

**50V PNP SURFACE MOUNT TRANSISTOR IN TO252-3L**
**Features**

- Epitaxial Planar Die Construction
- Low Collector-Emitter Saturation Voltage
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **"Lead Free", RoHS Compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

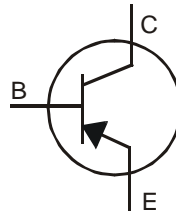
**Mechanical Data**

- Case: TO252-3L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Weight: 0.34 grams (approximate)

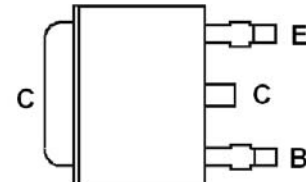
TO252-3L



Top View



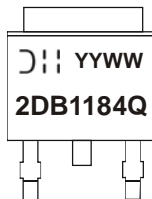
Device Schematic


 Pin Out Configuration  
Top view

**Ordering Information** (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
2DB1184Q-13	2DB1184Q	13	16	2,500

- Notes:
1. No purposefully added lead
  2. Diodes Inc's "Green" policy can be found on our website at <http://www.diodes.com>.
  3. For packaging details, go to our website at <http://www.diodes.com>.

**Marking Information**


2DB1184Q = Product Type Marking Code  
 Ⓜ = Manufacturers' code marking  
 YYWW = Date Code Marking  
 YY = Last Digit of Year, (ex: 08 = 2008)  
 WW = Week Code 01-52

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB0}$	-60	V
Collector-Emitter Voltage	$V_{CEO}$	-50	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Continuous Collector Current	$I_C$	-3	A
Peak Pulse Collector Current	$I_{CM}$	-4.5	A

**Thermal Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation	$P_D$	15	W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	8.3	$^\circ\text{C/W}$
Power Dissipation (Note 4)	$P_D$	1.2	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	104	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

Notes: 4. Device mounted on FR-4 PCB with minimum pad size recommended.

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 5)</b>						
Collector-Base Breakdown Voltage	$BV_{CB0}$	-60	—	—	V	$I_C = -50\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	-50	—	—	V	$I_C = -1\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-5	—	—	V	$I_E = -50\mu\text{A}, I_C = 0$
Collector Cutoff Current	$I_{CBO}$	—	—	-1	$\mu\text{A}$	$V_{CB} = -40\text{V}, I_E = 0$
Emitter Cutoff Current	$I_{EBO}$	—	—	-1	$\mu\text{A}$	$V_{EB} = -4\text{V}, I_C = 0$
<b>ON CHARACTERISTICS (Note 5)</b>						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	-1	V	$I_C = -2\text{A}, I_B = -0.2\text{A}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-1.2	V	$I_C = -1.5\text{A}, I_B = -0.15\text{A}$
DC Current Gain	$h_{FE}$	120	—	270	—	$V_{CE} = -3\text{V}, I_C = -0.5\text{A}$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	$f_T$	—	110	—	MHz	$V_{CE} = -5\text{V}, I_C = -0.1\text{A}, f = 30\text{MHz}$
Output Capacitance	$C_{obo}$	—	26	—	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$

