

METAL OXIDE VARISTOR (MOV)

How to Order

SR	241	K	10	D	S	40	X
Type code	Varistor Voltage	Tolerance	Disk Size Code	Disk Type	Lead Type or Taping Code	Lead Cutting	Special Request
SR: Walsin Varistor	(DC volt) (From 180 to 112) Two significant digits Followed by no. of zeros 180=18volt 101=100volt 102=1000volt	J:±5% K:±10%	05 : 5mm 07 : 7mm 10 : 10mm 14 : 14mm 18 : 18mm 20 : 20mm 25 : 25mm	D : Standard disk type E : High energy disk type V : Super high energy series	S : Straight Lead L : Inline Crimped O : Outward Crimped I : Inward Crimped Taping Code : Please refer to page 12 for taping codes.	Lead Cutting for Bulk Packing: 40=4.0±1.0mm 65=6.5±1.0mm P1=11±1.0mm No code ≥ 25mm	•Special lead cutting tolerance •Special leadspacing (Please see below) •Special varistor voltage range...etc

Varistor Special Request

F: 0.5mm lead length tolerance for short lead cutting
X: 7.5mm lead spacing for 20D and 20E (lead wire is 0.8mm diameter)
Z: 5mm lead spacing for 10D(E), 14D(E)
H: Special request

Varistor Part Number Examples :

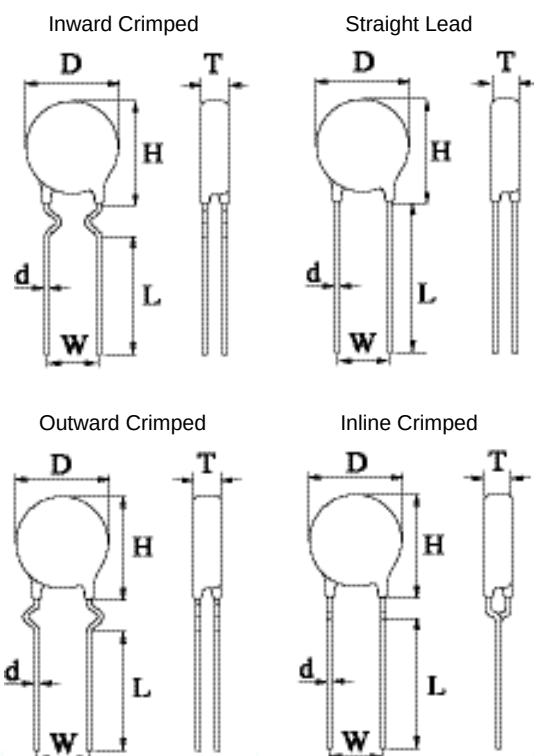
Ex.1. SR241K07DIT14: 7mm, 241K, inward crimped lead and reel taped.
Ex.2. SR361K10DI45: 10mm, 361K, bulk packing, inward crimped lead, lead cutting length 4.5 ±1.0mm
Ex.3. SR621K20EOP2: 20mm, 621K, high energy, bulk, outward crimped lead, lead spacing 12mm±1.0mm.
Ex.4. SR271K20DO65X: 20mm, 271K, bulk, outward crimped lead, lead spacing 7.5 mm, lead cutting 6.5 ± 1.0mm
Ex.5. SR241K10DS40F: 10mm, 241K, bulk, straight lead, lead cutting 4.0 ± 0.5mm.

Dimensions Quick Reference : If specific item's dimensions, please contact sales

Series	5D,5E	7D,7E	10D,10E	14D,14E	18E	20D,20E	25D
Dmax	7.0	9.5	14.0	17.5	21.0	24.0	28.5
d*	0.6	0.6	0.8	0.8	0.8	1.0	1.0
W**	5.0	5.0	7.5	7.5	7.5	10.0	12.7
Hmax	10.0	12.0	17.0	20.5	24.0	28.0	34
Tmax	4.9	4.9	8.5	8.5	9.0	9.0	9.5

*±0.02 **±1.0

(Unit: mm)



Remark:

The lead length (L) is 25mm minimum unless requested by customers; please refer to lead cutting code in "How to Order".

METAL OXIDE VARISTOR (MOV)

Characteristics

- High performance transient voltage suppression
- Short response time to surge voltage
- Low standby power dissipation
- Excellent clamping characteristics
- High performance withstanding surge currents
- High reliability
- UL, CSA, VDE and CQC recognized

Definition of Varistor Terms

Rated RMS Voltage, Rated DC Voltage :

The maximum designated values of power system voltage that may be applied continuously between the terminals of a device.

