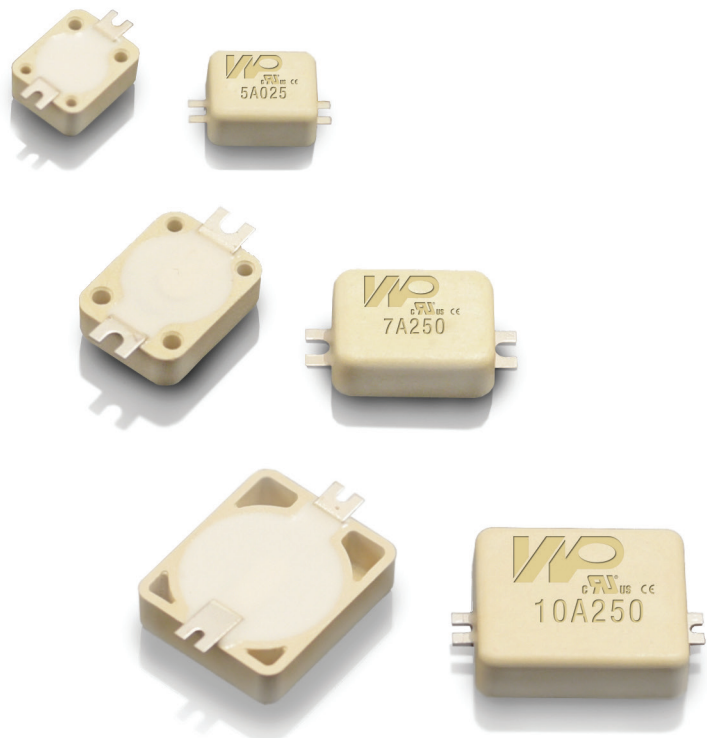


WP Surface Mount Varistor Series



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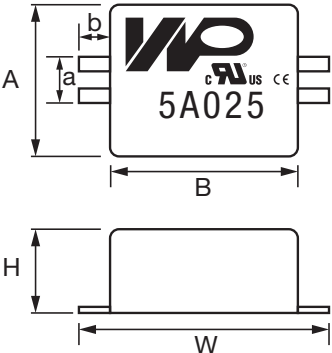
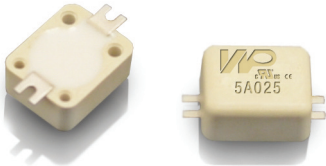
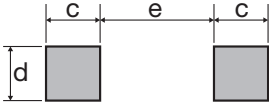
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Approvals

APPROVALS		5A011~5A350	7A011~7A510	10A011~10A510
UL and CUL 1449 ,Fourth Edition File #E321567		APPROVED	APPROVED	APPROVED
CE		APPROVED	APPROVED	APPROVED

Structure

WP05A Series

Item	Description		
Main Material	Metal Oxide Varistors (MOVs) are two-leaded, surface mounted components. Manufactured mainly from sintered zinc oxides and schematically equivalent to two back-to-back PN junctions, MOVs shunt surge currents by decreasing their resistance as transient voltage is applied.		
Package Type	Plastic enclosed and epoxy resin potted.		
Appearance	Without dirt and crack, marking should be clear.		
Dimensions		A	6.5±0.5
		B	8.0±0.5
		H	3.9±0.5
		W	10.4±1.0
		a	2.0±0.2
		b	1.2±0.2
			
Soldering Pad Layout		c	2.5
		d	2.5
		e	7.0

Electrical Characteristics

WP05A Series

Item	Performance	Test Methods
Standard Conditions		Unless otherwise specified, all tests are made under environmental conditions given below: Temperature: 20~35°C Relative Humidity: 45~85% RH
Maximum Continuous Operating Voltage (MCOV)		Maximum continuous AC sine wave (RMS) or DC voltage which may be applied.
Varistor Voltage		Varistors are connected to a variable voltage source adjusted to maintain a current of 1mA DC applied between 10 ms and 500 ms and the voltage across the varistor is measured.
Varistor Voltage Temperature Coefficient	-0.05 ~ +0.05%/°C	$\frac{V_{0.1mA \text{ at } 105} - V_{0.1mA \text{ at } 25^{\circ}C}}{V_{0.1mA \text{ at } 25^{\circ}C}} \times \frac{1}{60} \times 100 (\%/^{\circ}C)$
Max. Clamping Voltage		Peak voltage across the varistor with a specified peak impulse current of 8x20μs waveform.
Rated Power		Maximum 50~60Hz power which may be loaded for 1000 hrs at 105°±2°C with the varistor voltage change of less than ±10%.
Nominal Discharge Current (In)		Peak value of the current through the varistor having a current waveshape of 8x20μs where the varistor voltage change less than ±10% after applied 15 surges with intervals of 1 minute.
Withstanding Surge Current		Peak value of the current through the varistor having a current waveshape of 8x20μs where the varistor voltage change is less than ±10% after applied one or two times with intervals of 5 minutes.
Energy		The max. energy absorbed with the varistor voltage change less than ±10% when one impulse current waveform 10x1000μs is applied
Typical Capacitance (Reference)		Capacitance shall be measured at 1kHz ±10%, 1 Vrms max. (1MHz below 100pF) 0V bias and 20±2°C.

