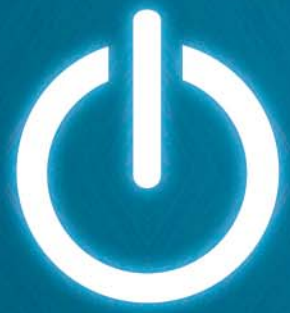

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Electronic Components

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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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.

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.

Inductors & Filters

Panasonic offers Inductive Products which include high performance Chip Inductors, in laser-cut or wire-wound technologies, SMD and Leaded Choke Coils and Power Choke Coils, as well as Filters for EMI, Noise / ESD, in addition to a broad range of AC Leaded Line Filters and Voltage Step-up Coils.

RoHS 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.

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.

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.

Full product specifications can be found online at:

www.panasonic.com/industrial/electronic-components

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							
ET								Input/Output Transformers	Transformers: Chip, pulse; Current; Common Mode Choke			
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 Attn, 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				Fiber Optic Components					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	Power Choke Coils		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.

			Series	Series	Appearance	Operating Temperature	(Working Voltage) Capacitance	Features
Aluminum Electrolytic	Surface Mount Type*	General Purpose	VS	EEE-_A/S		-40 ~ +85°C	(4 ~ 100 VDC) 0.1 ~ 1,500 μF	• General purpose, 2,000 hours at 85°C • Very compact size
		Long Life	HA	EEE-HA		-40 ~ +105°C	(6.3 ~ 100 VDC) 0.1 ~ 1,500 μF	• Long life, 1000~2,000 hours at 105°C • Very compact size
			HB	EEE-HB			(4 ~ 50 VDC) 0.1 ~ 470 μF	• Long life, 2,000 hours at 105°C • 5.8 mm height (< φ 6)
			HC	EEE-HC			(6.3 ~ 50 VDC) 33 ~ 1,000 μF	• Long life, 3,000~5,000 hours at 105°C • 5.8 mm height (< φ 6)
			HD	EEE-HD			(6.3 ~ 50 VDC) 0.1 ~ 1000 μF	• Very long life, 5,000 hours at 105°C • Industrial grade
			TG	EEE-TG		-40 ~ +125°C	(10 ~ 100 VDC) 10 ~ 4,700 μF	• High temperature, 2,000 hours at 125°C • Low ESR at low temperature
			TK	EEE-TK			(10 ~ 35 VDC) 47 ~ 4700 μF	• High temperature, 3,000 hours at 125°C • Low ESR at low temperature
			TP	EEE-TP			(10 ~ 35 VDC) 47 ~ 470 μF	• Low ESR at Low Temperatures • 2,000~3,000 hours at 125°C
		Low ESR/Long Life	FP	EEE-FP		-55 ~ +105°C	(6.3 ~ 35 VDC) 100 ~ 1,800 μF	• Very Low ESR, tantalum replacement • High Temperature Reflow (260°C)
			FK	EEE-FK			(6.3 ~ 100 VDC) 3.3 ~ 6,800 μF	• 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	• 1,000 hours at 105°C • Low impedance
		Bi-Polar	VS-BP	EEE-V__A___N		-40 ~ +85°C	(6.3 ~ 50 VDC) 0.22 ~ 47 μF	• General Purpose • 5.4 mm height (< φ 6)
			HB-BP	EEE-HP		-40 ~ +105°C		• Industrial Grade • 5.8 mm height
	Radial Lead	General Purpose	85°C	M		-40 ~ +85°C (-25°C: 160~450VDC)	(6.3 ~ 450 VDC) 0.1 ~ 22,000 μF	• General purpose, 2000 hours at 85°C • Compact size
			105°C	NHG		-55 ~ +105°C (-25°C: 160~450VDC)	(6.3 ~ 450 VDC) 0.1 ~ 22,000 μF	• 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	• General purpose, 1,000 hours at 85°C • 7 mm height
				KS	ECE-A__KK/KS			(4 ~ 50 VDC) 0.1 ~ 330 μF	• 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	• 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	• 5,000~10,000 hours at 105°C • Very long life
				ED	EEU-ED		-25 ~ +105°C	(160 ~ 450 VDC) 10 ~ 330 μF	• 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	• 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	• 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	• 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	• 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.)

