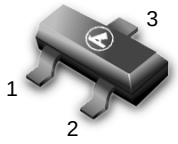
Darlington Amplifier Transistors

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

LMBTA13LT1G
LMBTA14LT1G
S-LMBTA13LT1G
S-LMBTA14LT1G

ORDERING INFORMATION

Device	Marking	Shipping
LMBTA13LT1G S-LMBTA13LT1G	1M	3000/Tape & Reel
LMBTA14LT1G S-LMBTA14LT1G	1N	3000/Tape & Reel
LMBTA13LT3G S-LMBTA13LT3G	1M	10000/Tape & Reel
LMBTA14LT3G S-LMBTA14LT3G	1N	10000/Tape & Reel



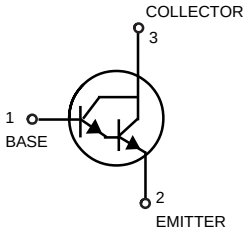
SOT–23

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CES}	30	Vdc
Collector–Base Voltage	V_{CBO}	30	Vdc
Emitter–Base Voltage	V_{EBO}	10	Vdc
Collector Current — Continuous	I_C	300	mAdc

THERMAL CHARACTERISTICS

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



DEVICE MARKING

(S-)LMBTA13LT1G = 1M; (S-)LMBTA14LT1G = 1N;

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage (I_C = 100 µAdc, V_{BE} = 0)	$V_{(BR)CEO}$	30	—	Vdc
Collector Cutoff Current (V_{CB} = 30Vdc, I_E = 0)	I_{CBO}	—	100	nAdc
Emitter Cutoff Current (V_{EB} = 10Vdc, I_C = 0)	I_{EBO}	—	100	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.

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

Characteristic		Symbol	Min	Max	Unit
ON CHARACTERISTICS (3)					
DC Current Gain		h_{FE}			—
(I_C = 10 mAdc, V_{CE} = 5.0 Vdc)	LMBTA13		5,000	—	
	LMBTA14		10,000	—	
(I_C = 100mAdc, V_{CE} = 5.0Vdc)	LMBTA13		10,000	—	
	LMBTA14		20,000	—	
Collector–Emitter Saturation Voltage (I_C = 100 mAdc, I_B = 0.1 mAdc)		$V_{CE(sat)}$	—	1.5	Vdc
Base–Emitter On Voltage (I_C = 100mAdc, V_{CE} = 5.0Vdc)		V_{BE}	—	2.0	Vdc
SMALL–SIGNAL CHARACTERISTICS					
Current – Gain–Bandwidth Product(4) (V_{CE} = 5.0 Vdc, I_C = 10mAdc, f = 100 MHz)		f_T	125	—	MHz

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

4. $f_T = |h f_e| * f_{test}$.

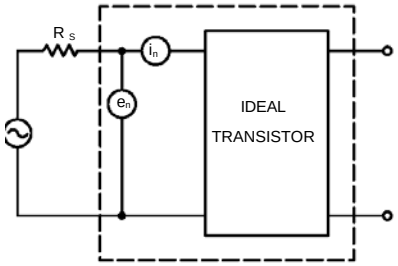
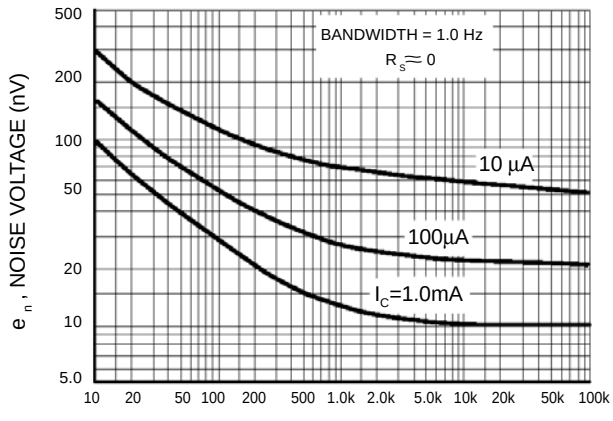


