

# Dual General Purpose Transistors

## NPN/PNP Duals

- 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.

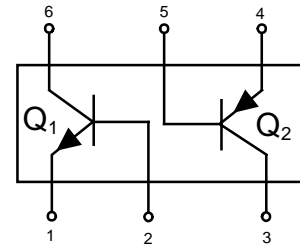
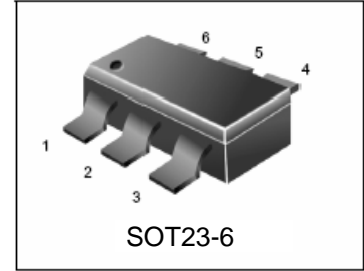
**LBC817-16DPMT1G**  
**LBC817-25DPMT1G**  
**LBC817-40DPMT1G**  
**S-LBC817-16DPMT1G**  
**S-LBC817-25DPMT1G**  
**S-LBC817-40DPMT1G**

### MAXIMUM RATING – NPN

Rating	Symbol	Value	Unit
Collector – Emitter Voltage	$V_{CEO}$	45	V
Collector – Base Voltage	$V_{CBO}$	50	V
Emitter – Base Voltage	$V_{EBO}$	5.0	V
Collector Current – Continuous	$I_C$	500	mAdc

### MAXIMUM RATING – PNP

Rating	Symbol	Value	Unit
Collector – Emitter Voltage	$V_{CEO}$	-45	V
Collector – Base Voltage	$V_{CBO}$	-50	V
Emitter – Base Voltage	$V_{EBO}$	-5.0	V
Collector Current – Continuous	$I_C$	-500	mAdc



### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, (Note 1) $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, (Note 2) $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	300 2.4	mW 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	$^\circ\text{C}$

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.

### ORDERING INFORMATION

DEVICE	MARKING	SHIPPING
LBC817-16DPMT1G S-LBC817-16DPMT1G	56A	3000/Tape & Reel
LBC817-16DPMT3G S-LBC817-16DPMT3G	56A	10,000/Tape & Reel
LBC817-25DPMT1G S-LBC817-25DPMT1G	56B	3000/Tape & Reel
LBC817-25DPMT3G S-LBC817-25DPMT3G	56B	10,000/Tape & Reel
LBC817-40DPMT1G S-LBC817-40DPMT1G	56C	3000/Tape & Reel
LBC817-40DPMT3G S-LBC817-40DPMT3G	56C	10,000/Tape & Reel

LBC817-16DPMT1G LBC817-25DPMT1G LBC817-40DPMT1G  
S-LBC817-16DPMT1G S-LBC817-25DPMT1G S-LBC817-40DPMT1G

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector – Emitter Breakdown Voltage ( $I_C = 10\text{ mA}$ )	$V_{(BR)CEO}$	45	–	–	V
Collector – Emitter Breakdown Voltage ( $V_{EB} = 0, I_C = 10\ \mu\text{A}$ )	$V_{(BR)CES}$	50	–	–	V
Emitter – Base Breakdown Voltage ( $I_E = 1.0\ \mu\text{A}$ )	$V_{(BR)EBO}$	5.0	–	–	V
Collector Cutoff Current ( $V_{CB} = 20\text{ V}$ ) ( $V_{CB} = 20\text{ V}, T_A = 150^\circ\text{C}$ )	$I_{CBO}$	–	–	100 5.0	nA $\mu\text{A}$
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_C = 100\text{ mA}, V_{CE} = 1.0\text{ V}$ )	$h_{FE}$	100	–	250	–
		160	–	400	
		250	–	600	
( $I_C = 500\text{ mA}, V_{CE} = 1.0\text{ V}$ )		40	–	–	
Collector – Emitter Saturation Voltage ( $I_C = 500\text{ mA}, I_B = 50\text{ mA}$ )	$V_{CE(sat)}$	–	–	0.7	V
Base – Emitter On Voltage ( $I_C = 500\text{ mA}, V_{CE} = 1.0\text{ V}$ )	$V_{BE(on)}$	–	–	1.2	V
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Current – Gain – Bandwidth Product ( $I_C = 10\text{ mA}, V_{CE} = 5.0\text{ Vdc}, f = 100\text{ MHz}$ )	$f_T$	100	–	–	MHz
Output Capacitance ( $V_{CB} = 10\text{ V}, f = 1.0\text{ MHz}$ )	$C_{obo}$	–	10	–	pF

