

# Chemicals contained in products

## Package-type

Epson Package name; **QFP8-160PIN-E1/ Halogen free**

JEITA Package name; **P-QFP160-2828-0.65**

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

Weight; **5.79 [g]\*Note1**

| Part                                | Subpart              | Subpart weight [mg] | Substance name    | CAS No.      | Content *Note2 |               | Application               |
|-------------------------------------|----------------------|---------------------|-------------------|--------------|----------------|---------------|---------------------------|
|                                     |                      |                     |                   |              | [mg]           | [ppm]         |                           |
| IC Die                              | IC Die               | 31.1                | Silicon           | 7440-21-3    | 31.1           | 999894        | Base material             |
|                                     |                      |                     | Boron             | 7440-42-8    | 0.000062       | 2             | Dopant                    |
|                                     |                      |                     | Phosphorus        | 7723-14-0    | 0.00016        | 5             | Dopant                    |
|                                     |                      |                     | Aluminum          | 7429-90-5    | 0.00062        | 20            | Metalization              |
|                                     |                      |                     | Arsenic *Note3    | 7440-38-2    | 0.00016        | 5             | Dopant                    |
|                                     |                      |                     | Fluorine *Note3   | 7782-41-4    | 0.000062       | 2             | Dopant                    |
|                                     |                      |                     | Titanium *Note3   | 7440-32-6    | 0.00062        | 20            | Metalization              |
|                                     |                      |                     | Molybdenum *Note3 | 7439-98-7    | 0.00062        | 20            | Metalization              |
|                                     |                      |                     | Tungsten *Note3   | 7440-33-7    | 0.00093        | 30            | Metalization              |
|                                     |                      |                     | Cobalt *Note3     | 7440-48-4    | 0.000062       | 2             | Metalization              |
|                                     | Stress buffer coat   | 0.62                | Polyimide         | -            | 0.62           | 100000        | Stress buffer coat *Note4 |
| Package                             | Die Bonding material | 5.7                 | Silver            | 7440-22-4    | 3.7            | 640000        | Base material             |
|                                     |                      |                     | Epoxy resin       | -            | 1.10           | 205000        | Adhesive                  |
|                                     |                      |                     | Phenol resin      | -            | 0.47           | 80000         | Adhesive                  |
|                                     |                      |                     | Inorganic powder  | -            | 0.28           | 48000         | Additive                  |
|                                     |                      |                     | Bismuth compound  | -            | 0.15           | 27000         | Ion trap                  |
|                                     | Lead Frame Plating   | 54.3                | Tin               | 7440-31-5    | 54.3           | 980000        | Solder                    |
|                                     | Lead Frame           | 880.3               | Copper            | 7440-50-8    | 831.9          | 945000        | Conductor                 |
|                                     |                      |                     | Silver            | 7440-22-4    | 4.4            | 5000          | Inner lead plating        |
|                                     |                      |                     | Others *Note5     | -            | 44             | 50000         | Additive                  |
|                                     | Bonding Wire         | 3.4                 | Gold              | 7440-57-5    | 3.4            | 1000000       | Conductor                 |
|                                     | Mold resin           | 4815                | Epoxy resin       | -            | 240.7          | 50000         | Base material             |
|                                     |                      |                     | Silica            | 60676-86-0/- | 4357.2         | 905000        | Filler                    |
|                                     |                      |                     | Carbon black      | 1333-86-4    | 24.1           | 5000          | Coloring agent            |
| Hardening chemical(ex:Phenol resin) |                      |                     | -                 | 192.6        | 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.