Figure 1. Transistor Noise Model

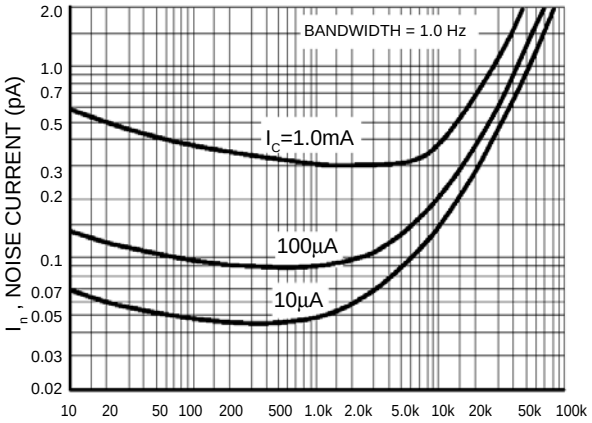
NOISE CHARACTERISTICS

(V_{CE} = 5.0 Vdc, T_A = 25°C)



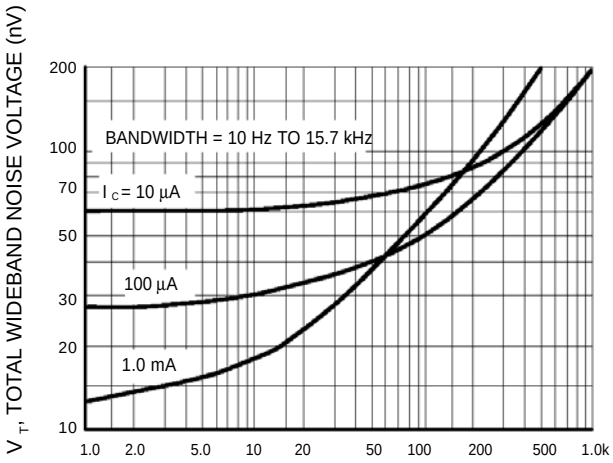
f, FREQUENCY (Hz)

Figure 2. Noise Voltage



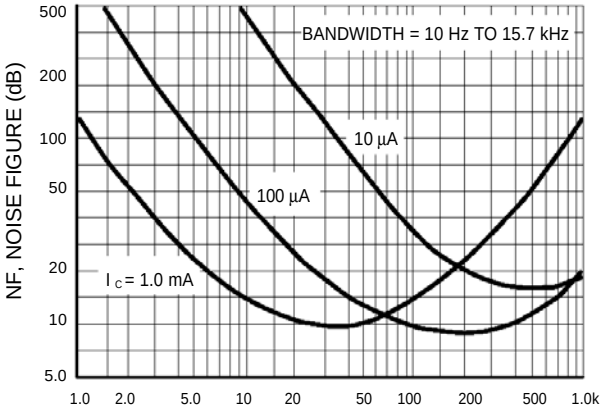
f, FREQUENCY (Hz)

Figure 3. Noise Current



R S , SOURCE RESISTANCE (kΩ)

Figure 4. Total Wideband Noise Voltage



R S , SOURCE RESISTANCE (kΩ)

