# HSC2412

## General Purpose Transistors
## NPN Silicon

## Features

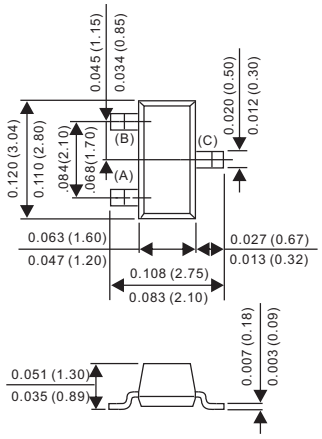
- We declare that the material of product compliance with RoHS requirements
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228

## Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

## Package outline

SOT-23




Dimensions in inches and (millimeters)

## Maximum ratings (AT $T_A$=25°C unless otherwise noted)

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector–Emitter Voltage | $V_{CEO}$ | 50 | V |
| Collector–Base Voltage | $V_{CBO}$ | 60 | V |
| Emitter–Base Voltage | $V_{EBO}$ | 7.0 | V |
| Collector Current — Continuous | $I_C$ | 150 | mAdc |
| Collector power dissipation | $P_D$ | 0.2 | W |
| Operating junction temperature range | $T_J$ | -55~+150 | °C |
| Storage temperature range | $T_{STG}$ | -55~+150 | °C |

## Electrical characteristics (AT $T_A$=25°C unless otherwise noted)

| Characteristic | Conditions | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector–Emitter Breakdown Voltage | $I_C$=1mA | $V_{(BR)CEO}$ | 50 | | | V |
| Emitter–Base Breakdown Voltage | $I_E$=50uA | $V_{(BR)EBO}$ | 7 | | | V |
| Collector–Base Breakdown Voltage | $I_C$=50uA | $V_{(BR)CBO}$ | 60 | | | V |
| Collector Cutoff Current | $V_{CB}$=60V | $I_{CBO}$ | | | 0.1 | uA |
| Emitter cutoff current | $V_{EB}$=7V | $I_{EBO}$ | | | 0.1 | uA |
| Collector-emitter saturation voltage | $I_C$/ $I_B$=50mA / 5mA | $V_{CE(sat)}$ | | | 0.4 | V |
| DC current transfer ratio | $V_{CE}$=6V, $I_C$=1mA | $h_{FE}$ | 120 | | 560 | - |
| Transition frequency | $V_{CE}$=12V, $I_E$=–2mA, f =30MHz | $f_T$ | | 180 | | MHZ |
| Output capacitance | $V_{CB}$=12V, $I_E$=0A, f=1MHz | $C_{ob}$ | | 2.0 | 3.5 | pF |

## $h_{FE}$ values are classified as follows:

| * | Q | R | S |
|---|---|---|---|
| $h_{FE}$ | 120~270 | 180~390 | 270~560 |

## Rating and characteristic curves (HSC2412 )

Fig.1 Grounded emitter propagation characteristics

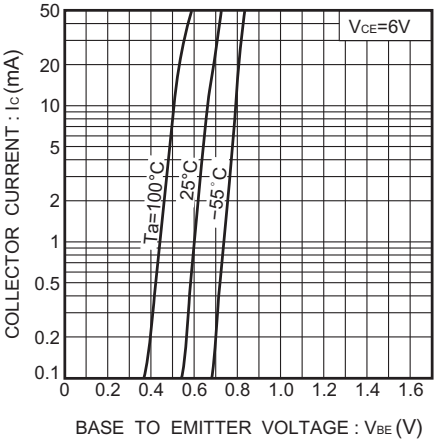



Fig.2 Grounded emitter output characteristics ( I )

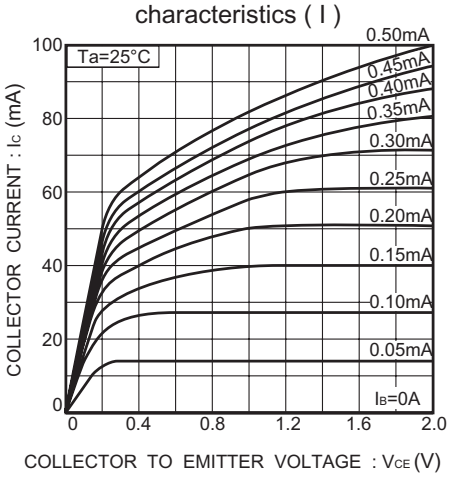



Fig.3 Grounded emitter output characteristics ( II )

