Features

- High energy handling density
- Hybrid (MOV and GDT) design
- Extended temperature range
- Ring-wave tolerant
- UL recognized
- TÜV certified
- RoHS compliant*

IsoMOV®

IsoMOV® Series - Hybrid Protection Component

General Information

Bourns introduces its hybrid technology that combines the breakthrough surge performance of EdgMOV™ protection devices with an integrated Gas Discharge Tube (GDT) isolation structure to create the innovative IsoMOV® Series Hybrid Protection Component. By combining the best features of both MOV and GDT technologies into a single component, the IsoMOV® Series achieves high performance as a long life protector with lower capacitance, very low leakage and superb energy handling density. The IsoMOV® Series is ideally suited for AC and DC power applications where premium performance and/or space savings are required.

Environmental Specifications

Storage Temperature Range (T_{STG}) .....-40 °C to +125 °C
Operating Temperature Range (T_{OPR})..... -40 °C to +125 °C
Climatic Category (IEC 60068-1).....40 / 125 / 21
Moisture Sensitivity Level.....1
ESD Classification (HBM).....N/A

How to Order

IsoM 8 - 320 - B - L2

Model Designator
IsoM = IsoMOV® Hybrid Protection Component

Component I_{nom} Rating
3 = 3 kA
5 = 5 kA
8 = 8 kA

RMS Voltage
See Electrical Characteristics Table

Packaging
B = Bulk (Standard)
R = Reel Pack*

Lead Style
L1 = Straight Leads
L2 = In-Line Leads (Standard)
L5 = Crimped Leads

*Reel Pack option not available for IsoM8 models.

BOURNS®

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Additional Information

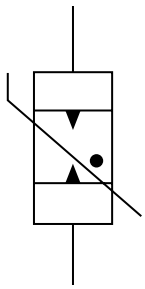
Click these links for more information:

PRODUCT SELECTOR | TECHNICAL LIBRARY | INVENTORY | SAMPLES | CONTACT

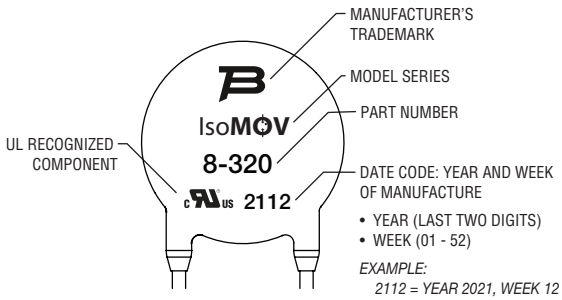
Agency Recognition

Agency	Standard	File Number
	1449 - 4th Ed. Type 4 CA Canadian Type 5 SPD CSA C22.2 No. 269.4-17	E313168
TÜVRheinland CERTIFIED	EN IEC 61051-1: 2018 IEC 61051-2-2: 1991 IEC 61051-2: 2021 IEC61051-1: 2018 EN IEC 61051-2: 2021	J50668307

Circuit Diagram



Typical Part Marking



- YEAR (LAST TWO DIGITS)
- WEEK (01 - 52)

EXAMPLE:
2112 = YEAR 2021, WEEK 12

T
0

CALIFORNIA WARNING: Can expose you to lead, a carcinogen and reproductive toxicant.
See www.P65Warnings.ca.gov

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

Applications

AC Line Protection
- White goods
- Fire alarm systems
- High value consumer goods
- LED lighting
- UL1449 SPD
- Industrial equipment

DC Line Protection
- Solar inverters
- Power supplies
- Distribution systems

IsoMOV®

IsoMOV® Series - Hybrid Protection Component

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Electrical Characteristics (1) (@ T_A = 25 °C Unless Otherwise Noted)

