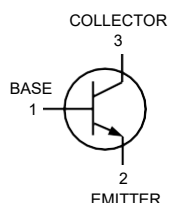
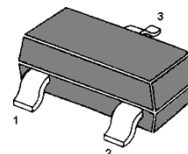


# MMBT5550 High Voltage Transistor NPN Silicon



MARKING : M1F

SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

## MAXIMUM RATINGS

| Rating                       | Symbol           | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Emitter Voltage    | V <sub>CEO</sub> | 140   | V    |
| Collector-Base Voltage       | V <sub>CBO</sub> | 160   | V    |
| Emitter-Base Voltage         | V <sub>EBO</sub> | 6.0   | V    |
| Collector Current-Continuous | I <sub>C</sub>   | 600   | mA   |

## THERMAL CHARACTERISTICS

| Characteristic                                                                          | Symbol                            | Max.        | Unit          |
|-----------------------------------------------------------------------------------------|-----------------------------------|-------------|---------------|
| Total Device Dissipation FR-5 Board <sup>(1)</sup> TA=25°C<br>Derate above 25°C         | P <sub>D</sub>                    | 225<br>1.8  | mW<br>mW / °C |
| Thermal Resistance Junction to Ambient                                                  | R <sub>θJA</sub>                  | 556         | °C / W        |
| Total Device Dissipation Alumina Substrate, <sup>(2)</sup> TA=25°C<br>Derate above 25°C | P <sub>D</sub>                    | 300<br>2.4  | mW<br>mW / °C |
| Thermal Resistance Junction to Ambient                                                  | R <sub>θJA</sub>                  | 417         | °C / W        |
| Junction and Storage Temperature                                                        | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C            |

## ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

| Characteristic                                                                                                                            | Symbol               | Min.   | Max.       | Unit     |
|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------|------------|----------|
| Collector-Emitter Breakdown Voltage <sup>(3)</sup><br>(I <sub>C</sub> =1.0mA, I <sub>B</sub> =0)                                          | V <sub>(BR)CEO</sub> | 140    | -          | V        |
| Collector-Base Breakdown Voltage<br>(I <sub>C</sub> =100 uA, I <sub>E</sub> =0)                                                           | V <sub>(BR)CBO</sub> | 160    | -          | V        |
| Emitter-Base Breakdown Voltage<br>(I <sub>E</sub> =10 uA, I <sub>C</sub> =0)                                                              | V <sub>(BR)EBO</sub> | 6.0    | -          | V        |
| Base Cutoff Current<br>(V <sub>CE</sub> =100 V, I <sub>E</sub> =0)<br>(V <sub>CE</sub> =100 V, I <sub>E</sub> =0, T <sub>A</sub> = 100°C) | I <sub>CBO</sub>     | -<br>- | 100<br>100 | nA<br>uA |
| Collector Cutoff Current<br>(V <sub>EB</sub> =4.0 V, I <sub>C</sub> =0)                                                                   | I <sub>EBO</sub>     | -      | 50         | nA       |

