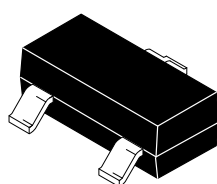


General Purpose Transistors PNP Silicon

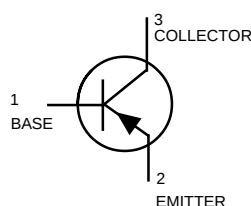
FEATURES:

- We declare that the material of product compliance with RoHS requirements.

Circuit Diagram & Pin Configuration:



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DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
TMBT3906	2A	3000/Tape&Reel

● MAXIMUM RATINGS(Ta = 25°C)

Parameter	Symbol	Limits	Unit
Collector–Emitter Voltage	V _{CEO}	–40	Vdc
Collector–Base Voltage	V _{CBO}	–40	Vdc
Emitter–Base Voltage	V _{EBO}	–5	Vdc
Collector Current — Continuous	I _C	–200	mAdc

● THERMAL CHARACTERISTICS

Total Device Dissipation, FR–5 Board (Note 1) @ T _A = 25°C Derate above 25°C	P _D	225	mW
		1.8	mW/°C
Thermal Resistance, Junction–to–Ambient(Note 1)	R _{θJA}	556	°C/W
Total Device Dissipation, Alumina Substrate (Note 2) @ T _A = 25°C Derate above 25°C	P _D	300	mW
		2.4	mW/°C
Thermal Resistance, Junction–to–Ambient(Note 2)	R _{θJA}	417	°C/W
Junction and Storage temperature	T _J , T _{stg}	–55 ~ +150	°C

1. FR–5 = 1.0×0.75×0.062 in.

2. Alumina = 0.4×0.3×0.024 in. 99.5% alumina.

●ELECTRICAL CHARACTERISTICS (Ta= 25℃)
OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage ($I_C = -1.0 \text{ mAdc}$, $I_B = 0$)	$V_{BR(CEO)}$	-40	–	–	V
Collector–Base Breakdown Voltage ($I_C = -10 \text{ } \mu\text{Adc}$, $I_E = 0$)	$V_{BR(CBO)}$	-40	–	–	V
Emitter–Base Breakdown Voltage ($I_E = -10 \text{ } \mu\text{Adc}$, $I_C = 0$)	$V_{BR(EBO)}$	-5	–	–	V
Collector Cutoff Current ($V_{CE} = -30 \text{ Vdc}$, $V_{EB} = -3.0 \text{ Vdc}$)	I_{CEX}	–	–	-50	nA
Base Cutoff Current ($V_{CE} = -30 \text{ Vdc}$, $V_{EB} = -3.0 \text{ Vdc}$)	I_{BL}	–	–	-50	nA

ON CHARACTERISTICS (Note 1.)

DC Current Gain ($I_C = -0.1 \text{ mAdc}$, $V_{CE} = -1.0 \text{ Vdc}$) ($I_C = -1.0 \text{ mAdc}$, $V_{CE} = -1.0 \text{ Vdc}$) ($I_C = -10 \text{ mAdc}$, $V_{CE} = -1.0 \text{ Vdc}$) ($I_C = -50 \text{ mAdc}$, $V_{CE} = -1.0 \text{ Vdc}$) ($I_C = -100 \text{ mAdc}$, $V_{CE} = -1.0 \text{ Vdc}$)	h_{FE}	60 80 100 60 30	– – – – –	– – 300 – –	
Collector–Emitter Saturation Voltage(3) ($I_C = -10 \text{ mAdc}$, $I_B = -1.0 \text{ mAdc}$) ($I_C = -50 \text{ mAdc}$, $I_B = -5.0 \text{ mAdc}$)	$V_{CE(sat)}$	– –	– –	-0.25 -0.4	V
Base–Emitter Saturation Voltage ($I_C = -10 \text{ mAdc}$, $I_B = -1.0 \text{ mAdc}$) ($I_C = -50 \text{ mAdc}$, $I_B = -5.0 \text{ mAdc}$)	$V_{BE(sat)}$	-0.65 –	– –	-0.85 -0.95	V

SMALL–SIGNAL CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Current–Gain — Bandwidth Product ($I_C = -10 \text{ mAdc}$, $V_{CE} = -20 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_r	250	–	–	MHz
Output Capacitance ($V_{CB} = -5.0 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{obo}	–	–	4.5	pF
Input Capacitance ($V_{EB} = -0.5 \text{ Vdc}$, $I_C = 0$, $f = 1.0 \text{ MHz}$)	C_{ibo}	–	–	10	pF
Input Impedance ($V_{CE} = -10 \text{ Vdc}$, $I_C = -1.0 \text{ mAdc}$, $f = 1.0 \text{ kHz}$)	h_{ie}	2	–	12	k Ω
Voltage Feedback Ratio ($V_{CE} = -10 \text{ Vdc}$, $I_C = -1.0 \text{ mAdc}$, $f = 1.0 \text{ kHz}$)	h_{re}	0.1	–	10	$\times 10^{-4}$
Small–Signal Current Gain ($V_{CE} = -10 \text{ Vdc}$, $I_C = -1.0 \text{ mAdc}$, $f = 1.0 \text{ kHz}$)	h_{fe}	100	–	400	
Output Admittance ($V_{CE} = -10 \text{ Vdc}$, $I_C = -1.0 \text{ mAdc}$, $f = 1.0 \text{ kHz}$)	h_{oe}	3	–	60	μmhos
Noise Figure ($V_{CE} = -5 \text{ V}$, $I_C = -100 \text{ } \mu\text{A}$, $R_S = 1.0 \text{ k}\Omega$, $f = 1.0 \text{ kHz}$)	NF	–	–	4	dB

