



Micro Commercial Components



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MMDT3904V

NPN

Plastic-Encapsulate Transistors

Features

- Halogen free available upon request by adding suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epitaxial Die Construction
- Ideal for Low Power Amplification and Switching
- Ultra-small Surface Mount Package
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking:KAP

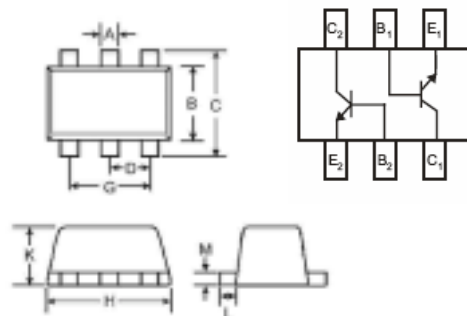
Maximum Ratings @ 250C Unless Otherwise Specified

Symbol	Rating	Rating	Unit
V_{CE0}	Collector-Emitter Voltage	40	V
V_{CBO}	Collector-Base Voltage	60	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current-Continuous	0.2	A
P_C	Collector Dissipation	0.2	W
R_{JA}	Thermal Resistance Junction to Ambient	625	$^{\circ}C/W$
T_J	Operating Junction Temperature	-55 to +150	$^{\circ}C$
T_{STG}	Storage Temperature	-55 to +150	$^{\circ}C$

Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Typ	Max	Units
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage ($I_C=1mA_{dc}$, $I_B=0$)	40	---	---	Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ($I_C=10uA_{dc}$, $I_E=0$)	60	---	---	Vdc
$V_{(BR)EBO}$	Collector-Emitter Breakdown Voltage ($I_E=10uA_{dc}$, $I_C=0$)	6	---	---	Vdc
I_{CEX}	Collector Cutoff Current ($V_{CE}=60V_{dc}$, $V_{EB(OFF)}=3V_{dc}$)	---	---	50	nAdc
I_{BL}	Base Cutoff Current ($V_{CE}=60V_{dc}$, $V_{EB(OFF)}=3V_{dc}$)	---	---	50	nAdc
h_{FE}	DC Current Gain ($I_C=0.1mA_{dc}$, $V_{CE}=1V_{dc}$) ($I_C=1mA_{dc}$, $V_{CE}=1V_{dc}$) ($I_C=10mA_{dc}$, $V_{CE}=1V_{dc}$) ($I_C=50mA_{dc}$, $V_{CE}=1V_{dc}$) ($I_C=100mA_{dc}$, $V_{CE}=1V_{dc}$)	40 70 100 60 30	---	---	---
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ($I_C=10mA_{dc}$, $I_B=1mA_{dc}$) ($I_C=50mA_{dc}$, $I_B=5mA_{dc}$)	---	---	0.2 0.3	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ($I_C=10mA_{dc}$, $I_B=1mA_{dc}$) ($I_C=50mA_{dc}$, $I_B=5mA_{dc}$)	0.65 ---	---	0.85 0.95	Vdc

SOT-563



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.006	.011	0.15	0.30	
B	.043	.049	1.10	1.25	
C	.061	.067	1.55	1.70	
D	.020		0.50		
G	.035	.043	0.90	1.10	
H	.059	.067	1.50	1.70	
K	.022	.023	0.56	0.60	
L	.004	.011	0.10	0.30	
M	.004	.007	0.10	0.18	

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Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter		Min	Typ	Max	Units
f_T	Transition Frequency ($V_{CE}=20V_{dc}$, $I_C=10mA_{dc}$, $f=100MHz$)		300	---	---	MHz
C_{ob}	Output Capacitance ($V_{CB}=5V_{dc}$, $f=1.0MHz$, $I_E=0$)		---	---	4	pF
NF	Noise Figure ($V_{CE}=5V$, $I_C=0.1mA$, $f=1KHz$, $R_S=1k\Omega$)		---	---	5	dB
t_d	Delay Time	$V_{CC}=3V$, $I_C=10mA$, $V_{BE(off)}=-0.5V$, $I_{B1}=-I_{B2}=1mA$	---	---	35	ns
t_r	Rise Time		---	---	35	ns
t_s	Storage Time	$V_{CC}=3V$, $I_C=10mA$, $I_{B1}=I_{B2}=1mA$	---	---	200	ns
t_f	Fall Time		---	---	50	ns