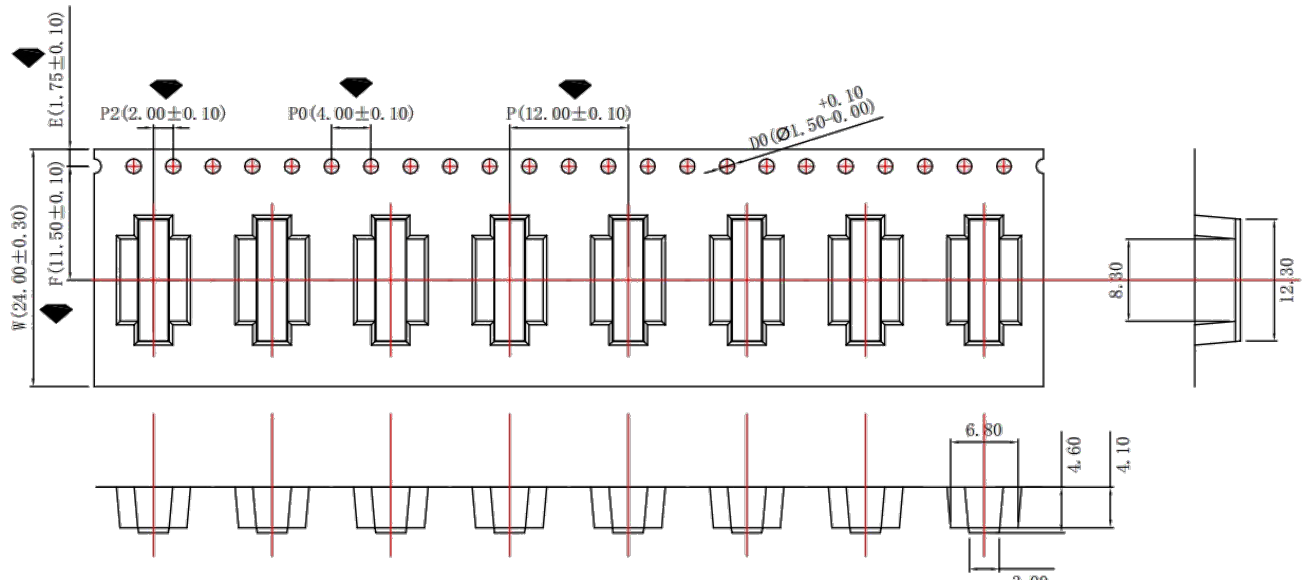
Specifications

WP05A Series

Part Number	Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Maximum Rated Wattage	Surge Current 8/20 μs		Maximum Energy (10/1000μs)	Typical Capacitance at 1MHz
	AC _{rms} (V)	DC (V)	(V)	(V)	Ip (A)	(W)	In	I _{max}	W _{tm} (joule)	@1kHz (pf)
							(A) 15 times	(A) 1 time		
WP05A011	11	14	16~21.5	40	1	0.01	150	250	0.6	1400
WP05A014	14	18	20~26	48					0.7	1150
WP05A017	17	22	24~31	60					0.9	930
WP05A020	20	26	30~36	73					1.1	760
WP05A025	25	31	35~43	86					1.2	640
WP05A030	30	38	42~52	104					1.5	530
WP05A035	35	45	50~62	123					1.8	450
WP05A040	40	56	61~75	150					2.2	370
WP05A050	50	65	74~90	145	5	0.1	500	800	3.5	300
WP05A060	60	85	90~110	175					4.0	250
WP05A075	75	100	108~132	210					5.0	210
WP05A095	95	125	135~165	260					6.5	165
WP05A115	115	150	162~198	320					8.0	140
WP05A130	130	170	185~225	355					8.5	125
WP05A140	140	180	198~242	380					9.0	110
WP05A150	150	200	216~264	415					10.5	100
WP05A175	175	225	243~297	475					11.0	95
WP05A190	190	250	270~330	525					12.0	85
WP05A210	210	275	297~363	570					13.0	75
WP05A230	230	300	324~396	620					16.0	70
WP05A250	250	320	351~429	675					17.0	65
WP05A275	275	350	387~473	745					20.0	60
WP05A300	300	385	423~517	810					21.0	55
WP05A320	320	415	459~561	845					22.5	50
WP05A350	350	460	504~616	920					24.0	45

Tape Dimensions

WP05A Series



Packing Length per 13" Reel: 12.576 meters.

