

Dual Bias Resistor Transistors PNP Silicon

The LMBT3906DW1T1G device is a spin-off of our popular SOT-23/SOT-323 three-leaded device. It is designed for general purpose amplifier applications and is housed in the SOT-363 six-leaded surface mount package. By putting two discrete devices in one package, this device is ideal for low-power surface mount applications where board space is at a premium.

● FEATURES

- 1) hFE, 100–300
- 2) Low VCE(sat), ≤ 0.4 V
- 3) Simplifies Circuit Design
- 4) Reduces Board Space
- 5) Reduces Component Count
- 6) We declare that the material of product compliant with RoHS requirements and Halogen Free.
- 7) S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

● DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
LMBT3906DW1T1G	A2	3000/Tape&Reel
LMBT3906DW1T3G	A2	10000/Tape&Reel

● MAXIMUM RATINGS(Ta = 25°C)

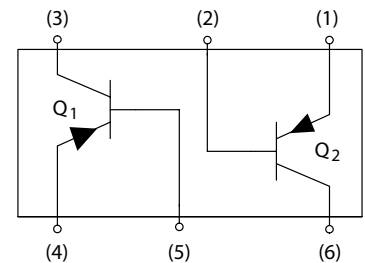
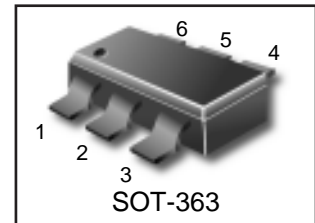
Parameter	Symbol	Limits	Unit
Collector–Emitter Voltage	V _{CEO}	–40	Vdc
Collector–Base Voltage	V _{CBO}	–40	Vdc
Emitter–Base Voltage	V _{EBO}	–5	Vdc
Collector Current — Continuous	I _C	–200	mAdc

● THERMAL CHARACTERISTICS

Total Device Dissipation, (Note 1) @ T _A = 25°C	P _D	150	mW
Thermal Resistance, Junction–to–Ambient	R _{θJA}	833	°C/W
Junction and Storage temperature	T _J , T _{stg}	–55 ~ +150	°C

1. Device mounted on FR4 glass epoxy printed circuit board using the minimum recommended footprint.

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● ELECTRICAL CHARACTERISTICS (Ta= 25°C)

OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage (I _C = –1.0 mA _{dc} , I _B = 0)	V _{BR(CEO)}	–40	–	–	V
Collector–Base Breakdown Voltage (I _C = –10 μA _{dc} , I _E = 0)	V _{BR(CBO)}	–40	–	–	V
Emitter–Base Breakdown Voltage (I _E = –10 μA _{dc} , I _C = 0)	V _{BR(EBO)}	–5	–	–	V
Collector Cutoff Current (V _{CE} = –30 V _{dc} , V _{EB} = –3.0V _{dc})	I _{CEx}	–	–	–50	nA
Base Cutoff Current (V _{CE} = –30 V _{dc} , V _{EB} = –3.0V _{dc})	I _{BL}	–	–	–50	nA

ON CHARACTERISTICS (Note 1.)

