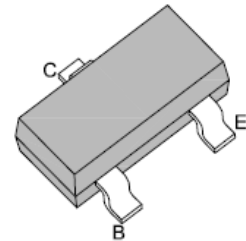
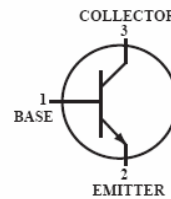


## SMD High Voltage Transistor (NPN)

### Features

- NPN Silicon Epitaxial Planar Transistor for Switching and Amplifier Applications
- RoHS compliance



SOT-23



### Mechanical Data

<b>Case:</b>	SOT-23, Plastic Package
<b>Terminals:</b>	Solderable per MIL-STD-202G, Method 208
<b>Weight:</b>	0.008 gram

### Maximum Ratings *(T<sub>Ambient</sub>=25°C unless noted otherwise)*

Symbol	Description	MMBT5550	MMBT5551	Unit
	Marking Code	M1F	G1	
<b>V<sub>CEO</sub></b>	Collector-Emitter Voltage	140	160	V
<b>V<sub>CB0</sub></b>	Collector-Base Voltage	160	180	V
<b>V<sub>EBO</sub></b>	Emitter-Base Voltage	6.0		V
<b>I<sub>c</sub></b>	Collector Current-Continuous	600		mA

### Thermal Characteristics

Symbol	Description	MMBT5550	MMBT5551	Unit
<b>P<sub>tot</sub></b>	Total Device Dissipation FR-5 Board, (Note 1) T <sub>A</sub> = 25°C	225		mW
	Derate above 25°C	1.8		mW/° C
<b>R<sub>θJA</sub></b>	Thermal Resistance from Junction to Ambient	556		° C/W
<b>P<sub>tot</sub></b>	Total Device Dissipation Alumina Substrate, (Note 2) T <sub>A</sub> = 25°C,	300		mW
	Derate above 25°C	2.4		mW/° C
<b>R<sub>θJA</sub></b>	Thermal Resistance from Junction to Ambient	417		° C/W
<b>T<sub>J</sub>, T<sub>STG</sub></b>	Junction and Storage Temperature Range	-55 to +150		° C

# SMD High Voltage Transistor (NPN)

## MMBT5550/MMBT5551

### Electrical Characteristics ( $T_{Ambient}=25^{\circ}C$ unless noted otherwise)

#### Off Characteristics

Symbol	Description	MMBT5550		MMBT5551		Unit	Conditions
		Min.	Max.	Min.	Max.		
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage (Note 3)	140	-	160	-	V	$I_C=1mA, I_B=0$
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	160	-	180	-	V	$I_C=100\mu A, I_E=0$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	6.0	-	6.0	-	V	$I_E=10\mu A, I_C=0$
$I_{CBO}$	Collector-Base Cut-off Current	-	100	-	50	nA	
		$V_{CB}=100V, I_E=0$		$V_{CB}=120V, I_E=0$			
		-	100	-	50	$\mu A$	$V_{CB}=100V, I_E=0, T_A=100^{\circ}C$
$I_{EBO}$	Emitter-Base Cut-off Current	-	50	-	50	nA	$V_{EB}=4V, I_C=0$

#### On Characteristics

Symbol	Description	MMBT5550		MMBT5551		Unit	Conditions
		Min.	Max.	Min.	Max.		
$h_{FE}$	D.C. Current Gain	60	-	80	-		$V_{CE}=5V, I_C=1mA$
		60	250	80	250		$V_{CE}=5V, I_C=10mA$
		20	-	30	-		$V_{CE}=5V, I_C=50mA$
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	-	0.15	-	0.15	V	$I_C=10mA, I_B=1mA$
		-	0.25	-	0.20	V	$I_C=50mA, I_B=5mA$
$V_{BE(on)}$	Base-Emitter On Voltage	-	1.0	-	1.0	V	$I_C=10mA, I_B=1mA$
		-	1.2	-	1.0	V	$I_C=50mA, I_B=5mA$

- Note:**
- FR-5=1.0x0.75x0.062 in.
  - Alumina=0.4x0.3x0.024 in, 99.5% alumina.
  - Pulse Test: Pulse Width=300 $\mu$ s, Duty Cycle=2.0%.