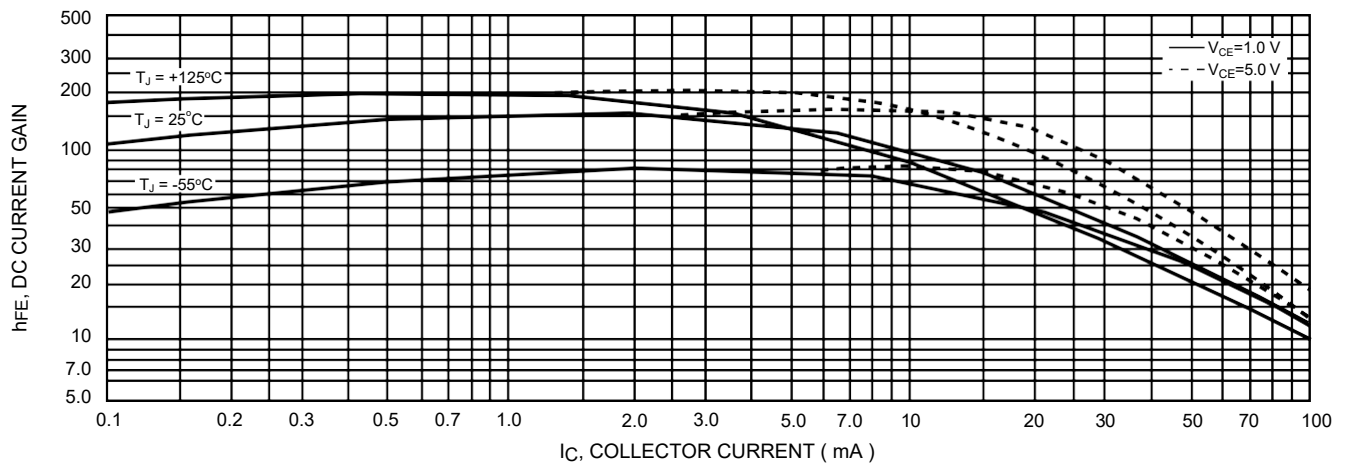
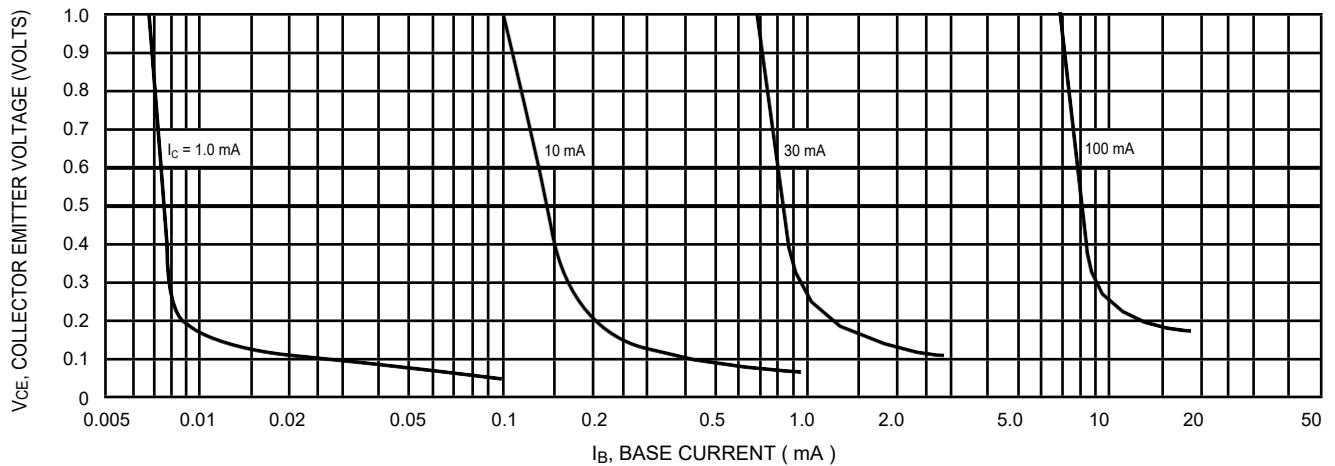
(1) FR-5=1.0 x 0.75 x 0.062in.

(2) Alumina=0.4 x 0.3 x 0.024in. 99.5% alumina.

(3) Pulse Test : Pulse Width = 300 uS, Duty Cycle = 2.0%.

**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise noted) (Continued)

| Characteristic                                                                                                                                                                     | Symbol        | Min.           | Max.          | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|---------------|------|
| <b>ON CHARACTERISTICS</b>                                                                                                                                                          |               |                |               |      |
| DC Current Gain<br>( $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ V}$ )<br>( $I_C = 10\text{ mA}$ , $V_{CE} = 5.0\text{ V}$ )<br>( $I_C = 50\text{ mA}$ , $V_{CE} = 5.0\text{ V}$ ) | $H_{FE}$      | 60<br>60<br>20 | -<br>250<br>- | -    |
| Collector-Emitter Saturation Voltage<br>( $I_C = 10\text{ mA}$ , $I_B = 1.0\text{ mA}$ )<br>( $I_C = 50\text{ mA}$ , $I_B = 5.0\text{ mA}$ )                                       | $V_{CE(sat)}$ | -<br>-         | 0.15<br>0.25  | V    |
| Base-Emitter Saturation Voltage<br>( $I_C = 10\text{ mA}$ , $I_B = 1.0\text{ mA}$ )<br>( $I_C = 50\text{ mA}$ , $I_B = 5.0\text{ mA}$ )                                            | $V_{BE(sat)}$ | -<br>-         | 1.0<br>1.2    | V    |

