

# Material Data Sheet

Date : Jun/17/2010  
 Company : Panasonic Electronic Devices Co., Ltd.  
 Address : 401 Sadamasa-cho, Fukui City, Fukui Japan  
 Department : Circuit Components Business Unit, Environment Management Team  
 Approved by : Hidemitsu Kura  
 Prepared by : Yasuo Katsuki  
 Telephone : +81-776-56-8028

Product P/N	ER112ZYJ0001			Weight TOTAL(mg)	25.1395
Product Classification	Electric/Electronic component (Passive component)				
Product Name	Chip Resistor	Substitute P/N	No		
Pb	Pb free	Packaging Material	Not included		

Part Name		Material Name	Chemical Name	CASNo.	Remark	Weight of each chemical material in a part (mg)	Weight of a part (mg)	Rate of each chemical material in a part (%)	Rate of each chemical material in a product (wt%)	Rate of each part in a product (wt%)
Substrate		Ceramics	Aluminum oxide ; Alumina; Corundum; Al2O3	1344-28-1		22.0248	22.8	96.6	90.693937	87.610341
			Silica; Silicon dioxide	7631-86-9	0.4788	2.1		1.904574		
			Magnesium oxide; MgO	1309-48-4	0.228	1		0.90694		
			Calcium oxide; CaO	1305-78-8	0.0684	0.3		0.272082		
Top Terminal		Other special metals	Silver; Ag	7440-22-4		0.116006	0.11972	96.89776	0.476236	0.461462
			Palladium; Pd	7440-05-3	0.001557	1.300535		0.006194		
		Glass	Lead(II) oxide; Lead oxide (PbO); C.I. Pigment Yellow 46; Lead monooxide; Lead(2+) oxide	1317-36-8		0.001078		0.900435		0.004288
			Cupric oxide; CuO	1317-38-0	0.000719	0.600568		0.00286		
			Silica; Silicon dioxide	7631-86-9	0.00036	0.300702		0.001432		
Bottom Terminal		Other special metals	Silver; Ag	7440-22-4		0.162453	0.16662	97.499098	0.662791	0.646215
		Glass	Lead(II) oxide; Lead oxide (PbO); C.I. Pigment Yellow 46; Lead monooxide; Lead(2+) oxide	1317-36-8		0.0025		1.500421		0.009945
Resistive Element		Glass	Silica; Silicon dioxide	7631-86-9		0.001667	0.13716	1.000481	0.545606	0.006631
			Lead(II) oxide; Lead oxide (PbO); C.I. Pigment Yellow 46; Lead monooxide; Lead(2+) oxide	1317-36-8		0.060349		43.998978		0.240065
			Ruthenium(IV) oxide; RuO2	12036-10-1	0.052396	38.200642		0.208422		
			Boron oxide; B2O3	1303-86-2	0.020574	15		0.08184		
			Other antimony compounds	---	0.002565	1.870079		0.010203		
First Protective Coating		Glass	Manganese dioxide; MnO2	1313-13-9		0.001276	0.08708	0.930301	0.346397	0.005076
			Lead(II) oxide; Lead oxide (PbO); C.I. Pigment Yellow 46; Lead monooxide; Lead(2+) oxide	1317-36-8		0.047892		54.997702		0.190513
			Silica; Silicon dioxide	7631-86-9	0.022293	25.600598		0.088678		
			Boron oxide; B2O3	1303-86-2	0.011234	12.900781		0.044687		
			Zinc oxide; ZnO	1314-13-2	0.003658	4.200735		0.014551		
			Chromium(III) oxide; Pigment green 17 (C.I.); Cr2O3	1308-38-9	0.002003	2.300184		0.007968		
Second Protective Coating		EP (Epoxy resin)	Epichlorohydrin, o-cresol, formaldehyde polymer; Formaldehyde, polymer with (chloromethyl)oxirane and 2-me	29690-82-2		0.300805	0.43595	68.999885	1.73413	1.196549
		Ceramics	Silica; Silicon dioxide	7631-86-9		0.100269		23.000115		0.398851
		Other thermoplastics	Carbon black; C	1333-86-4		0.034876		8		0.13873
Marking 1		EP (Epoxy resin)	Epichlorohydrin, o-cresol, formaldehyde polymer; Formaldehyde, polymer with (chloromethyl)oxirane and 2-me	29690-82-2		0.005581	0.00915	60.994534	0.036402	0.022205
		Ceramics	Silica; Silicon dioxide	7631-86-9		0.002791		30.502733		0.011102
		Other thermoplastics	Titanium dioxide; Pigment white 6; TiO2	13463-67-7		0.000778		8.502733		0.003095
Side Terminal		Other special metals	Silver; Ag	7440-22-4		0.175439	0.3678	47.699564	1.463048	0.697871
		EP (Epoxy resin)	Bisphenol A, epichlorohydrin polymer; Epoxy resin; Epon 820; Araldite GY 250	25068-38-6		0.153373		41.700109		0.610089
		Other thermoplastics	Carbon black; C	1333-86-4		0.021701		5.900218		0.086323
		Other nonferrous metal	Potassium titanate; Potassium titanium oxide; K2Ti6O13	12056-51-8		0.017287		4.700109		0.068765
Middle Terminal		Nickel and Nickel alloy	Nickel; Ni	7440-02-0		0.514	0.514	100	2.044593	2.044593
Outer Terminal		Other nonferrous metal	Tin; Sn	7440-31-5		0.502	0.502	100	1.99686	1.99686