

## TRANSISTOR(NPN)

### FEATURES

Switching transistor

**MARKING: MMBT4401=2X**

### MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Units
$V_{CB0}$	Collector-Base Voltage	60	V
$V_{CE0}$	Collector-Emitter Voltage	40	V
$V_{EB0}$	Emitter-Base Voltage	6	V
$I_C$	Collector Current -Continuous	600	mA
$P_C$	Collector Power dissipation	0.3	W
$T_j$	Junction Temperature	150	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature	-55to +150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance, junction to Ambient	357	$^{\circ}\text{C}/\text{mW}$

### SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

### ELECTRICAL CHARACTERISTICS ( $T_{amb}=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	MAX	UNIT
<b>Collector-base breakdown voltage</b>	$V_{(BR)CBO}$	$I_C=100\mu\text{A}$ , $I_E=0$	60		V
<b>Collector-emitter breakdown voltage</b>	$V_{(BR)CEO}$	$I_C=1\text{mA}$ , $I_B=0$	40		V
<b>Emitter-base breakdown voltage</b>	$V_{(BR)EBO}$	$I_E=100\mu\text{A}$ , $I_C=0$	6		V
<b>Collector cut-off current</b>	$I_{CBO}$	$V_{CB}=50\text{V}$ , $I_E=0$		0.1	$\mu\text{A}$
<b>Collector cut-off current</b>	$I_{CEO}$	$V_{CE}=30\text{V}$ , $I_B=0$		0.1	$\mu\text{A}$
<b>Emitter cut-off current</b>	$I_{EBO}$	$V_{EB}=5\text{V}$ , $I_C=0$		0.1	$\mu\text{A}$
<b>DC current gain</b>	$h_{FE}$	$V_{CE}=1\text{V}$ , $I_C=150\text{mA}$	100	300	
<b>Collector-emitter saturation voltage</b>	$V_{CE(sat)}$	$I_C=150\text{mA}$ , $I_B=15\text{mA}$		0.4	V
<b>Base-emitter saturation voltage</b>	$V_{BE(sat)}$	$I_C=150\text{mA}$ , $I_B=15\text{mA}$		0.95	V
<b>Transition frequency</b>	$f_T$	$V_{CE}=10\text{V}$ , $I_C=20\text{mA}$ $f=100\text{MHz}$	250		MHz

