# General purpose transistor (50V, 0.15A)

## 2SC2412K / 2SC4081 / 2SC4617 / 2SC5658 / 2SC1740S

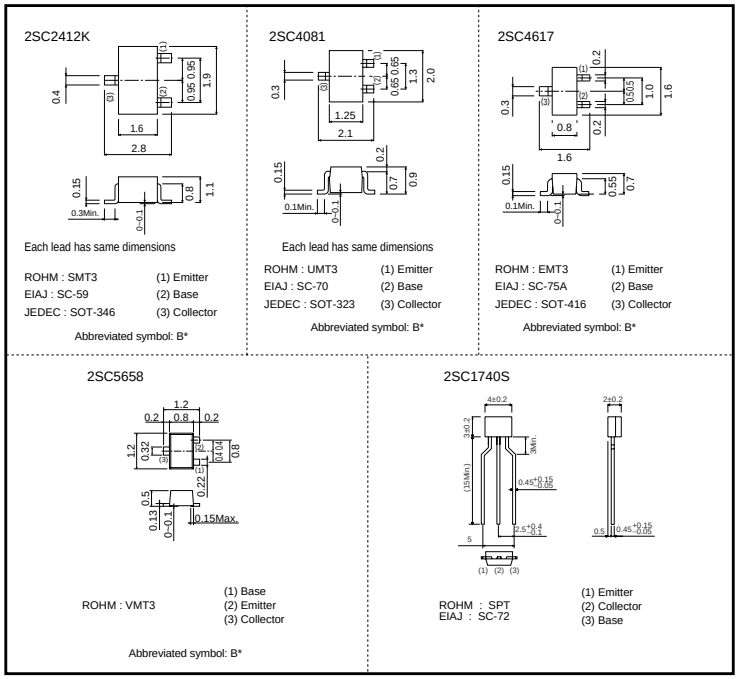
### ●Features

1) Low Cob.
   Cob=2.0pF (Typ.)
2) Complements the 2SA1037AK / 2SA1576A / 2SA1774H / 2SA2029 / 2SA933AS.

### ●Structure

Epitaxial planar type
NPN silicon transistor

### ●External dimensions (Units : mm)




* Denotes $h_{FE}$

### ●Absolute maximum (Ta=25°C)

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Collector-base voltage | | $V_{CBO}$ | 60 | V |
| Collector-emitter voltage | | $V_{CEO}$ | 50 | V |
| Emitter-base voltage | | $V_{EBO}$ | 7 | V |
| Collector current | | $I_C$ | 0.15 | A |
| Collector power dissipation | 2SC2412K, 2SC4081 | $P_C$ | 0.2 | W |
| | 2SC4617, 2SC5658 | | 0.15 | |
| | 2SC1740S | | 0.3 | |
| Junction temperature | | Tj | 150 | °C |
| Storage temperature | | Tstg | –55~+150 | °C |

●**Electrical characteristics** (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $BV_{CBO}$ | 60 | – | – | V | $I_C$=50μA |
| Collector-emitter breakdown voltage | $BV_{CEO}$ | 50 | – | – | V | $I_C$=1mA |
| Emitter-base breakdown voltage | $BV_{EBO}$ | 7 | – | – | V | $I_E$=50μA |
| Collector cutoff current | $I_{CBO}$ | – | – | 0.1 | μA | $V_{CB}$=60V |
| Emitter cutoff current | $I_{EBO}$ | – | – | 0.1 | μA | $V_{EB}$=7V |
| DC current transfer ratio | $h_{FE}$ | 120 | – | 560 | – | $V_{CE}$=6V, $I_C$=1mA |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | – | – | 0.4 | V | $I_C/I_B$=50mA/5mA |
| Transition frequency | $f_T$ | – | 180 | – | MHz | $V_{CE}$=12V, $I_E$=–2mA, f=100MHz |
| Output capacitance | Cob | – | 2 | 3.5 | pF | $V_{CE}$=12V, $I_E$=0A, f=1MHz |

●**Packaging specifications and $h_{FE}$**

| Type | $h_{FE}$ | Package | Taping | | | | Bulk |
|---|---|---|---|---|---|---|---|
| | | Code | T146 | T106 | TL | T2L | TP |
| | | Basic ordering unit (pieces) | 3000 | 3000 | 3000 | 8000 | 5000 |
| 2SC2412K | QRS | | ○ | – | – | – | – |
| 2SC4081 | QRS | | – | ○ | – | – | – |
| 2SC4617 | QRS | | – | – | ○ | – | – |
| 2SC5658 | QRS | | – | – | – | ○ | – |
| 2SC1740S | QRS | | – | – | – | – | ○ |

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

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

●**Electrical characterristic curves**

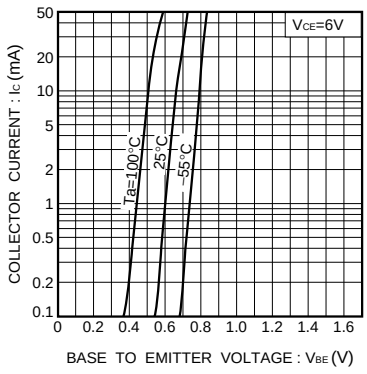



Fig.1 Grounded emitter propagation characteristics

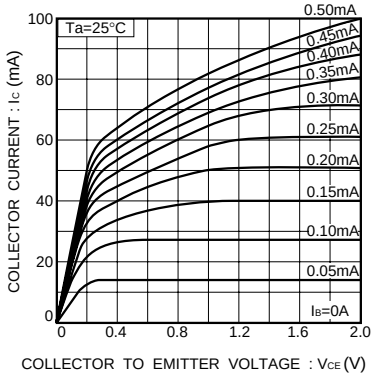



Fig.2 Grounded emitter output characteristics ( I )

