



**THE DATASHEET OF
MMBT3904M-TP**



Features

- Single General-Purpose Switching Transistor
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings @ 25°C Unless Otherwise Specified

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 1250°C/W Junction to Ambient ⁽¹⁾
- Thermal Resistance: 212°C/W Junction to Ambient ⁽²⁾

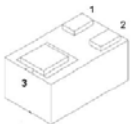
Parameter	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	200	mA
Power Dissipation	P_D	100 ⁽¹⁾	mW
		590 ⁽²⁾	mW

Note:1.Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

2.Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1cm².

Marking: 1N

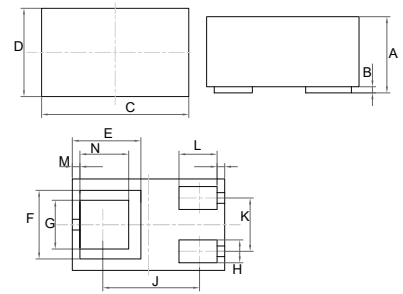
Internal Structure



1. BASE
2. EMITTER
3. COLLECTOR

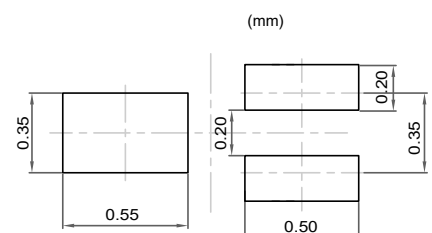
NPN Plastic Encapsulate Amplifier

SOT-883



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.018	0.022	0.45	0.55	
B	0.000	0.004	0.01	0.10	
C	0.037	0.041	0.95	1.05	
D	0.022	0.026	0.55	0.65	
E	0.018		0.450		REF.
F	0.018		0.450		REF. ^M
G	0.011	0.015	0.27	0.37	
H	0.004	0.008	0.10	0.20	
J	0.025		0.635		REF.
K	0.012	0.016	0.30	0.40	
L	0.008	0.012	0.20	0.30	
M	0.002		0.050		REF.
N	0.011	0.015	0.27	0.37	

Suggested Solder Pad Layout



Electrical Characteristics @ 25°C Unless Otherwise Specified

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	60			V	$I_C=10\mu A, I_E=0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40			V	$I_C=1mA, I_B=0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6			V	$I_E=10\mu A, I_C=0$
Collector-Base Cutoff Current	I_{CBO}			100	nA	$V_{CB}=30V, I_E=0$
Collector Cutoff Current	I_{CEX}			50	nA	$V_{CE}=30V, V_{EB(OFF)}=3V$
Emitter-Base Cutoff Current	I_{EBO}			100	nA	$V_{EB}=5V, I_C=0$
DC Current Gain	h_{FE}	100		300		$V_{CE}=1V, I_C=-10mA$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.3	V	$I_C=50mA, I_B=5mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			0.95	V	$I_C=50mA, I_B=5mA$
Transition Frequency	f_T	300			MHz	$V_{CE}=20V, I_C=10mA, f=100MHz$
Delay Time	t_d			35	ns	$V_{CC}=3V, I_C=10mA$
Rise Time	t_r			35	ns	$V_{BE(OFF)}=0.5V, I_{B1}=1mA$
Storage Time	t_s			200	ns	$V_{CC}=3V, I_C=10mA$
Fall Time	t_f			50	ns	$I_{B1}=I_{B2}=1mA$