DC Current Gain (I _C = –0.1 mA _{dc} , V _{CE} = –1.0 V _{dc}) (I _C = –1.0 mA _{dc} , V _{CE} = –1.0 V _{dc}) (I _C = –10 mA _{dc} , V _{CE} = –1.0 V _{dc}) (I _C = –50 mA _{dc} , V _{CE} = –1.0 V _{dc}) (I _C = –100 mA _{dc} , V _{CE} = –1.0 V _{dc})	h _{FE}	60 80 100 60 30	– – – – –	– – 300 – –	
Collector–Emitter Saturation Voltage(3) (I _C = –10 mA _{dc} , I _B = –1.0 mA _{dc}) (I _C = –50mA _{dc} , I _B = –5.0 mA _{dc})	V _{CE(sat)}	– –	– –	–0.25 –0.4	V
Base–Emitter Saturation Voltage (I _C = –10 mA _{dc} , I _B = –1.0 mA _{dc}) (I _C = –50mA _{dc} , I _B = –5.0 mA _{dc})	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 = –10mA _{dc} , V _{CE} = –20V _{dc} , f = 100MHz)	f _T	250	–	–	MHz
Output Capacitance (V _{CB} = –5.0 V _{dc} , I _E = 0, f = 1.0 MHz)	C _{obo}	–	–	4.5	pF
Input Capacitance (V _{EB} = –0.5 V _{dc} , I _C = 0, f = 1.0 MHz)	C _{ibo}	–	–	10	pF
Input Impedance (V _{CE} = –10 V _{dc} , I _C = –1.0 mA _{dc} , f = 1.0 kHz)	h _{ie}	2	–	12	k Ω
Voltage Feedback Ratio (V _{CE} = –10 V _{dc} , I _C = –1.0 mA _{dc} , f = 1.0 kHz)	h _{re}	0.1	–	10	X 10 ^{–4}
Small–Signal Current Gain (V _{CE} = –10 V _{dc} , I _C = –1.0 mA _{dc} , f = 1.0 kHz)	h _{fe}	100	–	400	
Output Admittance (V _{CE} = –10 V _{dc} , I _C = –1.0 mA _{dc} , f = 1.0 kHz)	h _{oe}	3	–	60	μmhos
Noise Figure (V _{CE} = –5V, I _C = –100μA, R _S = 1.0kΩ, f = 1.0kHz)	NF	–	–	4	dB

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

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● 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)	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	-	-	225	
Fall Time		t _f	-	-	75	

