

GSTMMBT3906W

PNP General Purpose Transistor


Product Description

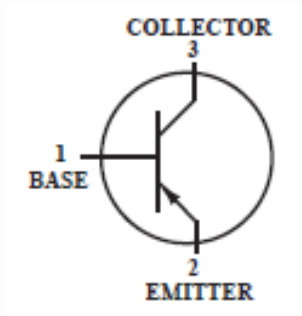
This device is designed as a general purpose amplifier and switch.

Features

- Collector-Emitter Voltage : -40V
- Collector-Base Voltage : -40V
- Collector Current-Continuous : -200mA
- Lead(Pb)-Free

Packages & Pin Assignments

GSTMMBT3906WF(SOT-323)	
	
Pin	Description
1	Base
2	Emitter
3	Collector

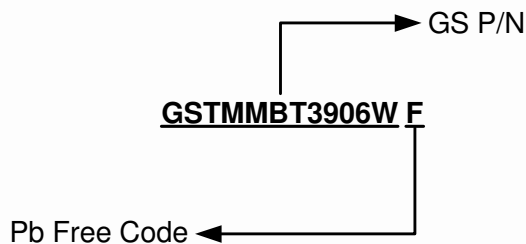


Marking Information

P/N	Package	Part Marking
GSTMMBT3906WF	SOT-323	3E

GSTMMBT3906W

Ordering Information



Part Number	Package	Quantity
GSTMMBT3906WF	SOT-323	3000 PCS

Absolute Maximum Ratings

$T_A=25^{\circ}\text{C}$

Symbol	Conditions	Value	Unit
V_{CEO}	Collector-Emitter Voltage	-40	V
V_{CBO}	Collector-Base Voltage	-40	V
V_{EBO}	Emitter-Base Voltage	-5.0	V
$I_{C(DC)}$	Collector Current (DC)	-200	mA
P_D	Total Device Dissipation $T_A=25^{\circ}\text{C}$	200	mW
T_J	Junction Temperature Range	-55 to +150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-55 to +150	$^{\circ}\text{C}$

Electrical Characteristics

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

Symbol	Conditions	Min	Max	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage ($I_C=-1.0\text{mA}$, $I_B=0\text{mA}$)	-40	-	V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ($I_C=-10\mu\text{A}$, $I_E=0\text{mA}$)	-40	-	V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ($I_E=-10\mu\text{A}$, $I_C=0\text{mA}$)	-5.0	-	V
I_{CEX}	Collector Cutoff Current ($V_{CE}=-30\text{V}$, $V_{EB}=-3.0\text{V}$)	-	-50	nA
I_{BL}	Base Cutoff Current ($V_{CE}=-30\text{V}$, $V_{EB}=-3.0\text{V}$)	-	-50	nA
h_{FE}	DC Current Gain ($I_C=-0.1\text{mA}$, $V_{CE}=-1.0\text{V}$)	60	-	-
	DC Current Gain ($I_C=-1.0\text{mA}$, $V_{CE}=-1.0\text{V}$)	80	-	-
	DC Current Gain ($I_C=-10\text{mA}$, $V_{CE}=-1.0\text{V}$)	100	300	-
	DC Current Gain ($I_C=-50\text{mA}$, $V_{CE}=-1.0\text{V}$)	60	-	-
	DC Current Gain ($I_C=-100\text{mA}$, $V_{CE}=-1.0\text{V}$)	30	-	-

Electrical Characteristics (Continue)