# SMD High Voltage Transistor (NPN)

## MMBT5550/MMBT5551

### Typical Characteristics Curves

Fig.1- DC Current Gain

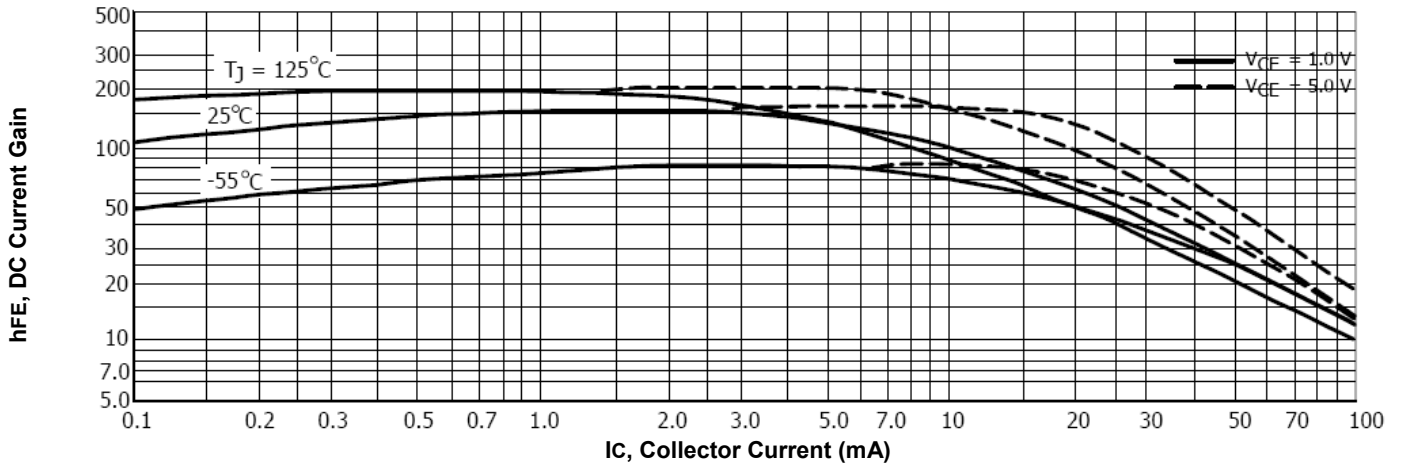
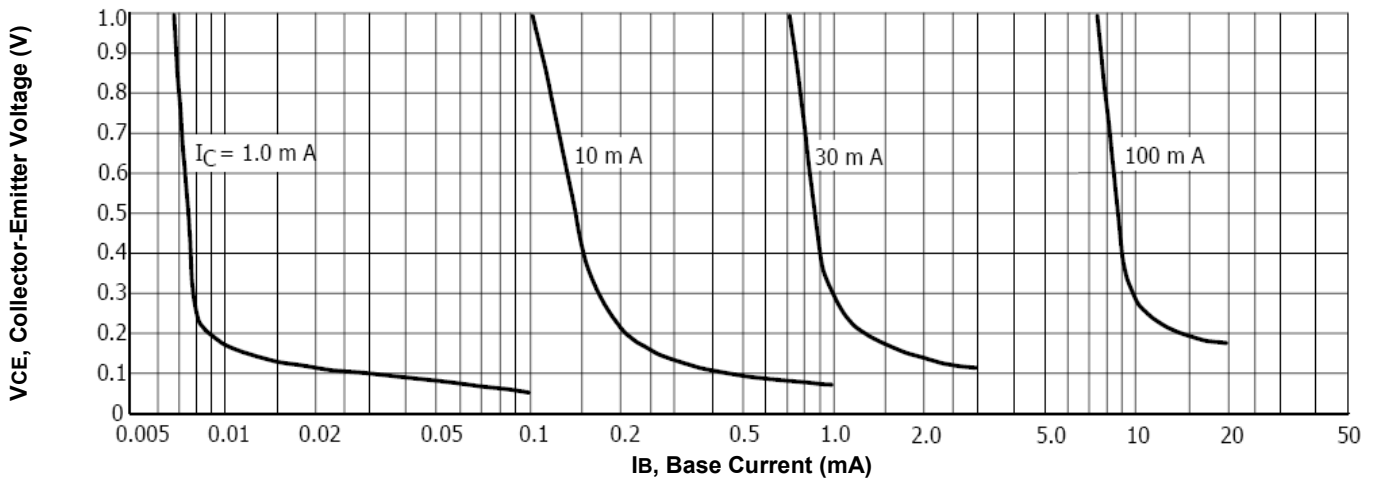