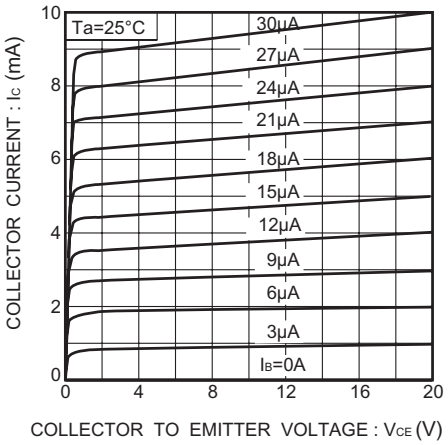



Fig.4 DC current gain vs. collector current ( I )

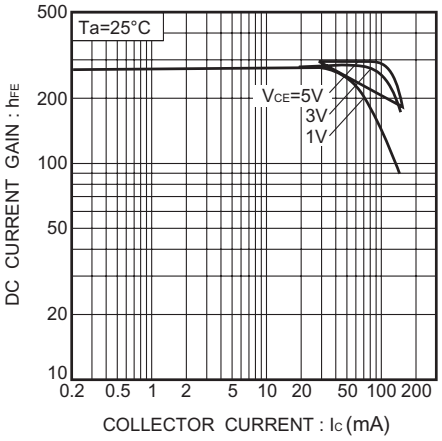



Fig.5 DC current gain vs. collector current ( II )

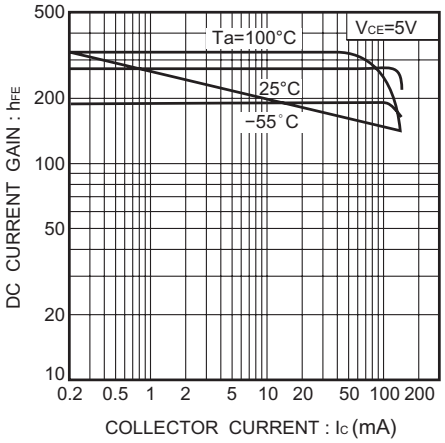
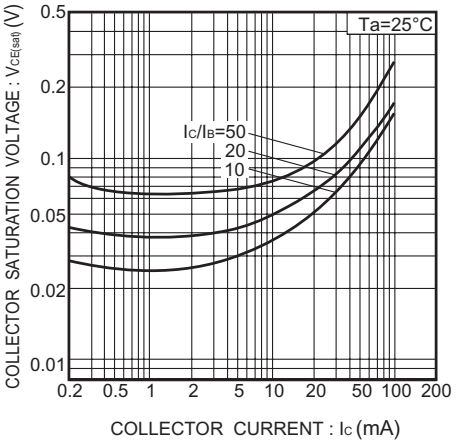



Fig. 6 Collector-emitter saturation voltage vs. collector current



## Rating and characteristic curves (HSC2412 )

Fig.7 Collector-emitter saturation voltage vs. collector current ( I )

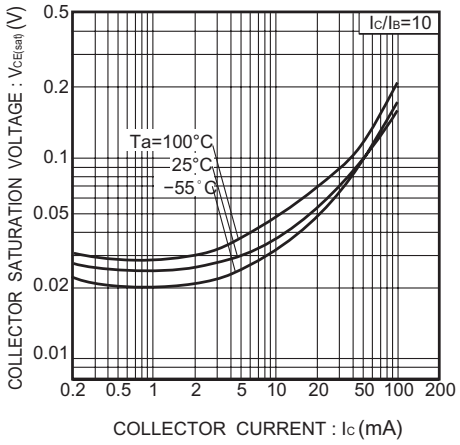



Fig.8 Collector-emitter saturation voltage vs. collector current (II)