Bourns Part No.	Operating					Protection						
	Maximum Continuous Operating Voltage (MCOV)		LCAOV Test	Maximum Leakage @ MCOV (2)	Nominal Capacitance	I_{nom} (3) (4)		I_{max} (4)	Energy (5)	Ring Wave Surge IEEE 62.41	Maximum Clamping Voltage	
	V_{rms}	V_{dc}	V_{rms}	A_{dc}	20 kHz	15 Operations	10 Operations	1 Operation	1 Operation	200 A	V_C	I_C
	V	V	V	μA	pF	A		A	J	Operations	V	A
IsoM3-175	175	225	240	< 1	30	3,000		6,000	88	± 250	470	50
IsoM3-230	230	300	240	< 1	30	3,000		6,000	109	± 250	620	50
IsoM3-250	250	320	240	< 1	30	3,000		6,000	117	± 250	675	50
IsoM3-275	275	350	400	< 1	30	3,000		6,000	126	± 250	730	50
IsoM3-300	300	385	480	< 1	30	3,000		6,000	136	± 250	800	50
IsoM3-320	320	415	480	< 1	30	3,000		6,000	144	± 250	875	50
IsoM5-175	175	225	240	< 1	40	5,000		10,000	144	± 250	470	100
IsoM5-230	230	300	240	< 1	40	5,000		10,000	188	± 250	620	100
IsoM5-250	250	320	240	< 1	40	5,000		10,000	203	± 250	675	100
IsoM5-275	275	350	400	< 1	40	5,000		10,000	223	± 250	730	100
IsoM5-300	300	385	480	< 1	40	5,000		10,000	242	± 250	800	100
IsoM5-320	320	415	480	< 1	40	5,000		10,000	258	± 250	875	100
IsoM5-380	385	505	480	< 1	40	5,000		10,000	305	± 250	1000	100
IsoM5-420	420	560	600	< 1	40	5,000		10,000	336	± 250	1100	100
IsoM5-510	510	670	690	< 1	40	5,000		10,000	407	± 250	1300	100
IsoM5-555	555	745	690	< 1	40	5,000		10,000	442	± 250	1400	100
IsoM8-250	250	320	240	< 1	50		8,000	15,000	313	± 250	675	200
IsoM8-275	275	350	400	< 1	50		8,000	15,000	340	± 250	730	200
IsoM8-300	300	385	480	< 1	50		8,000	15,000	367	± 250	800	200
IsoM8-320	320	415	480	< 1	50		8,000	15,000	388	± 250	875	200
IsoM8-380	385	505	480	< 1	50		8,000	15,000	453	± 250	1000	200
IsoM8-420	420	560	600	< 1	50		8,000	15,000	497	± 250	1100	200
IsoM8-510	510	670	690	< 1	50		8,000	15,000	594	± 250	1300	200
IsoM8-555	555	745	690	< 1	50		8,000	15,000	643	± 250	1400	200

(1) At delivery AQL 0.65 Level II, DIN ISO 2859.

(2) Maximum leakage limits after life ratings may exceed 1 μA, but will continue to protect at MCOV.

(3) I_{nom} service life specified at 3-minute time intervals between surges with rated MCOV applied during the entire resting period and 15 minutes after the last surge.

(4) Surge profile 8/20 μs per IEC 61000-4-5.

(5) Measured at I_{max}, 8/20 μs using numerical integration method $E = \int P(t)dt$

IsoMOV® Series - Hybrid Protection Component

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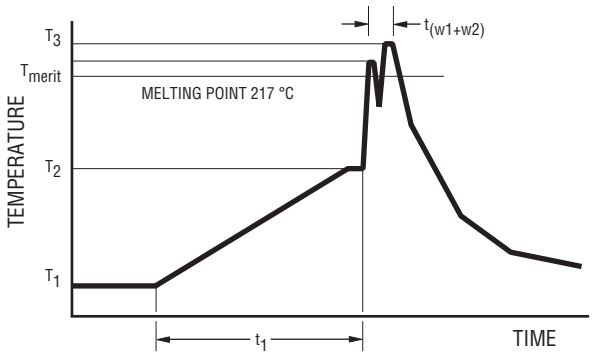
Assembly Recommendations for Through-Hole Components

Lead-free Wave Soldering Profile - Pb-free wave profile requirements for soldering heat resistance of components



Parameter	Symbol	Specification
Preheating temperature gradient		4 °C/sec. max.
Preheating time	t_1	2 to 5 min.
Min. preheating temperature	T_1	130 °C
Max. preheating temperature	T_2	180 °C
Melting temperature/point	T_{meltv}	217 °C
Time in wave soldering phase (w_1+w_2)	t_{w1+w2}	10 sec.
Max. wave temperature (w_1+w_2)	T_s	265 °C +0/-5 °C
Cooling temperature gradient		6° C/sec. max.
Temperature jump from T_2 to T_3 (w_1)	$T_{3(w1)}$ - T_2	120 °C max
Time from 25 °C to T_3 (wave temperature)		8 min. max.

