




## 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<sub>STG</sub>) ..... -40 °C to +125 °C  
 Operating Temperature Range (T<sub>OPR</sub>) ..... -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

Model Designator **IsoM 8 - 320 - B - L2**

IsoM = IsoMOV® Hybrid Protection Component

Component I<sub>nom</sub> 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.

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### Additional Information

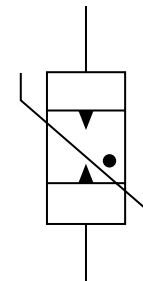
Click these links for more information:



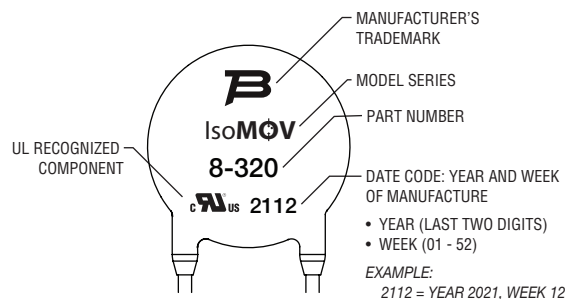
### Agency Recognition

Agency	Standard	File Number
	1449 - 4th Ed. Type 4 CA Canadian Type 5 SPD CSA C22.2 No. 269.4-17	<a href="#">E313168</a>
	EN IEC 61051-1: 2018 IEC 61051-2-2: 1991 IEC 61051-2: 2021 IEC61051-1: 2018 EN IEC 61051-2: 2021	<a href="#">J50668307</a>

### Circuit Diagram



### Typical Part Marking



"IsoMOV" is a registered trademark of Bourns, Inc.  
 "EdgMOV" is a trademark of Bourns, Inc.

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.  
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## 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® Series - Hybrid Protection Component

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### Electrical Characteristics <sup>(1)</sup> (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Bourns Part No.	Operating					Protection						
	Maximum Continuous Operating Voltage (MCOV)		LCAOV Test	Maximum Leakage @ MCOV <sup>(2)</sup>	Nominal Capacitance	I <sub>nom</sub> <sup>(3) (4)</sup>		I <sub>max</sub> <sup>(4)</sup>	Energy <sup>(5)</sup>	Ring Wave Surge IEEE 62.41	Maximum Clamping Voltage	
	V <sub>rms</sub>	V <sub>dc</sub>	V <sub>rms</sub>	A <sub>dc</sub>	20 kHz	15 Operations	10 Operations	1 Operation	1 Operation	200 A	V <sub>c</sub>	I <sub>c</sub>
	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

<sup>(1)</sup> At delivery AQL 0.65 Level II, DIN ISO 2859.

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

<sup>(3)</sup> I<sub>nom</sub> 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.

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

<sup>(5)</sup> Measured at I<sub>max</sub>, 8/20 μs using numerical integration method  $E = \int P(t)dt$

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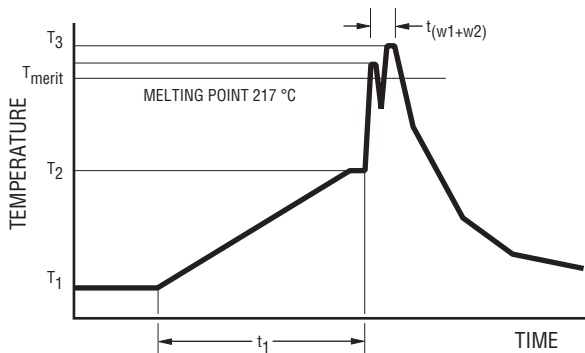
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## IsoMOV® Series - Hybrid Protection Component

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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.

