

**Panasonic Industrial Company : Lead-free ( RoHS Compliance) Electronic Components 9/6/2005**

Category	Product Type	Product Series	Plating Materials for Electrodes, etc.	RoHS Compliant (Pb,Hg,Cd,Cr+6,PBB/PBDE)	Special Soldering Conditions	Part Number Change
Electrolytic Capacitors	Aluminum Electrolytic Capacitors (Radial lead type)	ECA, EEA/EEU, ECE-A	Sn	✓++	-	No
	Aluminum Electrolytic Capacitors (Snap-in type)	ECE-S, ECO-S, ECE-C, EET	Sn	✓	-	No
	Aluminum Electrolytic Capacitors (Screw Terminal type)	EEG	Al terminals	Not RoHS	-	No (discont'd)
	Aluminum Electrolytic Capacitors (Surface mount type)	EEE (≤10mm dia.) [* EEV, ECE-V (≤10mm dia.) contains Pb - not RoHS] -EEV-FK, TG (≥12.5mm dia.) Pb-free	Sn/Sn-Bi Sn	✓*	< 5sec. at 250 deg C (Dia. 4 to 6.3) ; < 5sec. at 235 deg C ( Dia.8 to 18) ≤20sec at 230deg C	No
	Electric Double Layer Capacitors	EEC	Sn	✓	-	No
	Specialty Polymer Aluminum Electrolytic Capacitors	EEF	Sn	✓	Reflow peak temp: < 10sec at 240 degC	No
Ceramic Products	Multilayer Ceramic Chip Capacitors	ECJ, EGY, ECD	Sn	✓	-	No
	Multilayer Chip NTC Thermistors	ERT-J	Sn	✓	-	No
	Multilayer Chip Varistors	EZJ	Sn	✓	-	No
	Ceramic Resonators	EFJ-(C,N), EFO-	Sn, Au	✓	-	No
	"ZNR" Transient / Surge Absorbers (Discrete)	ERZ	Sn	✓	-	No
	SAW Filters	EFC-H	Au	✓	-	No
	Ceramic Disc Capacitors (Discrete)	ECK/ECC	Sn	✓	-	No
	SAW Duplexers	EFS	Au	✓	-	No
	Disc Type NTC Thermistors (Discrete)	ERT-D	Sn	✓	-	No
	Glass-sealed NTC Thermistors (Axial)	ERT-G	Sn-Ag-Cu	✓	-	No
	SMD High-voltage Ceramic Capacitors	ECK/ECC-T3F	Sn-Ag	✓	-	No
	Adjustable (pre-set) Ceramic Capacitors (Series J and L)	ECR-LA***12, ECV-IZW**53T	Sn-Cu	✓	-	No
	Resistors	Fixed Resistors (Thick Film Chip)	ERJ	Sn	✓	260 deg C max.
Fixed Resistors (Carbon: Discrete)		ERD	Sn	✓	260 deg C max.	No
Fixed Resistors (Metal Oxide Film: Discrete)		ERG/ERX-(S, F)	Sn	✓	260 deg C max.	No
Fixed Resistors (Array: SMD)		EXB	Sn	✓	260 deg C max.	No
Fixed Resistors (Metal Film Chip: SMD)		ERA	Sn	✓	260 deg C max.	No
Fixed Resistors (Metal Film Axial leaded)		ERO	Sn	✓	-	No
R-C Networks, C Networks		EZA	Sn	✓	260 deg C max.	No
Thermal Cutoff		EYP	Sn	✓	Please Inquire	No
Trimmer Potentiometer (Open Chip)		EVM-(2, 3, 1D)	Sn	✓	Please Inquire	No
Ferrite EMI Filters	Chip Bead Cores	EXC-(CL, ML, 3B)	Sn	✓	260 deg C max.	No
	Bead Core	EXC-EL	Sn	✓	-	No
	2 Mode Noise Filters	EXC-(24CB, CP)	Sn	✓	260 deg C max.	No
	Common Mode Noise Filters	EXC-24CD	Sn	✓	260 deg C max.	No
	Chip Bead Array	EXC-28B	Sn	✓	260 deg C max.	No
	Chip EMI Filters	EXC-CET	Sn	✓	260 deg C max.	No
Transformers	Chip Inductors (Wire Wound Type)	ELJ-(xA, xB, xC, Nd)	Sn-Cu	✓	250 °C / 10 sec. / 2 times	No
	Chip Inductors (Laser cut / Non-Winding Type)	ELJ-(xExxxxFA, xFxxxxFB)	Sn	✓	260 °C / 10 sec. / 2 times	Yes
	Coil Type EMI Filters (E Type: SMD)	ELK-E	Sn-Cu	✓	260 °C / 10 sec. / 2 times	No
Inductors	Voltage Step-up Coils (Model Type: SMD)	ELT	Sn-Cu	✓	260 °C / 10 sec. / 2 times	No
	Choke Coils ( SMD )	ELL	Sn	✓	260 °C / 10 sec. / 2 times	No
	Choke Coils ( Leaded )	ELC	Sn-Cu	✓	260 °C / 10 sec. / 2 times	No
	Inverter Transformers (Model Type: SMD)	ETJ-(09M,11M,13M 15M, 16M)	Sn	✓	260 °C / 10 sec. / 2 times	No
	Inverter Transformers (Model Type: SMD)	ETJ-(FJ18, FJ20, FJ23)	Sn-Cu	✓	s	No
	Power Choke Coils (SMD)	ETQ-P	Sn, Sn-Cu	✓	260 °C / 10 sec. / 2 times	No
	Line Filters (Discrete)	ELF	Sn-Cu	✓	260 °C / 10 sec. / 1 time	No
	Power Transformers (Discrete)	ETP	Sn-Cu	Please Inquire	Custom - Please Inquire	No
	Switching Transformers (Discrete)	ETS	Sn-Cu	✓	Custom - Please Inquire	No
Film Caps	Surface Mount Type	ECH-U, ECW-U, ECP-U	Sn-Ag-Cu	✓	ECHU: 260 degC max. ECWU/ECPU: 240 deg C max.	No
	Leaded Type	ECQ-(E,B,M,P,F,K,,V,U)	Sn	✓	-	No
	Leaded Type	ECH-A, ECH-S, ECW	Sn	✓	-	No
High Frequency Products & Hybrid ICs	Electronic Tuner (ER03R)	Please inquire	Sn-Cu, Plated 3-layer metal	Please Inquire	-	Please Inquire
	VCO (Model)	Please inquire	Au	Please Inquire	-	Please Inquire
	RF Devices	EHF	Sn	Please Inquire	-	Please Inquire
	Hybrid IC	EHD	Sn, Sn/Sn-Bi	Please Inquire	-	Please Inquire
Electromechanical Components	Electronic Control Unit	Please inquire	Sn-Ag-Cu	Please Inquire	-	No
	Remote Control Units	Please inquire	Sn-Ag-Cu	Please Inquire	-	Please Inquire
	Function Switches	ESE, ESD, ESB	Sn - Cu, Ag, Sn - Zn - Ni	✓	-	No
	Light Touch Switches	EVQ	Plated 3-layer metal, Au	✓	-	No
	Volume Control / Potentiometer	EVU, EVJ, EWA, EVL, EVN		✓	-	No
	Encoders	EVQ, EVE	Sn-Cu, Plated 3-layer metal	✓	-	No