Varistor Voltage :

Test characteristic that is used to classify varistors by type.

A test current of 1mA DC is typically used to determine varistor voltage classification type. Varistor voltage clamping characteristics can be defined at various test levels.

Rated Peak Single Pulse Transient Current :

Maximum surge current, 8/20 μ s waveform which a varistor is rated to withstand for a single surge.

Rated Single Pulse Transient Energy :

Maximum allowable energy for a single impulse (see specified waveforms).

Maximum Clamping Voltage :

Measured peak voltage across the device terminals when a current impulse of specified amplitude and waveform is conducted through the varistor.

Typical Capacitance :

Typical capacitance values are measured at a test frequency of 1kHz. Capacitance values are only for reference purpose only, not subject to outgoing inspection.

Applications

- Surge protection in:
 - Consumer electronics
 - Industrial electronics
 - Communication electronics
 - Measuring and controlling systems
 - Electronic home appliances
- Protection against surges induced by lightning striking incoming power lines.
- Suppression of surges caused by switching inductive loads such as transformers, relays and coils.
- Protection of rectification diodes, SCRs, power transistors, semiconductor devices, etc.

General Characteristics

Storage Temperature : -55°C to $+125^{\circ}\text{C}$

Operating Surface Temperature : 125°C

Operating Ambient Temperature : -55°C to $+85^{\circ}\text{C}$ (without derating)

Maximum Voltage-Temperature Coefficient : $< -0.05\% / ^{\circ}\text{C}$

Insulation Resistance : 1000 Mega-ohm minimum

Hi Pot (Leads To Case, 1 Min.) : 2500 VDC

Typical Response Time : < 15 Nano-seconds

Epoxy Rating : 94V-0

Current / Energy Derating ($> 85^{\circ}\text{C}$) : $-2.5\% / ^{\circ}\text{C}$

DC Leakage Current : 200 μ A maximum (at rated DC working voltage)

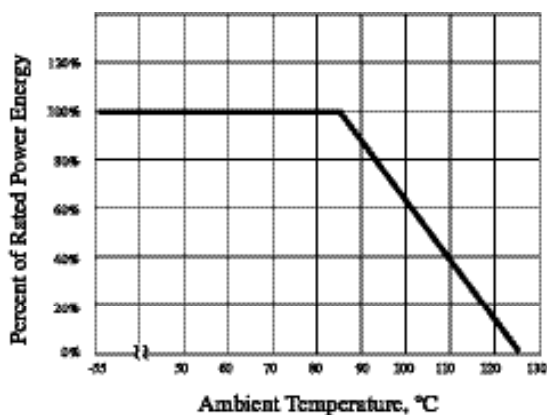
Solderability : MIL-STD-202F

Power Dissipation Ratings(P, in-watts) :

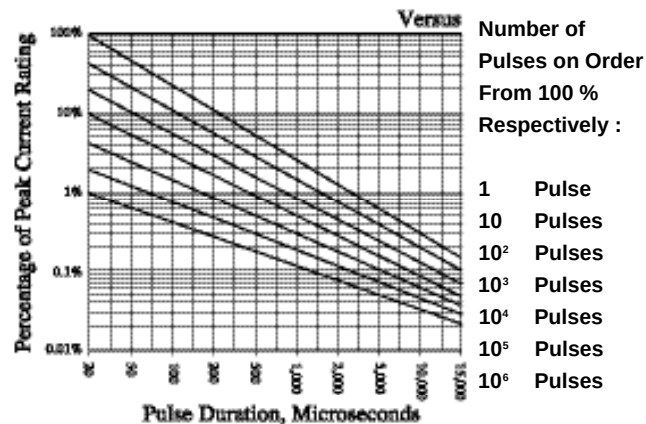
Disc Size	11Vac~40Vac	50Vac~680Vac
5mm	0.01	0.15
7mm	0.02	0.25
10mm	0.05	0.4
14mm	0.1	0.6
18mm	—	0.8
20mm	0.2	1.0
25mm	—	1.2
32mm	—	1.6
34mm(single)	—	2.1
34mm(dual)	—	2.73
40mm	—	2.1
53mm	—	2.5

All definitions are according to IEEE specifications C62.33.

