

Panasonic

Circuit Protection Line Card Catalog



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CIRCUIT PROTECTION

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Thermistors

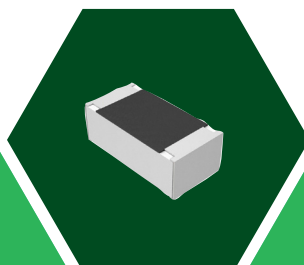
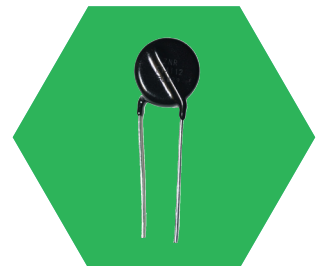
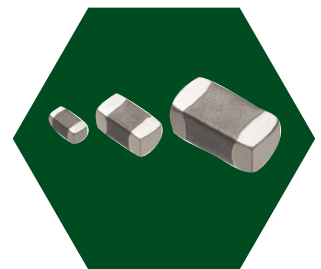
ZNR Surge Absorbers

Varistors

Varistor Arrays

Pyrolytic Graphite Sheet (PGS)

EMI Filters



	Series	Case Size (EIA) LxWxH (mm)	Electrical Characteristics	Operating Temperature	Features
Thermistors	ERT-JZ	0201 (0.6 x 0.3 x 0.3)	Nominal Resistance $\bar{R}$ 2K ~ 100 K	-40 ~ +125°C	• Surface Mount 0201, 0402, 0603 • Highly Reliable • Multi-layer & Monolithic available • Lead Free (RoHS)
	ERT-J0	0402 (1.0 x 0.5 x 0.5)	Nominal Resistance $\bar{R}$ 22 ~ 470 K	Power Dissipation 33 mW ~ 100mW	
	ERT-J1	0603 (1.6 x 0.8 x 0.8)	Nominal Resistance $\bar{R}$ 22 ~ 150 K	Dissipation Factor 1 mW/°C ~ 3m W/°C	

	Series	Case Size (EIA) LxWxH (mm)	Electrical Characteristics	Operating Temperature	Features
ZNR Surge Absorbers	Leaded	ERZExxA	Varistor voltages 200 to 1800 VDC Max Peak Currents 1200 to 10000A	-40 ~ +85°C	• Safety Agency recognized • Replace next larger V Series devices
		ERZ-VxxD	Varistor Voltages: 18 to 1,800 VDC Max. Peak Currents: 125 to 6,500 A		• Large energy handling capabilities • UL / VDE / CSA Safety Certifications • QS9000
		ERZ-VS34Cxx	Varistor Voltages: 170-765 VDC		• Very large surge withstand capability • Fast response to steep impulse voltage • Low clamping voltage for better surge protection
		ERZ-CxxCk	VAC 130 to 575 vms		• UL and CSA recognized • High energy handling capability (210 to 750 joules) • Common terminals for mounting and electrical connections
	Surface Mount	ERZ-VF	Varistor Voltages: 22 ~ 470 VDC Max. Peak Currents: 125 to 300 A		• Flow (wave) / Reflow soldering • UL (Pending)
		EZJ-Z0	Varistor Voltages: 12 ~ 170 VDC Capacitance: 1 ~ 220 pF Max. 8 kV Max. ESD Capability		• Small case sizes • Low capacitance loading • Ideal for high speed signal lines
		EZJ-Z1	Varistor Voltages: 12 ~ 170 VDC Capacitance: 1 ~ 330 pF Max. 8 kV Max. ESD Capability		• 2 Varistors per array • Part count reduction • Board space savings
		EZJ-ZS	Varistor Voltages: 12 ~ 170 VDC Capacitance: 3 ~ 220 pF Max. 8 kV Max. ESD Capability		
		EZJ-P0	Varistor Voltages: 8 VDC Capacitance: 27 ~ 680 pF Max. 8 kV Max. ESD Capability		• 4 Varistors per array • Part count reduction • Board space savings • Excellent ESD Suppression
		EZJ-S1	Varistor Voltages: 12 ~ 50 VDC Capacitance: 1,800 ~ 8,200 pF Max. 30 kV Max. ESD Capability		• High ESD capabilities
		EZJ-S2	Varistor Voltages: 12 ~ 50 VDC Capacitance: 4,700 ~ 22,000 pF Typical 30 kV Max. ESD Capability		• High ESD capabilities
	Strontium Titanate				
Varistors	Surface Mount				