IsoMOV® Series - Hybrid Protection Component

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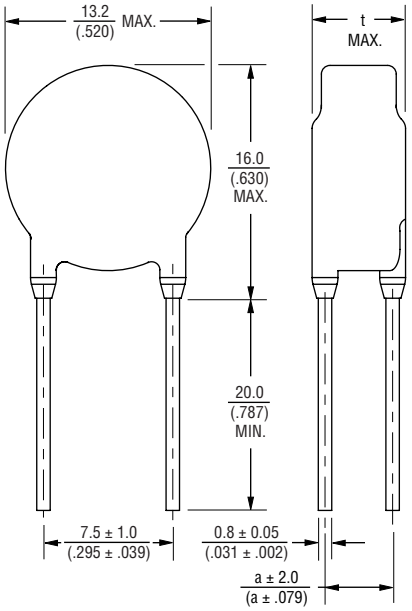
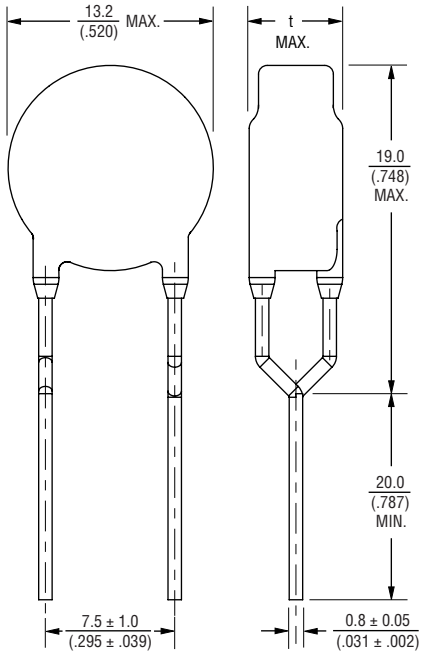
Product Dimensions

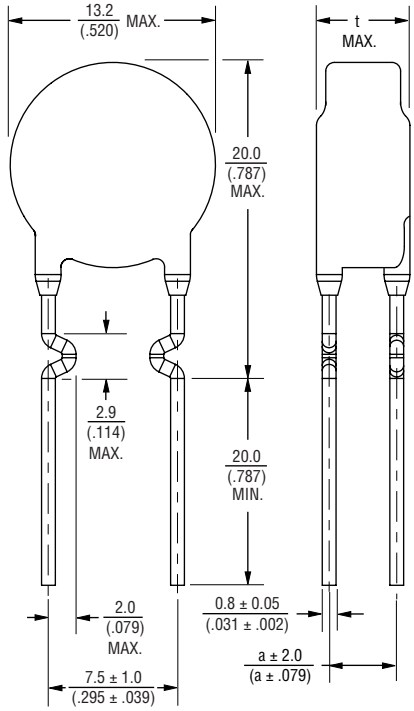
IsoM3-xxx-L1
Straight Leads



IsoM3-xxx-L2
In-Line Leads



IsoM3-xxx-L5
Crimped Leads



Model	IsoM3-xxx-L1		IsoM3-xxx-L2		IsoM3-xxx-L5	
	a	t	a	t	a	t
IsoM3-175	2.8 (.110)	6.1 (.240)	--	6.1 (.240)	2.8 (.110)	6.1 (.240)
IsoM3-230	3.3 (.129)	6.5 (.256)	--	6.5 (.256)	3.3 (.129)	6.5 (.256)
IsoM3-250	3.5 (.137)	6.7 (.264)	--	6.7 (.264)	3.5 (.137)	6.7 (.264)
IsoM3-275	3.6 (.141)	6.9 (.272)	--	6.9 (.272)	3.6 (.141)	6.9 (.272)
IsoM3-300	3.9 (.153)	7.1 (.280)	--	7.1 (.280)	3.9 (.153)	7.1 (.280)
IsoM3-320	4.0 (.157)	7.2 (.283)	--	7.2 (.283)	4.0 (.157)	7.2 (.283)

DIMENSIONS: MM (INCHES)