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			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	• Low ESR, high ripple current • 1.8 mm height, ESR 18 mΩ maximum
			CX	EEF-CX			(2 ~ 6.3 VDC) 100 ~ 470 µF	• Low ESR, high ripple current • 1.9 mm height, ESR 15 mΩ maximum
			UD	EEF-UD			(2 ~ 8 VDC) 68 ~ 470 µF	• Low ESR, high ripple current • 2.8 mm height, ESR 15 mΩ maximum
			UE	EEF-UE			(2 ~ 8 VDC) 100 ~ 560 µF	• 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	• 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		-40 ~ +125°C	(2 ~ 8 VDC) 33 ~ 330 µF	• High reliability • Low ESR, high ripple current
Electric Double Layer	SMT		EN	EEC-EN		-10 ~ +60°C	(3.3 VDC) 0.2 F	• SMT Re-flow solderable • Coin type, low profile
			EP	EEC-EP		-10 ~ +60°C	(3.3/2.6 VDC) 0.033 F	• 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	• 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	• 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	• 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	• 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	• Large capacitance • Backup for mA - A range
			HZ	EEC-HZ0D		-25 ~ +60°C	(2.5 VDC) 3.3~10 F	• 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	• General purpose • 2,000~3,000 hours at 85°C • 20 mm low profile available
			TS-UQ	EET-UQ		-40 ~ +85°C (-25°C: 350~450VDC)	(160 ~ 450 VDC) 82 ~ 100,000 µF	• 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	• 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	• 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	• 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	• 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	• 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	• 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	• 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	• 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 μF 10/16/50 VDC	• Non-inductive, stacked • Miniature • Reflow soldering • Tight C-tolerance	• High density mounting SMD (industrial grade)
		ECH-U(C)			0.01~0.22 μF 100 VDC	• Non-inductive, stacked • Miniature • Reflow and flow solderability • Tight C-tolerance	• High density mounting SMD • Industrial Use • Filters; oscillators
		ECW-U(C)		-55 ~ +105°C -55 ~ +125°C	0.1 ~ 1.0 μF 450 VDC	• Non-inductive, stacked • Miniature • Reflow Soldering • Noise Suppressor	• High density mounting SMD (commercial grade)
		ECW-U(V16)		-55 ~ +85°C	0.001~0.12 μF 250 VDC	• Non-inductive, stacked • Miniature • Similar to polyester film cap • Noise Suppressor	• High density mounting SMD (commercial grade)
		ECW-U(X)		-55 ~ +105°C	0.001 ~ 0.01 μF 100 VDC	• Non-inductive, stacked • Reflow soldering	• Electronic exchange • Ringer circuit telephone & PBX
		ECP-U(A)		-40 ~ +85°C	0.1 ~ 1.0 μF 16 VDC	• Non-inductive, stacked • Reflow soldering	• Coupling, filtering &PLL
Film Interference Suppressors	Metallized Polyester	**ECQ-U(Y)**		-40 ~ +100°C	0.001 ~ 0.047 μF 250 VAC	UL, CSA, SEMKO, DEMKO, NEMKO, FIMKO, VDE, SEV approved (Class Y)	• Universal applications • Interference suppression
		ECQ-U(G)			0.01 ~ 1.0 μF 250 VAC (UL, CSA) 300 VAC (IEC384-14)	• Flame retardant case • Equipped with safety mechanism • UL, CSA, SEMKO, DEMKO, NEMKO, FIMKO, VDE, SEV approved (Class X1)	• Noise suppressor for AC line
		ECQ-U(L)			0.01 ~ 2.2 μF 250 VAC (UL, CSA) 275 VAC (IEC384-14)	• Smaller size than ECQ-U(V) or ECQ-U(G) • UL, CSA, BDE approved (Class X2)	• High performance, fuse function type in AC line
Film (AC)	Metallized Polyester/ Polypropylene	**ECH-A(X)**		-25 ~ +70°C	0.5 ~ 6 μF 180 ~ 430 VAC	• Flame retardant epoxy coating • Equipped with safety mechanism	• Motors