		Type	Part Number	Case Size	Varistor Voltage	Max. Allowable Voltage (DC)	Capacitance	Maximum ESD [IE061000-4-2]
Varistors	Low Capacitance		EZJ-ZOV80010	0402	80 V	10 V	1 pF max	Contact Discharge Voltage: 8 kV
			EZJ-ZOV80015D	0402	80 V	5 V	1.5 ± 0.5	
			EZJ-ZOV500AA	0402	50 V	5 V	3 pF max	
			EZJ-ZOV800AA	0402	80 V	18 V	3 pF max	
			EZJ-ZOV171AA	0402	170 V	18 V	3 pF max	
			EZJ-Z1V80010	0603	80 V	10 V	1 pF max	
			EZJ-Z1V500AA	0603	50 V	5 V	3 pF max	
			EZJ-Z1V800AA	0603	80 V	18 V	3 pF max	
			EZJ-Z1V171AA	0603	170 V	18 V	3 pF max	
			EZJ-Z1V330GA	0603	33 V	26 V	100 pF max	
	Standard		EZJ-PZV6R8JA	0201	6.8 V	3.7 V	220 pF max	
			EZJ-PZV6R8GA	0201	6.8 V	3.7 V	100 pF max	
			EZJ-PZV080GA	0201	8 V	5.6 V	100 pF max	
			EZJ-PZV120GA	0201	12 V	7.5 V	100 pF max	
			EZJ-PZV120DA	0201	12 V	7.5 V	27 pF max	
			EZJ-PZV120RA	0201	12 V	7.5 V	20 pF max	
			EZJ-PZV150RA	0201	15 V	9 V	20 pF max	
			EZJ-PZV270RA	0201	27 V	16 V	20 pF max	
			EZJ-PZV270BA	0201	27 V	16 V	10 pF max	
			EZJ-P0V6R8MA	0402	6.8 V	3.7 V	680 pF max	
			EZJ-P0V6R8GA	0402	6.8 V	3.7 V	100 pF max	
			EZJ-P0V080MA	0402	8 V	5.6 V	680 pF max	
			EZJ-P0V080KA	0402	8 V	5.6 V	330 pF max	
			EZJ-P0V080GA	0402	8 V	5.6 V	100 pF max	
			EZJ-P0V080DA	0402	8 V	5.6 V	27 pF max	
			EZJ-ZOV120JA	0402	12 V	6.7 V	220 pF max	
			EZJ-ZOV180HA	0402	18 V	11 V	150 pF max	
			EZJ-ZOV220HA	0402	22 V	13 V	150 pF max	
			EZJ-P0V270EA	0402	27 V	16 V	47 pF max	
			EZJ-P0V270RA	0402	27 V	16 V	20 pF max	
			EZJ-ZOV420WA	0402	42 V	30 V	56 pF max	
			EZJ-ZOV650DA	0402	65 V	40 V	27 pF max	
			ERJ-Z1V120KA	0603	12 V	6.7 V	330 pF max	
			ERJ-Z1V180JA	0603	18 V	11 V	220 pF max	
			ERJ-Z1V220JA	0603	22 V	13 V	220 pF max	
			ERJ-Z1V270GA	0603	27 V	16 V	100 pF max	
			ERJ-Z1V270EA	0603	27 V	16 V	47 pF max	
			ERJ-Z1V270RA	0603	27 V	16 V	20 pF max	

	Type	Part Number	Case Size	Varistor Voltage	Max. Allowable Voltage (DC)	Capacitance	Maximum ESD [IE061000-4-2]
Varistors	Standard	ERJ-Z1V330GA	0603	33 V	26 V	100 pF max	Contact Discharge Voltage: 8 kV
		ERJ-Z1V420FA	0603	42 V	30 V	68 pF max	
		ERJ-Z1V650DA	0603	65 V	40 V	27 pF max	
Varistor Arrays	2 Array	EZJ-ZSV120JA	0504	12 V	6.7 V	220 pF max	
		EZJ-ZSV270RA	0504	27 V	16 V	20 pF max	
		EZJ-ZSV270EA	0504	27 V	16 V	47 pF max	
		EZJ-ZSV800AA	0504	80 V	18 V	3 pF max	
		EZJ-ZSV171AA	0504	170 V	18 V	3 pF max	
	2 Varistors 2 Capacitors Per Array	EZJ-ZSV270TA	0504	27 V	16 V	43 pF	
		EZJ-ZSV270EA	0504	27 V	27 V	47 pF	
Varistors	High Capacitance	EZJ-S1VB822	0603	12 V	6 V	8200 pF	Contact Discharge Voltage: 30kV
		EZJ-S1VC392	0603	30 V	18 V	3900 pF	
		EZJ-S1VD182	0603	50 V	30 V	1800 pF	
		EZJ-S2VB223	0805	12 V	6 V	22000 pF	
		EZJ-S2YC822	0805	30 V	18 V	8200 pF	
		EZJ-S2YD472	0805	50 V	30 V	4700 pF	