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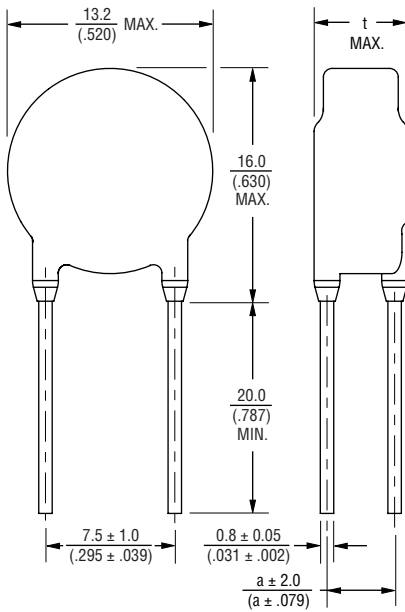
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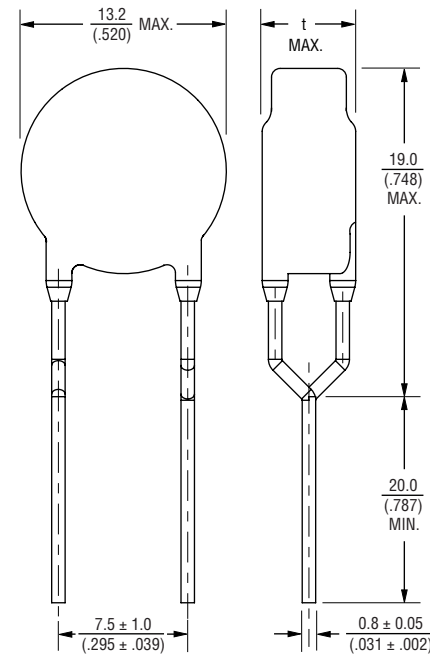
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### Product Dimensions

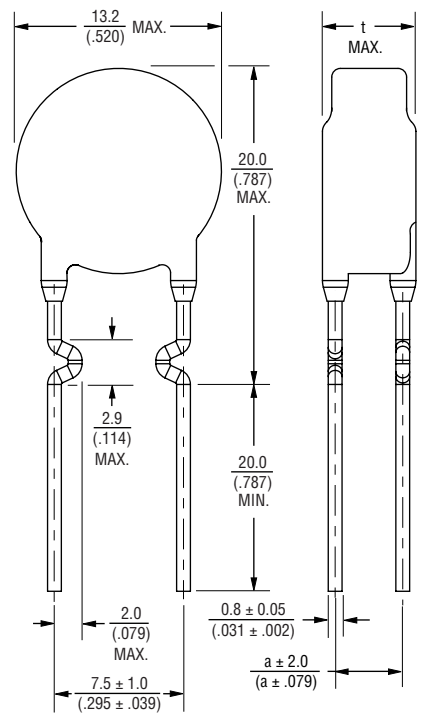
**IsoM3-xxx-L1  
Straight Leads**



**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	$\frac{2.8}{(.110)}$	$\frac{6.1}{(.240)}$	--	$\frac{6.1}{(.240)}$	$\frac{2.8}{(.110)}$	$\frac{6.1}{(.240)}$
IsoM3-230	$\frac{3.3}{(.129)}$	$\frac{6.5}{(.256)}$	--	$\frac{6.5}{(.256)}$	$\frac{3.3}{(.129)}$	$\frac{6.5}{(.256)}$
IsoM3-250	$\frac{3.5}{(.137)}$	$\frac{6.7}{(.264)}$	--	$\frac{6.7}{(.264)}$	$\frac{3.5}{(.137)}$	$\frac{6.7}{(.264)}$
IsoM3-275	$\frac{3.6}{(.141)}$	$\frac{6.9}{(.272)}$	--	$\frac{6.9}{(.272)}$	$\frac{3.6}{(.141)}$	$\frac{6.9}{(.272)}$
IsoM3-300	$\frac{3.9}{(.153)}$	$\frac{7.1}{(.280)}$	--	$\frac{7.1}{(.280)}$	$\frac{3.9}{(.153)}$	$\frac{7.1}{(.280)}$
IsoM3-320	$\frac{4.0}{(.157)}$	$\frac{7.2}{(.283)}$	--	$\frac{7.2}{(.283)}$	$\frac{4.0}{(.157)}$	$\frac{7.2}{(.283)}$