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Metallized Film

	Dielectric	Series	Appearance	Operating Temperature	Ratings	Features	Applications
Metallized Film	Plastic	ECQ-V		-40 ~ +85°C	0.01 ~ 2.2 μF 50/63/100 VDC	• Non-inductive • Stacked Construction	• General purpose applications • Audio
	Polyester	ECQ-E(H)		-40 ~ +105°C	0.1 ~ 2.2 μF 450 VDC	• Smaller Size • Self healing property	• Active filtering circuit
		ECQ-E(F)		-40 ~ +85°C	0.001 ~ 10 μF 100 ~ 1250 VDC	• Wide capacitance range • Compact size	• General purpose applications
		ECQ-E(B)			0.01 ~ 0.47 μF 250 VDC	• Wide capacitance range • Miniaturized	
		ECQ-E(T)		-40 ~ +105°C	0.01 ~ 10 μF 250~630 VDC, 125~250 VAC	Excellent Moisture Resistance	• High humidity environments
	Polypropylene	ECW-F(L)		-25 ~ +105°C	0.022 ~ 2.4 μF, 400 VDC 0.01 ~ 1.3 μF, 630 VDC	• Low Dissipation Factor • High Voltage	• High frequency, high current circuits
		ECW-F(B)		-25 ~ +85°C	0.022 ~ 0.47 μF 250/400 VDC	• Low Dissipation Factor	
		ECW-H(V)			0.001 ~ 0.1 μF 800 ~ 2000 VDC	• Low Dissipation Factor	• High pulse circuits (TV, display, electronic balast)
		ECW-F(A)		-40 ~ 105°C	0.1 ~ 6.8 μF 250/450 VDC	• Miniaturized Size • High Reliability Design	• Active Filter in PFC Circuits
		ECW-H(A)			0.01 ~ 0.047 μF 800 VDC	• Miniaturized Size • High Product Safety • Low Hum Noise	• Resonance circuits found in AC to DC Power Supplies • Active Filter in PFC Circuit

Ceramic

	Series	Appearance	Series	Operating Voltage	Temperature Characteristics	Capacitance Range	Features
Ceramic	ECC-T3		Hi-V SMD	1kVDC - 5kVDC	SL/GP	10 pF to 68 pF	• Molded SMD case for reflow soldering
	ECK-T3				Y5P	100 pF to 470 pF	
	ECC-TBC		BC	250VAC	SL/GP	10 pF to 68 pF	• UL(CSA)/SEMCO Y2 approval, 1500 VAC for 1 minute • SMD (7.1 x 6.3 x 2.5 mm)
	ECK-TBC				Y5P, Y5U, Y5V	100 pF to 4,700 pF	
	ECC-TFC		FC	250VAC	SL/GP	5 pF to 330 pF	• UL(CSA)/SEMCO Y2 approval, 1500 VAC for 1 minute • SMD, small size (5.7 x 4.5 x 2.3 mm)
	ECK-TFC				Y5P, Y5U, Y5V	470 pF to 4,700 pF	

	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	• Halogen Free
	ERJ-1GEJ	0201	1 / 20 W	1.0 ~ 1 M	± 5		0.60 x 0.3 x 0.23	15,000	• 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
	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	• 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			0.22 ~ 1.0		± 250			
	ERJ-2BQF				± 1				
	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	5,000	
	ERJ-3RQJ			0.22 ~ 0.91					
	ERJ-3RSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω ± 200			
	ERJ-3RQF			0.22 ~ 9.1					
	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					
	ERJ-6RSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω ± 200			
	ERJ-6RQF			0.22 ~ 9.1					
	ERJ-6BWF		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	3.2 x 1.6 x 0.6		
	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			
	ERJ-8RQJ			0.22 ~ 9.1					
	ERJ-8RSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω ± 200			
	ERJ-8RQF			0.22 ~ 9.1					
	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					
	ERJ-14RSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω ± 100			
	ERJ-14RQF			0.22 ~ 9.1					
	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					
	ERJ-12RSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω 100			
	ERJ-12RQF			0.22 ~ 9.1					
	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					
	ERJ-1TRSF			0.1 ~ 0.2	± 1	1.0 ~ 9.1 Ω ± 100			
	ERJ-1TRQF			0.22 ~ 0.91					

