

# MMBT3906FN3

## PNP GENERAL PURPOSE SWITCHING TRANSISTOR

**VOLTAGE** 40 Volt **POWER** 250 mWatt

**DFN1006-3L Dimension** Unit: inch(mm)

### FEATURES

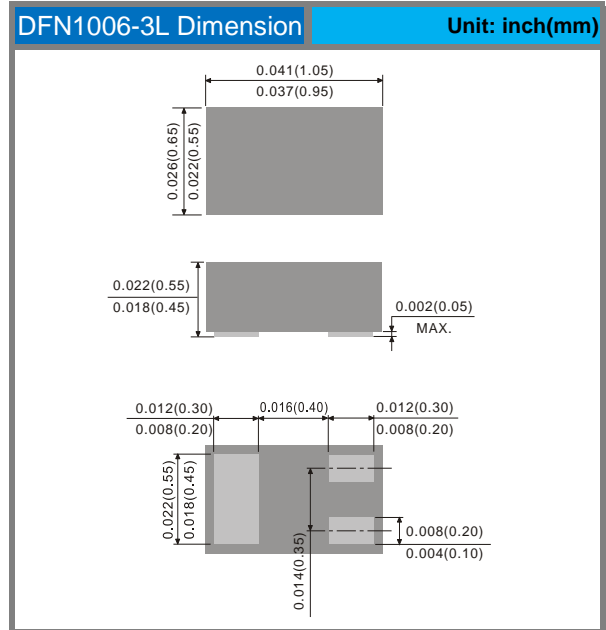
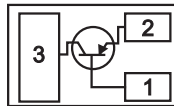
- PNP epitaxial silicon, planar design
- Collector-emitter voltage  $V_{CE} = -40V$
- Collector current  $I_C = -200mA$
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### MECHANICAL DATA

Case : DFN1006-3L Package

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

Approx Weight : 0.0007 gram



### ABSOLUTE RATINGS

Parameter	Symbol	Value	Units
Collector - Emitter Voltage	$V_{CEO}$	-40	V
Collector - Base Voltage	$V_{CBO}$	-40	V
Emitter - Base Voltage	$V_{EBO}$	-5	V
Collector Current - Continuous	$I_C$	-200	mA

### THERMAL CHARACTERISTICS

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

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

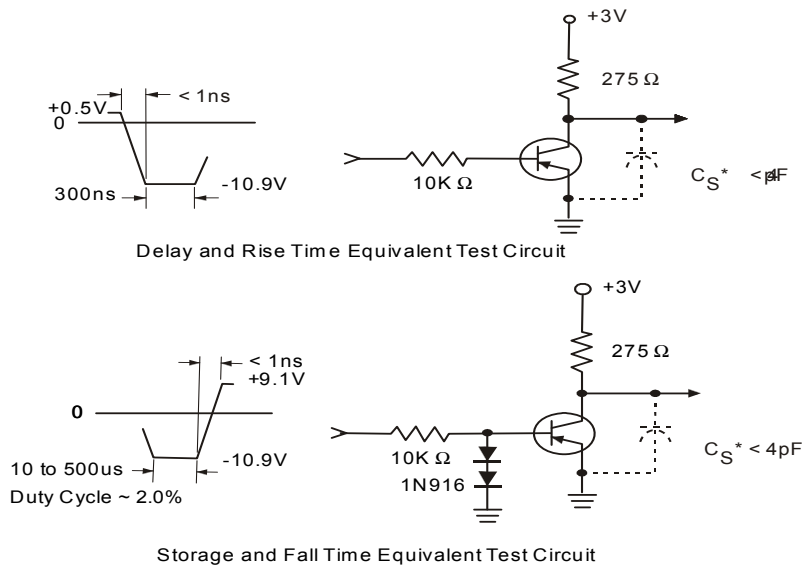
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## ELECTRICAL CHARACTERISTICS $T_A=25^\circ\text{C}$