IsoMOV® Series - Hybrid Protection Component

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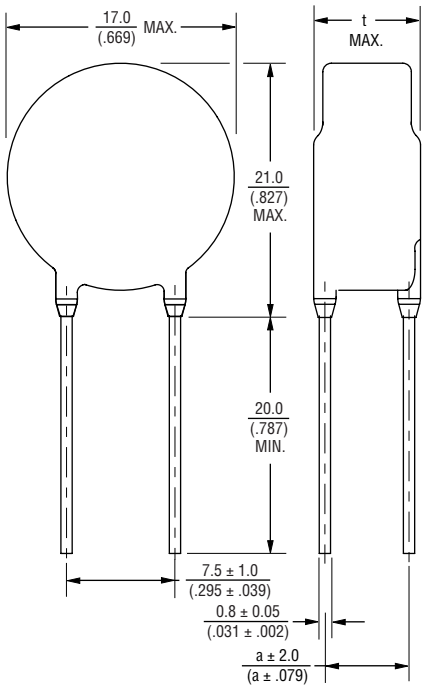
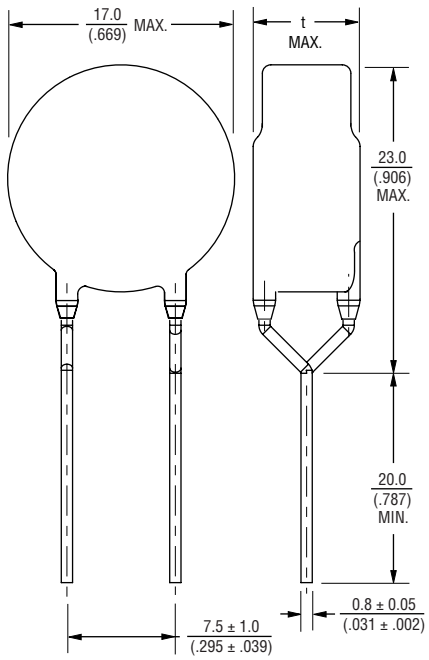
Product Dimensions (Continued)

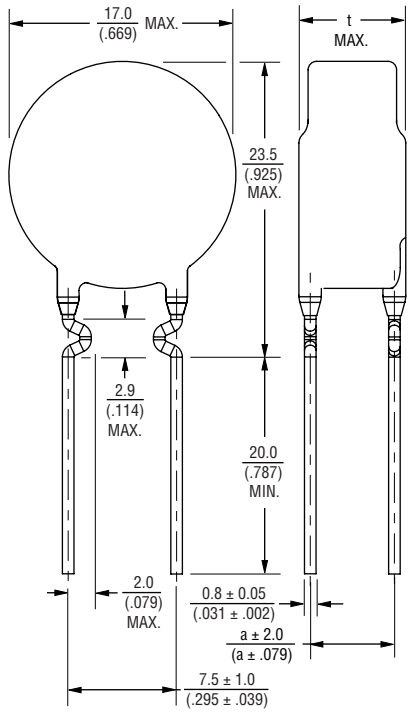
IsoM5-xxx-L1
Straight Leads



IsoM5-xxx-L2
In-Line Leads



IsoM5-xxx-L5
Crimped Leads

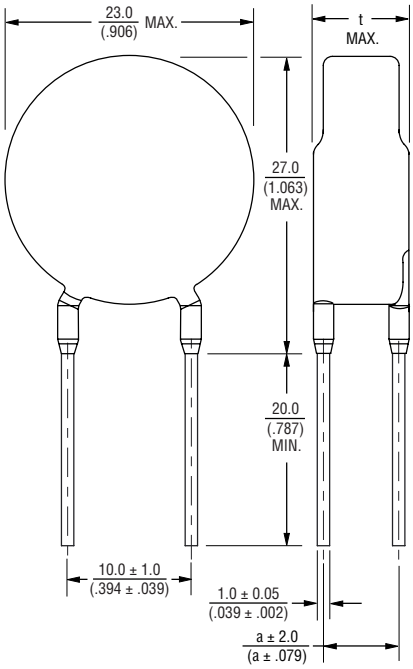


Model	IsoM5-xxx-L1		IsoM5-xxx-L2		IsoM5-xxx-L5	
	a	t	a	t	a	t
IsoM5-175	2.8 (.110)	6.0 (.236)	--	6.0 (.236)	2.8 (.110)	6.0 (.236)
IsoM5-230	3.3 (.130)	6.5 (.256)	--	6.5 (.256)	3.3 (.130)	6.5 (.256)
IsoM5-250	3.5 (.138)	6.7 (.264)	--	6.7 (.264)	3.5 (.138)	6.7 (.264)
IsoM5-275	3.6 (.142)	6.8 (.268)	--	6.8 (.268)	3.6 (.142)	6.8 (.268)
IsoM5-300	3.9 (.154)	7.1 (.280)	--	7.1 (.280)	3.9 (.154)	7.1 (.280)
IsoM5-320	3.9 (.154)	7.1 (.280)	--	7.1 (.280)	3.9 (.154)	7.1 (.280)
IsoM5-380	4.5 (.177)	7.7 (.303)	--	7.7 (.303)	4.5 (.177)	7.7 (.303)
IsoM5-420	4.9 (.193)	8.1 (.319)	--	8.1 (.319)	4.9 (.193)	8.1 (.319)
IsoM5-510	5.6 (.220)	8.8 (.346)	--	8.8 (.346)	5.6 (.220)	8.8 (.346)
IsoM5-555	5.8 (.228)	9.0 (.354)	--	9.0 (.354)	5.8 (.228)	9.0 (.354)