Component Load per 13" Reel: 1000 pcs.

Environmental Characteristics

WP05A Series

Item	Performance	Test Methods
Climate Sequence	$V_{0.1mA} / V_{0.1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $\geq 1M\Omega$.	IEC 60068-2-2, Test B _a Dry Heat: 105±2°C / 16 hrs IEC60068-2-30, Test D _b Damp Heat, cyclic (first cycle): 55±2°C / 24 hrs., 93±3% RH IEC60068-2-1, Test A _a Cold: -40±2°C / 2 hrs IEC60068-2-30, Test D _b Damp Heat, cyclic (remaining 5 cycles): 55±2°C / 25±2°C, 93±3% RH 24 hrs. / cycle
Damp Heat, Steady State	$V_{0.1mA} / V_{0.1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $1M\Omega$.	IEC 60068-2-78, Test B _a Temperature: 40±2°C Humidity: 93±3% RH Duration: 56 days
Rapid Change in Temperature	$V_{0.1mA} / V_{0.1mA} \leq \pm 10\%$ No visible damage.	IEC 60068-2-14, Test N _a T _A = 40°C; T _B = +105°C Duration: 30 minutes/step Total: 5 cycles
Dry Heat, Loading	$V_{0.1mA} / V_{0.1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $\geq 10M\Omega$.	IEC 60068-2-2, Test B Temperature: 105°C Duration: 1000 hrs Apply Voltage: Max. allowable voltage
Damp heat, Loading	$V_{0.1mA} / V_{0.1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $\geq 1M\Omega$.	IEC 60068-2-78, Test C _a Temperature: 40±2°C Humidity: 93±3% RH Duration: 56 days Apply Voltage: 10% of Max. allowable DC voltage

Mechanical Characteristics

WP05A Series

Item	Requirements	Test Specifications
Vibration	$V_{0.1mA} / V_{0.1mA} \leq \pm 5\%$ for No visible damage.	IEC 60068-2-6, Test F _c Method B4 Frequency range: 10~55Hz Amplitude: 0.75mm or 98 m/s ² Duration: 6 hrs (3 x 2 hrs) Pulse: sine wave
Solderability	95% of the immersed portion cover with solder.	IEC 60068-2-20, Test T _a Method 1 Solder Temp.: 245±5°C Immersed Time: 3±0.5 sec
Resistance to Soldering Heat	$V_{0.1mA} / V_{0.1mA} \leq \pm 5\%$ No visible damage.	IEC 60068-2-20, Test T _b Method 1A Solder Temp.: 260±5°C Immersed Time: 10±1 sec
Robustness of Terminations, Tensile	$V_{0.1mA} / V_{0.1mA} \leq \pm 5\%$ No break of solder joint, no wire break.	IEC 60068-2-21, Test U _{a1} Force: 1 kg _f for 0.6 and 0.8mm wire 2 kg _f for 1.0mm wire Duration: 10 sec
Shock	$V_{0.1mA} / V_{0.1mA} \leq \pm 5\%$ No visible damage.	IEC 60068-2-27, Test E _a Pulse Shape: half sine Acceleration: 49 m/s ² Pulse Duration: 11 ms 3 x 6 shocks

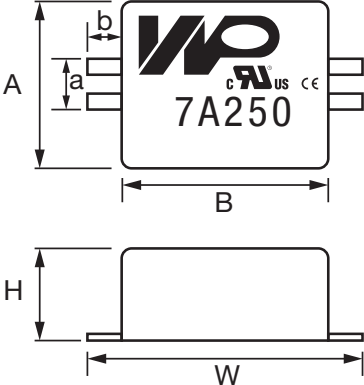
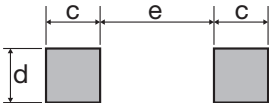
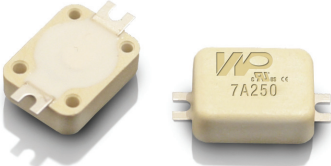
Technical Term

WP05A Series

Item	Specifications	Description
Operating Temperature Range	-40°C to 105°C	Operating temperature without derating.
Storage Temperature Range	-40°C to 125°C	Storage temperature range without voltage applied.
Transient Reponse Time	-50 ns	Time lag between application of surge and varistor's "turn-on" conduction action.
Insulation Resistance	10,000 M minimum	Minimum resistance between shorted terminals and varistor surface.
Hipot Test	2500VAc	Minimum voltage applied for one minute between shorted terminals and varistor surface.