Fig.2- Collector Saturation Region



# SMD High Voltage Transistor (NPN)

## MMBT5550/MMBT5551

Fig.3- Collector Cut-off Region

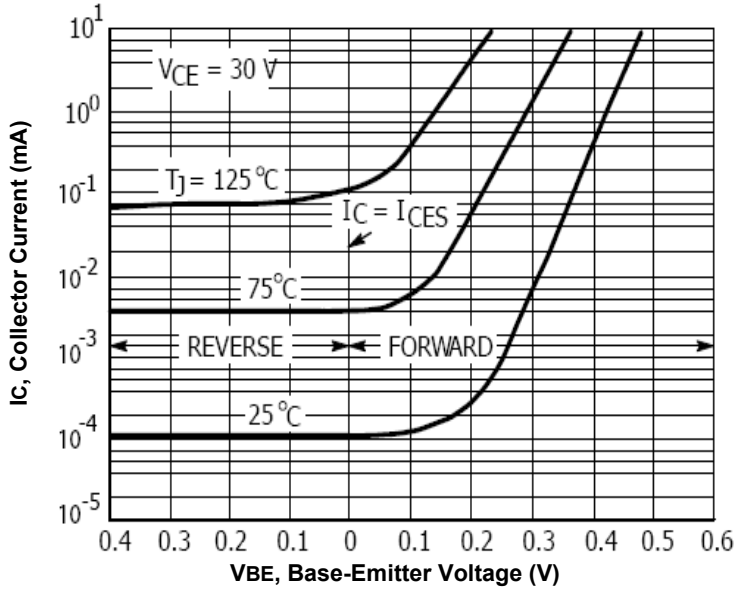


Fig.4- "ON" Voltages

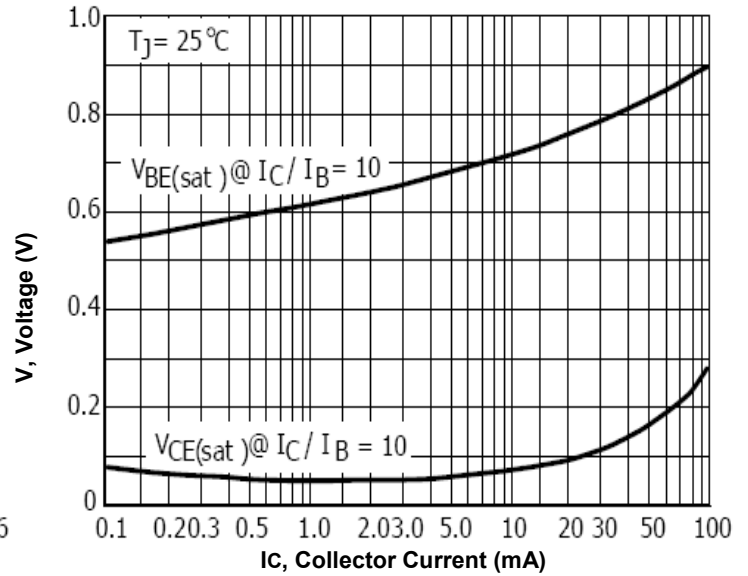


Fig.5- Temperature Coefficient

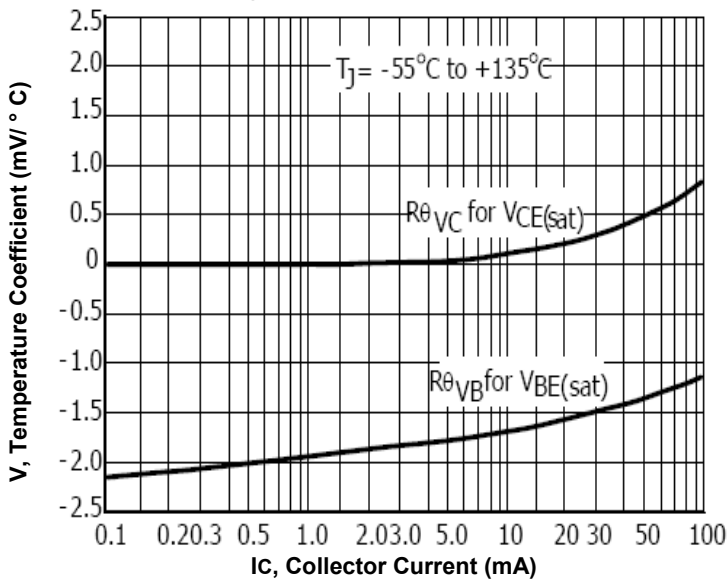
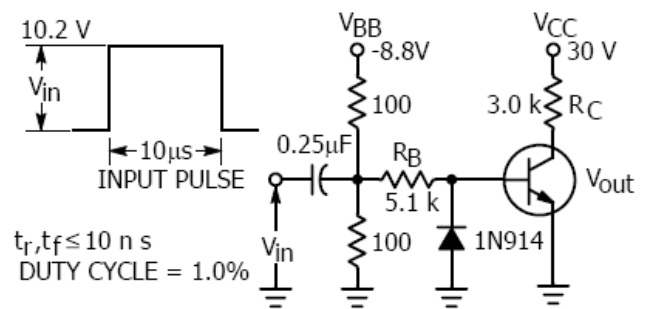