Resistance Range (Ω)	T.C.R. (ppm / ˚C)
<10	-100 ~ +600
10 - 1 M	± 200
>1M	-400 ~ +150

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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	• 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		4.5 x 3.2 x 0.6		
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 1 ~ 2 mΩ ± 500	6.4 x 3.2 x 0.8	3,000	• Metal plate is used as resistance element • Reflow and flow solderability • ERJ-M1WT type is for heat dissipation • ±1% tolerance for 1~2 mΩ available upon request
ERJ-M1WTF			3 ~ 4 milli.	± 1				
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	• 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	• 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		
			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		
			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		
			1 to 1M	+5	R>=10 ohm: ±200 R<10ohm: -100 to +600			

Anti-Pulse Thick Film Chip Resistors

ERJ-T06	0805	1/4W	1 to 1M	+5	R>=33 ohm: ±200 R<30ohm: ±300 R<10ohm: -100 to +600	2.0x1.25x0.60	5000	• Pulse Tolerant • High Reliability • High Power
ERJ-T08	1206	1/3W			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	• 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	• 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			1.6 x 0.8 x 0.45		
	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			3.2 x 2.5 x 0.6		
	ERA-AED	0402	1/16W	10-100K	± 0.5		1.0 x 0.5 x 0.35	10,000	
	ERA-3AED	0603	1/10 W	47 ~ 330 K			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		
	ERA-6AHD	0805	1/8 W	10 ~ 43		± 50	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		
	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	• 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%			
				7.5 ~ 390	± 5	3900 ± 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	• Space saving design using unbalanced pie-type attenuator

■ EIA Standard Resistance Values

E-96 Tolerance *1% | E-24 Tolerance *5%, 0.5%, 0.1%

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	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	0.5	± 25	3.2 x 1.6 x 0.5	5,000	• High density of resistors in single array chip • Improved placement efficiency (2 to 4 times greater) compared to flat chip type resistors
				1K~100K	0.1, 0.25				
	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		1.4 x 0.6 x 0.35		
	EXB-N8V	0402 x 4 Concave Term	1 / 32 W	1 ~ 1 M	± 5	1 - 10Ω: ± 600/-100x10^{-6}/ °C	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	5,000	
	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	• 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	• 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	

Fuse / Fusing

		Series	Case Size	Rated Functioning Temperature	Internal R at 25C (Max)	Rated Voltage	Interrupting Rating at Rated Voltage	Rated Current	Features
SMD	Micro Chip	ERB-SE ERB-SD	0402 ~ 1608	-40C to +100C	20 mohm ~ 700 mohm	32VDC, 35VDC	35A, 50A	0.25VAC ~ 5.0VAC	• Fast acting • Small size

		Series	Package Types	Rated Functioning Temperature	Voltage	Amp.	Holding Temperature	Max Temperature Limit	Features
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	• 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	• 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	• 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	• High current rating for • high-frequency use
		ELJ-PE	0603	2.2 to 22 nH	8 to 9	--	2100 to 700	0.03 to 0.15	6000 to 1800	
		ELJ-QF	0402	1.0 to 39 nH	10	35 to 41	150 to 400	0.05 to 1.7	6000 to 1800	• High Q
	Wire-Wound	ELJ-ND	0805	10 to 1,000 nH	8 to 15	--	540 to 120	0.18 to 3.88	3300 to 80	• 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		ELJ-FC	1008	0.22 to 100 μH	15 to 25	--	190 to 60	0.70 to 21	230 to 12	• 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		ELJ-PC	1008	1.0 to 33 μH	8 to 20	--	475 to 120	0.45 to 6.5	95 to 16	• 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	• 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	• Ultra Low Distortion