Curve Characteristics

Fig. 1 - Static Characteristics

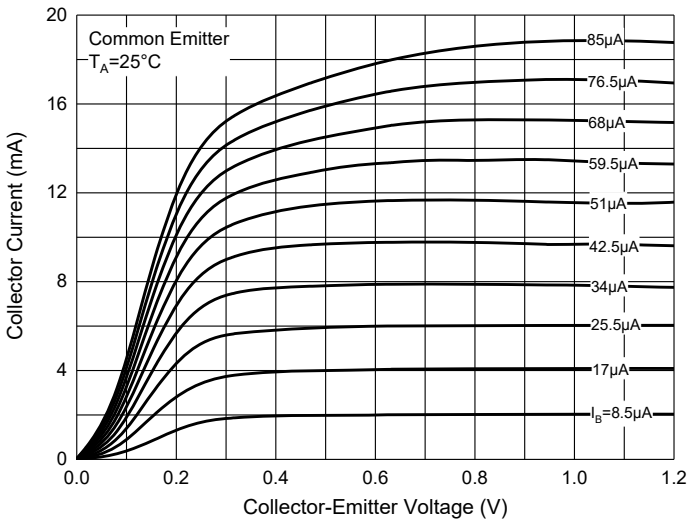


Fig. 2 - DC Current Gain Characteristics

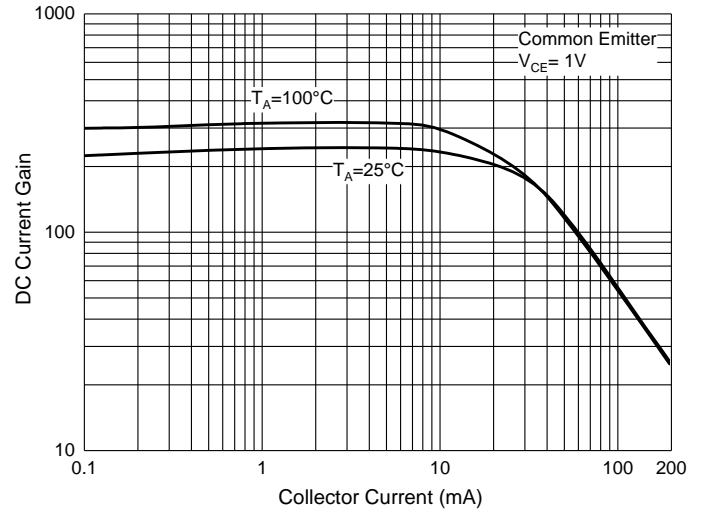


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

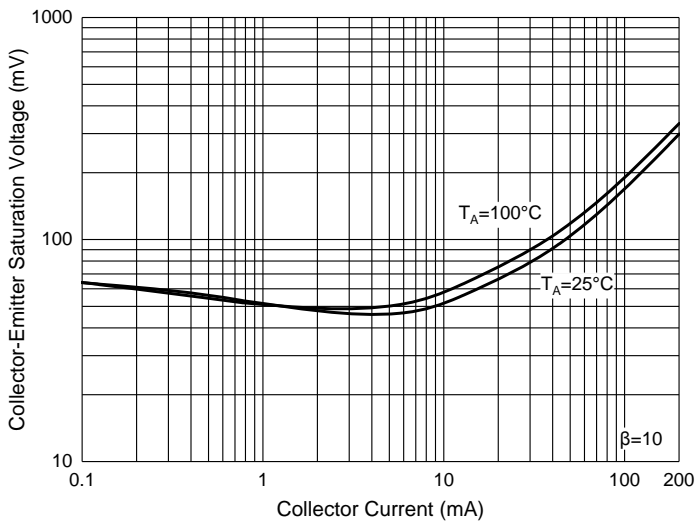


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

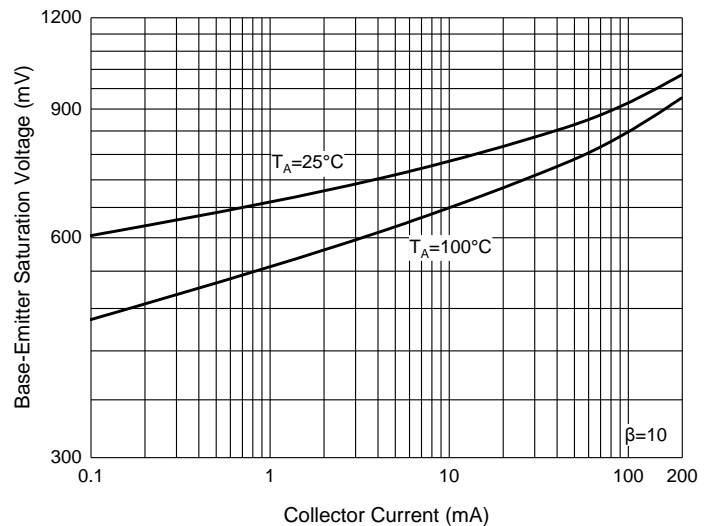


Fig. 5 - Base-Emitter Voltage Characteristics

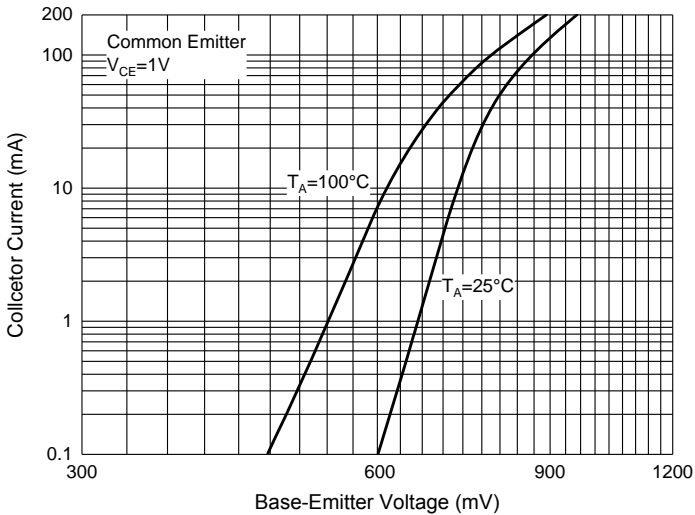
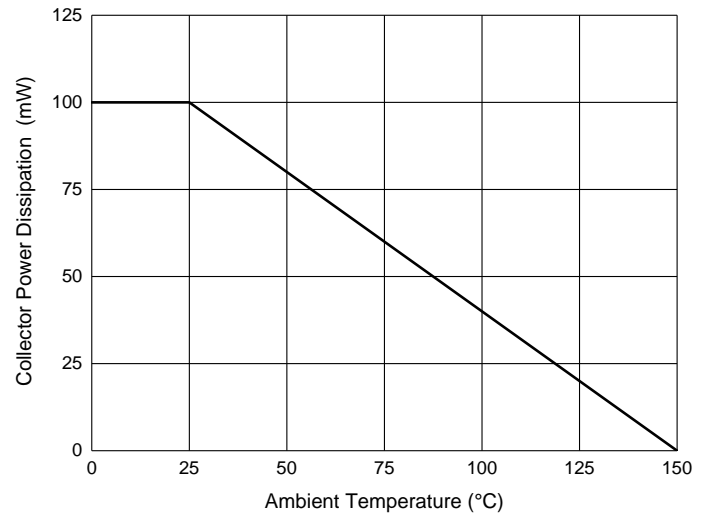


Fig. 3 - Collector Power Derating Curve



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 10Kpcs/Reel

Note : Adding "-HF" Suffix For Halogen Free, eg. Part Number-TP-HF

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