Fig.6-Switching Time Test Circuits



Values Shown are for  $I_C @ 10\text{ mA}$

# SMD High Voltage Transistor (NPN)

## MMBT5550/MMBT5551

Fig.7- Capacitance

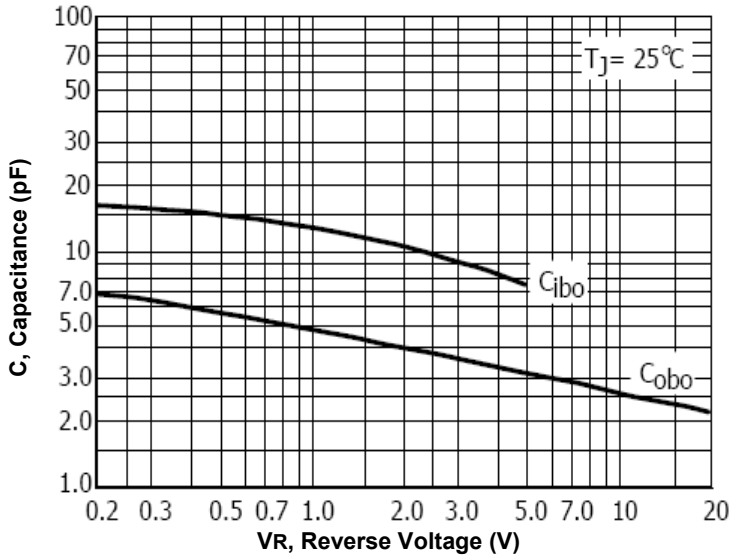


Fig.8- Turn-On Time

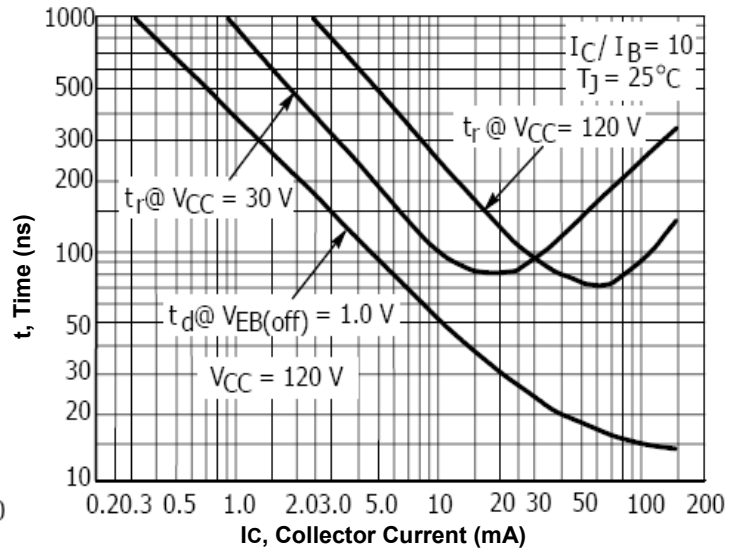
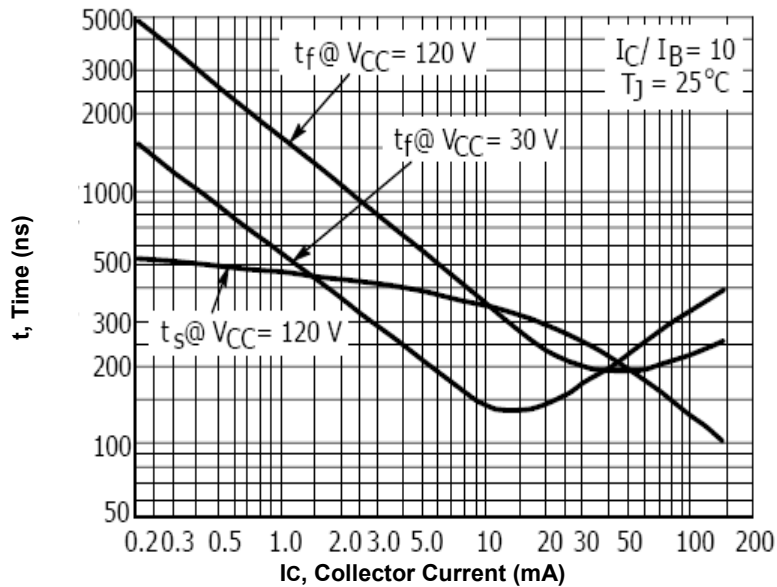


Fig.9- Turn-Off Time