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

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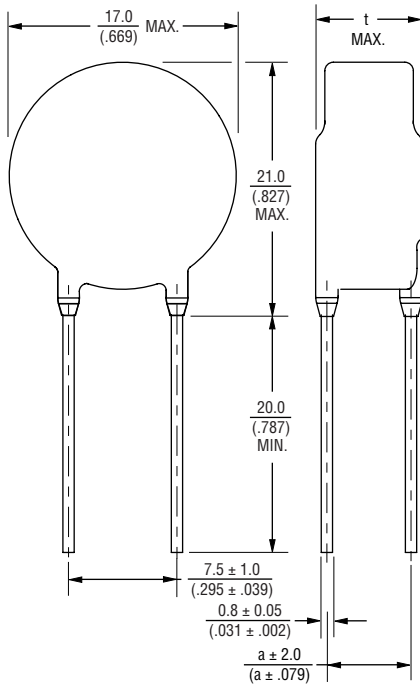
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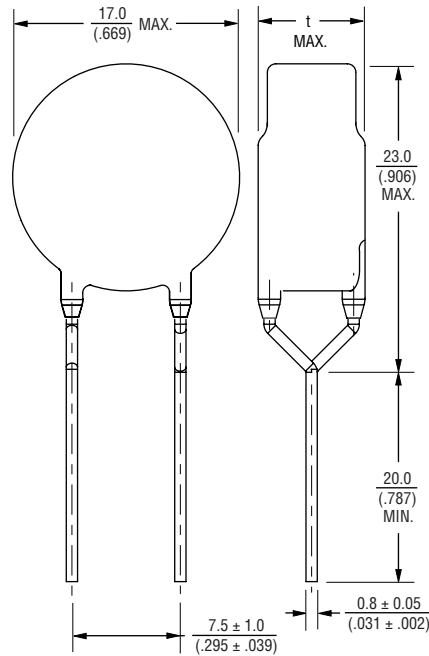
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### Product Dimensions (Continued)

