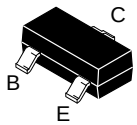
NPN General Purpose Amplifier

MMBT100



SOT−23 (TO−236)
CASE 318

- This Device is Designed for General Purpose Amplifier Applications at Collector Currents to 300 mA
- Sourced from Process 10
- This Device is Pb−Free, Halide Free and is RoHS Compliant

ABSOLUTE MAXIMUM RATINGS* (T_a = 25°C unless otherwise noted)

Symbol	Parameter	Ratings	Unit
V_{CEO}	Collector−Emitter Voltage	45	V
V_{CBO}	Collector−Base Voltage	75	V
V_{CBO}	Emitter−Voltage	6.0	V
I_C	Collector Current − Continuous	500	mA
T_j, T_{stg}	Junction and Storage Temperature	−55~+150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady−state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

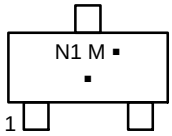
*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

THERMAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Max*	Unit
P_D	Total Device Dissipation Derate Above 25°C	350 2.8	MW mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

*Device mounted on FR−4 PCB 1.6” x 1.6” x 0.06”.

MARKING DIAGRAM



N1 = Specific Device Code
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
MMBT100	SOT−23 (TO−236) (Pb−Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Max	Unit
OFF CHARACTERISTICS					
BV_{CBO}	Collector−Base Breakdown Voltage	I_C = 10 μA, I_E = 0	75	−	V
BV_{CEO}	Collector−Emitter Breakdown Voltage*	I_C = 1mA, I_B = 0	45	−	V
BV_{EBO}	Emitter−Base Breakdown Voltage	I_E = 10 μA, I_C = 0	6.0	−	V
I_{CBO}	Collector−Base Cutoff Current	V_{CB} = 60 V	−	50	nA
I_{CES}	Collector−Emitter Cutoff Current	V_{CE} = 40 V	−	50	nA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 4 V	−	50	nA
ON CHARACTERISTICS					
hFE	DC Current Gain	I_C = 100 mA, V_{CE} = 1.0 V I_C = 10 mA, V_{CE} = 1.0 V I_C = 100 mA, V_{CE} = 1.0 V* I_C = 150 mA, V_{CE} = 5.0 V*	80 100 100 100	− 450 − 350	
$V_{CE(sat)}$	Collector−Emitter Saturation Voltage	I_C = 10 mA, I_B = 1.0 mA I_C = 200 mA, I_B = 20 mA	− −	0.2 0.4	V
$V_{BE(sat)}$	Base−Emitter Saturation Voltage	I_C = 10 mA, I_B = 1.0 mA I_C = 200 mA, I_B = 20 mA	− −	0.85 1.0	V
SMALL SIGNAL CHARACTERISTICS					
f_T	Current Gain Bandwidth Product	V_{CE} = 20 V, I_C = 20 mA	250	−	MHz
C_{obo}	Output Capacitance	V_{CB} = 5.0V, f = 1.0 MHz	−	4.5	pF
NF	Noise Figure	I_C = 100 μA, V_{CE} = 5.0 V R_G = 2.0 kΩ, f = 1.0 kHz	−	5.0	dB

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

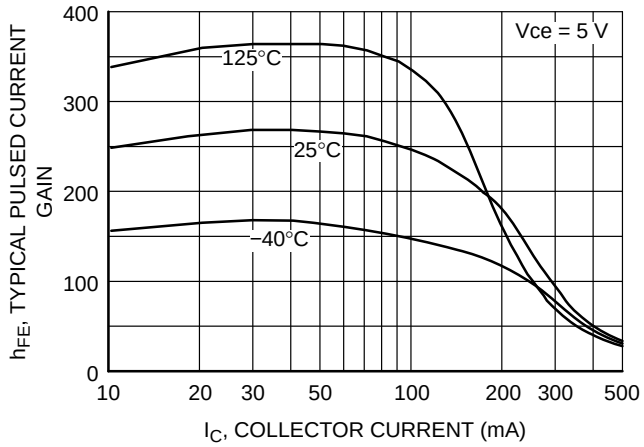


Figure 1. Typical Pulsed Current Gain vs. Collector Current

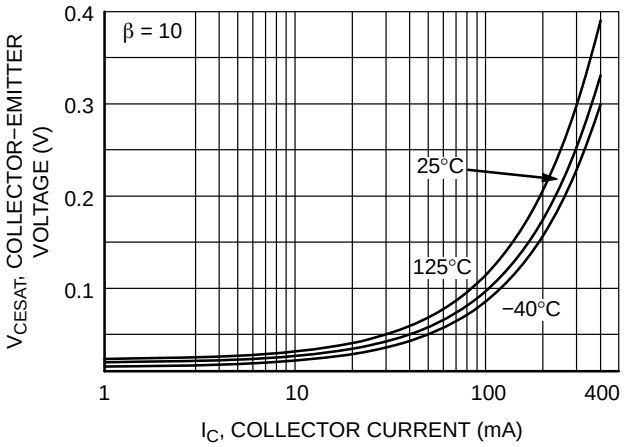


Figure 2. Collector−Emitter Saturation Voltage vs. Collector Current

TYPICAL CHARACTERISTICS (CONTINUED)