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

Symbol	Conditions	Min	Max	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ($I_C=-10\text{mA}$, $I_B=-1.0\text{mA}$) ($I_C=-50\text{mA}$, $I_B=-5.0\text{mA}$)	- -	-0.25 -0.4	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ($I_C=-10\text{mA}$, $I_B=-1.0\text{mA}$) ($I_C=-50\text{mA}$, $I_B=-5.0\text{mA}$)	-0.65 -	-0.85 -0.95	V
f_T	Current-Gain-Bandwidth Product ($I_C=-10\text{mA}$, $V_{CE}=-20\text{V}$, $f=100\text{MHz}$)	250	-	MHz
C_{obo}	Output Capacitance ($V_{CB}=-5\text{V}$, $I_E=0\text{mA}$, $f=1.0\text{MHz}$)	-	4.5	pF
C_{ibo}	Input Capacitance ($V_{EB}=-0.5\text{V}$, $I_C=0\text{mA}$, $f=1.0\text{MHz}$)	-	10	pF
h_{ie}	Input Impedance ($I_C=-1.0\text{mA}$, $V_{CE}=-10\text{V}$, $f=1.0\text{kHz}$)	2.0	12	$\text{K}\Omega$
h_{re}	Voltage Feedback Ratio ($I_C=-1.0\text{mA}$, $V_{CE}=-10\text{V}$, $f=1.0\text{kHz}$)	0.1	10	$\times 10^{-4}$
h_{fe}	Small-Signal Current Gain ($I_C=-1.0\text{mA}$, $V_{CE}=-10\text{V}$, $f=1.0\text{kHz}$)	100	400	-
h_{oe}	Output Admittance ($I_C=-1.0\text{mA}$, $V_{CE}=-10\text{V}$, $f=1.0\text{kHz}$)	3.0	60	umhos
NF	Noise Figure ($I_C=-100\mu\text{A}$, $V_{CE}=-5\text{V}$, $R_S=1.0\text{k}\Omega$, $f=1.0\text{kHz}$)	-	4.0	dB
t_d	Delay Time ($V_{CC}=-3.0\text{V}$, $V_{BE}=0.5\text{V}$, $I_C=-10\text{mA}$, $I_{B1}=-1.0\text{mA}$)	-	35	ns
t_r	Rise Time ($V_{CC}=-3.0\text{V}$, $V_{BE}=0.5\text{V}$, $I_C=-10\text{mA}$, $I_{B1}=-1.0\text{mA}$)	-	35	ns
t_s	Storage Time ($V_{CC}=-3.0\text{V}$, $I_C=-10\text{mA}$, $I_{B1}=I_{B2}=-1.0\text{mA}$)	-	225	ns
t_f	Fall Time ($V_{CC}=-3.0\text{V}$, $I_C=-10\text{mA}$, $I_{B1}=I_{B2}=-1.0\text{mA}$)	-	75	ns

