

Chemicals contained in products

Package-type

Epson Package name; **QFP20-144PIN / Halogen free**

JEITA Package name; **P-LQFP144-2020-0.50**

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

Weight; **1.38 [g]** *Note1

Part	Subpart	Subpart weight [mg]	Substance name	CAS No.	Content *Note2		Application
					[mg]	[ppm]	
IC Die	IC Die	27	Silicon	7440-21-3	27.3	999894	Base material
			Boron	7440-42-8	0.00005	2	Dopant
			Phosphorus	7723-14-0	0.0001	5	Dopant
			Aluminum	7429-90-5	0.0005	20	Metalization
			Arsenic *Note3	7440-38-2	0.0001	5	Dopant
			Fluorine *Note3	7782-41-4	0.00005	2	Dopant
			Titanium *Note3	7440-32-6	0.0005	20	Metalization
			Molybdenum *Note3	7439-98-7	0.0005	20	Metalization
			Tungsten *Note3	7440-33-7	0.0008	30	Metalization
			Cobalt *Note3	7440-48-4	0.00005	2	Metalization
	Stress buffer coat	0.72	Polyimide	-	0.72	1000000	Stress buffer coat *Note4
Package	Die Bonding material	3.9	Silver	7440-22-4	2.5	640000	Base material
			Epoxy resin	-	0.8	205000	Adhesive
			Phenol resin	-	0.3	80000	Adhesive
			Inorganic powder	-	0.2	48000	Additive
			Bismuth compound	-	0.10	27000	Ion trap
	Lead Frame Plating	18	Tin	7440-31-5	17.8	980000	Solder
			Bismuth	7440-69-9	0.36	20000	Solder
	Lead Frame	312	Copper	7440-50-8	295	945000	Conductor
			Silver	7440-22-4	1.60	5000	Inner lead plating
			Others *Note5	-	15.6	50000	Additive
	Bonding Wire	3.4	Gold	7440-57-5	3.4	1000000	Conductor
	Mold resin	1015	Epoxy resin	-	50.7	50000	Base material
			Silica	60676-86-0/-	918	905000	Filler
			Carbon black	1333-86-4	5.1	5000	Coloring agent
			Hardening chemical(ex:Phenol resin)	-	40.6	40000	Base material

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.