

Chemicals contained in products

Package-type

Epson Package name; **PFBGA13U-177 / Halogen free**

JEITA Package name; **(P-TFBGA-177-1313-0.80)**

Solder ball Type; **Lead(Pb) Free**

Weight; **0.32 [g] *Note1**

Part	Subpart	Subpart weight [mg]	Substance name	CAS No.	Content ※2		Application		
					[mg]	[ppm]			
IC Die	IC Die	19	Silicon	7440-21-3	19.3	999894	Base material		
			Boron	7440-42-8	0.00004	2	Dopant		
			Phosphorus	7723-14-0	0.0001	5	Dopant		
			Aluminum	7429-90-5	0.0004	20	Metalization		
			Arsenic *Note3	7440-38-2	0.0001	5	Dopant		
			Fluorine *Note3	7782-41-4	0.00004	2	Dopant		
			Titanium *Note3	7440-32-6	0.0004	20	Metalization		
			Molybdenum *Note3	7439-98-7	0.0004	20	Metalization		
			Tungsten *Note3	7440-33-7	0.0006	30	Metalization		
			Cobalt *Note3	7440-48-4	0.00004	2	Metalization		
	Stress buffer coat	0.39	Polyimide	-	0.39	1000000	Stress buffer coat *Note4		
Package	Substrate	71	Glass-cloth	-	12.5	175310	Reinforcement		
			Barium Sulfate	7727-43-7	2.9	40790	Additive		
			Epoxy resin	-	14.1	197180	Base material		
			Acrylate resin	-	4.1	57800	Base material		
			Pigment	-	1.8	25520	Additive		
			Organic filler	-	0.2	3400	Filler		
			Zinc	7440-66-6	0.1	920	Characteristic preserve		
			Chromium	7440-47-3	0.002	30	Characteristic preserve		
			Copper	7440-50-8	29.9	419050	Copper foil		
			Nickel	7440-02-0	4.6	64000	Plating		
			Gold	7440-57-5	1.1	16000	Plating		
			Die Bonding material	5.0	Epoxy resin	-	3.4	670000	Adhesive
					Acrylic resin	-	1.6	330000	Adhesive
	Solder ball	36	Tin	7440-31-5	34.6	957500	Solder ball		
			Silver	7440-22-4	1.2	35000	Solder ball		
			Copper	7440-50-8	0.27	7500	Solder ball		
	Bonding Wire	2.2	Gold	7440-57-5	2.2	1000000	Conductor		
	Mold resin	185	Epoxy resin	-	9.3	50000	Base material		
			Silica	60676-86-0/-	161.80	873000	Filler		
			Carbon black	1333-86-4	0.37	2000	Coloring agent		
			Hardening chemical(ex:Phenol resin)	-	9	50000	Base material		
			Organic phosphorous compound	-	0.91	5000	Hardening accelerator		
			others	-	3.7	20000	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.