

DUAL NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

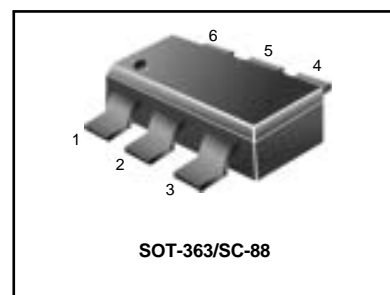
FEATURE

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

LMBT5551DW1T1G
S-LMBT5551DW1T1G

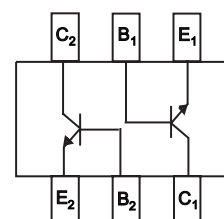
DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
LMBT5551DW1T1G S-LMBT5551DW1T1G	G1	3000/Tape&Reel
LMBT5551DW1T3G S-LMBT5551DW1T3G	G1	10000/Tape&Reel



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CE0}	140	Vdc
Collector–Base Voltage	V_{CBO}	160	Vdc
Emitter–Base Voltage	V_{EBO}	6.0	Vdc
Collector Current — Continuous	I_C	600	mAdc



THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR– 5 Board, (1) $T_A = 25^\circ\text{C}$	P_D	225	mW
Derate above 25°C		1.8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, (2) $T_A = 25^\circ\text{C}$	P_D	300	mW
Derate above 25°C		2.4	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage(3) ($I_C = 1.0 \text{ mAdc}, I_B = 0$)	$V_{(BR)CEO}$	160	—	Vdc
Collector–Base Breakdown Voltage ($I_C = 100 \mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$	180	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	6.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 120\text{Vdc}, I_E = 0$)	I_{CBO}	—	50	nAdc
($V_{CB} = 120\text{Vdc}, I_E = 0, T_A = 100^\circ\text{C}$)		—	50	μAdc
Emitter Cutoff Current ($V_{BE} = 4.0\text{Vdc}, I_C = 0$)	I_{EBO}	—	50	nAdc

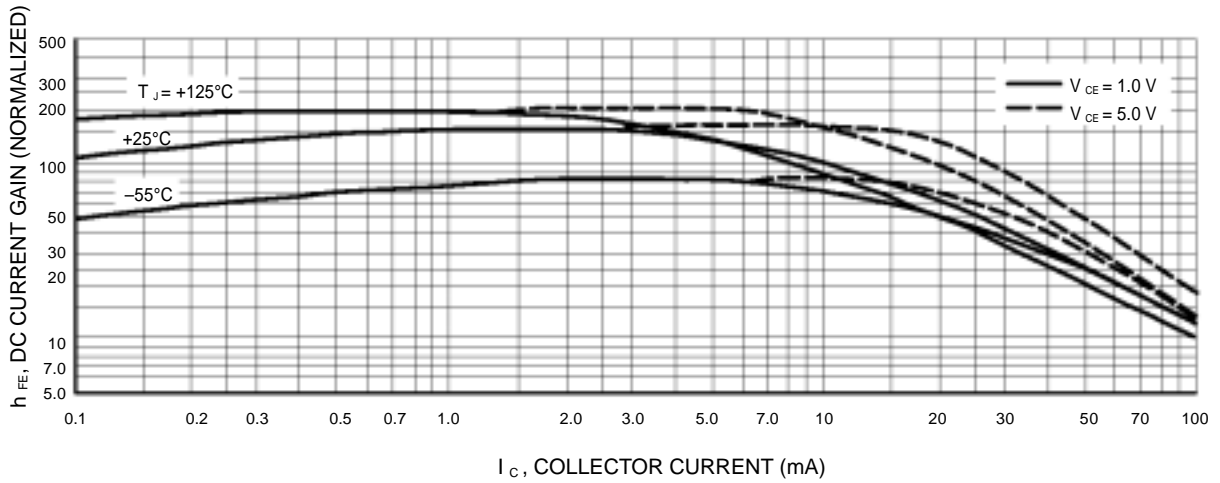
1. FR–5 = 1.0 x 0.75 x 0.062 in.
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.
3. Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2.0%.