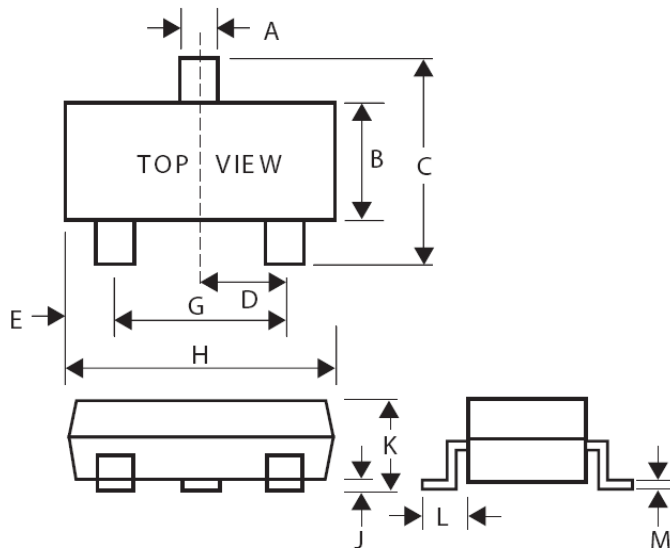


# SMD High Voltage Transistor (NPN)

## MMBT5550/MMBT5551

Dimensions in mm

SOT-23



Dim	Min	Max
A	0.35	0.51
B	1.19	1.80
C	2.10	3.00
D	0.85	1.05
E	0.46	1.00
G	1.70	2.10
H	2.70	3.10
J	0.01	0.13
K	0.89	1.60
L	0.30	0.61
M	0.076	0.25

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