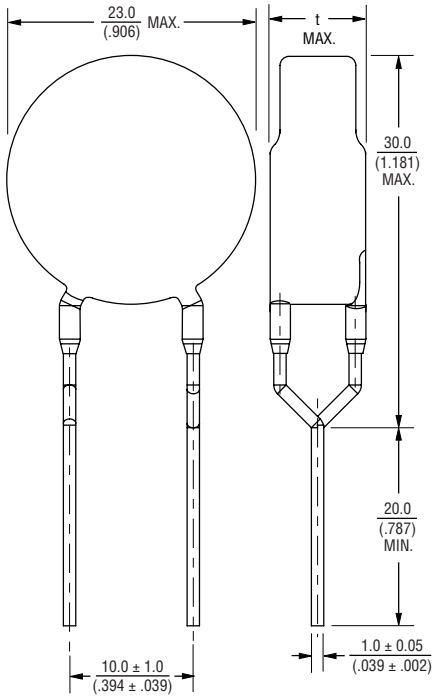
DIMENSIONS: MM (INCHES)

Product Dimensions (Continued)

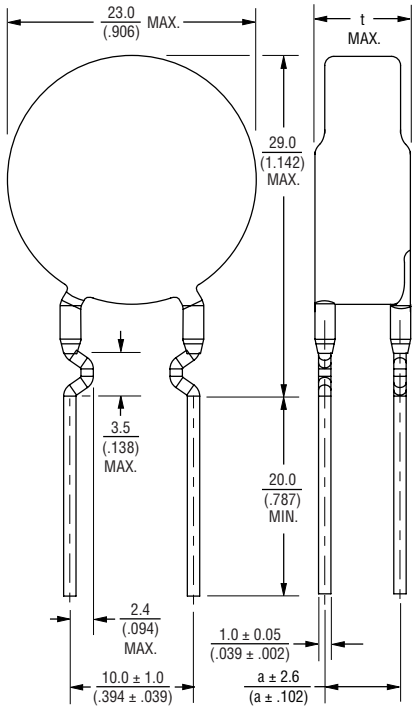
IsoM8-xxx-L1
Straight Leads



IsoM8-xxx-L2
In-Line Leads



IsoM8-xxx-L5
Crimped Leads

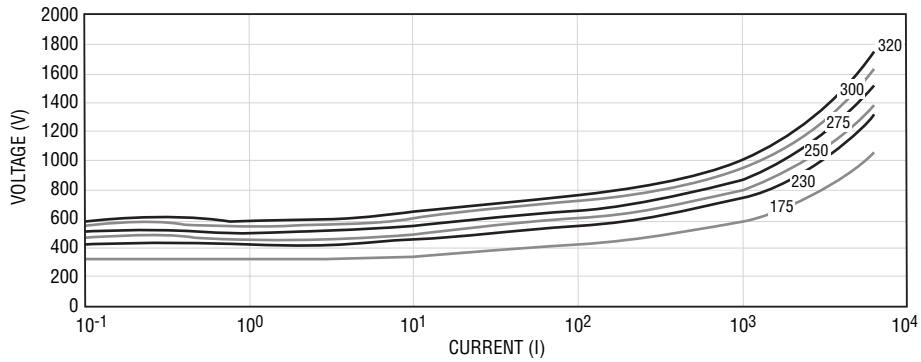


Model	IsoM8-xxx-L1		IsoM8-xxx-L2		IsoM8-xxx-L5	
	a	t	a	t	a	t
IsoM8-250	3.7 (.146)	7.1 (.280)	--	7.1 (.280)	3.7 (.146)	7.1 (.280)
IsoM8-275	3.8 (.150)	7.2 (.283)	--	7.2 (.283)	3.8 (.150)	7.2 (.283)
IsoM8-300	4.1 (.161)	7.5 (.295)	--	7.5 (.295)	4.1 (.161)	7.5 (.295)
IsoM8-320	4.2 (.165)	7.6 (.299)	--	7.6 (.299)	4.2 (.165)	7.6 (.299)
IsoM8-380	4.6 (.181)	8.0 (.315)	--	8.0 (.315)	4.6 (.181)	8.0 (.315)
IsoM8-420	5.0 (.197)	8.4 (.331)	--	8.4 (.331)	5.0 (.197)	8.4 (.331)
IsoM8-510	5.8 (.228)	9.2 (.362)	--	9.2 (.362)	5.8 (.228)	9.2 (.362)
IsoM8-555	6.0 (.236)	9.4 (.370)	--	9.4 (.370)	6.0 (.236)	9.4 (.370)