Structure

WP07A Series

Item	Description		
Main Material	Metal Oxide Varistors (MOVs) are two-leaded, surface mounted components. Manufactured mainly from sintered zinc oxides and schematically equivalent to two back-to-back PN junctions, MOVs shunt surge currents by decreasing their resistance as transient voltage is applied.		
Package Type	Plastic enclosed and epoxy resin potted.		
Appearance	Without dirt and crack, marking should be clear.		
Dimensions		A	8.3±0.5
		B	10.6±0.5
		a	3.0±0.2
		b	1.5±0.2
		W	13.8±1.0
		H (max)	7A011~7A300 4.4 7A320~7A510 8.0
Soldering Pad Layout			
		c	2.5
		d	3.5
		e	9.2

Electrical Characteristics

WP07A Series

Item	Performance	Test Methods
Standard Conditions		Unless otherwise specified, all tests are made under environmental conditions given below: Temperature: 20~35°C Relative Humidity: 45~85% RH
Maximum Continuous Operating Voltage (MCOV)		Maximum continuous AC sine wave (RMS) or DC voltage which may be applied.
Varistor Voltage		Varistors are connected to a variable voltage source adjusted to maintain a current of 1mA DC applied between 10 ms and 500 ms and the voltage across the varistor is measured.
Varistor Voltage Temperature Coefficient	-0.05 ~ +0.05%/°C	$\frac{V_{1mA} \text{ at } 105^{\circ}\text{C} - V_{1mA} \text{ at } 25^{\circ}\text{C}}{V_{1mA} \text{ at } 25^{\circ}\text{C}} \times \frac{1}{60} \times 100 (\%/^{\circ}\text{C})$
Max. Clamping Voltage		Peak voltage across the varistor with a specified peak impulse current of 8x20μs waveform.
Rated Power		Maximum 50~60Hz power which may be loaded for 1000 hrs at 105°±2°C with the varistor voltage change of less than ±10%.
Nominal Discharge Current (In)		Peak value of the current through the varistor having a current waveshape of 8x20μs where the varistor voltage change less than ±10% after applied 15 surges with intervals of 1 minute.
Withstanding Surge Current		Peak value of the current through the varistor having a current waveshape of 8x20μs where the varistor voltage change is less than ±10% after applied one time.
Energy		The max. energy absorbed with the varistor voltage change less than ±10% when one impulse current waveform 10x1000μs is applied
Typical Capacitance (Reference)		Capacitance shall be measured at 1kHz ±10%, 1 Vrms max. (1MHz below 100pF) 0V bias and 20±2°C.