* Q Min. - Please check each specification. ** SRF - Self Resonant Frequency

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	Type	Series	Case Size	Impendance (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	• 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
	Chip Bead Array	EXC-28BA EXC-28BB	0804	Z: 120, 220	+-25%		100 mA	0.5, 0.7	• SSOP Package (0.5mm Pitch) Compatibility • Small Size
	Chip	EXC-CET	1807		+-20%	22 ~ 10K	2A	0.05	• Wide Capacitance Range • Suitable For Narrow Pitch Insertion
	Coil	ELK-E	1207			10 ~ 33K			• For Filtering Digital Noise • Stable Attenuation Characteristics Over Current Changes
Leaded Filters	Leaded Bead Core	EXC-EL		30 ~ 160			7A	0.01	• 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 µH	600 ~ 1700 mA	• 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 µH	350 ~ 2200 mA	• 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 µH	330 ~ 1750 mA	• 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 µH	190 ~ 1400 mA	
ELL-PFG	3.6 x 3.6 x 1.2	1.0 ~ 68.0 µH	240 ~ 1700 mA	• 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 µH	220 ~ 2400 mA	
ELL-SFG	4.0 x 4.0 x 1.2	1.2 ~ 470.0 µH	100 ~ 1800 mA	
ELC-5FN	4.5 x 4.5 x 1.2	2.4 ~ 47.0 µH	320 ~ 1300 mA	• Low DC Resistance & large current capability • Vibration Resistant
ELL-5PS	5.0 x 5.0 x 2.0	1.2 ~ 100.0 µH	300 ~ 2500 mA	• 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 µH	180 ~ 3400 mA	• 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 µH	380 ~ 2500 mA	• Magnetic Shielding • Low DC Resistance & large current capability
ELC-6GN	6.0 x 6.0 x 1.6	1.2 ~ 68.0 µH	450 ~ 2700 mA	• Low DC Resistance & large current capability
ELL-ATV	10.0 x 10.0 x 4.5	1.5 ~ 1000.0 µH	320 ~ 6700 mA	• 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 µH	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%	• 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%	

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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%	• 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%	• 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		0.68µH +/-20%	21A	1.58mΩ +/-5%	
	ETQP4LR19WFC	11.5x10x4.0	0.19µH +/-20%	28A	0.70mΩ +/-10%	
	ETQP4LR36WFC		0.36µH +/-20%	24A	1.10mΩ +/-5%	
	ETQP4LR45XFC		0.45µH +20/-25%	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%	• 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	• 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	• 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	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	EZJ-ZZV120EA	0201	12 V	6.7 V	47 pF max	Contact Discharge Voltage: 8kV Air Gap Discharge Voltage: 15kV
		EZJ-ZZV270RA		27 V	16 V	20 pF max	
		EZJ-Z0V080KA	0402	8 V	5 V	330 pF max	
		EZJ-Z0V120JA		12 V	6.7 V	220 pF max	
		EZJ-Z0V270RA		27 V	16 V	47 pF max	
		EZJ-Z0V270EA				20 pF max	
		EZJ-Z1V080KA	0603	8V	5 V	330 pF max	
		EZJ-Z1V120KA		12 V	6.7 V		
		EZJ-Z1V270GA		27 V	16 V	100 pF max	
		EZJ-Z1V330GA		33 V	26 V		
	Ultra Low Capacitance	EZJ-ZZV800AA	0201	80 V	5 V	3 pF max	
		EZJ-Z0V80010	0402		18 V	1 pF max	
		EZJ-Z0V80015D			5 V	1.5 +_0.5 pF	
		EZJ-Z0V500AA		50 V			
		EZJ-Z0V800AA		80 V	18 V		
		EZJ-Z0V171AA		170 V			
		EZJ-Z1V80010	0603	80 V			
		EZJ-Z1V500AA		50 V	5 V		
		EZJ-Z1V800AA		80 V	18 V		
		EZJ-Z1V171AA		170 V			
Varistor Arrays	2 Array	EZJ-ZSV120JA	0504	12 V	6.7 V	220 pF max	
		EZJ-ZSV270RA		27 V	16 V	20 pF max	
		EZJ-ZSV270EA				47 pF max	
		EZJ-ZSV800AA		80 V	18 V	3 pF max	
		EZJ-ZSV171AA		170 V			
	4 Array	EZJ-P0V080MA	0402	8 V	5.6 V	680 pF max	
		EZJ-P0V080KA				330 pF max	
		EZJ-P0V080GA				100 pF max	
		EZJ-P0V080DA				27 pF max	
	2 Varistors 2 Capacitors Per Array	EZJ-ZSV270DA	0504	27 V	16 V	27 pF	
		EZJ-ZSV270PA				33 pF	
		EZJ-ZSV270SA				39 pF	
		EZJ-ZSV270TA				43 pF	
		EZJ-ZSV270EA				47 pF	
Varistors	High Capacitance	EZJ-S1VB822	0603	12 V	6 V	8200 pF	Contact Discharge Voltage: 30kV
		EZJ-S1VC392		30 V	18 V	3900 pF	
		EZJ-S1VD182		50 V	30 V	1800 pF	
		EZJ-S2VB223	0805	12 V	6 V	22000 pF	
		EZJ-S2YC822		30 V	18 V	8200 pF	
		EZJ-S2YD472		50 V	30 V	4700 pF	

