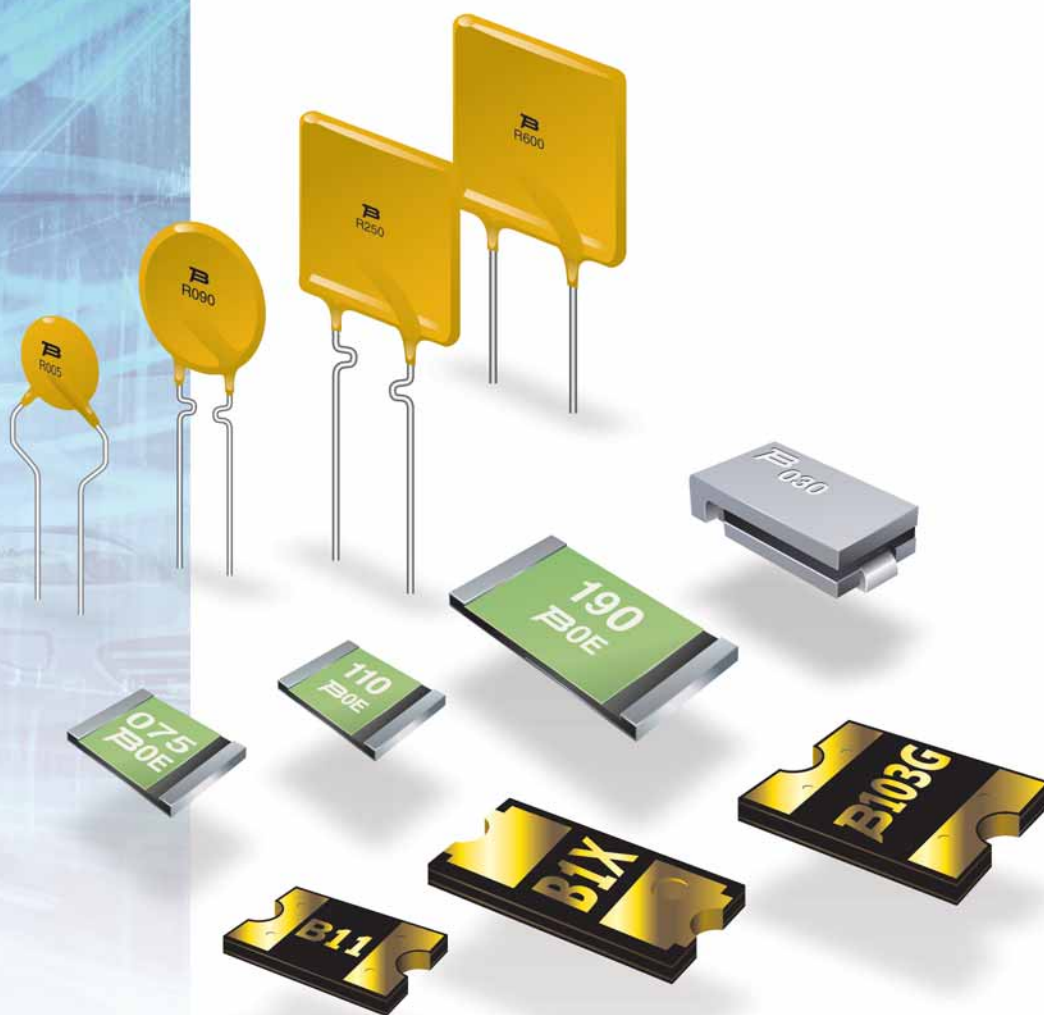


Bourns® Multifuse® Automotive Short Form

*Polymer PTC Thermistors for
Automotive Overcurrent Solutions*

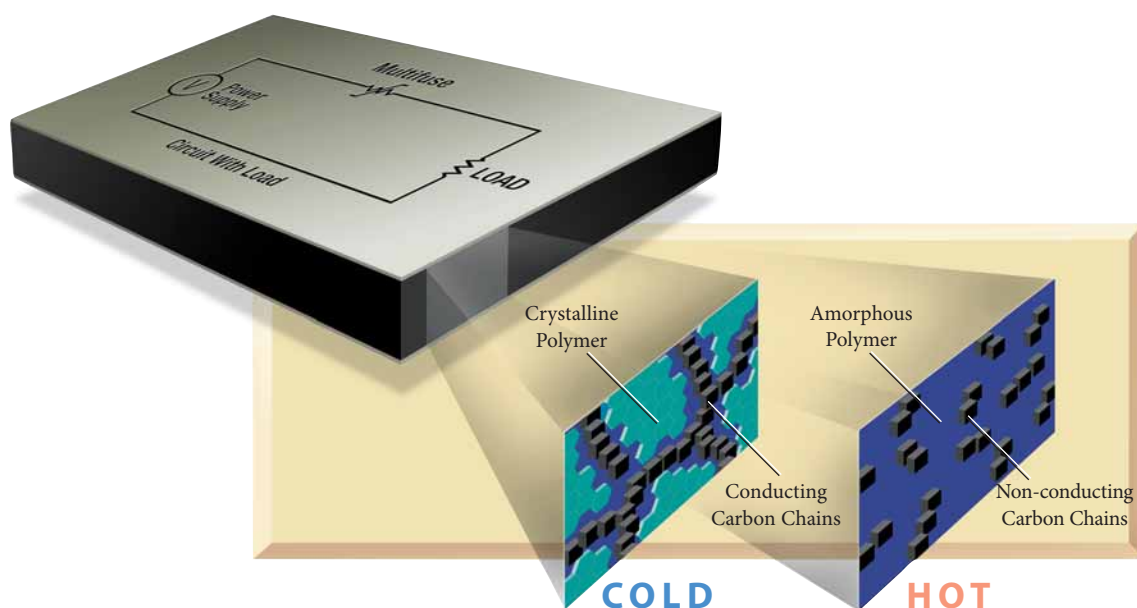


Bourns® Multifuse® – Resettable Fuse Protection

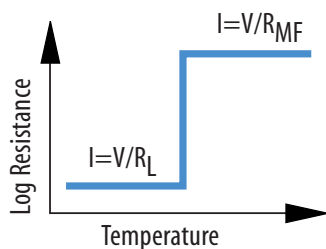
Multifuse® Products – What They Are

Bourns® Multifuse® family of Polymer Positive Temperature Coefficient (PPTC) Resettable Fuses are used in a wide variety of circuit protection applications. Under fault conditions the device resistance will rise exponentially and remain in a “tripped” state, providing continuous circuit protection until the fault is removed. Once the fault is removed, the power cycled the device will return to its normal low resistance state.

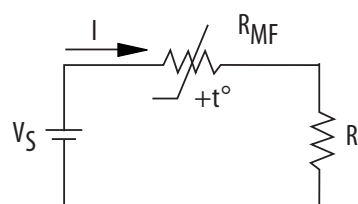
Multifuse® Products – How They Work



Multifuse® Products – How They Are Used



PTC Response Characteristic



Typical Circuit Application

Bourns® Automotive Multifuse® Products

Multifuse® Products – Automotive Applications

As the number of electronic safety, comfort control, and power management systems has increased, the need for integrated reliable circuit protection solutions has evolved into a critical design feature on all new automotive platforms. Bourns, Inc. has developed its line of Multifuse® Polymer PTC Resettable Fuses to help automotive manufacturers and designers meet this need. Typical examples of the electronic circuits where Bourns® Multifuse® products can be seen are:

- *Under the hood applications with new high temperature polymer PTC resettable fuses*
- *Steering column control modules*
- *Alarm modules*
- *Instrument panel/cluster protection*
- *Power Bus (e.g. AS System) - node protection*
- *Climate control units*
- *DC motor protection*
- *Window lift*

