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Panasonic
Electronic Components

LINE CARD CATALOG

A Comprehensive Guide by Product Series to
Panasonic Electronic Components' Product Line

Capacitors ■

Resistors ■

Inductors & Filters ■

Circuit Protection ■

Electromechanical ■

Wireless RF Modules ■

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Electronic Components

Capacitors

Panasonic's Capacitor technologies include electrolytic, electro-static and ceramic dielectrics. Panasonic's Electrolytic Capacitors include 'Wet' Aluminum (Surface Mount and Leaded packages), Snap-In, 'Solid' Specialty Polymer Aluminum Capacitors (Surface Mount) and Carbon Based Electric Double Layer Electrolytic Capacitors known as 'Gold Caps'. Panasonic is also a worldwide leader in Film Capacitors and offers a wide range of surface mount and radial leaded options that meet high safety standards and have superior performance in extremely small sizes. Panasonic's high voltage ceramic capacitors meet agency safety standards and are remarkably durable.

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Resistors

Panasonic offers a broad line of Resistors that include Surface Mount, Power, Low Power, Fuse, Potentiometers, Trimmers, EMI Filters, and Arrays and Networks for all applications. Panasonic Resistors have a wide range of features and specifications including conventional Thick Film Chip Resistors or specialized types like Anti-Sulfur, 0201 to 0805 case sized Chip Resistor Arrays, three different types of Power Resistors, Surface Mount and Leaded EMI Filters and one of the smallest Chip Fuses in the industry.

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Inductors & Filters

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Panasonic Electronic Components are RoHS Compliant.

Panasonic Electronic Components is an industry leading manufacturer of high quality, standard and custom electronic components. **Powered By Panasonic** means choosing the most reliable and advanced electronic components the industry has to offer. Trust Panasonic for all of your components needs.

Circuit Protection

Panasonic offers a variety of solutions for Circuit and Thermal Protection. Panasonic’s flexible PGS Graphite Sheet can be used in applications with limited space and is twice as thermally conductive as copper. Also offered are a wide range of Thermistors, both Surface Mount and Leaded, for excellent temperature compensation and detection and single and multi-layer Metal Oxide Varistors for surge absorption.

- Varistors 18, 19
- Thermistors 19
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Electromechanical

As an industry leader in Electromechanical Components, Panasonic Electronic Components maintains the highest level of features and quality with in-house design, material, processing, and testing technologies. Panasonic’s Electromechanical Components are used to convert mechanical movement into electrical signals. These products are used in everyday devices at the point of user interaction where user input needs to be detected and when other menu or function selections have to generate an electrical output to notify internal circuitry.

- Light Touch Switches 20, 21
- Multi-function Switches 20
- Detector Switches 21
- Encoders 21
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RF Modules

Panasonic provides powerful, highly flexible, cost effective RF Modules for a wide variety of wireless Personal Area Network (PAN) applications. New extended range products and small footprints combined with network firmware flexibility make Panasonic an industry leader in the development of cutting edge RF Module technology.

- ISM 23
- Bluetooth 23
- RPA 23
- 802.15.4 (Mesh Networking) 23

Full product specifications can be found online at:

www.panasonic.com/industrial/electronic-components

Design and specifications are subject to change without notice. Please review technical specifications before purchase. For any safety concerns regarding these products, please contact your Panasonic sales rep. immediately for technical consultation.

COMPONENT PART NUMBER DESIGNATIONS

	A	B	C	D	E	F	G	H	J	K	L	M
EA		Speaker Systems								Speaker Kits		
EC	Aluminum Electrolytic Caps. (radial lead)		Ceramic Disc Cap.		Aluminum Electrolytic Cap.			Plastic Film Cap.				
EE	Aluminum Electrolytic Caps. (radial lead)		Electric Double Layer Cap. "Gold Cap"		SMT AL Lytic (lead free)	Polymer Aluminum Electrolytic Capacitors						
EF		Piezoelectric Speakers	Ceramic Filters Saw Devices						Ceramic Filters		Acousto-Optic Devices	
EH												
EK												
EL		LC Filters, Duplexers, Choke Coils	Choke Coils		Peaking Coils	Line Filters		Linearity Coils	Chip Inductors	Coil Type EMI Filters	SMD Choke Coils	
EM												
EN	Up/Down Converters (CATV)		RF Modulators			Modules	RF Front end System Units	VIF Units				
EO											Aspherical Glass Lens	
EQ			Variable Inductors			Variable Inductors						
ER	Metal Film Chip Resistors	Circuit Protector; Micro Chip Fuse		Carbon Film Resonators		Wirewound Resistors	Metal (oxide) Film Resistors		Thick Film Chip Resistors			
ES		Push Signal Switches		Slide Switches	Push & Detector Switches				Transformers: Chip, pulse; Current; Common Mode Choke			
ET								Input/Output Transformers				
EU										High-Voltage Power Supplies		
EV	Slide Potentiometers; Position Sensors	Slide Potentiometers	Rotary Pots.		Encoders						Rotary Pots.	Cermet Trimmer Pots.
EW	Slide Potentiometers		Encoders, Rotary Pots.									
EX		Chip Resistor Networks, Resistor Array, Chip Attrn., RC Filter	Bead Cores; Chip Bead Cores, Chip Bead Arrays, EMI Filters			Capacitor Networks						
EY							Pyrolytic Graphite Sheet				Aspherical Glass Lenses	
EZ	Networks: Chip Cap., Chip RD; Chip 3-term Cap.								Multilayer Varistor			Magneto-Resistive Element

	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
EA						Speakers							
EC		Aluminum Electrolytic Capacitor (Snap-In)	Plastic Film Cap.	Plastic Film Cap.	Ceramic Trimmer Cap.				Ceramic Trimmer Cap.	Plastic Film Cap.			
EE							Aluminum Electrolytic Cap. (snap-in terminal)	Aluminum Electrolytic Cap. (Radial Lead)	Aluminum Electrolytic Cap. (SMT)				
EF		Ceramic Resonators SAW Resonators				SAW Duplexers			Piezoelectric Receivers				
EH								Hybrid ICs Module					
EK										ALIVH			
EL							Voltage Step-Up Coils			L-R Filter (Inductor)			
EM							Touch Panels, Keyless Entry Systems						
EN									Electronic Tuners	RF Modules			
EQ						Variable Inductors			Variable Inductors				
ER	Precision Metal Film Resistors	Metal Film Resistors		Metal (Oxide) Film Fuse Resistors		Thermally Sensitive Resistors	NTC Thermistors	Wirewound Resistors w/ Thermal Cutoffs		Wirewound Resistors	Metal Film Resistors		ZNR Transient Surge Absorbers
ES			Panel Switches					Panel Switches					
ET			Power Transformers			Switching Transformers		Power Supply Units			Power Supply units	Power Supply Units	
EU			PTC Thermistors; Ceramistor			Remote Control units							
EV	Trimmers; Carbon Chip; 6mm Carbon		Light Touch Switches	Encoders, Light Touch Switches				Rotary Pots.		Position Sensors, Rotary Pots.			
EW			Antenna				Sensors: Displacement, Rotation, Angular Rate		Rotary Pots.				
EY			Thermal Cut-offs (TCO)										

Capacitors

Resistors

Inductors & Filters

Circuit Protection

Electromechanical

RF Modules

These Electronic Components are not included in this catalog but can be found on the Panasonic Electronic Components web site.











Aluminum Electrolytic








		Series	Series	Appearance	Operating Temperature	(Working Voltage) Capacitance	Features		
Surface Mount Type*	General Purpose	VS	EEE-_A/S		-40 ~ +85°C	(4 ~ 100 VDC) 0.1 ~ 1,500 μF	<ul style="list-style-type: none"> General purpose, 2,000 hours at 85°C Very compact size 		
		HA	EEE-HA		-40 ~ +105°C	(6.3 ~ 100 VDC) 0.1 ~ 1,500 μF	<ul style="list-style-type: none"> Long life, 1,000~2,000 hours at 105°C Very compact size 		
		HB	EEE-HB			(4 ~ 50 VDC) 0.1 ~ 470 μF	<ul style="list-style-type: none"> Long life, 2,000 hours at 105°C 5.8 mm height (<math>\phi 6</math>) 		
		HC	EEE-HC			(6.3 ~ 50 VDC) 33 ~ 1,000 μF	<ul style="list-style-type: none"> Long life, 3,000~5,000 hours at 105°C 5.8 mm height (<math>\phi 6</math>) 		
		HD	EEE-HD			(6.3 ~ 50 VDC) 0.1 ~ 1000 μF	<ul style="list-style-type: none"> Very long life, 5,000 hours at 105°C Industrial grade 		
				TG	EEE-TG		-40 ~ +125°C	(10 ~ 100 VDC) 10 ~ 4,700 μF	<ul style="list-style-type: none"> High temperature, 2,000 hours at 125°C Low ESR at low temperature
				TK	EEE-TK			(10 ~ 35 VDC) 47 ~ 4700 μF	<ul style="list-style-type: none"> High temperature, 3,000 hours at 125°C Low ESR at low temperature
				TP	EEE-TP			(10 ~ 35 VDC) 47 ~ 470 μF	<ul style="list-style-type: none"> Low ESR at Low Temperatures 2,000~3,000 hours at 125°C
				FP	EEE-FP		-55 ~ +105°C	(6.3 ~ 35 VDC) 100 ~ 1,800 μF	<ul style="list-style-type: none"> Very Low ESR, tantalum replacement High Temperature Reflow (260°C)
				FK	EEE-FK			(6.3 ~ 100 VDC) 3.3 ~ 6,800 μF	<ul style="list-style-type: none"> Long life, 2,000~5,000 hours at 105°C Low ESR, Tantalum replacement Compact, wide size range: 4~18 mm (Dia)
				FC	EEE-FC		-40 ~ +105°C	(6.3 ~ 50 VDC) 1 ~ 1,500 μF	<ul style="list-style-type: none"> 1,000 hours at 105°C Low impedance
				VS-BP	EEE-V__A__N		-40 ~ +85°C	(6.3 ~ 50 VDC) 0.22 ~ 47 μF	<ul style="list-style-type: none"> General Purpose 5.4 mm height (<math>\phi 6</math>)
				HB-BP	EEE-HP		-40 ~ +105°C		<ul style="list-style-type: none"> Industrial Grade 5.8 mm height
		Radial Lead	General Purpose	85°C	M	ECA-__M		-40 ~ +85°C (-25°C: 160~450VDC)	(6.3 ~ 450 VDC) 0.1 ~ 22,000 μF
105°C	NHG			ECA-__HG		-55 ~ +105°C (-25°C: 160~450VDC)	(6.3 ~ 450 VDC) 0.1 ~ 22,000 μF	<ul style="list-style-type: none"> Long life, 1,000~2,000 hours at 105°C Compact size 	
Miniature	KA			ECE-A__KA		-40 ~ +85°C	(4 ~ 50 VDC) 0.1 ~ 470 μF	<ul style="list-style-type: none"> General purpose, 1,000 hours at 85°C 7 mm height 	
	KS			ECE-A__KK/KS			(4 ~ 50 VDC) 0.1 ~ 330 μF	<ul style="list-style-type: none"> General purpose, 1000 hours at 85°C 5 mm height 	
Bi-Polar	BP-SU			ECE-A__N__U/X		-40 ~ +85°C	(6.3 ~ 50 VDC) 0.47 ~ 6,800 μF	<ul style="list-style-type: none"> 2,000 hours at 85°C Bi-Polar general purpose 	
Long Life	High Voltage		EB	EEU-EB		-40 ~ +105°C (-25°C: 160~450VDC)	(10 ~ 450 VDC) 0.47 ~ 3,300 μF	<ul style="list-style-type: none"> 5,000~10,000 hours at 105°C Very long life 	
			ED	EEU-ED		-25 ~ +105°C	(160 ~ 450 VDC) 10 ~ 330 μF	<ul style="list-style-type: none"> Very long life 8,000~10,000 hours at 105°C High Ripple Current 	
			EE	EEU-EE		-25 ~ +105°C	(160 ~ 450 VDC) 10 ~ 330 μF	<ul style="list-style-type: none"> Very long life 8,000~10,000 hours at 105°C High Ripple Current at high frequency 	
	Low Impedance		FC	EEA/U-FC		-55 ~ +105°C	(6.3 ~ 100 VDC) 1.0 ~ 15,000 μF	<ul style="list-style-type: none"> 1,000~5,000 hours at 105°C Low impedance, miniature 	
			FM	EEU-FM		-40 ~ +105°C	(6.3 ~ 50 VDC) 22 ~ 6,800 μF	<ul style="list-style-type: none"> Long life, 2,000~7,000 hours at 105°C Low ESR, approximately half of FC 	
125°C	TA	EEU-TA		-40 ~ +125°C	(10 ~ 63 VDC) 1 ~ 4,700 μF	<ul style="list-style-type: none"> 2,000 hours at 125°C Automotive applications 			




*NOTE: Surface Mount Type RoHS Compliant Part Number Prefix:
 EEE (Diameter: 3~10mm)
 EEV (Diameter: 12.5~18mm)

NOTE: For higher temperature reflow, use EEE (A_) suffix:
 260°C Max. Reflow: AP & AR (4~10mm dia.)
 245°C Max. Reflow: AQ & AM (12.5~18mm dia.)

