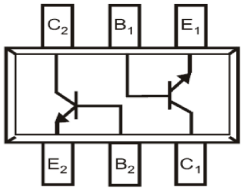
# Dual NPN Small Signal Surface Mount Transistor

## Features:

- Epitaxial planar die construction.
- Ultra-small surface mount package.
- Ideal for low power amplification and switching.

**Applications:**

- Dual NPN small signal surface mount transistor.




**SOT-363**

## Maximum Rating: @ $T_A$ = 25°C unless otherwise specified

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 60 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 40 | |
| Emitter-Base Voltage | $V_{EBO}$ | 6 | |
| Collector Current-Continuous | $I_C$ | 600 | mA |
| Power Dissipation | $P_D$ | 200 | mW |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 625 | °C/W |
| Junction and Storage Temperature | $T_j$, $T_{stg}$ | -55 to +150 | °C |

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

| Parameter | Symbol | Test Conditions | Min. | Max. | Unit |
|---|---|---|---|---|---|
| Collector-base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$ =100µA $I_E$ = 0 | 60 | - | V |
| Collector-emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$ = 1mA $I_B$ = 0 | 40 | - | |
| Emitter-base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$ = 100µA $I_C$ = 0 | 6 | - | |
| Collector Cut-off Current | $I_{CEX}$ | $V_{CE}$ = 35V, $V_{EB(OFF)}$ = 0.4V | - | 0.1 | µA |
| Base Cut-off Current | $I_{BL}$ | $V_{CE}$ = 35V, $V_{EB(OFF)}$ = 0.4V | - | 0.1 | |
| DC Current Gain | $h_{FE}$ | $V_{CE}$ = 1V $I_C$ = 0.1mA<br>$V_{CE}$ = 1V $I_C$ = 1mA<br>$V_{CE}$ = 1V $I_C$ = 10mA<br>$V_{CE}$ = 1V $I_C$ = 150mA<br>$V_{CE}$ = 2V $I_C$ = 500mA | 20<br>40<br>80<br>100<br>40 | -<br>-<br>-<br>300<br>- | - |

# Dual NPN Small Signal Surface Mount Transistor

| Parameter | Symbol | Test Conditions | Min. | Max. | Unit |
|---|---|---|---|---|---|
| Collector-emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$ = 150mA $I_B$ = 15mA<br>$I_C$ = 500mA $I_B$ = 50mA | - | 0.4<br>0.75 | V |
| Base-emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$ = 150mA $I_B$ = 15mA<br>$I_C$ = 500mA $I_B$ = 50mA | 0.75<br>- | 0.95<br>1.2 | V |
| Transition Frequency | $f_T$ | $V_{CE}$ = 10V $I_C$ = 20mA f = 1MHz | 250 | | MHz |
| Output Capacitance | $C_{obo}$ | $V_{CB}$ = 5V, f = 1MHz, $I_E$ = 0 | - | 6.5 | pF |
| Input Capacitance | $C_{ibo}$ | $V_{EB}$ = 0.5V, f = 1MHz,$I_C$ = 0 | - | 30 | pF |
| Delay Time | $t_d$ | $V_{CC}$ = 30V, $V_{BE(off)}$ = 2V<br>$I_C$ = 150mA , $I_{B1}$ = 15mA | | 15 | ns |
| Rise Time | $t_r$ | | | 20 | ns |
| Storage Time | $t_s$ | $V_{CC}$ = 30V, $I_C$ = 150mA<br>$I_{B1}$ = $I_{B2}$ = 15mA | | 225 | ns |
| Fall Time | $t_f$ | | | 30 | ns |