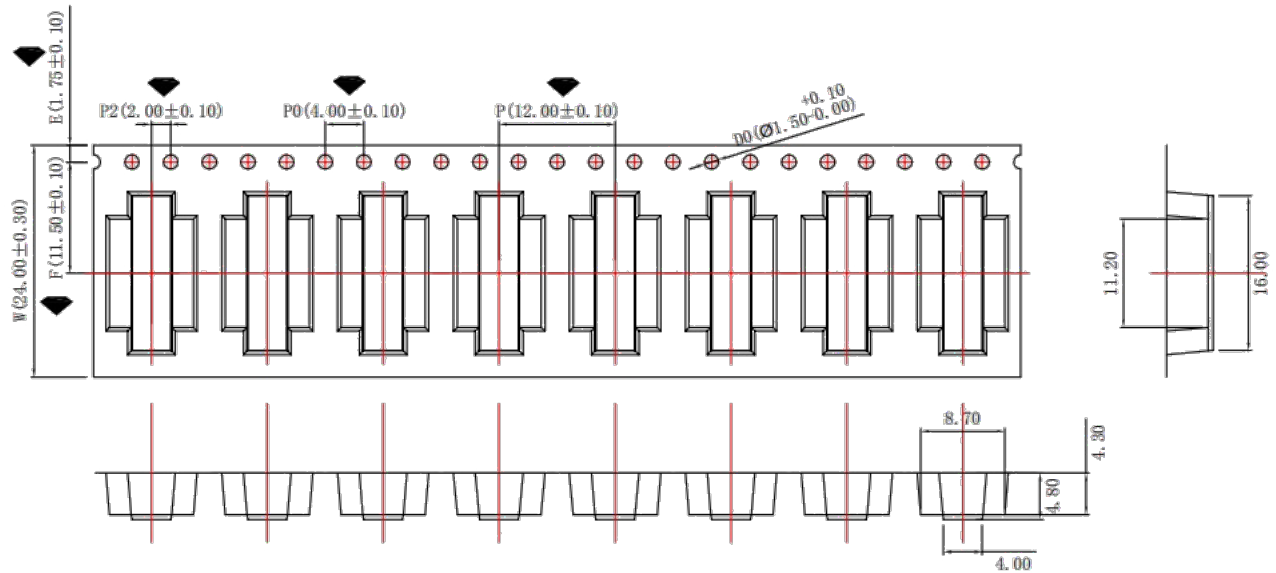
Specifications

WP07A Series

Part Number	Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Maximum Rated Wattage	Surge Current 8/20 μs		Maximum Energy (10/1000μs)	Typical Capacitance Reference
	AC (V)	DC (V)	Vn (V)	(V)	Ip (A)	(W)	In	I _{max}	(Joule)	(pF)
							(A) 15 times	(A) 1 time		
WP07A011	11	14	16~21.5	36	2.5	0.02	250	500	2.0	2800
WP07A014	14	18	20~26	43					2.4	2300
WP07A017	17	22	24~31	53					3.0	1800
WP07A020	20	26	30~36	65					3.5	1500
WP07A025	25	31	35~43	77					4.0	1300
WP07A030	30	38	42~52	93					5.0	1100
WP07A035	35	45	50~62	110					6.0	890
WP07A040	40	56	61~75	135					7.0	740
WP07A050	50	65	74~90	135	10	0.25	1000	1750	10.0	600
WP07A060	60	85	90~110	165					12.0	500
WP07A075	75	100	108~132	200					13.0	420
WP07A095	95	125	135~165	250					15.0	330
WP07A115	115	150	162~198	300					16.0	280
WP07A130	130	170	185~225	340					17.0	250
WP07A140	140	180	198~242	360					19.0	230
WP07A150	150	200	216~264	395					21.0	210
WP07A175	175	225	243~297	455					24.0	185
WP07A190	190	250	270~330	505					26.0	165
WP07A210	210	275	297~363	550					28.0	150
WP07A230	230	300	324~396	595					32.0	140
WP07A250	250	320	351~429	650					35.0	130
WP07A275	275	350	387~473	710					40.0	115
WP07A300	300	385	423~517	775					42.0	105
WP07A320	320	415	459~561	845					45.0	100
WP07A350	350	460	504~616	925					49.0	90
WP07A385	385	505	558~682	1025					55.0	80
WP07A420	420	560	612~748	1120					60.0	75
WP07A460	460	615	645~825	1240					64.0	70
WP07A485	485	640	702~858	1290					69.0	65
WP07A510	510	670	738~902	1355					73.0	60

Tape Dimensions

WP07A Series



Packing Length per 13" Reel: 12.576 meters.

Component Load per 13" Reel: 1000 pcs.

Environmental Characteristics

WP07A Series

Item	Performance	Test Methods
Climate Sequence	$\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $\geq 1M\Omega$.	IEC 60068-2-2, Test B _a Dry Heat: 105±2°C / 16 hrs IEC60068-2-30, Test D _b Damp Heat, cyclic (first cycle): 55±2°C / 24 hrs., 93±3% RH IEC60068-2-1, Test A _a Cold: -40±2°C / 2 hrs IEC60068-2-30, Test D _b Damp Heat, cyclic (remaining 5 cycles): 55±2°C / 25±2°C, 93±3% RH 24 hrs. / cycle
Damp Heat, Steady State	$V_{1mA} / V_{1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $\geq 1M\Omega$.	IEC 60068-2-78, Test B _a Temperature: 40±2°C Humidity: 93±3% RH Duration: 56 days
Rapid Change in Temperature	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ No visible damage.	IEC 60068-2-14, Test N _a T _A = 40°C; T _B = +105°C Duration: 30 minutes/step Total: 5 cycles
Dry Heat, Loading	$V_{1mA} / V_{1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $\geq 10M\Omega$.	IEC 60068-2-2, Test B Temperature: 105°C Duration: 1000 hrs Apply Voltage: Max. allowable voltage
Damp heat, Loading	$\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $\geq 1M\Omega$.	IEC 60068-2-78, Test C _a Temperature: 40±2°C Humidity: 93±3% RH Duration: 56 days Apply Voltage: 10% of Max. allowable DC voltage