- Material contained herein is strictly for reference and subject to change. Please verify your design. Review specifications before using any of these devices

- For Remote Controls and Speakers, only soldering materials are described (external terminal plating materials are not included).
- For Electronic Tuners the frame material is 3-layer metal plated (Sn-Zn-Ni), and terminal plating material is Sn-Cu.
- For VCOs, high-frequency devices and hybrid ICs the internal soldering material is Sn-Ag-Cu.
- For Custom Components of Hybrid ICs, etc. plating materials are individually chosen from Sn, Sn-Cu, Sn/Sn-Bi, Au and others.

- K coating for Printed Circuit Boards is a metal-reactive, heat resistant finishing (new development).
- Some Components may be Lead-Free but may not be able to withstand high reflow temperatures. Please check actual specification.
- Maximum time above soak temperature is equally important as peak reflow temperature. Please check actual specification.
- Availability of Lead-Free parts is based on product production standpoint, not what may be available at your local distributor.
- Sn (Tin), Cu (Copper), Ag (Silver), Al (Aluminum), Au (Gold), Bi (Bismuth), Zn (Zinc), Ni (Nickel), Pb (Lead)
- Information contained above is subject to change without notice.
- ++ EEU-FC as follow RoHS compliant with a date code newer than Jan 2004 due to lead in the PVC sleeve. Current production uses PET Sleeve material.

4x11mm, 5x15mm, 6.3x15mm, 12.5x15mm, 12.5x35mm, 12.5x40mm, 16x15mm, 16x35mm, 16x40mm, 18x15mm, 18x35mm, 18x40mm from Japan.