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector – Emitter Breakdown Voltage ( $I_C = -10\text{ mA}$ )	$V_{(BR)CEO}$	-45	–	–	V
Collector – Emitter Breakdown Voltage ( $V_{EB} = 0, I_C = -10\ \mu\text{A}$ )	$V_{(BR)CES}$	-50	–	–	V
Emitter – Base Breakdown Voltage ( $I_E = -1.0\ \mu\text{A}$ )	$V_{(BR)EBO}$	-5.0	–	–	V
Collector Cutoff Current ( $V_{CB} = -20\text{ V}$ ) ( $V_{CB} = -20\text{ V}, T_J = 150^\circ\text{C}$ )	$I_{CBO}$	–	–	-100 -5.0	nA $\mu\text{A}$
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_C = -100\text{ mA}, V_{CE} = -1.0\text{ V}$ )	$h_{FE}$	100	–	250	–
		160	–	400	
		250	–	600	
( $I_C = -500\text{ mA}, V_{CE} = -1.0\text{ V}$ )		40	–	–	
Collector – Emitter Saturation Voltage ( $I_C = -500\text{ mA}, I_B = -50\text{ mA}$ )	$V_{CE(sat)}$	–	–	-0.7	V
Base – Emitter On Voltage ( $I_C = -500\text{ mA}, I_B = -1.0\text{ V}$ )	$V_{BE(on)}$	–	–	-1.2	V
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Current – Gain – Bandwidth Product ( $I_C = -10\text{ mA}, V_{CE} = -5.0\text{ Vdc}, f = 100\text{ MHz}$ )	$f_T$	100	–	–	MHz
Output Capacitance ( $V_{CB} = -10\text{ V}, f = 1.0\text{ MHz}$ )	$C_{obo}$	–	10	–	pF

