

## Features

- True hybrid technology vs. hybrid with MOV backup
- Self-resetting sneak current protection
- Long service life
- GR-974-CORE Issue 3 compliant - medium voltage limiting (600 volts maximum over life vs. 1000 volts maximum for gas tube alone)



This model is available but not recommended for new designs. The 2410, 2420 and 2430 Series are preferred.

## Model 303M Hybrid 5-Pin Protector Modules

The Bourns® Hybrid 5-Pin Protector Module design combines solid-state semiconductor technology and gas tube technology. The hybrid protector (gas tube with coordinated MOV) provides the fastest response to damaging overvoltage transients as well as high energy handling capability.

The hybrid design technology provides optimum overvoltage protection for both primary and secondary protection applications. Since the hybrid is designed as a 5-pin configuration, it can easily be interchanged with all other standard 5-pin protectors. The hybrid design also includes a fail-safe mechanism that operates under sustained or high-current power cross conditions to permanently short the line to ground.

The hybrid design provides protection for data transmission over copper pairs. The solid-state semiconductor technology combined with the gas tube technology will allow the hybrid protector to respond quickly to protect sensitive equipment. The hybrid is ideal for providing protection for broadband voice and data circuits (ADSL, ADSL 2+, VDSL2) due to its solid-state speeds and low capacitance.

The Bourns® Hybrid 5-Pin Protector Module is also available with an option for a positive temperature coefficient (PTC) device to provide resettable sneak current protection. This feature protects digital equipment line cards against overheating caused by prolonged currents (commonly called sneak currents). Sneak currents are often caused by direct contact with low-voltage power lines; they may result from induction on telephone lines caused by fault currents, overloads or unbalanced loads on nearby power lines. The Bourns® Hybrid 5-Pin PPTC Resistor Module is unique in design because it has minimal signal loss in the ADSL, ADSL 2+, VDSL, CAT 3 and higher frequency ranges.

## Specifications

### Insertion Loss

Hybrid – no sneak current.....	0-26 MHz.....	< 0.1 dB
Hybrid – no sneak current.....	0-42 MHz.....	< 0.3 dB
Hybrid with sneak current .....	0-50 MHz.....	< 0.4 dB
Hybrid with sneak current .....	0-90 MHz.....	< 0.9 dB

Resistance (sneak current)..... 4.5 Ohms Max.

Hybrid with sneak current imbalance..... < 0.5 Ohms

### Response time (with sneak current)

+65 °C .....	Operates within 210 seconds.....	300 mA
+20 °C .....	Operates within 210 seconds.....	540 mA
-40 °C .....	Operates within 210 seconds.....	800 mA

### Hold Time (with sneak current)

Hold for > three hours .....	100 mA for -40, +20 and +65 °C
Hold for five seconds .....	260 mA for -40, +20 and +65 °C

DC Limiting Voltage..... -40 °C, +20 °C, +65 °C ..... 350 V at 2000 V/sec

### Leakage Current (Rated Voltage)

(Minimum Voltage Limit)..... -40 °C, +20 °C, +65 °C ..... 20 mA max. at 265 VDC, 100 V/μsec

Impulse Breakdown ( $V_{imp}$ )..... -40 °C, +20 °C, +65 °C ..... 500 V max. at 100 V/μsec  
600 V max at 1000 V/μsec

Insulation Resistance (IR)..... -40 °C, +20 °C, +65 °C ..... 1000 Mohms min. at 50 to 200 VDC

### DC Holdover (Impulse Reset)

@ 260 mA, ±52.5 VDC .....	-40 °C, +20 °C, +65 °C .....	20 ms max.
@ 200 mA, ±135 VDC .....	-40 °C, +20 °C, +65 °C .....	20 ms max.
@ 1.0 A, ±135 VDC (1.0 μF Network Capacitance).....		25 ms max.
@ 450 mA, ±135 VDC (0 μF Network Capacitance).....		90 ms max.

