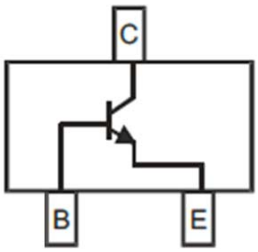
# NPN General Purpose Amplifier

SOT-23




## Features

- Epoxy meets UL-94 V-0 flammability rating
- Surface mount package ideally suited for automatic insertion
- Moisture Sensitivity Level 1
- Low equivalent on-resistance
- Part no. with suffix “Q” means AEC-Q101 qualified

## Mechanical Data

- Package: SOT-23
- Terminals: Tin plated leads, solderable per J-STD-002 and JESD22-B102
- Marking： 491

## ■ Maximum Ratings (Ta=25℃ Unless otherwise specified)

| Item | Symbol | Unit | Value |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | V | 80 |
| Collector-Emitter Voltage | $V_{CEO}$ | V | 60 |
| Emitter-Base Voltage | $V_{EBO}$ | V | 5 |
| Collector Current | $I_C$ | A | 1 |
| Collector Power Dissipation (*) | $P_C$ | mW | 300 |
| Thermal Resistance From Junction to Ambient (*) | $R_{\theta JA}$ | K/W | 417 |
| Operation Junction Temperature | $T_J$ | ℃ | -55 to +150 |
| Storage Temperature | $T_{STG}$ | ℃ | -55 to +150 |

(*) Device mounted on FR-4 PCB 1.0 x 1.0 x 0.06 inch

## ■ Electrical Characteristics（Ta=25℃ Unless otherwise specified）

| Item | Symbol | Unit | Conditions | Min | Type | Max |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $V_{CBO}$ | V | $I_C$=100μA,$I_E$=0 | 80 | | |
| Collector-emitter breakdown voltage | $V_{CEO}$ | V | $I_C$ =10mA,$I_B$=0 | 60 | | |
| Emitter-base breakdown voltage | $V_{EBO}$ | V | $I_E$=100μA,$I_C$=0 | 5 | | |
| Collector-Base cut-off current | $I_{CBO}$ | uA | $V_{CB}$=60 V,$I_E$=0 | | | 0.1 |
| Emitter-Base cut-off current | $I_{EBO}$ | uA | $V_{EB}$=4 V, $I_C$=0 | | | 0.1 |
| DC current gain | $h_{FE}1$ | | $V_{CE}$=5V,$I_C$=1mA | 100 | | |
| | $h_{FE}2$ | | $V_{CE}$=5V,$I_C$=500mA | 100 | | 300 |
| | $h_{FE}3$ | | $V_{CE}$=5V,$I_C$=1A | 80 | | |
| | $h_{FE}4$ | | $V_{CE}$=5V,$I_C$=2A | 30 | | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | V | $I_C$=500mA,$I_B$=50mA | | | 0.25 |
| | | V | $I_C$=1A,$I_B$=100mA | | | 0.5 |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | V | $I_C$=1A,$I_B$=100mA | | | 1.1 |
| Base-emitter voltage | $V_{BE}$ | V | $V_{CE}$=5V,$I_C$=1A | | | 1 |
| Transition frequency | $f_T$ | MHz | $V_{CE}$=10V, $I_C$=50mA,f=100MHz | 150 | | |
| Collector-Base Output Capacitance | Cob | pF | $V_{CB}$=10V ,$I_E$=0, f=1MHz | | | 10 |

## ■ Ordering Information (Example)

| PREFERED P/N | PACKING CODE | UNIT WEIGHT(g) | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---|---|---|---|---|---|---|
| FMMT491Q | F2 | Approximate 0.009 | 3000 | 30000 | 120000 | 7” reel |