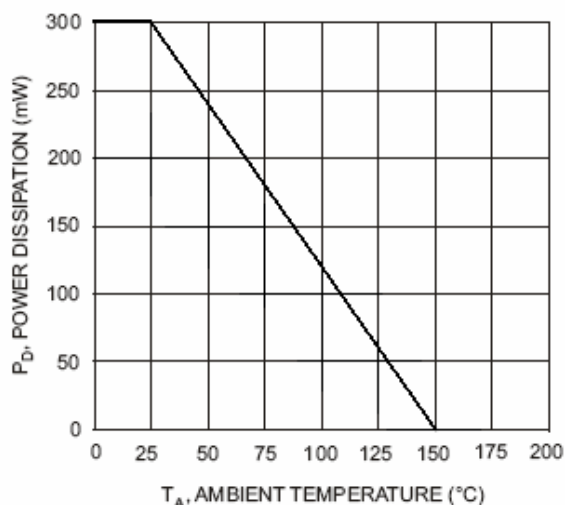


Fig. 1 Max Power Dissipation vs Ambient Temperature

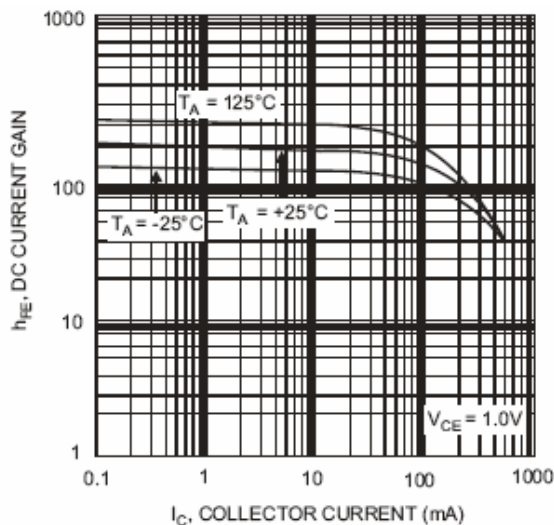


Fig. 2 Typical DC Current Gain vs Collector Current

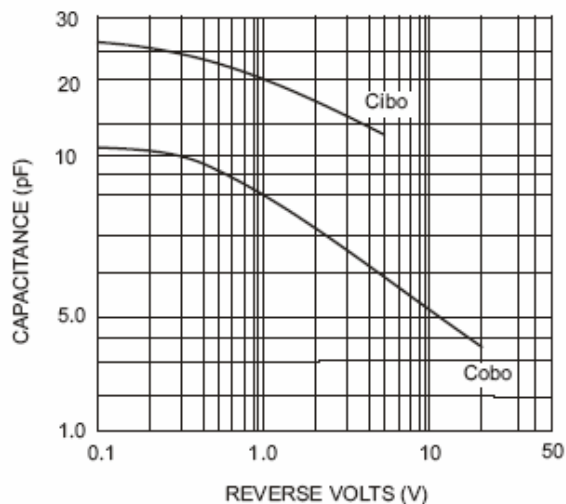


Fig. 3 Typical Capacitance

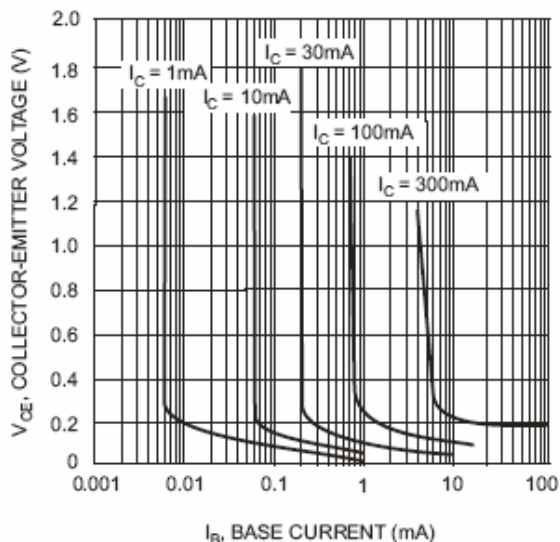


Fig. 4 Typical Collector Saturation Region

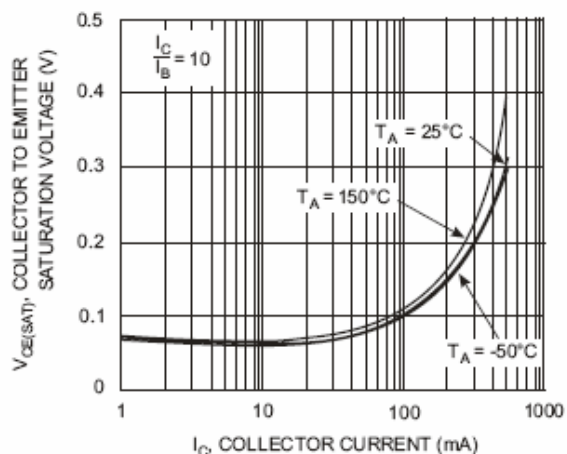


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

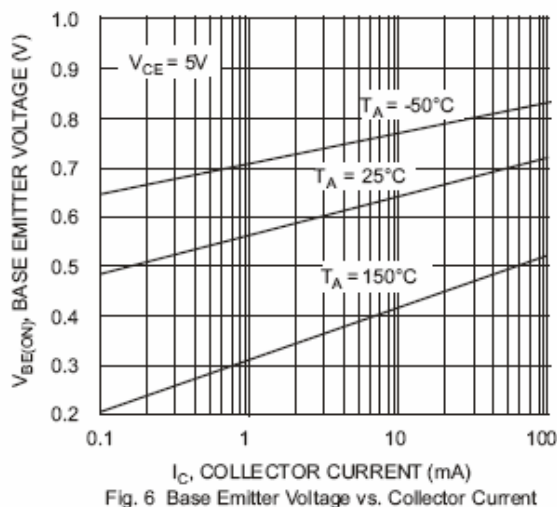


Fig. 6 Base Emitter Voltage vs. Collector Current

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