

DATA SHEET

MMBT3906

PNP GENERAL PURPOSE TRANSISTORS

VOLTAGE -40 V **CURRENT** -200 mA

FEATURES

- HIGH DC CURRENT GAIN
- LOW COLLECTOR-EMITTER SATURATION VOLTAGE
- LEAD FREE AND HALOGEN-FREE

MECHANICAL DATA

- CASE: SOT-23
- TERMINALS: SOLDERABLE PER MIL-STD-202, METHOD 208
- APPROX. WEIGHT: 0.008 GRAMS



CASE: SOT-23

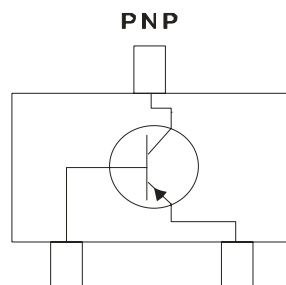
ABSOLUTE MAXIMUM RATINGS

AT $T_A=25^{\circ}\text{C}$, UNLESS OTHERWISE SPECIFIED.

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
POWER DISSIPATION	P_D	225	mW
THERMAL RESISTANCE, JUNCTION TO AMBIENT	$R_{\theta JA}$	417	$^{\circ}\text{C}/\text{W}$
JUNCTION TEMPERATURE	T_J	150	$^{\circ}\text{C}$
STORAGE TEMPERATURE RANGE	T_{STG}	-55 to +150	$^{\circ}\text{C}$

NOTE:

1. ABSOLUTE MAXIMUM RATINGS ARE THOSE VALUES BEYOND WHICH THE DEVICE COULD BE PERMANENTLY DAMAGED. ABSOLUTE MAXIMUM RATINGS ARE STRESS RATINGS ONLY AND FUNCTIONAL DEVICE OPERATION IS NOT IMPLIED.



ELECTRICAL CHARACTERISTICS

AT $T_A = 25^\circ\text{C}$, UNLESS OTHERWISE NOTED

OFF CHARACTERISTICS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	MAX.	UNITS
COLLECTOR-EMITTER BREAKDOWN VOLTAGE	$I_C = -1\text{mA}, I_B = 0$	$V_{(BR)CEO}$	-40	-	V
COLLECTOR-BASE BREAKDOWN VOLTAGE	$I_C = -10\mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	-40	-	V
EMITTER-BASE BREAKDOWN VOLTAGE	$I_E = -10\mu\text{A}, I_C = 0$	$V_{(BR)EBO}$	-5	-	V
EMITTER CUT-OFF CURRENT	$V_{EB} = -3\text{V}, I_C = 0$	I_{EBO}	-	-50	nA
COLLECTOR CUT-OFF CURRENT	$V_{CE} = -30\text{V}, V_{EB} = -3\text{V}$	I_{CEX}	-	-50	nA

ON CHARACTERISTICS

DC CURRENT GAIN	$I_C = -0.1\text{mA}, V_{CE} = -1\text{V}$	h_{FE}	60	-	-
	$I_C = -1\text{mA}, V_{CE} = -1\text{V}$		80	-	
	$I_C = -10\text{mA}, V_{CE} = -1\text{V}$		100	300	
	$I_C = -50\text{mA}, V_{CE} = -1\text{V}$		60	-	
	$I_C = -100\text{mA}, V_{CE} = -1\text{V}$		30	-	
COLLECTOR-EMITTER SATURATION VOLTAGE	$I_C = -10\text{mA}, I_B = -1\text{mA}$	$V_{CE(SAT)}$	-	-0.25	V
	$I_C = -50\text{mA}, I_B = -5\text{mA}$		-	-0.4	
BASE-EMITTER SATURATION VOLTAGE	$I_C = -10\text{mA}, I_B = -1\text{mA}$	$V_{BE(SAT)}$	-	-0.85	V
	$I_C = -50\text{mA}, I_B = -5\text{mA}$		-	-0.95	

