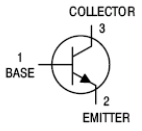
# NPN Silicon Epitaxial Planar Transistor

## 2SC2412-3L

## Features

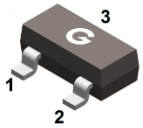
HF

- Epitaxial planar die construction
- Complementary to 2SA1037-3L
- RoHS compliant with Halogen-free




## Mechanical Data

- Case: SOT-23-3L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208




SOT-23-3L

## Ordering Information

| Part Number | Package | Shipping Quantity | Marking Code |
|---|---|---|---|
| 2SC2412-3L-Q | SOT-23-3L | 3000 pcs / Tape & Reel | BQ |
| 2SC2412-3L-R | SOT-23-3L | 3000 pcs / Tape & Reel | BR |
| 2SC2412-3L-S | SOT-23-3L | 3000 pcs / Tape & Reel | BS |

## Maximum Ratings (@ $T_A$ = 25°C unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{CBO}$ | 60 | V |
| Collector-Emitter Breakdown Voltage | $V_{CEO}$ | 50 | V |
| Emitter-Base Breakdown Voltage | $V_{EBO}$ | 7 | V |
| Continuous Collector Current | $I_C$ | 150 | mA |
| Peak Collector Current | $I_{CM}$ | 200 | mA |

## Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation( $T_A$ = 25°C) | $P_D$ | 200 | mW |
| Thermal Resistance Junction-to-Air *1 | $R_{\theta JA}$ | 420 | °C/W |
| Thermal Resistance Junction-to-Case *1 | $R_{\theta JC}$ | 250 | °C/W |
| Thermal Resistance Junction-to-Lead *1 | $R_{\theta JL}$ | 180 | °C/W |
| Junction Temperature Range | $T_J$ | -55 ~ +150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 ~ +150 | °C |

Note 1: The data tested by surface mounted on a minimum recommended FR-4 board

## Electrical Characteristics (@ $T_A$ = 25°C unless otherwise specified)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$ = 50μA, $I_E$ = 0 | 60 | - | - | V |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$ = 1mA, $I_B$ = 0 | 50 | - | - | V |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$ = 50μA, $I_C$ = 0 | 7 | - | - | V |
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$ = 60V, $I_E$ = 0 | - | - | 0.1 | μA |
| Emitter Cut-off Current | $I_{EBO}$ | $V_{EB}$ = 7V, $I_C$ = 0 | - | - | 0.1 | μA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$ = 6V, $I_C$ = 1mA | 120 | - | 560 | - |
| Collector-emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$ = 50mA, $I_B$ = 5mA | - | - | 0.4 | V |
| Base-emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$ = 50mA, $I_B$ = 5mA | - | - | 1.2 | V |
| Transition Frequency | $f_T$ | $I_C$ = 2mA, $V_{CE}$ = 12V<br>f = 100MHz | - | 180 | - | MHz |
| Output Capacitance | $C_{ob}$ | $V_{CB}$ =12V , $I_E$ = 0A , f = 1MHz | - | 2 | 3.5 | pF |

## Classification of $h_{FE}$

| Rank | Q | R | S |
|---|---|---|---|
| Range | 120-270 | 180-390 | 270-560 |
| Marking | BQ | BR | BS |

## Ratings and Characteristics Curves (@ $T_A$ = 25°C unless otherwise specified)

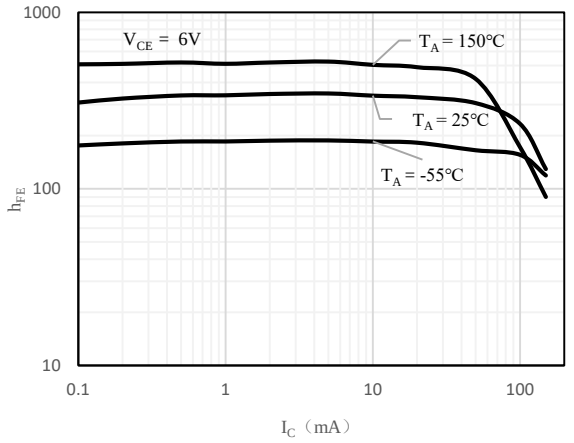



Fig 1 $h_{FE}$ vs. $I_C$ (R)