## ■ Electrical Characteristics (Typical)

Fig. 1 - Static Characteristic

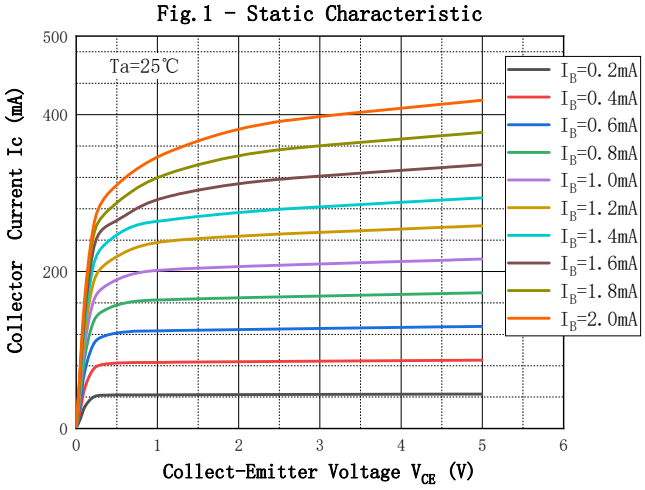



Fig. 2 - DC Current Gian

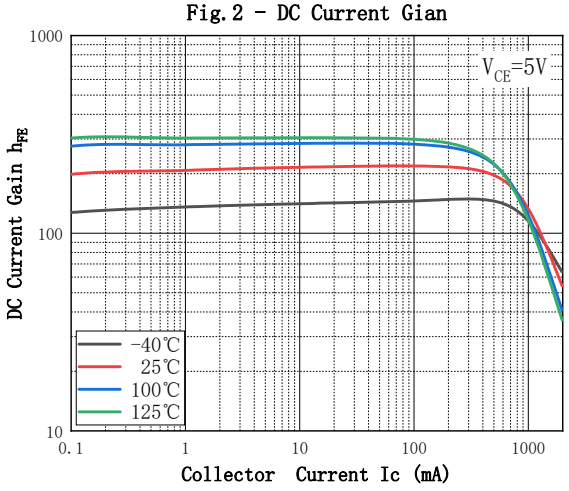



Fig. 3 - Collect-Emitter Saturation Voltage

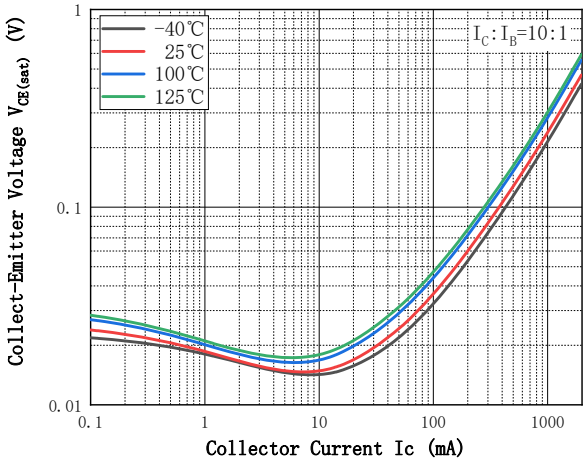



Fig. 4 - Base-Emitter Voltage

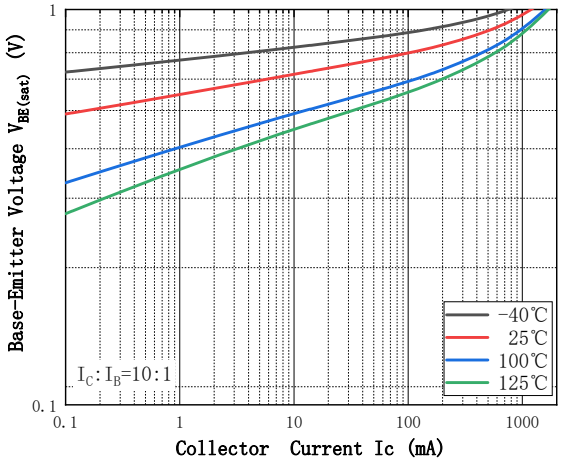



Fig. 5 - Base-Emitter On Voltage

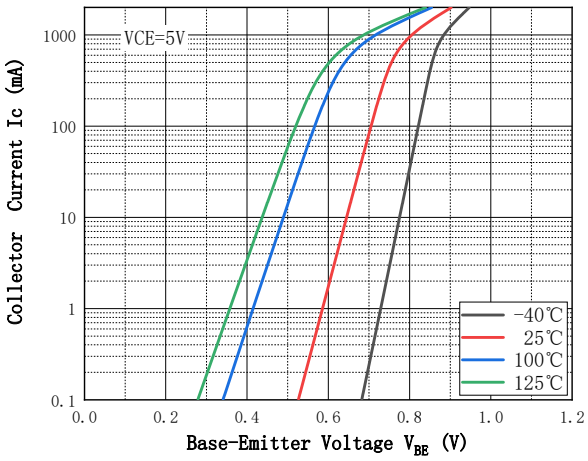



Fig. 6 - Cob/Cib—$V_{CB}$/$V_{EB}$

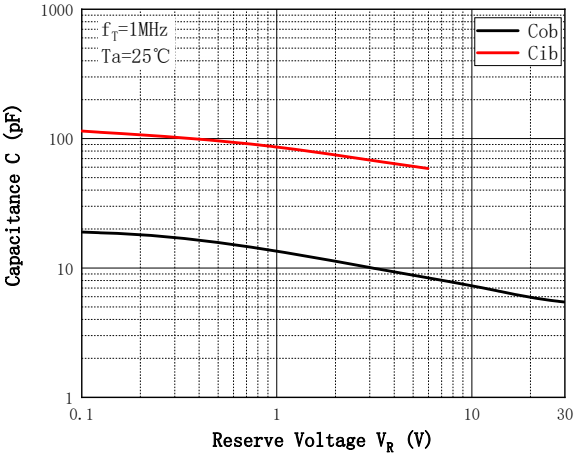
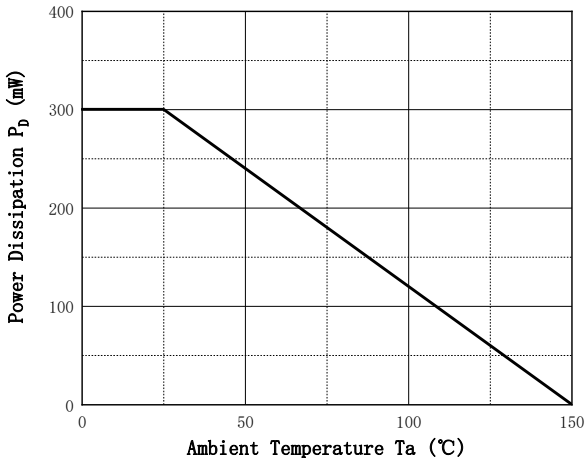
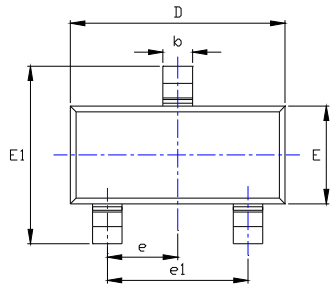


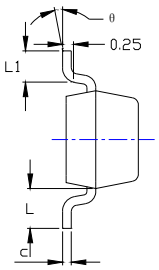
Fig.7 - Power Derating Curve



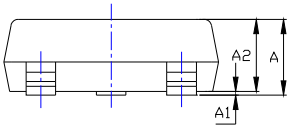

## ■SOT-23 Package Outline Dimensions & Suggested Pad Layout



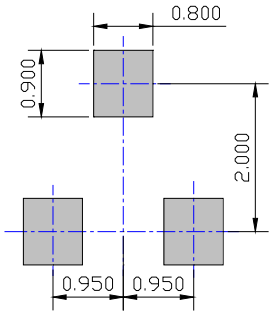

TOP VIEW




SIDE VIEW




SIDE VIEW




UNIT：mm

SUGGESTED SOLDER PAD LAYOUT

| DIMENSIONS | | | | |
|---|---|---|---|---|
| SYMBOL | INCHES | | Millimeter | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.035 | 0.045 | 0.900 | 1.150 |
| A1 | 0.000 | 0.004 | 0.000 | 0.100 |
| A2 | 0.035 | 0.041 | 0.900 | 1.050 |
| b | 0.012 | 0.020 | 0.300 | 0.500 |
| c | 0.004 | 0.008 | 0.100 | 0.200 |
| D | 0.110 | 0.118 | 2.800 | 3.000 |
| E | 0.047 | 0.055 | 1.200 | 1.400 |
| E1 | 0.089 | 0.100 | 2.250 | 2.550 |
| e | 0.037TYP | | 0.950TYP | |
| e1 | 0.071 | 0.079 | 1.800 | 2.000 |
| L | 0.022REF | | 0.550REF | |
| L1 | 0.012 | 0.020 | 0.300 | 0.500 |
| θ | 0° | 8° | 0° | 8° |

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

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