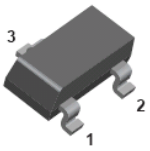
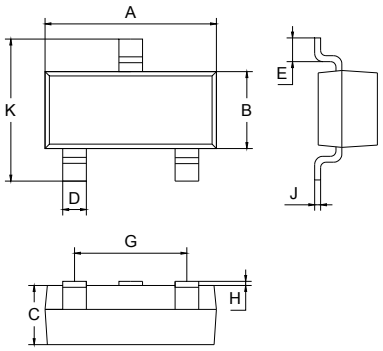
# BC846/847/848
## NPN general purpose Transistor

RoHS COMPLIANT




| SOT-23 | | |
|---|---|---|
| Dim | Min | Max |
| A | 2.70 | 3.10 |
| B | 1.10 | 1.50 |
| C | 1.0 Typical | |
| D | 0.4 Typical | |
| E | 0.35 | 0.48 |
| G | 1.80 | 2.00 |
| H | 0.02 | 0.1 |
| J | 0.1 Typical | |
| K | 2.20 | 2.60 |
| All Dimensions in mm | | |

## FEATURES

- High current gain.
- Excellent $h_{FE}$ linearity .
- Low noise between 30Hz and 15kHz.
- For AF input stages and driver applications.

## APPLICATIONS

- General purpose switching and amplification.

## ORDERING INFORMATION

| Type No. | Marking | Package |
|---|---|---|
| BC846A/B | 1A/1B | SOT-23 |
| BC847A/B/C | 1E/1F/1G | SOT-23 |
| BC848A/B/C | 1J/1K/1L | SOT-23 |

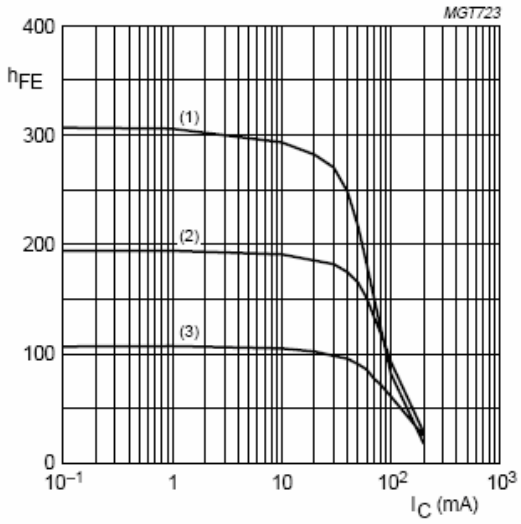
## MAXIMUM RATING @ Ta=25℃ unless otherwise specified

| Symbol | Parameter | | Value | Units |
|---|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | BC846<br>BC847<br>BC848 | 80<br>50<br>30 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | BC846<br>BC847<br>BC848 | 65<br>45<br>30 | V |
| $V_{EBO}$ | Emitter-Base Voltage | BC846<br>BC847<br>BC848 | 6<br>6<br>5 | V |
| $I_C$ | Collector Current -Continuous | | 0.1 | A |
| $P_C$ | Collector Dissipation | | 250 | mW |
| $R_{\theta JA}$ | Thermal Resistance,Junction to Ambient | | 417 | ℃/W |
| $T_j$,$T_{stg}$ | Junction and Storage Temperature | | -55 to +150 | ℃ |

## ELECTRICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

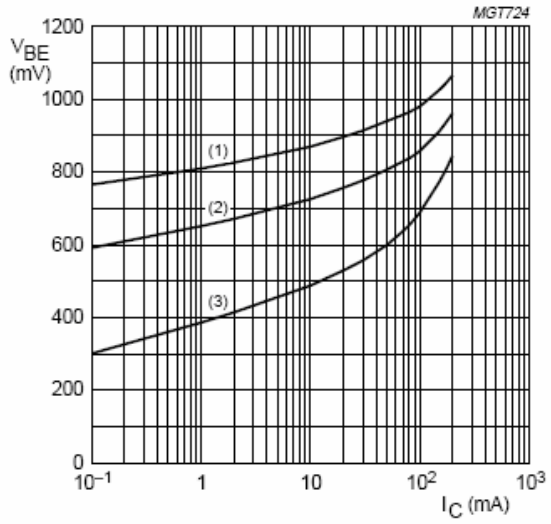
| Parameter | | Symbol | Test conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | BC846<br>BC847<br>BC848 | $V_{(BR)CBO}$ | $I_C$=10μA,$I_E$=0 | 80<br>50<br>30 | | | V |
| Collector-emitter breakdown voltage | BC846<br>BC847<br>BC848 | $V_{(BR)CEO}$ | $I_C$=10mA,$I_B$=0 | 65<br>45<br>30 | | | V |
| Emitter-base breakdown voltage | BC846<br>BC847<br>BC848 | $V_{(BR)EBO}$ | $I_E$=10μA,$I_C$=0 | 6<br>6<br>5 | | | V |
| Collector-base cut-off current | | $I_{CBO}$ | $V_{CB}$=30V,$I_E$=0<br>$V_{CB}$=30V,$I_E$=0,$T_j$=150℃ | | | 15<br>5 | nA<br>uA |
| Emitter-base cut-off current | | $I_{EBO}$ | $V_{EB}$=5V,$I_C$=0 | | | 100 | nA |
| DC current gain | BC846A,847A,848A<br>BC846B,847B,848B<br>BC847C,848C | $h_{FE}$ | $V_{CE}$=5V,$I_C$=10uA | | 90<br>150<br>270 | | |
| DC current gain | BC846A,847A,848A<br>BC846B,847B,848B<br>BC847C,848C | $h_{FE}$ | $V_{CE}$=5V,$I_C$=2mA | 110<br>200<br>420 | | 220<br>450<br>800 | |
| Collector-emitter saturation voltage | | $V_{CE(sat)}$ | $I_C$=10mA, $I_B$=0.5mA<br>$I_C$=100mA, $I_B$=5mA | | 0.09<br>0.2 | 0.25<br>0.6 | V |
| Base-emitter saturation voltage | | $V_{BE(sat)}$ | $I_C$=10mA, $I_B$=0.5mA<br>$I_C$=100mA, $I_B$=5mA | | 0.7<br>0.9 | | V |
| Base-emitter voltage | | $V_{BE(on)}$ | $I_C$=2mA,$V_{CE}$=5V<br>$I_C$=10mA,$V_{CE}$=5V | 0.58 | 0.66 | 0.7<br>0.77 | V |
| Collector capacitance | | $C_C$ | $V_{CB}$=10V,$I_E$=$I_e$=0,<br>f=1MHz | | 2.5 | | pF |
| Transition frequency | | $f_T$ | $V_{CE}$=5V, $I_C$= 10mA<br>f=100MHz | 100 | | | MHz |

## TYPICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified



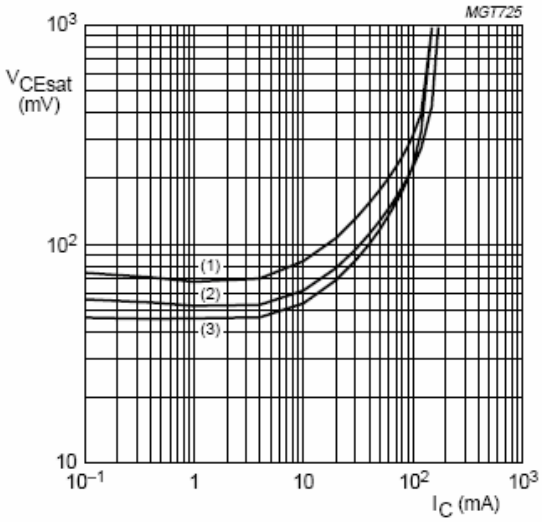

**BC846A;** $V_{CE}$ = 5 V.
(1) $T_{amb}$ = 150 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = −55 °C.

Fig.**1** DC current gain as a function of collector current; typical values.



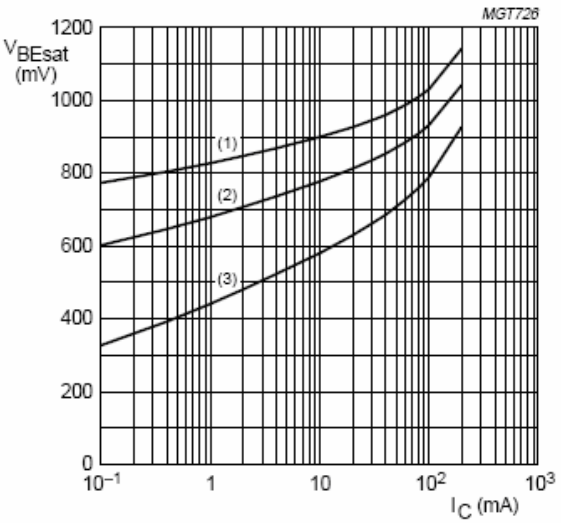

**BC846A;** $V_{CE}$ = 5 V.
(1) $T_{amb}$ = −55 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = 150 °C.

Fig.2 Base-emitter voltage as a function of collector current; typical values.



