

Chemicals contained in products

Package-type

Epson Package name; **TQFP12-48PIN / Halogen free**

JEITA Package name; **P-TQFP048-0707-0.50**

Lead frame plating; **Lead(Pb) Free**

Weight; **0.13 [g] *Note1**

Part	Subpart	Subpart weight [mg]	Substance name	CAS No.	Content *Note2		Application
					[mg]	[ppm]	
IC Die	IC Die	1.9	Silicon	7440-21-3	1.9	999894	Base material
			Boron	7440-42-8	0.000004	2	Dopant
			Phosphorus	7723-14-0	0.00001	5	Dopant
			Aluminum	7429-90-5	0.00004	20	Metalization
			Arsenic *Note3	7440-38-2	0.00001	5	Dopant
			Fluorine *Note3	7782-41-4	0.000004	2	Dopant
			Titanium *Note3	7440-32-6	0.00004	20	Metalization
			Molybdenum *Note3	7439-98-7	0.00004	20	Metalization
			Tungsten *Note3	7440-33-7	0.00006	30	Metalization
	Cobalt *Note3	7440-48-4	0.000004	2	Metalization		
	Stress buffer coat	0.04	Polyimide	-	0.04	1000000	Stress buffer coat *Note4
Package	Die Bonding material	0.93	Silver	7440-22-4	0.84	910000	Base material
			Acrylic resin	-	0.06	70000	Adhesive
			Epoxy resin	-	0.02	20000	Adhesive
	Lead Frame Plating	1.23	Tin	7440-31-5	1.23	1000000	Solder
	Lead Frame	53.84	Copper	7440-50-8	50.88	945000	Conductor
			Silver	7440-22-4	0.27	5000	Inner Lead plating
			Others *Note5	-	2.69	50000	Additive
	Bonding Wire	0.35	Gold	7440-57-5	0.35	1000000	Conductor
	Mold resin	71.72	Epoxy resin	-	3.59	50000	Base material
			Phenol resin	-	3.59	50000	Base material
Silica			60676-86-0/-	64.33	897000	Filler	
Carbon black			1333-86-4	0.22	3000	Coloring agent	

Regarding the information of chemical substances

*Note1 The weight might be somewhat different depending on an individual built-in IC-chip specification like the size etc.

*Note2 Content data are estimated values based on supplier information and intended levels of content in product.

Actual measurements may vary from these values somewhat.

*Note3 Use or not-use of these substances depends on individual built-in IC-chip specification.

*Note4 The stress buffer coat may not be used depending on the individual model.

*Note5 The nickel, zinc, tin, silicon, iron, and the zinc oxide are included.