



**THE DATASHEET OF  
MOV-10D220K**





## Features

- High voltage rating
- High current rating
- Bidirectional
- Surge protection
- Fast response time
- RoHS compliant\*
- Agency listing: US

## Applications

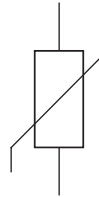
- Power supplies
- Power systems
- Line voltage
- Telecom systems
- White goods / appliances

# MOV-10DxxxK Series - Metal Oxide Varistor

### General Information

The MOV-10DxxxK Series of 10 mm radial leaded varistor devices protects against overvoltage transients such as lightning, power contact and power induction. The metal oxide varistors offer a choice of varistor voltages from 18 V to 820 V and  $V_{RMS}$  voltages from 11 V to 510 V.

The devices have a high current handling, high energy absorption capability and fast response times to protect against transient faults up to rated limits.



### Industry Standard Compliance

Standard	UL 1449
File Number	E313168

Standard	ITU-T K.20, K.21, K.45
MOV-10D201K MOV-10D361K MOV-10D391K MOV-10D431K	Will pass 600 V rms, 600 ohm, 1 A, 0.2 s, 5 cycles, every 1 minute condition.

### Absolute Maximum Ratings (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Temperature	$T_{OPR}$	-40	25	+105	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-40	25	+125	$^\circ\text{C}$
Rated Wattage	$P_w$			0.40	Watt
Varistor Voltage Temperature Coefficient	$V_{TC}$	0		0.05	$\% / ^\circ\text{C}$
Response Time	$T_r$		10	25	ns
Varistor Voltage Tolerance	$V_{tol}$	-10		10	$\%$

### Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Bourns Part No.	Max. Continuous Voltage (V)		Voltage @ 1 mA DC (V)			Voltage @ Class Current (8/20 $\mu\text{s}$ )		Max. Peak Current (8/20 $\mu\text{s}$ )	Max. Energy (J)	Typ. Cap. (pF)
	r.m.s.	d.c.	Min.	Nom.	Max.	Class Current (A)	Max. Clamping Voltage (V)	One Time	8/20 $\mu\text{s}$	1 kHz
MOV-10D180K	11	14	16	18	20	5	36	500	2.1	8160
MOV-10D220K	14	18	20	22	24	5	43	500	2.5	6000
MOV-10D270K	17	22	24	27	30	5	53	500	3.0	5280
MOV-10D330K	20	26	30	33	36	5	65	500	4.0	4800
MOV-10D390K	25	31	35	39	43	5	77	500	4.6	3840
MOV-10D470K	30	38	42	47	52	5	93	500	5.5	3600
MOV-10D560K	35	45	50	56	62	5	110	500	7.0	2640
MOV-10D680K	40	56	61	68	75	5	135	500	8.2	1920
MOV-10D820K	50	65	74	82	90	25	135	2500	12	1440
MOV-10D101K	60	85	90	100	110	25	165	2500	15	1200
MOV-10D121K	75	100	108	120	132	25	200	2500	18	996
MOV-10D151K	95	125	135	150	165	25	250	2500	22	804
MOV-10D181K	115	150	162	180	198	25	300	2500	27	672
MOV-10D201K	130	170	185	200	225	25	340	2500	30	600
MOV-10D221K	140	180	198	220	242	25	360	2500	32	540
MOV-10D241K	150	200	216	240	264	25	395	2500	35	504
MOV-10D271K	175	225	243	270	297	25	455	2500	40	444
MOV-10D301K	190	250	270	300	330	25	500	2500	40	396
MOV-10D331K	210	275	297	330	363	25	550	2500	43	360
MOV-10D361K	230	300	324	360	396	25	595	2500	47	336
MOV-10D391K	250	320	351	390	429	25	650	2500	60	312
MOV-10D431K	275	350	387	430	473	25	710	2500	65	276
MOV-10D471K	300	385	423	470	517	25	775	2500	70	252
MOV-10D511K	320	415	459	510	561	25	845	2500	70	240
MOV-10D561K	350	460	504	560	616	25	925	2500	70	216
MOV-10D621K	385	505	558	620	682	25	1025	2500	70	192
MOV-10D681K	420	560	612	680	748	25	1120	2500	70	180
MOV-10D751K	460	615	675	750	825	25	1240	2500	75	156
MOV-10D781K	485	640	702	780	858	25	1290	2500	80	156
MOV-10D821K	510	670	738	820	902	25	1355	2500	85	132