Energy Derating Versus Temperature

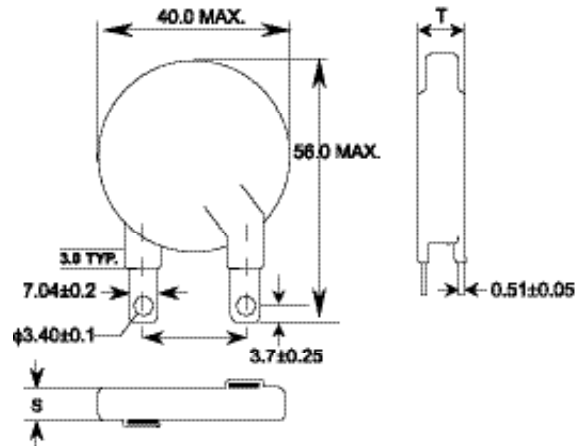


Peak Current Per Pulse Versus Pulse Duration

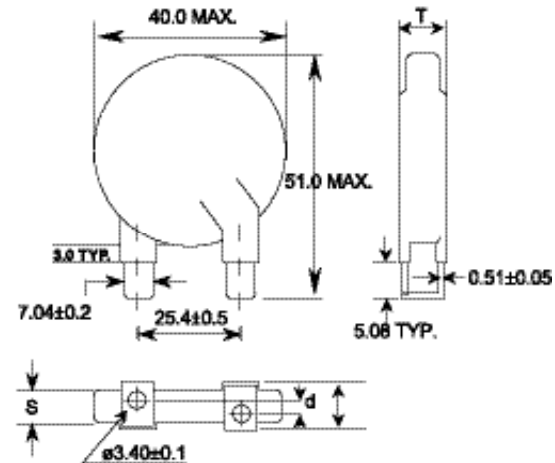


BIG SIZE VARISTOR – 32D SERIES

Straight Leads Part Number No Suffix



90° Bend Leads Part Number Suffix "Q"



Part Number	Maximum Ratings				Electrical Characteristics					Tmax.	s	d
	Continuous Rated Voltage		Rated Single Pulse Transient		Varistor Voltage @ 1mA DC		Maximum Clamping Voltage @ Test Current 8/20ms		Typical Capacitance @1KHZ 25°C			
	AC RMS Volts	DC Volts	Energy 10/1000µs Jules	Peak 8/20µs KAmps	Min Volts	Max Volts	Volts	Amps	PF			
SR201K32D □	130	175	210	30	184	224	340	200	4700	7.5	2.5±1.0	5.7±1.0
SR221K32D □	140	180	225	30	198	242	360	200	4300	7.5	2.5±1.0	5.5±1.0
SR241K32D □	150	200	240	30	216	264	395	200	4000	7.5	2.8±1.0	5.4±1.0
SR271K32D □	180	230	255	30	255	311	455	200	3500	8.5	2.8±1.0	5.2±1.0
SR331K32D □	210	275	300	30	297	363	550	200	3000	9.0	3.1±1.0	4.8±1.0
SR361K32D □	230	300	315	30	324	396	595	200	2800	9.0	3.3±1.0	4.6±1.0
SR391K32D □	250	330	330	30	351	429	650	200	2500	9.0	3.6±1.0	4.4±1.0
SR431K32D □	275	370	360	30	387	473	710	200	2200	9.0	3.6±1.0	4.2±1.0
SR471K32D □	300	385	380	30	423	517	775	200	2000	9.7	3.8±1.0	4.2±1.0
SR511K32D □	320	420	430	30	459	561	840	200	1900	9.7	3.8±1.0	4.0±1.0
SR621K32D □	390	505	470	30	558	682	1025	200	1600	9.7	4.3±1.0	3.9±1.0
SR681K32D □	420	560	495	30	612	748	1120	200	1500	9.7	4.6±1.0	3.6±1.0
SR751K32D □	460	615	520	30	675	825	1240	200	1400	10.5	4.8±1.0	3.3±1.0
SR781K32D □	485	640	550	30	702	858	1290	200	1300	10.5	4.8±1.0	3.1±1.0
SR821K32D □	510	675	580	30	738	902	1355	200	1200	10.5	5.1±1.0	2.9±1.0
SR911K32D □	550	745	620	30	819	1001	1500	200	1150	11.5	5.6±1.0	2.5±1.0
SR951K32D □	575	765	650	30	855	1043	1570	200	1100	11.5	5.6±1.0	2.3±1.0
SR102K32D □	625	825	680	30	900	1100	1650	200	1000	12.0	5.8±1.0	2.1±1.0
SR112K32D □	680	895	760	30	962	1175	1815	200	900	12.0	6.4±1.0	2.1±1.0

□ - Part Number Suffix Code (ie: SR201K32DML)