Impulse Life (-20 °C, +65 °C) Criteria:..... ±10 A, 10/1000 μsec ..... 1500 surges

IR>10<sup>9</sup> and at 50 VDC .....
 ±100 A, 10/1000 μsec ..... | 100 surges |

Limiting Voltage during Surge <600 V .....
 ±300 A, 10/1000 μsec ..... | 50 surges |

Impulse Reset/DC Holdover < 30 ms.....
 ±2000 A, 10/250 μsec ..... | 5 surges |

## Features (Continued)

- Exceeds GR-974 requirements for central office protection by meeting station protection requirements
- Compatible with temperature extremes in the outside plant environment
- cULus Listed

## Model 303M Hybrid 5-Pin Protector Modules

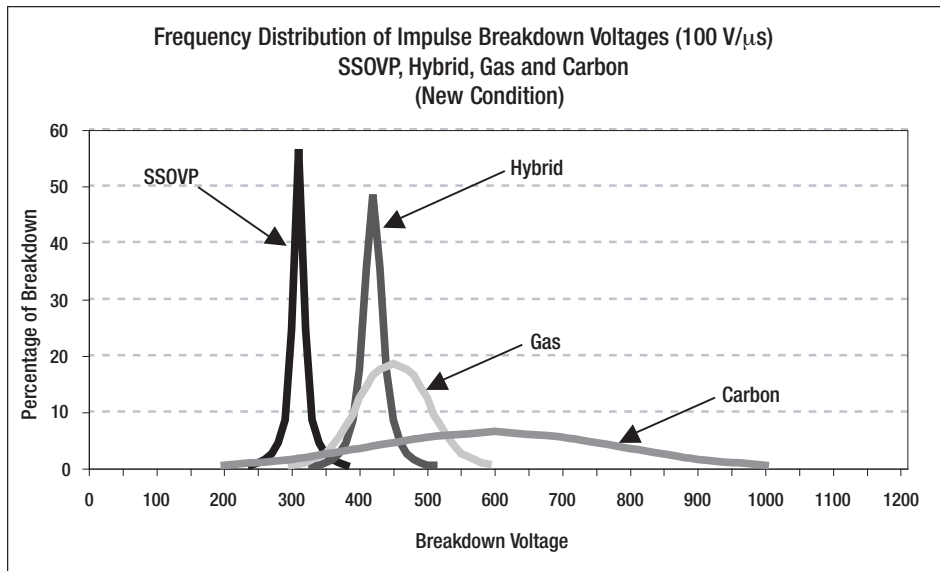
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### Specifications (Continued)