Notes: 5. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

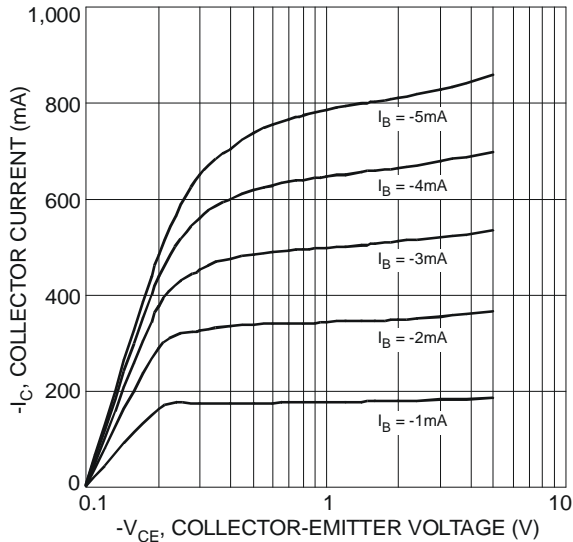


Fig. 1 Typical Collector Current vs. Collector-Emitter Voltage

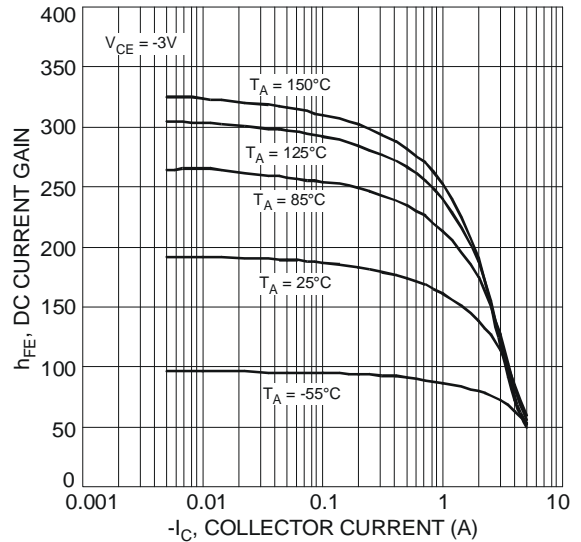


Fig. 2 Typical DC Current Gain vs. Collector Current

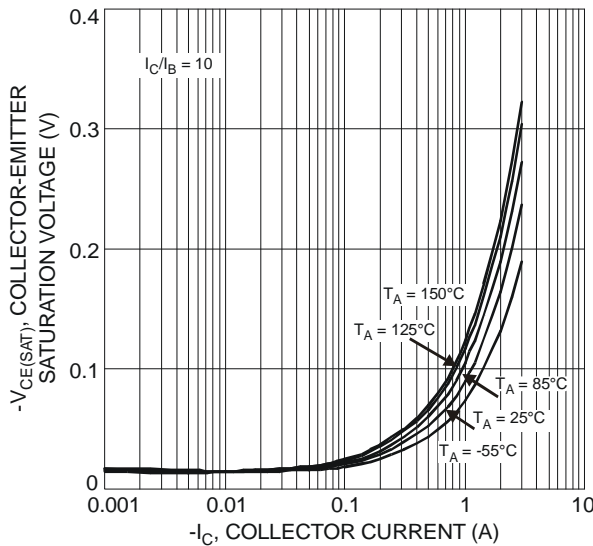


Fig. 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

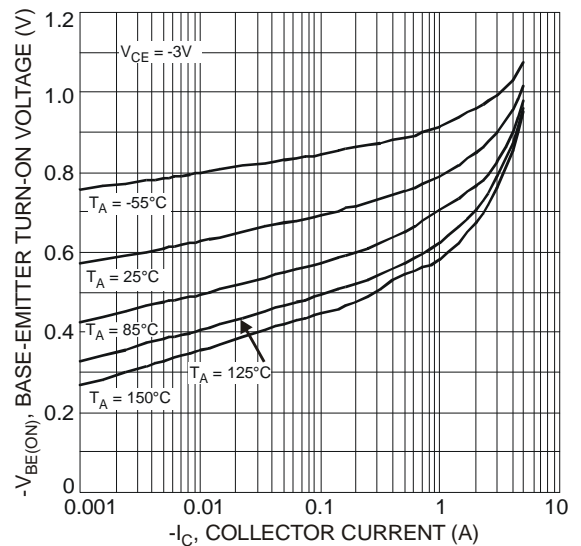