No suffix - Straight Lead

Q – 90° Bend Lead

F – Un-coated Disk – with Leads

ML – One Side coated Disk – with one Left Orientation Lead only

NL – Uncoated Disk – with one Left Orientation Lead only

L – Straight Lead – Left Side Lead Orientation

R – Uncoated Disk – without Leads

M – One Side Coated Disk – with one Right Orientation Lead only

N – Uncoated Disk – with one Right Orientation Lead only

UL 1449 recognized (File # E172311)

UL 1414 recognized (File # E182369)

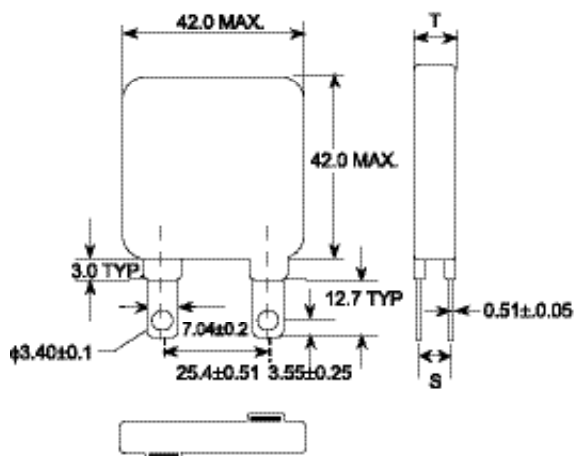
CSA 22.2 #1 certified (File #206608M000)

Approvals not applicable for uncoated disk product

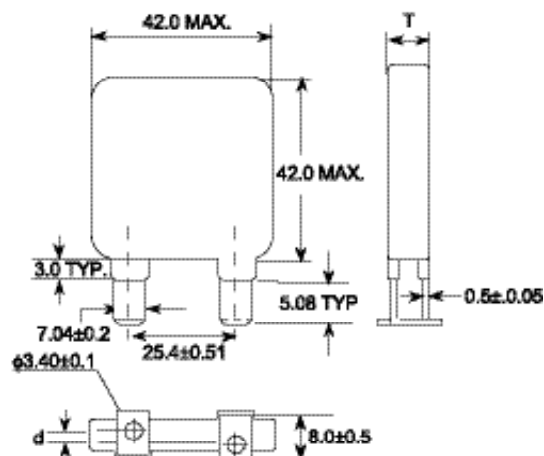
Packing: 1,000pcs per Walsin varistor standard carton listed in bulk packing section

BIG SIZE VARISTOR – 34MM SINGLE SERIES

Straight Leads Part Number No Suffix



90° Bend Leads Part Number Suffix "Q"



Part Number	Maximum Ratings				Electrical Characteristics					Tmax.	s	d
	Continuous Rated Voltage		Rated Single Pulse Transient		Varistor Voltage @ 1mA DC		Maximum Clamping Voltage @ Test Current 8/20ms		Typical Capacitance @1KHZ 25°C			
	AC RMS Volts	DC Volts	Energy 10/1000µs Jules	Peak 8/20µs KAmps	Min Volts	Max Volts	Volts	Amps	PF			
SR201K34R □	130	175	310	40	185	225	340	300	10000	7.5	2.5 ± 1.0	5.7 ± 1.0
SR221K34R □	140	180	330	40	198	242	360	300	9000	7.5	2.5 ± 1.0	5.5 ± 1.0
SR241K34R □	150	200	360	40	216	264	395	300	8000	7.5	2.8 ± 1.0	5.4 ± 1.0
SR271K34R □	180	230	390	40	255	311	455	300	7100	8.5	2.8 ± 1.0	5.2 ± 1.0
SR301K34R □	195	250	405	40	270	330	505	300	6500	9.0	3.0 ± 1.0	5.0 ± 1.0
SR331K34R □	210	275	430	40	297	363	550	300	6000	9.0	3.1 ± 1.0	4.8 ± 1.0
SR361K34R □	230	300	460	40	324	396	595	300	5600	9.0	3.3 ± 1.0	4.6 ± 1.0
SR391K34R □	250	330	490	40	351	429	650	300	5000	9.0	3.6 ± 1.0	4.4 ± 1.0
SR431K34R □	275	370	550	40	387	473	710	300	4500	9.0	3.6 ± 1.0	4.2 ± 1.0
SR471K34R □	300	385	600	40	423	517	775	300	4000	9.7	3.8 ± 1.0	4.2 ± 1.0
SR511K34R □	320	420	640	40	459	561	840	300	3800	9.7	3.8 ± 1.0	4.0 ± 1.0
SR561K34R □	360	470	710	40	522	638	910	300	3500	9.7	4.0 ± 1.0	4.0 ± 1.0
SR621K34R □	390	505	800	40	558	682	1025	300	3200	9.7	4.3 ± 1.0	3.9 ± 1.0
SR681K34R □	420	560	910	40	612	748	1120	300	2900	9.7	4.6 ± 1.0	3.6 ± 1.0
SR751K34R □	460	615	980	40	675	825	1240	300	2700	10.5	4.8 ± 1.0	3.3 ± 1.0
SR781K34R □	485	640	1020	40	702	858	1290	300	2500	10.5	5.1 ± 1.0	3.1 ± 1.0
SR821K34R □	510	675	1100	40	738	902	1355	300	2300	10.5	5.6 ± 1.0	2.9 ± 1.0
SR911K34R □	550	745	1150	40	819	1001	1500	300	2100	11.5	5.6 ± 1.0	2.5 ± 1.0
SR951K34R □	575	765	1200	40	855	1045	1570	300	1900	11.5	5.6 ± 1.0	2.3 ± 1.0
SR102K34R □	625	825	1250	40	900	1100	1650	300	1700	12.0	5.8 ± 1.0	2.1 ± 1.0
SR112K34R □	680	895	1350	40	962	1175	1815	300	1500	12.0	6.4 ± 1.0	2.1 ± 1.0