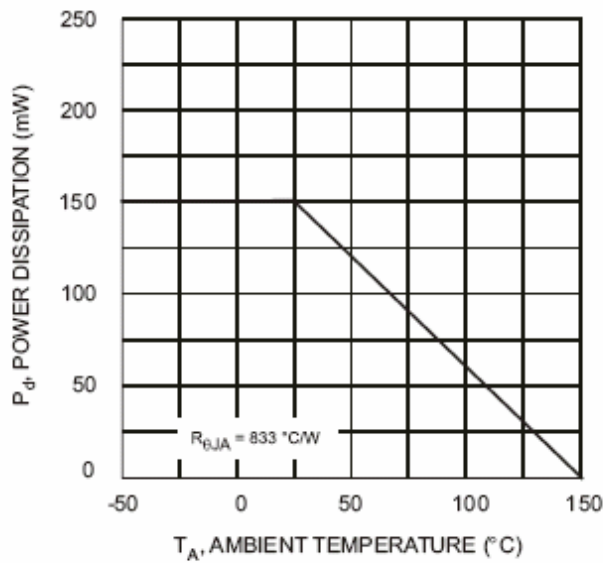


Fig. 1, Derating Curve - Total

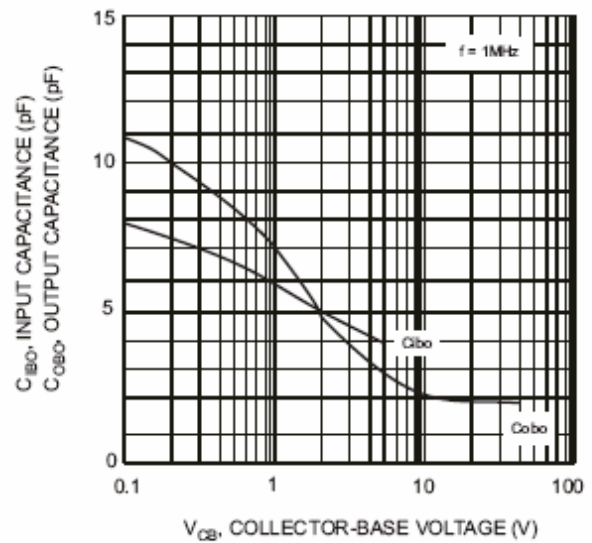


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage

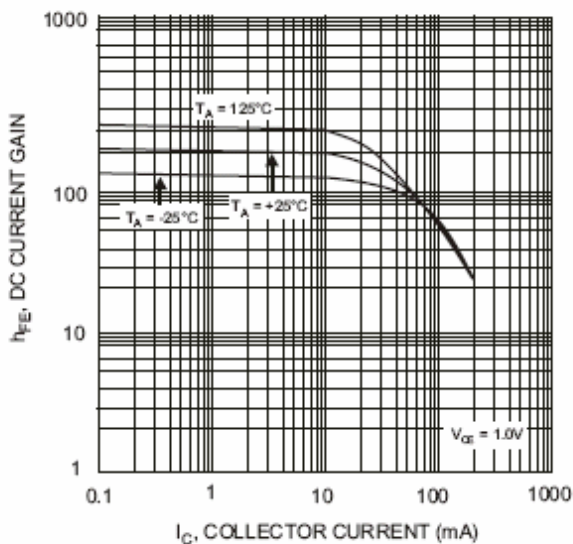


Fig. 3, Typical DC Current Gain vs Collector Current

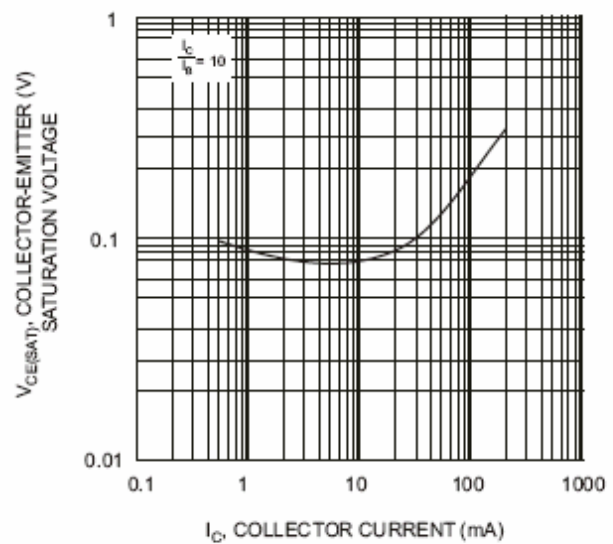
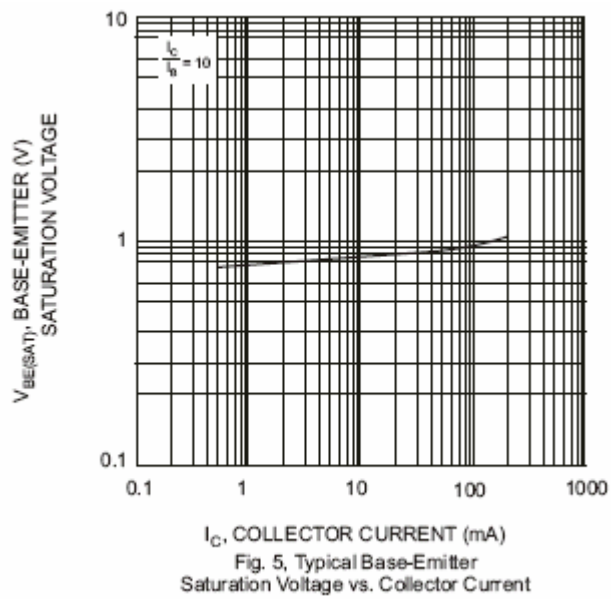


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

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Ordering Information :

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

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

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