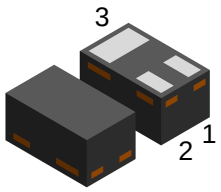
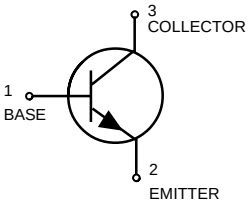
General Purpose Transistors
NPN Silicon

LMBT3904N3T5G

S-LMBT3904N3T5G



SOT883



●FEATURES

1) We declare that the material of product compliant with RoHS requirements and Halogen Free.
2) S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

●DEVICE MARKING AND RESISTOR VALUES

Device	Marking	Shipping
LMBT3904N3T5G	1A	10000/Tape&Reel

●MAXIMUM RATINGS(Ta = 25℃)

Parameter	Symbol	Limits	Unit
Collector–Emitter Voltage	V_{CEO}	40	Vdc
Collector–Base Voltage	V_{CBO}	60	Vdc
Emitter–Base Voltage	V_{EBO}	6	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	250 2	mW mW/℃
Thermal Resistance, Junction–to–Ambient(Note 1)	$R_{\Theta JA}$	500	℃/W
Junction and Storage temperature	T_J,Tstg	−55～+150	℃

1. FR–5 = 1.0×0.75×0.062 in.

●ELECTRICAL CHARACTERISTICS (Ta= 25℃)

OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	$V_{BR(CEO)}$	40	–	–	V
Collector–Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	$V_{BR(CBO)}$	60	–	–	V
Emitter–Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	$V_{BR(EBO)}$	6	–	–	V
Collector Cutoff Current (V_{CE} = 30 Vdc, V_{EB} = 3.0Vdc)	I_{CEX}	–	–	50	nA
Base Cutoff Current (V_{CE} = 30 Vdc, V_{EB} = 3.0 Vdc)	I_{BL}	–	–	50	nA

ON CHARACTERISTICS (Note 2.)

DC Current Gain	h_{FE}				
(I_C = 0.1 mAdc, V_{CE} = 1.0 Vdc)		40	–	–	
(I_C = 1.0 mAdc, V_{CE} = 1.0 Vdc)		70	–	–	
(I_C = 10 mAdc, V_{CE} = 1.0 Vdc)		100	–	300	
(I_C = 50 mAdc, V_{CE} = 1.0 Vdc)		60	–	–	
(I_C = 100 mAdc, V_{CE} = 1.0 Vdc)		30	–	–	

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ON CHARACTERISTICS (Note 2.)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Saturation Voltage(2) (I_C = 10 mAdc, I_B = 1.0 mAdc) (I_C = 50mAdc, I_B = 5.0 mAdc)	$V_{CE(sat)}$	 – –	 – –	 0.2 0.3	V
Base–Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc) (I_C = 50mAdc, I_B = 5.0 mAdc)	$V_{BE(sat)}$	 0.65 –	 – –	 0.85 0.95	V
SMALL–SIGNAL CHARACTERISTICS					
Current–Gain — Bandwidth Product (I_C = 10mAdc, V_{CE}= 20Vdc, f = 100MHz)	f_T	 300	 –	 –	MHz
Output Capacitance (V_{CB} = 5.0 Vdc, I_E = 0, f = 1.0 MHz)	C_{obo}	 –	 –	 4	pF
Input Capacitance (V_{EB} = 0.5 Vdc, I_C = 0, f = 1.0 MHz)	C_{ibo}	 –	 –	 8	pF
Input Impedance (V_{CE}= 10 Vdc, I_C = 1.0 mAdc, f = 1.0 kHz)	h_{ie}	 1	 –	 10	k Ω
Voltage Feedback Ratio (V_{CE}= 10 Vdc, I_C = 1.0 mAdc, f = 1.0 kHz)	h_{re}	 0.5	 –	 8	X 10^{-4}
Small–Signal Current Gain (V_{CE}= 10 Vdc, I_C = 1.0 mAdc, f = 1.0 kHz)	h_{fe}	 100	 –	 400	
Output Admittance (V_{CE}= 10 Vdc, I_C = 1.0 mAdc, f = 1.0 kHz)	h_{oe}	 1	 –	 40	μmhos
Noise Figure (V_{CE}=5V, I_C=100μA, R_S=1.0kΩ , f =1.0kHz)	NF	 –	 –	 5	dB
SWITCHING CHARACTERISTICS					
Delay Time	(V_{CC} = 3.0 Vdc, V_{BE}= – 0.5 Vdc, I_C = 10 mAdc, I_{B1} = 1.0 mAdc)	t_d	–	–	35	ns
Rise Time		t_r	–	–	35	
Storage Time	(V_{CC} = 3.0 Vdc, I_C = 10 mAdc, I_{B1} = I_{B2} = 1.0 mAdc)	t_s	–	–	200	
Fall Time		t_f	–	–	50	

