

Chemicals contained in products

Package-type

Epson Package name; **QFP21-216PIN / Halogen free**

JEITA Package name; **P-LQFP216-2424-0.40**

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

Weight; **1.96 [g] *Note1**

| Part | Subpart | Subpart weight [mg] | Substance name | CAS No. | Content *Note2 | | Application |
|--------------|----------------------|---------------------|-------------------|-----------|----------------|----------------|---------------------------|
| | | | | | [mg] | [ppm] | |
| IC Die | IC Die | 20.0 | Silicon | 7440-21-3 | 20.0 | 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 | 0.001 | 30 | Metalization |
| | | | Cobalt *Note3 | 7440-48-4 | 0.00004 | 2 | Metalization |
| | Stress buffer coat | 0.40 | Polyimide | - | 0.40 | 1000000 | Stress buffer coat *Note4 |
| Package | Die Bonding material | 2.80 | Silver | 7440-22-4 | 2.55 | 910000 | Base material |
| | | | Acrylic resin | - | 0.20 | 70000 | Adhesive |
| | | | Epoxy resin | - | 0.06 | 20000 | Adhesive |
| | Lead Frame Plating | 6.55 | Tin | 7440-31-5 | 6.55 | 1000000 | Solder |
| | Lead Frame | 643.83 | Copper | 7440-50-8 | 608.42 | 945000 | Conductor |
| | | | Silver | 7440-22-4 | 3.22 | 5000 | Inner lead plating |
| | | | Others *Note5 | - | 32.2 | 50000 | Additive |
| | Bonding Wire | 2.1 | Copper | 7440-50-8 | 2.05 | 1000000 | Conductor |
| | Mold resin | 1284.4 | Epoxy resin | - | 64.22 | 50000 | Base material |
| | | | Phenol resin | - | 64.22 | 50000 | Base material |
| Silica | | | 60676-86-0/- | 1152.08 | 897000 | Filler | |
| Carbon black | | | 1333-86-4 | 3.85 | 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.