CHIP RESISTOR
EPIC

Resistors - Fast Firing Ignitor Down to 50 µs

Electro-Pyrotechnic Initiator Chip Resistor

KEY BENEFITS

- Firing energy down to 50 µJ
- Very fast firing time down to 50 µs
  - Compatible with various pyrotechnic compositions, even those requiring no primer
- No fire/all fire ratio up to 70 %
- Standard dimensions (0603 chip resistor)
- Easy set-up of firing levels
- Predictable, reproducible, and reliable behavior

APPLICATIONS

- Automotive safety systems
- Mining and demolition equipment
- Pilot seat ejection systems
- Explosive bolt disengagement of airborne missiles
- Projectile activators
- Fireworks

RESOURCES

- Datasheet: EPIC - http://www.vishay.com/doc?53041
- For technical questions contact sfer@vishay.com

Electro-Pyrotechnic Initiator Chip Resistor

Electro-pyrotechnic initiator resistors, also known as bridge resistors, are resistive elements, which convert electrical energy into heat energy in a precise electro-thermal profile for the purpose of initiating a series of pyrotechnic events in a controlled energetic reaction. In automotive applications this effect is used to deploy automotive airbags and other safety devices. These same devices are also used in military applications for pilot ejection systems, explosive bolt disengagement of airbone missiles, chaff dispensers, artillery projectile activators, anti-tank mines, etc. Commercially, they are used in mining and de-constructions applications.

FEATURES

Pb-free Available

RoHS* COMPLIANT

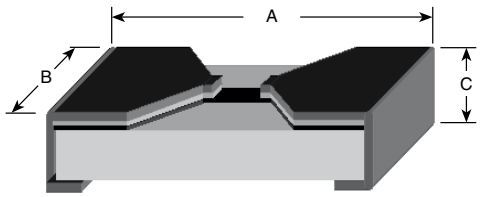
Vishay has developed a special thin film resistor chip specifically designed to provide pyrotechnic engineers with a lot of advantages

- Firing energy down to 50 µJ
- Firing time down to 50 µs
- Ohmic range: 2R to 10R
- Compatibility with various pyrotechnic composition even with no primer
- Joule effect ignition or flash ignition for very fast firing
- Easy set up by design of firing levels
- “No fire”/“all fire” ratio up to 70 %
- Very predictable, reproducible and reliable behaviour
- Size: 0603 preferred - other size available upon request
- Compliant to RoHS directive 2011/65/EU

PRINCIPLE OF OPERATION

The two main parameters of an EPIC are “no fire” and “all fire” conditions.
“No fire” represents the immunity of the resistor to the environmental electro-magnetic pollution and electric continuity test: Therefore customer will have to provide Vishay Sfernice with “no firing” conditions: Maximum current and longest duration when part should not ignite the explosive powder.
“All fire” represents the command pulse. Customer will have to provide Vishay Sfernice with “all firing” conditions: Minimum current, duration necessary to ignite the explosive powder.

DIMENSIONS in millimeters (inches)



CASE SIZE	DIMENSION		
	A	B	C
	MAX. TOL. + 0.152 (0.006) MIN. TOL. - 0.152 (0.006)	MAX. TOL. + 0.127 (0.005) MIN. TOL. - 0.127 (0.005)	MAX. TOL. + 0.127 (0.005) MIN. TOL. - 0.127 (0.005)
0603	1.52 (0.060)	0.75 (0.030)	0.5 (0.020)

MECHANICAL SPECIFICATIONS

- Substrate: Special alumina based substrate
- Resistive element: Fine line patterned Tantalum nitride thin film layer
- Diffusion and conductive thin film layers
- Terminations: Wraparound over nickel barrier

TECHNOLOGY

This technology contributes to the stability of the heating element, the precise electro-thermal response profile and the ability to design a precise activation energy.
All these features are perfectly controlled on high production volumes.

* Pb containing terminations are not RoHS compliant, exemptions may apply

Revision 10-Sep-10