		Type, Heat Resistance: 400°C, Bending (Angle 180, R5): 1000 cycles	Thickness	Part Number	Sheet Size	Density	Thermal Conductivity (a-b plane)	Electrical Conductivity	Extensional Strength	Expansion Coefficient (a-b plane)	Expansion Coefficient (c axis)
Pyrolytic Graphite Sheet (PGS)	A-V	Graphite Sheet With High Heat Resistant Acrylic Adhesive	70 µm 0.07 ± 0.015 mm	EGY-A091207V	90 x 115	1.21 g/cm3	1000 W/(m-K)	10000 S/cm	22.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121807V	115 x 180						
			25 µm 0.025 ± 0.010	EGY-A091203V	90 x 115	1.90 g/cm3	1600 W/(m-K)	20000 S/cm	30.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121803V	115 x 180						
			17 µm 0.017 ± 0.005	EGY-A091202V	90 x 115	2.10 g/cm3	1750 W/(m-K)	20000 S/cm	40.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121802V	115 x 180						
	A-RV	Graphite Sheet With High Heat Resistant Acrylic Adhesive Peek Tape	70 µm 0.07 ± 0.015 mm	EGY-A091207RV	90 x 115	1.21 g/cm3	1000 W/(m-K)	10000 S/cm	22.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121807RV	115 x 180						
			25 µm 0.025 ± 0.010	EGY-A091203RV	90 x 115	1.90 g/cm3	1600 W/(m-K)	20000 S/cm	30.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121803RV	115 x 180						
			17 µm 0.017 ± 0.005 mm	EGY-A091202RV	90 x 115	2.10 g/cm3	1750 W/(m-K)	20000 S/cm	40.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121802RV	115 x 180						
	A-KV	Graphite Sheet With High Heat Resistant Acrylic Adhesive and Polyimide Tape	70 µm 0.07 ± 0.015 mm	EGY-A091207KV	90 x 115	1.21 g/cm3	1000 W/(m-K)	10000 S/cm	22.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121807KV	115 x 180						
			25 µm 0.025 ± 0.010	EGY-A091203KV	90 x 115	1.90 g/cm3	1600 W/(m-K)	20000 S/cm	30.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121803KV	115 x 180						
			17 µm 0.017 ± 0.005	EGY-A091202KV	90 x 115	2.10 g/cm3	1750 W/(m-K)	20000 S/cm	40.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121802KV	115 x 180						