Figure 5. Wideband Noise Figure

SMALL–SIGNAL CHARACTERISTICS

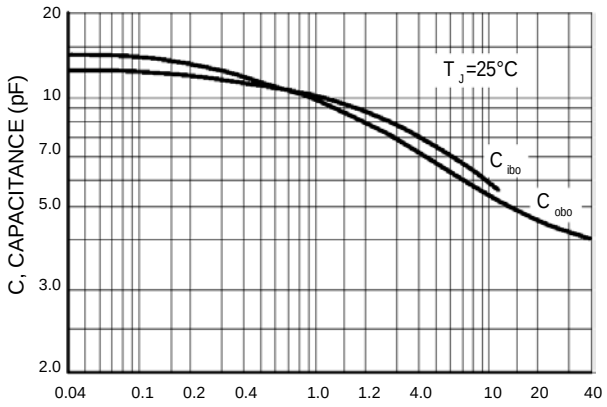


Figure 6. Capacitance

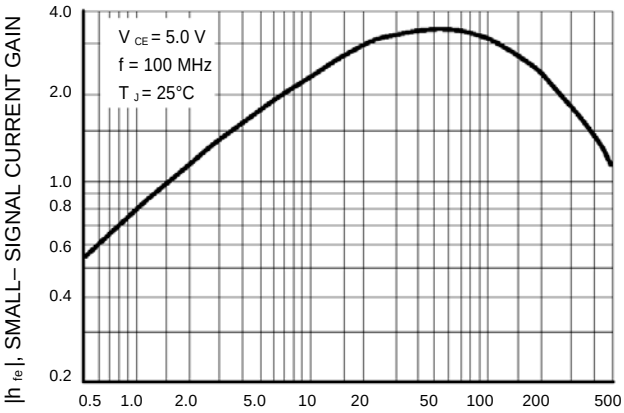


Figure 7. High Frequency Current Gain

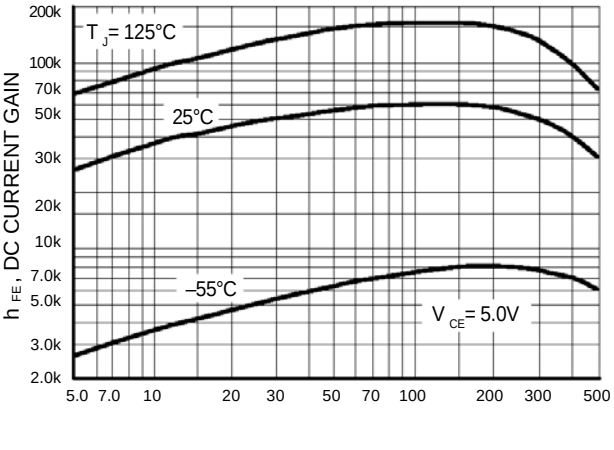


Figure 8. DC Current Gain

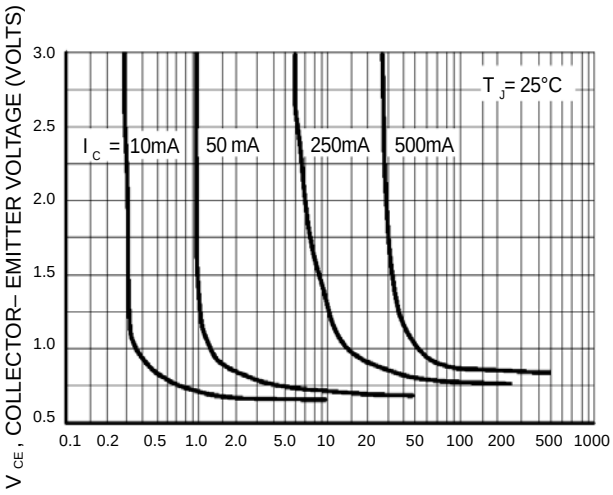