LMBT5551DW1T1G , S-LMBT5551DW1T1G

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

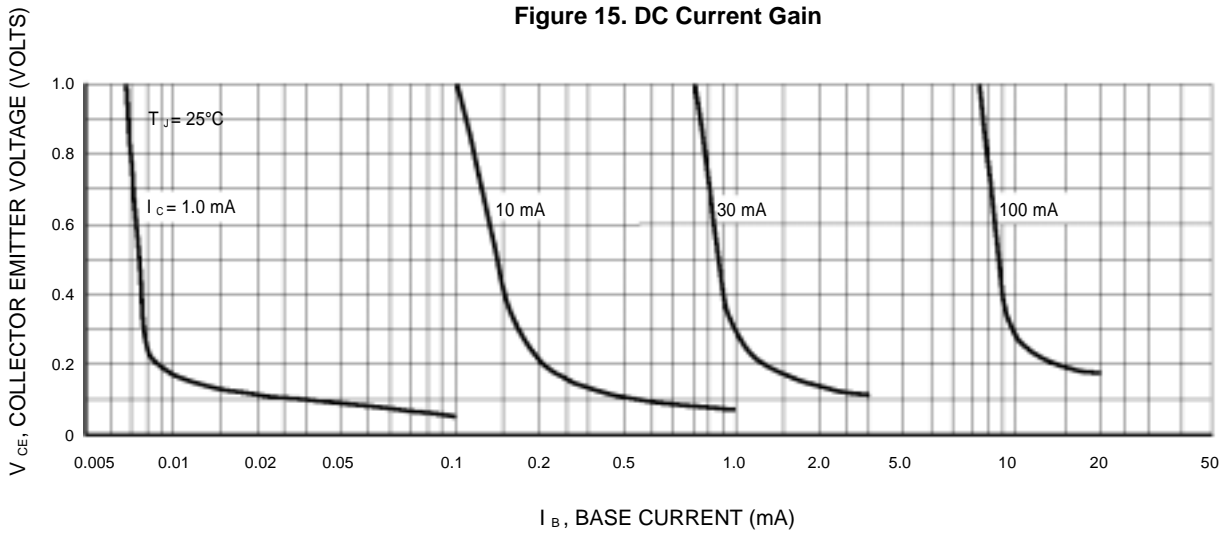
Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain (I _C = 1.0 mA _{dc} , V _{CE} = 5.0 V _{dc})	h_{FE}	80	—	—
(I _C = 10 mA _{dc} , V _{CE} = 5.0 V _{dc})		80	250	
(I _C = 50 mA _{dc} , V _{CE} = 5.0V _{dc})		30	—	
Collector–Emitter Saturation Voltage (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc})	$V_{CE(sat)}$	—	0.15	V _{dc}
(I _C = 50 mA _{dc} , I _B = 5.0 mA _{dc})		—	0.20	
Base–Emitter Saturation Voltage (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc})	$V_{BE(sat)}$	—	1.0	V _{dc}
(I _C = 50 mA _{dc} , I _B = 5.0 mA _{dc})		—	1.0	

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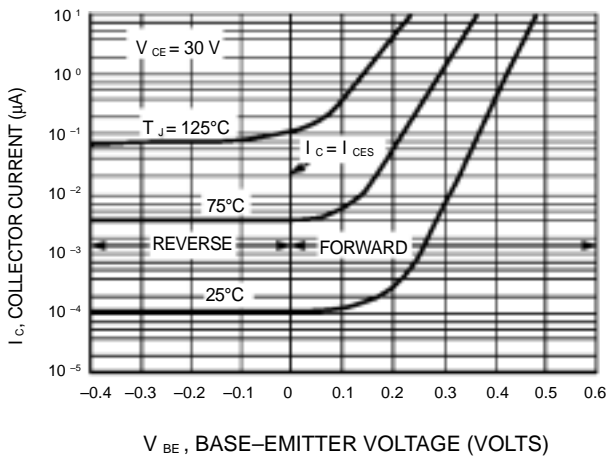
I_C , COLLECTOR CURRENT (mA)