Fig. 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

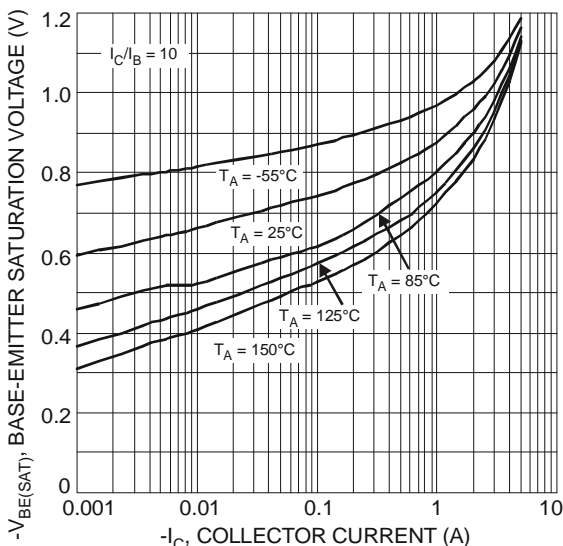


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

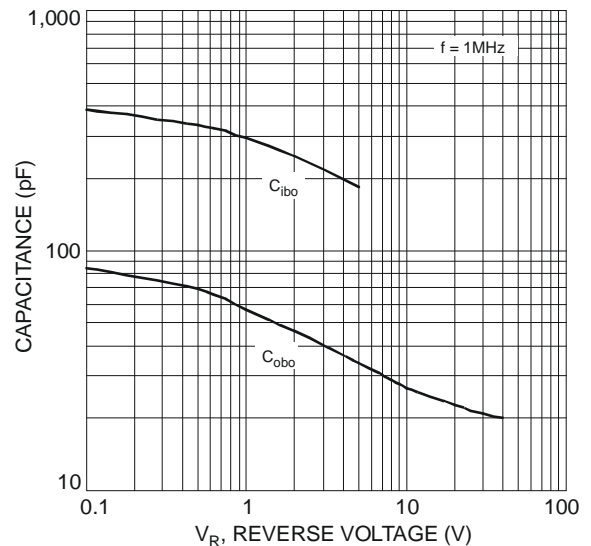


Fig. 6 Typical Capacitance Characteristics

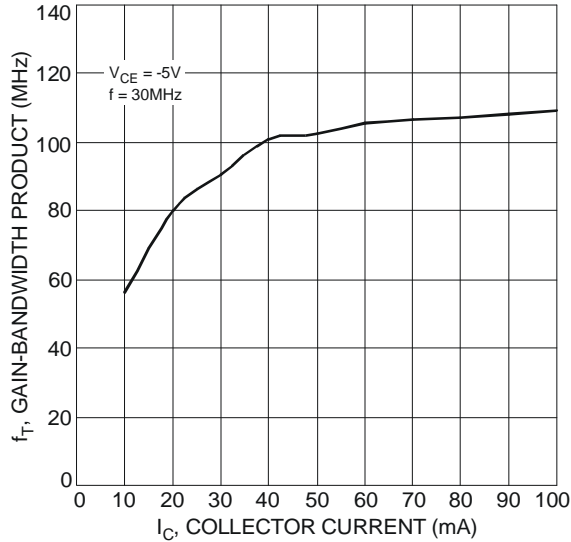


Fig. 7 Typical Gain-Bandwidth Product vs. Collector Current

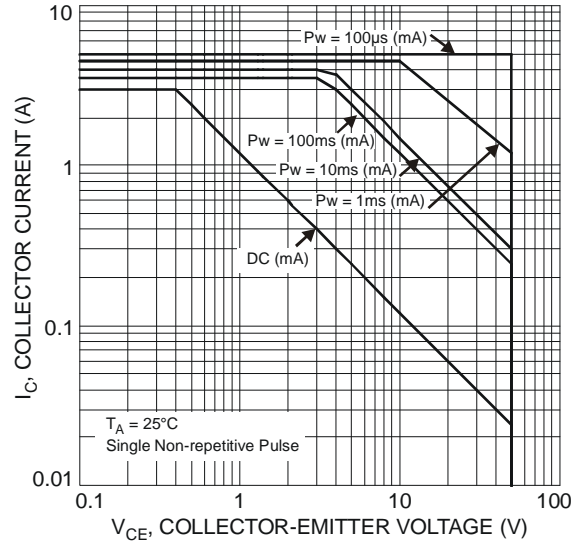


Fig. 8 Safe Operating Area (Note 3)