		Series	Part Number	Appearance	Operating Temperature	(Working Voltage) Capacitance		
Specialty Polymer	Surface Mount	General Purpose	CD	EEF-CD		-40 ~ +105°C	(2 ~ 16Vdc) 2.2 ~ 220 μF	<ul style="list-style-type: none"> Low ESR, high ripple current 1.8 mm height, ESR 18 mΩ maximum
			CX	EEF-CX			(2 ~ 6.3 Vdc) 100 ~ 470 μF	<ul style="list-style-type: none"> Low ESR, high ripple current 1.9 mm height, ESR 15 mΩ maximum
	UD		EEF-UD		(2 ~ 8 Vdc) 68 ~ 470 μF		<ul style="list-style-type: none"> Low ESR, high ripple current 2.8 mm height, ESR 15 mΩ maximum 	
	UE		EEF-UE		(2 ~ 8 Vdc) 100 ~ 560 μF		<ul style="list-style-type: none"> Low ESR, high ripple current 4.2 mm height, ESR 12 mΩ maximum 	
	Low ESR		S	EEF-S			(2 ~ 6.3 VDC) 82 ~ 470 μF	<ul style="list-style-type: none"> Lower ESR, higher ripple current 1.8/2.0/2.8/4.2mm height, ESR 5 to 9 mΩ max
			125°C	H	EEF-H			(2 ~ 8 Vdc) 33 ~ 330 μF
Electric Double Layer	SMT	EN	EEC-EN		-10 ~ +60°C	(3.3 Vdc) 0.2 F	<ul style="list-style-type: none"> SMT Re-flow solderable Coin type, low profile 	
		EP	EEC-EP		-10 ~ +60°C	(3.3/2.6 Vdc) 0.033 F	<ul style="list-style-type: none"> SMT Re-flow 260°C max. Miniature, 3.8mm dia. x 1.5mm Height 	
	Radial Lead	SD SG	EEC-S0HD EEC-S5R5		-25 ~ +70°C	(5.5 Vdc) 0.022 ~ 0.33 F (5.5 Vdc) 0.47 ~ 1.5 F	<ul style="list-style-type: none"> General purpose, 1,000 hours at 70°C uA range IC memory back-up 	
		SE	EEC-SE0H			(5.5 Vdc) 0.022 ~ 0.22 F	<ul style="list-style-type: none"> 1,000 hours at 70°C Lead taping for auto insertion 	
		NF F	EEC-F5R5U EEC-F5R5H		-25 ~ +70°C -25 ~ +85°C	(5.5 Vdc) 0.1 ~ 1.5 F (5.5 Vdc) 0.033 ~ 1.0 F	<ul style="list-style-type: none"> 1,000 hours at 70°C, general purpose 1,000 hours at 85°C, high reliability 	
		RG RF	EEC-RG EEC-RF		-25 ~ +85°C	(3.6 Vdc) 1.0 F (3.6~5.5 Vdc) 0.68 F	<ul style="list-style-type: none"> 2,000 hours at 85°C, general purpose High Reliability Backup for mA-A range 	
		HW	EEC-HW0D		-25 ~ +70°C -25 ~ +60°C	(2.3 Vdc) 1 ~ 50 F (2.1 Vdc) 70 F	<ul style="list-style-type: none"> Large capacitance Backup for mA - A range 	
		HZ	EEC-HZ0D		-25 ~ +60°C	(2.5 Vdc) 3.3~10 F	<ul style="list-style-type: none"> Large Capacitance Lower ESR than HW 	
		Large Can Aluminum	2 & 3 - Terminal Snap-In	TS-UP	ECO-S__P ECE-C__P ECE-3__P		-40 ~ +85°C (-25°C: 350~450Vdc)	(16 ~ 450 Vdc) 33 ~ 68,000 μF
TS-UQ	EET-UQ				-40 ~ +85°C (-25°C: 350~450Vdc)	(160 ~ 450 Vdc) 82 ~ 100,000 μF	<ul style="list-style-type: none"> General purpose, 2000 hours at 85°C 30% smaller than TS-UP 	
TS-HA	ECO-S__A ECE-C__A ECE-3__A				-40 ~ +105°C (-25°C: 385~450Vdc)	(10 ~ 450 Vdc) 33 ~ 68,000 μF	<ul style="list-style-type: none"> 2,000~3,000 hours at 105°C 20 mm low profile available 	
TS-HB	ECO-S__B ECE-C__B ECE-3__B				-40 ~ +105°C (-25°C: 385~450Vdc)	(160 ~ 450 Vdc) 82 ~ 2,700 μF	<ul style="list-style-type: none"> 3,000 hours at 105°C 20 ~ 25% smaller than TS-HA 	
TS-HC	EET-HC				-40 ~ +105°C (-25°C: 350~450Vdc)	(10 ~ 450 Vdc) 100 ~ 100,000 μF	<ul style="list-style-type: none"> 2,000 hours at 105°C 30% smaller than TS-HB 	
TS-ED	EET-ED				-40 ~ +105°C (-25°C: 400~450Vdc)	(200 ~ 450 Vdc) 56 ~ 2,200 μF	<ul style="list-style-type: none"> High ripple current capability 3,000 hours at 105°C 	
TS-EE	EET-EE				-40 ~ +105°C (-25°C: 400~450Vdc)	(200 ~ 450 Vdc) 75 ~ 1,800 μF	<ul style="list-style-type: none"> 3,000 hours at 105°C Very high ripple current capability 	
TS-XB	EET-XB				-40 ~ +105°C (-25°C: 315~450Vdc)	(160 ~ 450 Vdc) 39 ~ 2,200 μF	<ul style="list-style-type: none"> Long life: 7,000 hours at 105°C Compact size 	
4 Terminal Snap-In	T-UP		ECE-T__P		-40 ~ +85°C (-25°C: 350~450Vdc)	(16 ~ 500 Vdc) 270 ~ 270,000 μF	<ul style="list-style-type: none"> 3,000 hours at 85°C Wide capacitance/voltage range 	
	T-HA		ECE-T__A		-40 ~ +105°C (-25°C: 350~450Vdc)	(16 ~ 450 Vdc) 390 ~ 120,000 μF 330 ~ 250,000 μF	<ul style="list-style-type: none"> 3,000 hours at 105°C Wide capacitance/voltage range 	

	Dielectric	Series	Appearance	Operating Temp.	Ratings	Features	Applications
Chip Film Capacitors	Stacked Metallized	ECH-U(X)		-55 ~ +105°C	0.0001~0.22 μ F 10/16/50 V _{DC}	<ul style="list-style-type: none"> Non-inductive, stacked Miniature Reflow soldering Tight C-tolerance 	<ul style="list-style-type: none"> High density mounting SMD (industrial grade)
		ECH-U(C)			0.01~0.22 μ F 100 V _{DC}	<ul style="list-style-type: none"> Non-inductive, stacked Miniature Reflow and flow solderability Tight C-tolerance 	<ul style="list-style-type: none"> High density mounting SMD Industrial Use Filters; oscillators
		ECW-U(C)		-55 ~ +105°C -55 ~ +125°C	0.1 ~ 1.0 μ F 450 V _{DC}	<ul style="list-style-type: none"> Non-inductive, stacked Miniature Reflow Soldering Noise Suppressor 	<ul style="list-style-type: none"> High density mounting SMD (commercial grade)
		ECW-U(V16)		-55 ~ +85°C	0.001~0.12 μ F 250 V _{DC}	<ul style="list-style-type: none"> Non-inductive, stacked Miniature Similar to polyester film cap Noise Suppressor 	<ul style="list-style-type: none"> High density mounting SMD (commercial grade)
		ECW-U(X)		-55 ~ +105°C	0.001 ~ 0.01 μ F 100 V _{DC}	<ul style="list-style-type: none"> Non-inductive, stacked Reflow soldering 	<ul style="list-style-type: none"> Electronic exchange Ringer circuit telephone & PBX
		ECP-U(A)		-40 ~ +85°C	0.1 ~ 1.0 μ F 16 V _{DC}	<ul style="list-style-type: none"> Non-inductive, stacked Reflow soldering 	<ul style="list-style-type: none"> Coupling, filtering & PLL
Film Interference Suppressors	Metallized Polyester	ECQ-U(Y)		-40 ~ +100°C	0.001 ~ 0.047 μ F 250 VAC	UL, CSA, SEMKO, DEMKO, NEMKO, FIMKO, VDE, SEV approved (Class Y)	<ul style="list-style-type: none"> Universal applications Interference suppression
		ECQ-U(G)			0.01 ~ 1.0 μ F 250 VAC (UL, CSA) 300 VAC (IEC384-14)	<ul style="list-style-type: none"> Flame retardant case Equipped with safety mechanism UL, CSA, SEMKO, DEMKO, NEMKO, FIMKO, VDE, SEV approved (Class X1) 	<ul style="list-style-type: none"> Noise suppressor for AC line
		ECQ-U(L)			0.01 ~ 2.2 μ F 250 VAC (UL, CSA) 275 VAC (IEC384-14)	<ul style="list-style-type: none"> Smaller size than ECQ-U(V) or ECQ-U(G) UL, CSA, BDE approved (Class X2) 	<ul style="list-style-type: none"> High performance, fuse function type in AC line
Film (AC)	Metallized Polyester/ Polypropylene	ECH-A(X)		-25 ~ +70°C	0.5 ~ 6 μ F 180 ~ 430 VAC	<ul style="list-style-type: none"> Flame retardant epoxy coating Equipped with safety mechanism 	<ul style="list-style-type: none"> Motors

