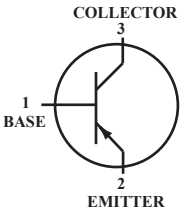
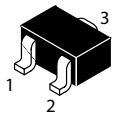
WEITRON

MMBT3906W

General Purpose Transistor
PNP Silicon

Lead(Pb)-Free





SOT-323(SC-70)

Maximum Ratings

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	-40	Vdc
Collector-Base Voltage	V_{CBO}	-40	Vdc
Emitter-Base VOltage	V_{EBO}	-5.0	Vdc
Collector Current-Continuous	I_C	-200	mAdc

Thermal Characteristics

Characteristics	Symbol	Max	Unit
Total Device Dissipation T_A=25°C	P_D	150	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	°C/W
Junction and Storage, Temperature	$T_{J,Tstg}$	-55 to +150	°C

Device Marking

MMBT3906W=2A

Electrical Characteristics (T_A=25°C Unless Otherwise noted)

Characteristics	Symbol	Min	Max	Unit
Off Characteristics				
Collector-Emitter Breakdown Voltage(2) (I_C=-1.0mAdc.I_B=0)	V(BR)CEO	-40	-	Vdc
Collector-Base Breakdown Voltage (I_C=-10 μAdc, I_E=0)	V(BR)CBO	-40	-	Vdc
Emitter-Base Breakdown Voltage (I_E=-10 μAdc, I_C=0)	V(BR)EBO	-5.0	-	Vdc
Base Cutoff Current (V_{CE}=-30 Vdc, V_{EB} =-3.0 Vdc)	IBL	-	-50	nAdc
Collector Cutoff Current (V_{CE}=-30Vdc, V_{EB}=-3.0Vdc)	ICEX	-	-50	nAdc

1. Device mounted FR4 glass epoxy printed circuit board suing the minimun recommended footprint.
2. Pulse Test:Pulse Width ≦300 μS, Duty Cycle ≦2.0%.

Electrical Characteristics (T_A=25°C unless otherwise noted) (Countinued)

Characteristics	Symbol	Min	Max	Unit
On Characteristics (2)				
DC Current Gain (I_C= -0.1 mAdc, V_{CE}= -1.0Vdc) (I_C= -1.0 mAdc, V_{CE}= -1.0 Vdc) (I_C= -10 mAdc, V_{CE}= -1.0Vdc) (I_C= -50 mAdc, V_{CE}= -1.0Vdc) (I_C= -100 mAdc, V_{CE}= -1.0Vdc)	H_{FE}	 60 80 100 60 30	 - - 300 - -	-
Collector-Emitter Saturation Voltage (2) (I_C= -10 mAdc, I_B= -1.0mAdc) (I_C= -50 mAdc, I_B= -5.0mAdc)	$V_{CE(sat)}$	 - -	 -0.25 -0.4	Vdc
Base-Emitter Saturation Voltage (2) (I_C= -10 mAdc, I_B= -1.0 mAdc) (I_C= -50 mAdc, I_B= -5.0 mAdc)	$V_{BE(sat)}$	-0.65 -	-0.85 -0.95	Vdc
Small-signal Characteristics				
Current-Gain-Bandwidth Product (I_C= -10 mAdc, V_{CE}= -20 Vdc, f=100MHz)	f_T	250	-	MHz
Output Capacitance (V_{CB}= -5.0 Vdc, I_E=0, f=1.0MHz)	C_{obo}	-	4.5	pF
Input Capacitance (V_{EB}= -0.5 Vdc, I_C=0, f=1.0MHz)	C_{ibo}	-	10	pF
Input Impedance (VCE= -10 Vdc IC=-1.0 mAdc, f=1.0 kHz)	h_{ie}	2.0	12	k ohms
Voltage Feeback Radio (V_{CE}= -10Vdc I_C=1.0 mAdc, f=1.0 kHz)	h_{re}	0.1	10	x 10-4
Small-Signal Current Gain (VCE= -10Vdc I_C=1.0 mAdc, , f=1.0 kHz)	h_{fe}	100	400	.
Output Admittance (V_{CE}= -10Vdc I_C=1.0 mAdc, f=-1.0kHz)	h_{oe}	3.0	60	µmhos
Noise Figure (V_{CE}= -5.0Vdc I_C= -100 µAdc, , R_S=1.0k ohms, f=1.0kHz)	NF	-	4.0	dB
Switching Characteristics				
Delay Time	(Vcc= -3.0 Vdc, V_{BE}= 0.5 Vdc Ic= -10 mAdc, I_{B1}= -1.0 mAdc)	td	-	35	ns
Rise Time		tr	-	35	
Storage Time	(Vcc= -3.0 Vdc, Ic= -10 mAdc, I_{B1}=I_{B2}= -1.0 mAdc)	ts	-	225	ns
Fall Time		tf	-	75	

