



# DMMT3904W

## MATCHED NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

**VOLTAGE** 40 Volts **POWER** 225 mWatts

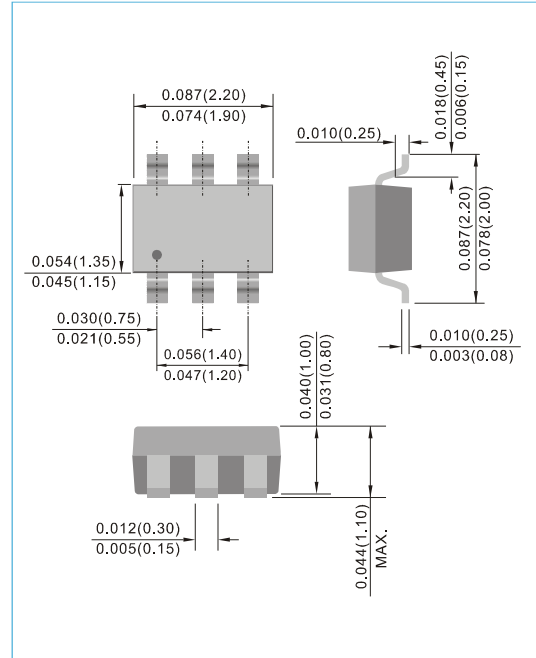
**SOT-363** Unit : inch(mm)

### FEATURES

- NPN epitaxial silicon, planar design
- Collector-emitter voltage  $V_{CE} = 40V$
- Collector current  $I_c = 200mA$
- S<sub>max</sub>A<sup>max</sup>A<sup>max</sup> A<sup>max</sup> { } |<sup>max</sup> A<sup>max</sup> @OWÁÚ[ PÚÁCECCEBÍ BÓÓÁa^&ca^•ÉÁ  
-Á<sup>max</sup>;^^} Á [|áã \* & { [|<sup>max</sup> } áã Á<sup>max</sup> Á<sup>max</sup> Á<sup>max</sup> FG JÁÚcáÉP a[ \* ^) Á<sup>max</sup>^D

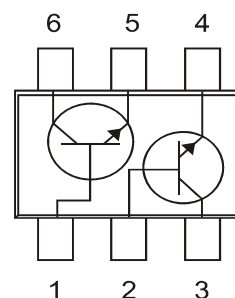
### MECHANICAL DATA

- Case: SOT-363, Plastic
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0002 ounces, 0.006 grams
- Marking: S4A



### ABSOLUTE RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Collector - Base Voltage	$V_{CBO}$	60	V
Collector - Emitter Voltage	$V_{CEO}$	40	V
Emitter - Base Voltage	$V_{EBO}$	6.0	V
Collector Current - Continuous	$I_c$	200	mA
Power Dissipation (Note2)	$P_{TOT}$	225	mW
Thermal Resistance, Junction to Ambient (Note2)	$R_{\theta JA}$	625	$^{\circ}C/W$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^{\circ}C$



Note 1: Built with adjacent die from a single wafer.

2: Device mounted on FR4 PCB: 70 x 60 x 1mm.



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## ELECTRICAL CHARACTERISTICS