\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

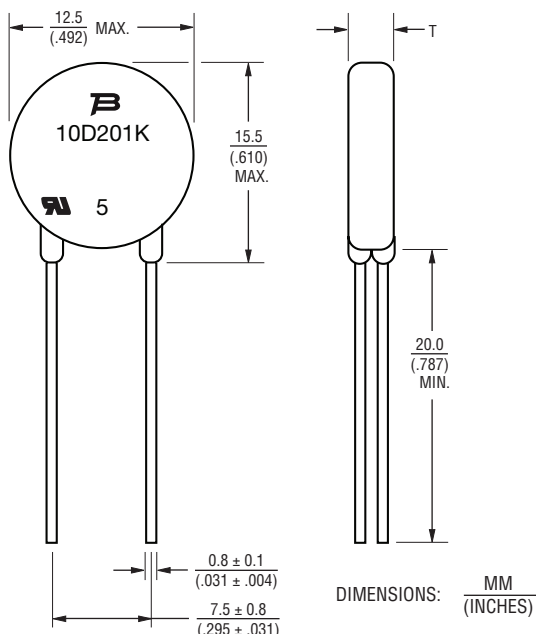
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

# MOV-10DxxxK Series - Metal Oxide Varistor

**BOURNS®**

## Product Dimensions

This is an RoHS compliant molded radial package with 100 % Sn plating on the terminations.



Bourns Part Number	Dim. T (Max.)
MOV-10D180K	$\frac{3.8}{(.150)}$
MOV-10D220K	$\frac{3.9}{(.154)}$
MOV-10D270K	$\frac{4.2}{(.165)}$
MOV-10D330K	$\frac{3.8}{(.150)}$
MOV-10D390K	$\frac{4.0}{(.157)}$
MOV-10D470K	$\frac{4.2}{(.165)}$
MOV-10D560K	$\frac{4.3}{(.169)}$
MOV-10D680K	$\frac{4.4}{(.173)}$
MOV-10D820K	$\frac{3.8}{(.150)}$
MOV-10D101K	$\frac{4.0}{(.157)}$
MOV-10D121K	$\frac{4.2}{(.165)}$
MOV-10D151K	$\frac{4.4}{(.173)}$
MOV-10D181K	$\frac{3.6}{(.142)}$
MOV-10D201K	$\frac{3.8}{(.150)}$
MOV-10D221K	$\frac{3.9}{(.154)}$

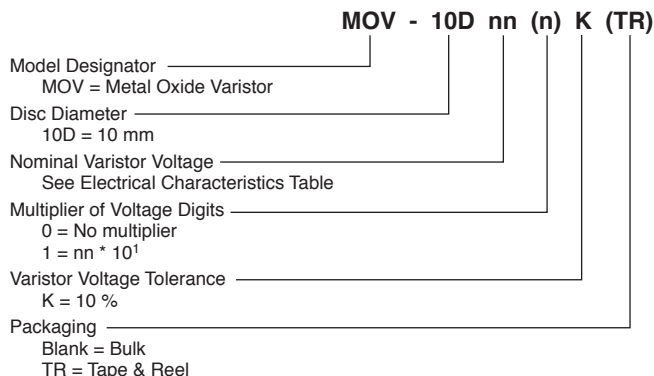
Bourns Part Number	Dim. T (Max.)
MOV-10D241K	$\frac{4.0}{(.157)}$
MOV-10D271K	$\frac{4.2}{(.165)}$
MOV-10D301K	$\frac{4.4}{(.173)}$
MOV-10D331K	$\frac{4.6}{(.181)}$
MOV-10D361K	$\frac{4.8}{(.189)}$
MOV-10D391K	$\frac{5.0}{(.197)}$
MOV-10D431K	$\frac{5.2}{(.205)}$
MOV-10D471K	$\frac{5.4}{(.213)}$
MOV-10D511K	$\frac{5.5}{(.217)}$
MOV-10D561K	$\frac{5.9}{(.232)}$
MOV-10D621K	$\frac{6.2}{(.244)}$
MOV-10D681K	$\frac{6.4}{(.252)}$
MOV-10D751K	$\frac{6.6}{(.260)}$
MOV-10D781K	$\frac{6.8}{(.268)}$
MOV-10D821K	$\frac{7.2}{(.283)}$