□ – Part Number Suffix Code (i.e.: SR201K34RML)

No suffix – Straight Lead

Q – 90° Bend Lead

F – Un-coated Disk – with Leads

ML – One Side coated Disk – with one Left Orientation Lead only

NL – Uncoated Disk – with one Left Orientation Lead only

L – Straight Lead – Left Side Lead Orientation

R – Uncoated Disk – without Leads

M – One Side Coated Disk – with one Right Orientation Lead only

N – Uncoated Disk – with one Right Orientation Lead only

UL 1449 recognized (File # 172311)

UL 1414 pending

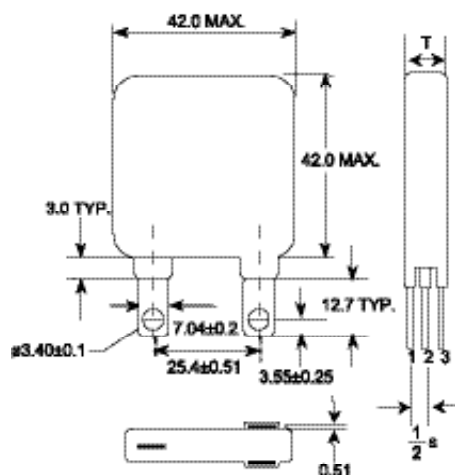
CSA 22.2 #1 recognized (File # 206608)

Approvals not applicable for uncoated disk product

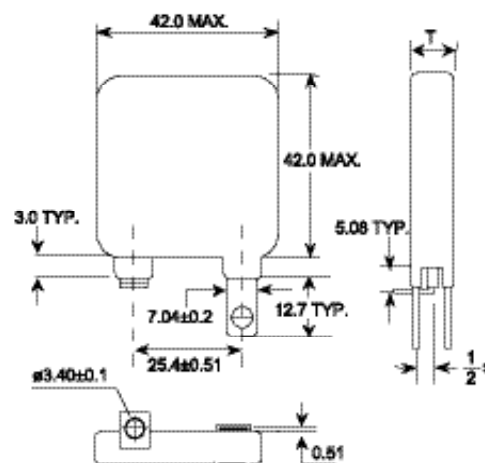
Packing: 1,000pcs per Walsin varistor standard carton listed in bulk packing section

BIG SIZE VARISTOR – 34MM DUAL SERIES

Straight Leads Part Number No Suffix



90° Bend Leads Part Number Suffix "Q"



