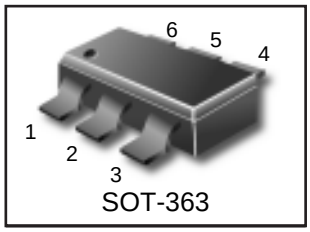
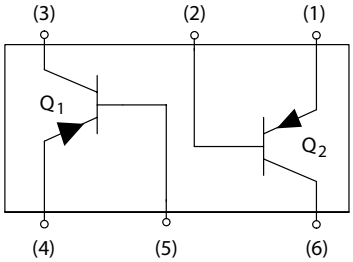
Dual General Purpose Transistors

LBC85XBDW1T1G



These transistors are designed for general purpose amplifier applications. They are housed in the SOT–363/SC–88 which is designed for low power surface mount applications.

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



- Device Marking:

  LBC856BDW1T1G= 3B
  LBC857BDW1T1G= 3F
  LBC857CDW1T1G= 3G
  LBC858BDW1T1G= 3K
  LBC858CDW1T1G = 3L

MAXIMUM RATINGS

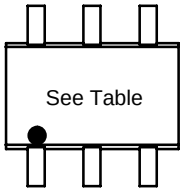
Rating	Symbol	BC856	BC857	BC858	Unit
Collector–Emitter Voltage	V_{CEO}	–65	–45	–30	V
Collector–Base Voltage	V_{CBO}	–80	–50	–30	V
Emitter–Base Voltage	V_{EBO}	–5.0	–5.0	–5.0	V
Collector Current – Continuous	I_C	–100	–100	–100	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation Per Device FR–5 Board (Note 1.) T_A = 25°C Derate Above 25°C	P_D	380 250 3.0	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	328	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	–55 to +150	°C

1. FR–5 = 1.0 x 0.75 x 0.062 in

DEVICE MARKING



ORDERING INFORMATION

Device	Shipping
LBC85XBDW1T1G	3000/Tape & Reel
LBC85XBDW1T3G	10000/Tape & Reel

LBC856BDW1T1G,LBC857BDW1T1G,LBC857CDW1T1G, LBC858BDW1T1G, LBC858CDW1T1G

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage (I_C = –10 mA)	LBC856 Series	$V_{(BR)CEO}$	–65	–	–	V
	LBC857 Series		–45	–	–	
	LBC858 Series		–30	–	–	
Collector–Emitter Breakdown Voltage (I_C = –10 μA, V_{EB} = 0)	LBC856 Series	$V_{(BR)CES}$	–80	–	–	V
	LBC857 Series		–50	–	–	
	LBC858 Series		–30	–	–	
Collector–Base Breakdown Voltage (I_C = –10 μA)	LBC856 Series	$V_{(BR)CBO}$	–80	–	–	V
	LBC857 Series		–50	–	–	
	LBC858 Series		–30	–	–	
Emitter–Base Breakdown Voltage (I_E = –1.0 μA)	LBC856 Series	$V_{(BR)EBO}$	–5.0	–	–	V
	LBC857 Series		–5.0	–	–	
	LBC858 Series		–5.0	–	–	
Collector Cutoff Current (V_{CB} = –30 V)		I_{CBO}	–	–	–15	nA
(V_{CB} = –30 V, T_A = 150°C)			–	–	–4.0	μA
ON CHARACTERISTICS						
DC Current Gain (I_C = –10 μA, V_{CE} = –5.0 V)	LBC856B, LBC857B, LBC858B	h_{FE}	–	150	–	–
	LBC857C, LBC858C		–	270	–	
(I_C = –2.0 mA, V_{CE} = –5.0 V)	LBC856B, LBC857B, LBC858B		220	290	475	
	LBC857C, LBC858C		420	520	800	
Collector–Emitter Saturation Voltage (I_C = –10 mA, I_B = –0.5 mA)		$V_{CE(sat)}$	–	–	–0.3	V
(I_C = –100 mA, I_B = –5.0 mA)			–	–	–0.65	
Base–Emitter Saturation Voltage (I_C = –10 mA, I_B = –0.5 mA)		$V_{BE(sat)}$	–	–0.7	–	V
(I_C = –100 mA, I_B = –5.0 mA)			–	–0.9	–	
Base–Emitter On Voltage (I_C = –2.0 mA, V_{CE} = –5.0 V)		$V_{BE(on)}$	–0.6	–	–0.75	V
(I_C = –10 mA, V_{CE} = –5.0 V)			–	–	–0.82	
SMALL–SIGNAL CHARACTERISTICS						
Current–Gain – Bandwidth Product (I_C = –10 mA, V_{CE} = –5.0 Vdc, f = 100 MHz)		f_T	100	–	–	MHz
Output Capacitance (V_{CB} = –10 V, f = 1.0 MHz)		C_{ob}	–	–	4.5	pF
Noise Figure (I_C = –0.2 mA, V_{CE} = –5.0 Vdc, R_S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)		NF	–	–	10	dB