	Dielectric	Series	Appearance	Operating Temperature			Ratings	Features	Applications						
				Temperature	Capacitance	Voltage									
Metallized Film	Plastic	ECQ-V		-40 ~ +85°C	0.01 ~ 2.2 μF	50/63/100 V _{DC}	<ul style="list-style-type: none"> • Non-inductive • Stacked Construction 	<ul style="list-style-type: none"> • General purpose applications • Audio 							
	Polyester	ECQ-E(H)		-40 ~ +105°C	0.1 ~ 2.2 μF	450 V _{DC}	<ul style="list-style-type: none"> • Smaller Size • Self healing property 	<ul style="list-style-type: none"> • Active filtering circuit 							
									ECQ-E(F)		-40 ~ +85°C	0.001 ~ 10 μF	100 ~ 1250 V _{DC}	<ul style="list-style-type: none"> • Wide capacitance range • Compact size 	<ul style="list-style-type: none"> • General purpose applications
									ECQ-E(T)		-40 ~ +105°C	0.01 ~ 10 μF	250~630 V _{DC} , 125~250 V _{AC}	<ul style="list-style-type: none"> • Excellent Moisture Resistance 	<ul style="list-style-type: none"> • High humidity environments
	Polypropylene	ECW-F(L)		-25 ~ +105°C	0.022 ~ 2.4 μF, 400 V _{DC}	0.01 ~ 1.3 μF, 630 V _{DC}	<ul style="list-style-type: none"> • Low Dissipation Factor • High Voltage 	<ul style="list-style-type: none"> • High frequency, high current circuits 							
									ECW-F(B)		-25 ~ +85°C	0.022 ~ 0.47 μF	250/400 V _{DC}	<ul style="list-style-type: none"> • Low Dissipation Factor 	<ul style="list-style-type: none"> • High pulse circuits (TV, display, electronic balast)
									ECW-F(A)		-40 ~ 105°C	0.1 ~ 6.8 μF	250/450 V _{DC}	<ul style="list-style-type: none"> • Miniaturized Size • High Reliability Design 	<ul style="list-style-type: none"> • Active Filter in PFC Circuits

	Series	Appearance	Operating Temperature		Capacitance Range	Features
			Series	Operating Voltage		
Ceramic	ECC-T3		Hi-V SMD	1kV _{DC} - 5kV _{DC}	10 pF to 68 pF	<ul style="list-style-type: none"> • Molded SMD case for reflow soldering
	ECC-TBC		BC	250V _{AC}	10 pF to 68 pF	<ul style="list-style-type: none"> • UL(CSA)/SEMCO Y2 approval, 1500 VAC for 1 minute • SMD (7.1 x 6.3 x 2.5 mm)
	ECC-TFC		FC	250V _{AC}	5 pF to 330 pF	<ul style="list-style-type: none"> • UL(CSA)/SEMCO Y2 approval, 1500 VAC for 1 minute • SMD, small size (5.7 x 4.5 x 2.3 mm)

	Series	Case Size	Power Rating (W)	Resistance Range	Resistance Tolerance (%)	T.C.R. (ppm/°C)	LxWxT Dimensions (mm)	Quantity 7" Reel (pcs.)	Features								
Thick Film Chip Resistors	ERJ-XGNJ	01005	1 / 32 W	10 ~ 1 M	± 5	± 200	0.40 x 0.20 x 0.13	20,000	<ul style="list-style-type: none"> • Halogen Free • Small size and lightweight • High reliability using metal glaze thick film resistive element and three layers of electrodes • Compatible with automatic placement of bulk taping and bulk case packaging • Reflow and flow solderability • Meets ISO-9001 & QS-9000 standards • Low resistance tolerance: ERJ-3E; 6E; 8E; 14, 12 series: ±1% • NOTE: Chip resistor 5% tolerance <table border="1"> <tr> <th>Resistance Range (Ω)</th> <th>T.C.R. (ppm / °C)</th> </tr> <tr> <td><10</td> <td>-100 ~ +600</td> </tr> <tr> <td>10 - 1 M</td> <td>± 200</td> </tr> <tr> <td>>1M</td> <td>-400 ~ +150</td> </tr> </table>	Resistance Range (Ω)	T.C.R. (ppm / °C)	<10	-100 ~ +600	10 - 1 M	± 200	>1M	-400 ~ +150
	Resistance Range (Ω)	T.C.R. (ppm / °C)															
	<10	-100 ~ +600															
	10 - 1 M	± 200															
	>1M	-400 ~ +150															
	ERJ-1GEJ	0201	1 / 20 W	1.0 ~ 1 M	± 5		0.60 x 0.3 x 0.23	15,000									
	ERJ-1GEF			10 ~ 1 M	± 1												
	ERJ-2GEJ	0402	1 / 16 W	1.0 ~ 2.2 M	± 5		1.0 x 0.5 x 0.35	10,000									
	ERJ-2RKF			10 ~ 1 M	± 1		± 100										
	ERJ-3GEYJ	0603	1 / 10 W	1.0 ~ 10 M	± 5		± 200	1.6 x 0.8 x 0.45		5,000							
	ERJ-3EKF			10 ~ 1 M	± 1		± 100										
	ERJ-6GEYJ	0805	1 / 8 W	1.0 ~ 10 M	± 5		± 200	2.0 x 1.25 x 0.6		5,000							
	ERJ-6ENF			10 ~ 2.2 M	± 1		± 100										
	ERJ-8GEYJ	1206	1 / 4 W	1.0 ~ 10 M	± 5		± 200	3.2 x 1.6 x 0.6		5,000							
	ERJ-8ENF			10 ~ 2.2 M	± 1		± 100										
	ERJ-14YJ	1210	1 / 4 W	1.0 ~ 10 M	± 5		± 200	3.2 x 2.5 x 0.6		5,000							
ERJ-14NF			10 ~ 1 M	± 1	± 100												
ERJ-12YJ	1812	1 / 2 W	1.0 ~ 10 M	± 5	± 200	4.5 x 3.2 x 0.6	5,000										
ERJ-12NF			10 ~ 1 M	± 1	± 100												
ERJ-12ZYJ	2010	1 / 2 W	1.0 ~ 10 M	± 5	± 200	5.0 x 2.5 x 0.6	5,000										
ERJ-12SF			10 ~ 1 M	± 1	± 100												
ERJ-1TYJ	2512	1 W	1.0 ~ 1 M	± 5	± 200	6.4 x 3.2 x 0.6	4,000										
ERJ-1TNF			10 ~ 1 M	± 1	± 100												
Low Resistance Thick Film Chip Resistors	ERJ-2BWF	0402	1 / 8 W	0.047 ~ 0.091	± 1	± 300	1.0 x 0.5 x 0.35	10,000	<ul style="list-style-type: none"> • Small size and lightweight • High reliability using metal glaze thick film resistive elements and three layers of electrodes • Compatible with automatic placement of bulk taping and bulk case packaging • Reflow and flow solderability • Meets ISO-9001 & QS-9000 standards • Low resistance tolerance: ERJ-2R; 3R; 6R series; ±5%, ±1% 								
	ERJ-2BWJ			± 5													
	ERJ-2BSJ			0.10 ~ 0.20	± 5												
	ERJ-2BQJ			± 1													
	ERJ-2BQF	0.22 ~ 1.0	± 1	± 250													
	ERJ-3RSJ	0603	1 / 10 W	0.1 ~ 0.2	± 5	0.1 ~ 0.91 Ω ± 300	1.6 x 0.8 x 0.45										
	ERJ-3RQJ			0.22 ~ 0.91	± 1	1.0 ~ 9.1 Ω ± 200											
	ERJ-3RSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω ± 200											
	ERJ-3RQF			0.22 ~ 9.1	± 1	1.0 ~ 9.1 Ω ± 200											
	ERJ-6RSJ	0805	1 / 8 W	0.1 ~ 0.2	± 5	0.1 ~ 0.91 Ω ± 300	2.0 x 1.25 x 0.6										
	ERJ-6RQJ			0.22 ~ 0.91	± 1	1.0 ~ 9.1 Ω ± 200											
	ERJ-6RSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω ± 200											
	ERJ-6RQF			0.22 ~ 9.1	± 1	1.0 ~ 9.1 Ω ± 200											
	ERJ-6BWF	1206	1/4 W	10m ~ 50m	± 1	0.01 ~ 0.014 Ω ± 300	2.0 x 1.25 x 0.65										
	ERJ-6BWJ			± 5	0.015 ~ 0.05 Ω ± 200												
	ERJ-8BWF	1206	1/2 W	0.01 ~ 0.1	± 1	0.01Ω-0.18Ω: ±200 0.02Ω-0.39Ω: ±150 0.047Ω-0.1Ω: ±100	5,000										
	ERJ-8BWJ	1206	1/2 W	0.01 ~ 0.1	± 5												
	ERJ-8RSJ	1206	1 / 4 W	0.1 ~ 0.2	± 5	0.1 ~ 0.91 Ω ± 250	3.2 x 1.6 x 0.6										
	ERJ-8RQJ			0.22 ~ 9.1	± 1	1.0 ~ 9.1 Ω ± 200											
	ERJ-8RSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω ± 200											
	ERJ-8RQF			0.22 ~ 9.1	± 1	1.0 ~ 9.1 Ω ± 200											
	ERJ-14RSJ	1210	1 / 4 W	0.1 ~ 0.2	± 5	0.1 ~ 0.91 Ω ± 200	3.2 x 2.5 x 0.6										
	ERJ-14RQJ			0.22 ~ 0.91	± 1	1.0 ~ 9.1 Ω ± 100											
	ERJ-14RSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω ± 100											
	ERJ-14RQF			0.22 ~ 9.1	± 1	1.0 ~ 9.1 Ω ± 100											
	ERJ-12RSJ	1812	1 / 2 W	0.1 ~ 0.2	± 5	0.1 ~ 0.91 Ω ± 200	4.5 x 3.2 x 0.6										
	ERJ-12RQJ			0.22 ~ 0.91	± 1	1.0 ~ 9.1 Ω ± 100											
	ERJ-12RSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω ± 100											
ERJ-12RQF	0.22 ~ 9.1			± 1	1.0 ~ 9.1 Ω ± 100												
ERJ-1TRSJ	2512	1 W	0.1 ~ 0.2	± 5	0.1 ~ 0.91 Ω ± 200	6.4 x 3.2 x 0.6	4,000										
ERJ-1TRQJ			0.22 ~ 0.91	± 1	1.0 ~ 9.1 Ω ± 100												
ERJ-1TRSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω ± 100												
ERJ-1TRQF			0.22 ~ 0.91	± 1	1.0 ~ 9.1 Ω ± 100												

Ultra Low Value Chip Resistors	Series	Case Size	Power Rating (W)	Resistance Range	Resistance Tolerance (%)	T.C.R. (ppm/°C)	LxWxT Dimensions (mm)	Quantity 7" Reel (pcs.)	Features
	ERJ-L03	0603	1 / 10 W	47 - 100 milli.	± 5	± 200	1.6 x 0.8 x 0.45	5,000	<ul style="list-style-type: none"> • Small size and lightweight • High reliability using metal glaze thick film resistive elements and three layers of electrodes • Compatible with automatic placement of bulk taping and bulk case packaging • Reflow and flow solderability • Meets ISO-9001 & QS-9000 standards • Low resistance values for ERJ-L14; L12; L1W series: 47 mΩ~100 mΩ
	ERJ-L06	0805	1 / 8 W	47 - 100 milli.	± 5	± 100	2.0 x 1.25 x 0.6	5,000	
	ERJ-L08	1206	1/4 W	47 - 100 milli.	± 5	± 100	3.2 x 1.6 x 0.6	5,000	
	ERJ-L14KJ	1210	1/3 W	20 - 100 milli.	± 5	± 100	3.2 x 2.5 x 0.6	5,000	
	ERJ-L14KF				± 1				
	ERJ-L12KJ	1812	1/2 W	20 - 100 milli.	± 5	± 100	4.5 x 3.2 x 0.6	5,000	
	ERJ-L12KF				± 1				
	ERJ-L1D	2010	1/2 W	40 - 100 milli.	± 5	<47 milli: ± 300 ≥47 milli: ± 100	5.0 x 2.5 x 0.6	5,000	
	ERJ-L1WKJ	2512	1W	40 - 100 milli.	± 5	± 100	6.4 x 3.2 x 1.1	3,000	
ERJ-L1WKF	± 1								
ERJ-M1WT	2512	1W	1 - 4 milli.	± 5	1 ~ 2 mΩ ± 500	6.4 x 3.2 x 0.8	3,000		
ERJ-M1WTF			3 - 4 milli.	± 1	1 ~ 2 mΩ ± 500				
ERJ-M1WSJ			3 - 20 milli.	± 5	≥ 5 mΩ: ± 100 < 5 mΩ: ± 350				
ERJ-M1WSF				± 1					