Electrical Characteristics Curves

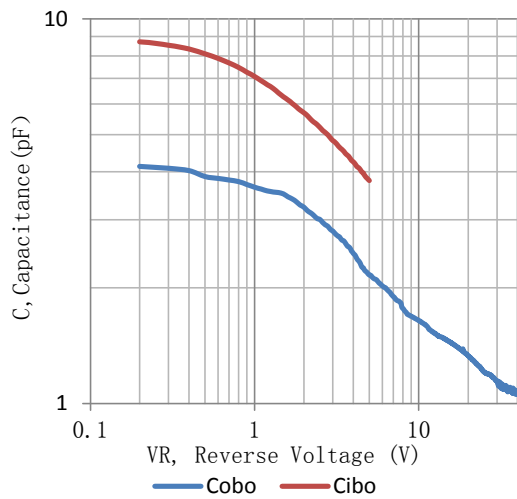


Figure 1. Capacitance

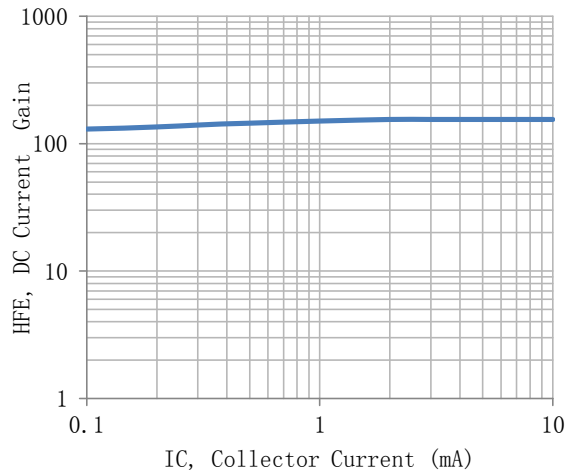


Figure 2. Current Gain

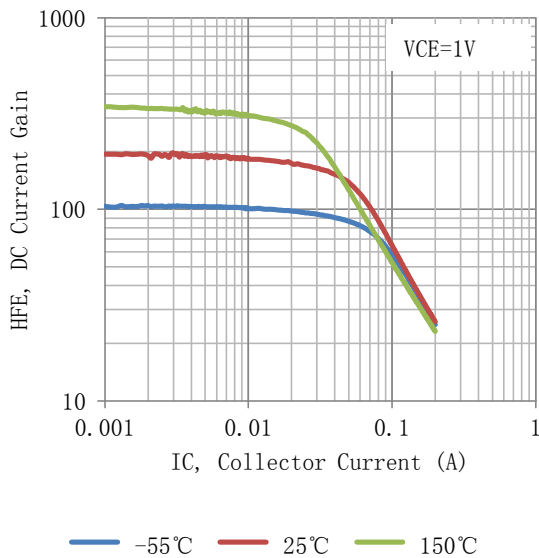


Figure 3. DC Current Gain

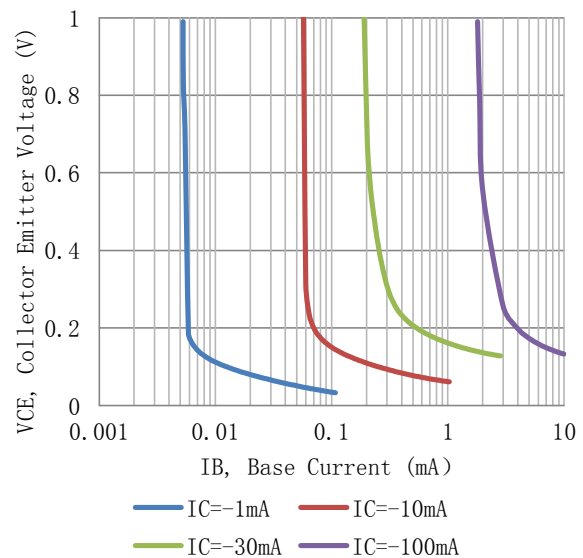


Figure 4. Collector Saturation Region

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Electrical Characteristics Curves