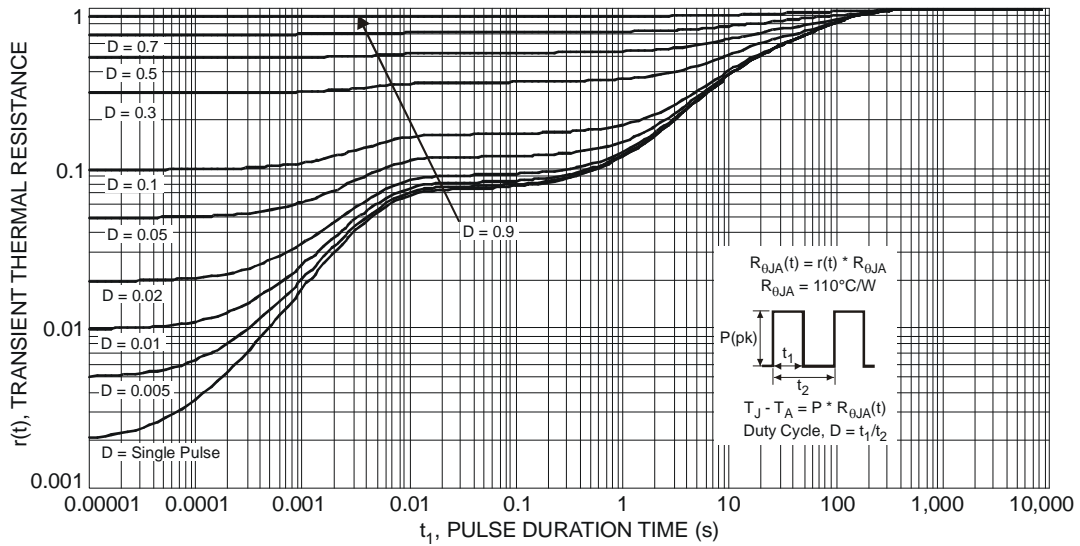
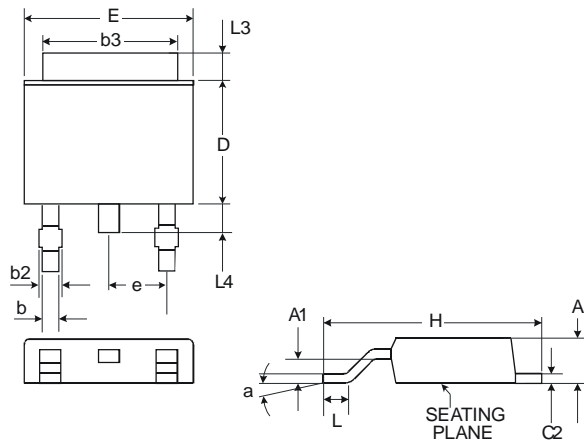


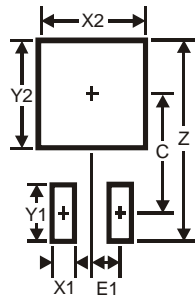
Fig. 9 Transient Thermal Response

**Package Outline Dimensions**



TO252-3L			
Dim	Min	Typ	Max
A	2.19	2.29	2.39
A1	0.97	1.07	1.17
b	0.64	0.76	0.88
b2	0.76	0.95	1.14
b3	5.21	5.33	5.50
C2	0.45	0.51	0.58
D	6.00	6.10	6.20
E	6.45	6.58	6.70
e	2.286 Typ.		
H	9.40	9.91	10.41
L	1.40	1.59	1.78
L3	0.88	1.08	1.27
L4	0.64	0.83	1.02
a	0°	-	10°
All Dimensions in mm			

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	11.6
X1	1.5
X2	7.0
Y1	2.5
Y2	7.0
C	6.9
E1	2.3

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