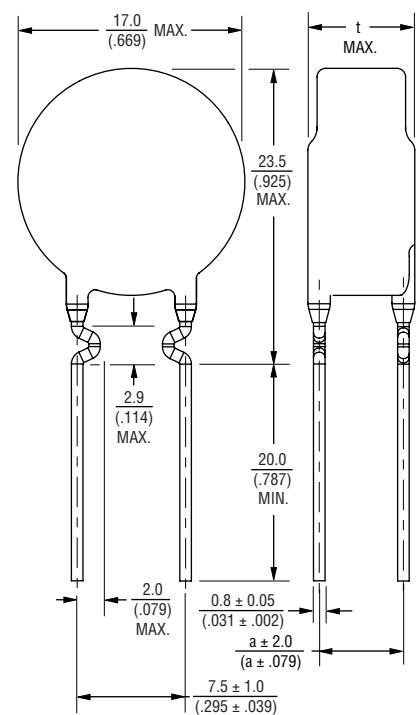
**IsoM5-xxx-L1  
Straight Leads**



**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	$\frac{2.8}{(.110)}$	$\frac{6.0}{(.236)}$	--	$\frac{6.0}{(.236)}$	$\frac{2.8}{(.110)}$	$\frac{6.0}{(.236)}$
IsoM5-230	$\frac{3.3}{(.130)}$	$\frac{6.5}{(.256)}$	--	$\frac{6.5}{(.256)}$	$\frac{3.3}{(.130)}$	$\frac{6.5}{(.256)}$
IsoM5-250	$\frac{3.5}{(.138)}$	$\frac{6.7}{(.264)}$	--	$\frac{6.7}{(.264)}$	$\frac{3.5}{(.138)}$	$\frac{6.7}{(.264)}$
IsoM5-275	$\frac{3.6}{(.142)}$	$\frac{6.8}{(.268)}$	--	$\frac{6.8}{(.268)}$	$\frac{3.6}{(.142)}$	$\frac{6.8}{(.268)}$
IsoM5-300	$\frac{3.9}{(.154)}$	$\frac{7.1}{(.280)}$	--	$\frac{7.1}{(.280)}$	$\frac{3.9}{(.154)}$	$\frac{7.1}{(.280)}$
IsoM5-320	$\frac{3.9}{(.154)}$	$\frac{7.1}{(.280)}$	--	$\frac{7.1}{(.280)}$	$\frac{3.9}{(.154)}$	$\frac{7.1}{(.280)}$
IsoM5-380	$\frac{4.5}{(.177)}$	$\frac{7.7}{(.303)}$	--	$\frac{7.7}{(.303)}$	$\frac{4.5}{(.177)}$	$\frac{7.7}{(.303)}$
IsoM5-420	$\frac{4.9}{(.193)}$	$\frac{8.1}{(.319)}$	--	$\frac{8.1}{(.319)}$	$\frac{4.9}{(.193)}$	$\frac{8.1}{(.319)}$
IsoM5-510	$\frac{5.6}{(.220)}$	$\frac{8.8}{(.346)}$	--	$\frac{8.8}{(.346)}$	$\frac{5.6}{(.220)}$	$\frac{8.8}{(.346)}$
IsoM5-555	$\frac{5.8}{(.228)}$	$\frac{9.0}{(.354)}$	--	$\frac{9.0}{(.354)}$	$\frac{5.8}{(.228)}$	$\frac{9.0}{(.354)}$

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

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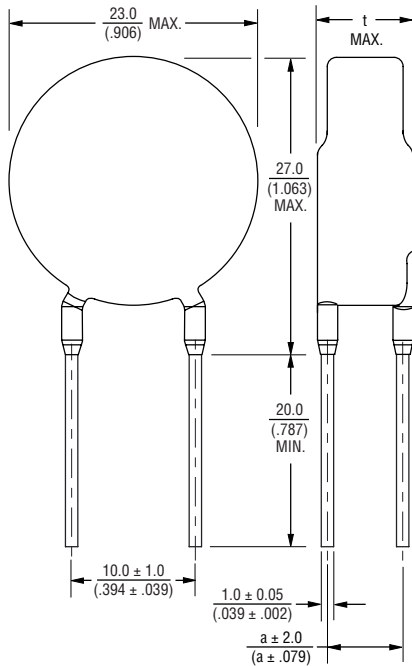
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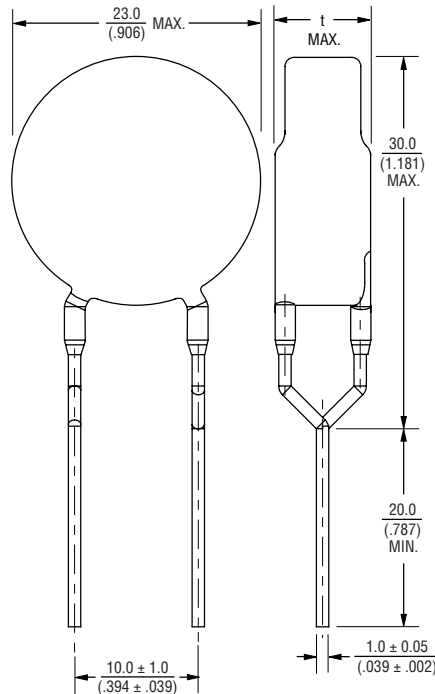
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### Product Dimensions (Continued)