Multifuse® Products – Features for Automotive Applications

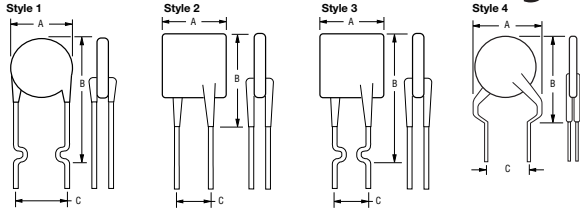
- **Resettable overcurrent protection** – offers greater reliability, longer part life and Multifuse® Polymer PTC Resettable Fuses can be located close to the load being protected instead of traditionally locating fuses in a fuse box.
- **ISO/TS 16949 Certified** – September 2005 sees the Bourns, Inc. production facility for the Multifuse® Polymer PTC Resettable Fuses certified to ISO/TS 16949. Together with ISO 9001:2000, ISO/TS 16949 specifies the quality system requirements for the design, development, production, installation and servicing of automotive related products.

- **AEC Certification** - Bourns® Multifuse® family of Polymer Positive Temperature Coefficient (PPTC) Resettable Fuses can be certified to AEC-Q200-Rev B. This specification defines the stress test requirements and reference test conditions for qualification of passive electrical devices in automotive applications as defined by a committee of automotive companies.
- **RoHS compliant** – All Bourns® Multifuse® Polymer Positive Temperature Coefficient (PPTC) Resettable Fuses are RoHS compliant as standard.

Multifuse® Products – What's new in this edition?

- **MF-RHT Series** – High temperature radial through-hole product series
- **MF-SMHT Series** – High temperature surface mount product series
- **MF-RG Series** – 16 V radial through-hole product series.

Radial Leaded Low Voltage Products



MF-RHT Series Radial Leaded High Temperature

Operating Temperature
-40°C ~ 125°C

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R_T) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
MF-RHT070	0.7	16	40	0.3	0.8	6.86 (0.27)	10.8 (0.425)	5.1 ± 0.7 (0.201 ± 0.028)	3
MF-RHT450	4.5	16	100	0.022	0.054	10.4 (0.41)	15.6 (0.61)	5.1 ± 0.7 (0.201 ± 0.028)	2
MF-RHT650	6.5	16	100	0.011	0.026	12.7 (0.5)	22.2 (0.88)	5.1 ± 0.7 (0.201 ± 0.028)	2
MF-RHT750	7.5	16	100	0.0094	0.022	14 (0.55)	23.5 (0.93)	5.1 ± 0.7 (0.201 ± 0.028)	2
MF-RHT1300	13	16	100	0.0041	0.01	23.5 (0.925)	28.7 (1.17)	10.2 ± 0.7 (0.402 ± 0.028)	2

MF-RG Series Radial Leaded 16 V

Operating Temperature
-40°C ~ 85°C

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R_T) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
MF- RG300	3.0	16	100	0.038	0.0975	7.1 (0.28)	11.0 (0.43)	5.1±0.7 (0.201±0.028)	2
MF- RG500	5.0	16	100	0.015	0.034	10.4 (0.41)	14.3 (0.56)	5.1±0.7 (0.201±0.028)	2