Figure 15. DC Current Gain



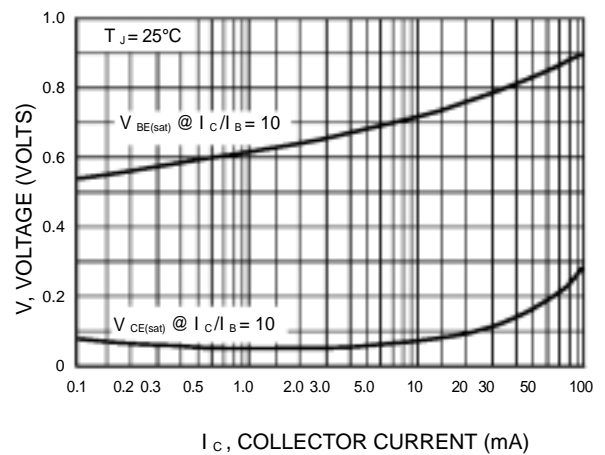
I_B , BASE CURRENT (mA)

Figure 16. Collector Saturation Region



V_{BE} , BASE-EMITTER VOLTAGE (VOLTS)

Figure 3. Collector Cut-Off Region



I_C , COLLECTOR CURRENT (mA)

Figure 4. "On" Voltages

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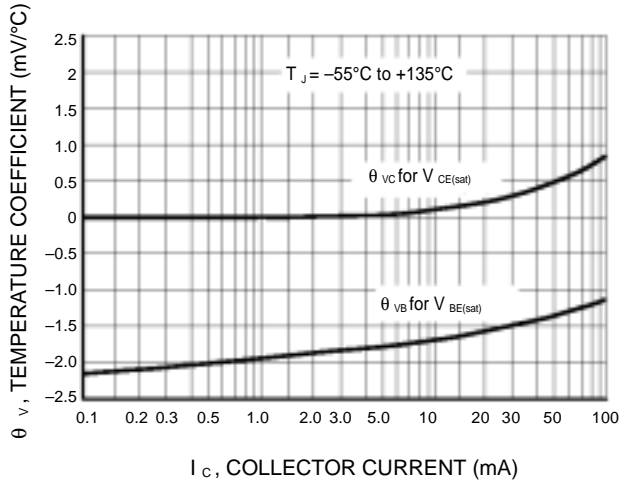
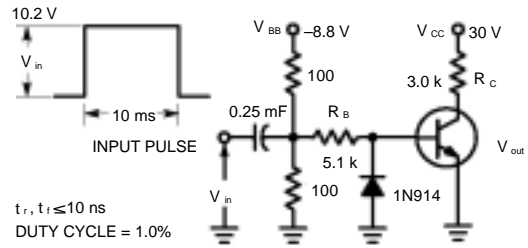