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TYPICAL NPN CHARACTERISTICS

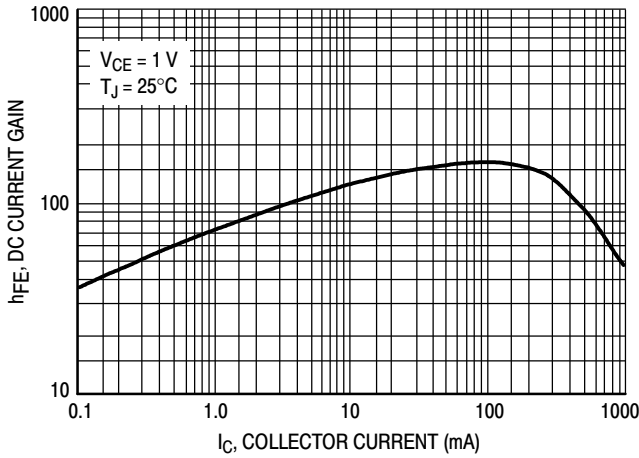


Figure 1. DC Current Gain

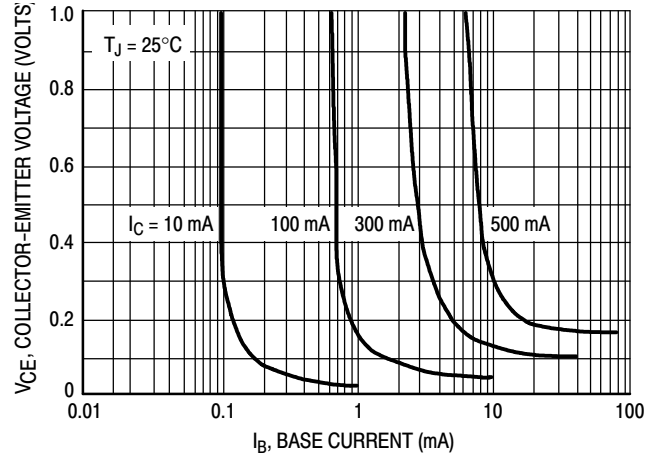


Figure 2. Saturation Region

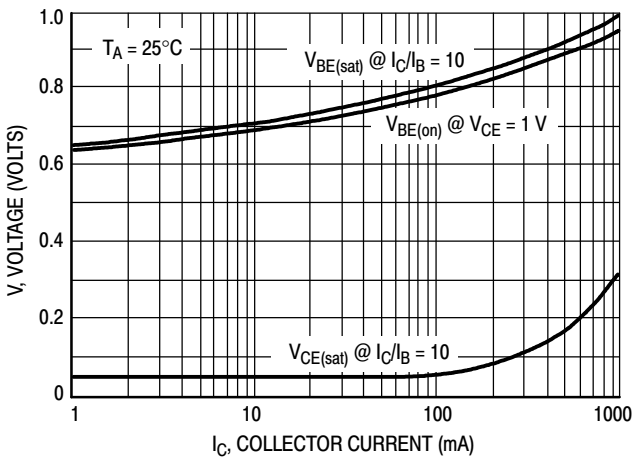


Figure 3. "On" Voltages

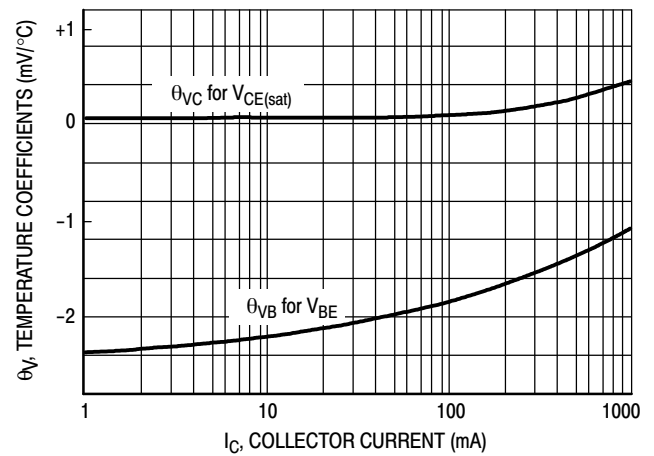


Figure 4. Temperature Coefficients

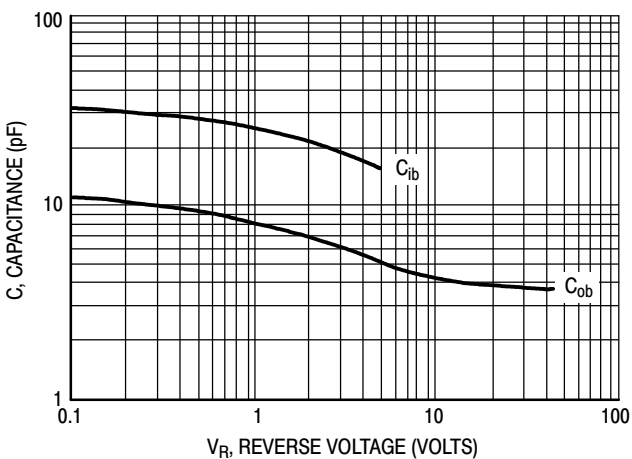


Figure 5. Capacitances

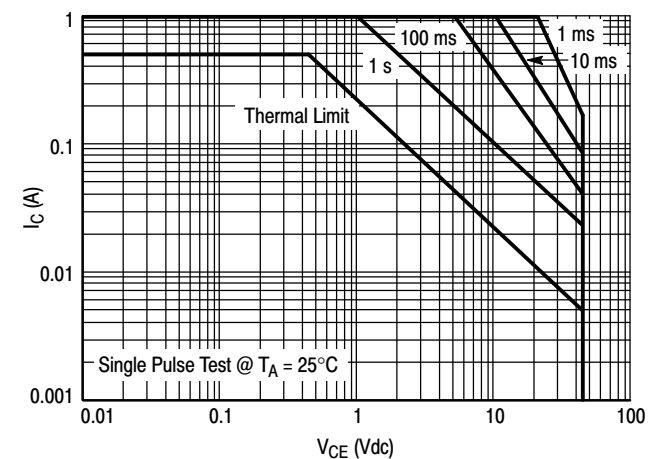


Figure 6. BC817-40L Safe Operating Area