LBC856BDW1T1G,LBC857BDW1T1G,LBC857CDW1T1G, LBC858BDW1T1G, LBC858CDW1T1G

TYPICAL CHARACTERISTICS – LBC856

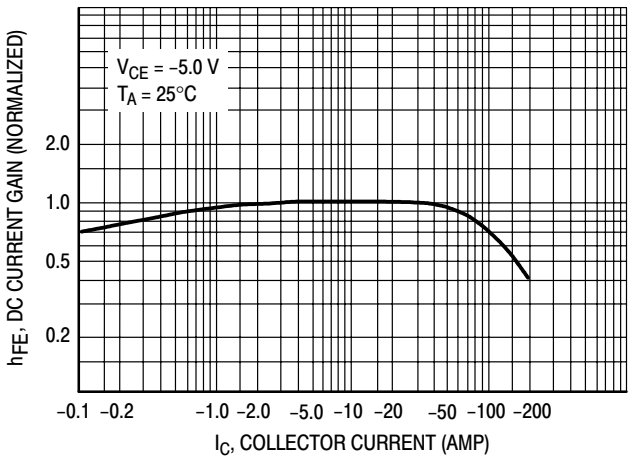


Figure 1. DC Current Gain

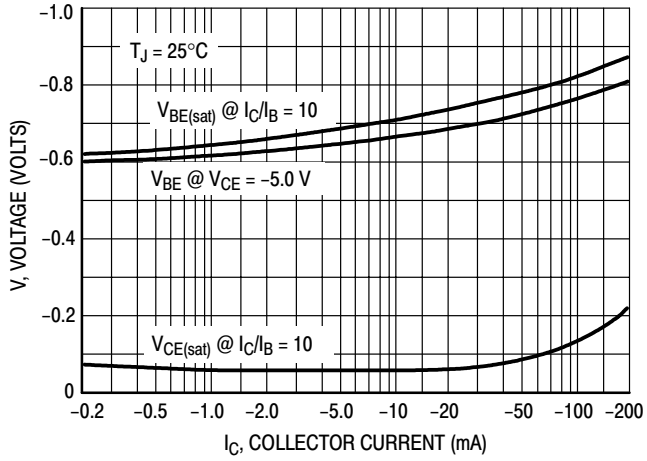


Figure 2. “On” Voltage

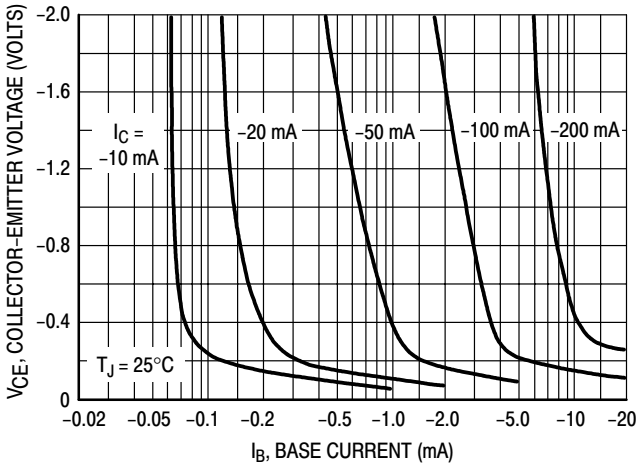


Figure 3. Collector Saturation Region

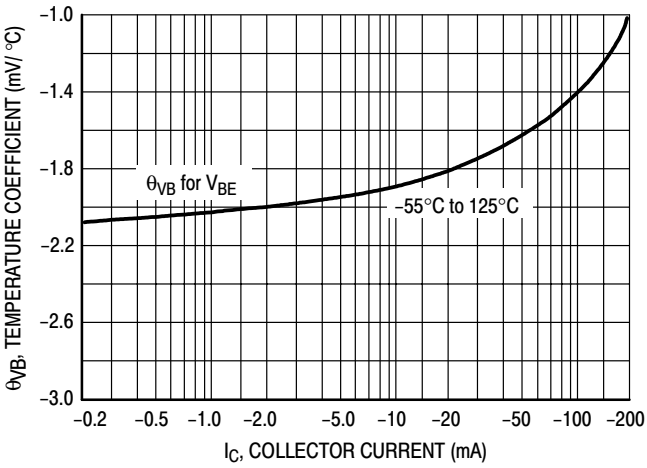


Figure 4. Base–Emitter Temperature Coefficient

