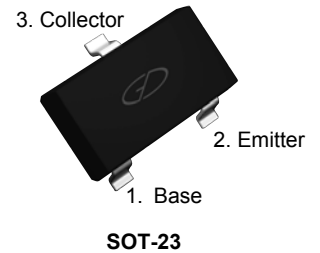


Features

- Very low $V_{CE(SAT)}$
- Power amplifier



Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Max.	Unit
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	32	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current-Continuous	I_C	0.8	A
Peak Pulse Collector Current	I_{CM}	1.5	A
Total Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature Range	T_{STG}	-55 To +150	$^{\circ}C$
Thermal Resistance from Junction to Ambient ¹	$R_{\theta JA}$	625	$^{\circ}C/W$

Note:

1. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=50\mu A$	40	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1mA$	32	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=50\mu A$	5	-	-	V
Collector Cut-off Current	I_{CBO}	$V_{CB}=20V$	-	-	0.5	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB}=4V$	-	-	0.5	μA
DC Current Gain (MMBT1781-Q)	h_{FE}	$V_{CE}=3V, I_C=100mA$	120	-	270	-
DC Current Gain (MMBT1781-R)			180	-	390	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=500mA, I_B=50mA$	-	-	0.4	V
Transition Frequency	f_T	$V_{CE}=5V, I_E=-50mA, F=100MHz$	-	150	-	MHz
Output Capacitance	C_{ob}	$V_{CB}=10V, I_E=0A, F=1MHz$	-	5	-	pF