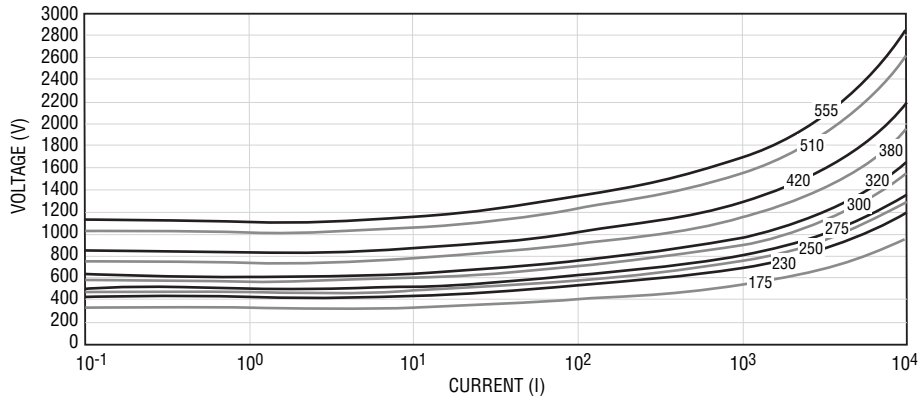
DIMENSIONS: MM (INCHES)

V-I Curves

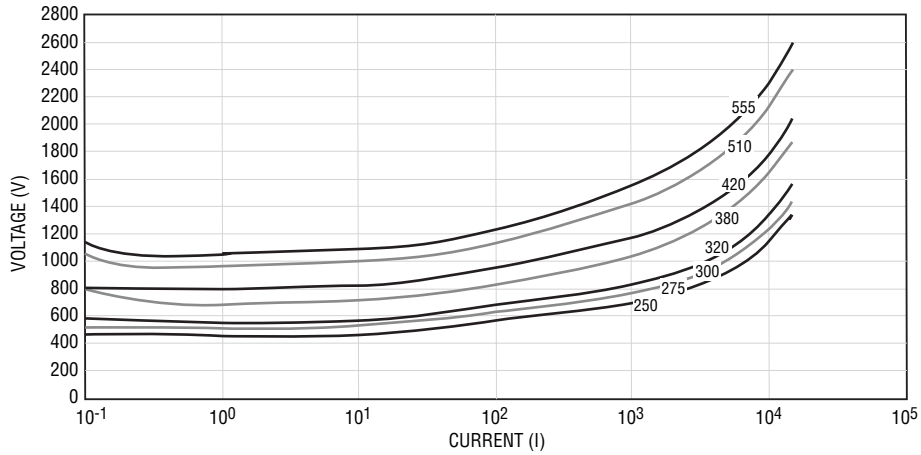
IsoM3



IsoM5



IsoM8



IsoMOV® Series - Hybrid Protection Component

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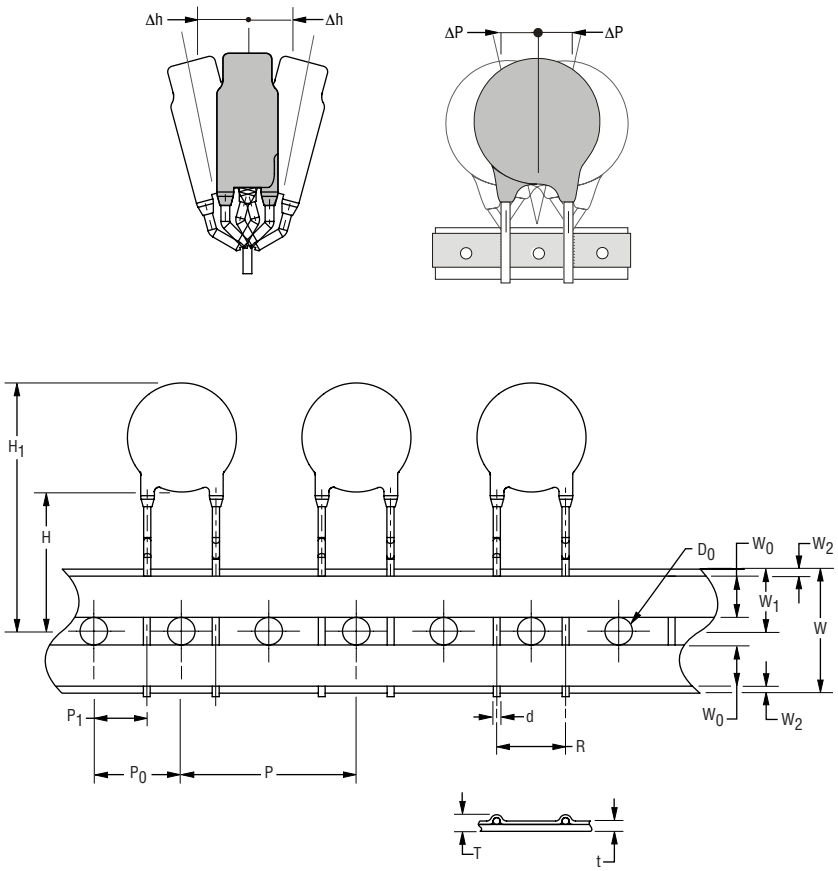
Packaging Specifications