Part Number	Maximum Ratings					Maximum Ratings					Tmax.	S
	Continuous Rated Voltage		Rated Single Pulse Transient			Varistor Voltage @ 1mA DC		Maximum Clamping Voltage @ Test Current 8/20ms		Typical Capacitance @1KHZ 25°C		
	AC RMS Volts	DC Volts	Energy	Peak		Min Volts	Max Volts	Volts	Amps	PF		
10/1000µs Jules			8/20µs KAmper Lead 1-3	8/20µs KAmper Lead 1-2 or 2-3								
SR221K34RD □	130	175	310	40	80	185	225	340	300	7900	9.1	4.1 ± 1.0
SR221K34RD □	140	180	330	40	80	198	242	360	300	7200	9.2	4.2 ± 1.0
SR241K34RD □	150	200	360	40	80	216	264	395	300	6600	9.3	4.6 ± 1.0
SR271K34RD □	180	230	390	40	80	255	311	455	300	5600	9.5	4.8 ± 1.0
SR301K34RD □	195	250	405	40	80	270	330	505	300	5200	10.5	5.2 ± 1.0
SR331K34RD □	210	275	430	40	80	297	363	550	300	4800	11.3	5.4 ± 1.0
SR361K34RD □	230	300	460	40	80	324	396	595	300	4400	11.5	5.8 ± 1.0
SR391K34RD □	250	330	490	40	80	351	429	650	300	4100	11.6	6.2 ± 1.0
SR431K34RD □	275	370	550	40	80	387	473	710	300	3800	11.9	6.5 ± 1.0
SR471K34RD □	300	385	600	40	80	423	517	775	300	3400	12.8	6.9 ± 1.0
SR511K34RD □	320	420	640	40	80	459	561	840	300	3200	13.1	7.2 ± 1.0
SR561K34RD □	360	470	710	40	80	522	638	910	300	2700	13.4	7.7 ± 1.0
SR621K34RD □	390	505	800	40	80	558	682	1025	300	2600	13.6	8.2 ± 1.0
SR681K34RD □	420	560	910	40	80	612	748	1120	300	2400	13.9	8.8 ± 1.0
SR751K34RD □	460	615	980	40	80	675	825	1240	300	2200	15.3	9.3 ± 1.0
SR781K34RD □	485	640	1020	40	80	702	858	1290	300	2100	15.5	9.6 ± 1.0
SR821K34RD □	510	675	1100	40	80	738	902	1355	300	2000	15.5	10.1 ± 1.0
SR911K34RD □	550	745	1150	40	80	819	1001	1500	300	1800	17.0	11.1 ± 1.0
SR951K34RD □	575	765	1200	40	80	855	1045	1570	300	1700	17.2	11.3 ± 1.0
SR102K34RD □	625	825	1250	40	80	900	1100	1650	300	1600	18.0	11.8 ± 1.0
SR112K34RD □	680	895	1350	40	80	962	1175	1815	300	1500	18.6	13.0 ± 1.0

□ - Part Number Suffix Code (ie: SR201K34RD)

No suffix - Straight Lead

Q – 90° Bend Lead

UL 1449 recognized (File # 172311)

UL 1414 pending

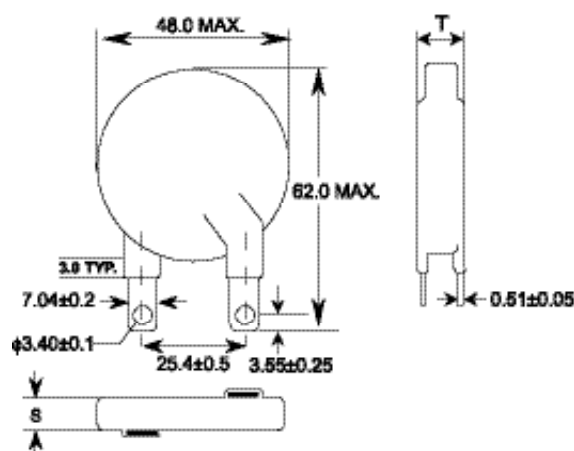
CSA 22.2 #1 recognized (File # 206608)

Approvals not applicable for uncoated disk product

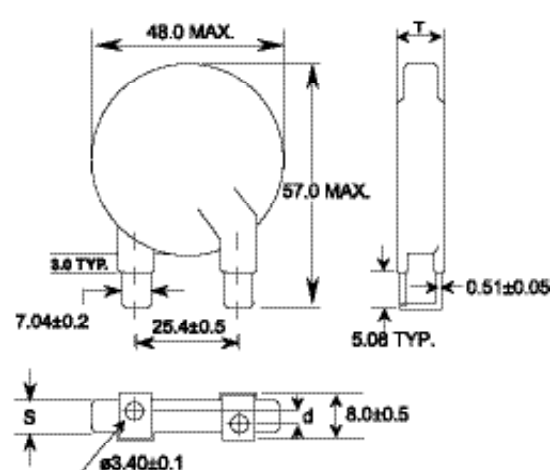
Packing: 1,000pcs per Walsin varistor standard carton listed in bulk packing section

BIG SIZE VARISTOR – 40D SERIES

Straight Leads Part Number No Suffix



90° Bend Leads Part Number Suffix "Q"