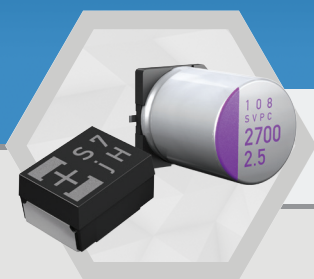
		Type, Heat Resistance: 400°C, Bending (Angle 180, R5): 1000 cycles	Thickness	Part Number	Sheet Size	Density	Thermal Conductivity (a-b plane)	Electrical Conductivity	Extensional Strength	Expansion Coefficient (a-b plane)	Expansion Coefficient (c axis)
Pyrolytic Graphite Sheet (PGS)	S	Graphite Sheet Only	100 μm 0.10 ± 0.03 mm	EGY-S091210*	90 x 115	0.85 g/cm3	700 W/(m-K)	10000 S/cm	19.6 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-S121810*	115 x 180						
				EGY-S182310*	180 x 230						
			70 μm 0.07 ± 0.015 mm	EGY-S091207*	90 x 115	1.21 g/cm3	1000 W/(m-K)	10000 S/cm	22.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-S121807 *	115 x 180						
				EGY-S182307*	180 x 230						
	A-A	Graphite Sheet With Acrylic Adhesive	25 μm 0.025 ± 0.010mm	EGY-S091203*	90 x 115	1.90 g/cm3	1600 W/(m-K)	20000 S/cm	30.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-S121803*	115 x 180						
			70 μm 0.07 ± 0.015 mm	EGY-A091207A	90 x 115	1.21 g/cm3	1000 W/(m-K)	10000 S/cm	22.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121807A	115 x 180						
	A-M	Graphite Sheet With Thin Acrylic Adhesive	25 μm 0.025 ± 0.010	EGY-A091203A	90 x 115	1.90 g/cm3	1600 W/(m-K)	20000 S/cm	30.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121803A	115 x 180						
			17 μm 0.017 ± 0.005 mm	EGY-A091202A	90 x 115	2.10 g/cm3	1750 W/(m-K)	20000 S/cm	40.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121802A	115 x 180						
	A-PA	Graphite Sheet With Acrylic Adhesive and Polyester Tape	70 μm 0.07 ± 0.015 mm	EGY-A091207M	90 x 115	1.21 g/cm3	1000 W/(m-K)	10000 S/cm	22.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121807M	115 x 180						
			25 μm 0.025 ± 0.010	EGY-A091203M	90 x 115	1.90 g/cm3	1600 W/(m-K)	20000 S/cm	30.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121803M	115 x 180						
	A-PM	Graphite Sheet With Thin Acrylic Adhesive and Polyester Tape	17 μm 0.017 ± 0.005	EGY-A091202M	90 x 115	2.10 g/cm3	1750 W/(m-K)	20000 S/cm	40.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121802M	115 x 180						
			70 μm 0.07 ± 0.015 mm	EGY-A091207PA	90 x 115	1.21 g/cm3	1000 W/(m-K)	10000 S/cm	22.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121807PA	115 x 180						
	A-DM	Graphite Sheet With Thin Acrylic Adhesive and Thin Polyester Tape	25 μm 0.025 ± 0.010	EGY-A091203PA	90 x 115	1.90 g/cm3	1600 W/(m-K)	20000 S/cm	30.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121803PA	115 x 180						
			17 μm 0.017 ± 0.005 mm	EGY-A091202PA	90 x 115	2.10 g/cm3	1750 W/(m-K)	20000 S/cm	40.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121802PA	115 x 180						
			70 μm 0.07 ± 0.015 mm	EGY-A091207PM	90 x 115	1.21 g/cm3	1000 W/(m-K)	10000 S/cm	22.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121807PM	115 x 180						
			25 μm 0.025 ± 0.010	EGY-A091203PM	90 x 115	1.90 g/cm3	1600 W/(m-K)	20000 S/cm	30.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121803PM	115 x 180						
			17 μm 0.017 ± 0.005 mm	EGY-A091207DM	90 x 115	1.21 g/cm3	1000 W/(m-K)	10000 S/cm	22.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121807DM	115 x 180						
				EGY-A020207DM	20 x 20						
				EGY-A030307DM	30 x 30						
				EGY-A060907DM	60 x 90						
				EGY-A091203DM	90 x 115						
				EGY-A121803DM	115 x 180						
				EGY-A020203DM	20 x 20						
				EGY-A030303DM	30 x 30						
				EGY-A060903DM	60 x 90						
			17 μm 0.017 ± 0.005 mm	EGY-A091202DM	90 x 115	2.10 g/cm3	1750 W/(m-K)	20000 S/cm	40.0 MPa	9.3 x 10-7 1/K	3.2 x 10-5 1/K
				EGY-A121802DM	115 x 180						
				EGY-A020202DM	20 x 20						
				EGY-A030302DM	30 x 30						
				EGY-A060902DM	60 x 90						

NOTE: * “DP” suffix individually packed in paper separator folders

			Series	Case Size	Impedance (Ω)	Tolerance	Cap. (pF)	Rated DC Current	DC Resistance Max (Ω)	Features	
EMI Filters	Surface Mount Filters	Common Mode Noise Filter	EXC-14CE	0302	Common mode Z: 65, 90	±20%		130 mA	2.5	• Low DC Resistance and Insertion Loss • Low Profile	
			EXC-24CG	0504	Common mode Z: 24, 90	±20%		160mA, 100mA	1.5, 3.0	• Meet The Mask-Test For HDMI • High Reliability	
			EXC-24CE EXC-24CF	0504	Common mode Z: 36 ~ 200	±25%		130mA ~ 200 mA	1.0 ~ 2.70	• High-Q Impedance Available • Magnetic Shield	
			EXC-28CE	0804	Common mode Z: 90 ~ 200	±25%		130mA ~ 160 mA	1.5 ~ 2.50	• 2 Common Mode Noise Filters Per Package • Magnetic Shield • Small Size	
			EXC-28CG	0804	Common mode Z: 90	±25%		130 mA	3.0		
		2 Mode Noise Filter		EXC-24CB/CP EXC-24CN	0504	Common mode Z: 120 ~ 1000	±25%		50mA ~ 500 mA	0.3 ~ 1.5	• Burst/Radiation Noise Reduction For Audio Circuits • Filtering Common & Normal Mode Noises • Magnetic Shielding
		Chip Bead Cores		EXC-CL EXC-ML EXC-3B	0603 ~ 4532	Z: 25 ~ 115 Z: 27 ~ 68 Z: 60 ~ 1000	±25%		50mA ~ 2000 mA	0.1 ~ 1.0	• Effective Noise Suppression For Power Lines And High Speed Signal Lines
	Coil	ELK-E	1207			10 ~ 33K		• For Filtering Digital Noise • Stable Attenuation Characteristics Over Current Changes			

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