High Power Wide Term.	Series	Case Size	Power Rating (W)	Resistance Range	Resistance Tolerance (%)	T.C.R. (ppm/°C)	LxWxT Dimensions (mm)	Quantity 7" Reel (pcs.)	Features
	ERJ-A1	2512	1.33W	10m - 10k	± 1, ± 5	≥100 mΩ, 1%: ± 100 ≥100 mΩ, 5%: ± 200 <100 mΩ: ± 350	6.4 x 3.2 x .55	4,000	<ul style="list-style-type: none"> • High solder joint reliability • Excellent heat dissipation
	ERJ-B1	2010	1W				5.0 x 2.5 x .55	5,000	
	ERJ-B2	1206	1/2 W	5m - 1M	5-9 mΩ 1mΩ step 10m to 1m, E-24	3.2 x 1.6 x 0.65	5,000		

Anti-Surge Thick Film Chip Resistors	Series	Case Size	Power Rating (W)	Resistance Value	Resistance Tolerance (%)	T.C.R. (ppm/°C)	LxWxT Dimensions (mm)	Quantity 7" Reel	Features
	ERJ-P03	0603	1/5 W	10 to 1M	±0.5, ±1	±150, ±200	1.60x0.8x0.45	5000	<ul style="list-style-type: none"> • Anti-Surge characteristics superior to standard metal film resistors • High reliability • High Power • Suitable for both flow and re-flow soldering
				1 to 1M	+5	R>10 ohm: ±200 R<10ohm: -150 to 400			
	ERJ-P06	0805	1/4W	10 to 1M	±0.5, ±1	R>=30 ohm: ±100 R<30ohm: ±300	2.0x1.25x0.60	5000	
				1 to 1M	+5	R>=30 ohm: ±200 R<30ohm: ±300			
	ERJ-P08	1206	1/3 W	10 to 1M	±0.5, ±1	±100	3.20x1.60x0.60	5000	
				1 to 1M	+5	R>=10 ohm: ±200 R<10ohm: -100 to +600			
	ERJ-P14	1210	1/2 W	10 to 1M	±0.5, ±1	±100	3.20x2.50x0.60	5000	
				1 to 1M	+5	R>=10 ohm: ±200 R<10ohm: -100 to +600			
	ERJ-T06	0805	1/4W			R>=33 ohm: ±200 R<30ohm: ±300 R<10ohm: -100 to +600	2.0x1.25x0.60	5000	
ERJ-T08	1206	1/3W	1 to 1M	+5	R>=10 ohm: ±200 R<10ohm: -100 to +600	3.20x1.60x0.60			
ERJ-T14	1210	1/4W				3.20x2.50x0.60			

	Series	Case Size	Power Rating (W)	Resistance Value	Resistance Tolerance (%)	T.C.R (ppm/C)	LxWxT Dimensions (mm)	Quantity 7" Reel	Features
Anti-Sulfurated Thick Film Chip Resistors	ERJ-S02	0402	0.063W	10 to 1M	±1	±200	1.0x0.50x0.35	10000	<ul style="list-style-type: none"> • Sulfur resistance • High reliability • Suitable for flow and re-flow soldering
				1 to 3.3M	±5				
	ERJ-S03	0603	0.1W	10 to 1M	±1	±100	1.60x0.8x0.45	5000	
				1 to 1M	±5				
	ERJ-S06	0805	0.125W	10 to 1M	±1	±100	2.0x1.25x0.60		
				1 to 1M	±5				
	ERJ-S08	1206	0.25W	10 to 1M	±1	±100	3.20x1.60x0.60		
				1 to 1M	±5				
	ERJ-S14	1210	0.25W	10 to 1M	±1	±100	3.20x2.50x0.60		
				1 to 1M	±5				
	ERJ-S12	1812	0.5W	10 to 1M	±1	±100	4.50x3.20x0.60		
				1 to 1M	±5				
	ERJ-S1D	2010	0.5W	10 to 1M	±1	±100	5.0x2.50x0.60		
				1 to 1M	±5				
ERJ-S1T	2512	1W	10 to 1M	±1	±100	6.40x3.20x0.60	40000		
			1 to 1M	±5					

	Series	Case Size	Power Rating (W)	Resistance Range	Resistance Tolerance (%)	T.C.R. (ppm/°C)	LxWxT Dimensions (mm)	Quantity 7" Reel	Features
Thin Film Chip Resistors	ERA-2AEB	0402	1/16W	10-100K	±0.1	±25	1.0 x 0.5 x 0.35	10,000	<ul style="list-style-type: none"> • Small size and lightweight • High reliability • Low T.C.R. and current noise • Excellent non-linearity • Reflow & flow solderability • Meets ISO-9001 standards • High operating temperature capability -55 to +155 for ERA-2A, ERA-3A and ERA6A types
	ERA-3AEB	0603	1/10 W	47 ~ 330 K	±0.1		1.6 x .80 x 0.45	5,000	
	ERA-6AEB	0805	1/8 W	47 ~ 1 M			2.0 x 1.25 x .5		
	ERA-3YEB	0603	1/10 W	100 ~ 33 K	±0.5		1.6 x 0.8 x 0.45	5,000	
	EBA-6YEB	0805	1/8 W	100 ~ 100 K			2.0 x 1.25 x 0.5		
	ERA-14EB	1210	1/4 W	100 ~ 200 K	±50, ±25, ±100		3.2 x 2.5 x 0.6	10,000	
	ERA-AED	0402	1/16W	10-100K			1.0 x 0.5 x 0.35		
	ERA-3AED	0603	1/10 W	47 ~ 330 K	±50		1.6 x .80 x 0.45	5,000	
	ERA-6AED	0805	1/8 W	47 ~ 1 M			2.0 x 1.25 x .5		
	ERA-3AHD	0603	1/10 W	10 ~ 43	±50		1.6 x .80 x 0.45	5,000	
	ERA-6AHD	0805	1/8 W	10 ~ 43			2.0 x 1.25 x .5		
	ERA-3Y_D	0603	1/10 W	10 ~ 330K	±50, ±25, ±100		1.6 x 0.8 x 0.45	5,000	
	ERA-6Y_D	0805	1/8 W	10 ~ 1M			2.0 x 1.25 x 0.5		
Linear Thermistors	ERAS	0805	1/10 W	10 ~ 10 K	±5	1500 ± 200	2.0 x 1.25 x 0.5	5,000	<ul style="list-style-type: none"> • Excellent linearity of temperature coefficient to resistance value • Good for temperature compensation circuit in applications such as VRM and/or PA module
				43 ~ 5.1 K	±5	2700 ± 10%			
				6.2 ~ 470	±5	3900 ± 10%			
	ERAV	0603	1/16 W	10 ~ 10 K	±5	1500 ± 200	1.6 x 0.8 x 0.45	5,000	
				43 ~ 3.3 K	±5	2700 ± 10%			
	ERAW	0402	1/32 W	43 ~ 1K	±5	2700 ± 10%	1.0 x 0.5 x 0.35	10,000	
22 ~ 390				3300 ± 10%					
Chip Att.	EXB-24AT	0404	1 / 25 W Package	Attenuation Range 1 ~ 5 dB 6 ~ 10 dB	Attenuation Tolerance ± 0.3 dB ± 0.5 dB	Characteristic Impedance 50 Ω	1.0 x 1.0 x 0.35	10,000	<ul style="list-style-type: none"> • Space saving design using unbalanced pie-type attenuator

■ EIA Standard Resistance Values E-96 Tolerance *1% | E-24 Tolerance *5%, 0.5%, 0.1%

	Series	Case Size	Power Rating (W)	Resistance Range	Resistance Tolerance (%)	T.C.R. (ppm/°C)	LxWxT Dimensions (mm)	Quantity 7" Reel	Features
Chip Resistor Array	ERA-38V	0603 x 4 Convex Term	1 / 16 W Element	100K~220K 1K~100K	0.5 0.1, 0.25	± 25	3.2 x 1.6 x 0.5	5,000	<ul style="list-style-type: none"> High density of resistors in single array chip Improved placement efficiency (2 to 4 times greater) compared to flat chip type resistors
	EXB-14V	0201 x 2 Convex Term	1 / 32 W	10 ~ 1 M	± 5	± 200 x 10 ⁻⁶ / °C	0.8 x 0.6 x 0.35	10,000	
	EXB-18V	0201 x 4 Flat Term	1 / 32 W	10 ~ 1 M	± 5	1 - 10Ω : ± 600/-100x10 ⁻⁶ / °C	1.4 x 0.6 x 0.35		
	EXB-N8V	0402 x 4 Concave Term	1 / 32 W	1 ~ 1 M	± 5		2.0 x 1.0 x 0.45		
	EXB-24V	0402 x 2 Convex Term	1 / 16 W	1 ~ 1 M	± 5 ± 1 upon request	10 - 1 M : ± 200 10 > : -100 - + 600	1.0 x 1.0 x 0.35		
	EXB-28V	0402 x 4 Convex Term	1 / 32 W				2.0 x 1.0 x 0.35		
	EXB-2HV	0402 x 8 Convex Term	1 / 16 W Element				3.8 x 1.6 x 0.45		
	EXB-34V	0603 x 2 Convex Term					1.6 x 1.6 x 0.50		
	EXB-38V	0603 x 4 Convex Term					3.2 x 1.6 x 0.50		
	EXB-V4V	0603 x 2 Concave Term	1.6 x 1.6 x 0.60						
	EXB-V8V	0603 x 4 Concave Term	3.2 x 1.6 x 0.60						
	EXB-S8V	0805 x 4 Concave Term	1 / 10 W Element	10 ~ 1 M			5.08 x 2.2 x 0.70	2,500	
Chip R-Network	EXB-D10C	1206 Concave Term	1 / 20 W Element	47 ~ 1 M	± 5	± 200	3.2 x 1.6 x 0.55	5,000	<ul style="list-style-type: none"> High density placement for digital signal applications: 8 bussed resistors for pull up/down circuits Superior mountability due to unique concave terminal
	EXB-E10C	1608 Concave Term	1 / 16 W Element				4.0 x 2.1 x 0.55	4,000	
	EXB-A10P	2512 Concave Term	1 / 16 W Element				6.4 x 3.1 x 0.55		
Chip RC-Network	EZA-CT	0805	R = 1 / 32 W C = 12 V	Combination of R and C R = 10, 22, 47, 100, 220, 470, 1KΩ C = 10, 22 pF			2.0 x 1.25 x 0.55	5,000	<ul style="list-style-type: none"> R-C filters for noise reduction in an 0805, 1206 & 1608 package
	EZA-DT	1206	R = 1 / 16 W C = 12 V	Combination of R and C R = 22, 47, 100, 220, 470, 1KΩ C = 22, 47 100 pF			3.2 x 1.6 x 0.65	5,000	
	EZA-ST	1608	R = 1 / 16 W C = 25 V				4.0 x 2.1 x 0.65	4,000	