## Typical Part Marking

Bourns Part Number	Bourns Part Marking
MOV-10D180K	10D180K
MOV-10D220K	10D220K
MOV-10D270K	10D270K
MOV-10D330K	10D330K
MOV-10D390K	10D390K
MOV-10D470K	10D470K
MOV-10D560K	10D560K
MOV-10D680K	10D680K
MOV-10D820K	10D820K
MOV-10D101K	10D101K
MOV-10D121K	10D121K
MOV-10D151K	10D151K
MOV-10D181K	10D181K
MOV-10D201K	10D201K
MOV-10D221K	10D221K
MOV-10D241K	10D241K
MOV-10D271K	10D271K
MOV-10D301K	10D301K
MOV-10D331K	10D331K
MOV-10D361K	10D361K
MOV-10D391K	10D391K
MOV-10D431K	10D431K
MOV-10D471K	10D471K
MOV-10D511K	10D511K
MOV-10D561K	10D561K
MOV-10D621K	10D621K
MOV-10D681K	10D681K
MOV-10D751K	10D751K
MOV-10D781K	10D781K
MOV-10D821K	10D821K

NOTE: The "5" marking on MOV products is for traceability of production assembly for quality assurance compliance.

## How to Order



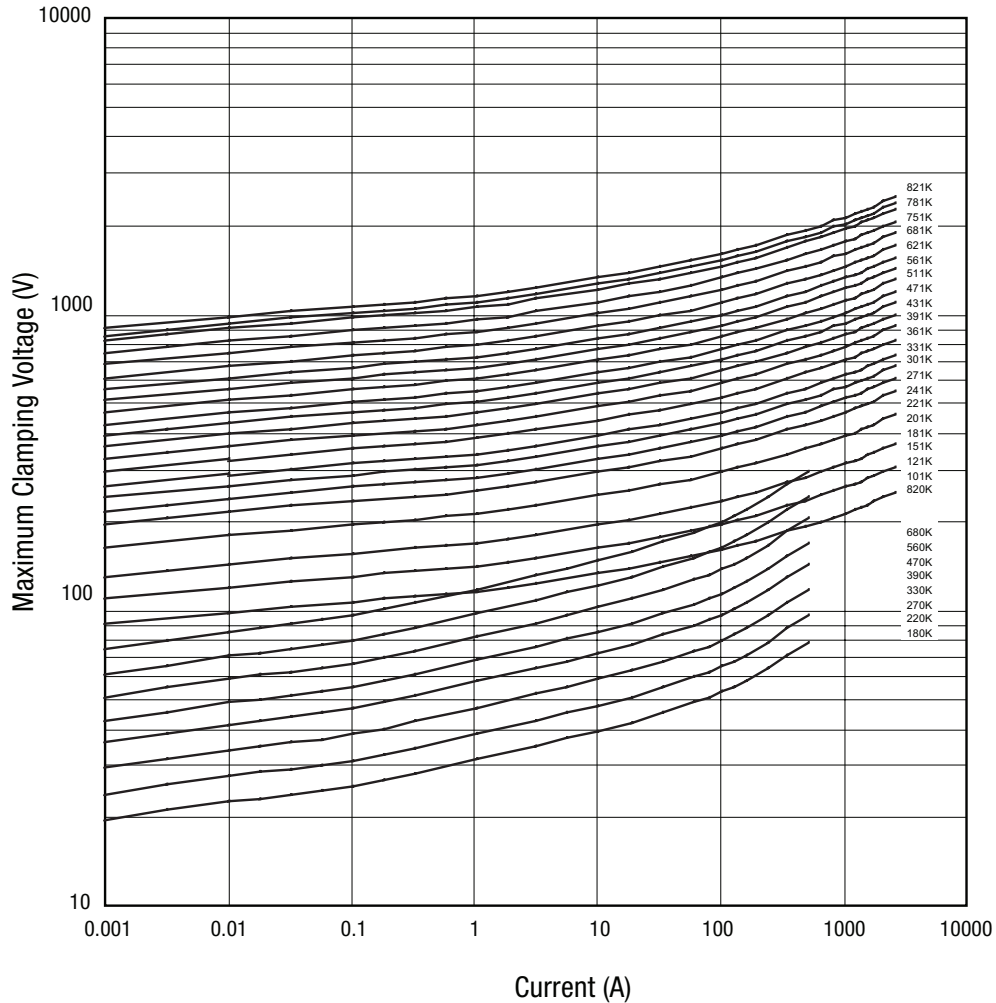
Examples: MOV-10D270K = 27 V, Bulk Pack  
MOV-10D331KTR = 330 V, Tape & Reel

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](http://www.bourns.com/docs/legal/disclaimer.pdf).