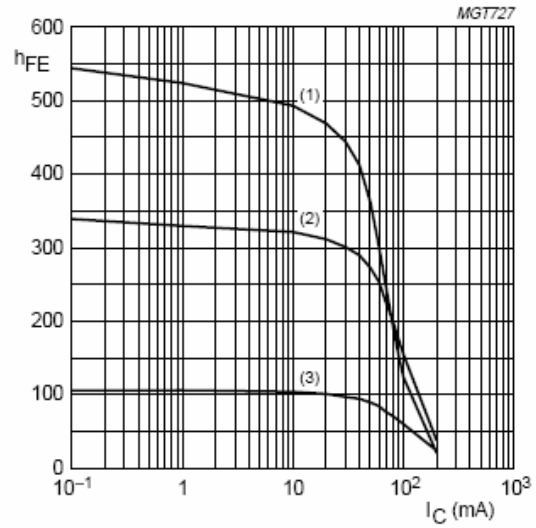

**BC846A;** $I_C/I_B$ = 20.
(1) $T_{amb}$ = 150 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = −55 °C.

Fig.3 Collector-emitter saturation voltage as a function of collector current; typical values.



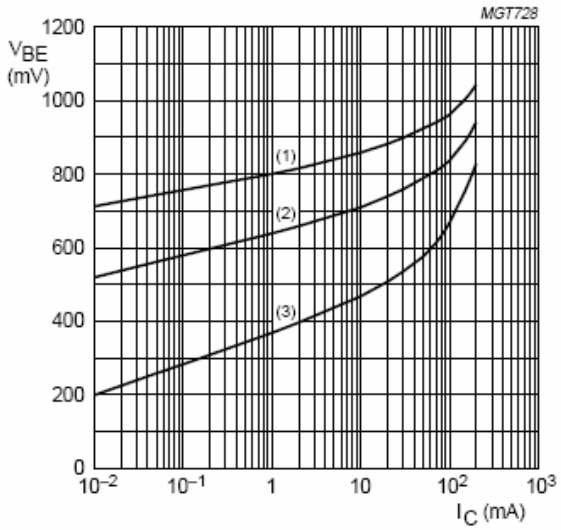

**BC846A;** $I_C/I_B$ = 10.
(1) $T_{amb}$ = −55 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = 150 °C.

Fig.4 Base-emitter saturation voltage as a function of collector current; typical values.



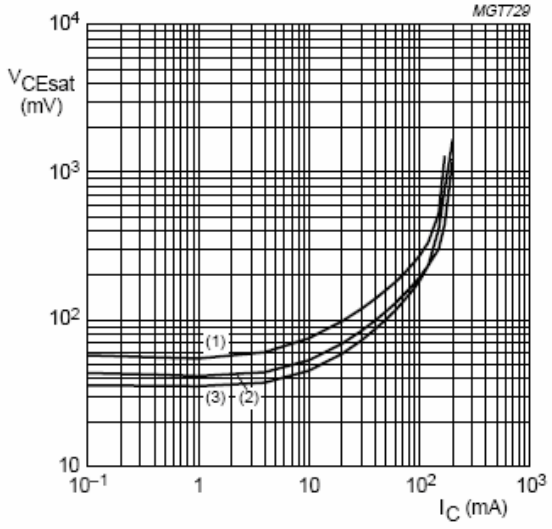

**BC847B;** $V_{CE}$ = 5 V.
(1) $T_{amb}$ = 150 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = −55 °C.

Fig.5 DC current gain as a function of collector current; typical values.



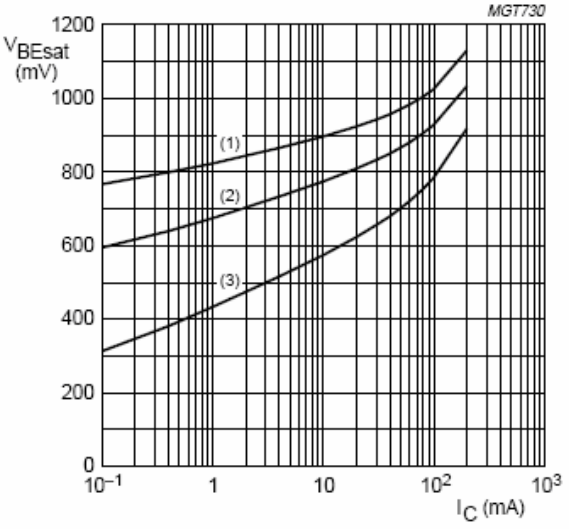

**BC847B;** $V_{CE}$ = 5 V.
(1) $T_{amb}$ = −55 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = 150 °C.

Fig.6 Base-emitter voltage as a function of collector current; typical values.