Typical Application Circuit

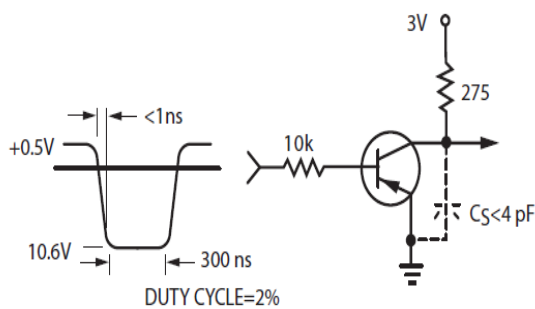


FIG.1 Delay and Rise Time
Equivalent Test Circuit

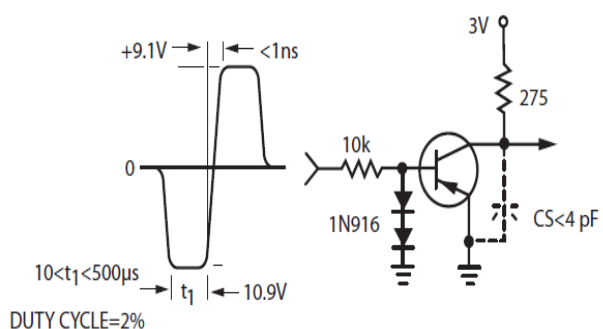


FIG.2 Storage and Fall Time
Equivalent Test Circuit

*Total shunt capacitance of test jig and connectors

Typical Performance Characteristics

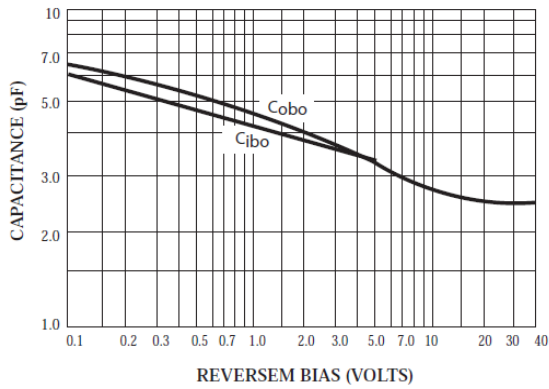


FIG.3 Capacitance

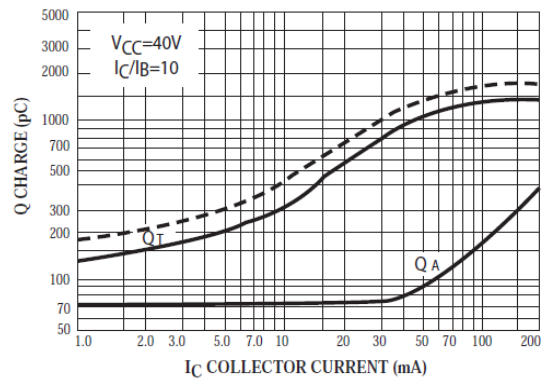


FIG.4 Charge Data

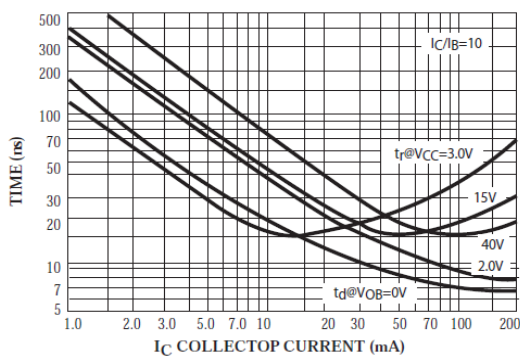


FIG.5 Turn-On Time

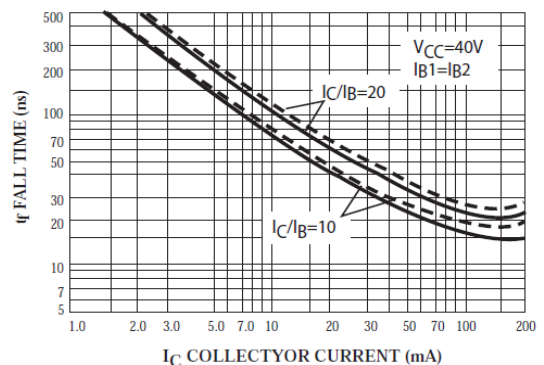


FIG.6 Fall Time

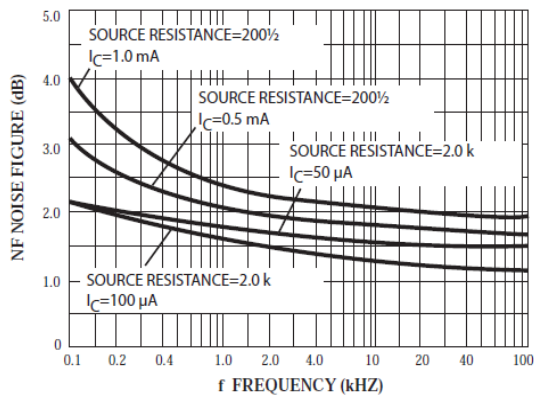


FIG.7

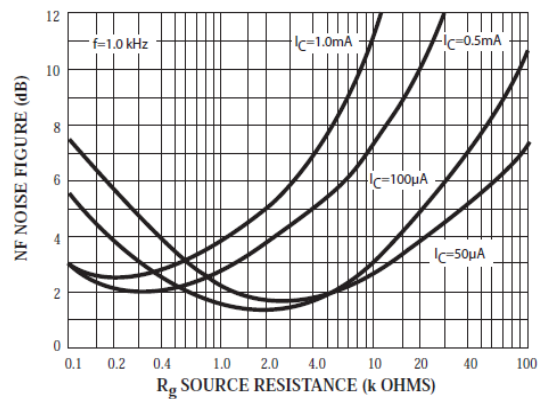


FIG.8

h PARAMETERS (VCE = -10 Vdc, f = 1.0 kHz, TA = 25°C)

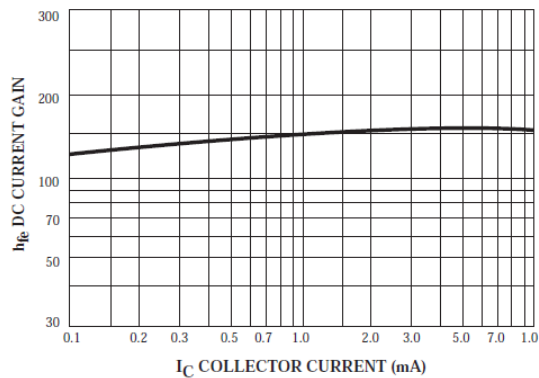


FIG.9 Current Gain

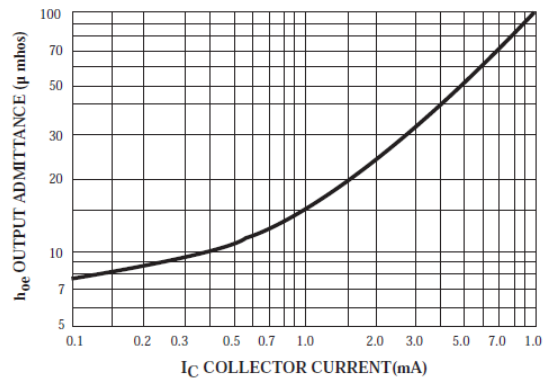


FIG.10 Input Impedance

Typical Performance Characteristics (Continue)