LBC817-16DPMT1G LBC817-25DPMT1G LBC817-40DPMT1G  
 S-LBC817-16DPMT1G S-LBC817-25DPMT1G S-LBC817-40DPMT1G

TYPICAL PNP CHARACTERISTICS

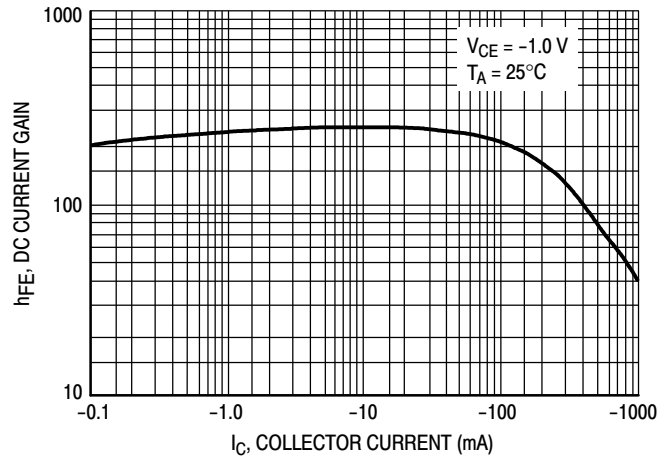


Figure 1. DC Current Gain

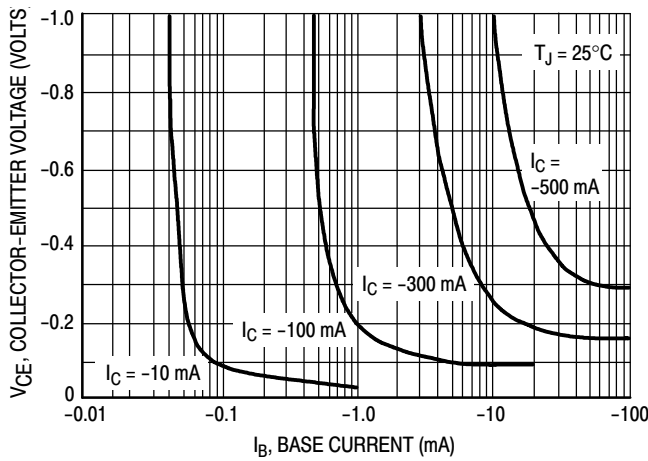


Figure 2. Saturation Region

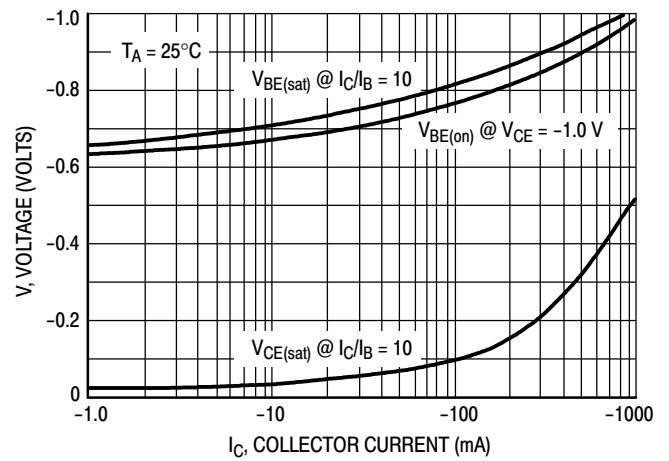


Figure 3. "On" Voltages

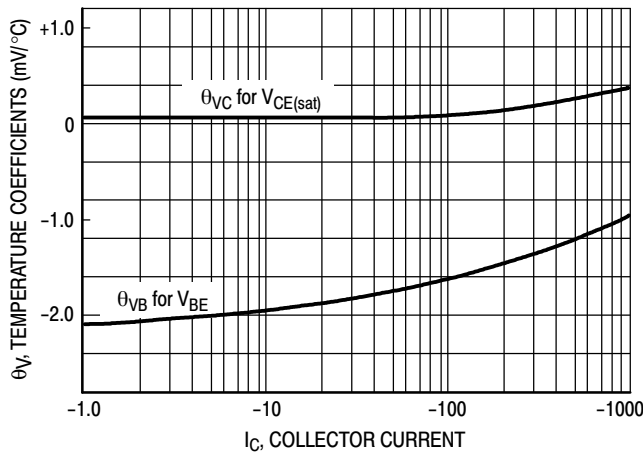


Figure 4. Temperature Coefficients

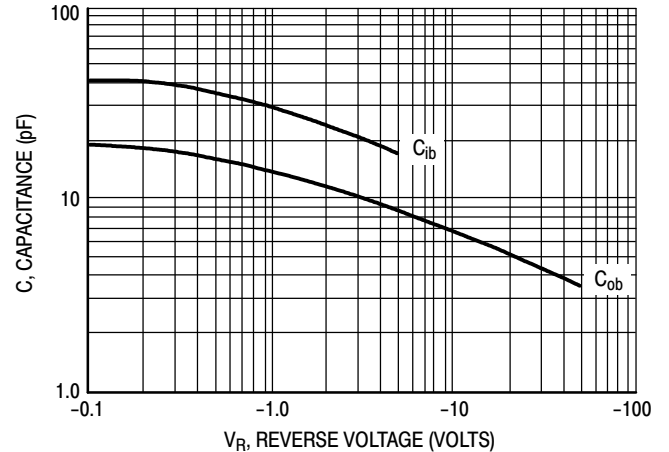
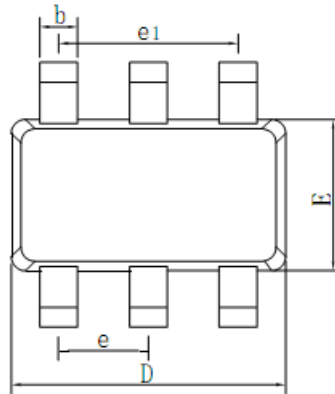
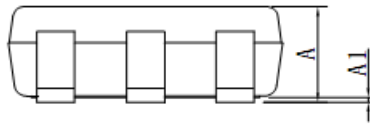