MF-RX/72 Series Radial Leaded 72V

Operating Temperature
-40°C ~ 85°C

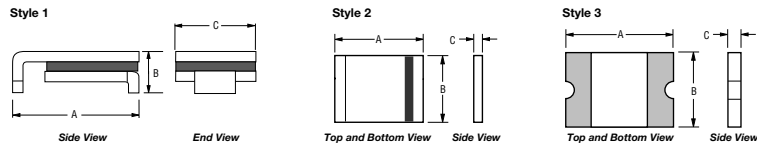
Model	<i>I</i> _{hold} Amperes at 23 °C	V _{max} . Volts	<i>I</i> _{max} . Amps	Initial Resistance	1 Hour (<i>R</i> _T) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
MF-RX110/72	1.1	72	40	0.15	0.38	10.84 (0.427)	16.8 (0.661)	5.1 ± 0.7 (0.201 ± 0.028)	2
MF-RX135/72	1.35	72	40	0.12	0.30	12.26 (0.483)	18.3 (0.720)	5.1 ± 0.7 (0.201 ± 0.028)	2
MF-RX160/72	1.60	72	40	0.09	0.22	13.94 (0.549)	19.9 (0.785)	5.1 ± 0.7 (0.201 ± 0.028)	2
MF-RX185/72	1.85	72	40	0.08	0.19	15.18 (0.598)	21.2 (0.834)	5.1 ± 0.7 (0.201 ± 0.028)	2
MF-RX250/72	2.50	72	40	0.05	0.13	17.84 (0.702)	23.8 (0.939)	10.2 ± 0.7 (0.402 ± 0.028)	2
MF-RX300/72	3.00	72	40	0.04	0.10	20.67 (0.814)	26.7 (1.050)	10.2 ± 0.7 (0.402 ± 0.028)	2
MF-RX375/72	3.75	72	40	0.03	0.08	23.51 (0.926)	29.6 (1.162)	10.2 ± 0.7 (0.402 ± 0.028)	2

MF-R Series Radial Leaded 16 ~ 60 Volts

Operating Temperature
-40°C ~ 85°C

Model	I _{hold} Amperes at 23 °C	V _{max} . Volts	I _{max} . Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
MF-R005	0.05	60	40	7.3	22.0	8.0 (0.315)	8.3 (0.327)	5.1 (0.201)	4
MF-R010	0.10	60	40	2.50	7.50	7.4 (0.291)	12.7 (0.500)	5.1 (0.201)	1
MF-R017	0.17	60	40	2.00	8.00	7.4 (0.291)	12.7 (0.500)	5.1 (0.201)	1
MF-R020	0.20	60	40	1.50	4.40	7.4 (0.291)	12.7 (0.500)	5.1 (0.201)	1
MF-R025	0.25	60	40	1.00	3.00	7.4 (0.291)	12.7 (0.500)	5.1 (0.201)	1
MF-R030	0.30	60	40	0.76	2.10	7.4 (0.291)	13.4 (0.528)	5.1 (0.201)	1
MF-R040	0.40	60	40	0.52	1.29	7.4 (0.291)	13.7 (0.539)	5.1 (0.201)	1
MF-R050	0.50	60	40	0.41	1.17	7.9 (0.311)	13.7 (0.539)	5.1 (0.201)	1
MF-R065	0.65	60	40	0.27	0.72	9.7 (0.382)	15.2 (0.598)	5.1 (0.201)	1
MF-R075	0.75	60	40	0.18	0.60	10.4 (0.409)	16.0 (0.630)	5.1 (0.201)	1
MF-R090	0.90	60	40	0.14	0.47	11.7 (0.461)	16.7 (0.657)	5.1 (0.201)	1
MF-R090-0-9	0.90	30	40	0.07	0.22	7.4 (0.291)	12.2 (0.480)	5.1 (0.201)	3
MF-R110	1.10	30	40	0.10	0.27	8.9 (0.350)	14.0 (0.551)	5.1 (0.201)	1
MF-R135	1.35	30	40	0.065	0.17	8.9 (0.350)	18.9 (0.744)	5.1 (0.201)	1
MF-R160	1.60	30	40	0.055	0.15	10.2 (0.402)	16.8 (0.661)	5.1 (0.201)	1
MF-R185	1.85	30	40	0.040	0.11	12.0 (0.472)	18.4 (0.724)	5.1 (0.201)	1
MF-R250	2.50	30	40	0.025	0.07	12.0 (0.472)	18.3 (0.720)	5.1 (0.201)	2
MF-R250-0-10	2.50	30	40	0.025	0.07	12.0 (0.472)	18.3 (0.720)	5.1 (0.201)	3
MF-R300	3.00	30	40	0.020	0.08	12.0 (0.472)	18.3 (0.720)	5.1 (0.201)	2
MF-R400	4.00	30	40	0.010	0.05	14.4 (0.567)	24.8 (0.976)	5.1 (0.201)	2
MF-R500	5.00	30	40	0.010	0.05	17.4 (0.685)	24.9 (0.980)	10.2 (0.402)	2
MF-R600	6.00	30	40	0.005	0.04	19.3 (0.760)	31.9 (1.256)	10.2 (0.402)	2
MF-R700	7.00	30	40	0.005	0.03	22.1 (0.870)	29.8 (1.173)	10.2 (0.402)	2
MF- R800	8.0	30	40	0.005	0.03	24.2 (0.953)	32.9 (1.295)	10.2 (0.402)	2
MF-R900	9.00	30	40	0.005	0.02	24.2 (0.953)	32.9 (1.295)	10.2 (0.402)	2
MF-R1100	11.00	16	100	0.003	0.014	24.2 (0.953)	32.9 (1.295)	10.2 (0.402)	2