SMALL-SIGNAL CHARACTERISTICS

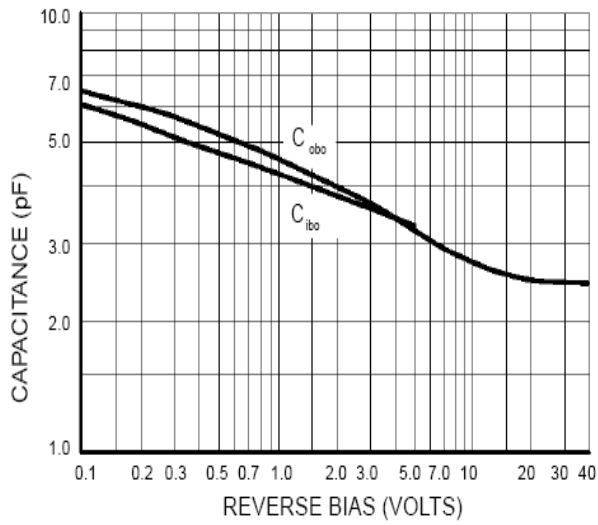
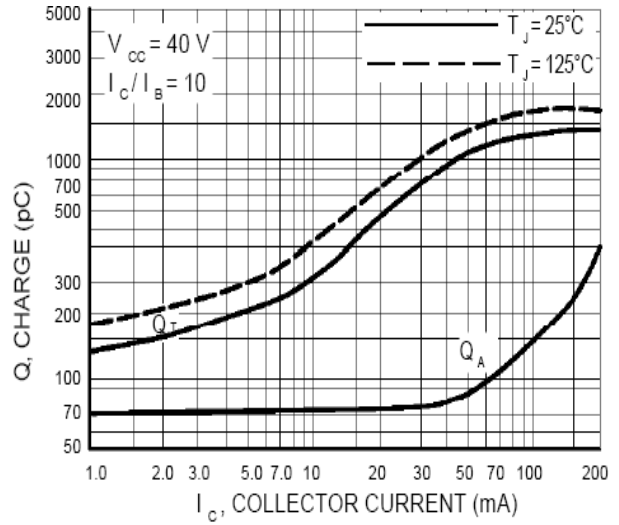
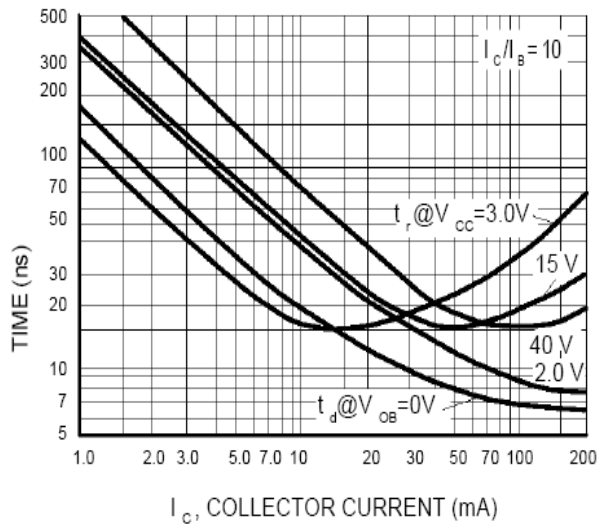
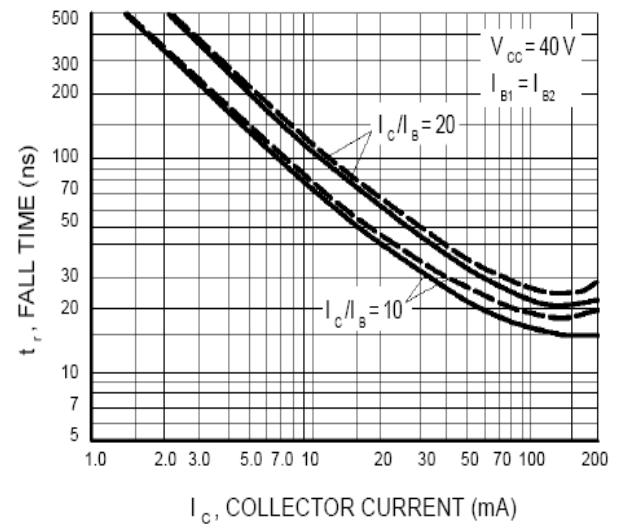
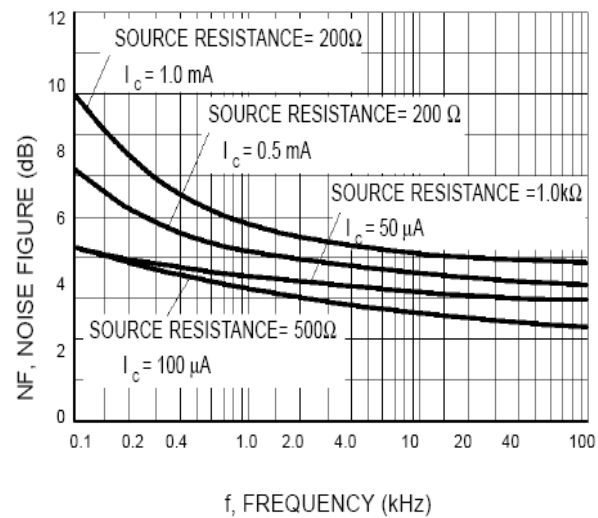