TAPE

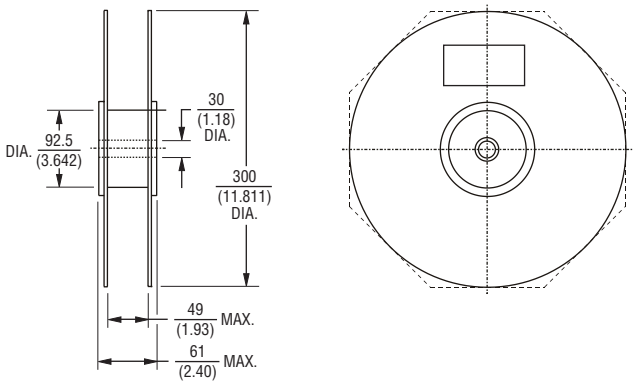
Conforms to IEC 60286-2:2015.



Symbol	Parameter	Dimension
W	Carrier tape width	18 +1.0/-0.5 (.709 +.039/-.020)
W_0	Hold down tape width	5 (.197) MIN.
W_1	Sprocket hole position	9 +0.75/-0.5 (.354 +.030/-.020)
W_2	Distance between the upper edges of the carrier tape and hold down tape	3 (.118) MAX.
T	Total tape thickness	1.7 (.067) MAX.
t	Tape thickness	0.9 (.035) MAX.
P	Pitch of component	25.4 ± 1.0 (1.000 ± .039)
P_0	Feed hole pitch	12.7 ± 0.3 (.500 ± .012)
P_1	Feed hole center to pitch	8.95± 0.7 (.352 ± .028)
R	Lead spacing	7.5 ± 1.0 (.295 +.039)
ΔP	Component alignment	±1.3 (±.051) MAX.
Δh	Component alignment	±2.0 (±.079) MAX.
d	Wire diameter	0.8 ± 0.05 (.031 ± .002)
D_0	Feed hole diameter	4 ± 0.2 (.157 ± .008)
H	Height from tape center to component base	18 +2.0/-0.0 (.709 +.079/-.000)
H_1	Component height	46.5 (1.831) MAX.

DIMENSIONS: MM (INCHES)

REEL



DIMENSIONS: MM (INCHES)

IsoMOV® Series - Hybrid Protection Component

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Packaging Quantities - Bulk

Voltage	Model		
	IsoM3	IsoM5	IsoM8
175	500	300	
230			
250			200
275			
300			
320			
380			
420			
510			
555			

Packaging Quantities - Reel

Voltage	Model		
	IsoM3	IsoM5	IsoM8
175	500	400	
230			
250	400		
275			
300			
320			
380		300	
420			
510			
555			

Terminology

Term	Symbol	Definition
Maximum Continuous Operating Voltage	MCOV	Maximum voltage that a Surge Protection Device (SPD) can handle continuously without breaking down or losing effectivness. Operating above this voltage could shorten lifespan or cause failure.
LCAOV	LCAOV	Part of UL 1449 standards evaluating SPD performance under limited, low-energy surges causing abnormal overvoltage, ensuring equipment protection in uncommon electrical conditions.
Maximum Leakage @ MCOV	—	Current (microamps or milliamps) that leaks through the component at MCOV. Low leakage is essential to avoid energy waste and prevent long-term device damage.
Nominal Capacitance @ 20 kHz	—	Inherent capacitance of the component measured at 20 kHz. Low capacitance minimizes the impact on high-frequency signal performance in connected equipment.
Nominal Discharge Current	I_{nom}	Current level the SPD can repeatedly handle during surge events wjile maintaining performance. Usually tested over 10 surges to assess device durability.
Maximum Discharge Current	I_{max}	Highest surge current the SPD can absorb in a single event without failure. Critical for assessing SPD capability in high-risk environments.
Energy Rating (8/20 μs Surge Profile)	—	SPD energy handling capacity measured using an 8/20 μs waveform, simulating real-world surges. Higher energy ratings indicate better resilience to strong surges.
Ring Wave Surge (IEEE 62.41)	—	Simulates oscillating voltage surges common in residential/light industrial setups to test SPD performance against repetitive small surges from appliances or grid fluctuations.
Maximum Clamping Voltage	V_C	Peak voltage across the SPD during a specified surge. This determines the protection level provided to connected equipment during high-energy transients.
Front Protection Voltage	V_{fp}	Initial transient very low energy spike (lasting <300 ns). The V_{fp} can be created when a Gas Discharge Tube (GDT) is placed in series with a Metal Oxide Varistor (MOV). GDTs typically have a high impulse voltage, so when combined with an MOV, its impulse voltage may add to the MOV voltage to create a total combined breakdown voltage.