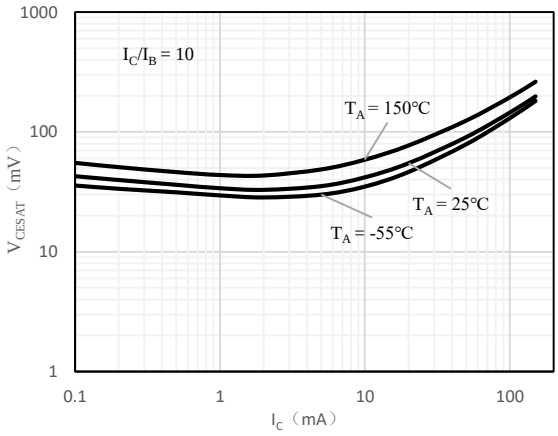



Fig 2 $V_{CE(sat)}$ vs. $I_C$

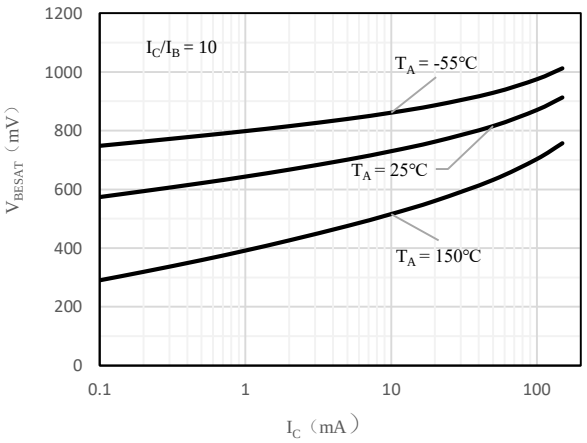



Fig 3 $V_{BE(sat)}$ vs. $I_C$

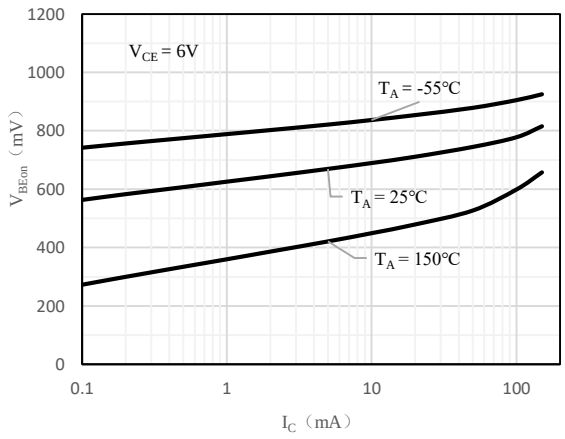
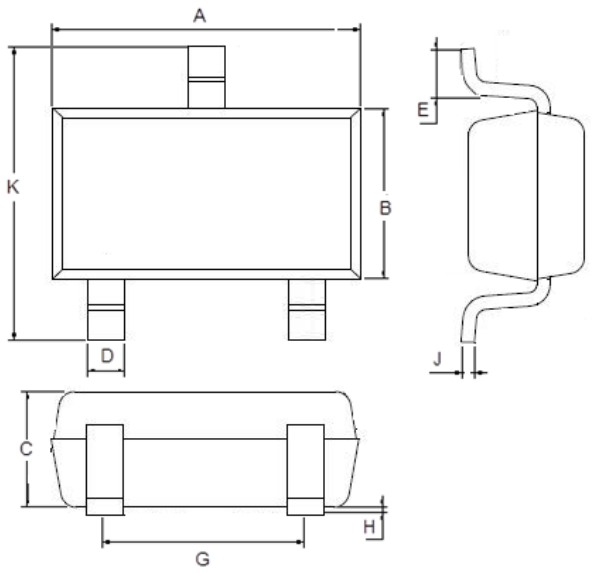



Fig 4 $V_{BE(ON)}$ vs. $I_C$

## Package Outline Dimensions (Unit: mm)




| SOT-23-3L | | |
|---|---|---|
| **Dimension** | **Min.** | **Max.** |
| A | 2.80 | 3.00 |
| B | 1.50 | 1.70 |
| C | 1.00 | 1.20 |
| D | 0.35 | 0.45 |
| E | 0.35 | 0.55 |
| G | 1.80 | 2.00 |
| H | 0.02 | 0.10 |
| J | 0.10 | 0.20 |
| K | 2.60 | 3.00 |

## Mounting Pad Layout (Unit: mm)

### SOT-23-3L

