



SOT-23 Plastic-Encapsulate Transistors

MMBT3906 TRANSISTOR (PNP)

SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

FEATURES

- As complementary type, the NPN transistor MMBT3904 is Recommended
- Epitaxial planar die construction

MARKING: 2A

MAXIMUM RATINGS ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Units
V_{CB0}	Collector-Base Voltage	-40	V
V_{CE0}	Collector-Emitter Voltage	-40	V
V_{EB0}	Emitter-Base Voltage	-5	V
I_C	Collector Current -Continuous	-0.2	A
P_C	Collector Power Dissipation	0.3	W
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature	-55-150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_{amb}=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = -10\mu\text{A}, I_E = 0$	-40		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_{CBO}	$V_{CB} = -40\text{V}, I_E = 0$		-0.1	μA
Collector cut-off current	I_{CEX}	$V_{CE} = -30\text{V}, V_{BE(off)} = -3\text{V}$		-50	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = -5\text{V}, I_C = 0$		-0.1	μA
DC current gain	$h_{FE(1)}$	$V_{CE} = -1\text{V}, I_C = -10\text{mA}$	100	300	
	$h_{FE(2)}$	$V_{CE} = -1\text{V}, I_C = -50\text{mA}$	60		
	$h_{FE(3)}$	$V_{CE} = -1\text{V}, I_C = -100\text{mA}$	30		
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -50\text{mA}, I_B = -5\text{mA}$		-0.4	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = -50\text{mA}, I_B = -5\text{mA}$		-0.95	V
Transition frequency	f_T	$V_{CE} = -20\text{V}, I_C = -10\text{mA}, f = 100\text{MHz}$	250		MHz
Delay Time	t_d	$V_{CC} = -3.0\text{V}, V_{BE} = -0.5\text{V}$		35	nS
Rise Time	t_r	$I_C = -10\text{mA}, I_{B1} = -1.0\text{mA}$		35	nS
Storage Time	t_s	$V_{CC} = -3.0\text{V}, I_C = -10\text{mA}$		225	nS
Fall Time	t_f	$I_{B1} = I_{B2} = -1.0\text{mA}$		75	nS