Legal Disclaimer Notice

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The characteristics and parameters of a Bourns® product set forth in its data sheet are based on laboratory conditions, and statements regarding the suitability of products for certain "typical" applications are based on Bourns' knowledge of typical requirements in generic applications. Bourns assumes that "typical" applications include failsafe/backup features to address critical risks to users and are designed to allow rework of Bourns® product to avoid scrap of a device solely due to malfunctioning Bourns® product. The characteristics and parameters of a Bourns® product in a user application may vary from the data sheet characteristics and parameters due to (i) the combination of the Bourns® product with other components in the user's application, or (ii) the environment of the user application itself. The characteristics and parameters of a Bourns® product also can and do vary in different applications and actual performance may vary over time. Thus, users should always verify the actual performance of the Bourns® product in their specific devices and applications and make their own independent judgments regarding the suitability of Bourns® product and the amount of additional test margin to design into their device or application to compensate for differences between laboratory and real-world conditions.

Unless Bourns has explicitly designated an individual Bourns® product as meeting the requirements of a particular industry standard (e.g., IATF 16949) or a particular qualification (e.g., UL listed or recognized), Bourns is not responsible for any failure of an individual Bourns® product to meet the requirements of such industry standard or particular qualification even if such industry standard or qualification is a "state of art". Users of Bourns® products are responsible for ensuring compliance with safety-related requirements and standards applicable to their devices or applications.

Bourns® products are not recommended, authorized or intended for use in applications where failure or malfunction may result in personal injury, death, or severe property or environmental damage, such as without limitation nuclear, life-critical medical and certain automotive and aviation applications. Except as set forth in the bullet points below or unless expressly and specifically approved in writing on a case-by-case basis by an authorized Bourns' representative, use of any Bourns® products in such unauthorized high-risk applications is at the user's sole risk.

- Bourns considers implantable/invasive devices and devices/procedures designed as life-supporting or life-sustaining by the U.S. Food and Drug Administration or equivalent organizations outside of the United States as "life-critical" medical applications. Bourns expressly identifies those Bourns® standard products that are suitable for use in typical medical applications that are not life-critical in its publication entitled "Bourns Medical Grade Component Guide."

- Bourns expressly identifies those Bourns® standard products that are suitable for use in typical automotive applications associated with any Automate Safety Integrity Level (ASIL) in its publication entitled "Bourns Automotive Grade Component Guide." Bourns' designation of Bourns® product as compliant with the AEC-Q standard does not by itself mean that Bourns has approved such product for use in an automotive application.

- Bourns expressly identifies Bourns® standard products that are suitable for use in the typical aviation applications/systems requiring System Design Assurance Level (RTCA DO-254 DAL) of C, D or E in its publication entitled "Bourns Civilian Aerospace/Aviation Grade Component Guide." Bourns does not test its products for compliance with United States Federal Aviation Administration standards or any other generally equivalent governmental organization standard applicable to products designed or manufactured for use in aviation applications. Use of Bourns® standard components in aviation applications associated with RTCA DO-254 DAL A or B without proper approval noted above shall be at the user's sole risk.

- Bourns will review and authorize on a case-by-case basis the use of Bourns® standard products which are at least AEC-Q compliant in space-related civil applications (rockets, satellites) with a negotiated cross-waiver and indemnity agreement.

The use and level of testing applicable to Bourns® custom products shall be negotiated on a case-by-case basis by Bourns and the user for which such Bourns® custom products are specially designed. Absent a written agreement between Bourns and the user regarding the use and level of such testing, the above provisions applicable to Bourns® standard products shall also apply to such Bourns® custom products.

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