

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 | 16.1 | Silicon | 7440-21-3 | 16.1 | 999894 | Base material |
| | | | Boron | 7440-42-8 | 0.00003 | 2 | Dopant |
| | | | Phosphorus | 7723-14-0 | 0.00008 | 5 | Dopant |
| | | | Aluminum | 7429-90-5 | 0.0003 | 20 | Metalization |
| | | | Arsenic *Note3 | 7440-38-2 | 0.00008 | 5 | Dopant |
| | | | Fluorine *Note3 | 7782-41-4 | 0.00003 | 2 | Dopant |
| | | | Titanium *Note3 | 7440-32-6 | 0.0003 | 20 | Metalization |
| | | | Molybdenum *Note3 | 7439-98-7 | 0.0003 | 20 | Metalization |
| | | | Tungsten *Note3 | 7440-33-7 | 0.0005 | 30 | Metalization |
| | | | Cobalt *Note3 | 7440-48-4 | 0.00003 | 2 | Metalization |
| | Stress buffer coat | 0.32 | Polyimide | - | 0.32 | 1000000 | Stress buffer coat *Note4 |
| Package | Die Bonding material | 2.66 | Silver | 7440-22-4 | 1.70 | 640000 | Base material |
| | | | Epoxy resin | - | 0.54 | 205000 | Adhesive |
| | | | Phenol resin | - | 0.22 | 80000 | Adhesive |
| | | | Inorganic powder | - | 0.13 | 48000 | Additive |
| | | | Bismuth compound | - | 0.07 | 27000 | Ion trap |
| | Lead Frame Plating | 18.10 | Tin | 7440-31-5 | 18.10 | 1000000 | Solder |
| | Lead Frame | 311.20 | Copper | 7440-50-8 | 294.10 | 945000 | Conductor |
| | | | Silver | 7440-22-4 | 1.60 | 5000 | Inner lead plating |
| | | | Others *Note5 | - | 15.50 | 50000 | Additive |
| | Bonding Wire | 3.00 | Gold | 7440-57-5 | 3.00 | 1000000 | Conductor |
| | Mold resin | 1028.60 | Epoxy resin | - | 51.50 | 50000 | Base material |
| | | | Silica | 60676-86-0/- | 930.80 | 905000 | Filler |
| | | | Carbon black | 1333-86-4 | 5.10 | 5000 | Coloring agent |
| | | | Hardening chemical(ex:Phenol resin) | - | 41.20 | 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.