	Series	Case Size	Rated Functioning Temperature	Internal R at 25C (Max)	Rated Voltage	Interrupting Rating at Rated Voltage	Rated Current	Features	
Fuse / Fusing	SMD Micro Chip	ERB-SE ERB-SD	0402 ~ 1608	-40C to +100C	20 mohm ~ 700 mohm	32VDC, 35VDC	35A, 50A	0.25VAC ~ 5.0VAC	<ul style="list-style-type: none"> Fast acting Small size
	Leaded Thermal Cutoff	EYP	Thin, Axial Lead, Radial Lead	92C, 98C, 102C, 115C, 134C, 139C, 145C	250VAC, 50VDC, 32VDC	0.5A, 1.5A, 2A, 3A, 3.5A, 4A	55C ~ 125C (Vary by part number)	135C, 200C	<ul style="list-style-type: none"> High Reliability Various Package Styles: Radial, Axial Lead, and Thin

	Appearance	Series	Case Size	Power Rating (W)	Resistance Range	Resistance Tolerance (%)	T.C.R. (ppm/°C)	LxWxT (mm) Dimensions	Quantity 7" Reel (pcs.)	Features
ESD Suppressors		EZAEG3A	0603		C = 0.05 pF			1.6 x .80 x 0.5	5,000	<ul style="list-style-type: none"> Good ESD Suppression Good ESD Withstanding Low Capacitance
		EZAEG2A	0402		C = 0.10 pF			1.0 x 0.5 x 0.38	10,000	
		EZAEGCA	0805		C = 0.25 pF (4 Per Pkg.)			2.6 x 1.85 x 0.5	5,000	

	Series	EIA Case Size	Inductance @ 100 MHz Nominal	Q Min @ 100 MHz	Q* Typical @ 800 MHz	Rated DC Current Max. (mA)	DC Resistance (Ω)	SRF Min. (MHz)	Features**	
High Frequency Inductors	Laser Cut	ELJ-RF	0402	1.0 to 100 nH	8	21 to 14	400 to 90	0.05 to 5.5	6000 to 1200	<ul style="list-style-type: none"> • Non-polarity • Precision inductance • High self-resonant frequency
		ELJ-RE	0603	1.0 to 220 nH	4 to 12	47 to 20	500 to 70	0.05 to 7.5	6000 to 900	
		ELJ-PF	0402	2.2 to 10 nH	7	--	1900 to 750	0.04 to 0.26	5300 to 3200	
		ELJ-PE	0603	2.2 to 22 nH	8 to 9	--	2100 to 700	0.03 to 0.15	6000 to 1800	<ul style="list-style-type: none"> • High current rating for high-frequency use
		ELJ-QF	0402	1.0 to 39 nH	10	35 to 41	150 to 400	0.05 to 1.7	6000 to 1800	<ul style="list-style-type: none"> • High Q
High Frequency Inductors	Wire-Wound	ELJ-ND	0805	10 to 1,000 nH	8 to 15	--	540 to 120	0.18 to 3.88	3300 to 80	<ul style="list-style-type: none"> • Low inductance, tight tolerance • Stable L-value over varied ambient conditions
		ELJ-NC	1008	10 to 820 nH	10 to 15	--	280 to 100	0.32 to 2.1	2500 to 100	
		ELJ-NA	1210	0.047 to 8.20 μH	10 to 13	--	450 to 60	0.20 to 11	680 to 38	
General Use Inductors	Wire-Wound	ELJ-FC	1008	0.22 to 100 μH	15 to 25	--	190 to 60	0.70 to 21	230 to 12	<ul style="list-style-type: none"> • Suitable for general use applications
		ELJ-FA	1210	0.22 to 220 μH	20 to 30	--	360 to 45	0.29 to 21	230 to 7	
		ELJ-SA	1210	10 to 270 μH	40	--	18 to 5	1.80 to 14	30 to 4	
		ELJ-FB	1812	0.22 to 1,000 μH	30 to 50	--	700 to 40	0.30 to 53	230 to 2.1	
High Current Inductors	Wire-Wound	ELJ-PC	1008	1.0 to 33 μH	8 to 20	--	475 to 120	0.45 to 6.5	95 to 16	<ul style="list-style-type: none"> • Low DC resistance and high DC current rating • Suitable for use in power lines as a choke coil
		ELJ-PA	1210	1.0 to 330 μH	7 to 20	--	600 to 50	0.15 to 16	150 to 3	
		ELJ-PB	1812	10 to 220 μH	10 to 20	--	360 to 90	0.65 to 9	19 to 4	
		ELJ-EA	1210	1.0 to 330 μH	7 to 20	--	500 to 30	0.09 to 9.23	100 to 4	<ul style="list-style-type: none"> • Very Low DC resistance
		ELJ-DA	1210	39 to 100	19 to 24 (0.796 MHz) @2.52MHz	--	70 to 100	52 to 130	7 to 11	<ul style="list-style-type: none"> • Ultra Low Distortion

* Q Min. - Please check each specification.

** SRF - Self Resonant Frequency

Type	Series	Case Size	Impedance (Ω)	Tolerance	Cap. (pF)	Rated DC Current	DC Resistance Max (Ω)	Features	
Surface Mount Filters	Common Mode Noise Filter	EXC-14CE	0302	Common mode Z: 65, 90	+/-20%		130 mA	2.5	<ul style="list-style-type: none"> Low DC Resistance And Insertion Loss Low Profile
		EXC-24CG	0504	Common mode Z:24, 90	+/-20%		160mA, 100mA	1.5, 3.0	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> High-Q Impedance Available Magnetic Shield
		EXC-28CE	0804	Common mode Z:90 ~ 200	+/-25%		130mA ~ 160 mA	1.5 ~ 2.50	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Effective Noise Suppression For Power Lines And High Speed Signal Lines
Chip Bead Array	EXC-28BA EXC-28BB	0804	Z: 120, 220	+/-25%		100 mA	0.5, 0.7	<ul style="list-style-type: none"> SSOP Package (0.5mm Pitch) Compatibility Small Size 	
Chip	EXC-CET	1807		+/-20%	22 ~ 10K	2A	0.05	<ul style="list-style-type: none"> Wide Capacitance Range Suitable For Narrow Pitch Insertion 	
Coil	ELK-E	1207			10 ~ 33K			<ul style="list-style-type: none"> For Filtering Digital Noise Stable Attenuation Characteristics Over Current Changes 	
Leaded Filters	Leaded Bead Core	EXC-EL						<ul style="list-style-type: none"> For High Frequency Applications Radial And Axial Types Available Lower Cost 	

Chip Choke Coils	Series	Size (mm)	Inductance Range	Saturation Rated Current	Features
	ELL-3FU	3.0 x 3.0 x 1.2	1.0 ~ 10.0 μ H	600 ~ 1700 mA	<ul style="list-style-type: none"> • Large Current, Low Loss • Magnetic Shielding • Low Profile
	ELL-VEG ELL-VFG ELL-VGG	3.0 x 3.0 x 1.0 3.0 x 3.0 x 1.2 3.0 x 3.0 x 1.5	1.0 ~ 68.0 μ H	350 ~ 2200 mA	<ul style="list-style-type: none"> • Magnetic Shielding • Low DC Resistance & large current capability • Vibration Resistant
	ELC-VEN ELC-VFN	3.0 x 3.0 x 1.0 3.0 x 3.0 x 1.2	1.0 ~ 22.0 μ H	330 ~ 1750 mA	<ul style="list-style-type: none"> • Low DC Resistance & large current capability • Vibration Resistant
	ELC-3FN ELC-3GN	3.2 x 3.2 x 1.2 3.2 x 3.2 x 1.5	1.0 ~ 68.0 μ H	190 ~ 1400 mA	
	ELL-PFG	3.6 x 3.6 x 1.2	1.0 ~ 68.0 μ H	240 ~ 1700 mA	<ul style="list-style-type: none"> • Magnetic Shielding • Low DC Resistance & large current capability • Vibration Resistant
	ELL-4FG ELL-4GG ELL-4LG	3.8 x 3.8 x 1.2 3.8 x 3.8 x 1.4 3.8 x 3.8 x 1.8	1.0 ~ 150.0 μ H	220 ~ 2400 mA	
	ELL-SFG	4.0 x 4.0 x 1.2	1.2 ~ 470.0 μ H	100 ~ 1800 mA	
	ELC-5FN	4.5 x 4.5 x 1.2	2.4 ~ 47.0 μ H	320 ~ 1300 mA	<ul style="list-style-type: none"> • Low DC Resistance & large current capability • Vibration Resistant
	ELL-5PS	5.0 x 5.0 x 2.0	1.2 ~ 100.0 μ H	300 ~ 2500 mA	<ul style="list-style-type: none"> • Magnetic Shielding • Low DC Resistance & large current capability
	ELL-6RH ELL-6SH ELL-6UH	6.0 x 6.0 x 2.8 6.0 x 6.0 x 3.3 6.0 x 6.0 x 5.0	1.0 ~ 1000.0 μ H	180 ~ 3400 mA	<ul style="list-style-type: none"> • Thin • High Mounting Reliability • Large Current Capability
	ELL-6GG ELL-6GP	6.0 x 6.0 x 1.6 6.0 x 6.0 x 2.0	0.8 ~ 100.0 μ H	380 ~ 2500 mA	<ul style="list-style-type: none"> • Magnetic Shielding • Low DC Resistance & large current capability
	ELC-6GN	6.0 x 6.0 x 1.6	1.2 ~ 68.0 μ H	450 ~ 2700 mA	<ul style="list-style-type: none"> • Low DC Resistance & large current capability
	ELL-ATV	10.0 x 10.0 x 4.5	1.5 ~ 1000.0 μ H	320 ~ 6700 mA	<ul style="list-style-type: none"> • Magnetic Shielding • Low DC Resistance & large current capability • Available on Tape & Reel for automatic insertion
ELL-CTV	12.0 x 12.0 x 4.5	1.2 ~ 1000.0 μ H	410 ~ 6500 mA		

Power Choke Coils	Series	Parts No	Size(mm)	Inductance	Rated current	DCR	Features
	PCC-M0754M	ETQP5M4R7YFM	7.5x7.0x5.4	4.7uH +/-20%	4.5A	20.4mohm +/-10%	<ul style="list-style-type: none"> • High Heat Resistance • High Reliability • High Bias Current • Temperature Stability • Low Audible Noise • Highly Efficient
		ETQP5M470YFM		48uH +/-20%	1.6A	156mohm +/-10%	
	PCC-M0854M	ETQP5M2R5YFK	8.5x8.0x5.4	2.45uH +/-20%	7.5A	7.6mohm +/-10%	
		ETQP5M220YFK		22uH +/-20%	2.6A	63mohm +/-10%	
		ETQP5M470YFK		48uH +/-20%	1.8A	125mohm +/-10%	
	PCC-M1054M	ETQP5M2R5YFC	10.7x10x5.4	2.5uH +/-20%	10A	5.3mohm +/-10%	
		ETQP5M3R3YFC		3.3uH +/-20%	8.6A	7.1mohm +/-10%	
		ETQP5M4R7YFC		4.7uH +/-20%	7.2A	10.2mohm +/-10%	
	PCC-M105YGC	ETQP5M101YGC	10.7x10x5.0	97uH +/-20%	1.6A	208mohm +/-10%	