## Typical Characteristics: @ $T_A$ = 25°C unless otherwise specified

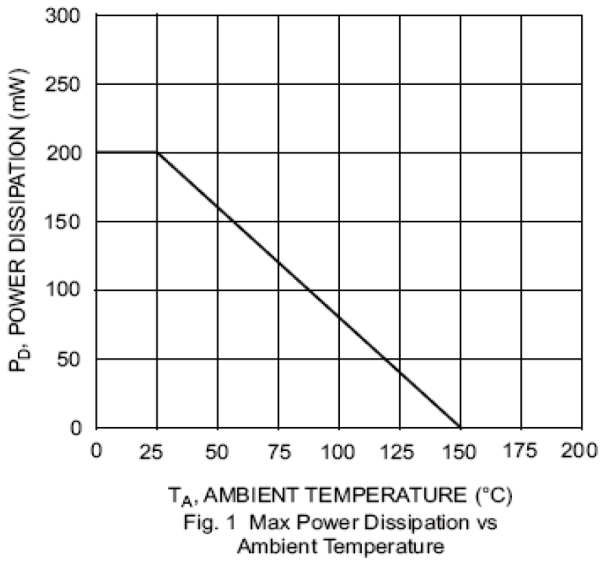


Fig. 1 Max Power Dissipation vs Ambient Temperature

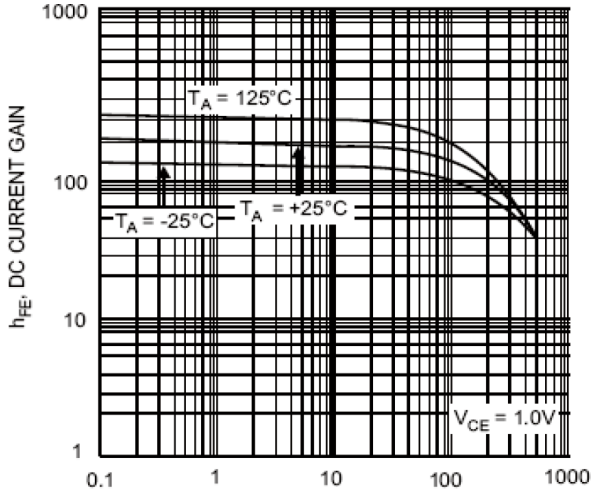


Fig. 2 Typical DC Current Gain vs Collector Current

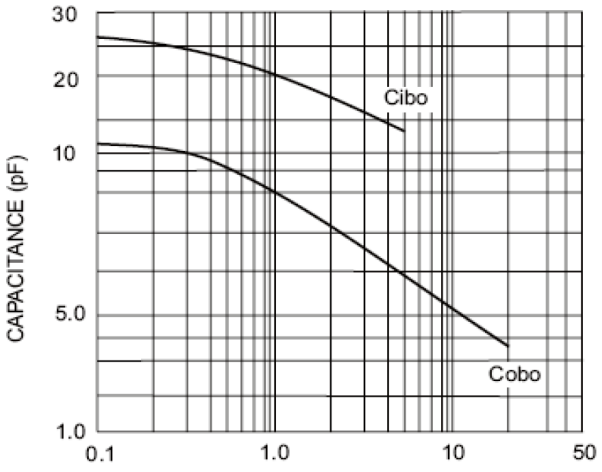


Fig. 3 Typical Capacitance

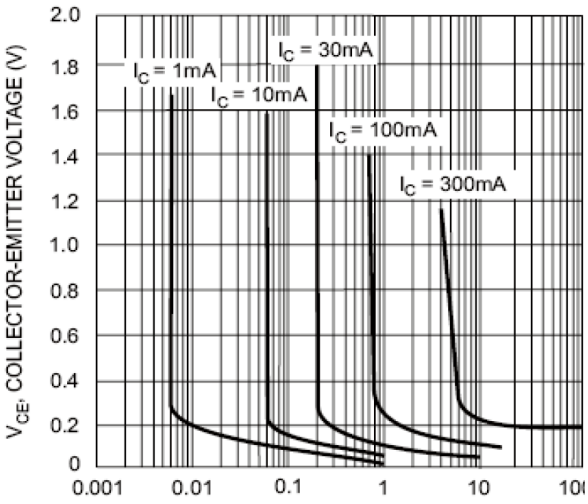


Fig. 4 Typical Collector Saturation Region

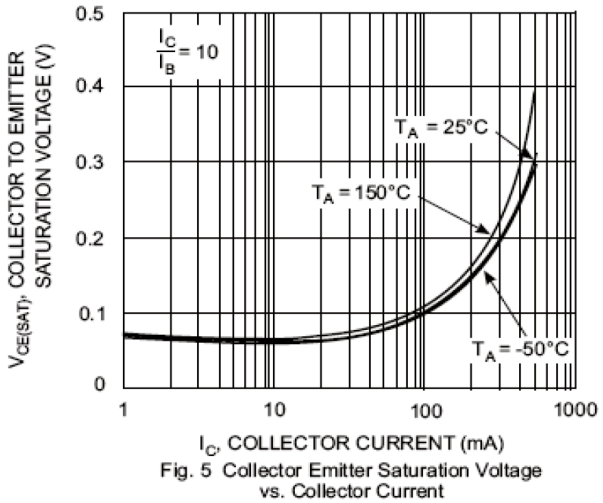


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

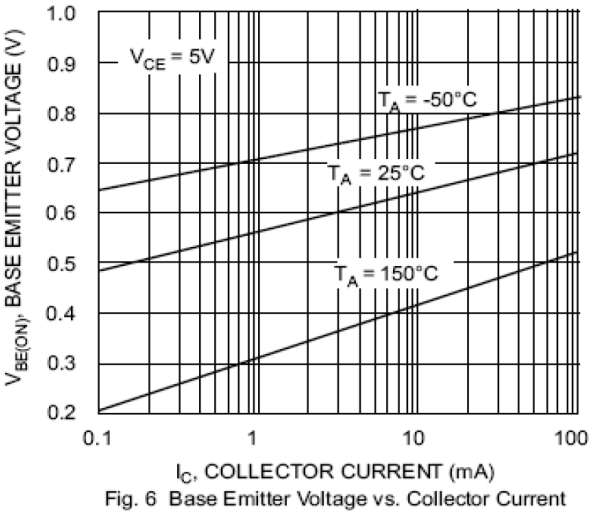
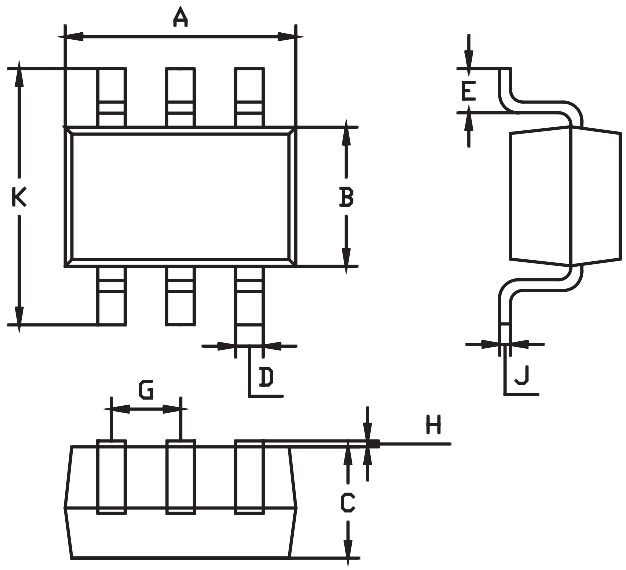