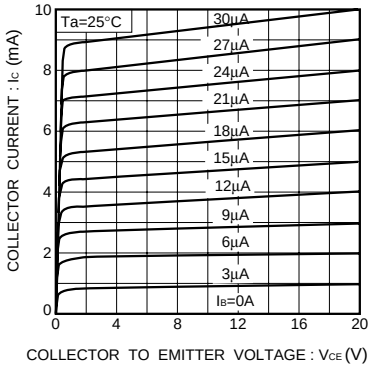



Fig.3 Grounded emitter output characteristics ( II )

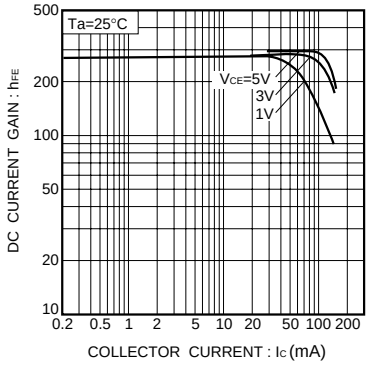



Fig.4 DC current gain vs. collector current ( I )

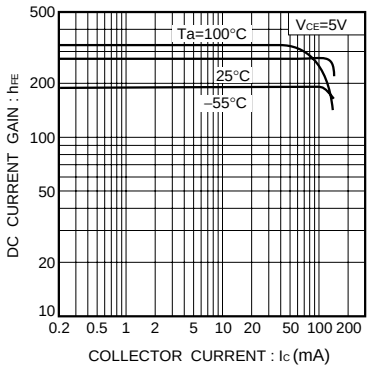



Fig.5 DC current gain vs. collector current ( II )

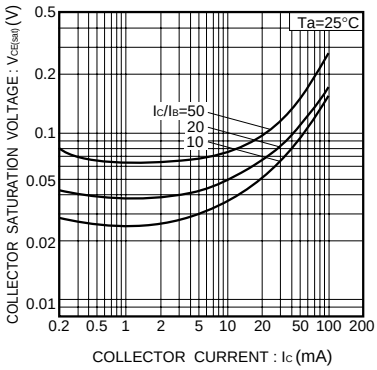



Fig. 6 Collector-emitter saturation voltage vs. collector current

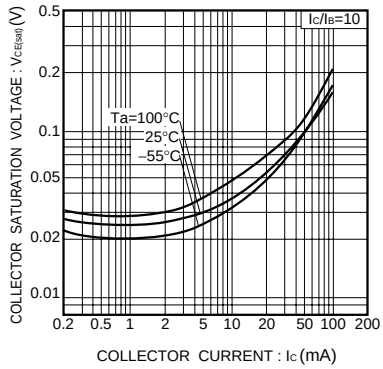



Fig.7 Collector-emitter saturation voltage vs. collector current ( I )

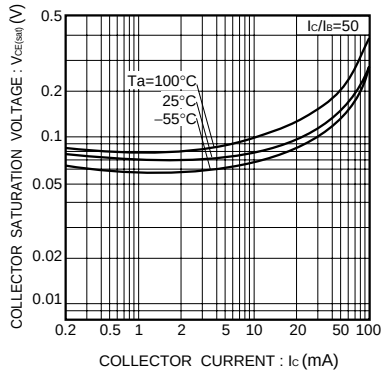



Fig.8 Collector-emitter saturation voltage vs. collector current (II)

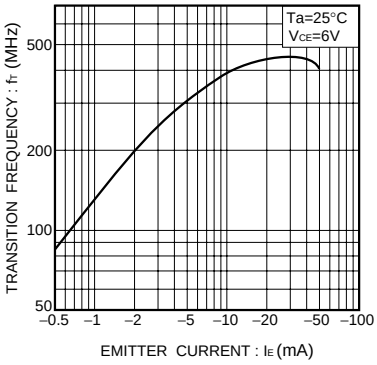



Fig.9 Gain bandwidth product vs. emitter current

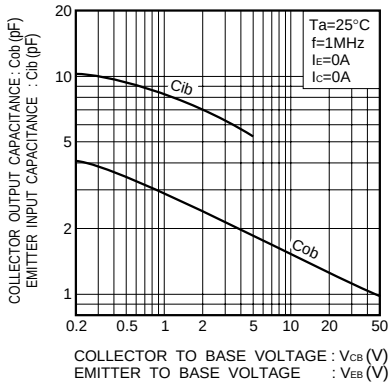



Fig.10 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

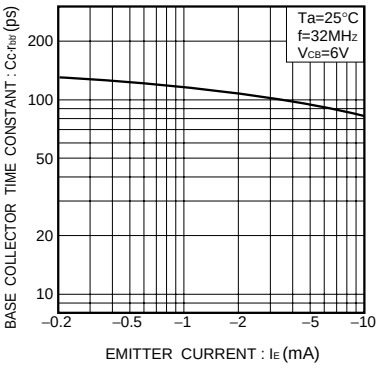



Fig.11 Base-collector time constant vs. emitter current