#### End-of-Life Criteria

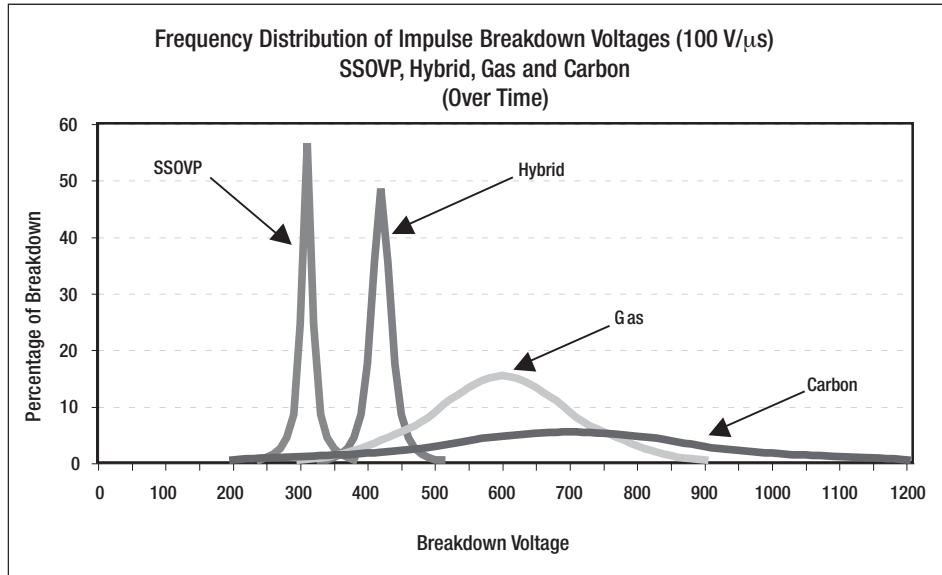
100 V/ $\mu$ s Breakdown < 1000 V .....	$\pm 10$ A, 10/1000 $\mu$ sec .....	3000 surges
	$\pm 100$ A, 10/1000 $\mu$ sec .....	300 surges
	$\pm 300$ A, 10/1000 $\mu$ sec .....	100 surges
	$\pm 500$ A, 10/1000 $\mu$ sec .....	500 surges
	$\pm 2000$ A, 10/250 $\mu$ sec .....	100 surges
	$\pm 5000$ A, 20/100 $\mu$ sec .....	10 surges
	$\pm 20000$ A, 8/20 $\mu$ sec .....	1 surge
AC Life, 60 Hz .....	120 A, 0.1 sec .....	1 surge
	10 A <sub>rms</sub> , 1 sec .....	5 surges
	1 A <sub>rms</sub> , 1 sec .....	60 surges
	0.5 A, 30 sec .....	1 surge
Safety .....	60 A, 3 sec .....	Fail-safe
	120 A, 0.6 sec .....	Does not cause a fire hazard
	350 A, 0.04 sec .....	Does not cause a fire hazard
	30 A, 15 min .....	Fail-safe, does not cause a fire hazard
Capacitance .....		35 pF max.
Storage and Operating Temperature .....	-40 °C to + 65 °C	
Safety Standards Listing .....		cULus

**Notes:** All values at 20 °C except where noted.  
Nominal voltages provided, except where noted.



# Model 303M Hybrid 5-Pin Protector Modules

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## How to Order

Part Number	Description
303M-07G1G0	5-Pin Hybrid, 350 V, gold pins, black case
303M-07G3G0	5-Pin Hybrid, 350 V, gold pins, red case
303M-07H1G0	5-Pin Hybrid, 350 V, gold pins, black case, front test
303M-07H3G0	5-Pin Hybrid, 350 V, gold pins, red case, front test
303M-07G1T0	5-Pin Hybrid, 350 V, tin pins, black case
303M-07G3T0	5-Pin Hybrid, 350 V, tin pins, red case
303M-07H1T0	5-Pin Hybrid, 350 V, tin pins, black case, front test
303M-07H3T0	5-Pin Hybrid, 350 V, tin pins, red case, front test
303M-09G1G0	5-Pin Hybrid, 350 V, gold pins, black case
303M-09G3G0	5-Pin Hybrid, 350 V, gold pins, red case
303M-09H1G0	5-Pin Hybrid, 350 V, gold pins, black case, front test
303M-09H3G0	5-Pin Hybrid, 350 V, gold pins, red case, front test
303M-09G1T0	5-Pin Hybrid, 350 V, tin pins, black case
303M-09G3T0	5-Pin Hybrid, 350 V, tin pins, red case
303M-09G1GP	5-Pin Hybrid, 350 V, gold pins, black case, with PPTC
303M-09G3GP	5-Pin Hybrid, 350 V, gold pins, red case, with PPTC
303M-09H1GP	5-Pin Hybrid, 350 V, gold pins, black case, front test, with PPTC
303M-09H3GP	5-Pin Hybrid, 350 V, gold pins, red case, front test, with PPTC
303M-09G1TP	5-Pin Hybrid, 350 V, tin pins, black case, with PPTC
303M-09G3TP	5-Pin Hybrid, 350 V, tin pins, red case, with PPTC

For additional information or ordering assistance, please contact Bourns Inside Sales at [trimcus@bourns.com](mailto:trimcus@bourns.com).

