



Micro Commercial Components



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MMBT3904T

150mW NPN General Purpose Amplifier

Features

- Halogen free available upon request by adding suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Operating and Storage Junction Temperatures: -55°C to 150°C
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Collector Current: 0.2A
- Marking: 1N

Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
OFF CHARACTERISTICS				
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage* ($I_C=1.0mA_{dc}$, $I_B=0$)	40		Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ($I_C=10\mu A_{dc}$, $I_E=0$)	60		Vdc
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ($I_E=10\mu A_{dc}$, $I_C=0$)	6.0		Vdc
I_{CBO}	Collector Cut-off Current ($V_{CB}=30V_{dc}$, $I_E=0$)		50	nAdc
I_{EBO}	Emitter Cut-off Current ($V_{EB}=5V_{dc}$, $I_C=0$)		50	nAdc

ON CHARACTERISTICS

h_{FE}	DC Current Gain* ($I_C=0.1mA_{dc}$, $V_{CE}=1.0V_{dc}$) ($I_C=1.0mA_{dc}$, $V_{CE}=1.0V_{dc}$) ($I_C=10mA_{dc}$, $V_{CE}=1.0V_{dc}$) ($I_C=50mA_{dc}$, $V_{CE}=1.0V_{dc}$) ($I_C=100mA_{dc}$, $V_{CE}=1.0V_{dc}$)	40	300	Vdc
		70		
		100		
		60		
		30		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ($I_C=10mA_{dc}$, $I_B=1.0mA_{dc}$) ($I_C=50mA_{dc}$, $I_B=5.0mA_{dc}$)		0.2 0.3	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ($I_C=10mA_{dc}$, $I_B=1.0mA_{dc}$) ($I_C=50mA_{dc}$, $I_B=5.0mA_{dc}$)	0.65	0.85 0.95	Vdc

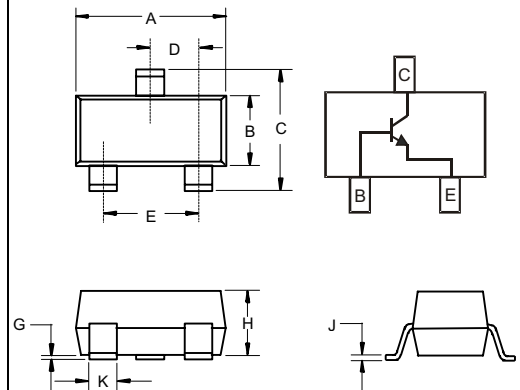
SMALL-SIGNAL CHARACTERISTICS

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

SWITCHING CHARACTERISTICS

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

SOT-523



DIM	DIMENSIONS				NOTE
	INCHES		MM		
A	.059	.067	1.50	1.70	
B	.030	.033	0.75	0.85	
C	.057	.069	1.45	1.75	
D	.020 Nominal		0.50Nominal		
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	