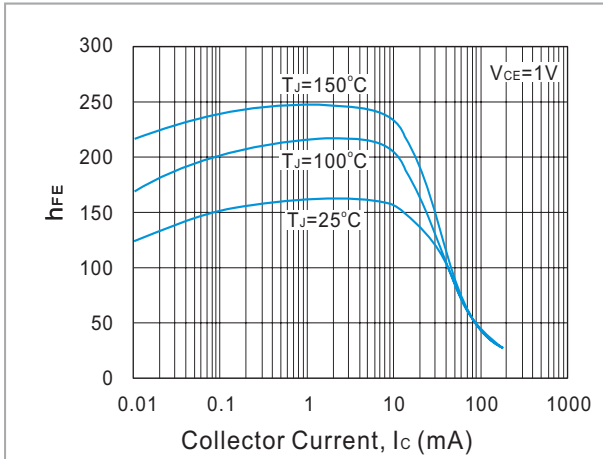
PARAMETER	Symbol	Test Condition	MIN.	MAX.	Units
Collector - Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	60	-	V
Collector - Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1.0mA, I_B=0$	40	-	V
Emitter - Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0$	6.0	-	V
Collector Cutoff Current	$I_{CEX}$	$V_{CE}=30V, V_{EB(off)}=3.0V$	-	50	nA
Base Cutoff Current	$I_{BI}$	$V_{CE}=30V, V_{EB(off)}=3.0V$	-	50	nA
DC Current Gain	$h_{FE}$	$I_C=0.1mA, V_{CE}=1.0V$ $I_C=1.0mA, V_{CE}=1.0V$ $I_C=10mA, V_{CE}=1.0V$ $I_C=50mA, V_{CE}=1.0V$ $I_C=100mA, V_{CE}=1.0V$	40 70 100 60 30	- - 300 - -	-
Collector - Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=10mA, I_B=1.0mA$ $I_C=50mA, I_B=5.0mA$	-	0.2 0.3	V
Base - Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=10mA, I_B=1.0mA$ $I_C=50mA, I_B=5.0mA$	0.65 -	0.85 0.95	V
Base - Emitter Voltage Matching	$\Delta V_{BE}$	$V_{CE}=5V, I_C=2mA$	-	1	mV
Output Capacitance	$C_{OBO}$	$V_{CB}=5V, I_E=0, f=1MHz$	-	4.0	pF
Input Capacitance	$C_{IBO}$	$V_{CB}=0.5V, I_C=0, f=1MHz$	-	8.0	pF
Input Impedance	$h_{ie}$	$V_{CE}=10V, I_C=0mA, f=1.0KHz$	1.0	10	k $\Omega$
Voltage Feedback Ratio	$h_{re}$		0.5	8	$\times 10^{-4}$
Small Signal Current Gain	$h_{fe}$		100	400	-
Output Admittance	$h_{oe}$		1.0	40	$\mu S$
Current Gain-Bandwidth Product	ft		$V_{CE}=20V, I_C=10mA, f=100MHz$	300	-
Noise Figure	NF	$V_{CE}=5.0V,$ $I_C=100\mu A, RS=1.0k\Omega, f=1.0KHz$	-	5.0	dB
Delay Time	td	$V_{CC}=3V, V_{BE}=-0.5V,$ $I_C=10mA, I_B=1.0mA$	-	35	ns
Rise Time	tr	$V_{CC}=3V, V_{BE(off)}=-0.5V,$ $I_C=10mA, I_B=1.0mA$	-	35	ns
Storage Time	ts	$V_{CC}=3V, I_C=10mA$ $I_{B1}=I_{B2}=1.0mA$	-	200	ns
Fall Time	tf	$V_{CC}=3V, I_C=10mA$ $I_{B1}=I_{B2}=1.0mA$	-	50	ns

Note 2: Pulse Test: Pulse Width < 300 us, Duty Cycle < 2.0%.

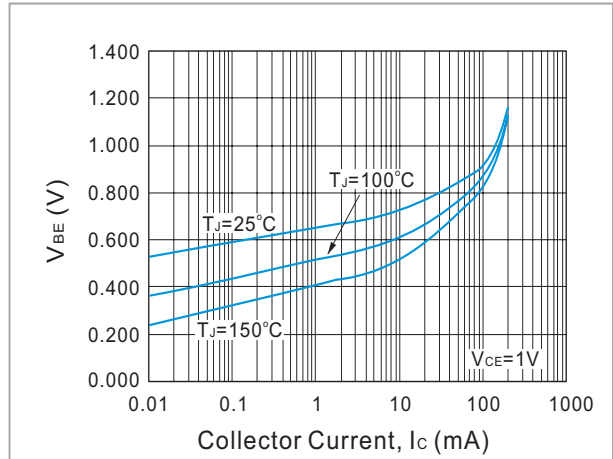


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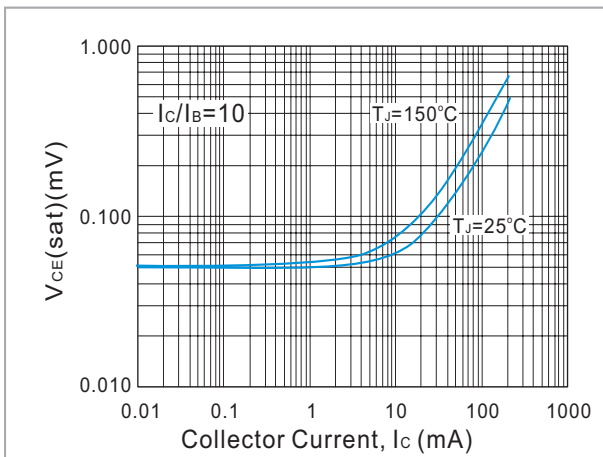
## ELECTRICAL CHARACTERISTICS CURVE