Power Choke Coils

Series	Parts No	Size(mm)	Inductance	Rated current	DCR	Features	
PCC-M0630L	ETQP3LR33XFN	7.5x6.5x3.0	0.33μH +/-20%	17A	2.0mΩ +/-10%	<ul style="list-style-type: none"> • Low profile for smaller circuits • Excellent DC bias performance • High reliability in humid conditions • High frequency range for excellent performance • Low Audible noise 	
PCC-M0630M	ETQP3MR68YFN	6.5x6.0x3.0	0.68μH +/-20%	7.4A	6.3mΩ +/-10%		
	ETQP3M1R0YFN		1.0μH +/-20%	6.6A	7.9mΩ +/-10%		
	ETQP3M1R5YFN		1.5μH +/-20%	5.6A	11mΩ +/-10%		
PCC-M104L	ETQP4LR36AFC	11.7x10x4.0	0.36μH +/-20%	30A	0.76mΩ +/-5%	<ul style="list-style-type: none"> • Small Size, Space Saving • High Power (21A to 30A) • Low loss (RDC: 0.76 to 1.58 mohm) • Tighter DCR tolerance (±5%) • Suitable for high frequency circuit (up to 1 MHz) • Low Audible Noise 	
	ETQP4LR68XFC	11.5x10x4.0	0.68μH +/-20%	21A	1.58mΩ +/-5%		
	ETQP4LR19WFC		0.19μH +/-20%	28A	0.70mΩ +/-10%		
	ETQP4LR36WFC		0.36μH +/-20%	24A	1.10mΩ +/-5%		
	ETQP4LR45XFC		0.45μH +/-20%	25A	1.10mΩ +/-5%		
	ETQP4LR56WFC		0.56μH +/-20%	21A	1.56mΩ +/-5%		
PCC-M125L	ETQP5LR50XFA	14.5x12.5x5.0	0.50μH +/-20%	30A	0.80mΩ +/-7%	<ul style="list-style-type: none"> • High Power (25A to 30A) • Low loss (RDC:0.8 to 1.1 mohm) • Tighter DCR tolerance (±5% ~ ±7%) • Low profile • High frequency (up to 1 MHz) • Low Audible Noise 	
	ETQP5LR60XFA		0.60μH +/-20%	27A	1.10mΩ +/-5%		
PCC-D124H	ETQP3H0R4BFA	13.0x12.9x3.9	0.36μH +/-20%	23A	1.04mΩ max	<ul style="list-style-type: none"> • High Power, High Inductance (Metal Dust Core provides no saturation performance limitations.) • Low Loss from Low RDC • Low Audible Noise • Surface Mount, Low profile 	
	ETQP3H0R8BFA		0.80μH +/-20%	16A	2.33mΩ max		
	ETQP3H1R4BFA		1.43μH +/-20%	12A	4.52mΩ max		
PCC-D125H	ETQP2H0R3BFA	13.0x12.9x4.9	0.29μH +/-20%	36A	0.54mΩ max		
	ETQP2H0R7BFA		0.69μH +/-20%	21A	1.30mΩ max		
	ETQP2H1R2BFA		1.22μH +/-20%	16A	2.27mΩ max		
	ETQP2H1R8BFA		1.83μH +/-20%	14A	3.48mΩ max		
	ETQP2H2R6BFA		2.61μH +/-20%	12A	4.98mΩ max		
PCC-D126H	ETQP1H0R6BFA	13.0x12.9x6.0	0.60μH +/-25%	26A	0.90mΩ max		
	ETQP1H1R0BFA		1.00μH +/-20%	19A	1.56mΩ max		
PCC-D126F	ETQP6F0R6BFA	12.5x12.5x6.0	0.58μH +/-20%	19A	1.44mΩ max		<ul style="list-style-type: none"> • High Power, High Inductance (Metal Dust Core provides no saturation performance limitations.) • Low Loss from Low RDC • Low Audible Noise • Surface Mount, Low profile
	ETQP6F1R1BFA		1.06μH +/-20%	16A	2.24mΩ max		
	ETQP6F1R8BFA		1.71μH +/-20%	14A	3.30mΩ max		
	ETQP6F2R5BFA		2.45μH +/-20%	12A	4.92mΩ max		
	ETQP6F3R4BFA		3.32μH +/-20%	10A	6.48mΩ max		
PCC-F126F	ETQP6F0R8LFA	12.5x12.5x5.7	0.8μH +/-30%	14.2A	2.24mΩ max	<ul style="list-style-type: none"> • High Power (Isat 20A/100) • Thin Profile (5.7mm height)/SMD • Low Leakage Flux (EI type/Center gap core) 	
	ETQP6F102HFA		10.2μH +/-25%	6.5A	13.30mΩ max		
	ETQP6F1R0SFA		1.0μH +/-30%	14.2A	2.24mΩ max		
	ETQP6F1R2HFA		1.2μH +/-30%	14.2A	2.24mΩ max		
	ETQP6F1R3LFA		1.3μH +/-30%	12.5A	3.30mΩ max		
	ETQP6F1R6SFA		1.6μH +/-30%	12.5A	3.30mΩ max		
	ETQP6F2R0HFA		2.0μH +/-30%	12.5A	3.30mΩ max		
	ETQP6F2R0LFA		2.0μH +/-30%	10.8A	4.92mΩ max		
	ETQP6F2R5SFA		2.5μH +/-30%	10.8A	4.92mΩ max		
	ETQP6F2R9LFA		2.9μH +/-30%	9.3A	6.48mΩ max		
	ETQP6F3R2HFA		3.2μH +/-25%	10.8A	4.92mΩ max		
	ETQP6F3R5SFA		3.5μH +/-30%	9.3A	6.48mΩ max		
	ETQP6F4R1LFA		4.1μH +/-20%	7.9A	8.64mΩ max		
	ETQP6F4R6HFA		4.6μH +/-25%	9.3A	6.48mΩ max		
	ETQP6F6R4HFA		6.4μH +/-25%	7.9A	8.64mΩ max		
ETQP6F8R2HFA	8.2μH +/-25%	7.2A	10.90mΩ max				

Type	Part Number	Case Size	Varistor Voltage	Max. Allowable Voltage (DC)	Capacitance	Maximum ESD [IE061000-4-2]	
Varistors	Low Capacitance	0201	12 V	6.7 V	47 pF max	Contact Discharge Voltage: 8kV Air Gap Discharge Voltage: 15kV	
			27 V	16 V	20 pF max		
		0402	8 V	5 V	330 pF max		
			12 V	6.7 V	220 pF max		
			27 V	16 V	47 pF max		
					20 pF max		
			0603	8V	5 V		330 pF max
				12 V	6.7 V		
		27 V		16 V	100 pF max		
		33 V		26 V			
	Ultra Low Capacitance	0201	80 V	5 V	3 pF max		
		EZJ-Z0V80010		18 V	1 pF max		
		EZJ-Z0V80015D	0402	5 V	1.5 +_0.5 pF		
		EZJ-Z0V500AA					50 V
		EZJ-Z0V800AA		80 V			
		EZJ-Z0V171AA	170 V	18 V			
		EZJ-Z1V80010	0603	80 V	5 V		
		EZJ-Z1V500AA		50 V			
		EZJ-Z1V800AA		80 V	18 V		
		EZJ-Z1V171AA		170 V			
Varistor Arrays	2 Array	0504	12 V	6.7 V	220 pF max		
			27 V	16 V	20 pF max		
					47 pF max		
			80 V	18 V	3 pF max		
			170 V				
	4 Array	0402	8 V	5.6 V	680 pF max		
					330 pF max		
					100 pF max		
					27 pF max		
	2 Varistors 2 Capacitors Per Array	0504	27 V	16 V	27 pF		
					33 pF		
					39 pF		
					43 pF		
					47 pF		
	Varistors	High Capacitance	0603	12 V	6 V	8200 pF	
30 V				18 V	3900 pF		
50 V				30 V	1800 pF		
0805			12 V	6 V	22000 pF		
			30 V	18 V	8200 pF		
			50 V	30 V	4700 pF		

	Series	Appearance	Case Size (EIA) LxWxH (mm)	Electrical Characteristics	Operating Temperature	Features		
Multi-layer Varistor	Zinc-oxide		EZJ-ZZ	0201 (0.6 x 0.3 x 0.3)	Varistor Voltages: 12 ~ 80 Vdc Capacitance: 1 ~ 47 pF Max 8 kV Max. ESD Capability	-40 to 85°C	<ul style="list-style-type: none"> Very small case size 	
			EZJ-Z0	0402 (1.0 x 0.5 x 0.5)	Varistor Voltages: 12 ~ 170 Vdc Capacitance: 1 ~ 220 pF Max. 8 kV Max. ESD Capability			
			EZJ-Z1	0603 (1.6 x 0.8 x 0.8)	Varistor Voltages: 12 ~ 170 Vdc Capacitance: 1 ~ 330 pF Max. 8 kV Max. ESD Capability			
			Surface Mount	EZJ-ZS	0504 (1.37 x 1.0 x 0.6)	Varistor Voltages: 12 ~ 170 Vdc Capacitance: 3 ~ 220 pF Max. 8 kV Max. ESD Capability	-40 to 85°C	<ul style="list-style-type: none"> 2 Varistors per array Part count reduction Board space savings
				EZJ-P0	0402 (1.0 x 0.5 x 0.5)	Varistor Voltages: 8 Vdc Capacitance: 27 ~ 680 pF Max. 8 kV Max. ESD Capability		
	Strontium Titanate		EZJ-S1	0603 (1.37 x 1.0 x 0.6)	Varistor Voltages: 12 ~ 50 Vdc Capacitance: 1,800 ~ 8,200 pF Max. 30 kV Max. ESD Capability	-40 to 85°C	<ul style="list-style-type: none"> High ESD capabilities 	
			EZJ-S2	0805 (2.0 x 1.25 x .85)	Varistor Voltages: 12 ~ 50 Vdc Capacitance: 4,700 ~ 22,000 pF Typical 30 kV Max. ESD Capability			
	ZNR Surge Absorbers	Zinc-oxide		Molded Case (6.0 x 8.0 x 3.2)	Varistor Voltages: 22 ~ 470 Vdc Max. Peak Currents: 125 to 300 A	-40 to 85°C	<ul style="list-style-type: none"> Flow (wave) / Reflow soldering UL (Pending) 	
								Leaded









	Series	Appearance	Case Size (EIA) LxWxH (mm)	Electrical Characteristics	Operating Temperature	Features
Multi-layer NTC Thermistors	ERT-JZ		0201 (0.6 x 0.3 x 0.3)	Nominal Resistance @ 2K ~ 1000K Ω	-40 to 125°C	<ul style="list-style-type: none"> 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 @ 22 ~ 470K Ω		
	ERT-J1		0603 (1.6 x 0.8 x 0.8)	Nominal Resistance @ 22 ~ 150K Ω	1 mW/°C ~ 3m W/°C	

Part Number	Dimension X (mm)	Dimension Y (mm)	Thickness (mm)
EYGS1823(10, 07)	180 ±5	230 ±5	0.10 ±0.03, 0.07 ±0.015
EYGS1218(10, 07, 03)	115 ±5	180 ±5	0.10 ±0.03, 0.07 ±0.015, 0.025 ±0.010
EYGS0912(10, 07, 03)	90 ±5	115 ±5	0.10 ±0.03, 0.07 ±0.015, 0.025 ±0.010









Pyrolytic Graphite Sheet (PGS)	Thickness	0.10 ±0.03 mm	0.07 ±0.015 mm	0.025 ±0.010 mm	
	Density	0.85 g/cm ³	1.1 g/cm ³	2.1 g/cm ³	
	Thermal Conductivity	a-b plane	600 to 800 W/(m-K)	750 to 950 W/(m-K)	1500 to 1700 W/(m-K)
	Electrical Conductivity		10,000 S/cm	10,000 S/cm	20,000 S/cm
	Extensional Strenght		19.6 MPa	22.0 MPa	30.0 MPa
	Expansion Coefficient	a-b plane	9.3 X 10 ⁻⁷ 1/K	9.3 X 10 ⁻⁷ 1/K	9.3 X 10 ⁻⁷ 1/K
		c axis	3.2 X 10 ⁻⁵ 1/K	3.2 X 10 ⁻⁵ 1/K	3.2 X 10 ⁻⁵ 1/K
	Heat Resistance		400°C		
	Bending (180° angle, R5)		10,000 Cycles		

