

MMBT3904FN3

NPN GENERAL PURPOSE SWITCHING TRANSISTOR

VOLTAGE	40 Volts	POWER	250 mWatts	DFN 3L	Unit : inch(mm)
----------------	-----------------	--------------	-------------------	---------------	------------------------

FEATURES

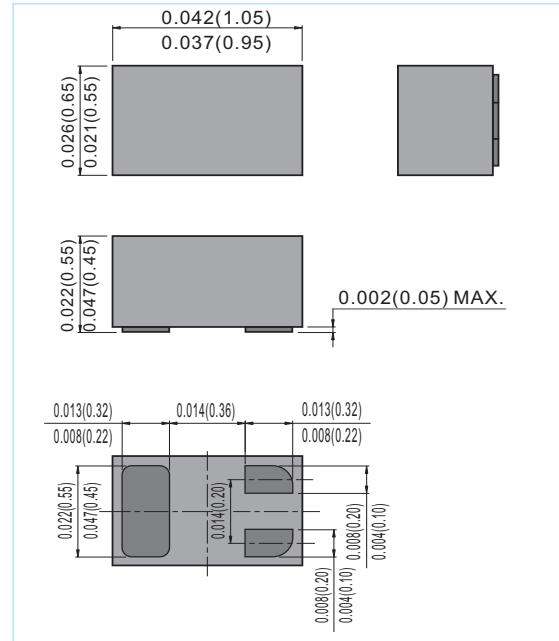
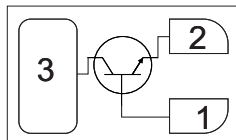
- NPN epitaxial silicon, planar design
- Collector-emitter voltage $V_{CE} = 40V$
- Collector current $I_C = 200mA$
- In compliance with EU RoHS 2002/95/EC directives

MECHANICAL DATA

Case: DFN 3L, Plastic

Terminals: Solderable per MIL-STD-750, Method 2026

Marking: AC



ABSOLUTE RATINGS

Parameter	Symbol	Value	Units
Collector - Emitter Voltage	V_{CEO}	40	V
Collector - Base Voltage	V_{CBO}	60	V
Emitter - Base Voltage	V_{EBO}	6.0	V
Collector Current - Continuous	I_C	200	mA

THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Units
Max Power Dissipation (Note 1)	P_{TOT}	250	mW
Thermal Resistance , Junction to Ambient	$R_{\theta JA}$	500	$^{\circ}C/W$
Junction Temperature	T_J	-55 to +150	$^{\circ}C$
Operating Temperature	T_{STG}	-55 to +150	$^{\circ}C$

Note 1: Transistor mounted on FR-4 board 70 x 60 x 1mm.