3. Pulse Test: Pulse Width <300 μs , Duty Cycle <2.0%.

●ELECTRICAL CHARACTERISTICS (Ta= 25°C)

SWITCHING CHARACTERISTICS

Delay Time	(V _{CC} = -3.0 Vdc, V _{BE} = 0.5 Vdc, I _C = -10 mAdc, I _{B1} = -1.0 mAdc)	td	—	—	35	ns
Rise Time		tr	—	—	35	
Storage Time	(V _{CC} = -3.0 Vdc, I _C = -10 mAdc, I _{B1} = I _{B2} = -1.0 mAdc)	ts	—	—	225	
Fall Time		tf	—	—	75	

Electrical Characteristics Curves

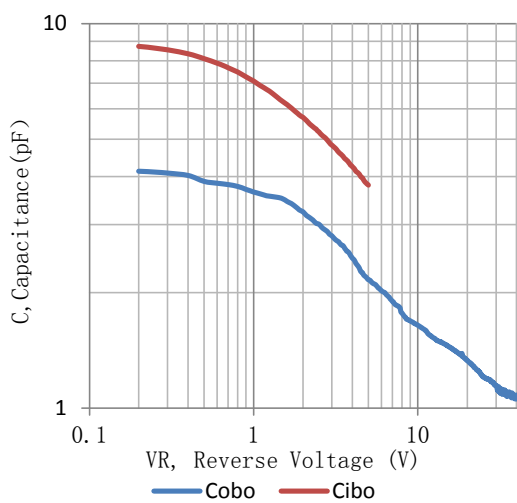


Figure 1. Capacitance

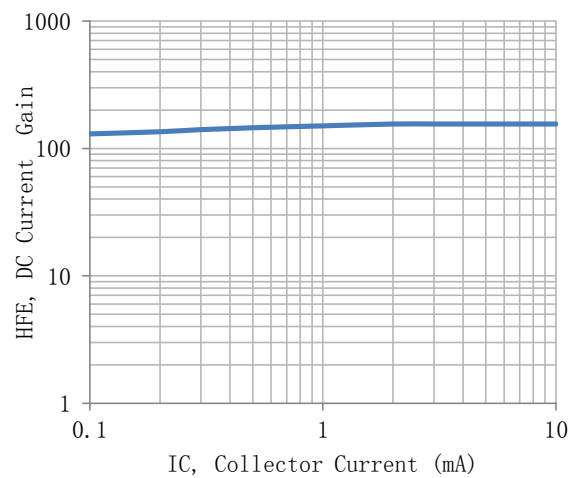


Figure 2. Current Gain

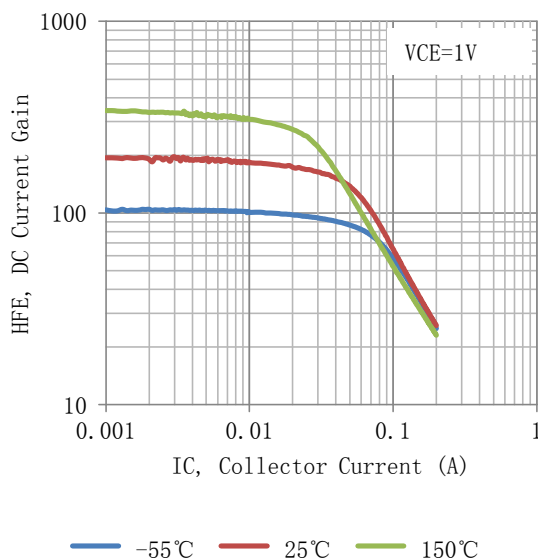


Figure 3. DC Current Gain

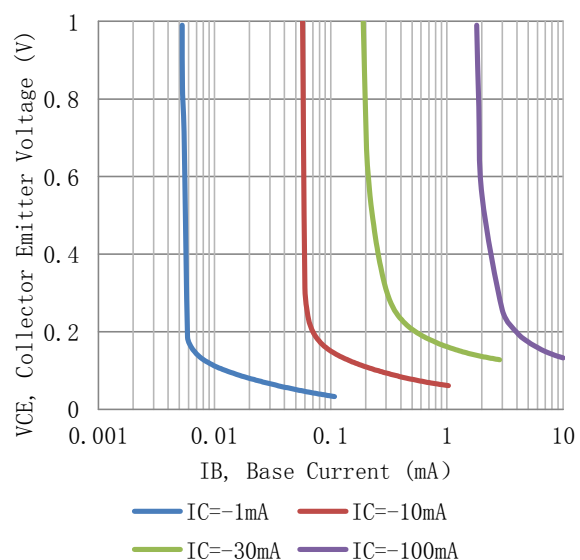


Figure 4. Collector Saturation Region