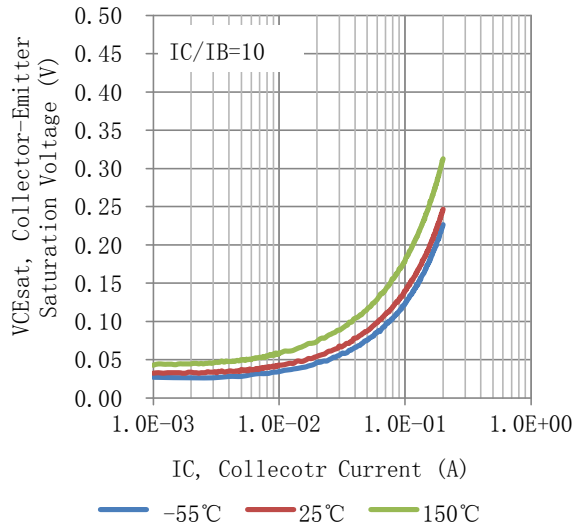


Figure 5. Collector Emitter Saturation Voltage vs. Collector Current

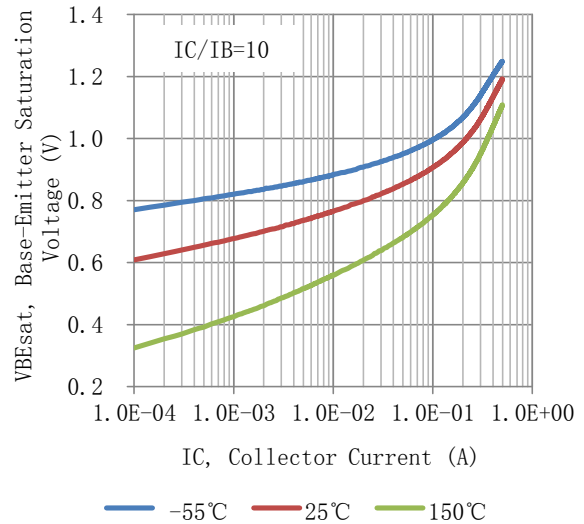


Figure 6. Base Emitter Saturation Voltage vs. Collector Current

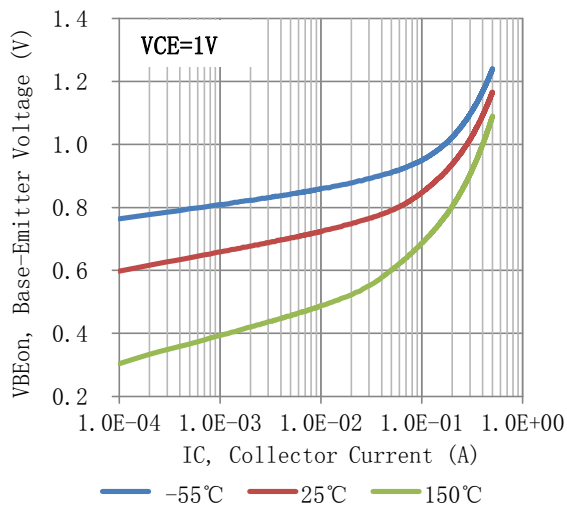
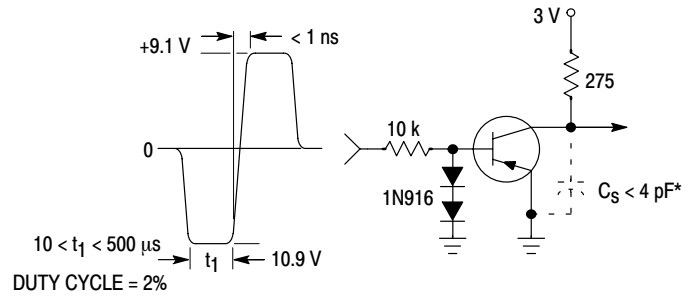
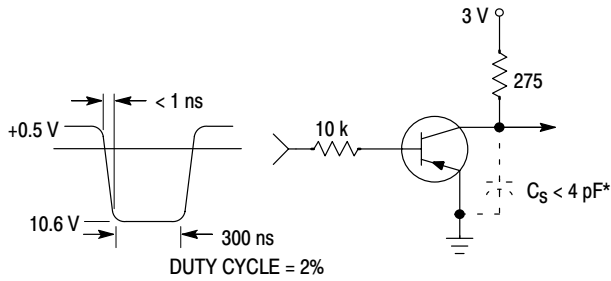


Figure 7. Base Emitter Voltage vs. Collector Current

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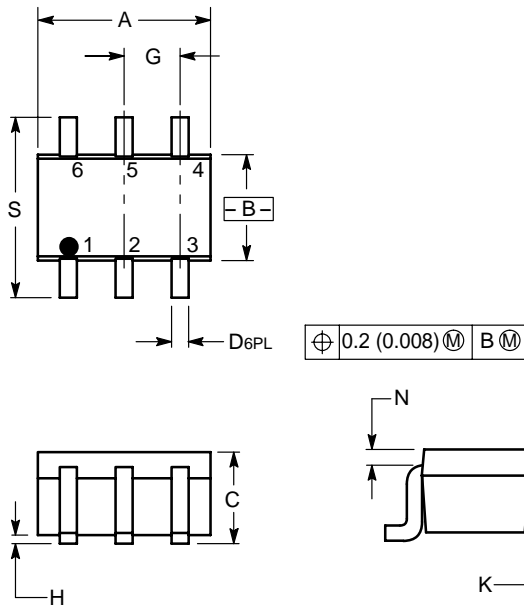
* Total shunt capacitance of test jig and connectors

Figure 8. Delay and Rise Time Equivalent Test

Figure 9. Storage and Fall Time Equivalent Test

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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	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	---	0.004	---	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF		0.20 REF	
S	0.079	0.087	2.00	2.20

- PIN 1. EMITTER 2
- 2. BASE 2
- 3. COLLECTOR 1
- 4. EMITTER 1
- 5. BASE 1
- 6. COLLECTOR 2