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Multi-layer Varistor / ZNR Surge Absorbers

			Series	Appearance	Case Size (EIA) LxWxH (mm)	Electrical Characteristics	Operating Temperature	Features
Multi-layer Varistor	Zinc-oxide	Surface Mount	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	• 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		• Small case sizes • Low capacitance loading • Ideal for high speed signal lines
			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		
			EZJ-ZS	Array	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	• 2 Varistors per array • Part count reduction • Board space savings
			EZJ-P0	Array	0402 (1.0 x 0.5 x 0.5)	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
	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	• 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	Surface Mount	ERZ-VF		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	• Flow (wave) / Reflow soldering • UL (Pending)
		Leaded	ERZ-VD		5 to 20 mm Diameter Disc	Varistor Voltages: 18 to 1,800 VDC Max. Peak Currents: 125 to 6,500 A	-40 to 85°C	• Large energy handling capabilities • UL / VDE / CSA Safety Certifications • QS9000

Multi-layer NTC Thermistors

Series	Appearance	Case Size (EIA) LxWxH (mm)	Electrical Characteristics	Operating Temperature	Features
ERT-JZ		0201 (0.6 x 0.3 x 0.3)	Nominal Resistance @ 2K ~ 1000K Ω	-40 to 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 @ 22 ~ 470K Ω	Power Dissipation 33 mW ~ 100mW	
ERT-J1		0603 (1.6 x 0.8 x 0.8)	Nominal Resistance @ 22 ~ 150K Ω	1 mW/°C ~ 3m W/°C	

Pyrolytic Graphite Sheet (PGS)

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

Thickness		0.10 ±0.03 mm	0.07 ±0.015 mm	0.025 ±0.010 mm
Density		0.85 g/cm³	1.1 g/cm³	2.1 g/cm³
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	9.3×10^{-7} 1/K	9.3×10^{-7} 1/K	9.3×10^{-7} 1/K
	c axis	3.2×10^{-5} 1/K	3.2×10^{-5} 1/K	3.2×10^{-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)	• 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)	• 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)	• 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)	• 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)	• 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)	• 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)	• 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	• 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)	• 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	• Double action for camera shutter function • Edge mount for ultra hight impact resistance
Side Operated	EVQ-PU		4.7 x 3.5 x 1.65	1.6 N (160 gf) 2.2 N (220 gf)	• 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)	• 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)	• 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)	• 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)	• 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)	• 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)	• 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	• Compact and thin profile • Long life • Dust-proof structure