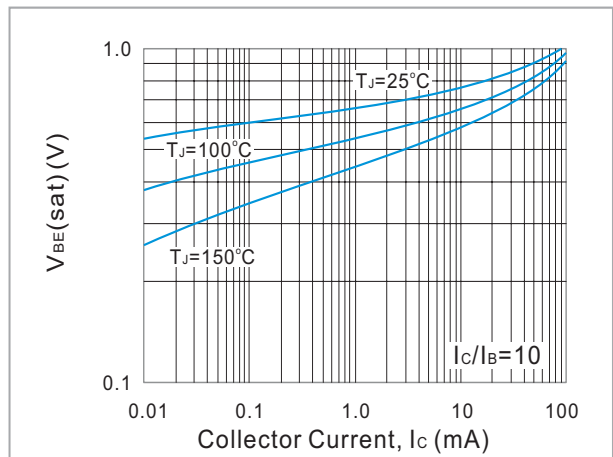
**Fig. 1. Typical  $h_{FE}$  vs. Collector Current**



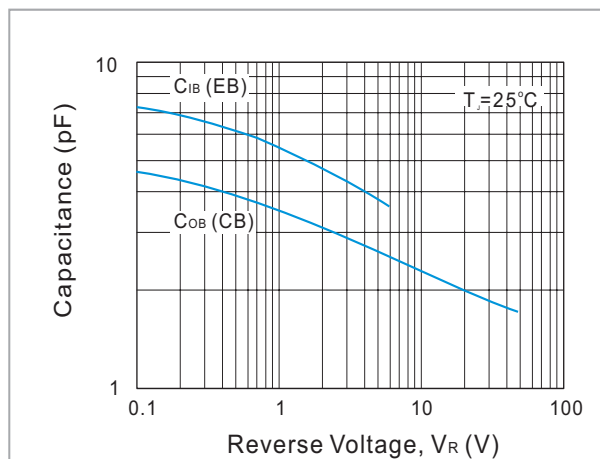
**Fig. 2. Typical  $V_{BE}$  vs. Collector Current**



**Fig. 3. Typical  $V_{CE(sat)}$  vs. Collector Current**



**Fig. 4. Typical  $V_{BE(sat)}$  vs Collector Current**

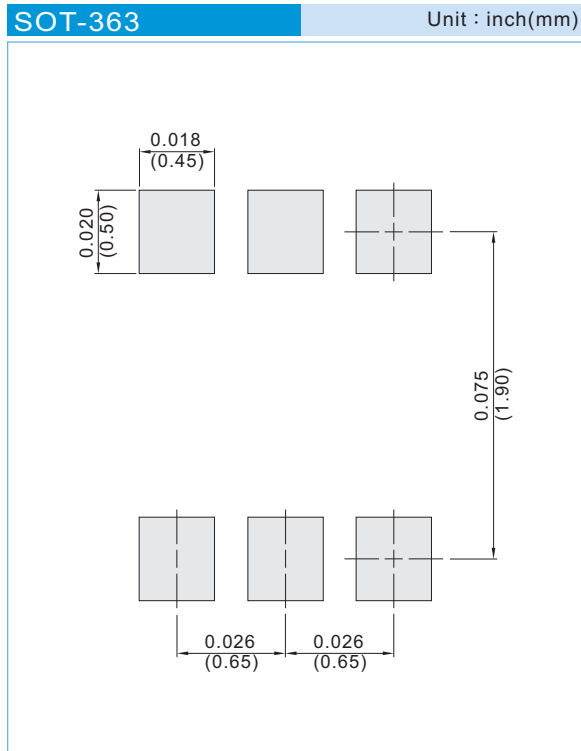


**Fig. 5. Typical Capacitances vs. Reverse Voltage**



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## MOUNTING PAD LAYOUT



## ORDER INFORMATION

- Packing information
  - T/R - 10K per 13" plastic Reel
  - T/R - 3K per 7" plastic Reel

## LEGAL STATEMENT

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