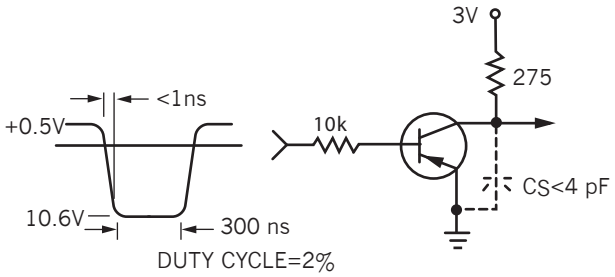
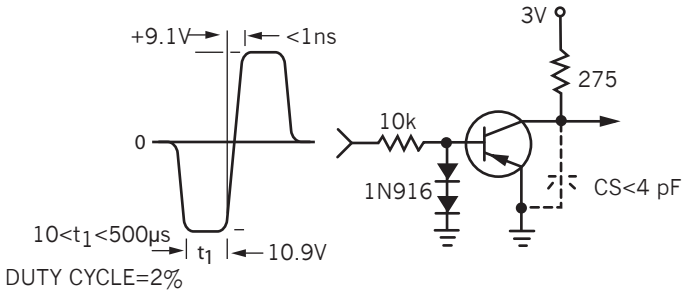


Figure 1. Delay and Rise Time Equivalent Test Circuit



*Total shunt capacitance of test jig and connectors

Figure . Storage and Fall Time Equivalent Test Circuit

TYPICAL TRANSIENT CHARACTERISTICS

——— T_J=25°C ·- - - - T_J=125°C

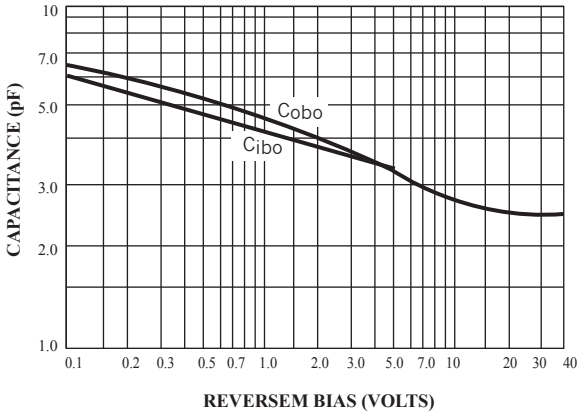


Figure 3. Capacitance

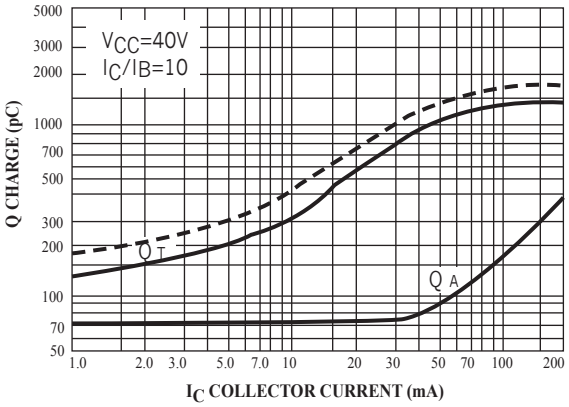