Part Number	Maximum Ratings				Maximum Ratings					Tmax.	S	D
	Continuous Rated Voltage		Rated Single Pulse Transient		Varistor Voltage @ 1mA DC		Maximum Clamping Voltage @ Test Current 8/20ms		Typical Capacitance @1KHZ 25°C			
	AC RMS Volts	DC Volts	Energy 10/1000µs Jules	Peak 8/20µs KAmps	Min Volts	Max Volts	Volts	Amps	PF			
SR201K40D □	130	175	310	40	185	225	340	300	10000	7.5	2.5±1.0	5.7±1.0
SR221K40D □	140	180	330	40	198	242	360	300	9000	7.5	2.5±1.0	5.5±1.0
SR241K40D □	150	200	360	40	216	264	395	300	8000	7.5	2.8±1.0	5.4±1.0
SR271K40D □	180	230	390	40	255	311	455	300	7100	8.5	2.8±1.0	5.2±1.0
SR331K40D □	210	275	460	40	297	363	550	300	6000	9.0	3.1±1.0	4.8±1.0
SR361K40D □	230	300	475	40	324	396	595	300	5600	9.0	3.3±1.0	4.6±1.0
SR391K40D □	250	330	490	40	351	429	650	300	5000	9.0	3.6±1.0	4.4±1.0
SR431K40D □	275	370	550	40	387	473	710	300	4500	9.0	3.6±1.0	4.2±1.0
SR471K40D □	300	385	600	40	423	517	775	300	4000	9.7	3.8±1.0	4.2±1.0
SR511K40D □	320	420	640	40	459	561	840	300	3800	9.7	3.8±1.0	4.0±1.0
SR621K40D □	390	505	800	40	558	682	1025	300	3300	9.7	4.3±1.0	3.9±1.0
SR681K40D □	420	560	910	40	612	748	1120	300	3000	9.7	4.6±1.0	3.6±1.0
SR751K40D □	460	615	920	40	675	825	1240	300	2600	10.5	4.8±1.0	3.3±1.0
SR781K40D □	485	640	930	40	702	858	1290	300	2500	10.5	4.8±1.0	3.1±1.0
SR821K40D □	510	675	940	40	738	902	1355	300	2300	10.5	5.1±1.0	2.9±1.0
SR911K40D □	550	745	960	40	819	1001	1500	300	2200	11.5	5.6±1.0	2.5±1.0
SR951K40D □	575	765	1000	40	855	1043	1570	300	2000	11.5	5.6±1.0	2.3±1.0
SR102K40D □	625	825	1055	40	900	1100	1650	300	1900	12.0	5.8±1.0	2.1±1.0
SR112K40D □	680	895	1155	40	962	1175	1815	300	1800	12.0	6.4±1.0	2.1±1.0

□ – Part Number Suffix Code (ie: SR201K40DQ)

No suffix - Straight Lead

Q – 90° Bend Lead

F – Un-coated Disk – with Leads

ML – One Side coated Disk – with one Left Orientation Lead only

NL – Uncoated Disk – with one Left Orientation Lead only

UL 1449 recognized (File # E172311)

UL 1414 recognized (File # E182369)

CSA 22.2 #1 certified (File #206608M000)

Approvals not applicable for uncoated disk product

Packing: 160 to 280 pcs, up to varistor voltage, per Walsin varistor standard carton listed in bulk packing section

L – Straight Lead – Left Side Lead Orientation

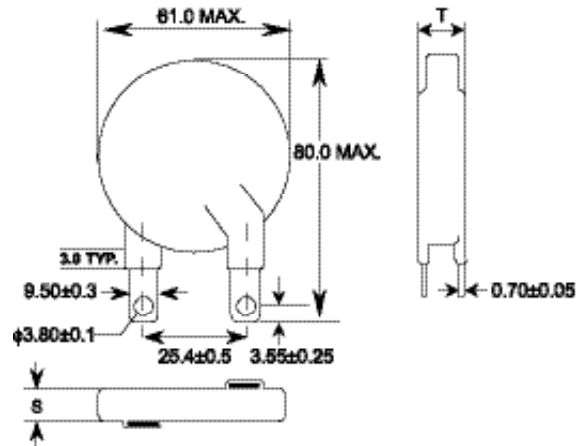
R – Uncoated Disk – without Leads

M – One Side Coated Disk – with one Right Orientation Lead only

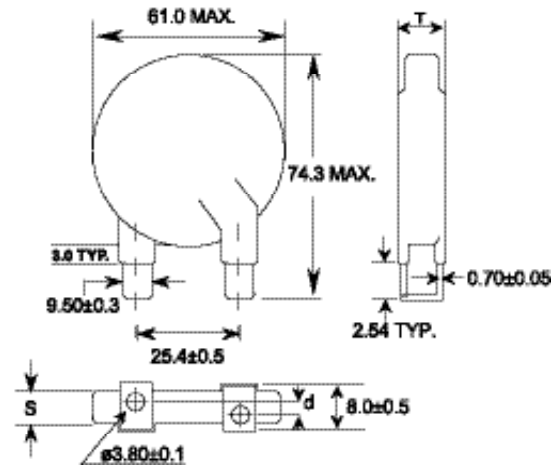
N – Uncoated Disk – with one Right Orientation Lead only