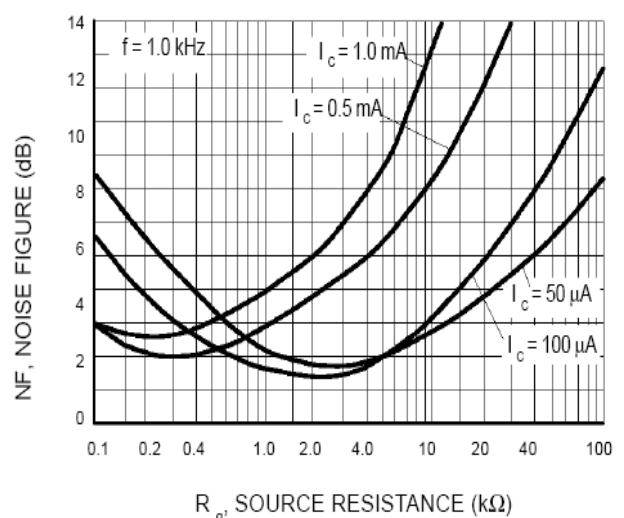
COLLECTOR OUTPUT CAPACITANCE	$V_{CB} = -5\text{V}, I_E = 0, f = 1\text{MHz}$	C_{ob}	-	4.5	pF
CURRENT-GAIN-BANDWIDTH PRODUCT	$I_C = -10\text{mA}, V_{CE} = -20\text{V}, f = 100\text{MHz}$	f_T	250	-	MHz