Figure 4. Charge Data

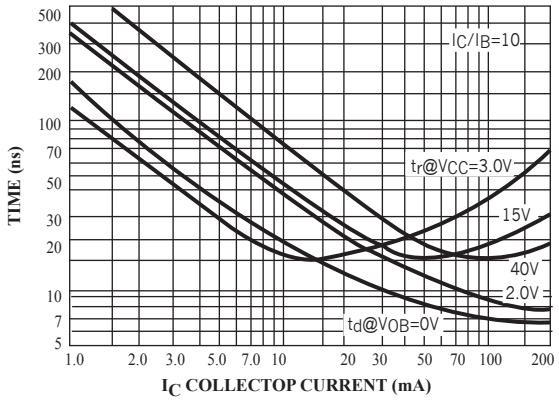


Figure 5. Turn-On Time

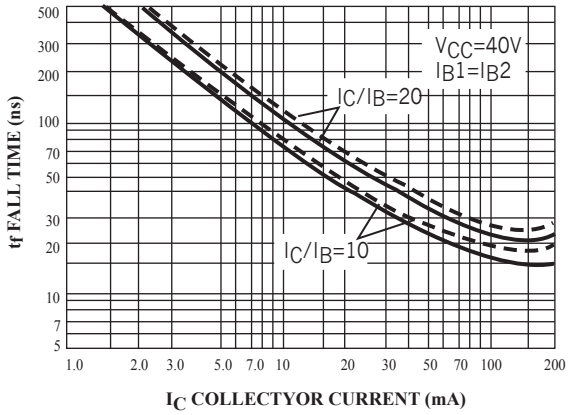


Figure 6.Fall Time

TYPICAL AUDIO SMALL-SIGNAL CHARACTERISTICS NOISE FIGURE VARIATIONS

(V_{CE}= -5.0 Vdc, T_A= 25°C, Bandwidth= 1.0Hz)

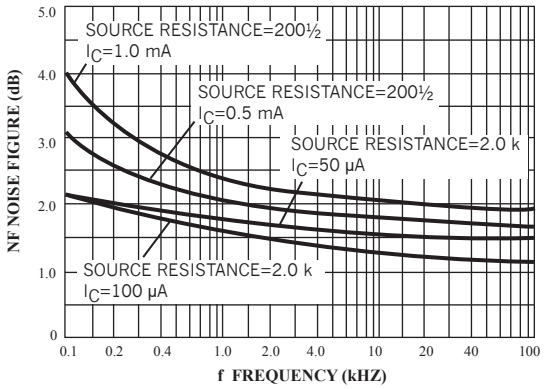


Figure 7.

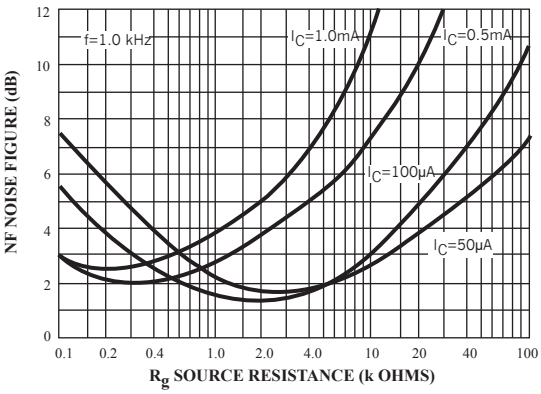


Figure 8.

h PARAMETERS (V_{CE}= -10 Vdc, f= 1.0 kHz, T_A= 25°C)