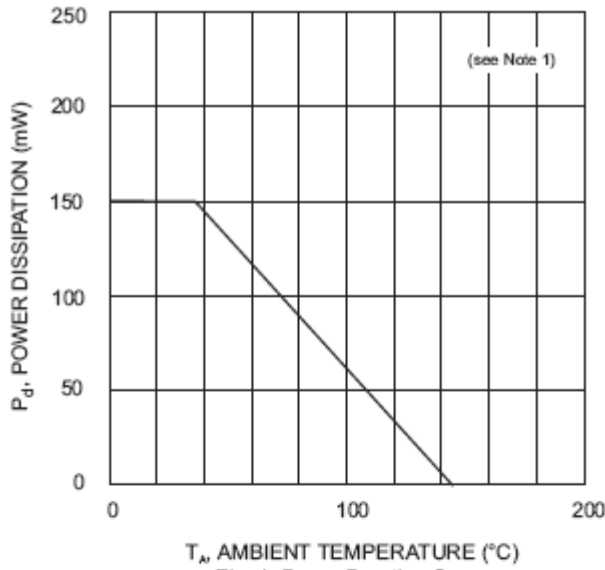


Fig. 1, Power Derating Curve

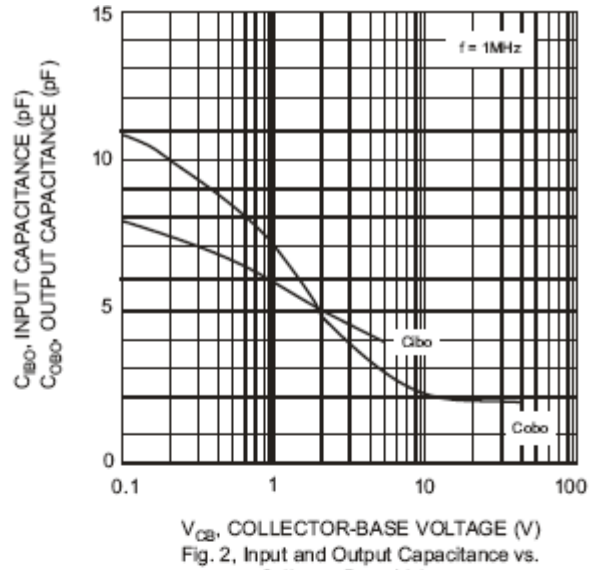


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage

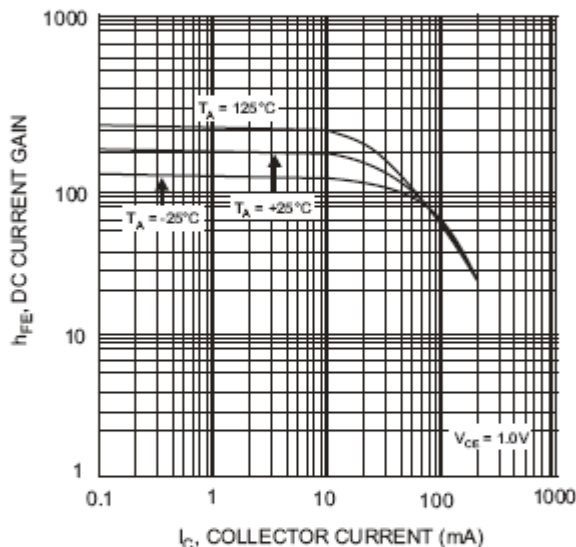


Fig. 3, Typical DC Current Gain vs. Collector Current

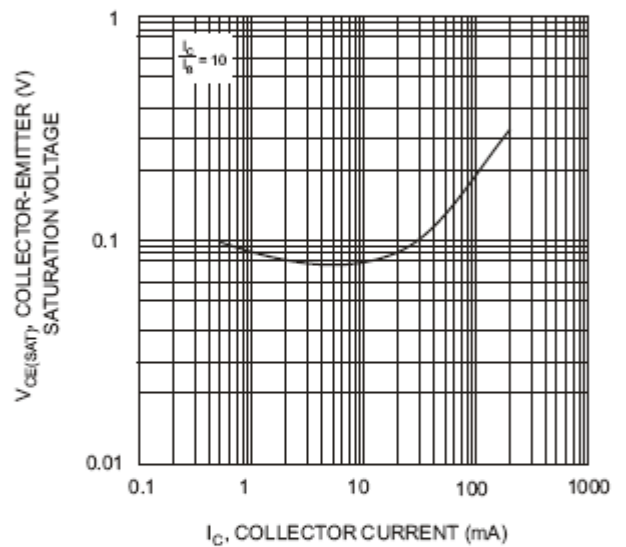


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

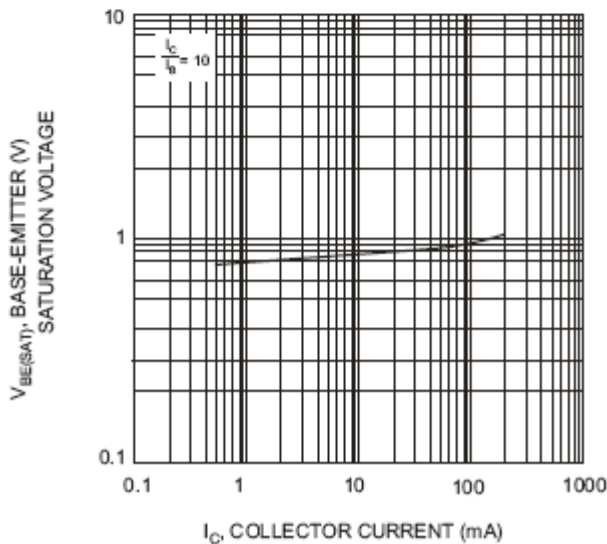


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current



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Ordering Information :

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

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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