Typical Characteristic Curves

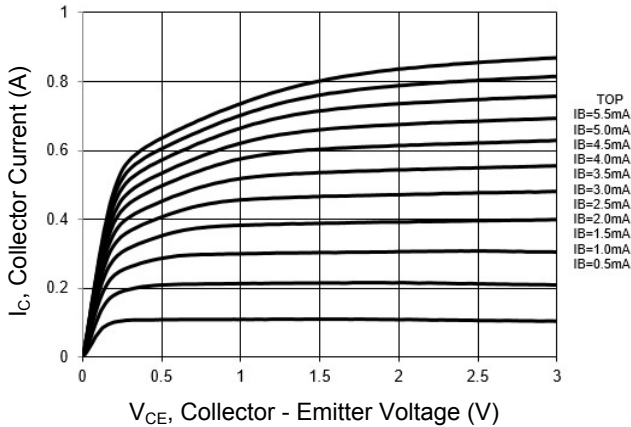


Figure 1. Output Characteristics Curve

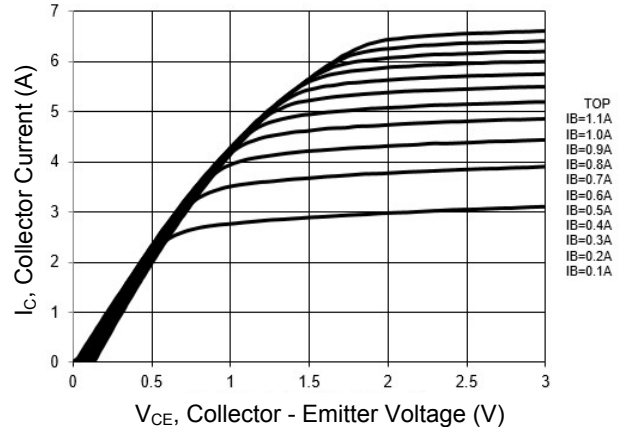


Figure 2. Output Characteristics Curve

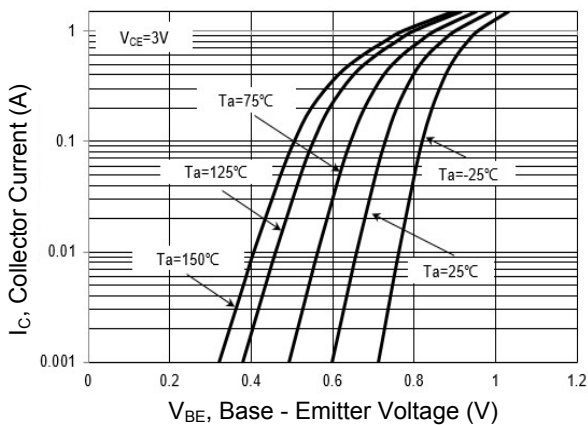


Figure 3. Collector Current vs. Base - Emitter Voltage

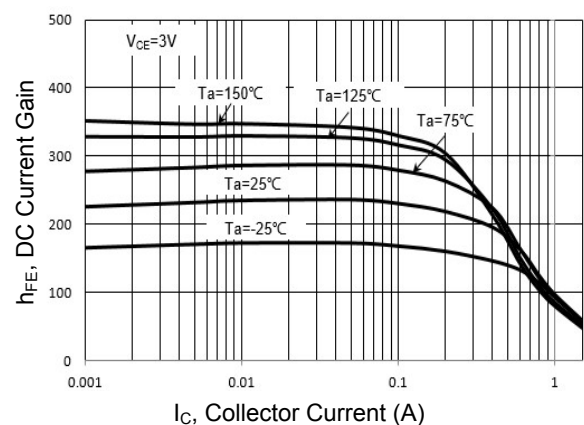


Figure 4. DC Current Gain vs. Collector Current

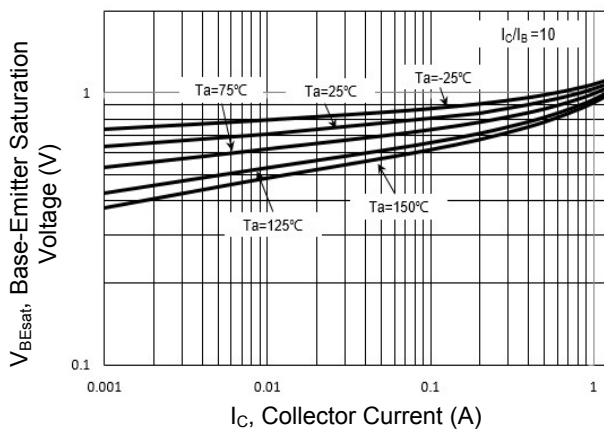


Figure 5. Base - Emitter Saturation Voltage vs. Collector Current

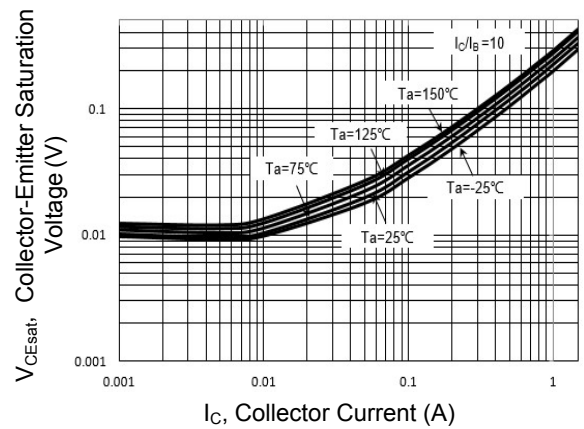


Figure 6. Collector - Emitter Saturation Voltage vs. Collector Current

Typical Characteristic Curves

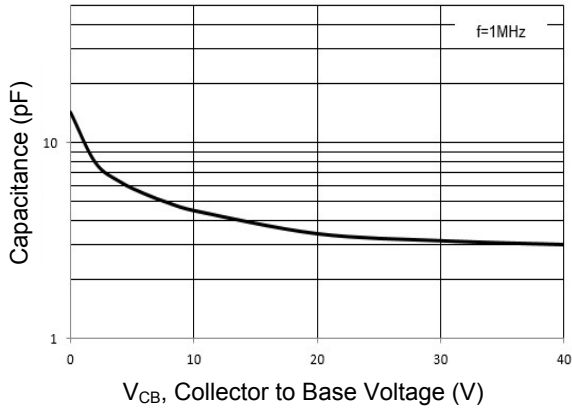


Figure 7. Output Capacitance

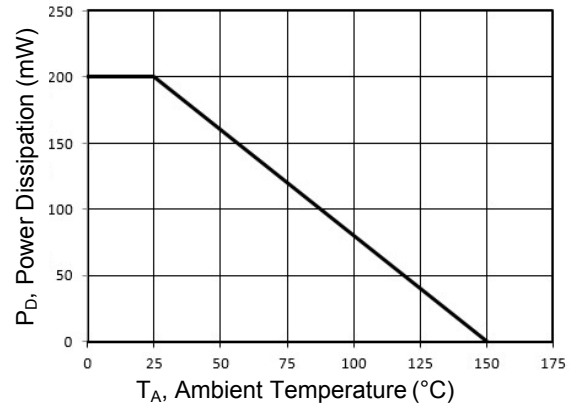
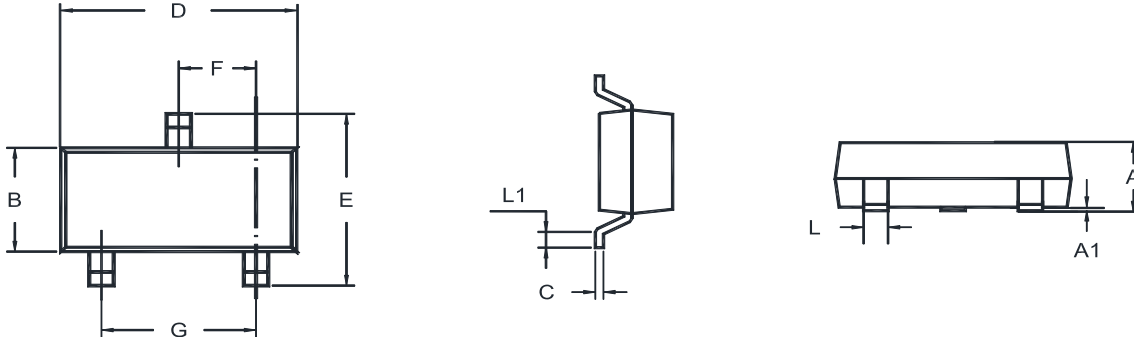


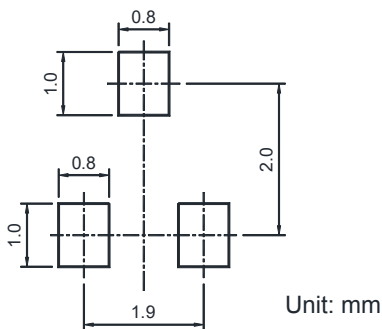
Figure 8. Power Derating Curve

Package Outline Dimensions (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.890	1.200	0.035	0.047
A1	0.013	0.100	0.001	0.004
B	1.200	1.400	0.047	0.055
C	0.080	0.190	0.003	0.007
D	2.800	3.040	0.110	0.120
E	2.200	2.600	0.087	0.102
F	0.890	1.020	0.035	0.040
G	1.780	2.040	0.070	0.080
L	0.370	0.510	0.015	0.020
L1	0.200 Min		0.008 Min	

Recommended Pad Layout



Order Information

Device	Package	Marking	Quantity	HSF Status
MMBT1781-Q	SOT-23	Y1	3,000 pcs / Reel	RoHS Compliant
MMBT1781-R	SOT-23	Y2	3,000 pcs / Reel	RoHS Compliant