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

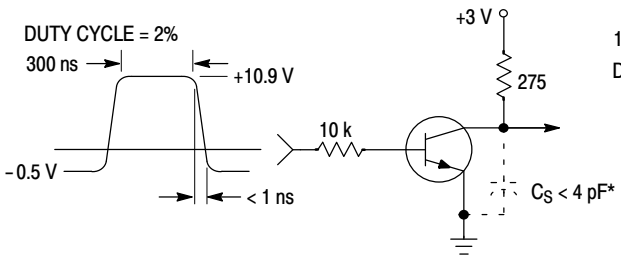

Figure 1. Delay and Rise Time Equivalent Test Circuit

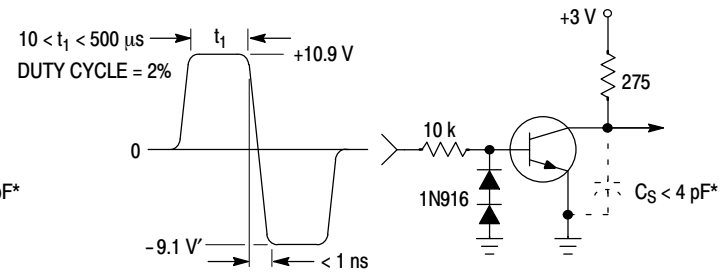

Figure 2. Storage and Fall Time Equivalent Test Circuit

* Total shunt capacitance of test jig and connectors

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ELECTRICAL CHARACTERISTICS CURVES