Mechanical Characteristics

WP07A Series

Item	Requirements	Test Specifications
Vibration	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ No visible damage.	IEC 60068-2-6, Test Fc Method B4 Frequency range: 10~55Hz Amplitude: 0.75mm or 98 m/s ² Duration: 6 hrs (3 x 2 hrs) Pulse: sine wave
Solderability	95% of the immersed portion cover with solder.	IEC 60068-2-20, Test Ta Method 1 Solder Temp.: 245±5°C Immersed Time: 3±0.5 sec
Resistance to Soldering Heat	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ No visible damage.	IEC 60068-2-20, Test Tb Method 1A Solder Temp.: 260±5°C Immersed Time: 10±1 sec
Robustness of Terminations, Tensile	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ No break of solder joint, no wire break.	IEC 60068-2-21, Test Ua1 Force: 1 kgf for 0.6 and 0.8 φmm wire 2 kgf for 1.0 φmm wire Duration: 10 sec
Shock	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ No visible damage.	IEC 60068-2-27, Test Ea Pulse Shape: half sine Acceleration: 49 m/s ² Pulse Duration: 11 ms 3 x 6 shocks

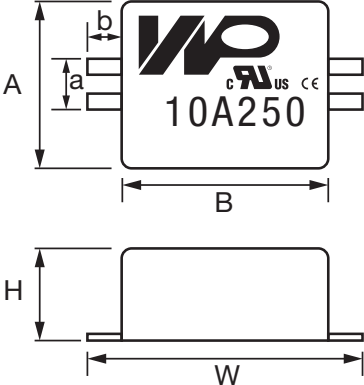
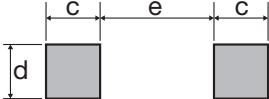
Technical Term

WP07A Series

Item	Specifications	Description
Operating Temperature Range	-40°C to 105°C	Operating temperature without derating.
Storage Temperature Range	-40°C to 125°C	Storage temperature range without voltage applied.
Transient Reponse Time	<50 ns	Time lag between application of surge and varistor's "turn-on" conduction action.
Insulation Resistance	10,000 M minimum	Minimum resistance between shorted terminals and varistor surface.
Hipot Test	≥2500VAc	Minimum voltage applied for one minute between shorted terminals and varistor surface.

Structure

WP10A Series

Item	Description		
Main Material	Metal Oxide Varistors (MOVs) are two-leaded, surface mounted components. Manufactured mainly from sintered zinc oxides and schematically equivalent to two back-to-back PN junctions, MOVs shunt surge currents by decreasing their resistance as transient voltage is applied.		
Package Type	Plastic enclosed and epoxy resin potted.		
Appearance	Without dirt and crack, marking should be clear.		
Dimensions		A	14.0±0.5
		B	16.6±0.5
		a	3.0±0.2
		b	1.5±0.2
		W	19.6±1.0
		H (max)	10A011~10A300 5.5 10A320~10A510 11.5
Soldering Pad Layout			
		c	2.5
		d	4.0
		e	16.6

Electrical Characteristics

WP10A Series

Item	Performance	Test Methods
Standard Conditions		Unless otherwise specified, all tests are made under environmental conditions given below: Temperature: 20~35°C Relative Humidity: 45~85% RH
Maximum Continuous Operating Voltage (MCOV)		Maximum continuous AC sine wave (RMS) or DC voltage which may be applied.
Varistor Voltage		Varistors are connected to a variable voltage source adjusted to maintain a current of 1mA DC applied between 10 ms and 500 ms and the voltage across the varistor is measured.
Varistor Voltage Temperature Coefficient	-0.05 ~ +0.05%/°C	$\frac{V_{1mA} \text{ at } 105^{\circ}\text{C} - V_{1mA} \text{ at } 25^{\circ}\text{C}}{V_{1mA} \text{ at } 25^{\circ}\text{C}} \times \frac{1}{60} \times 100 (\%/^{\circ}\text{C})$
Max. Clamping Voltage		Peak voltage across the varistor with a specified peak impulse current of 8x20μs waveform.
Rated Power		Maximum 50~60Hz power which may be loaded for 1000 hrs at 105°±2°C with the varistor voltage change of less than ±10%.
Nominal Discharge Current (In)		Peak value of the current through the varistor having a current waveshape of 8x20μs where the varistor voltage change less than ±10% after applied 15 surges with intervals of 1 minute.
Withstanding Surge Current		Peak value of the current through the varistor having a current waveshape of 8x20μs where the varistor voltage change is less than ±10% after applied one time.
Energy		The max. energy absorbed with the varistor voltage change less than ±10% when one impulse current waveform 10x1000μs is applied
Typical Capacitance (Reference)		Capacitance shall be measured at 1kHz ±10%, 1 Vrms max. (1MHz below 100pF) 0V bias and 20±2°C.

