

THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN



Semi-Conductor Bridge (SCB) Initiator

Northrop Grumman's patented semiconductor bridge (SCB) initiator is a state-of-the-art squib device that utilizes an SCB chip in place of standard bridgewire to reduce function time and firing energy without the use of primary explosives.

Our unique squib design employs a patented SCB initiator to provide advantages over traditional hot-wire devices. Operation of the SCB chip produces a plasma output that enhances safety by allowing the initiation of insensitive materials (rather than primary explosives) in the squib. It achieves highly repeatable and fast function times (as low as 50 microseconds). The SCB initiator (with a Lexan® jacket) has been qualified to MIL-STD-1512 and serves as part of the human-rated U.S. Air Force Universal Water-Activated Release System (UWARS). The SCB takes only 10 percent of the energy required by a conventional bridgewire for initiation (requiring 1 to 3 millijoules versus 30 to 35 millijoules for conventional bridgewire devices), but can meet 1-watt/1-amp for 5 minutes minimum no-fire requirements. The SCB interface configuration and all-fire and no-fire levels can be tailored for individual mission requirements. The device currently meets both Department of Defense (DoD) and Department of Energy (DoE) military requirements for electrostatic discharge.

Product Features and Benefits

- Contains no primary explosive material
- Includes same safety features as the MIL-STD-1316
- Qualified to MIL-STD-1512 (human-rated)
- Digital and optical addressable units available
- Customizable interface configuration
- All-fire and no-fire levels
- DoE approved for use in actuators of weapon systems

Application

The output of the squib and its mechanical interface can be tailored for specific applications. Our baseline initiator design serves as the core component for all of our new devices, including digitally and optically addressable units. Design modifications can be made as necessary to accommodate new requirements or to optimize high-volume production needs.

Specifications

Technical Data*

Case:	305 stainless steel
Hermetic seal:	<1 X 10 ⁻⁶ STD cc/sec helium
Weight:	0.588 grams (0.0013 lb)
Function time:	50 μsec typical at -10°F
Pressure output:	729 psi in a 10 cc bomb
Pressure shock:	15,000 psi
Calorific output:	136 calories
Bridgewire resistance:	1.0 ± 0.1 ohms
Min firing current:	3.5 amperes for 0.02 sec (max)
Max no-fire current:	1-watt/1-amp at ambient, 5 min
Demonstrated reliability:	0.9992 at 95% confidence
Pyrotechnic material:	Titanium subhydride potassium perchlorate
Monitor current:	100 ma; 1008 hours; -40 to 194°F; 42 cycles
Recommended firing method:	15 volts at the squib generated via 68-μF capacitor discharge

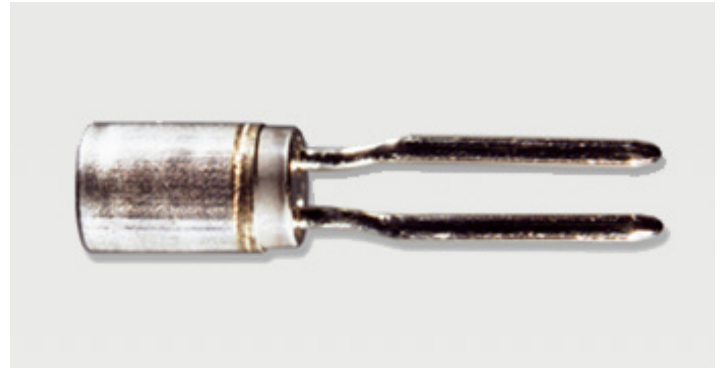
Test Data

Performance:	-420°F; >50,000 gs
Simulated aging:	10 years
Electrostatic discharge:	25 kv, 500 pF through a 5000-ohm resistor more than 100 pulses
MIL-1-23659:	Passed 28-day temperature shock, humidity and altitude environments

*Data is from our standard SCB chip

Electrical Characteristics

Model No.	Bridge Resistance, ohms	No-fire Current, amperes (MIL-DTL-23659)	All-fire Current, amperes
A	2.0	0.7	1.2
B	1.0	1.0	3.5
C	1.0	0.6	1.3



Pin configuration

For more information contact:

John Arrell
 Phone: 410-392-1223
 Mobile: 302-521-4210
 Email: john.arrell@ngc.com

northropgrumman.com

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