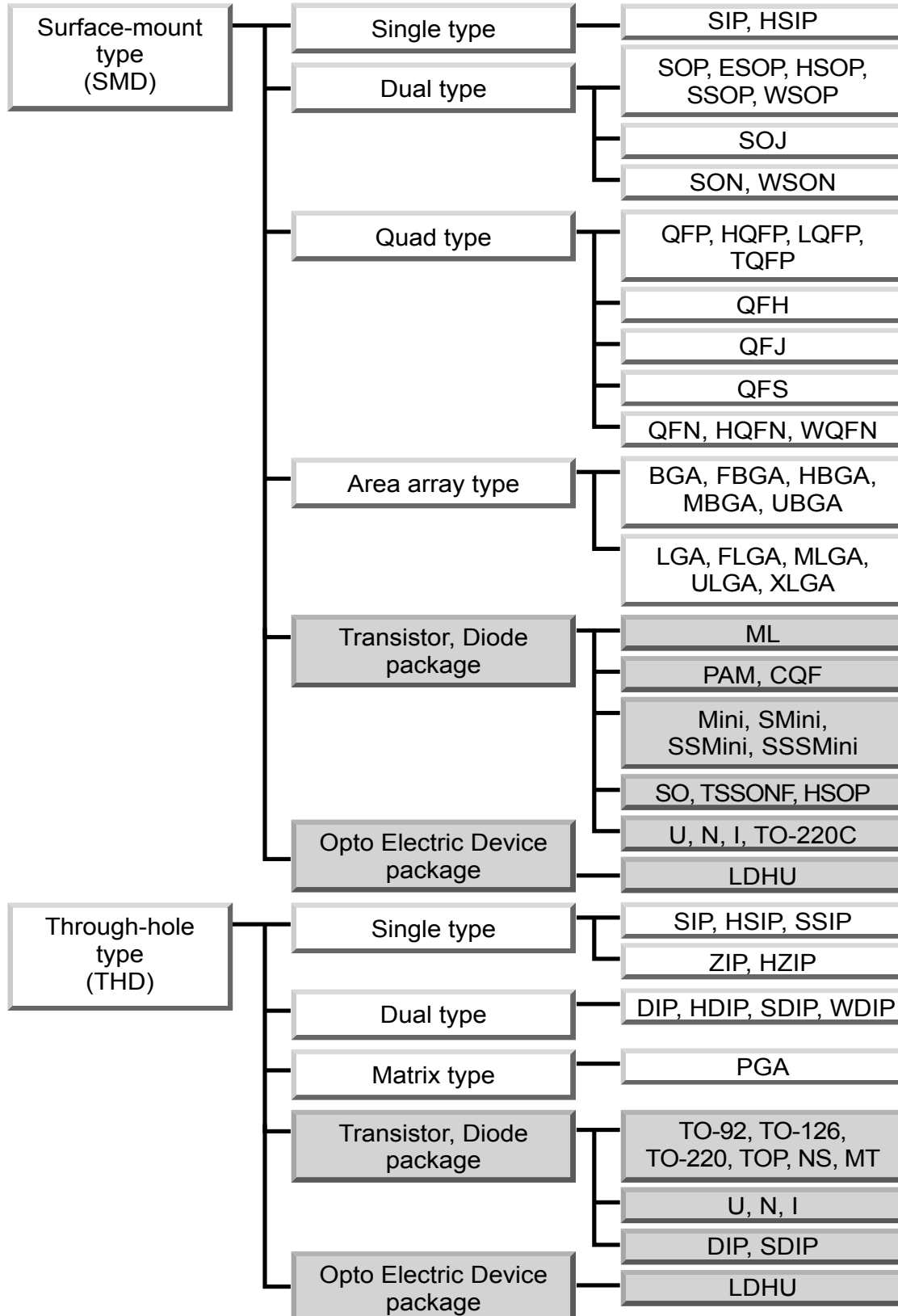


# Package explanation

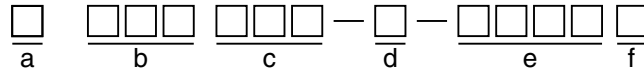
## 1 Package classification

Packages are classified as shown below according to the package shape and the method for mounting the package on the printed-circuit board.