Figure 9. Collector Saturation Region

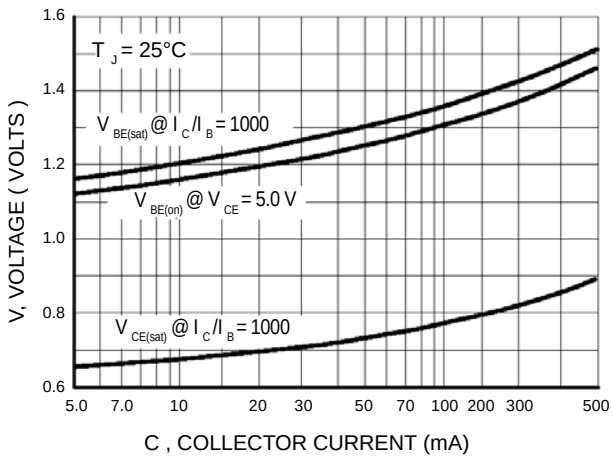


Figure 17. “ON” Voltages

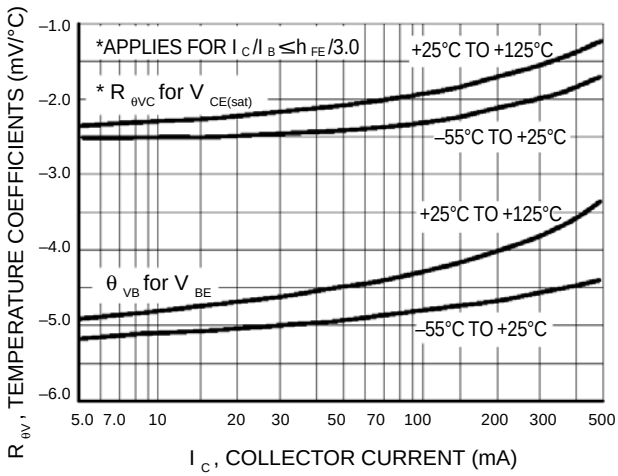


Figure 18. Temperature Coefficients

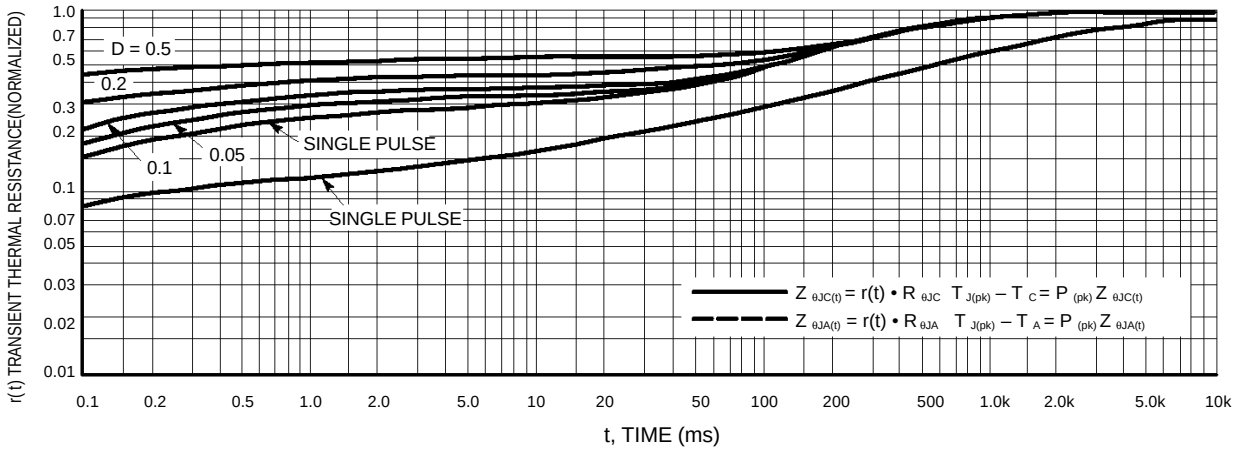


Figure 12. Thermal Response

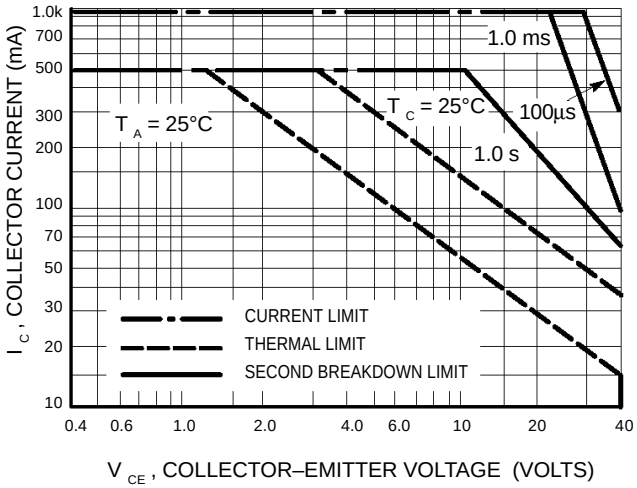
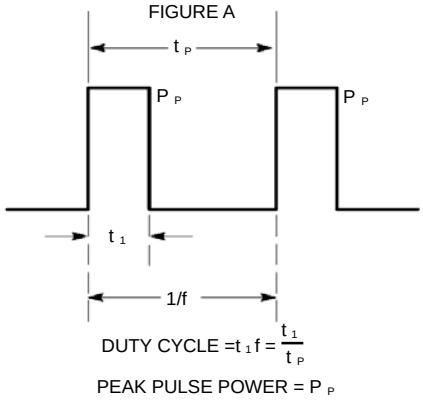