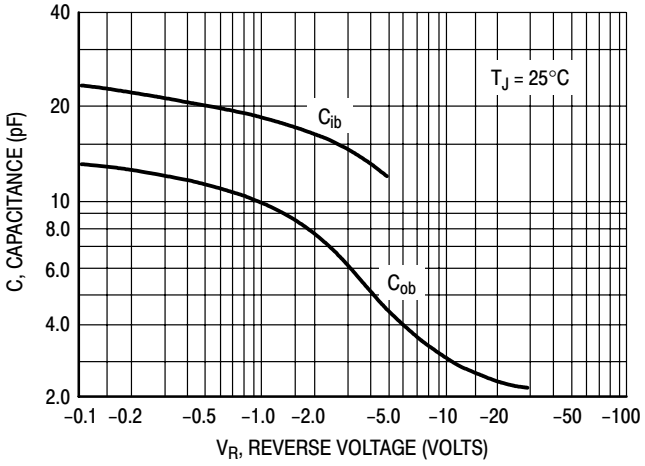


Figure 5. Capacitance

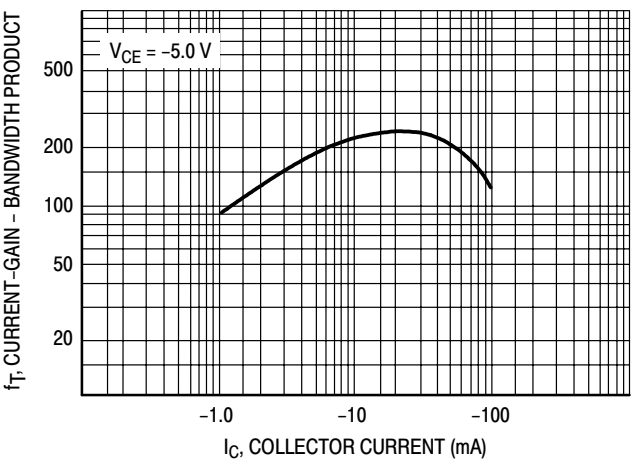


Figure 6. Current–Gain – Bandwidth Product

LBC856BDW1T1G,LBC857BDW1T1G,LBC857CDW1T1G, LBC858BDW1T1G, LBC858CDW1T1G

TYPICAL CHARACTERISTICS – LBC857/LBC858

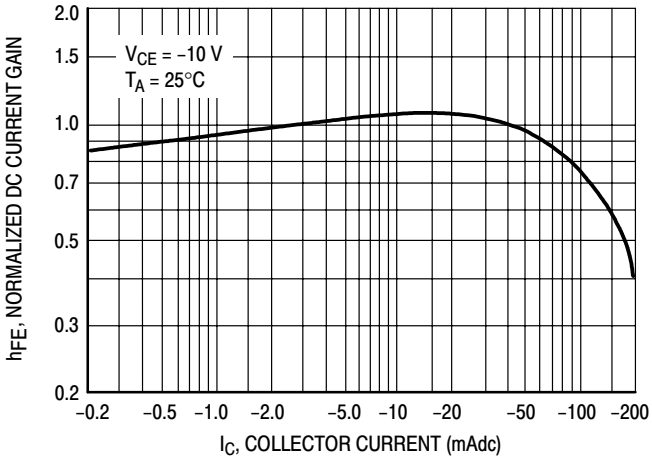


Figure 7. Normalized DC Current Gain

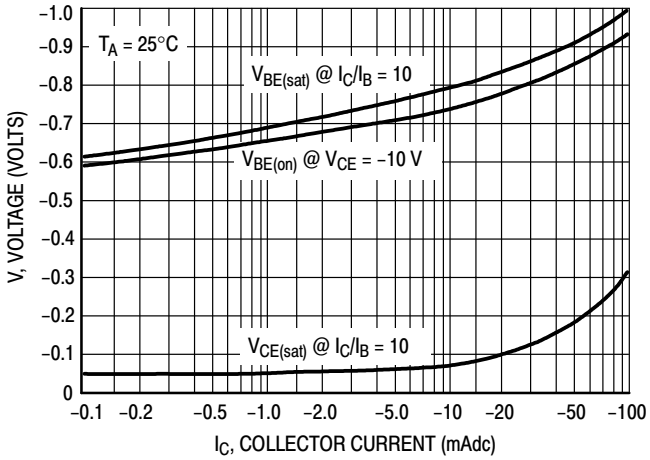