Light Touch Switches	Type	Series	Appearance	L x W x H (mm)	Operating Force	Features
	Top Push	EVP-AF		3.0 x 2.6 x 0.65	1.6 N (160 gf)	<ul style="list-style-type: none"> Built-in actuator for consistent tactile performance World's smallest with actuator
	Top Push	EVP-AA		3.5 x 2.9 x 1.4 3.5 x 2.9 x 1.7	1.0 N (100 gf) 1.6 N (160 gf) 2.4 N (240 gf) 3.5 N (350 gf) 5.0 N (500 gf)	<ul style="list-style-type: none"> Super small-sized, thin profile J-bent terminal Wide range of operating force Long operating life
	Top Push	EVQ-P6		4.1 x 4.1 x 0.38 4.1 x 4.1 x 0.43 4.1 x 4.1 x 0.58	1.0 N (100 gf) 1.6 N (160 gf) 2.4 N (240 gf) 3.5 N (350 gf)	<ul style="list-style-type: none"> Compact/Thin Profile Long-life: up to 1,000,000 cycles min. Optional push-plate for improved actuation Optional ground terminal for ESD protection
	Top Push	EVQ-PQ		4.5 x 4.5 x 0.55	1.6 N (160 gf) 2.4 N (240 gf)	<ul style="list-style-type: none"> Thin Profile Sealing film for dust resistance
	Top Push	EVQ-P2 EVQ-3P2		4.7 x 3.5 x 2.5 4.7 x 3.5 x 2.1	1.0 N (100 gf) 1.6 N (160 gf) 2.4 N (240 gf) 2.5 N (250 gf) 3.5 N (350 gf) 5.0 N (500 gf)	<ul style="list-style-type: none"> J-bent terminals Ground terminal optional Middle Push: 0.7 mm Short Push: 0.25 mm
	Top Push	EVQ-PL		4.9 x 4.9 x 0.8 4.9 x 4.9 x 1.5	1.0 N (100 gf) 1.6 N (160 gf) 2.6 N (260 gf)	<ul style="list-style-type: none"> Optional push-plate for improved actuation GND terminal included
	Top Push	EVQ-P0 EVQ-Q2		6.5 x 6.0 x 2.0 6.5 x 6.0 x 2.5 6.5 x 6.0 x 3.1	0.5 N (50 gf) 1.3 N (130 gf) 1.6 N (160 gf) 2.6 N (260 gf) 3.5 N (350 gf) 5.0 N (500 gf)	<ul style="list-style-type: none"> Low cost Wide selection of height and force Wide push plate for reliable actuation Over-stroke & GND type available Long operating life
	Double Action	EVQ-3P EVQ-PR		6.0 x 6.0 x 0.9 6.0 x 6.0 x 1.05	1st 0.7 N, 2nd 2.6 N 1st 1.0 N, 2nd 2.6 N	<ul style="list-style-type: none"> Double action for Camera shutter function Push plate, Boss & Ground as options
	Side Operated	EVQ-P7		3.5 x 2.9 x 1.35	1.6 N (160 gf) 2.2 N (220 gf)	<ul style="list-style-type: none"> High impact resistance Boss and L-terminal available
	Double Action, Side Operated	EVQ-Q0		6.2 x 3.5 x 5.25	1.0 N / 2.6 N	<ul style="list-style-type: none"> Double action for camera shutter function Edge mount for ultra high impact resistance
	Side Operated	EVQ-PU		4.7 x 3.5 x 1.65	1.6 N (160 gf) 2.2 N (220 gf)	<ul style="list-style-type: none"> High impact resistance Straight or J-bent terminals
	Side Operated	EVQ-P4 EVQ-P8		6.2 x 3.5 x 3.0 6.2 x 3.5 x 3.4	1.0 N (100 gf) 1.6 N (160 gf) 2.4 N (240 gf) 2.5 N (250 gf) 3.5 N (350 gf) 5.0 N (500 gf)	<ul style="list-style-type: none"> Optional edge mount for ultra high impact resistance 0.25 mm, 0.70 mm travel Life: 200 K to 1 Million cycles
	Side Operated	EVQ-PS		6.1 x 4.0 x 1.8	1.6 N (160 gf) 2.2 N (220 gf)	<ul style="list-style-type: none"> Straight or J-bent terminals With or without positioning boss
	Long Travel	EVQ-P1 EVQ-9P		6.1 x 6.0 x 5.0	2.0 N (200 gf) 2.2 N (220 gf) 2.5 N (250 gf) 3.5 N (350 gf)	<ul style="list-style-type: none"> Push travel: 1.0 mm, 1.3 mm Popular for automotive applications J-bent terminal Large push plate for superior actuation
	Long Travel	EVQ-Q1		8.5 x 8.5 x 6.5	4.0 N (400 gf) 5.0 N (500 gf)	<ul style="list-style-type: none"> Ultra high force Popular for automotive applications Large push plate for superior actuation J-Bent Terminal
Center Space, Long Travel	EVP-AD		9.8 x 10.15 x 4.6	4.0 N (400 gf)	<ul style="list-style-type: none"> World's first open Center Space for LED Long travel of 1.0mm 100K life 	
Multi-Function 5 Way	EVQ-WH		6.0 x 3.5 x 4.36	1.0 N (100 gf) 1.6 N (160 gf) 2.4 N (240 gf)	<ul style="list-style-type: none"> Compact and thin profile Optional boss for stability 	
Multi-Function 5 Way	EVQ-Q7		7.7 x 7.7 x 1.75	Push: 2.6 N Leaning: 1.3 N	<ul style="list-style-type: none"> Compact and thin profile Long life Dust-proof structure 	






Light Touch Switches







Type	Series	Appearance	L x W x H (mm)	Operating Force	Features
Top Push	EVQ-PA EVQ-PB		6.0 x 6.0 x 4.3 6.0 x 6.0 x 5.0	1.0 N (100 gf) 1.3 N (130 gf)	<ul style="list-style-type: none"> Without ground terminal (EVQ-PA) With ground terminal (EVQ-PB)
Top Push	EVQ-2		6.0 x 6.0 x 7.0 6.0 x 6.0 x 9.5	1.6 N (160 gf) 2.6 N (260 gf)	<ul style="list-style-type: none"> With or without ground terminal Wide selection of height and force
Top Push	EVQ-PE/ PJ/PN/5P		6.0 x 3.5 x 4.3 6.0 x 3.5 x 5.0	1.0 N (100 gf) 1.6 N (160 gf) 2.4 N (240 gf)	<ul style="list-style-type: none"> Narrow width for space saving SMT, bulk, radial-tape terminal types available
Top Push	EVQ-11		6.0 mm dia. x 4.3 6.0 mm dia. x 5.0 6.0 mm dia. x 7.0 6.0 mm dia. x 9.5	1.0 N (100 gf) 1.3 N (130 gf) 1.6 N (160 gf) 2.6 N (260 gf)	<ul style="list-style-type: none"> Radial Taping Forged terminals to improve mounting efficiency Round shape for improved packaging density
Top Push	EVQ-P0		6.2 x 6.2 x 7.0	0.74 N (74 gf) 1.3 N (130 gf)	<ul style="list-style-type: none"> Knob shape: De-centering, centering Ideal for frequent usage such as mouse button
Top Push	EVQ-PV		6.1 x 6.0 x 5.0	2.0 N (200 gf) 2.2 N (220 gf) 2.5 N (250 gf) 3.5 N (350 gf)	<ul style="list-style-type: none"> Push travel: 1.0 mm, 1.3 mm Forged terminals Large push plate for superior actuation
Side Operated	EVQ-PC EVQ-PF		PC 7.5 x 7.1 x 9.25 PF { 7.5 x 7.1 x 7.15 7.5 x 7.1 x 7.85 7.5 x 7.1 x 9.85 7.5 x 7.1 x 12.35	1.0 N (100 gf) 1.3 N (130 gf) 1.6 N (160 gf) 2.6 N (260 gf)	<ul style="list-style-type: none"> Without ground terminal Bulk (EVQ-PF) or radial taping (EVQ-PC) Wide selection of height and force
Long Travel	EVQ-QJ		8.0 x 8.0 x 5.0 8.0 x 8.0 x 5.5 8.0 x 8.0 x 6.1	0.8 N (80 gf) 1.3 N (130 gf) 2.5 N (250 gf)	<ul style="list-style-type: none"> Push travel: 1.0mm, 1.2mm, 1.75mm Long life: Self Cleaning Quiet operation





Detector Switches








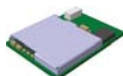




Type	Series	Appearance	Dimensions (mm)	Operating Force	Features
Horizontal Detector	ESE-58		3.5 x 3.0 x 0.9	300 mN max	<ul style="list-style-type: none"> Industry smallest form factor & thinnest profile Normal close or normal open style Positioning boss optional Multiple actuation methods for design flexibility
1HW Detector	ESE-23		Mounting height: 1.5 mm Outer dimensions: 5.0 mm x 4.4 mm	300 mN (30 gf)	<ul style="list-style-type: none"> Small/thin profile Long over-travel Usable as an operation switch (an input device)
2W Detector	ESE-24		Outer dimensions: 7.5 mm x 3.0 mm x 5.6 mm 7.5 mm x 4.65 mm x 5.6 mm	350 mN (35 gf)	<ul style="list-style-type: none"> Compact/thin profile Long over-travel Usable as an operation switch (an input device)
Vertical Detector	ESE-16		3.35 x 2.2 x 1.5	250 mN max	<ul style="list-style-type: none"> Industry's smallest projected size
2 mm Size Type 2N	ESE-22		Mounting height: 4.1 mm Vertical or horizontal	300 mN (30 gf)	<ul style="list-style-type: none"> Wiping contact construction Operable in two directions: X-X or Y-Y Extremely thin profile, SMD
2 mm Size Type 2NV	ESE-21		Mounting height: 2.3 mm Outer dimensions: 3.4 mm x 3.8 mm	300 mN (30 gf)	<ul style="list-style-type: none"> Self-wiping leaf spring contact construction Pole position: 1 pole, 1 position
5 mm Size Type 5N	ESE-11		Mounting height: 4.9 mm	350 mN (35 gf)	<ul style="list-style-type: none"> Self-wiping leaf spring contact construction Pole position: 1 pole, 1 position
Super Thin Type	ESE-13 ESE-18		Mounting height: 1.2 mm Travel: 1.5 mm	300 mN (30gf)	<ul style="list-style-type: none"> For horizontal and vertical mounting (ESE-13) For left and right side operation (ESE-18)