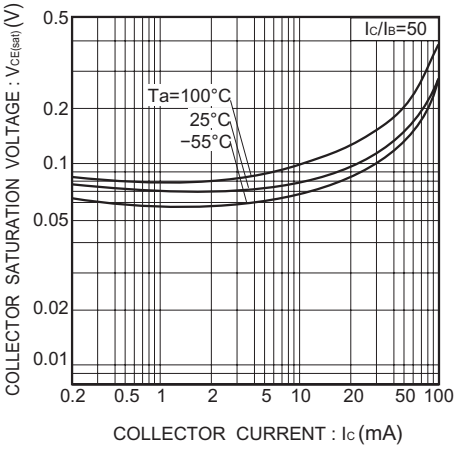



Fig.9 Gain bandwidth product vs. emitter current

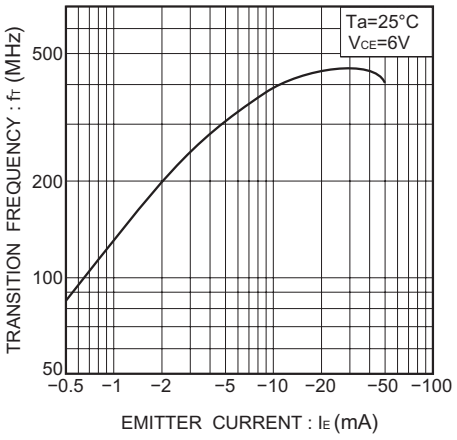



Fig.10 Collector output capacitance vs.collector-base voltage
Emitter input capacitance vs.emitter-base voltage

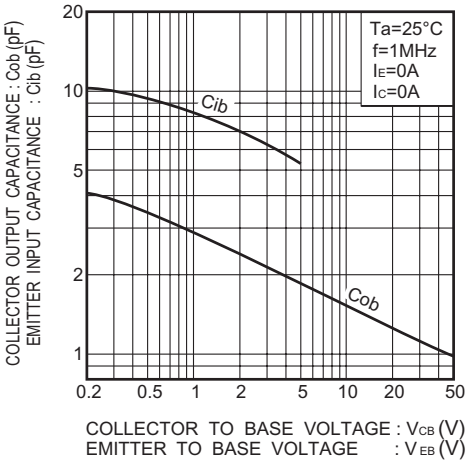
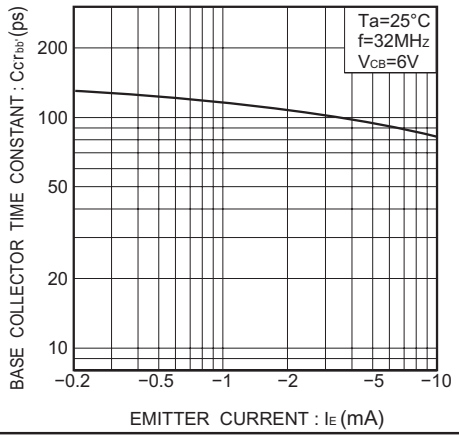
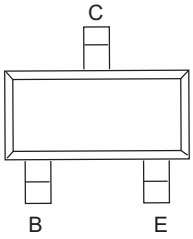
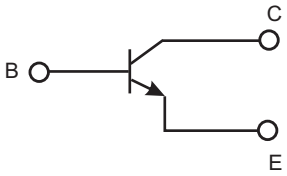



Fig.11 Base-collector time constant vs. emitter current



# HSC2412K

## Pinning information

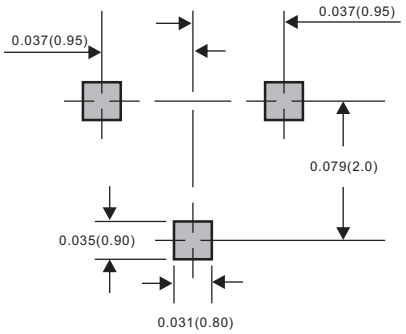
| Pin | Simplified outline | Symbol |
|---|---|---|
| PinB Base<br>PinC Collector<br>PinE Emitter |  |  |

## Marking

| Type number | Marking code |
|---|---|
| HSC2412Q | BQ |
| HSC2412R | BR |
| HSC2412S | BS |

## Suggested solder pad layout

**SOT-23**




Dimensions in inches and (millimeters)