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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 6.0 x 6.0 x 7.0 6.0 x 6.0 x 9.5	1.0 N (100 gf) 1.3 N (130 gf) 1.6 N (160 gf) 2.6 N (260 gf)	• Without ground terminal (EVQ-PA) • With ground terminal (EVQ-PB)
Top Push	EVQ-2				• 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)	• 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)	• 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)	• 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)	• 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)	• 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)	• 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	• 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)	• 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)	• 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	• Industry's smallest projected size
2 mm Size Type 2N	ESE-22		Mounting height: 4.1 mm Vertical or horizontal	300 mN (30 gf)	• 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)	• 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)	
Super Thin Type	ESE-13 ESE-18		Mounting height: 1.2 mm Travel: 1.5 mm	300 mN (30gf)	• 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	• 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	• 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	• 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)	• 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	• 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	• 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	• Dual output with accurate tracking
16mm Center Space	EWV-YC		30,000	20, 25 or 30 mN-m	• Large diameter with smooth rotation • LED integration optional
10mm Sensor	EVWAE		1,000,000	3 mN-m max.	• Low profile, small size, long life • <3% linearity
Center Space 39/20mm	EWV-YE		30,000	20 mN-m	• 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	• 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	• Excellent operational feel • Low noise, long operating life, highly accurate attenuation • Light operating force available
Thin	EVA(B) JQ / NA		50,000	• 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	• Slim type fader series: 9 mm width; 8 mm height • Excellent cost performance

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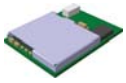
	Series	Appearance	Dimensions (mm)	Receiver Sensitivity	Operating Temperature	Max. Output Power	Power Supply	Frequency Range	I/Os	Interfaces	Max. Data Rate (KBits/s)
ISM	PAN2350		20.3 x 14.8 x 4.2	-117 dBm 17 mA	-40 to +85°C	5 dBm 33 mA	2.3 to 3.6 V	402 - 470 or 804 - 940 MHz	4	SPI	153.6
	PAN2355		8.0 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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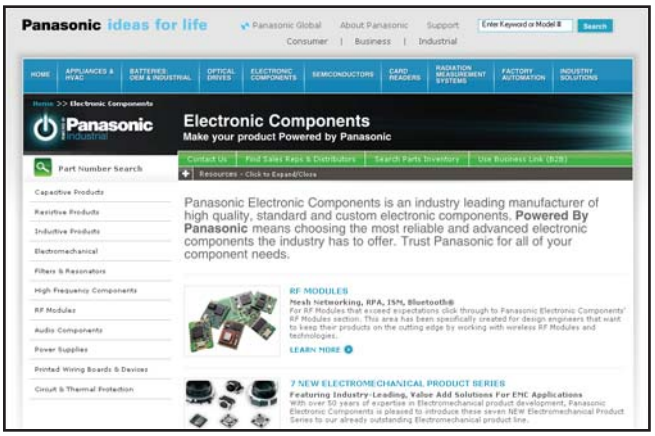