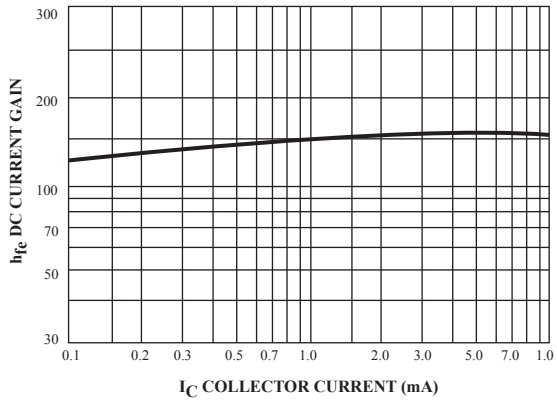


Figure 9. Current Gain

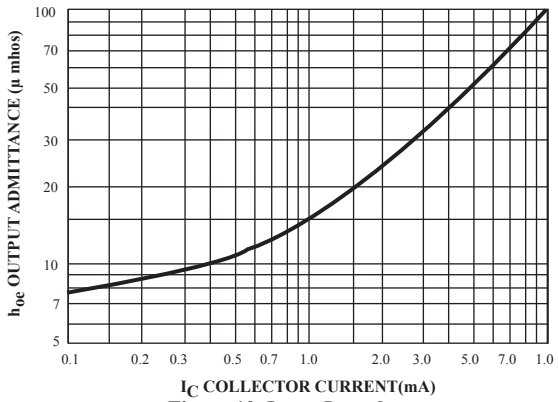


Figure 10. Input Impedance

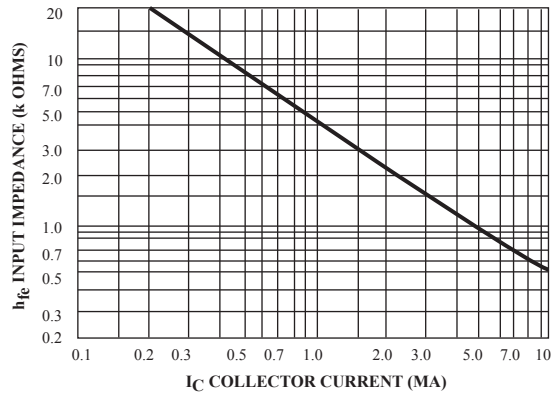


Figure .11 Input Impedance

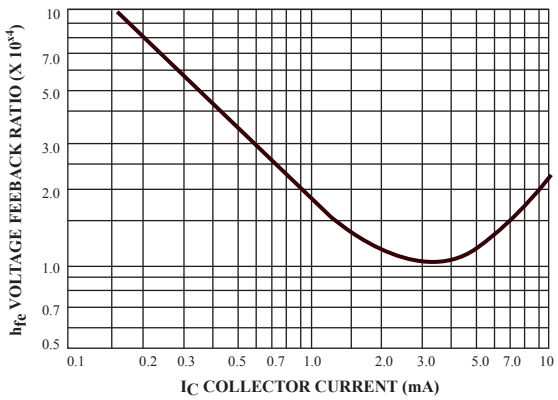
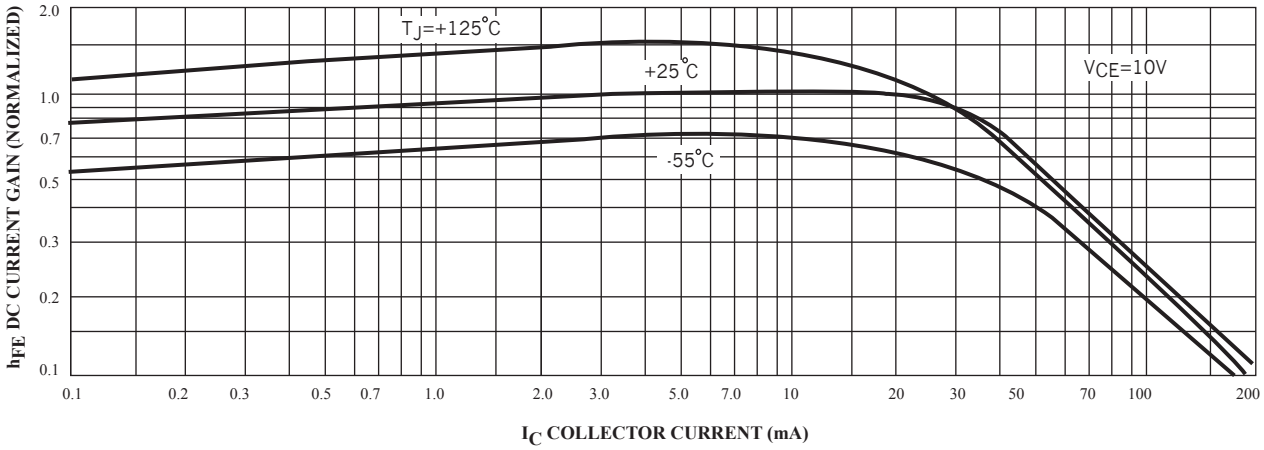


