



Micro Commercial Components

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MMBT3904T

150mW
NPN General
Purpose Amplifier

Features

- Case Material: Molded Plastic. UL Flammability Classification Rating 94-0 and MSL Rating 1
- Collector Current: 0.2A
- Operating and Storage Junction Temperatures: -55°C to 150°C
- Marking: 1N

Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
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OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage* ($I_C=1.0\text{mA}$, $I_B=0$)	40		Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ($I_C=10\mu\text{A}$, $I_E=0$)	60		Vdc
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ($I_E=10\mu\text{A}$, $I_C=0$)	6.0		Vdc
I_{CBO}	Collector Cut-off Current ($V_{CB}=30\text{Vdc}$, $I_E=0$)		50	nAdc
I_{EBO}	Emitter Cut-off Current ($V_{EB}=5\text{Vdc}$, $I_C=0$)		50	nAdc

ON CHARACTERISTICS

h_{FE}	DC Current Gain*			
	($I_C=0.1\text{mA}$, $V_{CE}=1.0\text{Vdc}$)	40		
	($I_C=1.0\text{mA}$, $V_{CE}=1.0\text{Vdc}$)	70		
	($I_C=10\text{mA}$, $V_{CE}=1.0\text{Vdc}$)	100	300	
	($I_C=50\text{mA}$, $V_{CE}=1.0\text{Vdc}$)	60		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ($I_C=10\text{mA}$, $I_B=1.0\text{mA}$)		0.2	Vdc
	($I_C=50\text{mA}$, $I_B=5.0\text{mA}$)		0.3	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ($I_C=10\text{mA}$, $I_B=1.0\text{mA}$)	0.65	0.85	Vdc
	($I_C=50\text{mA}$, $I_B=5.0\text{mA}$)		0.95	

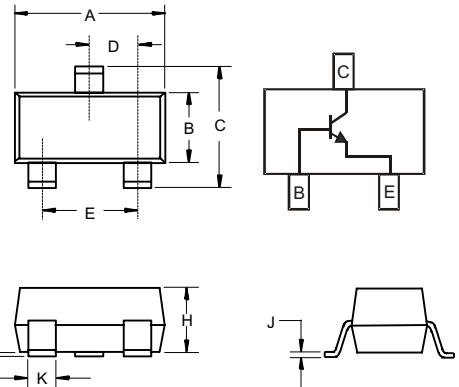
SMALL-SIGNAL CHARACTERISTICS

f_T	Current Gain-Bandwidth Product ($I_C=10\text{mA}$, $V_{CE}=20\text{Vdc}$, $f=100\text{MHz}$)	300		MHz
C_{obo}	Output Capacitance ($V_{CB}=5.0\text{Vdc}$, $I_E=0$, $f=1.0\text{MHz}$)		4.0	pF
NF	Noise Figure ($I_C=100\mu\text{A}$, $V_{CE}=5.0\text{Vdc}$, $R_S=1.0\text{k}\Omega$, $f=1\text{MHz}$)		5.0	dB

SWITCHING CHARACTERISTICS

t_d	Delay Time	($V_{CC}=3.0\text{Vdc}$, $V_{BE}=0.5\text{Vdc}$)	35	ns
t_r	Rise Time	$I_C=10\text{mA}$, $I_{B1}=1.0\text{mA}$	35	ns
t_s	Storage Time	($V_{CC}=3.0\text{Vdc}$, $I_C=10\text{mA}$)	200	ns
t_f	Fall Time	$I_{B1}=I_{B2}=1.0\text{mA}$	50	ns

SOT-523



DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.059	.067	1.50	1.70	
B	.030	.033	0.75	0.85	
C	.057	.069	1.45	1.75	
D	.020 Nominal		0.50 Nominal		
E	.035	.043	0.90	1.10	
G	.000	.004	.000	.100	
H	.028	.031	.70	0.80	
J	.004	.008	.100	.200	
K	.010	.014	.25	.35	