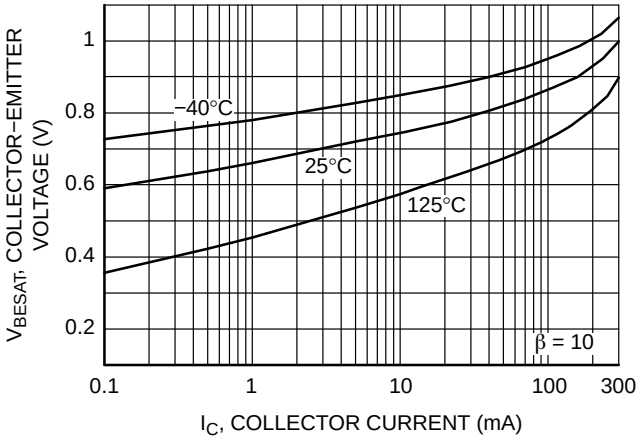


Figure 3. Base−Emitter Saturation Voltage vs. Collector Current

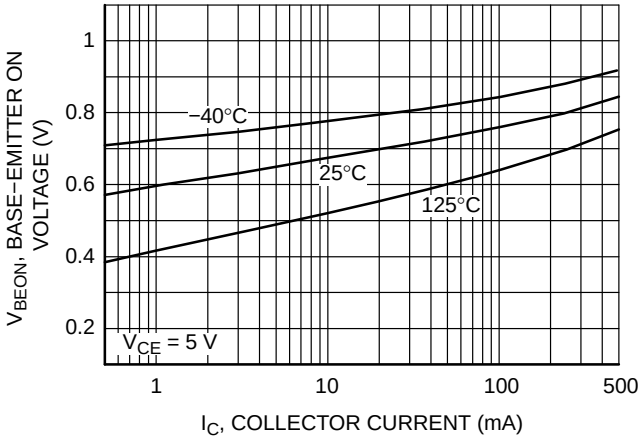


Figure 4. Base−Emitter On Voltage vs. Collector Current

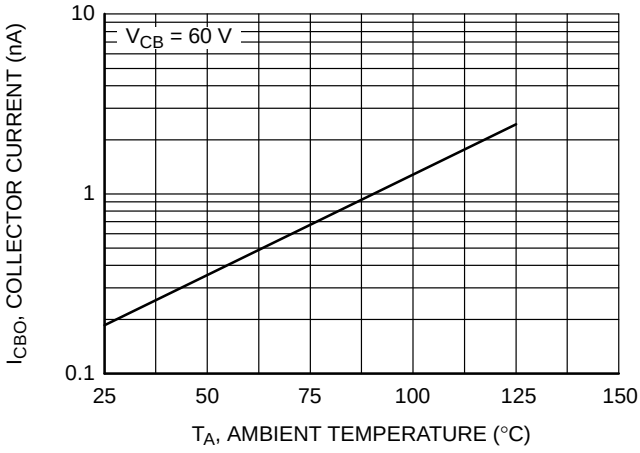


Figure 5. Collector Cutoff Current vs. Ambient Temperature

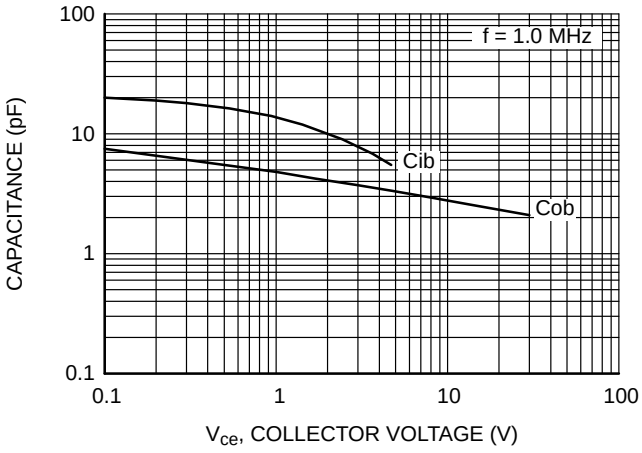


Figure 6. Input and Output Capacitance vs. Reverse Voltage

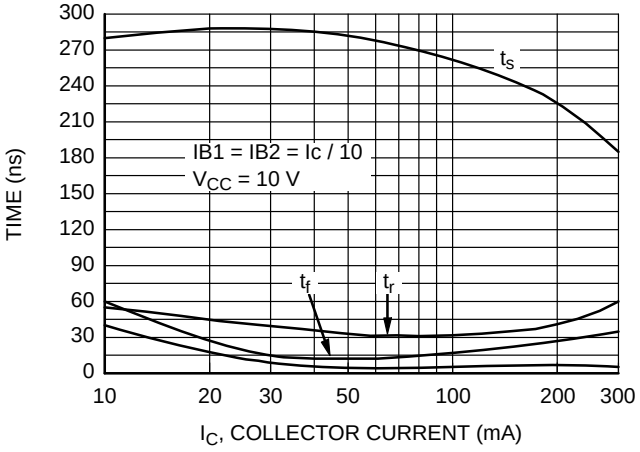


Figure 7. Switching Times vs. Collector Current

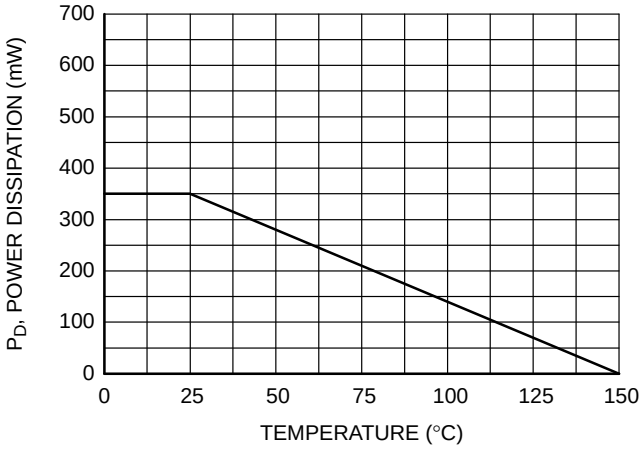


Figure 8. Power Dissipation vs. Ambient Temperature

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
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