Figure 5. Temperature Coefficients



Values Shown are for $I_c @ 10 \text{ mA}$
Figure 6. Switching Time Test Circuit

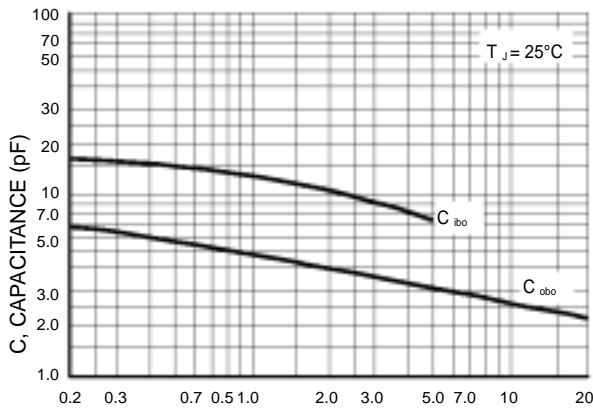
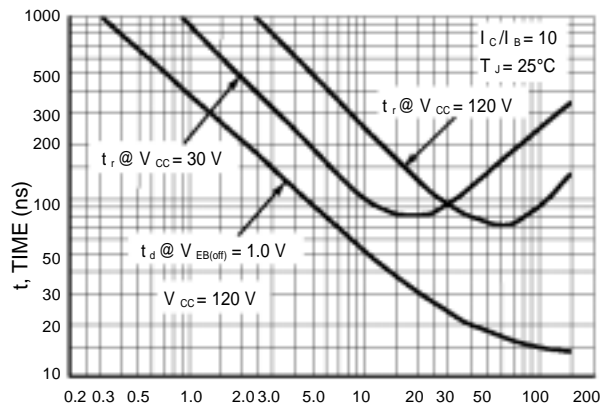


Figure 7. Capacitances Figure



8. Turn-On Time

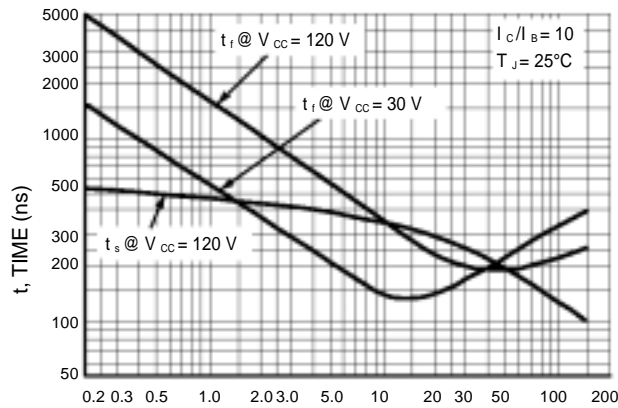
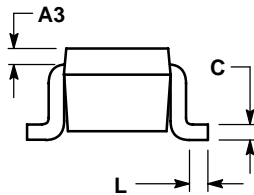
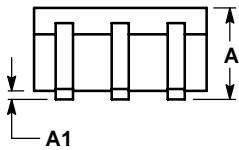
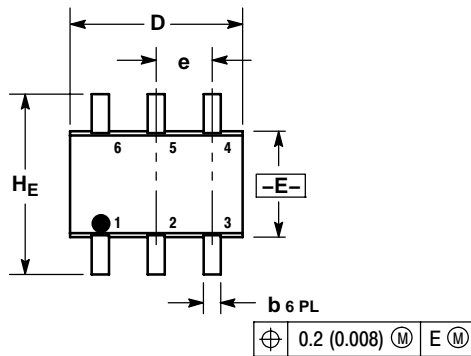


Figure 9. Turn-Off Time

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SC-88

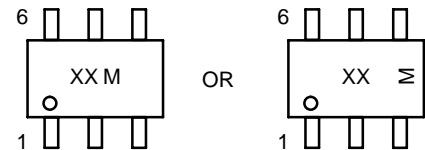


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419B-01 OBSOLETE, NEW STANDARD 419B-02.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.95	1.10	0.031	0.037	0.043
A1	0.00	0.05	0.10	0.000	0.002	0.004
A3	0.20 REF			0.008 REF		
b	0.10	0.21	0.30	0.004	0.008	0.012
C	0.10	0.14	0.25	0.004	0.005	0.010
D	1.80	2.00	2.20	0.070	0.078	0.086
E	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.10	0.20	0.30	0.004	0.008	0.012
HE	2.00	2.10	2.20	0.078	0.082	0.086

GENERIC MARKING DIAGRAM*



XX = Specific Device Code
M = Date Code