SURFACE MOUNT VARISTOR SERIES

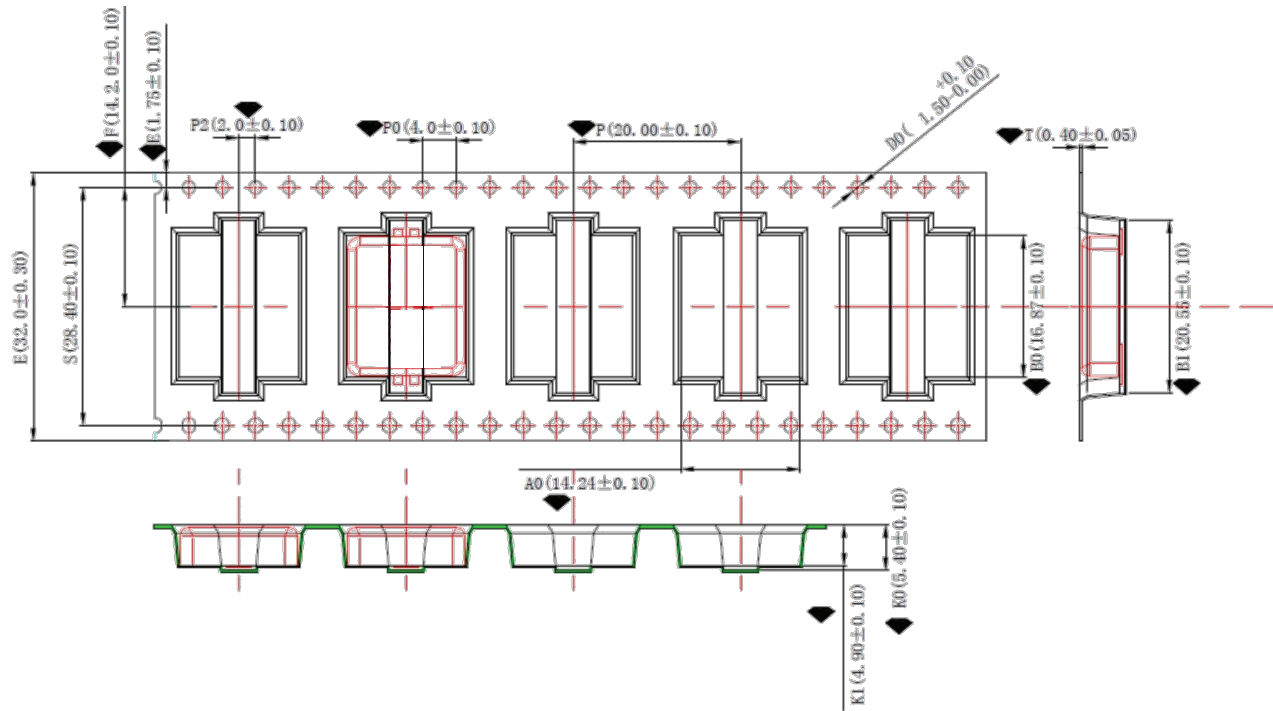
Specifications

WP10A Series

Part Number	Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Maximum Rated Wattage	Surge Current 8/20 μ s		Maximum Energy (10/1000 μ s)	Typical Capacitance Reference
	AC (V)	DC (V)	V _n (V)	(V)	I _p (A)	(W)	In	I _{max}	(Joule)	(pF)
							(A) 15 times	(A) 1 time		
WP10A011	11	14	16~21.5	36	5	0.05	500	1000	2.1	6700
WP10A014	14	18	20~26	43					2.5	5400
WP10A017	17	22	24~31	53					3.0	4400
WP10A020	20	26	30~36	65					4.0	3600
WP10A025	25	31	35~43	77					4.6	2900
WP10A030	30	38	42~52	93					5.5	2500
WP10A035	35	45	50~62	110					7.0	2200
WP10A040	40	56	61~75	135					8.2	1800
WP10A050	50	65	74~90	135	25	0.4	3000	3500	12.0	1560
WP10A060	60	85	90~110	165					15.0	1300
WP10A075	75	100	108~132	200					18.0	1080
WP10A095	95	125	135~165	250					22.0	870
WP10A115	115	150	162~198	300					27.0	730
WP10A130	130	170	185~225	340					30.0	650
WP10A140	140	180	198~242	360					32.0	590
WP10A150	150	200	216~264	395					35.0	550
WP10A175	175	225	243~297	455					37.0	480
WP10A190	190	250	270~330	500					40.0	430
WP10A210	210	275	297~363	550					43.0	390
WP10A230	230	300	324~396	595					47.0	360
WP10A250	250	320	351~429	650					60.0	340
WP10A275	275	350	387~473	710					65.0	300
WP10A300	300	385	423~517	775					67.0	270
WP10A320	320	410	459~561	845					69.0	260
WP10A350	350	460	504~616	925					70.0	230
WP10A385	385	505	558~682	1025					72.0	210
WP10A420	420	560	612~748	1120					75.0	200
WP10A440	440	585	639~781	1180					76.0	180
WP10A460	460	615	675~825	1240					77.0	170
WP10A485	485	640	702~858	1290					80.0	160
WP10A510	510	670	738~902	1355					85.0	160

Tape Dimensions

WP10A Series



Packing Length per 13" Reel: 10.6 meters.

Component Load per 13" Reel: 500 pcs.

Environmental Characteristics

WP10A Series

Item	Performance	Test Methods
Climate Sequence	$\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $\geq 1M\Omega$.	IEC 60068-2-2, Test B _a Dry Heat: 105±2°C / 16 hrs IEC60068-2-30, Test D _b Damp Heat, cyclic (first cycle): 55±2°C / 24 hrs., 93±3% RH IEC60068-2-1, Test A _a Cold: -40±2°C / 2 hrs IEC60068-2-30, Test D _b Damp Heat, cyclic (remaining 5 cycles): 55±2°C / 25±2°C, 93±3% RH 24 hrs. / cycle
Damp Heat, Steady State	$V_{1mA} / V_{1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $\geq 1M\Omega$.	IEC 60068-2-78, Test B _a Temperature: 40±2°C Humidity: 93±3% RH Duration: 56 days