Surface Mount Low Voltage Products



MF-SMHT Series (2920 & 3425 package) Operating Temperature Surface Mount High Temperature -40°C ~ 125°C

Model	Ihold Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R1) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-SMHT136	1.36	16	100	0.085	0.33	7.98 (0.314)	3 (0.118)	5.44 (0.214)	1
MF-SMHT160	1.60	16	100	0.050	0.15	9.5 (0.374)	3 (0.118)	6.71 (0.264)	1

MF-SM Series (2920 & 3425 package) Operating Temperature Surface Mount -40°C ~ 85°C

Model	Ihold Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R1) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-SM030	0.30	60	40	0.9	4.80	7.98 (0.314)	3.18 (0.125)	5.44 (0.214)	1
MF-SM050	0.50	60	40	0.35	1.40	7.98 (0.314)	3.18 (0.125)	5.44 (0.214)	1
MF-SM075	0.75	30	80	0.23	1.00	7.98 (0.314)	3.18 (0.125)	5.44 (0.214)	1
MF-SM075/60	0.75	60	10	0.23	1.00	7.98 (0.314)	3.18 (0.125)	5.44 (0.214)	1
MF-SM100	1.10	30	80	0.12	0.48	7.98 (0.314)	3 (0.118)	5.44 (0.214)	1
MF-SM100/33	1.10	33	40	0.12	0.41	7.98 (0.314)	3 (0.118)	5.44 (0.214)	1
MF-SM125	1.25	15	100	0.07	0.25	7.98 (0.314)	3 (0.118)	5.44 (0.214)	1
MF-SM150	1.50	15	100	0.06	0.25	9.5 (0.374)	3 (0.118)	6.71 (0.264)	1
MF-SM150/33	1.50	33	40	0.06	0.23	9.5 (0.374)	3 (0.118)	6.71 (0.264)	1
MF-SM200	2.00	15	100	0.045	0.125	9.5 (0.374)	3 (0.118)	6.71 (0.264)	1
MF-SM250	2.50	15	100	0.024	0.085	9.5 (0.374)	3 (0.118)	6.71 (0.264)	1

MF-SMDF Series (2018 package) Operating Temperature Surface Mount -40°C ~ 85°C

Model	Ihold Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R1) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-SMDF050	0.55	60	10	0.20	1.0	5.44 (0.214)	4.93 (0.194)	1.09 (0.043)	3
MF-SMDF150	1.50	15	40	0.7	0.17	5.44 (0.214)	4.93 (0.194)	0.85 (0.033)	3