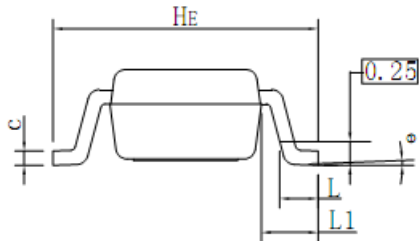


Figure 5. Capacitances

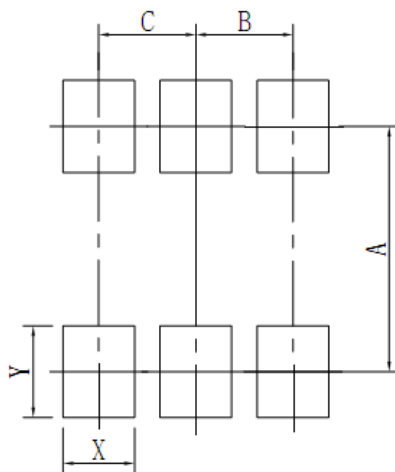
### OUTLINE AND DIMENSIONS

SOT23-6



SOT23-6			
DIM	MIN	NOR	MAX
A	0.90	1.00	1.10
A1	0.01	0.06	0.10
b	0.25	0.40	0.50
c	0.10	0.17	0.26
D	2.80	2.90	3.10
E	1.30	1.60	1.70
e	0.85	0.95	1.05
e1	1.80	1.90	2.00
L	0.20	0.40	0.60
L1	0.60REF		
HE	2.50	2.80	3.00
θ	0°	-	10°

### SOLDERING FOOTPRINT



SOT23-6	
DIM	(mm)
X	0.70
Y	0.90
A	2.40
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.
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