PAN JI T RESERVES THE RIGHT TO IMPROVE PRODUCT DESIGN,FUNCTIONS AND RELIABILITY WITHOUT NOTICE

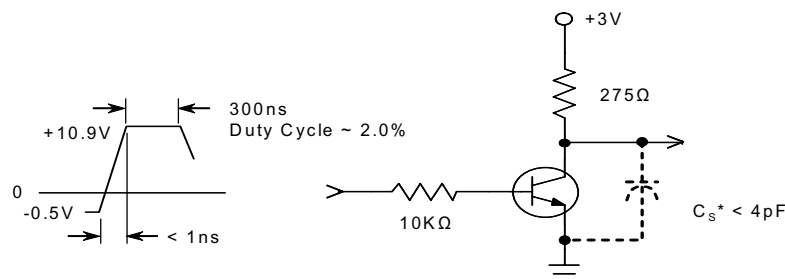
MMBT3904FN3

ELECTRICAL CHARACTERISTICS

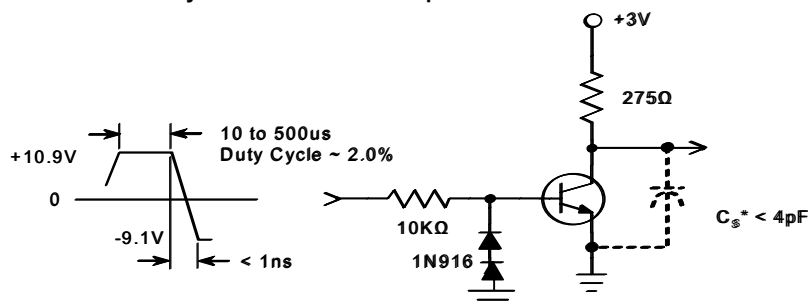
Parameter	Symbol	Test Condition	MIN.	TYP.	MAX.	Units
Collector - Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1.0mA, I_B=0$	40	-	-	V
Collector - Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	60	-	-	V
Emitter - Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0$	6.0	-	-	V
Base Cutoff Current	I_{BL}	$V_{CE}=30V, V_{EB}=3.0V$	-	-	50	nA
Collector Cutoff Current	I_{CEX}	$V_{CE}=30V, V_{EB}=3.0V$	-	-	50	nA
DC Current Gain (Note 2)	h_{FE}	$I_C=0.1mA, V_{CE}=1.0V$	40	-	-	-
		$I_C=1.0mA, V_{CE}=1.0V$	70	-	-	
		$I_C=10mA, V_{CE}=1.0V$	100	-	300	
		$I_C=50mA, V_{CE}=1.0V$	60	-	-	
		$I_C=100mA, V_{CE}=1.0V$	30	-	-	
Collector - Emitter Saturation Voltage (Note 2)	$V_{CE(SAT)}$	$I_C=10mA, I_B=1.0mA$ $I_C=50mA, I_B=5.0mA$	-	-	0.2 0.3	V
Base - Emitter Saturation Voltage (Note 2)	$V_{BE(SAT)}$	$I_C=10mA, I_B=1.0mA$ $I_C=50mA, I_B=5.0mA$	0.65 -	- -	0.85 0.95	V
Collector - Base Capacitance	C_{CBO}	$V_{CB}=5V, I_E=0, f=1MHz$	-	-	4.0	pF
Emitter - Base Capacitance	C_{EBO}	$V_{EB}=0.5V, I_C=0, f=1MHz$	-	-	8.0	pF
Delay Time	t_d	$V_{CC}=3V, V_{BE}=-0.5V, I_C=10mA, I_B=1.0mA$	-	-	35	ns
Rise Time	t_r	$V_{CC}=3V, V_{BE}=-0.5V, I_C=10mA, I_B=1.0mA$	-	-	35	ns
Storage Time	t_s	$V_{CC}=3V, I_C=10mA, I_B1=I_B2=1.0mA$	-	-	200	ns
Fall Time	t_f	$V_{CC}=3V, I_C=10mA, I_B1=I_B2=1.0mA$	-	-	50	ns