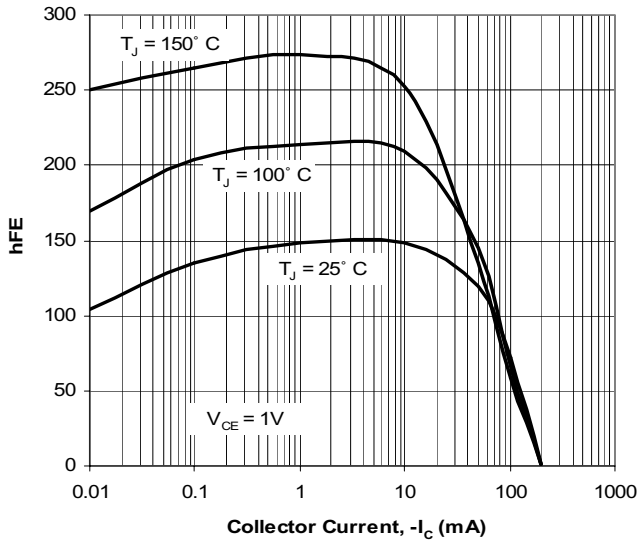
Parameter	Symbol	Test Condition	MIN.	TYP.	MAX.	Units
Collector - Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=-1\text{mA}, I_B=0$	-40	-	-	V
Collector - Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=-10\mu\text{A}, I_E=0$	-40	-	-	V
Emitter - Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=-10\mu\text{A}, I_C=0$	-5	-	-	V
Base Cutoff Current	$I_{BL}$	$V_{CE}=-30\text{V}, V_{EB}=-3\text{V}$	-	-	-50	nA
Collector Cutoff Current	$I_{CEX}$	$V_{CE}=-30\text{V}, V_{EB}=-3\text{V}$	-	-	-50	nA
DC Current Gain <sup>(Note 2)</sup>	$h_{FE}$	$I_C=-0.1\text{mA}, V_{CE}=-1\text{V}$ $I_C=-1\text{mA}, V_{CE}=-1\text{V}$ $I_C=-10\text{mA}, V_{CE}=-1\text{V}$ $I_C=-50\text{mA}, V_{CE}=-1\text{V}$ $I_C=-100\text{mA}, V_{CE}=-1\text{V}$	60 80 100 60 30	- - - - -	- - 300 - -	-
Collector - Emitter Saturation Voltage <sup>(Note 2)</sup>	$V_{CE(SAT)}$	$I_C=-10\text{mA}, I_B=-1\text{mA}$ $I_C=-50\text{mA}, I_B=-5\text{mA}$	-	-	-0.25 -0.4	V
Base - Emitter Saturation Voltage <sup>(Note 2)</sup>	$V_{BE(SAT)}$	$I_C=-10\text{mA}, I_B=-1\text{mA}$ $I_C=-50\text{mA}, I_B=-5\text{mA}$	-0.65 -	- -	-0.85 -0.95	V
Collector - Base Capacitance	$C_{CBO}$	$V_{CB}=-5\text{V}, I_E=0, f=1\text{MHz}$	-	-	4.5	pF
Emitter - Base Capacitance	$C_{EBO}$	$V_{EB}=-0.5\text{V}, I_C=0, f=1\text{MHz}$	-	-	10	pF
Delay Time	$t_d$	$V_{CC}=-3\text{V}, V_{BE}=-0.5\text{V}, I_C=-10\text{mA}, I_B=-1\text{mA}$	-	-	35	ns
Rise Time	$t_r$	$V_{CC}=-3\text{V}, V_{BE}=-0.5\text{V}, I_C=-10\text{mA}, I_B=-1\text{mA}$	-	-	35	ns
Storage Time	$t_s$	$V_{CC}=-3\text{V}, I_C=-10\text{mA}, I_{B1}=I_{B2}=-1\text{mA}$	-	-	225	ns
Fall Time	$t_f$	$V_{CC}=-3\text{V}, I_C=-10\text{mA}, I_{B1}=I_{B2}=-1\text{mA}$	-	-	75	ns
Current Gain-Bandwidth Product	$f_T$	$I_C=-10\text{mA}, V_{CE}=-20\text{V}, f=100\text{MHz}$	250	-	-	MHz

Note 2: Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

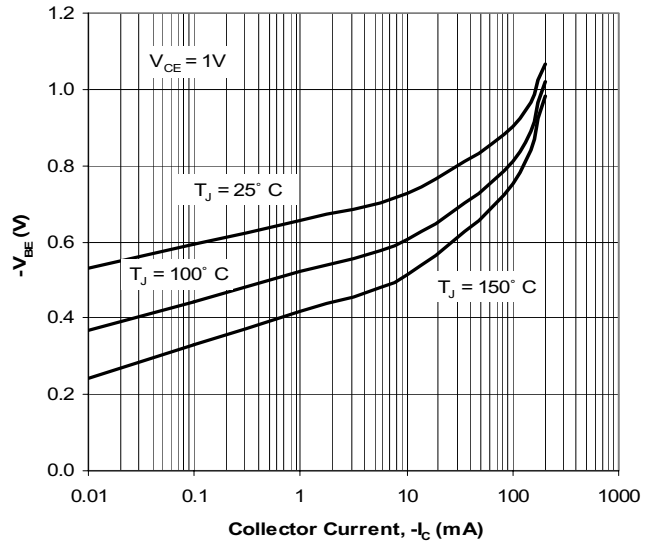
### SWITCHING TIME EQUIVALENT TEST CIRCUITS