Figure 12. Votage Feeback Ratio

TYPICAL STATIC CHARACTERISTICS



Figurer 13. DC Current Gain

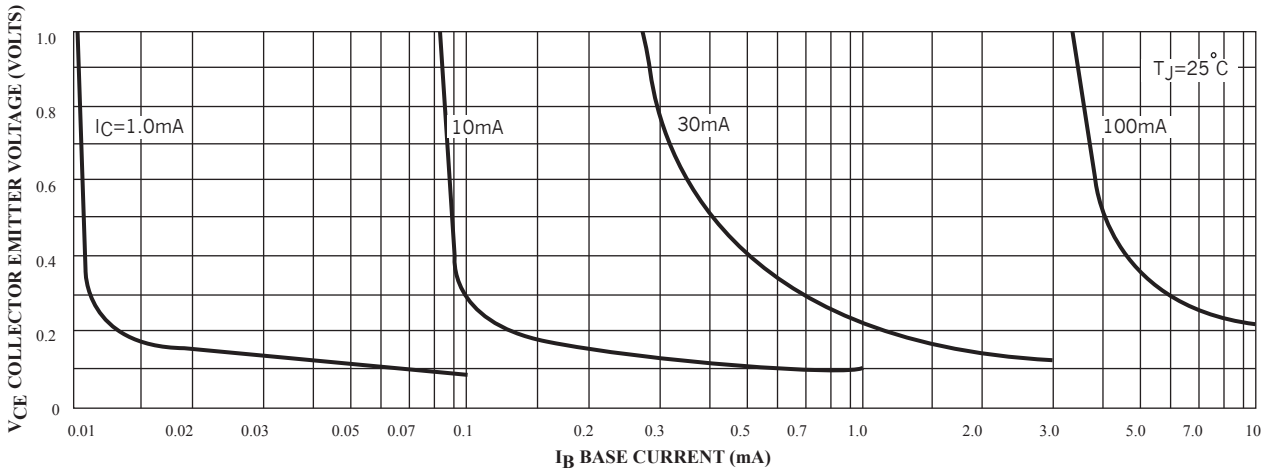


Figure 14. Collector Saturation Region

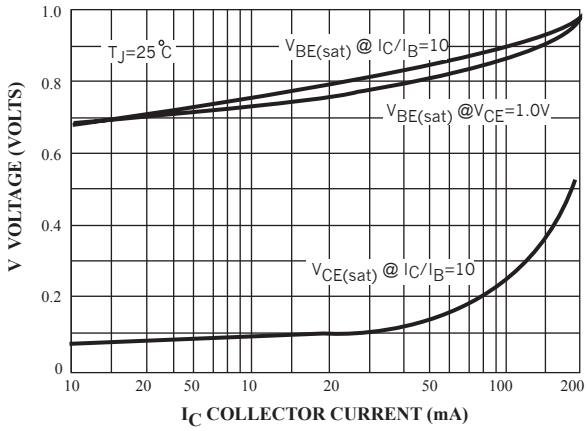


Figure 15. "ON" Voltages

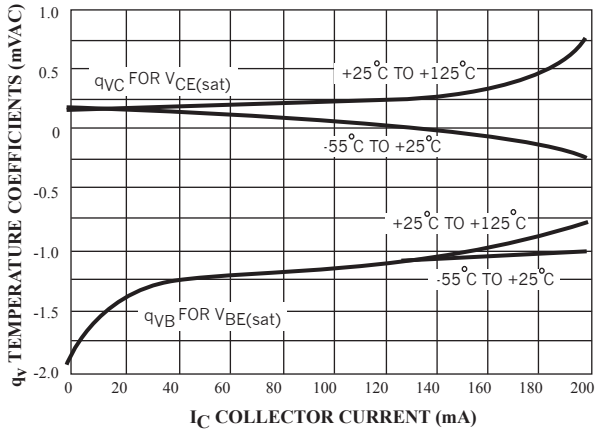
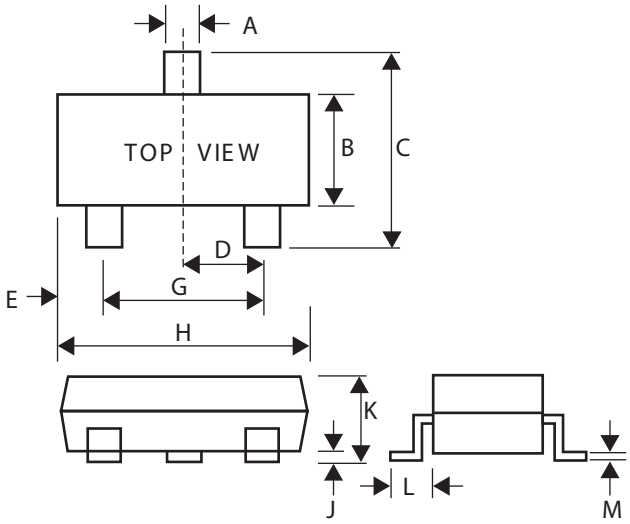


Figure 16.Temperature Coefficients

SOT-323 Outline Demensions

Unit:mm



SOT-323		
Dim	**Min**	**Max**
A	0.30	0.40
B	1.15	1.35
C	2.00	2.40
D	-	0.65
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.00	0.10
K	0.80	1.00
L	0.42	0.53
M	0.10	0.25