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

SWITCHING TIME EQUIVALENT TEST CIRCUITS



Delay and Rise Time Equivalent Test Circuit



Storage and Fall Time Equivalent Test Circuit

ELECTRICAL CHARACTERISTICS CURVE

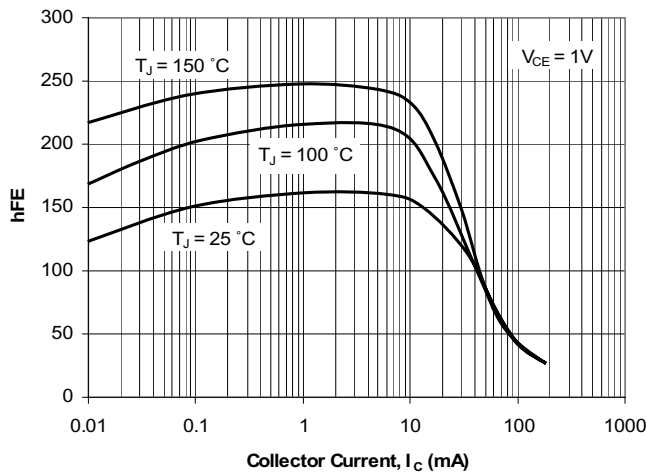


Fig. 1. Typical h_{FE} vs Collector Current

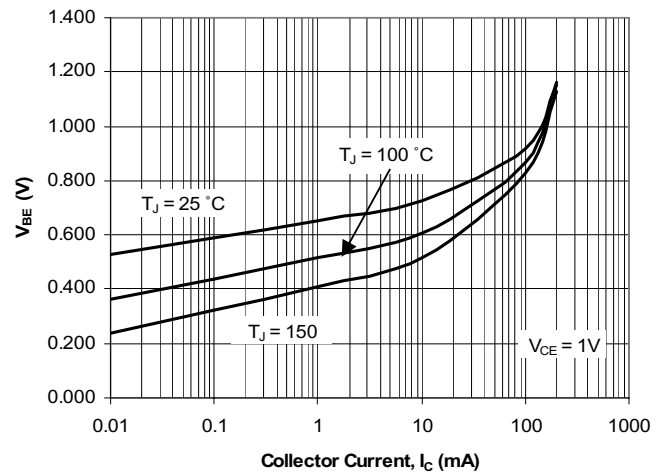


Fig. 2. Typical V_{BE} vs Collector Current

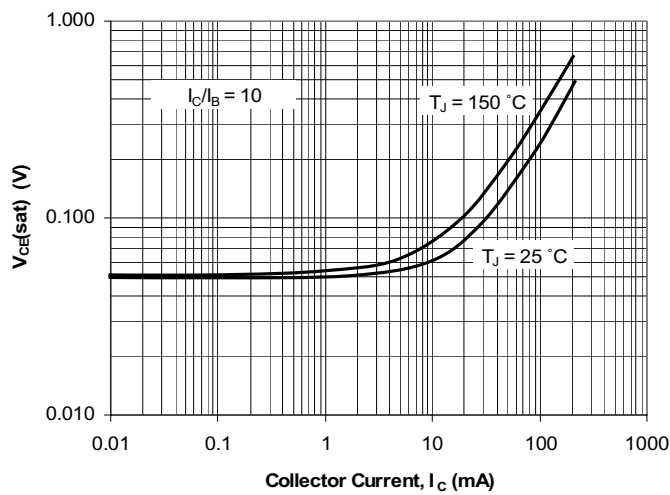


Fig. 3. Typical $V_{CE(sat)}$ vs Collector Current

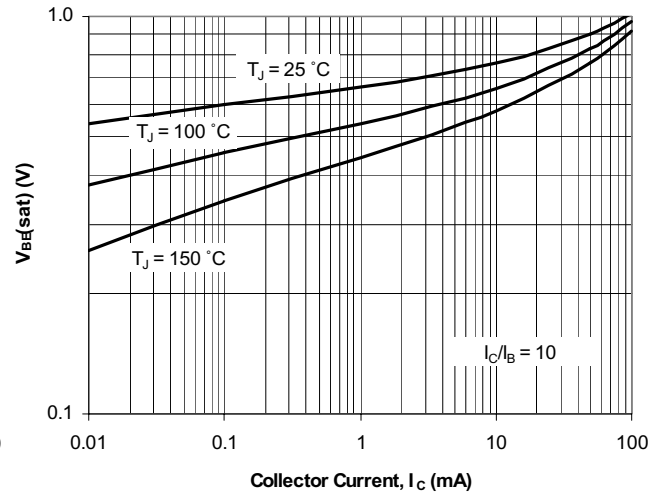


Fig. 4. Typical $V_{BE(sat)}$ vs Collector Current

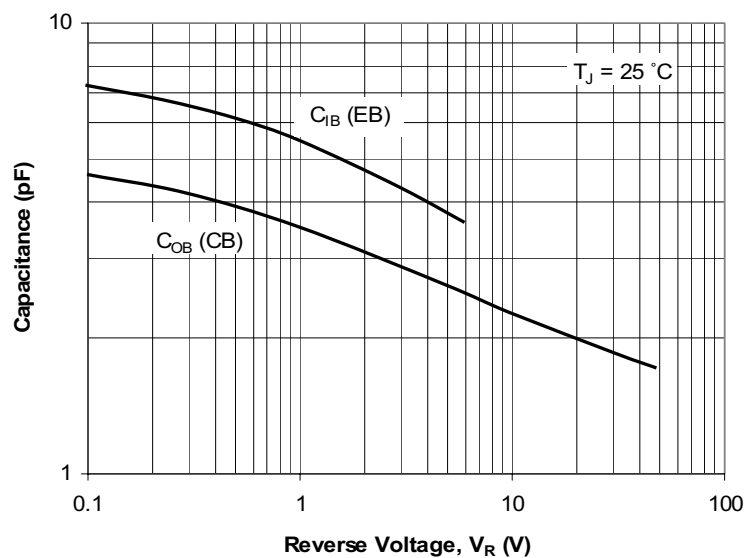


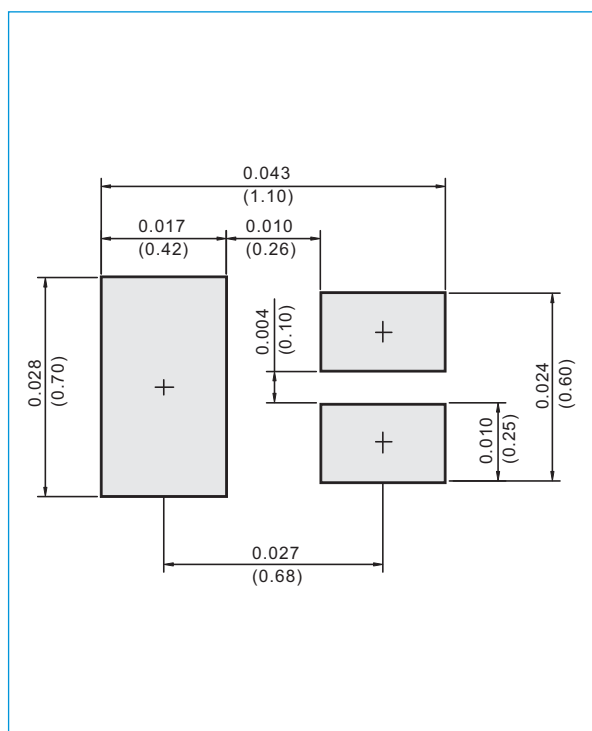
Fig. 5. Typical Capacitances vs Reverse Voltage

MMBT3904FN3

MOUNTING PAD LAYOUT

DFN 3L

Unit: inch (mm)



ORDER INFORMATION

- Packing information
T/R - 8K per 7" plastic Reel

LEGAL STATEMENT

Copyright PanJit International, Inc 2009

The information presented in this document is believed to be accurate and reliable. The specifications and information herein are subject to change without notice. Pan Jit makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose. Pan Jit products are not authorized for use in life support devices or systems. Pan Jit does not convey any license under its patent rights or rights of others.