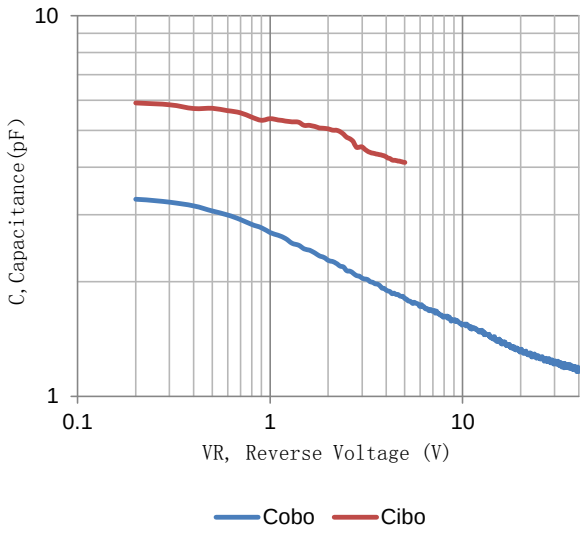

Figure 3. Capacitance

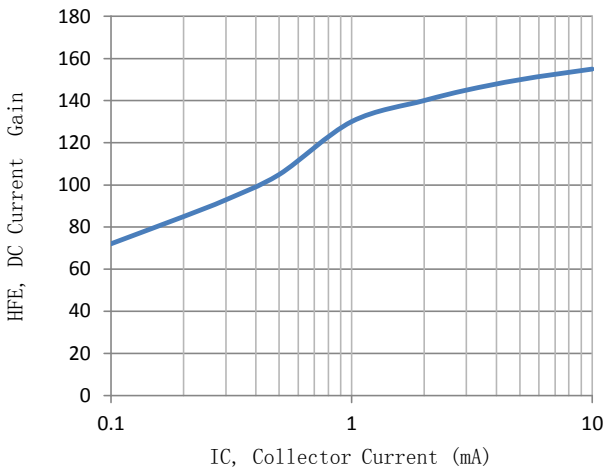

Figure 4. Current Gain

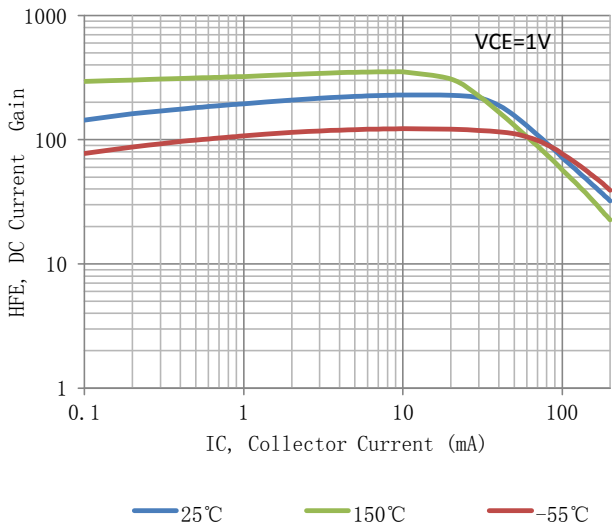

Figure 5. DC Current Gain

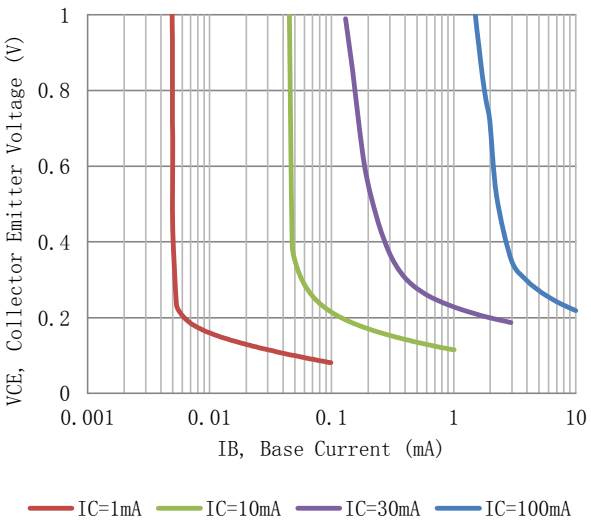

Figure 6. Collector Saturation Region

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ELECTRICAL CHARACTERISTICS CURVES

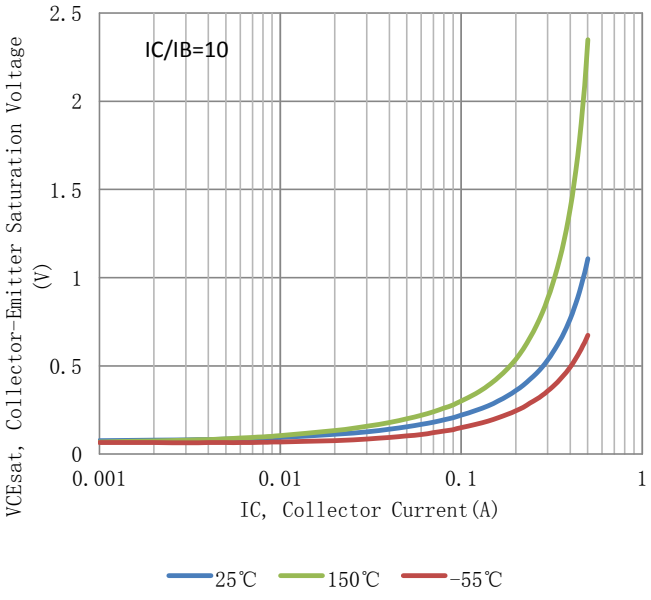

Figure 7. VCE(sat) vs. IC

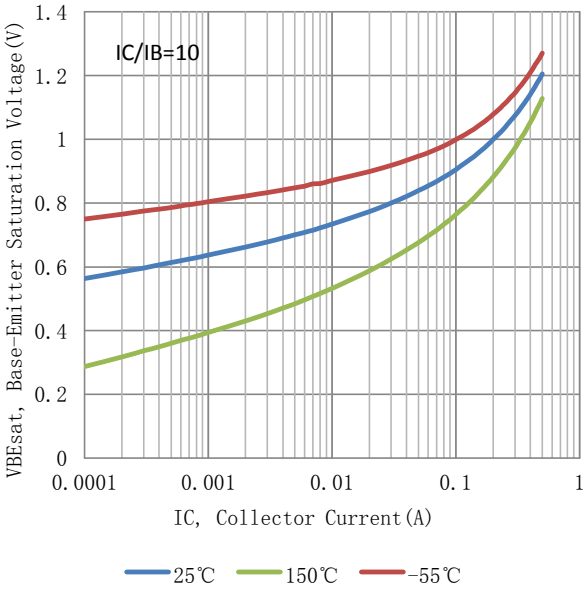

Figure 8. VBE(sat) vs. IC

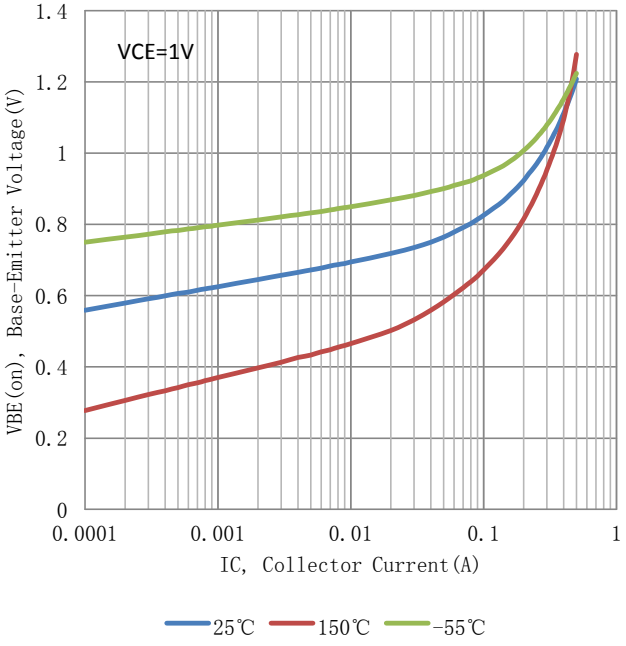

Figure 9. VBE(on) vs. IC

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DIMENSION OUTLINE: Unit:mm