Rapid Change in Temperature	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ No visible damage.	IEC 60068-2-14, Test N _a T _A = 40°C; T _B = +105°C Duration: 30 minutes/step Total: 5 cycles
Dry Heat, Loading	$V_{1mA} / V_{1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $\geq 10M\Omega$.	IEC 60068-2-2, Test B Temperature: 105°C Duration: 1000 hrs Apply Voltage: Max. allowable voltage
Damp heat, Loading	$\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$ No visible damage. Insulation resistance $\geq 1M\Omega$.	IEC 60068-2-78, Test C _a Temperature: 40±2°C Humidity: 93±3% RH Duration: 56 days Apply Voltage: 10% of Max. allowable DC voltage

Mechanical Characteristics

WP10A Series

Item	Requirements	Test Specifications
Vibration	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ No visible damage.	IEC 60068-2-6, Test Fc Method B4 Frequency range: 10~55Hz Amplitude: 0.75mm or 98 m/s ² Duration: 6 hrs (3 x 2 hrs) Pulse: sine wave
Solderability	95% of the immersed portion cover with solder.	IEC 60068-2-20, Test Ta Method 1 Solder Temp.: 245±5°C Immersed Time: 3±0.5 sec
Resistance to Soldering Heat	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ No visible damage.	IEC 60068-2-20, Test Tb Method 1A Solder Temp.: 260±5°C Immersed Time: 10±1 sec
Robustness of Terminations, Tensile	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ No break of solder joint, no wire break.	IEC 60068-2-21, Test Ua1 Force: 1 kgf for 0.6 and 0.8 φmm wire 2 kgf for 1.0 φmm wire Duration: 10 sec
Shock	$\Delta V_{1mA} / V_{1mA} \leq \pm 5\%$ No visible damage.	IEC 60068-2-27, Test Ea Pulse Shape: half sine Acceleration: 49 m/s ² Pulse Duration: 11 ms 3 x 6 shocks

Technical Term

WP10A Series

Item	Specifications	Description
Operating Temperature Range	-40°C to 105°C	Operating temperature without derating.
Storage Temperature Range	-40°C to 125°C	Storage temperature range without voltage applied.
Transient Reponse Time	<50 ns	Time lag between application of surge and varistor's "turn-on" conduction action.
Insulation Resistance	10,000 M minimum	Minimum resistance between shorted terminals and varistor surface.
Hipot Test	≥2500VAc	Minimum voltage applied for one minute between shorted terminals and varistor surface.

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