

## 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	6.5	Silicon	7440-21-3	6.5	999895	Base material
			Boron	7440-42-8	0.00001	2	Dopant
			Phosphorus	7723-14-0	0.00003	5	Dopant
			Aluminum	7429-90-5	0.0001	20	Metalization
			Arsenic *Note3	7440-38-2	0.00003	5	Dopant
			Fluorine *Note3	7782-41-4	0.00001	2	Dopant
			Titanium *Note3	7440-32-6	0.0001	20	Metalization
			Molybdenum *Note3	7439-98-7	0.0001	20	Metalization
			Tungsten *Note3	7440-33-7	0.0002	30	Metalization
			Cobalt *Note3	7440-48-4	0.00001	2	Metalization
	Stress buffer coat	0.13	Polyimide	-	0.13	1000000	Stress buffer coat *Note4
Package	Die Bonding material	1.9	Silver	7440-22-4	1.73	910000	Base material
			Acrylic resin	-	0.13	70000	Adhesive
			Epoxy resin	-	0.038	20000	Adhesive
	Lead Frame Plating	4.9	Tin	7440-31-5	4.8	980000	Solder
			Bismuth	7440-69-9	0.10	20000	Solder
	Lead Frame	49	Copper	7440-50-8	46.5	945000	Conductor
			Silver	7440-22-4	0.25	5000	Inner lead plating
			Others *Note5	-	2.5	50000	Additive
	Bonding Wire	0.47	Gold	7440-57-5	0.47	1000000	Conductor
	Mold resin	67	Epoxy resin	-	4.2	63000	Base material
			Silica	60676-86-0/-	59.0	880000	Filler
			Carbon black	1333-86-4	0.13	2000	Coloring agent
			Hardening chemical(ex:Phenol resin)	-	2.7	40000	Base material
Organic phosphorous compound			-	0.34	5000	Hardening accelerator	
others			-	0.67	10000	Additive	

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 for the Cu type. And the carbon, silicon, and manganese are included for 42alloy type.