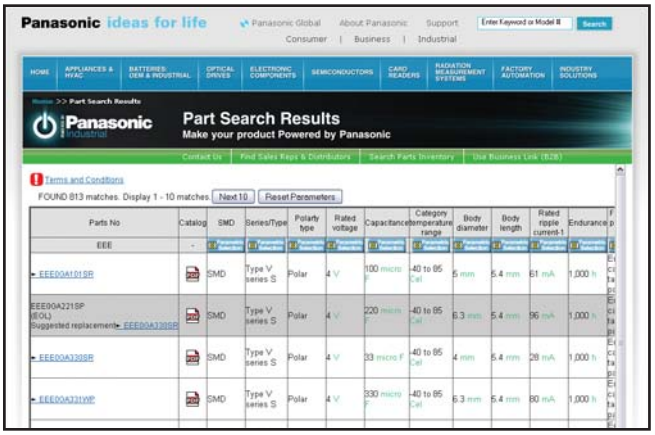

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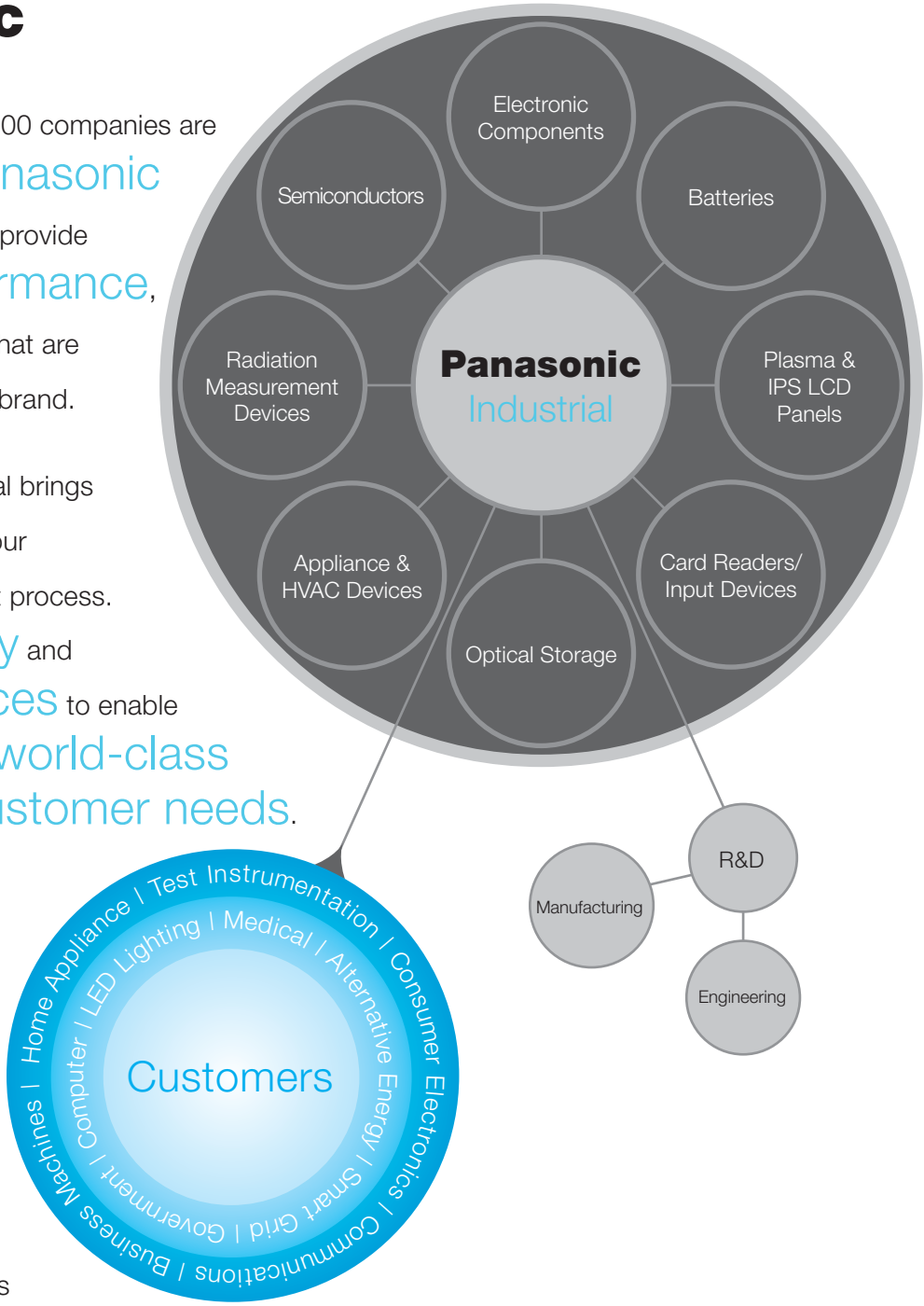

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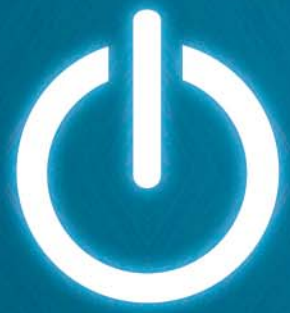

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