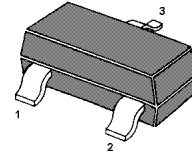


# MMBTSD1781

## NPN Silicon Epitaxial Planar Transistor

Medium Power Transistor

The transistor is subdivided into two group Q and R according to its DC current gain.



1. Base 2. Emitter 3. Collector  
SOT-23 Plastic Package

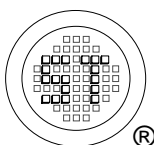
### Absolute Maximum Ratings ( $T_a = 25\text{ }^\circ\text{C}$ )

Parameter	Symbol	Value	Unit
Collector Base Voltage	$V_{CBO}$	40	V
Collector Emitter Voltage	$V_{CEO}$	32	V
Emitter Base Voltage	$V_{EBO}$	5	V
Collector Current	$I_C$	0.8	A (DC)
	$I_{CP}$	1.5	A (Pulse) <sup>1)</sup>
Power Dissipation	$P_{tot}$	200	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	- 55 to + 150	$^\circ\text{C}$

<sup>1)</sup> Single pulse  $P_w = 100\text{ ms}$

### Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $V_{CE} = 3\text{ V}$ , $I_C = 100\text{ mA}$ Current Gain Group	Q $h_{FE}$	120	-	270	-
	R $h_{FE}$	180	-	390	-
Collector Emitter Breakdown Voltage at $I_C = 1\text{ mA}$	$V_{(BR)CEO}$	32	-	-	V
Collector Base Breakdown Voltage at $I_C = 50\text{ }\mu\text{A}$	$V_{(BR)CBO}$	40	-	-	V
Emitter Base Breakdown Voltage at $I_E = 50\text{ }\mu\text{A}$	$V_{(BR)EBO}$	5	-	-	V
Collector Cutoff Current at $V_{CB} = 20\text{ V}$	$I_{CBO}$	-	-	0.5	$\mu\text{A}$
Emitter Cutoff Current at $V_{EB} = 4\text{ V}$	$I_{EBO}$	-	-	0.5	$\mu\text{A}$
Collector Emitter Saturation Voltage at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$	$V_{CE(sat)}$	-	-	0.4	V
Transition Frequency at $V_{CE} = 5\text{ V}$ , $-I_E = 50\text{ mA}$ , $f = 100\text{ MHz}$	$f_T$	-	150	-	MHz
Output Capacitance at $V_{CB} = 10\text{ V}$ , $I_E = 0\text{ A}$ , $f = 1\text{ MHz}$	$C_{ob}$	-	15	-	pF



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Dated : 16/12/2005

● **Electrical characteristic curves**

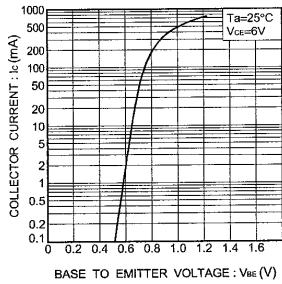


Fig.1 Grounded emitter propagation characteristics

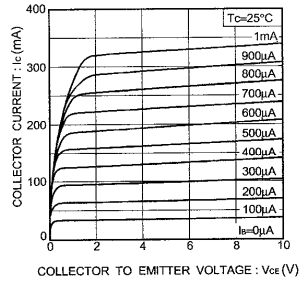


Fig.2 Grounded emitter output characteristics

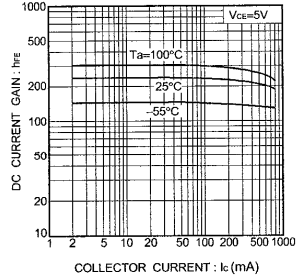


Fig.3 DC current gain vs. collector current

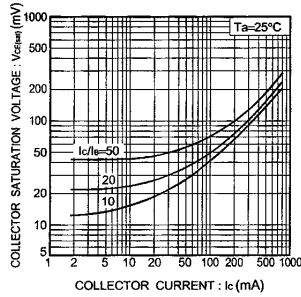


Fig.4 Collector-emitter saturation voltage vs. collector current ( I )

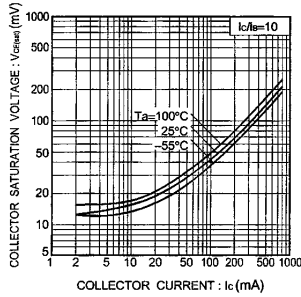


Fig.5 Collector-emitter saturation voltage vs. collector current ( II )

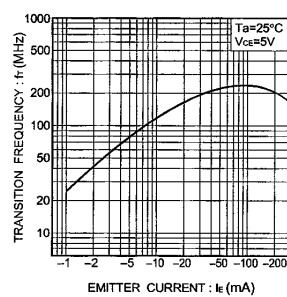


Fig.6 Gain bandwidth product vs. emitter current

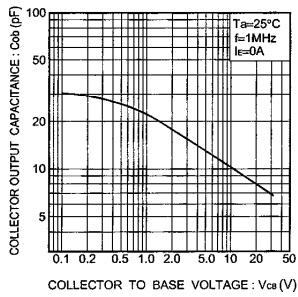


Fig.7 Collector output capacitance vs. collector-base voltage

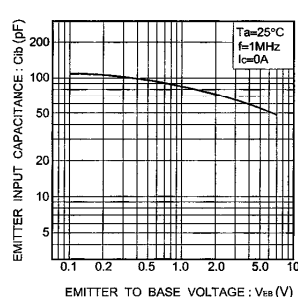
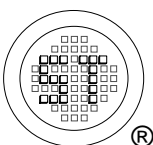


Fig.8 Emitter input capacitance vs. emitter-base voltage



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