-STD-883, Method 1011, Condition A
Moisture Resistance	MIL-STD-883, Method 1004
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Mechanical Vibration	MIL-STD-883, Method 2007, Condition A
Resistance to Soldering Heat	J-STD-020C, Table 5-2 Pb-free devices (except 2 cycles max)
Hazardous Substance	Pb-Free / RoHS / Green Compliant
Solderability	JESD22-B102-D Method 2 (Preconditioning E)
Terminal Strength	MIL-STD-883, Method 2004, Test Condition D
Gross Leak	MIL-STD-883, Method 1014, Condition C
Fine Leak	MIL-STD-883, Method 1014, Condition A2, R1=2x10 <sup>-8</sup> atm cc/s
Solvent Resistance	MIL-STD-202, Method 215

**Marking**

Line 1: ILSI  
Line 2: Frequency