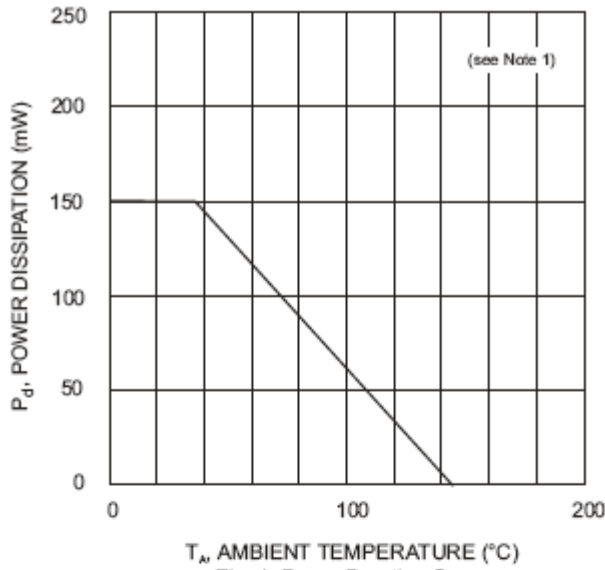


Fig. 1, Power Derating Curve

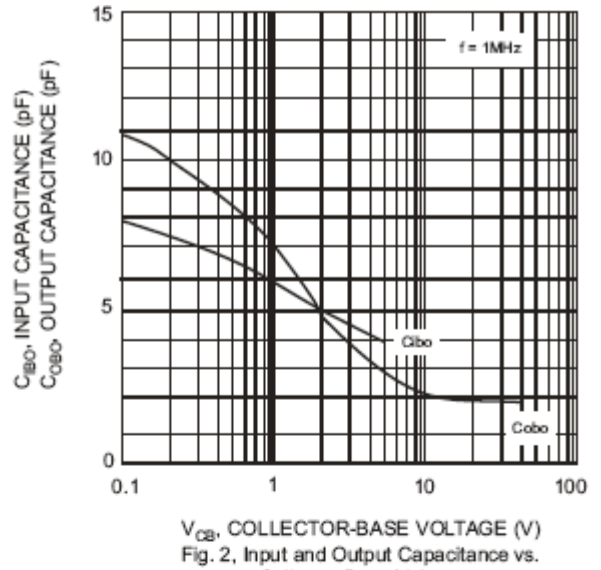


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage

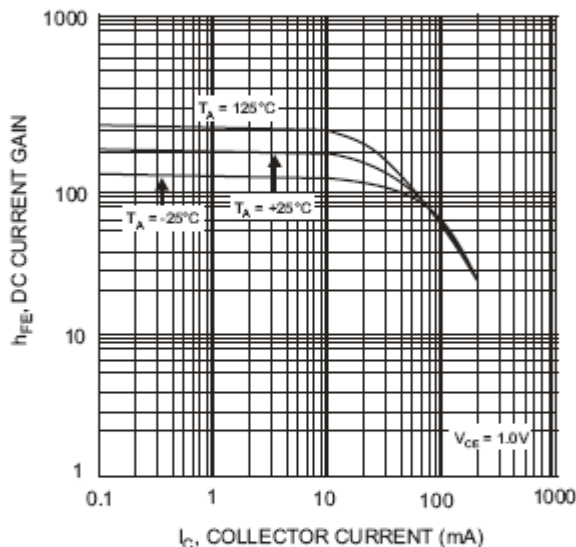


Fig. 3, Typical DC Current Gain vs. Collector Current

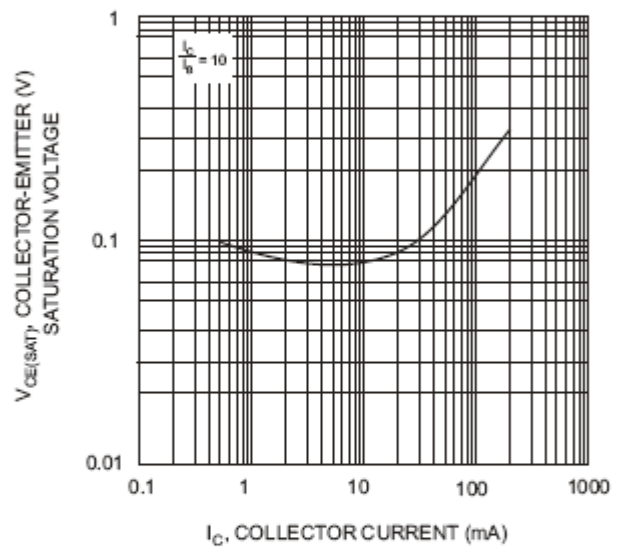


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

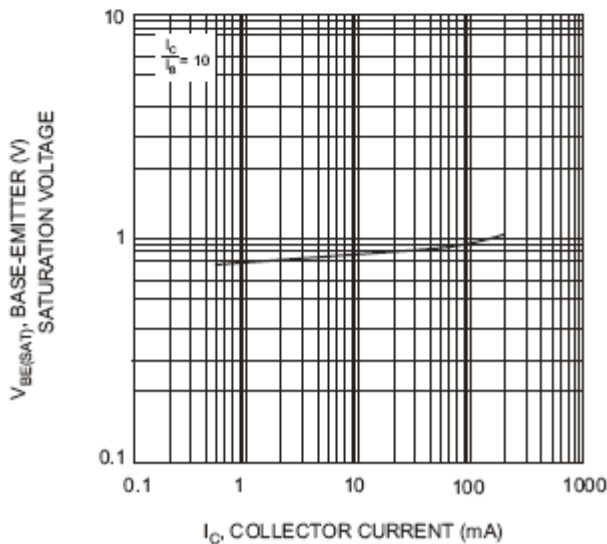


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current



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Ordering Information

Device	Packing
(Part Number)-TP	Tape&Reel;3Kpcs/Reel

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