Fig. 6 Base Emitter Voltage vs. Collector Current

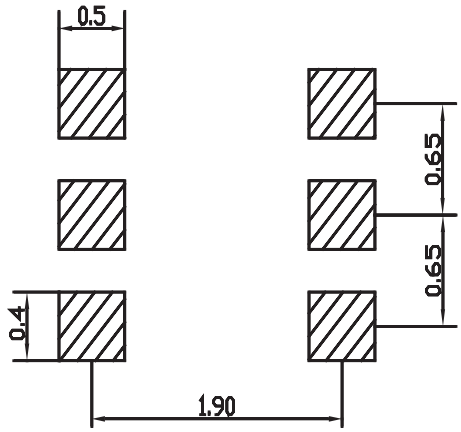
# Dual NPN Small Signal Surface Mount Transistor

## Package Outline:




| SOT-363 | | |
|---|---|---|
| **Dim** | **Min.** | **Max.** |
| A | 1.8 | 2.2 |
| B | 1.15 | 1.35 |
| C | 1 Typical | |
| D | 0.10 | 0.30 |
| E | 0.25 | 0.40 |
| G | 0.65 Typical | |
| H | 0.02 | 0.10 |
| J | 0.1 Typical | |
| K | 2.1 | 2.3 |
| All Dimensions in mm | | |

## Soldering Footprint:




Dimensions : Millimetres

## Part Number Table

| Description | Part Number |
|---|---|
| Transistor, Array, Dual NPN, 40V, 600mA, SOT-363 | MMDT4401-7-F |