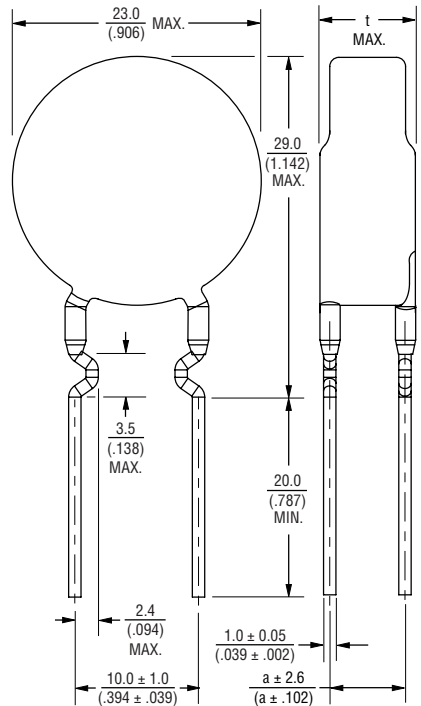
**IsoM8-xxx-L1  
Straight Leads**



**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	$\frac{3.7}{(.146)}$	$\frac{7.1}{(.280)}$	--	$\frac{7.1}{(.280)}$	$\frac{3.7}{(.146)}$	$\frac{7.1}{(.280)}$
IsoM8-275	$\frac{3.8}{(.150)}$	$\frac{7.2}{(.283)}$	--	$\frac{7.2}{(.283)}$	$\frac{3.8}{(.150)}$	$\frac{7.2}{(.283)}$
IsoM8-300	$\frac{4.1}{(.161)}$	$\frac{7.5}{(.295)}$	--	$\frac{7.5}{(.295)}$	$\frac{4.1}{(.161)}$	$\frac{7.5}{(.295)}$
IsoM8-320	$\frac{4.2}{(.165)}$	$\frac{7.6}{(.299)}$	--	$\frac{7.6}{(.299)}$	$\frac{4.2}{(.165)}$	$\frac{7.6}{(.299)}$
IsoM8-380	$\frac{4.6}{(.181)}$	$\frac{8.0}{(.315)}$	--	$\frac{8.0}{(.315)}$	$\frac{4.6}{(.181)}$	$\frac{8.0}{(.315)}$
IsoM8-420	$\frac{5.0}{(.197)}$	$\frac{8.4}{(.331)}$	--	$\frac{8.4}{(.331)}$	$\frac{5.0}{(.197)}$	$\frac{8.4}{(.331)}$
IsoM8-510	$\frac{5.8}{(.228)}$	$\frac{9.2}{(.362)}$	--	$\frac{9.2}{(.362)}$	$\frac{5.8}{(.228)}$	$\frac{9.2}{(.362)}$
IsoM8-555	$\frac{6.0}{(.236)}$	$\frac{9.4}{(.370)}$	--	$\frac{9.4}{(.370)}$	$\frac{6.0}{(.236)}$	$\frac{9.4}{(.370)}$