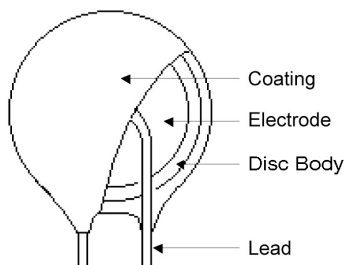
# MOV-10DxxxK Series - Metal Oxide Varistor

**BOURNS®**

## Performance Graphs



## Internal Construction



## Environmental Specifications

Moisture Sensitivity Level.....	1
ESD Classification (HBM).....	6

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

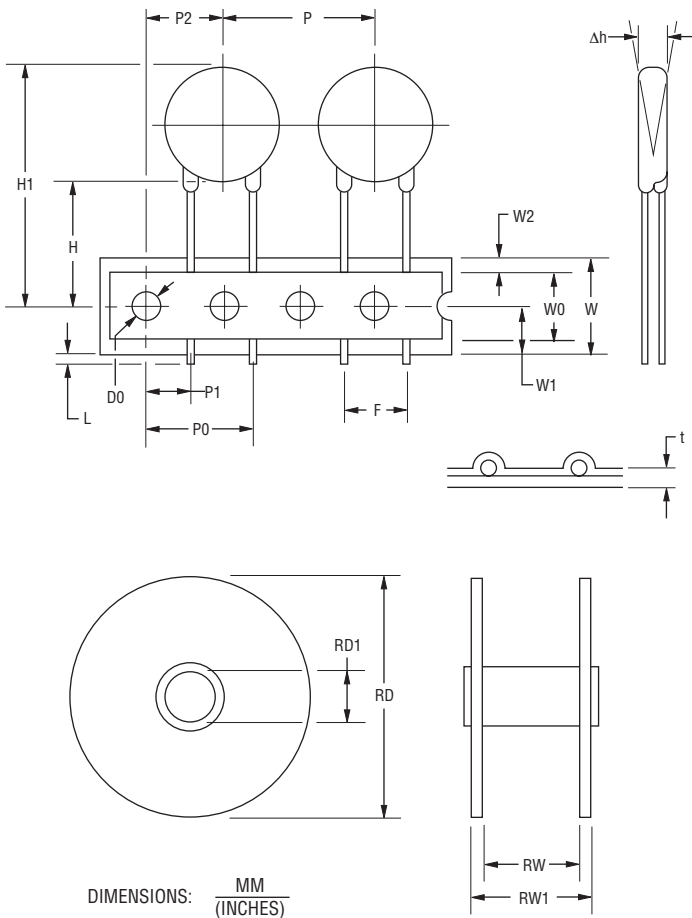
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

# MOV-10DxxxK Series - Metal Oxide Varistor

# BOURNS®

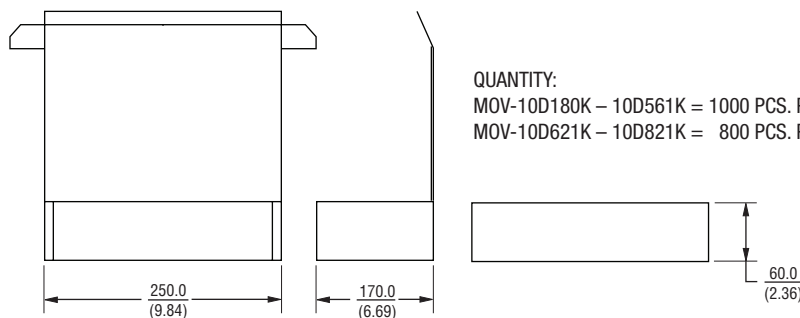
## Packaging Information

### TAPE & REEL



Item	Symbol	10 mm Disc
Reel Outside Diameter	RD	$\frac{355}{(13.98)}$
Reel Inner Diameter	RD1	$\frac{30}{(1.181)}$
Tape Width	RW	$\frac{55}{(2.16)}$
Reel Width	RW1	$\frac{63}{(2.48)}$ max.
Pitch of Component	P	$\frac{25.4 \pm 0.7}{(1.00 \pm 0.03)}$
Feed Hole Pitch	P0	$\frac{12.7 \pm 1.0}{(0.50 \pm 0.04)}$
Feed Hole Center to Pitch	P1	$\frac{8.95 \pm 0.7}{(0.352 \pm 0.03)}$
Feed Hole Center to Component Center	P2	$\frac{12.7 \pm 1.0}{(0.50 \pm 0.04)}$
Lead to Lead Distance	F	$\frac{7.50 \pm 0.8}{(0.30 \pm 0.03)}$
Component Alignment	$\Delta h$	$\frac{2.0}{(0.079)}$
Tape Width	W	$\frac{18.0 \pm 0.5}{(0.71 \pm 0.02)}$
Hole Down Tape Width	W0	$\frac{12.0 \pm 0.8}{(0.47 \pm 0.03)}$
Hole Position	W1	$\frac{9.0 \pm 0.5}{(0.35 \pm 0.02)}$
Hole Down Tape Position	W2	$\frac{3.0}{(0.12)}$ max.
Height From Center to Component Base	H	$\frac{19.0 \pm 1.0}{(0.75 \pm 0.04)}$
Seating Plane Height	H0	$\frac{16.0 \pm 1.0}{(0.63 \pm 0.04)}$
Component Height	H1	$\frac{36.0}{(1.42)}$ max.
Crimp Length	C	$\frac{2.60}{(0.10)}$ typ.
Feed Hole Diameter	D0	$\frac{4.0 \pm 0.2}{(0.16 \pm 0.08)}$
Total Tape Thickness	t	$\frac{0.6 \pm 0.3}{(0.02 \pm 0.01)}$
Length of Clipped Height	L	$\frac{1.0}{(0.04)}$ max.
Quantity per Reel (10D180K – 10D361K)	-	1000
Quantity per Reel (10D391K – 10D821K)	-	500

