

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.

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_{CEO}	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	$^\circ\text{C/W}$
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	$^\circ\text{C/W}$
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.)

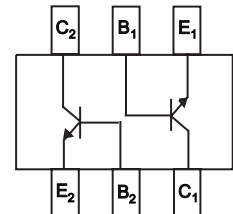
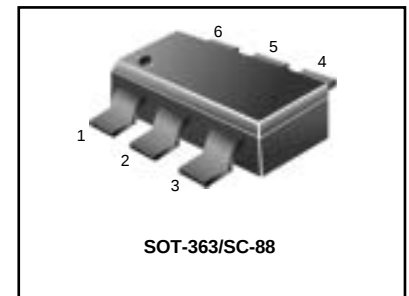
Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage(3) ($I_C = 1.0\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	160	—	Vdc
Collector–Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{A}$, $I_E = 0$)	$V_{(BR)CBO}$	180	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{A}$, $I_C = 0$)	$V_{(BR)EBO}$	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 = $1.0 \times 0.75 \times 0.062\text{ in.}$
2. Alumina = $0.4 \times 0.3 \times 0.024\text{ in.}$ 99.5% alumina.
3. Pulse Test: Pulse Width = $300\text{ }\mu\text{s}$, Duty Cycle = 2.0%.

LMBT5551DW1T1G
S-LMBT5551DW1T1G

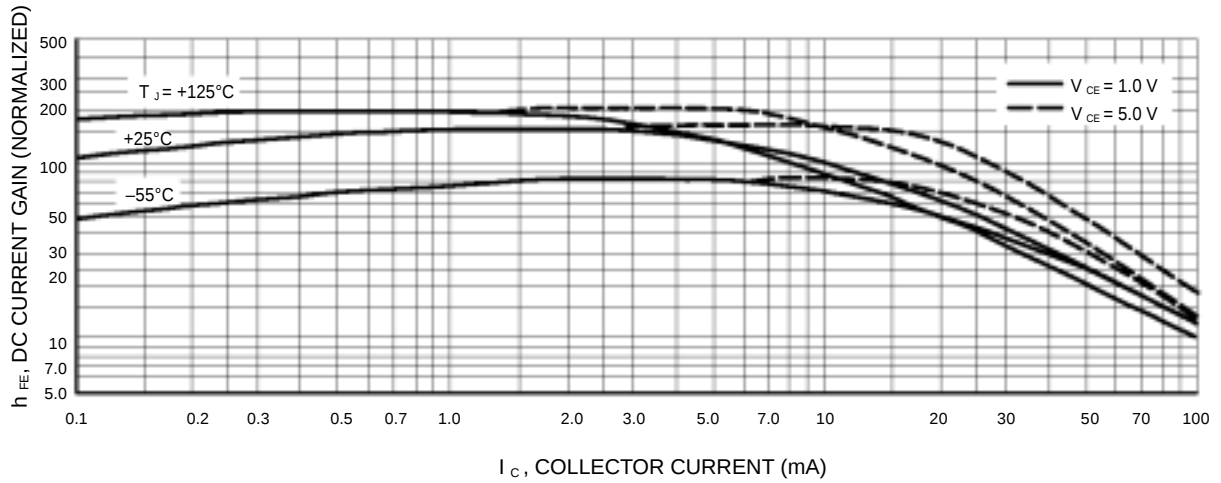


LMBT5551DW1T1G , S-LMBT5551DW1T1G

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

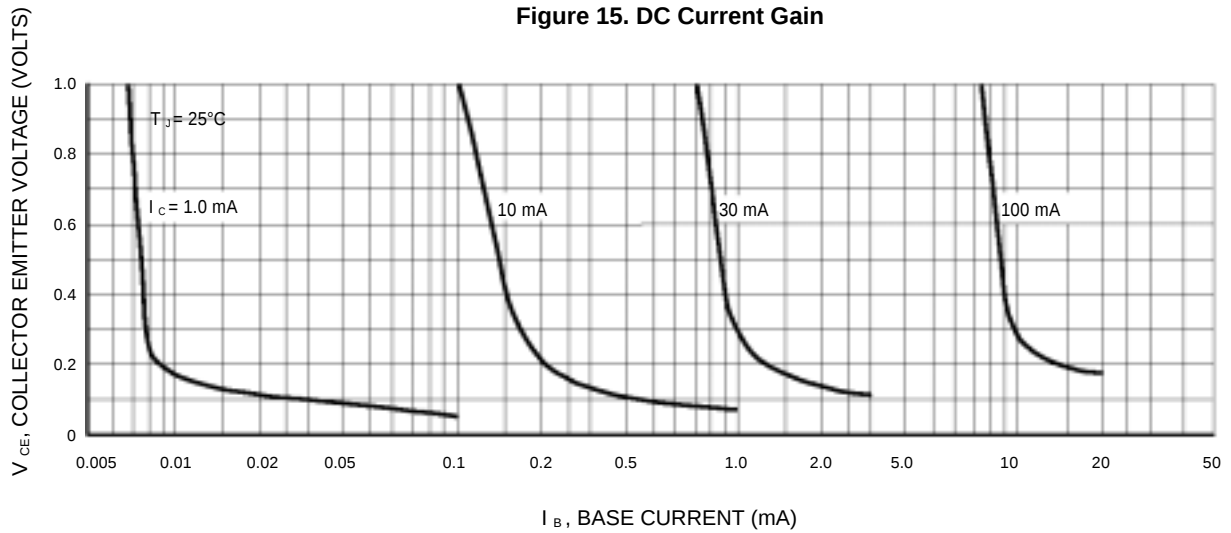
Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain (I _C = 1.0 mAdc, V _{CE} = 5.0 Vdc)	h _{FE}	80	—	—
(I _C = 10 mAdc, V _{CE} = 5.0 Vdc)		80	250	
(I _C = 50 mAdc, V _{CE} = 5.0Vdc)		30	—	
Collector–Emitter Saturation Voltage (I _C = 10 mAdc, I _B = 1.0 mAdc)	V _{CE(sat)}	—	0.15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

LMBT5551DW1T1G , S-LMBT5551DW1T1G



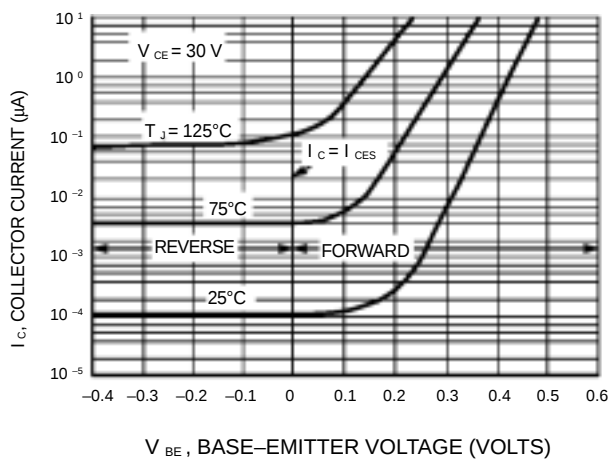
I_C , COLLECTOR CURRENT (mA)

Figure 15. DC Current Gain



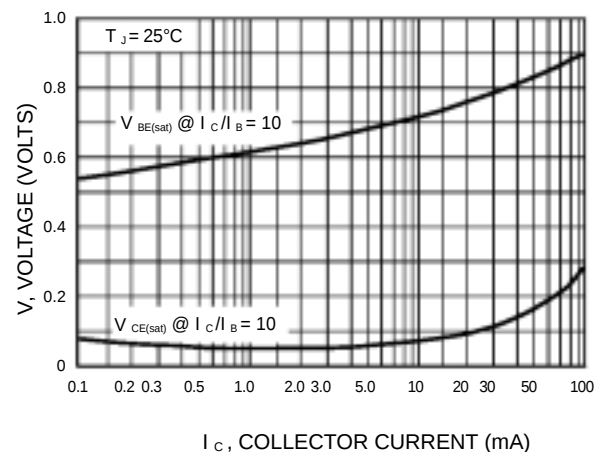
I_B , BASE CURRENT (mA)

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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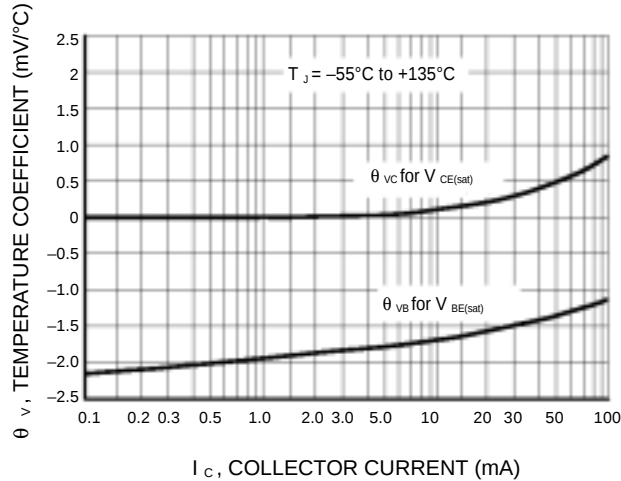
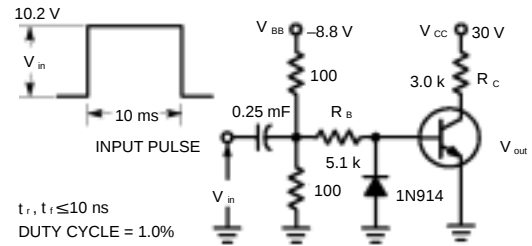