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

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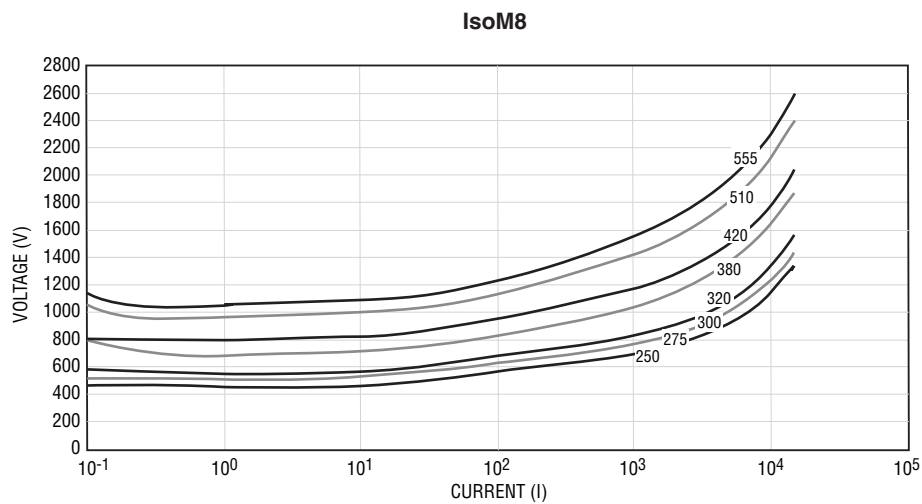
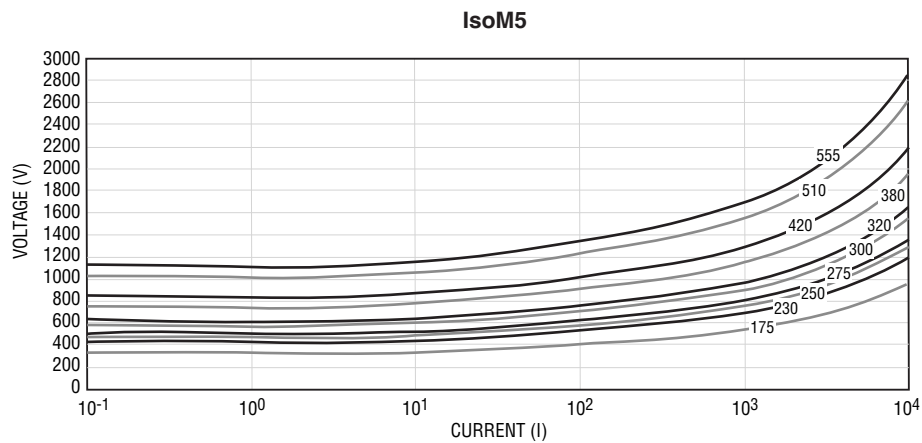
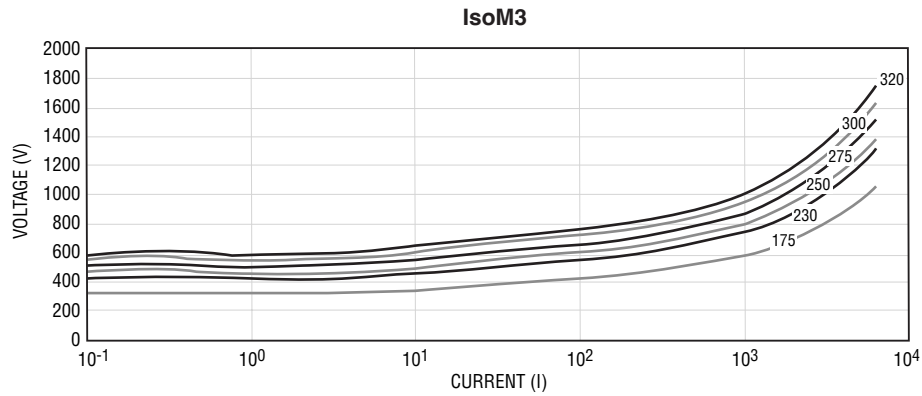
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## IsoMOV® Series - Hybrid Protection Component

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### V-I Curves



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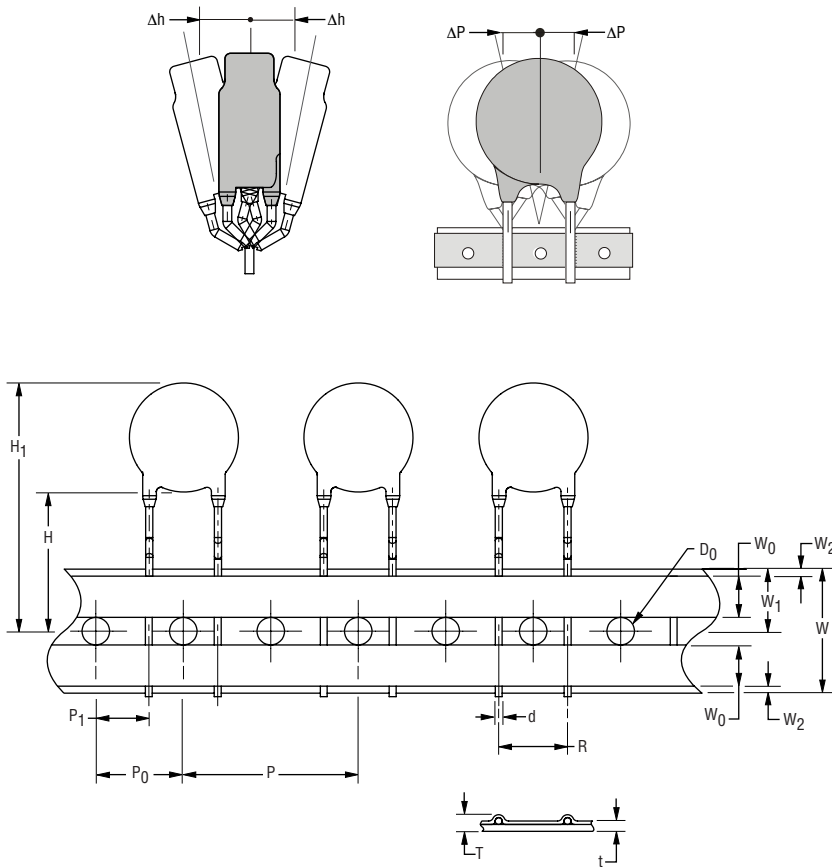
## IsoMOV® Series - Hybrid Protection Component