### BULK



REV. 08/17

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](http://www.bourns.com/docs/legal/disclaimer.pdf).

This legal disclaimer applies to purchasers and users of Bourns® products manufactured by or on behalf of Bourns, Inc. and its affiliates (collectively, “Bourns”).

Unless otherwise expressly indicated in writing, Bourns® products and data sheets relating thereto are subject to change without notice. Users should check for and obtain the latest relevant information and verify that such information is current and complete before placing orders for Bourns® products.

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 types of applications are based on Bourns’ knowledge of typical requirements in generic applications. 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. 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 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., ISO/TS 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. 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 nuclear, lifesaving, life-critical or life-sustaining applications, nor in any other applications where failure or malfunction may result in personal injury, death, or severe property or environmental damage. Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any Bourns® products in such unauthorized applications might not be safe and thus is at the user’s sole risk. Life-critical applications include devices identified by the U.S. Food and Drug Administration as Class III devices and generally equivalent classifications outside of the United States.

Bourns expressly identifies those Bourns® standard products that are suitable for use in automotive applications on such products’ data sheets in the section entitled “Applications.” Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any other Bourns® standard products in an automotive application might not be safe and thus is not recommended, authorized or intended and is at the user’s sole risk. If Bourns expressly identifies a sub-category of automotive application in the data sheet for its standard products (such as infotainment or lighting), such identification means that Bourns has reviewed its standard product and has determined that if such Bourns® standard product is considered for potential use in automotive applications, it should only be used in such sub-category of automotive applications. Any reference to Bourns® standard product in the data sheet as compliant with the AEC-Q standard or “automotive grade” does not by itself mean that Bourns has approved such product for use in an automotive application.

Bourns® standard products are not tested to comply with United States Federal Aviation Administration standards generally or any other generally equivalent governmental organization standard applicable to products designed or manufactured for use in aircraft or space applications. Bourns expressly identifies Bourns® standard products that are suitable for use in aircraft or space applications on such products’ data sheets in the section entitled “Applications.” Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any other Bourns® standard product in an aircraft or space application might not be safe and thus is not recommended, authorized or intended and is at the user’s sole risk.

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.

Users shall not sell, transfer, export or re-export any Bourns® products or technology for use in activities which involve the design, development, production, use or stockpiling of nuclear, chemical or biological weapons or missiles, nor shall they use Bourns® products or technology in any facility which engages in activities relating to such devices. The foregoing restrictions apply to all uses and applications that violate national or international prohibitions, including embargos or international regulations. Further, Bourns® products and Bourns technology and technical data may not under any circumstance be exported or re-exported to countries subject to international sanctions or embargoes. Bourns® products may not, without prior authorization from Bourns and/or the U.S. Government, be resold, transferred, or re-exported to any party not eligible to receive U.S. commodities, software, and technical data.

To the maximum extent permitted by applicable law, Bourns disclaims (i) any and all liability for special, punitive, consequential, incidental or indirect damages or lost revenues or lost profits, and (ii) any and all implied warranties, including implied warranties of fitness for particular purpose, non-infringement and merchantability.

*For your convenience, copies of this Legal Disclaimer Notice with German, Spanish, Japanese, Traditional Chinese and Simplified Chinese bilingual versions are available at:*

*Web Page:* <http://www.bourns.com/legal/disclaimers-terms-and-policies>

*PDF:* <http://www.bourns.com/docs/Legal/disclaimer.pdf>

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

 [View MOV-10D220K on WIN SOURCE](#)

 [Bourns Inc. Information](#)

## Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management