MF-MSMF Series (1812 package) Operating Temperature Surface Mount -40°C ~ 85°C

Model	Ihold Amperes at 23 °C	Vmax. Volts	I max. Amps	Initial Resistance	1 Hour (R1) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-MSMF010	0.10	60	40	0.70	15.0	4.73 (0.186)	3.41 (0.134)	1.1 (0.043)	3
MF-MSMF014	0.14	60	40	0.40	6.50	4.73 (0.186)	3.41 (0.134)	1.1 (0.043)	3
MF-MSMF020	0.20	30	80	0.40	6.00	4.73 (0.186)	3.41 (0.134)	1.1 (0.043)	3
MF-MSMF030	0.30	30	10	0.30	3.00	4.73 (0.186)	3.41 (0.134)	1.1 (0.043)	3
MF-MSMF050	0.50	15	100	0.15	1.00	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	3
MF-MSMF075	0.75	13.2	100	0.11	0.45	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	3
MF-MSMF075/24	0.75	24	40	0.11	0.45	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	3
MF-MSMF110/16	1.10	16	100	0.04	0.21	4.73 (0.186)	3.41 (0.134)	0.75 (0.03)	3
MF-MSMF250/16	2.50	16	100	0.015	0.1	4.73 (0.186)	3.41 (0.134)	2.0 (0.078)	3

MF-NSMF Series (1206 package) Operating Temperature Surface Mount -40°C ~ 85°C

Model	Ihold Amperes at 23 °C	Vmax. Volts	I max. Amps	Initial Resistance	1 Hour (R1) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-NSMF012	0.12	30	10	1.35	8.5	3.4 (0.134)	1.8 (0.071)	1.1 (0.043)	3
MF-NSMF020	0.2	24	10	0.6	2.6	3.4 (0.134)	1.8 (0.071)	0.85 (0.033)	3
MF-NSMF050	0.5	13.2	100	0.15	0.70	3.4 (0.134)	1.8 (0.071)	0.85 (0.033)	3

MF-USMD Series (1210 package) Operating Temperature Surface Mount -40°C ~ 85°C

Model	Ihold Amperes at 23 °C	Vmax. Volts	I max. Amps	Initial Resistance	1 Hour (R1) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-USMD005	0.05	30.0	10	2.80	50.0	3.43 (0.135)	2.80 (0.110)	0.85 (0.033)	2
MF-USMD010	0.10	30.0	10	0.80	15.0	3.43 (0.135)	2.80 (0.110)	0.85 (0.033)	2
MF-USMD020	0.20	30.0	10	0.40	5.00	3.43 (0.135)	2.80 (0.110)	0.85 (0.033)	2
MF-USMD050	0.50	13.2	40	0.18	0.90	3.43 (0.135)	2.80 (0.110)	0.62 (0.024)	2



Worldwide Sales Offices

Country	Phone	Fax
Benelux:	+31 (0)70 300 4333	+31 (0)70 300 4345
Brazil:	+55 11 5505 0601	+55 11 5505 4370
China:	+86 21 64821250	+86 21 64821249
France:	+33 (0)2 5473 5151	+33 (0)2 5473 5156
Germany:	+49 (0)69 800 78212	+49 (0)69 800 78299
India:	+91 484 302483	+91 484 302 287
Ireland:	+353 (0)1276 691087	+353 (0)1276 691088
Italy:	+390 2 389 00041	+390 2 389 00042
Japan:	+81 49 269 3204	+81 49 269 3297
Malaysia (KL Office):	+60 3 71183138	+60 3 71183139
Malaysia (Penang Office):	+60 4 6581771	+60 4 6582771
Singapore:	+65 63461933	+65 63461911
Switzerland:	+41 (0)41 768 5555	+41 (0)41 768 5510
Taiwan:	+886 2 25624117	+886 2 25624116
UK:	+44 (0)1276 691087	+44 (0)1276 691088
USA:	+1-951-781-5500	+1-951-781-5006
Non-Listed European Countries:	+41 (0)41 768 5555	+41 (0)41 768 5510

Technical Assistance

Region	Phone	Fax
Asia-Pacific:	+886 2 25624117	+886 2 25624116
Europe:	+41 (0)41 768 5555	+41 (0)41 768 5510
North America:	+1-951-781-5500	+1-951-781-5700

www.bourns.com

Bourns® products are available through an extensive network of manufacturer's representatives, agents and distributors. To obtain technical applications assistance, a quotation, or to place an order, contact a Bourns representative in your area.

Specifications subject to change without notice. Actual performance in specific customer applications may differ due to the influence of other variables. Customers should verify actual device performance in these specific applications.



Circuit Protection Solutions