Figure 8. “Saturation” and “On” Voltages

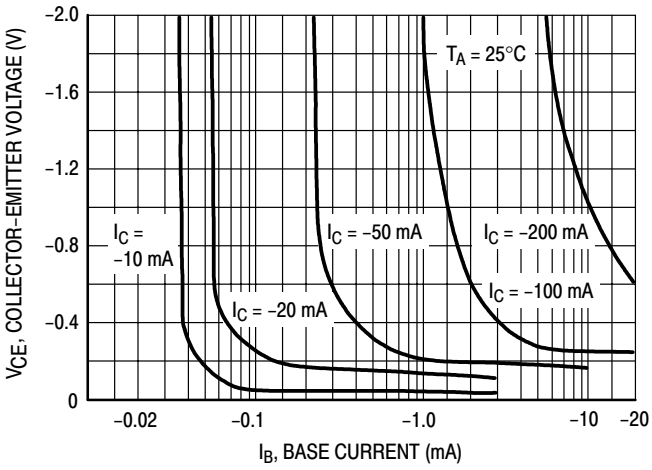


Figure 9. Collector Saturation Region

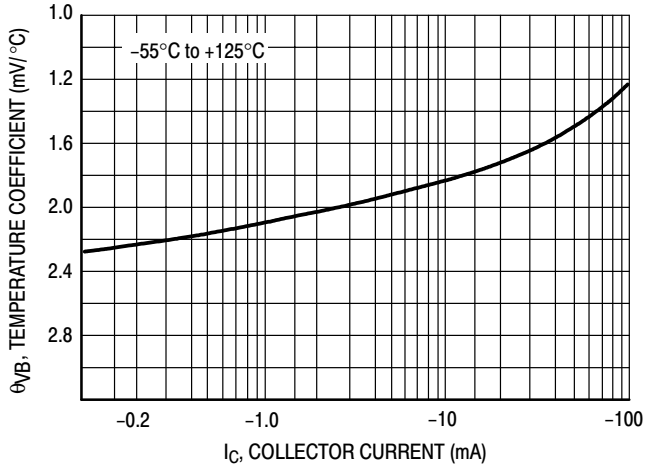


Figure 10. Base–Emitter Temperature Coefficient

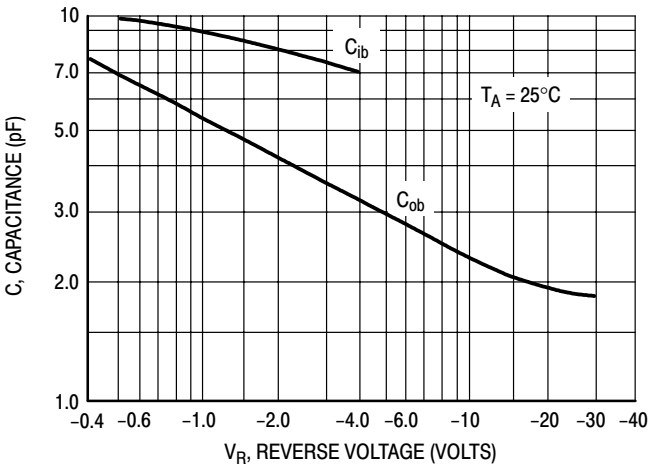


Figure 11. Capacitances

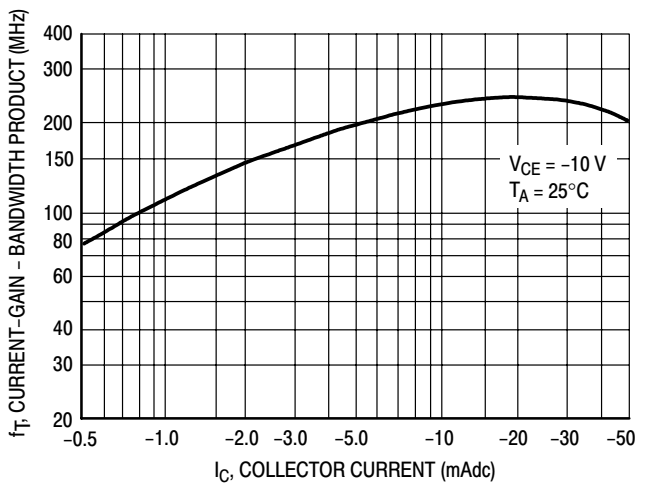


Figure 12. Current–Gain – Bandwidth Product