# Package explanation

## 2 Package code structure (integrated circuits)



- a) Feature of package external appearance/shape ..... 1-character designation ..... See Tables 1 and 2. (for area arrays, pitch code)
- b) Package external appearance label ..... 3-character designation ..... See Table 4.
- c) Package terminal count ..... 3-character designation
- d) Package body material and characteristics ..... 1-character designation ..... See Table 3.
- e) Package standard dimensions ..... 4-character designation ..... See Table 4.
- f) Additional models (used only for those which do not fit the above classifications) ..... One capital English letter

Table 1 Feature of package external appearance/shape

| Code | Features  |
|------|---|
| *    | Standard package                                  |
| S    | Standard package with narrow terminal pitch       |
| E    | Standard package with wide terminal pitch         |
| L    | Package with approx. 1.4mm body height            |
| T    | Package with approx. 1mm body height              |
| H    | Package equipped with heat sink to dissipate heat |
| W    | Package equipped with transparent window          |
| B    | Package equipped with bumper to protect leads     |
| M    | Standard package with multiple rows of terminals  |
| A    | Piggyback package                                 |
| G    | Package equipped with guard ring to protect leads |
| X    | Other   |

Table 2 Area array pitch codes

| Code | Pitch (mm)  |
|------|-------------|
| *    | 1.0 or more |
| F    | 0.8         |
| M    | 0.65        |
| U    | 0.5         |
| X    | 0.4         |

# Package explanation

Table 3 Package body material and characteristics

| Code | Material   | Application   |
|------|------------|---|
| C    | Ceramic    | Packages using ceramic base or carrier                                    |
| G    |            | Ceramic airtight sealed package with glass seal                           |
| N    |            | Ceramic packages without airtight seals                                   |
| M    | Metal      | Packages made with metal materials  |
| P    | Plastic    | Packages made with plastic resin or packages using plastic resin carriers |
| W    | Silicon    | Packages made and cut at the wafer level                                  |
| T    | Tape       | TCP (Tape carrier package)  |
| F    | Lead frame | Area array packages smaller than 3.0 × 2.5mm which use lead frames        |
| L    |            | Area array packages larger than 3.0 × 2.5mm which use lead frames         |
| X    |            | Packages other than those described above                                 |

Table 4 Package label and standard dimensions

| Package abbreviation | Standard dimensions (nominal dimensions)   |                              | Code example     |                  |
|----------------------|--|------------------------------|------------------|------------------|
| SOP                  | Mounting pad center-to-center spacing  | (× 0.0254 mm)                | 0225, 0300, etc. |                  |
| SOL                  | Package width  | (× 0.0254 mm)                | 0150, 0300, etc. |                  |
| SOI                  | Terminal row spacing   | (× 0.0254 mm)                | 0300, 0400, etc. |                  |
| SOJ                  | Package width  | (× 0.0254 mm)                | 0300, 0400, etc. |                  |
| SON                  | —  |                              | 0000             |                  |
| QFP                  | Package outer dimensions (mm); for rectangular types, short dimension is first.  |                              | 1010, 1420, etc. |                  |
| QFH                  | Package outer dimensions (mm); for rectangular types, short dimension is first.  |                              | 1010, 1420, etc. |                  |
| QFS                  | Package outer dimensions (mm); for rectangular types, short dimension is first.  |                              | 1010, 1420, etc. |                  |
| QFL                  | —  |                              | 0000             |                  |
| QFI                  | Terminal row spacing   | (× 0.0254 mm)                | 0300, 0400, etc. |                  |
| QFJ                  | Package outer dimensions (square/rectangular)  | (× 0.0254 mm)                | S115, R285, etc. |                  |
| QFN                  | Package outer dimensions (square/rectangular)  |                              | 0304, 0606, etc. |                  |
| DTP, QTP             | Tape width + outer lead center-to-center spacing   | (mm)                         | 3530, 4836, etc. |                  |
| LGA                  | Package outer dimensions   | When body material is C or L | (mm)             | 0606, 1010, etc. |
|                      |  | When body material is R or F | (× 0.1 mm)       | 1213, 1517, etc. |
| BGA                  | Package outer dimensions   |                              | (mm)             | 1010, 1420, etc. |
| SIP                  | —  |                              | 0000             |                  |
| ZIP                  | Package mounting height  | (× 0.0254 mm)                | 0325, 0400, etc. |                  |
| DIP                  | Terminal row spacing   | (× 0.0254 mm)                | 0300, 0400, etc. |                  |
| PGA                  | (Square/rectangular) matrix size; (raised/depressed cavity); for rectangular types, only the short dimension is shown. |                              | S10U, R11U, etc. |                  |