BIG SIZE VARISTOR – 53D SERIES

Straight Leads Part Number No Suffix



90° Bend Leads Part Number Suffix "Q"



Part Number	Maximum Ratings				Maximum Ratings						Tmax.	S	D
	Continuous Rated Voltage		Rated Single Pulse Transient		Varistor Voltage @ 1mA DC		Maximum Clamping Voltage @ Test Current 8/20ms		Typical Capacitance @1KHZ 25°C				
	AC RMS Volts	DC Volts	Energy 10/1000µs Jules	Peak 8/20µs KAmps	Min Volts	Max Volts	Volts	Amps	PF	mm			
SR201K53D □	130	175	490	70	185	225	340	500	15000	7.5	2.5±1.0	5.7 ± 1.0	
SR221K53D □	140	180	530	70	198	242	360	500	13800	7.5	2.5±1.0	5.5 ± 1.0	
SR241K53D □	150	200	570	70	216	264	395	500	12500	7.5	2.8±1.0	5.4 ± 1.0	
SR271K53D □	180	230	630	70	255	311	455	500	11000	8.5	2.8±1.0	5.2 ± 1.0	
SR331K53D □	210	275	680	70	297	363	550	500	9000	9.0	3.1±1.0	4.8 ± 1.0	
SR361K53D □	230	300	730	70	324	396	595	500	8500	9.0	3.3±1.0	4.6 ± 1.0	
SR391K53D □	250	330	880	70	351	429	650	500	7500	9.0	3.6±1.0	4.4 ± 1.0	
SR431K53D □	275	370	950	70	387	473	710	500	7000	9.0	3.6±1.0	4.2 ± 1.0	
SR471K53D □	300	385	1000	70	423	517	775	500	6500	9.7	3.8±1.0	4.2 ± 1.0	
SR511K53D □	320	420	1100	70	459	561	840	500	6000	9.7	3.8±1.0	4.0 ± 1.0	
SR561K53D □	360	470	1200	70	522	638	910	500	5600	9.7	4.3±1.0	4.0 ± 1.0	
SR621K53D □	390	505	1300	70	558	682	1025	500	5200	9.7	4.3±1.0	3.9 ± 1.0	
SR681K53D □	420	560	1500	70	612	748	1120	500	4800	9.7	4.6±1.0	3.6 ± 1.0	
SR751K53D □	460	615	1600	70	675	825	1240	500	4300	10.5	4.6±1.0	3.3 ± 1.0	
SR781K53D □	485	640	1650	70	702	858	1290	500	3900	10.5	4.8±1.0	3.1 ± 1.0	
SR821K53D □	510	675	1800	70	738	902	1355	500	3700	10.5	5.1±1.0	2.9 ± 1.0	
SR911K53D □	550	745	2000	70	819	1001	1500	500	3300	11.5	5.6±1.0	2.5 ± 1.0	
SR951K53D □	575	765	2100	70	855	1043	1570	500	3200	11.5	5.6±1.0	2.3 ± 1.0	
SR102K53D □	625	825	2200	70	900	1100	1650	500	3000	11.5	5.8±1.0	2.1 ± 1.0	
SR112K53D □	680	895	2500	70	962	1175	1815	500	2800	11.5	6.4±1.0	2.1 ± 1.0	
SR122K53D □	750	970	2700	70	1062	1300	1980	500	2700	12.6	7.0±1.0	1.5 ± 1.0	

□ – Part Number Suffix Code (ie: SR201K53DQ)

No suffix - Straight Lead

Q – 90° Bend Lead

F – Un-coated Disk – with Leads

ML – One Side coated Disk – with one Left Orientation Lead only

NL – Uncoated Disk – with one Left Orientation Lead only

UL 1449 recognized (File # 172311)

UL 1414 pending

CSA 22.2 #1 recognized (File # 206608)

Approvals not applicable for uncoated disk product

Packing: Please contact sales for packing information

L – Straight Lead – Left Side Lead Orientation

R – Uncoated Disk – without Leads

M – One Side Coated Disk – with one Right Orientation Lead only

N – Uncoated Disk – with one Right Orientation Lead only