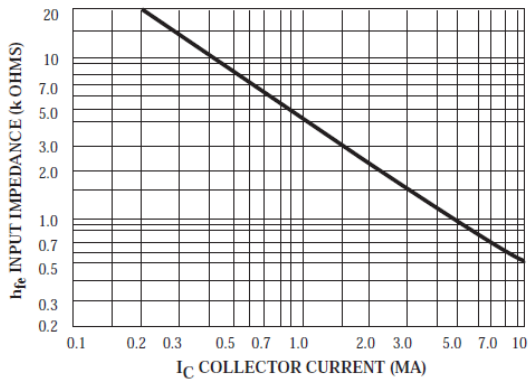


FIG.11 Input Impedance

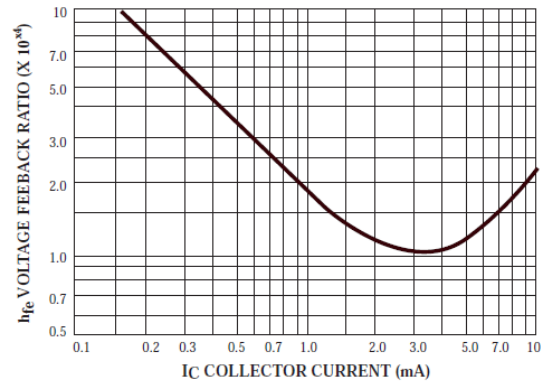


FIG.12 Voltage Feedback Ratio

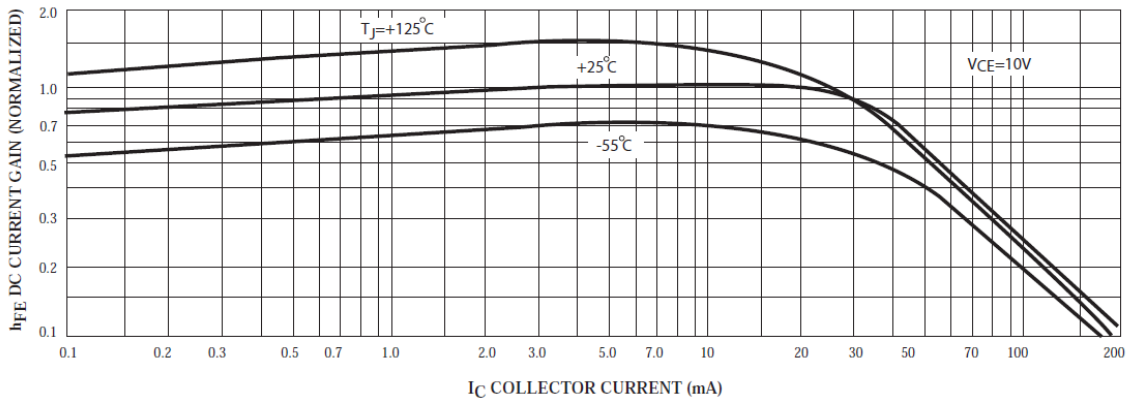


FIG.13 DC Current Gain

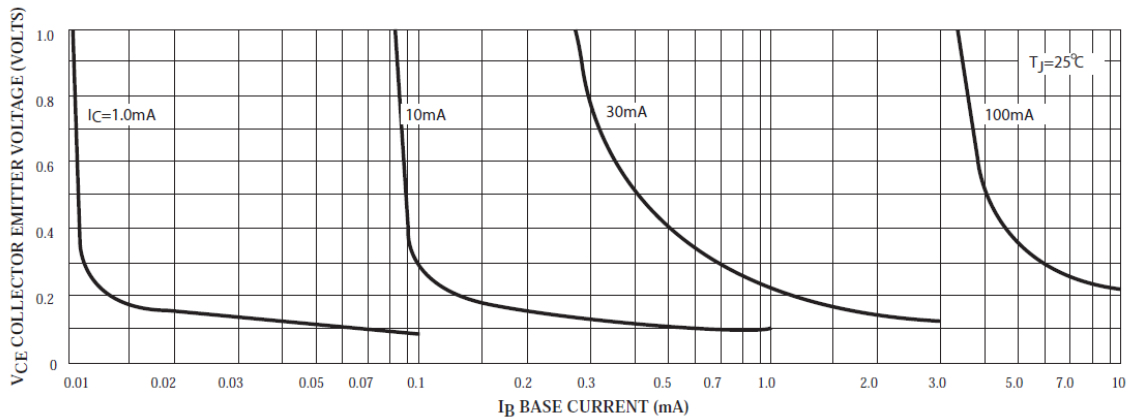


FIG.14 Collector Saturation Region

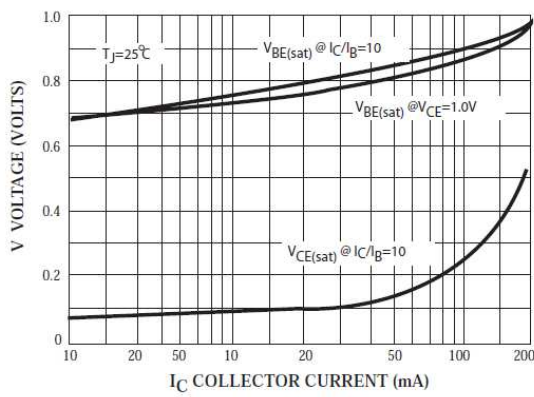


FIG.15 "ON" Voltages

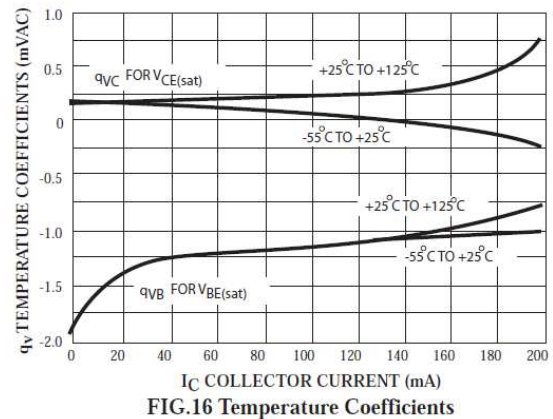
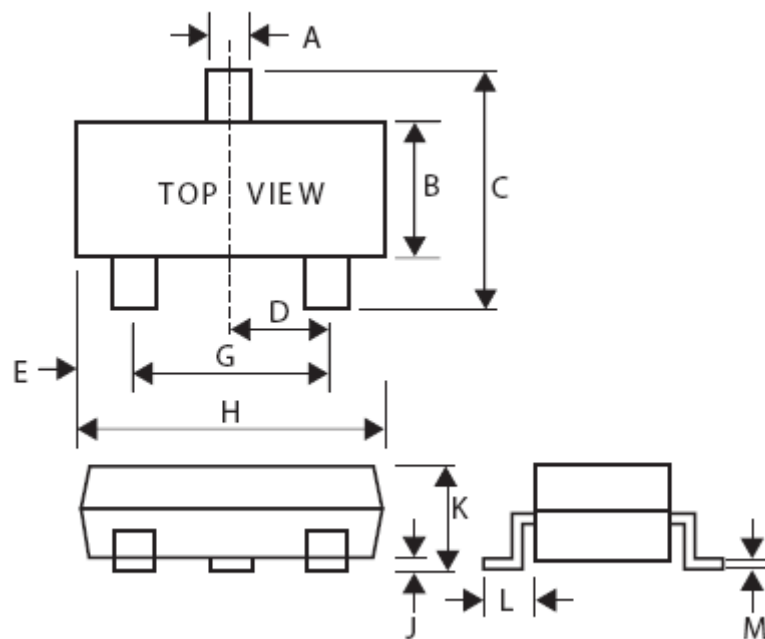


FIG.16 Temperature Coefficients

Package Dimension

SOT-323









Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.30	0.40	0.012	0.016
B	1.15	1.35	0.045	0.053
C	2.00	2.40	0.079	0.094
D	-	0.65	-	0.026
E	0.30	0.40	0.012	0.016
G	1.20	1.40	0.047	0.055
H	1.80	2.20	0.071	0.087
J	0.00	0.10	0.000	0.004
K	0.80	1.00	0.032	0.039
L	0.42	0.53	0.017	0.021
M	0.10	0.25	0.004	0.010

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CONTACT US

GS Headquarter	
	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, Taiwan (R.O.C)
	886-2-2657-9980
	886-2-2657-3630
	sales_twn@gs-power.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587