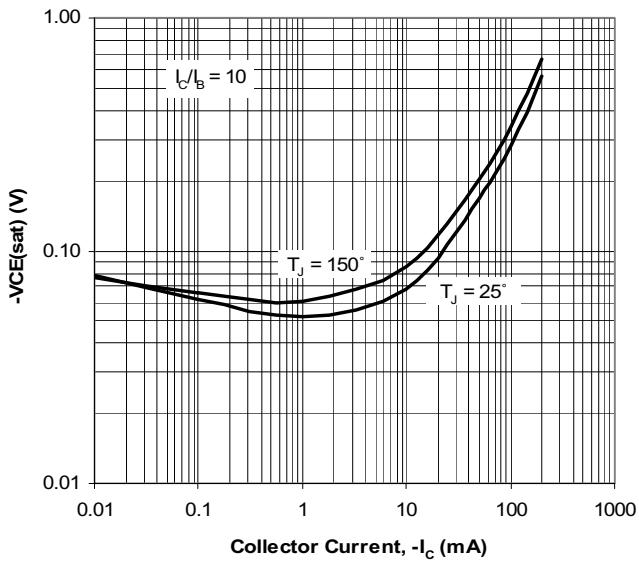
**ELECTRICAL CHARACTERISTICS CURVE**



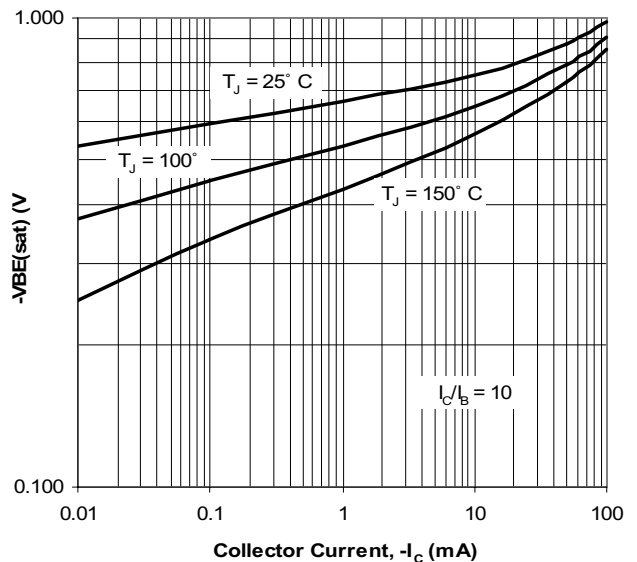
**Fig. 1. Typical  $h_{FE}$  vs. Collector Current**



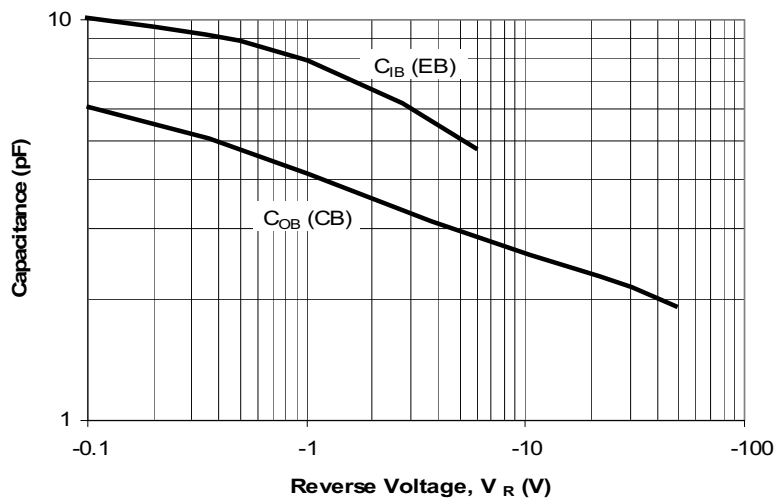
**Fig. 2. Typical  $V_{BE}$  vs. Collector Current**



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



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



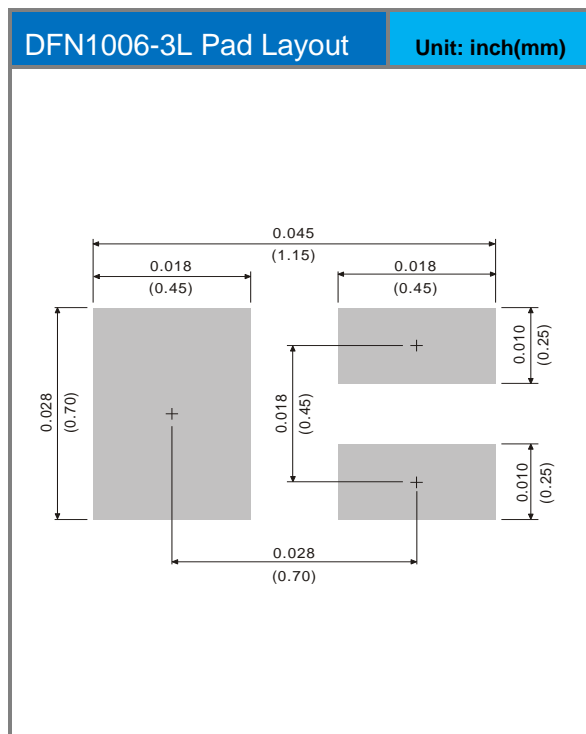
**Fig. 5. Typical Capacitances vs. Reverse Voltage**

# MMBT3906FN3

## Product and Packing Information

Part No.	Package Type	Packing Type	Marking
MMBT3906FN3	DFN1006-3L	10K pcs / 7" reel	AD

## Mounting Pad Layout



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