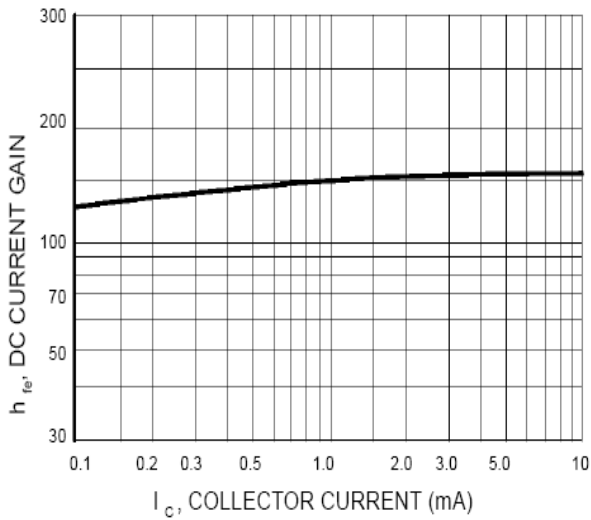
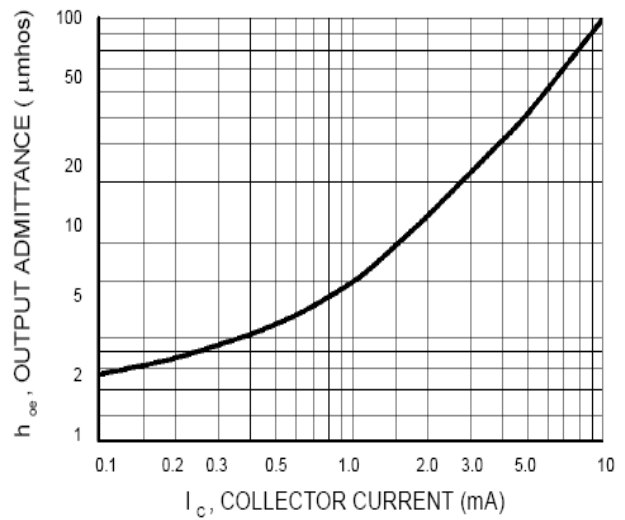
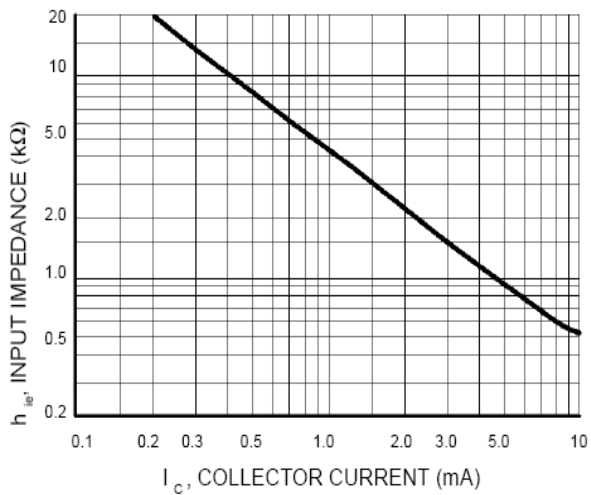
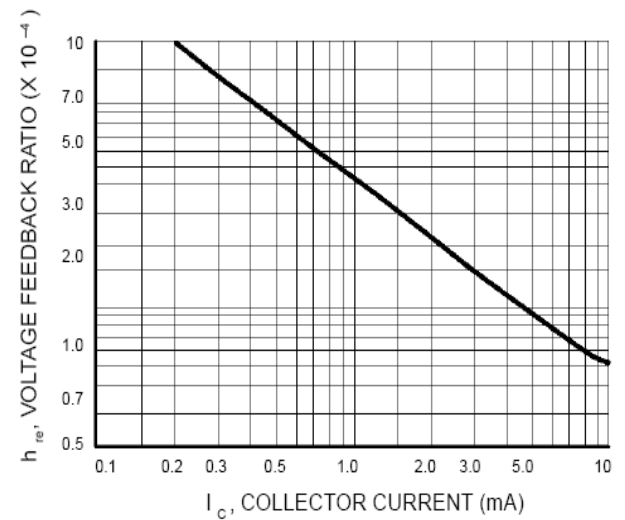
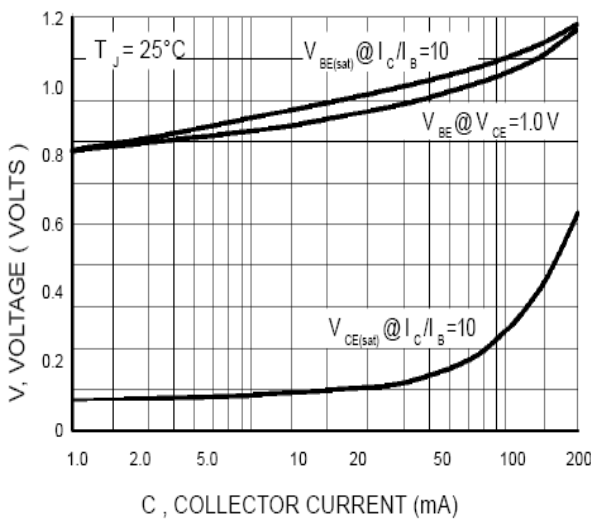
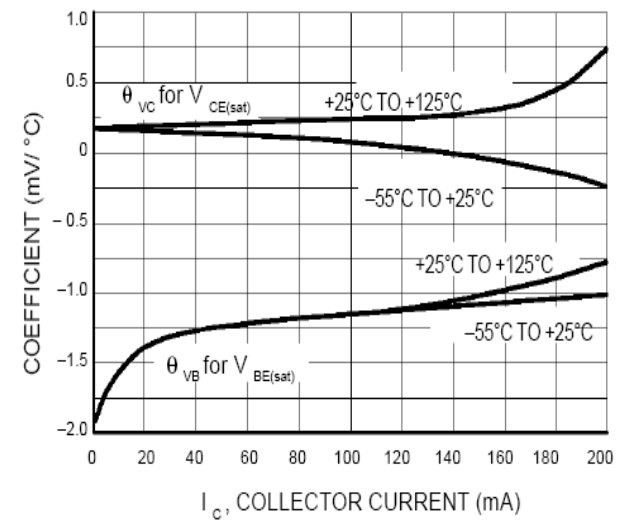
NOTE:

