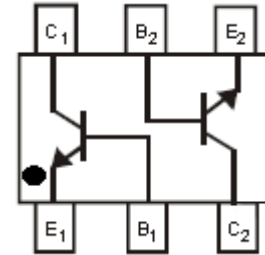


Features

- Epitaxial planar die construction
- Ideal for low power amplification and switching
- Ultra-small surface mount package

Mechanical Data

- Case: SOT-563
- Molding compound: UL flammability classification rating 94V-0
- Terminal s: Tin-plated; solderability per MIL-STD-202, Method 208



SOT-563

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Collector-Base Breakdown Voltage	V _{CB0}	60	V
Collector-Emitter Breakdown Voltage	V _{CEO}	40	V
Emitter-Base Breakdown Voltage	V _{EB0}	6	V
Collector Current (Continuous)	I _C	0.2	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (Collector) ^{*1}	P _C	150	mW
Thermal Resistance (Junction-to-Ambient) ^{*1}	R _{θJA}	833	°C/W
Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Note 1: Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.



MMDT3904V

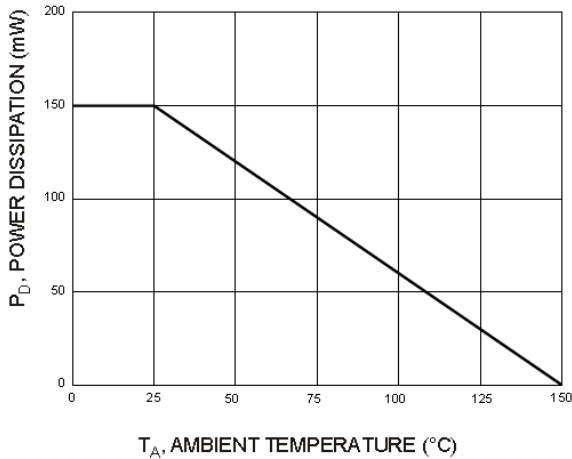
Dual Bipolar Transistor(NPN+NPN)



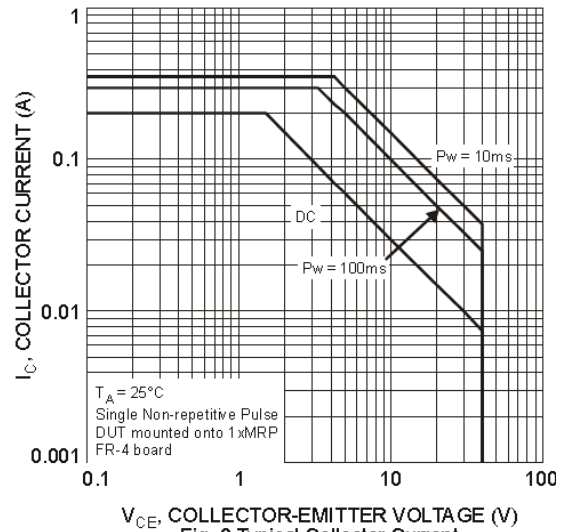
Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}, I_E = 0$	60	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_B = 0$	40	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}, I_C = 0$	5	-	-	V
Collector Cut-off Current	I_{CEX}	$V_{CE} = 30\text{V}, V_{EB(OFF)} = 3.0\text{V}$	-	-	50	nA
Base Cut-off Current	I_{BL}	$V_{CE} = 30\text{V}, V_{EB(OFF)} = 3.0\text{V}$	-	-	50	nA
DC Current Gain	h_{FE}	$V_{CE} = 1\text{V}, I_C = 0.1\text{mA}$	40	-	-	-
		$V_{CE} = 1\text{V}, I_C = 1\text{mA}$	70	-	-	-
		$V_{CE} = 1\text{V}, I_C = 10\text{mA}$	100	-	300	-
		$V_{CE} = 1\text{V}, I_C = 50\text{mA}$	60	-	-	-
		$V_{CE} = 1\text{V}, I_C = 100\text{mA}$	30	-	-	-
Collector-emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	-	-	0.2	V
		$I_C = 50\text{mA}, I_B = 5\text{mA}$	-	-	0.3	V
Base-emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	0.65	-	0.85	V
		$I_C = 50\text{mA}, I_B = 5\text{mA}$	-	-	0.95	V
Output Capacitance	C_{OBO}	$V_{CB} = 5\text{V}, I_E = 0\text{A}, f = 1\text{MHz}$	-	-	4	pF
Input Capacitance	C_{IBO}	$I_C = 0, V_{EB} = 0.5\text{V}, f = 1\text{MHz}$	-	-	8	pF
Transition Frequency	f_T	$I_C = 10\text{mA}, V_{CE} = 20\text{V}$ $f = 100\text{MHz}$	300	-	-	MHZ
Noise Figure	NF	$I_C = 0.1\text{mA}, V_{CE} = 5\text{V}$ $R_S = 1\text{k}\Omega, f = 1\text{kHz}$	-	-	5	dB
Delay Time	t_d	$V_{CC} = 3\text{V}, V_{BE(off)} = -0.5\text{V}$	-	-	35	ns
Rise Time	t_r	$I_C = 10\text{mA}, I_{B1} = 1\text{mA}$	-	-	35	ns
Storage Time	t_s	$V_{CC} = 3\text{V}, I_C = 10\text{mA}$	-	-	200	ns
Fall Time	t_f	$I_{B1} = I_{B2} = 1\text{mA}$	-	-	50	ns

Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)



T_A , AMBIENT TEMPERATURE ($^\circ\text{C}$)
Fig. 1 Power Dissipation vs. Ambient Temperature



V_{CE} , COLLECTOR-EMITTER VOLTAGE (V)
Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

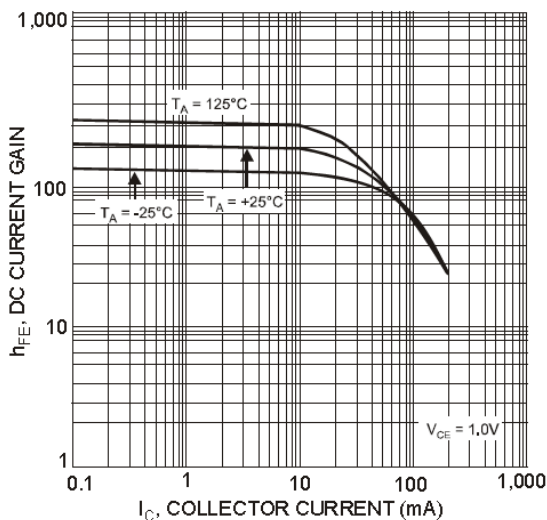


Fig. 3 Typical DC Current Gain vs. Collector Current

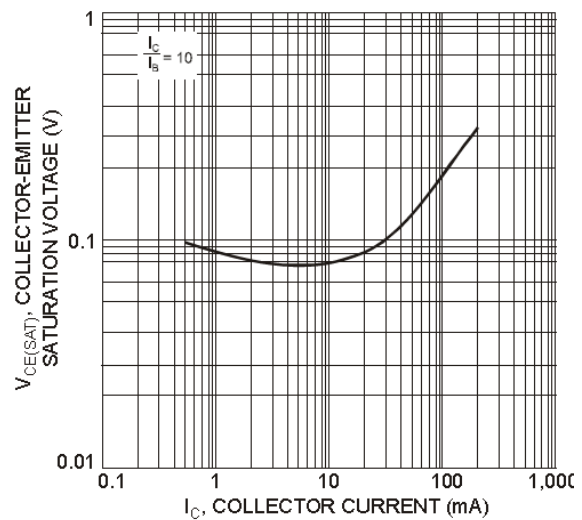


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

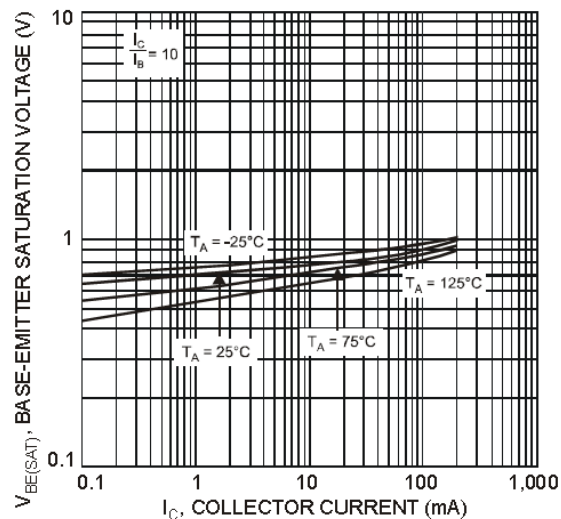


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