Electrical Characteristics Curves

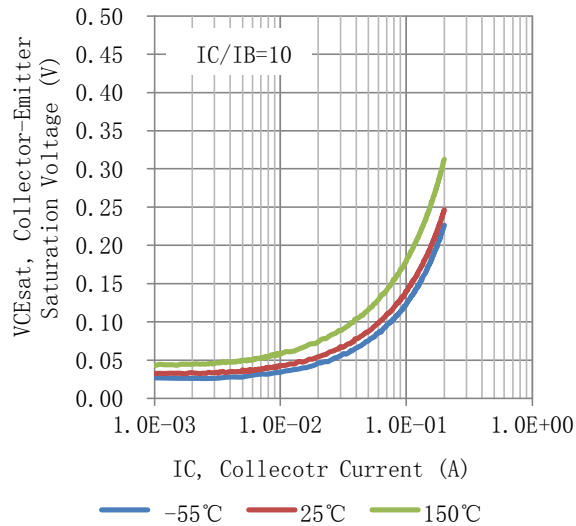


Figure 5. Collector-Emitter Saturation Voltage vs. Collector Current

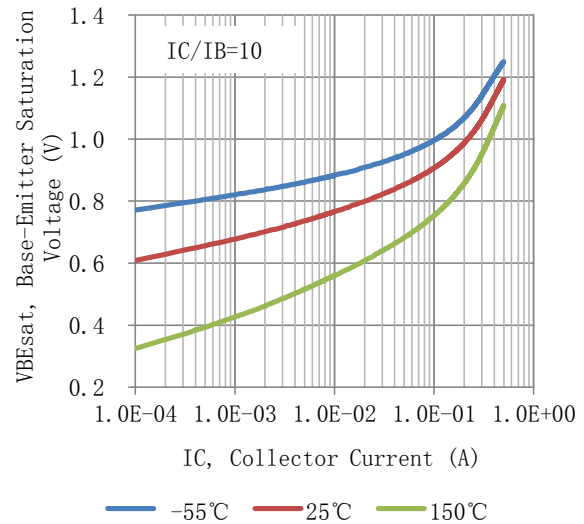


Figure 6. Base-Emitter Saturation Voltage vs. Collector Current

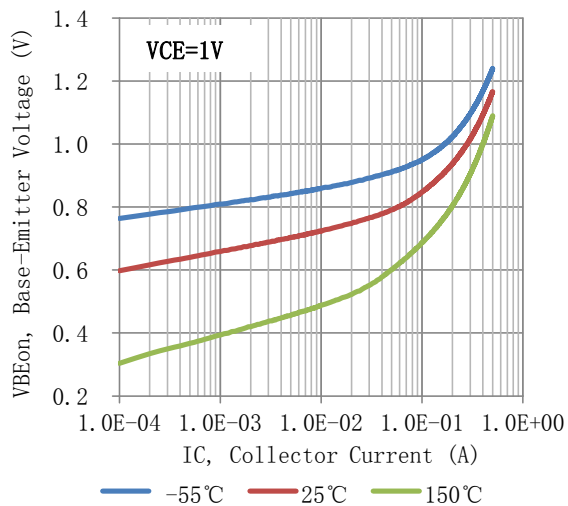
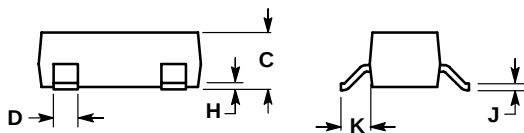
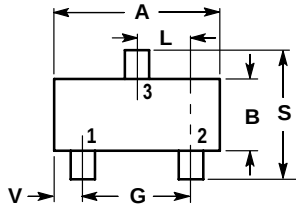


Figure 7. Base-Emitter Voltage vs. Collector Current

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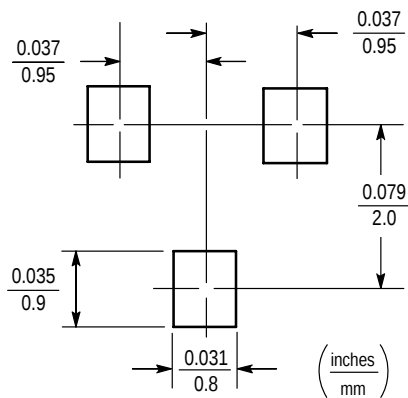


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

PIN 1. BASE
2. EMITTER
3. COLLECTOR



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