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### Packaging Specifications

#### TAPE

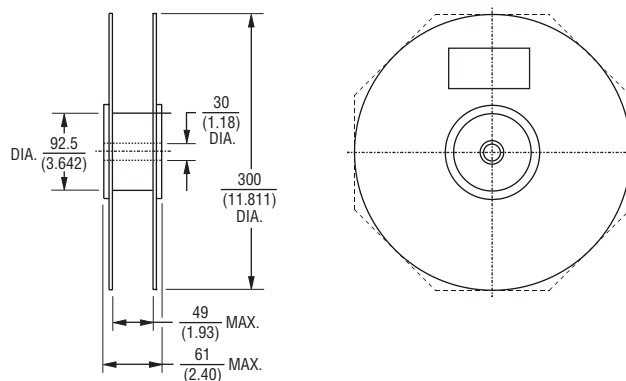
Conforms to IEC 60286-2:2015.



Symbol	Parameter	Dimension
W	Carrier tape width	$18 \pm 1.0 / -0.5$ (.709 ± .039 / -.020)
W <sub>0</sub>	Hold down tape width	$\frac{5}{(.197)}$ MIN.
W <sub>1</sub>	Sprocket hole position	$9 \pm 0.75 / -0.5$ (.354 ± .030 / -.020)
W <sub>2</sub>	Distance between the upper edges of the carrier tape and hold down tape	$\frac{3}{(.118)}$ MAX.
T	Total tape thickness	$\frac{1.7}{(.067)}$ MAX.
t	Tape thickness	$\frac{0.9}{(.035)}$ MAX.
P	Pitch of component	$25.4 \pm 1.0$ (1.000 ± .039)
P <sub>0</sub>	Feed hole pitch	$12.7 \pm 0.3$ (.500 ± .012)
P <sub>1</sub>	Feed hole center to pitch	$8.95 \pm 0.7$ (.352 ± .028)
R	Lead spacing	$7.5 \pm 1.0$ (.295 ± .039)
ΔP	Component alignment	$\pm 1.3$ (± .051) MAX.
Δh	Component alignment	$\pm 2.0$ (± .079) MAX.
d	Wire diameter	$0.8 \pm 0.05$ (.031 ± .002)
D <sub>0</sub>	Feed hole diameter	$4 \pm 0.2$ (.157 ± .008)
H	Height from tape center to component base	$18 \pm 2.0 / -0.0$ (.709 ± .079 / -.000)
H <sub>1</sub>	Component height	$46.5$ (1.831) MAX.

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

#### REEL



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

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## IsoMOV® Series - Hybrid Protection Component

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### Packaging Quantities - Bulk

Voltage	Model		
	IsoM3	IsoM5	IsoM8
175	500	300	
230			
250			
275			
300			
320			
380			200
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 effectiveness. 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 <sub>nom</sub>	Current level the SPD can repeatedly handle during surge events while maintaining performance. Usually tested over 10 surges to assess device durability.
Maximum Discharge Current	I <sub>max</sub>	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 $\mu$ s Surge Profile)	—	SPD energy handling capacity measured using an 8/20 $\mu$ s 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 <sub>c</sub>	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 <sub>fp</sub>	Initial transient very low energy spike (lasting <300 ns). The V <sub>fp</sub> 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.

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