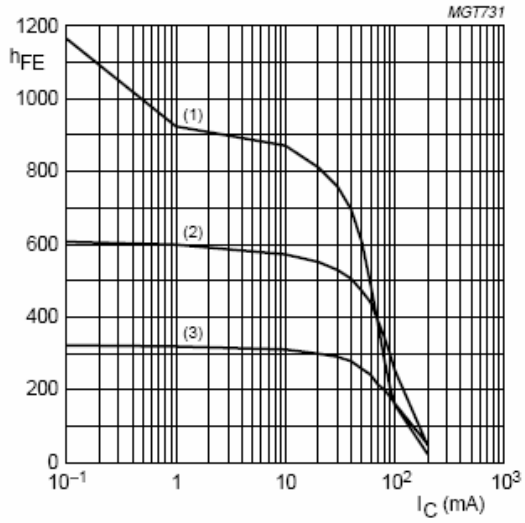

**BC847B;** $I_C/I_B$ = 20.
(1) $T_{amb}$ = 150 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = −55 °C.

Fig.7 Collector-emitter saturation voltage as a function of collector current; typical values.



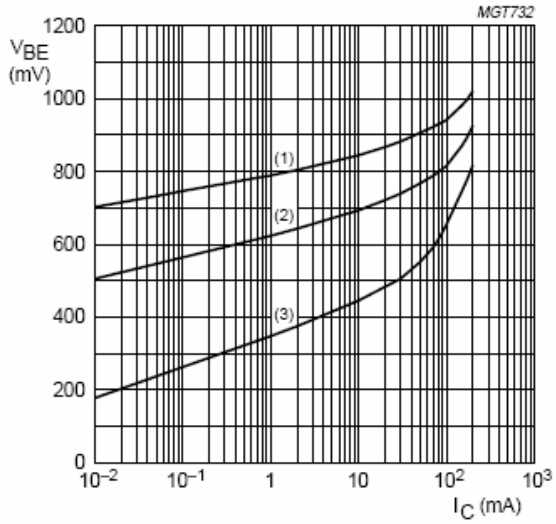

**BC847B;** $I_C/I_B$ = 10.
(1) $T_{amb}$ = −55 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = 150 °C.

Fig.8 Base-emitter saturation voltage as a function of collector current; typical values.



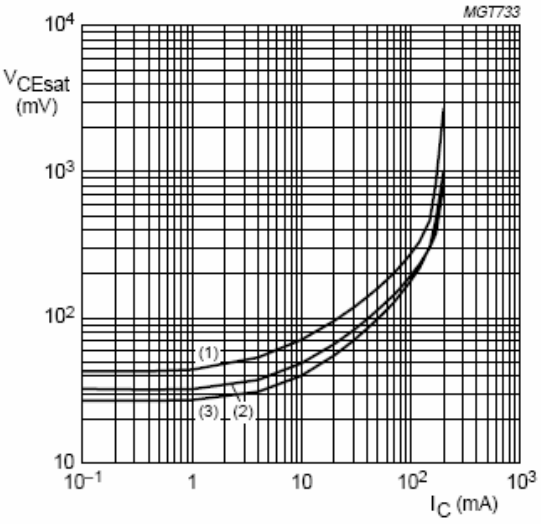

**BC847C;** $V_{CE}$ = 5 V.
(1) $T_{amb}$ = 150 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = −55 °C.

Fig.9 DC current gain as a function of collector current; typical values.



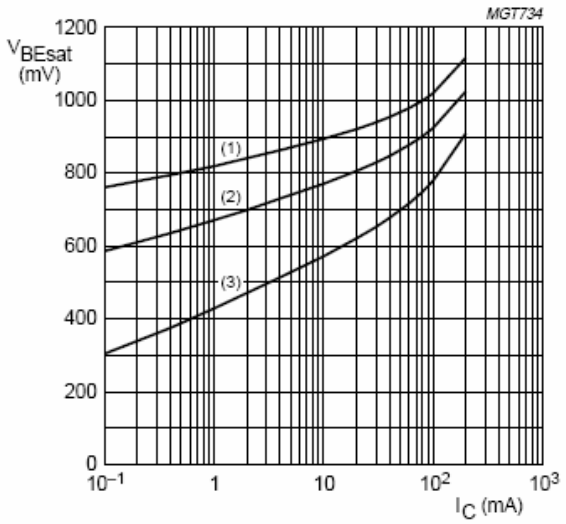

**BC847C;** $V_{CE}$ = 5 V.
(1) $T_{amb}$ = −55 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = 150 °C.

Fig.10 Base-emitter voltage as a function of collector current; typical values.




**BC847C;** $I_C/I_B$ = 20.
(1) $T_{amb}$ = 150 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = −55 °C.

Fig.11 Collector-emitter saturation voltage as a function of collector current; typical values.




**BC847C;** $I_C/I_B$ = 10.
(1) $T_{amb}$ = −55 °C.
(2) $T_{amb}$ = 25 °C.
(3) $T_{amb}$ = 150 °C.

Fig.12 Base-emitter saturation voltage as a function of collector current; typical values.

| Device | Package | Shipping |
|---|---|---|
| BC846/847/848 | SOT-23 | 3000/Tape&Reel |

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