CLASSIFICATION OF h_{FE1}

Rank	O	Y
Range	100-200	200-300

Typical Characteristics

MMBT3906

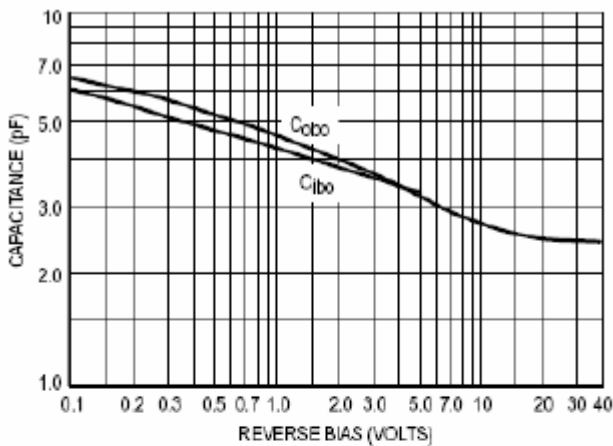


Figure 1 Capacitance

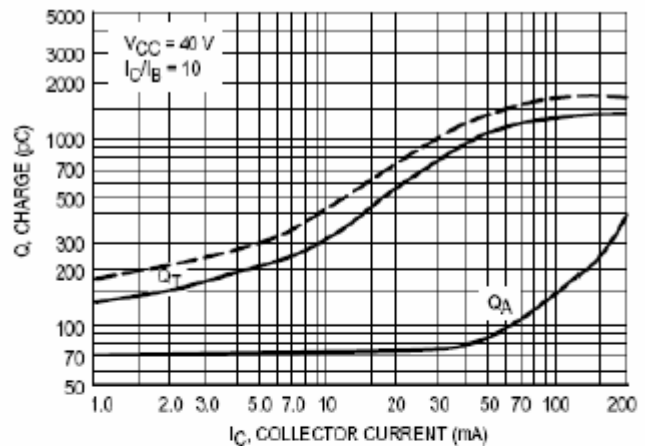


Figure 2 Charge Data

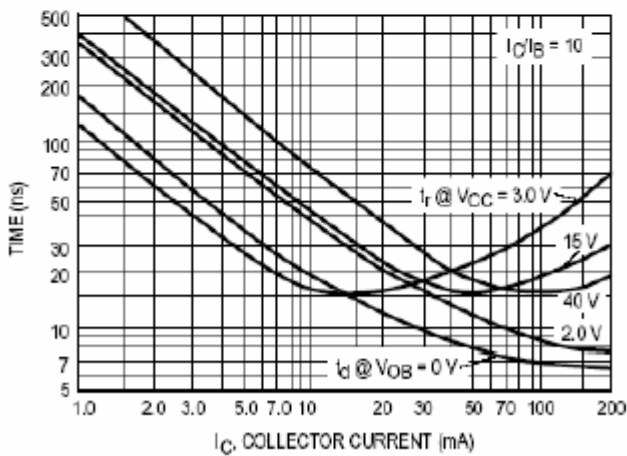


Figure 3 Turn-On Time

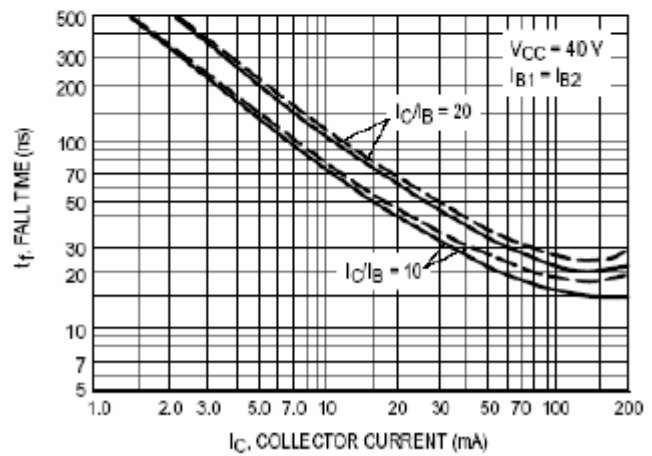


Figure 4 Fall Time

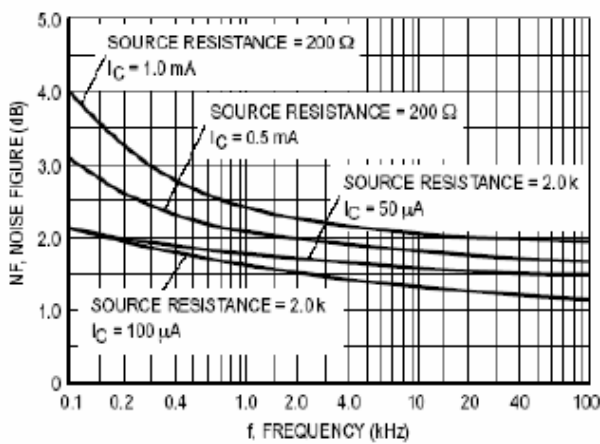


Figure 5

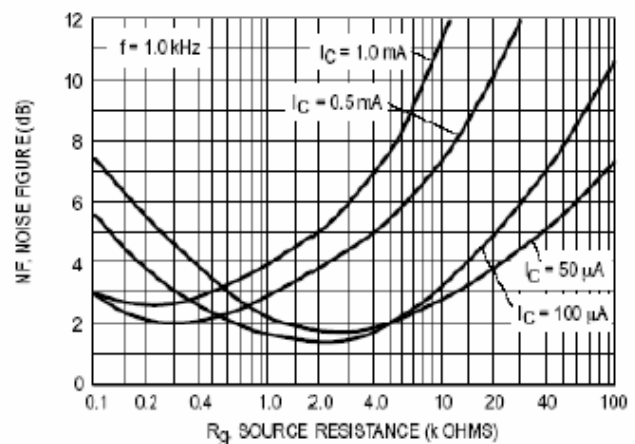


Figure 6

h PARAMETERS

($V_{CE} = -10$ Vdc, $f = 1.0$ kHz, $T_A = 25^\circ\text{C}$)