Encoders

Type	Series	Appearance	Life (cycles)	Rotation Torque	Features
12 mm Square GS Encoders	EVE-G EVE-H EVE-J EVE-K EVE-L		30,000 (std. type) 15,000 (high rotational torque)	3 to 20 mN-m 10 to 50 mN-m	<ul style="list-style-type: none"> Heavy rotation torque optional Various shaft/bushing types available Integrated push switch optional
11 mm Square GS Encoders	EVE-R EVE-V EVE-U EVE-Y		30,000	3 to 20 mN-m	<ul style="list-style-type: none"> Low Profile Reflow Type 3.5mm Body Height Through-Hole Type 4mm Body Height Integrated Push Switch 0.4mm Or 1.5mm Travel Minimum-Wobble Type Available
16 mm Square High Grade	EVE-P		1,000,000	3 to 25 mN-m	<ul style="list-style-type: none"> Smooth operating feel with minimal wobble Integrated Switch Long Life: 1,000,000 cycles minimum
Edge Drive Jog	EVQ-WK		100,000	1 to 10 mN-m 4.5 N (push-on)	<ul style="list-style-type: none"> 15 detents with excellent tactile response Push-on switch with tactile response Compact size, thin profile Reflow soldering available Anti-electrostatic measures available
Center Space 20/12mm, 27/18mm, 60/40mm	EVQ-V/W		30,000	3 to 20 mN-m 35 mN-m	<ul style="list-style-type: none"> Open center space for LED and switch Allows for large knob design Allows for transparent shaft for superior lighting effect

Potentiometers	Type	Series	Appearance	Life (cycles)	Rotation Torque	Features
	9mm Rotary	EVU-E/F		10,000	1 to 20 mN-m	<ul style="list-style-type: none"> Multiple Bushing & Height Configurations Midpoint detent optional
	12 Rotary	EVJ-01/02		15,000	2 to 20 mN-m	
	12mm Dual Rotary	EVJ-C/Y		15,000	2 to 20 mN-m	<ul style="list-style-type: none"> Dual output with accurate tracking
	16mm Center Space	EWV-YC		30,000	20, 25 or 30 mN-m	<ul style="list-style-type: none"> Large diameter with smooth rotation LED integration optional
	10mm Sensor	EVWAE		1,000,000	3 mN-m max.	<ul style="list-style-type: none"> Low profile, small size, long life <3% linearity
	Center Space 39/20mm	EWV-YE		30,000	20 mN-m	<ul style="list-style-type: none"> Large center space for switch and LED Low wobble of 0.25mm max Multiple detent options (5, 8, 29) Automotive grade

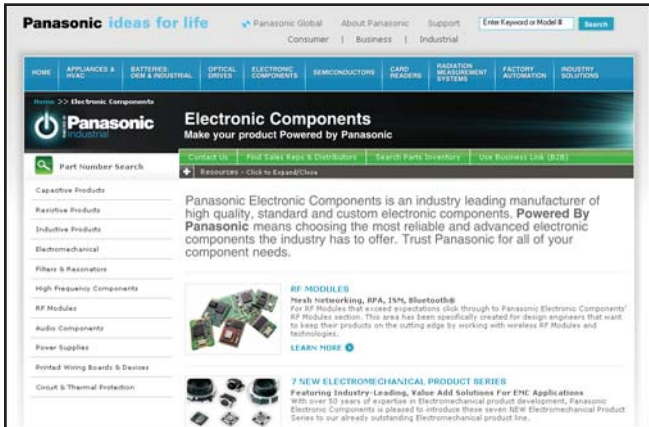
Faders	Type	Series	Appearance	Life (cycles)	Features
	Standard	EWA-K/M/N/P/Q		30,000	<ul style="list-style-type: none"> Compact size and wave-soldering type available High reliability Available with: 15.0, 20.0, 30.0, 45.0 and 60.0 mm travel
		EWA-P1/Q1		30,000	<ul style="list-style-type: none"> Excellent operational feel Low noise, long operating life, highly accurate attenuation Light operating force available
	Thin	EVA(B) JQ / NA		50,000	<ul style="list-style-type: none"> Thin and compact design: 8 mm body height & 15 mm width Light sliding force and smooth operability Highly accurate attenuation characteristics: more than 100dB max.
Mono	EVA-NF EVA-NE		30,000	<ul style="list-style-type: none"> Slim type fader series: 9 mm width; 8 mm height Excellent cost performance 	

	Series	Appearance	Dimensions (mm)	Receiver Sensitivity	Operating Temperature	Max. Output Power	Power Supply	Frequency Range	I/Os	Interfaces	Max. Data Rate (KBits/s)
ISM	PAN2350		20.3 x 14.8 x 4.2	-117 dBm 17 mA	-40 to +85°C	5 dBm 33 mA	2.3 to 3.6 V	402 - 470 or 804 - 940 MHz	4	SPI	153.6
	PAN2355		8.0 x 8.2 x 1.9	-100 dBm	-40 to +85°C	6 dBm	1.8 to 3.6 V	800 - 928 MHz	-	SPI	500
	PAN2365		8.0 x 8.2 x 1.9	-104 dBm	-40 to +85°C	1 dBm	1.8 to 3.6 V	2.4	-	SPI	500
	PAN2357		8.0 x 8.2 x 1.9	-104 dBm	-40 to +85°C	10 dBm	1.8 to 3.6 V	433 MHz	-	SPI	500
Bluetooth®	PAN1315		6.5 x 9.0 x 1.7	-93 dBm	-20 to +70°C	10 dBm	1.7 - 4.8 V	2.4 GHz	-	SPI, HCI	2100
	PAN1315 LE		6.5 x 9.0 x 1.7	-93 dBm	-20 to +70°C	10 dBm	1.7 - 4.8 V	2.4 GHz	-	SPI, HCI	TBD
	PAN1455		18.7 x 13.4 x 2.2	-86 dBm	-40 to +85°C	4 dBm	2.7 to 3.6 V	2.4 GHz	30	GPIO, USB, PCM, UART, SPI, JTAG	2100
	PAN1555		22.8 x 20.0 x 4.0	-86 dBm	-40 to +85°C	4 dBm	2.7 to 3.6 V	2.4 GHz	30	GPIO, USB, PCM, UART, SPI, JTAG	2100
RPA	PAN5375		29 x 15 x 4	-97 dBm	-40 to +85°C	+20 dBm	2.3 ~ 2.7 V	2.4 GHz	-	SPI, HCI	2100
802.15.4 (Mesh)	PAN4555		16.4 x 12.2 x 2.1	-98 dBm	-40 to +85°C	0 dBm	2.0 to 3.4 V	2.4 GHz	19	GPIO, UART, SPI	250
	PAN4560		35 x 15 x 3.5	-92 dBm	-40 to +85°C	0 dBm	2.7 to 3.3 V	2.4 GHz	33	UART, GPIO, I2C	250
	PAN4561		35 x 15 x 3.5	-105 dBm	-40 to +85°C	20 dBm	2.7 to 3.3 V	2.4 GHz	33	UART, GPIO, I2C, SPI	250
	PAN4562		35 x 15 x 3.5	-102 dBm	-40 to +85°C	10 dBm	2.7 to 3.3 V	2.4 GHz	33	UART, GPIO, I2C, SPI	250
	PAN4565		35 x 15 x 3.5	-100 dBm	-40 to +85°C	0 dBm	2.7 to 3.3 V	2.4 GHz	40	UART, SPI, I2C, GPIO	2000
	PAN4566		35 x 15 x 3.5	-112 dBm	-40 to +85°C	20 dBm	2.7 to 3.3 V	2.4 GHz	40	UART, SPI, I2C, GPIO	2000

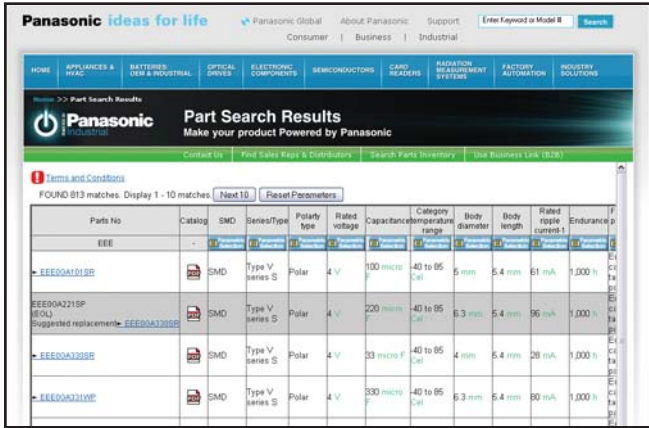
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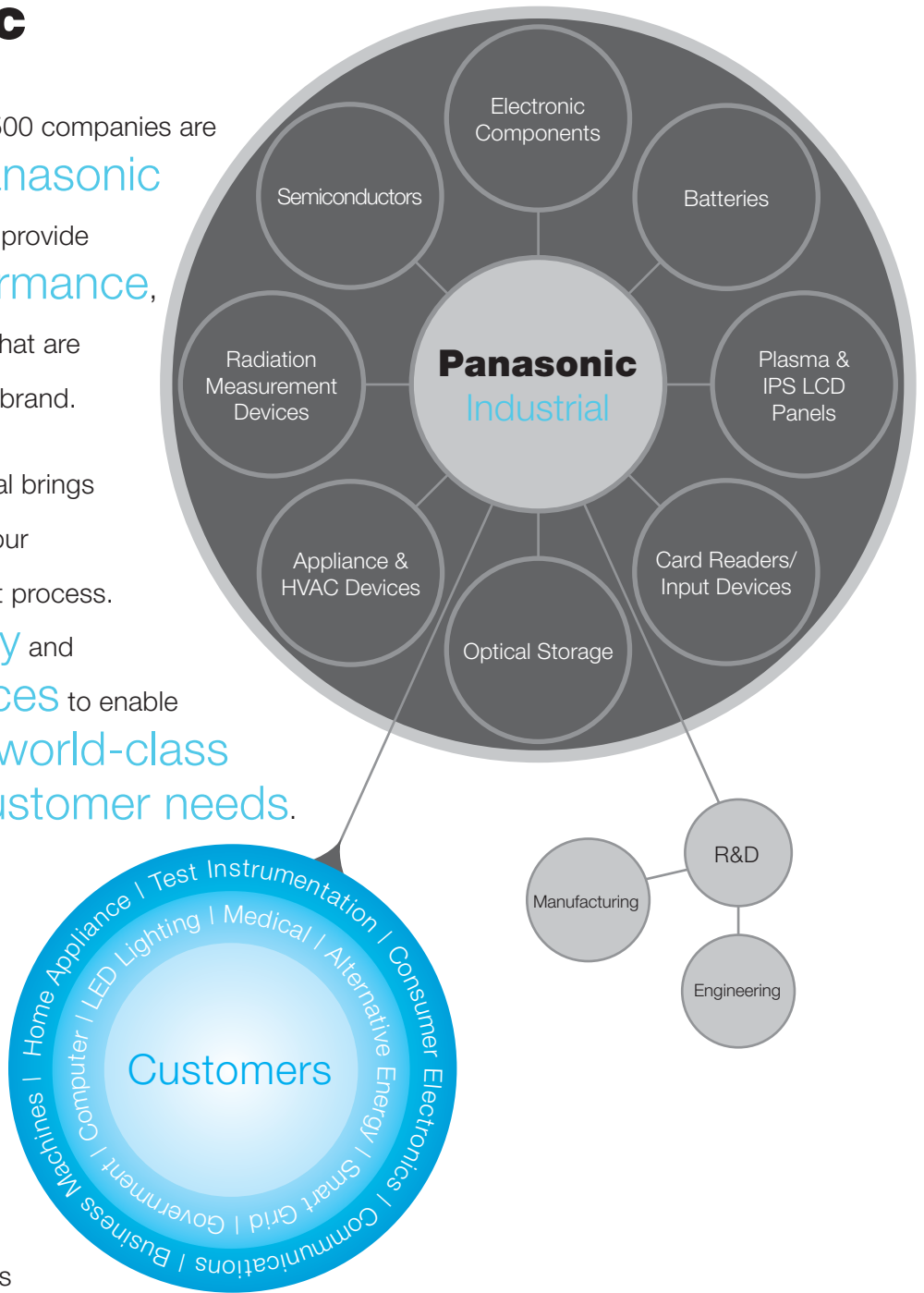


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