Figure 5. Temperature Coefficients



Values Shown are for $I_C @ 10 \text{ mA}$

Figure 6. Switching Time Test Circuit

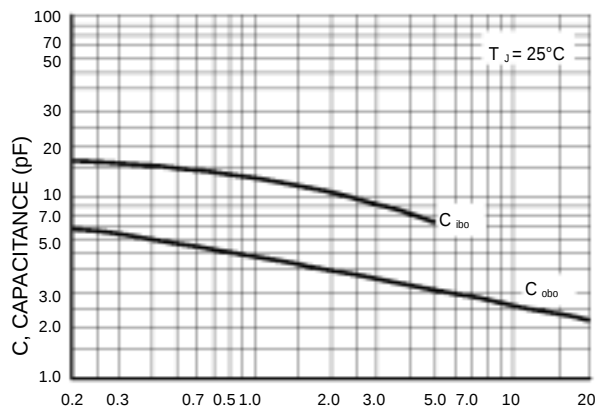
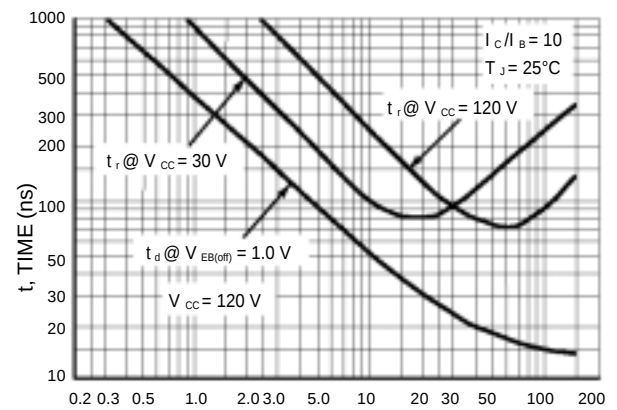


Figure 7. Capacitances



8. Turn-On Time

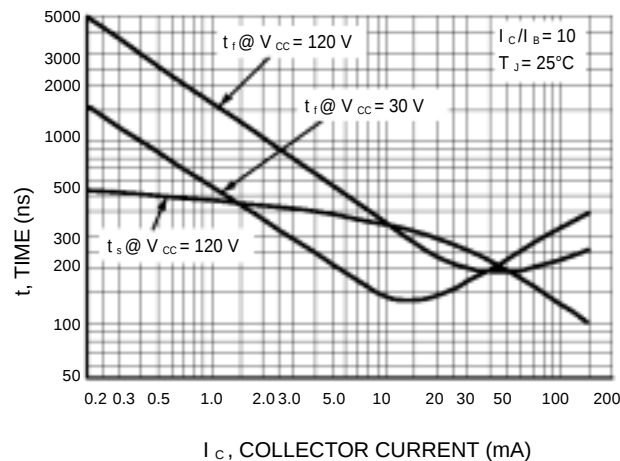
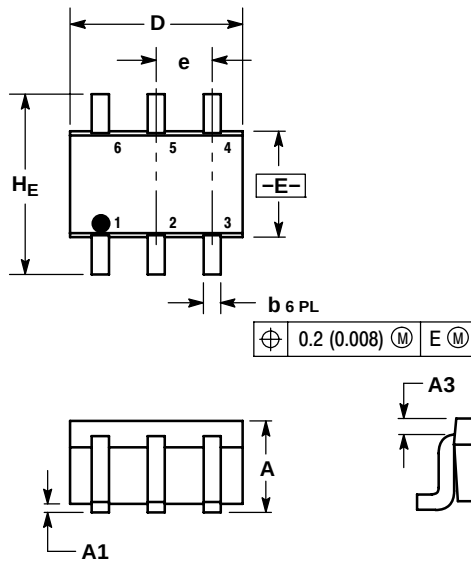


Figure 9. Turn-Off Time

LMBT5551DW1T1G , S-LMBT5551DW1T1G

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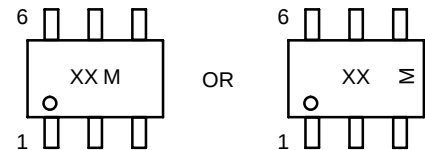


NOTES:

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
H _E	2.00	2.10	2.20	0.078	0.082	0.086

GENERIC MARKING DIAGRAM*



XX = Specific Device Code
M = Date Code