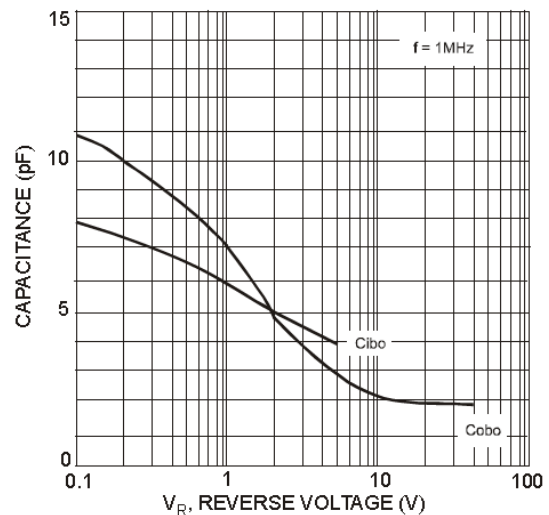
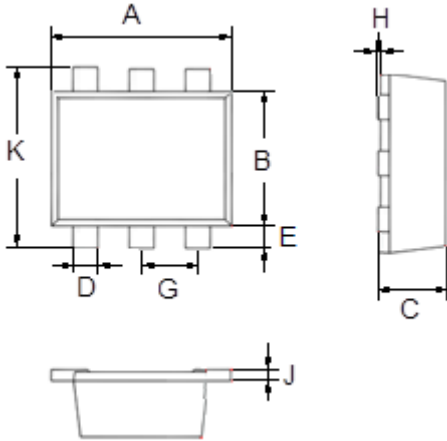


Fig. 6 Typical Capacitance Characteristics

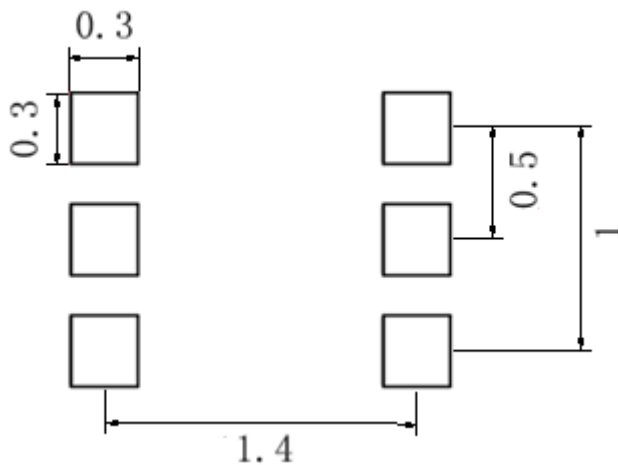
Package Outline Dimensions (Unit: mm)



SOT-563		
Dimension	Min.	Max.
A	1.500	1.700
B	1.100	1.300
C	0.525	0.600
D	0.170	0.270
E	0.100	0.300
G	0.450	0.550
H	0.000	0.050
J	0.090	0.160
K	1.500	1.700

Package Outline Dimensions (Unit: mm)

SOT-563



Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
MMDT3904V	SOT-563	3000pcs / Tape & Reel	K6N