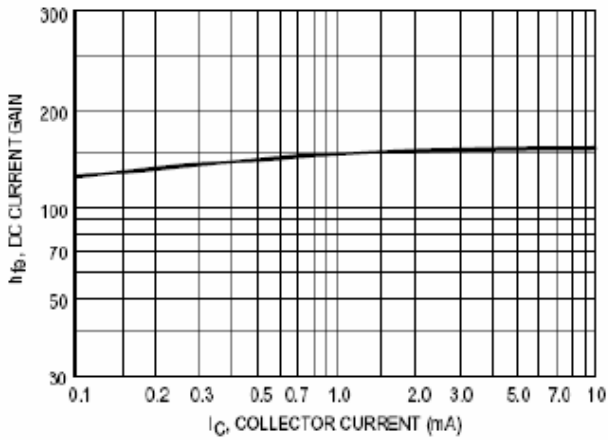


Figure 7 Current Gain

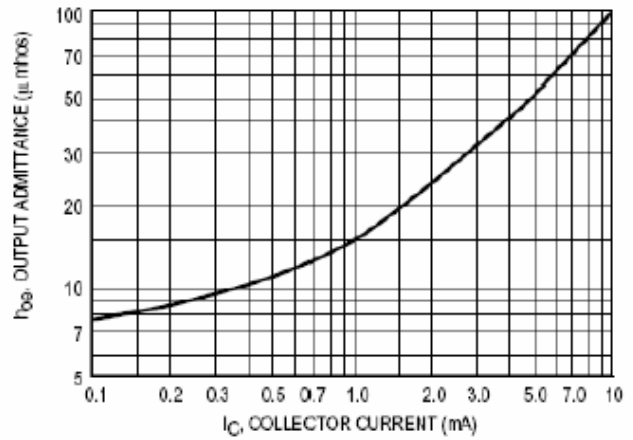


Figure 8 Output Admittance

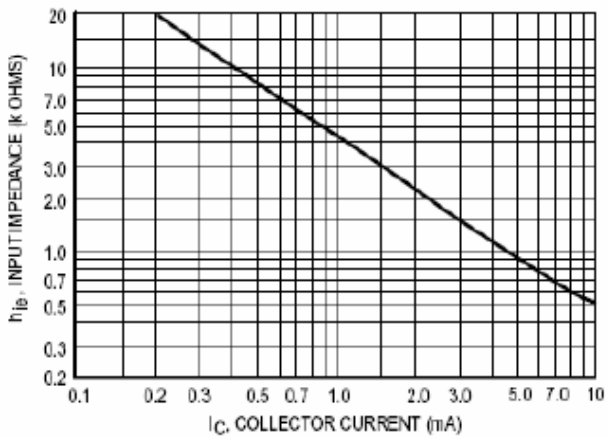


Figure 9 Input Impedance

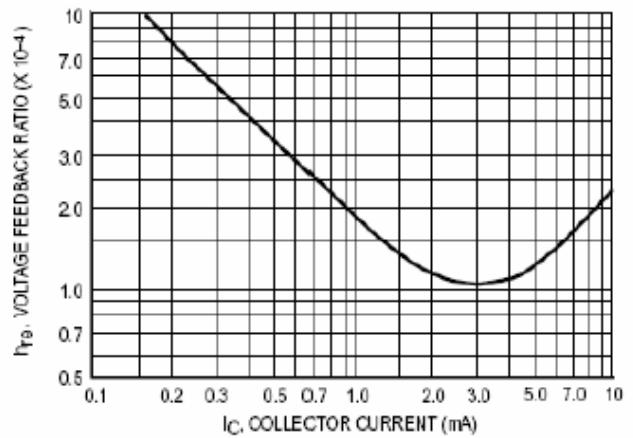


Figure 10 Voltage Feedback Ratio

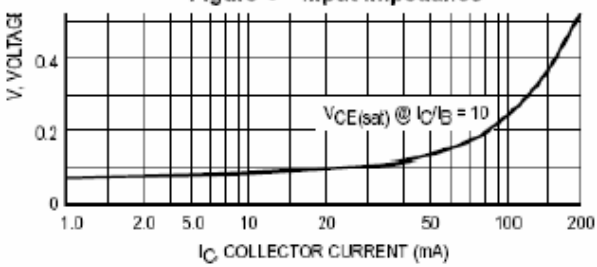


Figure 11 "ON" Voltages

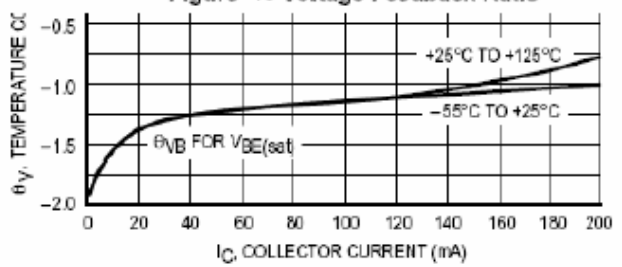


Figure 12 Temperature Coefficients