LBC856BDW1T1G,LBC857BDW1T1G,LBC857CDW1T1G, LBC858BDW1T1G, LBC858CDW1T1G

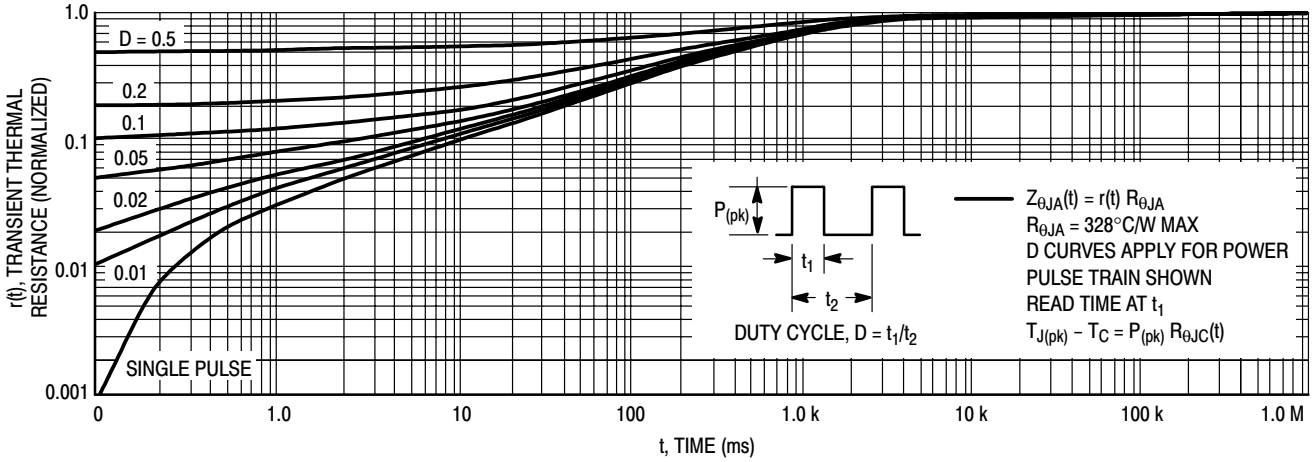


Figure 13. Thermal Response

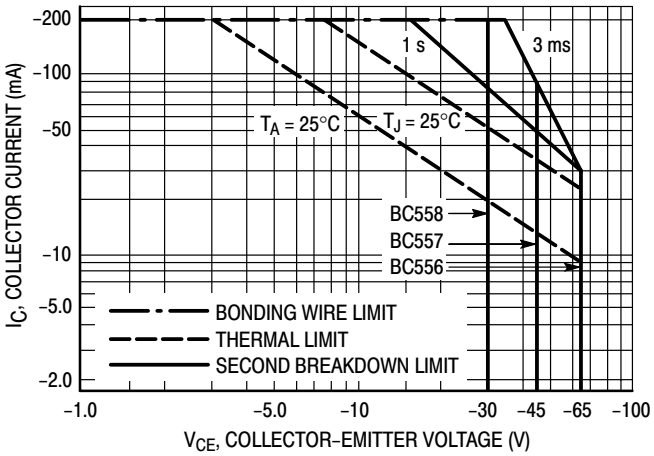


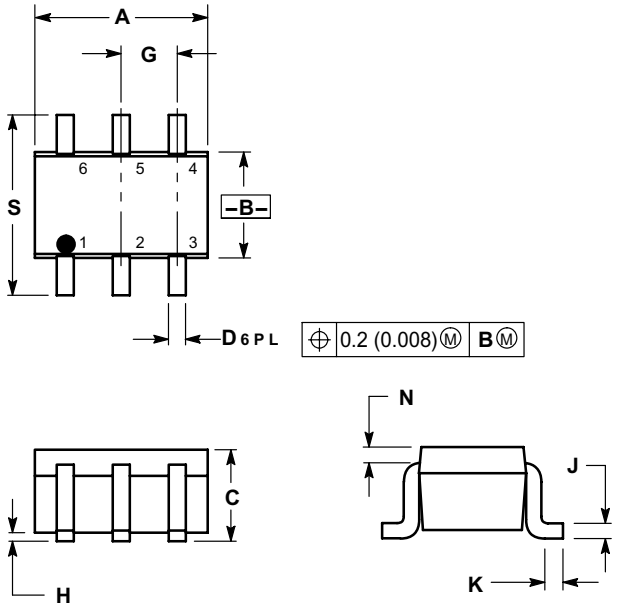
Figure 14. Active Region Safe Operating Area

The safe operating area curves indicate I_C–V_{CE} limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 14 is based upon $T_{J(pk)}$ = 150°C; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq$ 150°C. $T_{J(pk)}$ may be calculated from the data in Figure 13. At high case or ambient temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by the secondary breakdown.

LBC856BDW1T1G,LBC857BDW1T1G,LBC857CDW1T1G, LBC858BDW1T1G, LBC858CDW1T1G

SC-88/SOT–363

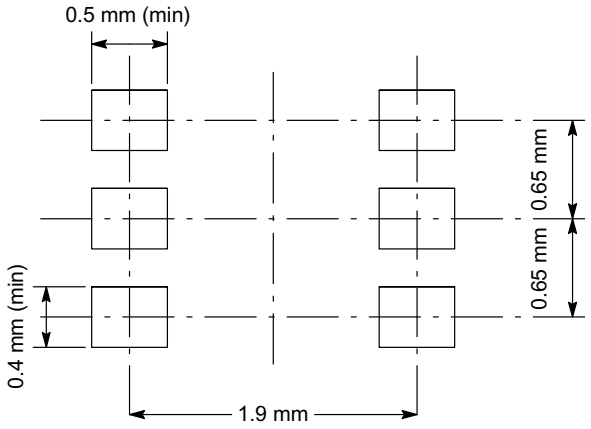


NOTES:

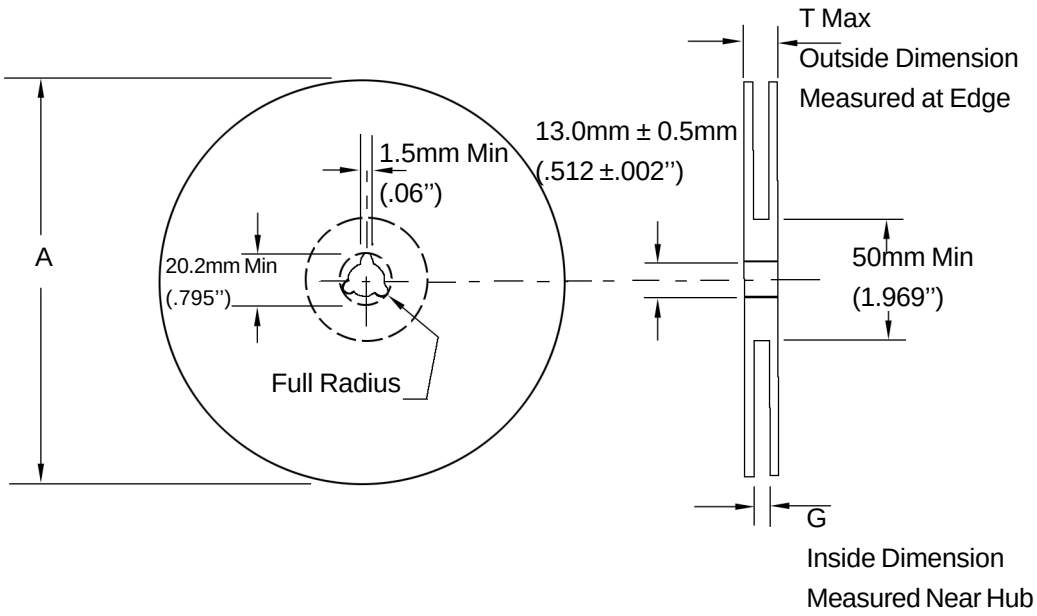
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

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



EMBOSSED TAPE AND REEL DATA FOR DISCRETES



Size	A Max	G	T Max
8 mm	330mm (12.992")	8.4mm+1.5mm, -0.0 (.33"+.059", -0.00)	14.4mm (.56")

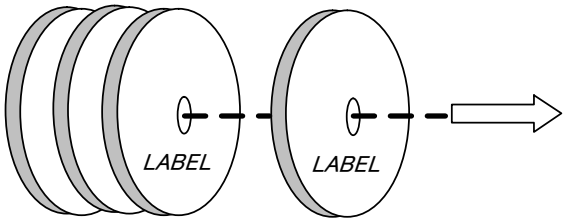
Reel Dimensions

Metric Dimensions Govern — English are in parentheses for reference only

Storage Conditions

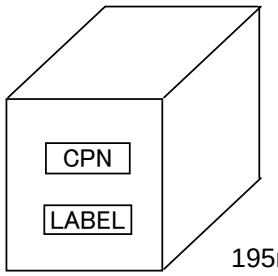
Temperature: 5 to 40 Deg.C (20 to 30 Deg. C is preferred)
Humidity: 30 to 80 RH (40 to 60 is preferred)
Recommended Period: One year after manufacturing
(This recommended period is for the soldering condition only. The characteristics and reliabilities of the products are not restricted to this limitation)

Shipment Specification



10 Reel

3000PCS/Reel
8000PCS/Reel (SOT-723,SOD-723)



Dim(Unit:mm)

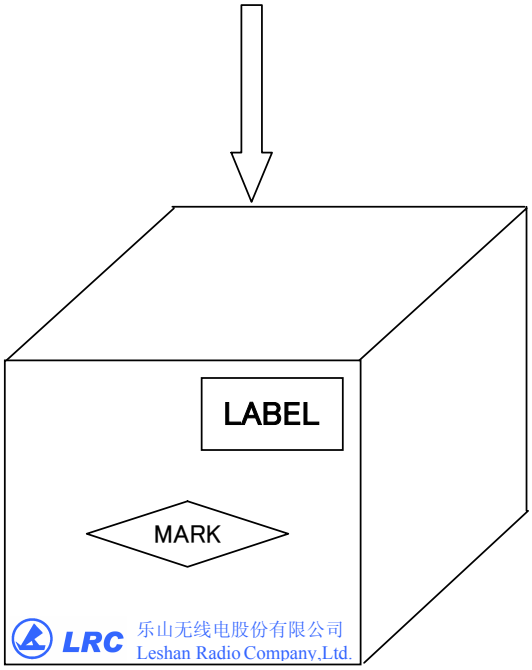
195mm*195mm*150mm

10Reel/Inner Box

30KPCS/Inner Box
80KPCS/Inner Box (SOT-723,SOD-723)

Dim(Unit:mm)

460mm*400mm*420mm



12 Inner Box/Carton

360KPCS/Carton
960KPCS/Carton (SOT-723,SOD-723)