**Typical Characteristics****Figure 1. DC Current Gain****Figure 2. Collector Saturation Region**

## Typical Characteristics

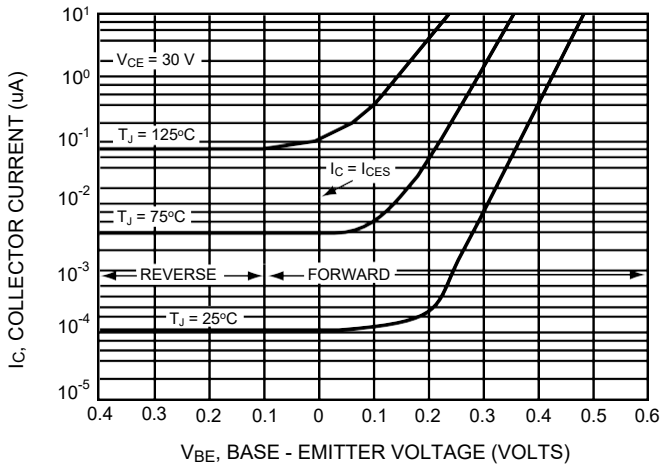


Figure 3. Collector Cut - Off Region

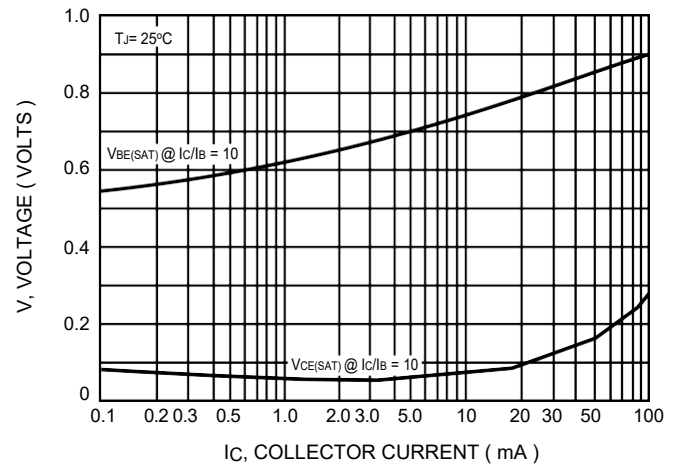


Figure 4. " On " Voltages

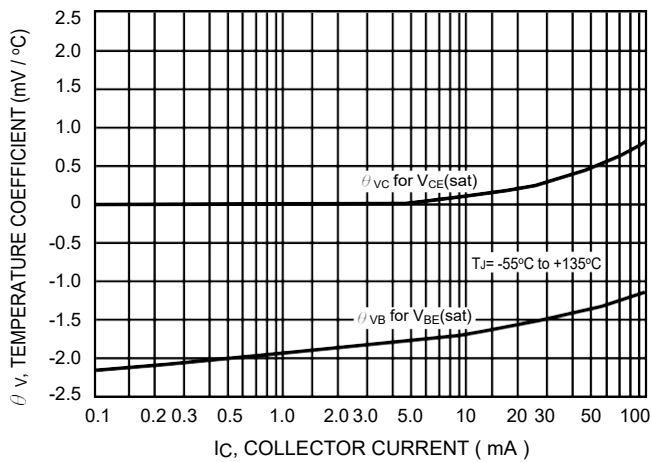


Figure 5. Temperature Coefficients

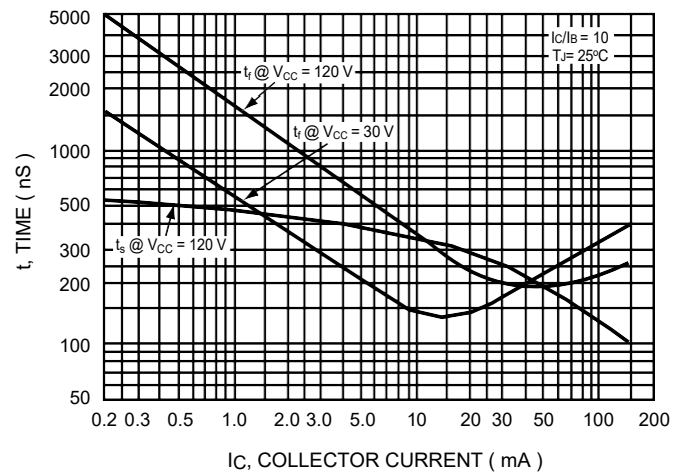


Figure 6. Turn - Off Time

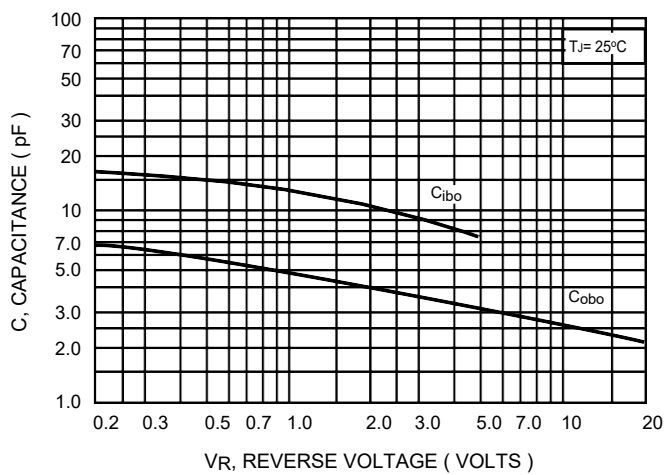


Figure 7. Capacitances

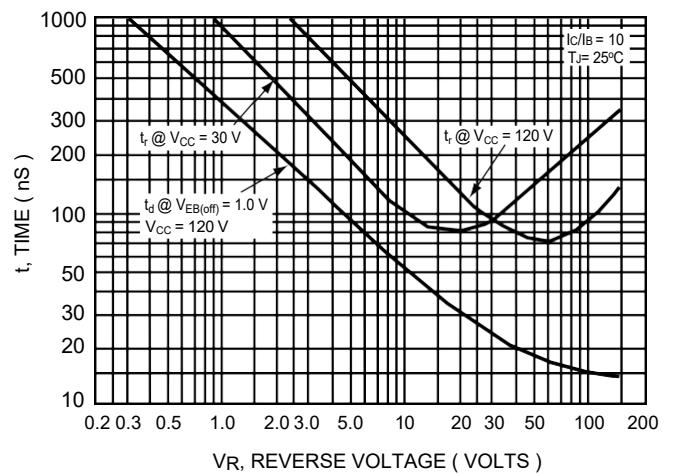
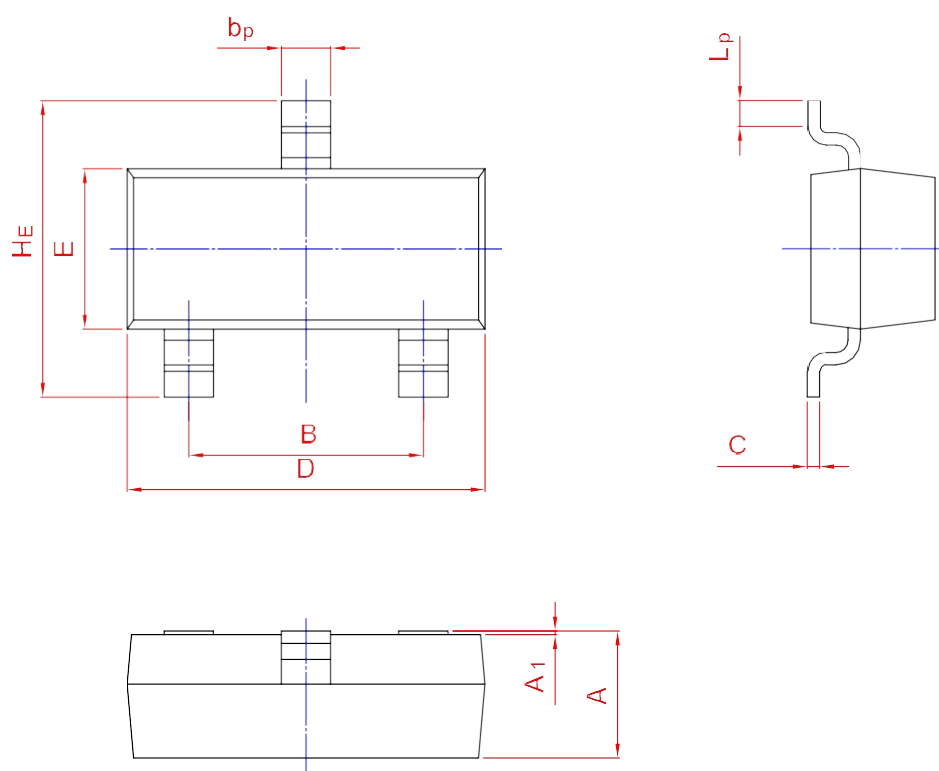
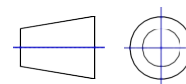


Figure 8. Turn-On Time

## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

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| UNIT | A            | B            | b <sub>p</sub> | C            | D            | E            | H <sub>E</sub> | A <sub>1</sub> | L <sub>p</sub> |
|------|--------------|--------------|----------------|--------------|--------------|--------------|----------------|----------------|----------------|
| mm   | 1.40<br>0.95 | 2.04<br>1.78 | 0.50<br>0.35   | 0.19<br>0.08 | 3.10<br>2.70 | 1.65<br>1.20 | 3.00<br>2.20   | 0.100<br>0.013 | 0.50<br>0.20   |