# Model 303M Hybrid 5-Pin Protector Modules

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## Product Dimensions

Part Number	Test Points	Type	Figure
303M-07G1G0	No test	3B1H	1
303M-07G3G0	No test	3B3H	1
303M-07H1G0	Test	3C1H	2
303M-07H3G0	Test	3C3H	2
303M-07G1T0	No test	3B1H	1
303M-07G3T0	No test	3B3H	1
303M-07H1T0	Test	3C1H	2
303M-07H3T0	Test	3C3H	2
303M-09G1G0	No test	3B1H	3
303M-09G3G0	No test	3B3H	3
303M-09H1G0	Test	3C1H	4
303M-09H3G0	Test	3C3H	4
303M-09G1T0	No test	3B1H	3
303M-09G3T0	No test	3B3H	3

Part Number	Test Points	Type	Figure
303M-09G1GP	No test	4B1H	3
303M-09G3GP	No test	4B3H	3
303M-09H1GP	Test	4C1H	4
303M-09H3GP	Test	4C3H	4
303M-09G1TP	No test	4B1H	3
303M-09G3TP	No test	4B3H	3

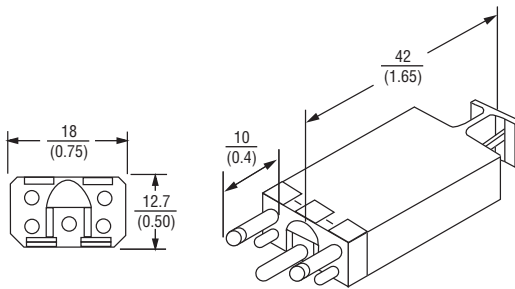


Figure 1

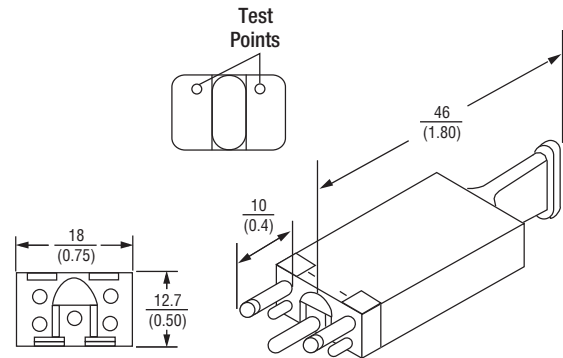
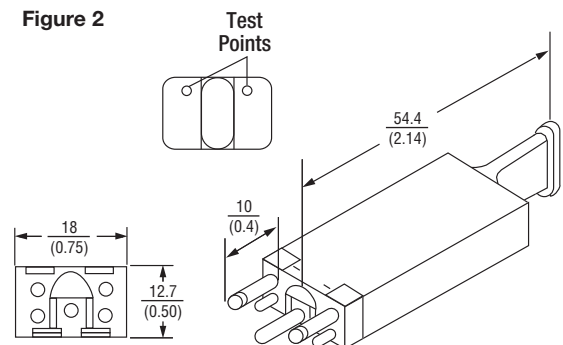
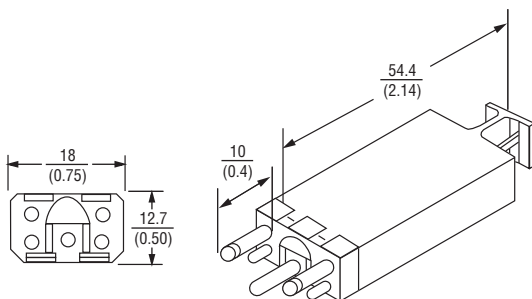


Figure 2



DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

REV. C 01/13

Specifications are subject to change without notice. Customers should verify actual device performance in their specific applications.