- PULSE TEST: PULSE WIDTH $\leq 300\mu\text{s}$; DUTY CYCLE $\leq 2\%$.

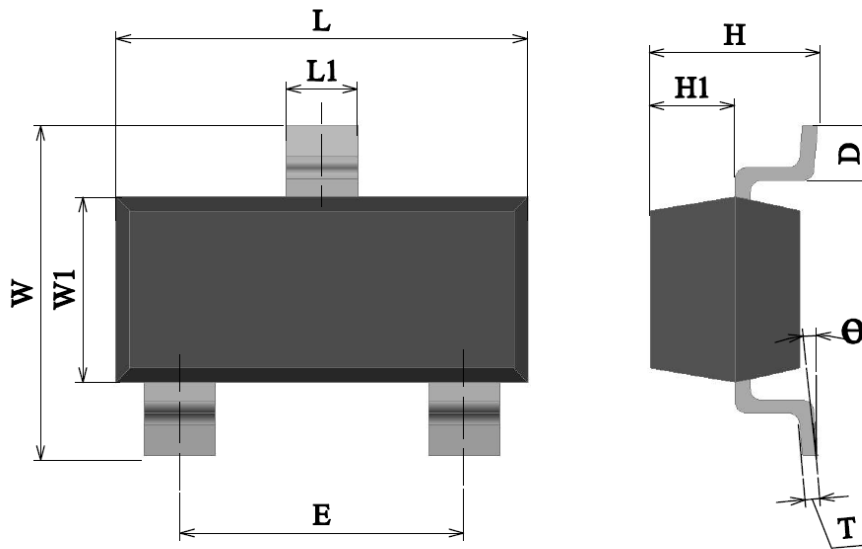
ORDERING INFORMATION

PART NUMBER	PACKAGE	SHIPPING
MMBT3906-T3R	SOT-23	TAPE REEL


Figure 1. Capacitance

Figure 2. Charge Data

Figure 3. Turn-On Time

Figure 4. Fall Time

Figure 5. Noise Figure

Figure 6. Noise Figure


Figure 7. Current Gain

Figure 8. Output Admittance

Figure 9. Input Impedance

Figure 10. Voltage Feedback Ratio

Figure 11. "ON" Voltages

Figure 12. Temperature Coefficients

SOT-23 DIMENSION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
L	2.80	3.10	0.110	0.122
L1	0.30	0.50	0.012	0.020
W	2.25	2.54	0.089	0.100
W1	1.20	1.40	0.047	0.055
E	1.80	2.00	0.071	0.079
H	0.90	1.15	0.035	0.045
H1	0.40	0.80	0.016	0.031
D	0.30	0.50	0.012	0.020
T	0.08	0.15	0.003	0.006
θ	0°	8°	0°	8°

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