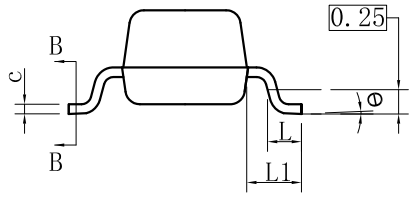
Figure 13.Active Region Safe Operating Area

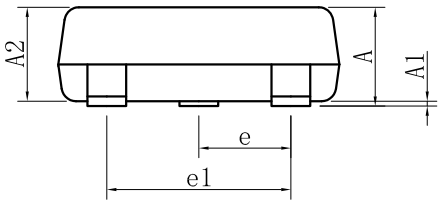


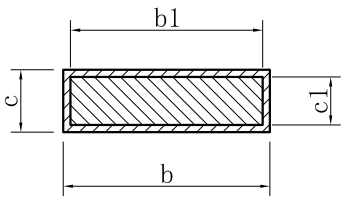
Design Note: Use of Transient Thermal Resistance Data

LMBTA13LT1G LMBTA14LT1G
S-LMBTA13LT1G S-LMBTA14LT1G

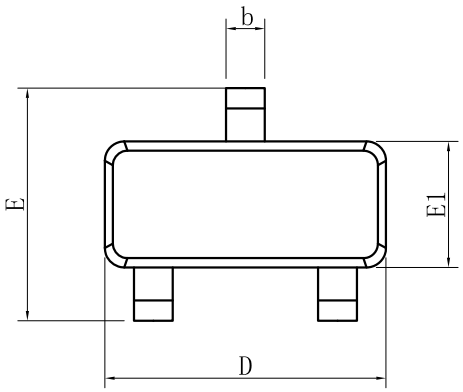
OUTLINE AND DIMENSIONS







SECTION B-B

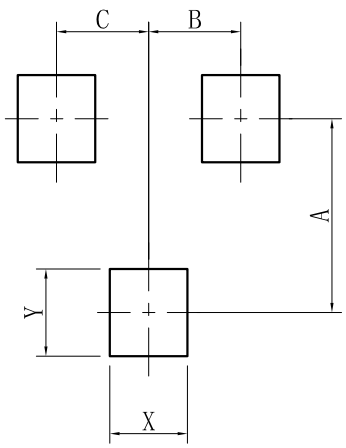


SOT23			
DIM	MIN	NOR	MAX
A	0.89	-	1.12
A1	0.01	-	0.10
A2	0.88	0.95	1.02
b	0.30	-	0.50
b1	0.30	0.40	0.45
c	0.08	-	0.20
c1	0.08	0.10	0.16
D	2.80	2.90	3.04
E	2.10	-	2.64
E1	1.20	1.30	1.40
e	0.95BSC		
e1	1.90BSC		
L	0.40	0.46	0.60
L1	0.54REF		
θ	0°	-	8°
All Dimensions in mm			

GENERAL NOTES

1. Top package surface finish Ra0.4±0.2um
2. Bottom package surface finish Ra0.7±0.2um
3. Side package surface finish Ra0.4±0.2um

SOLDERING FOOTPRINT



SOT-23	
DIM	(mm)
X	0.80
Y	0.90
A	2.00
B	0.95
C	0.95

DISCLAIMER

- Curve guarantee in the specification. The curve of test items with electric parameter is used as quality guarantee. The curve of test items without electric parameter is used as reference only.

- Before you use our Products for new Project, you are requested to carefully read this document and fully under--stand its contents. LRC shall not be in any way responsible or liable for failure, malfunction or accident arising from the use of any LRC's Products against warning, caution or note contained in this document.

- All information contained in this document is current as of the issuing date and subject to change without any prior notice. Before purchasing or using LRC's Products,please confirm the latest information with a LRC sales represe--ntative.