


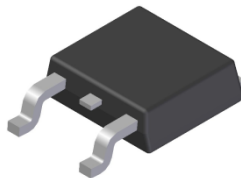
## Features

- $BV_{CEO} > -50V$
- $I_C = -3A$  High Continuous Collector Current
- $I_{CM} = -4.5A$  Peak Pulse Current
- Epitaxial Planar Die Construction
- Low Collector-Emitter Saturation Voltage
- Ideal for Medium Power Switching or Amplification Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

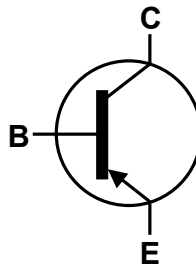
## Mechanical Data

- Case: TO252 (DPAK)
- 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 Plated Leads, Solderable per MIL-STD-202, Method 208 
- Weight: 0.34 grams (approximate)

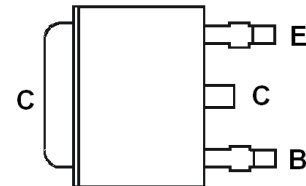
TO252 (DPAK)



Top View



Device Schematic



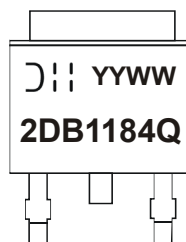
Pin Out Configuration  
Top view

## Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
2DB1184Q-13	AEC-Q101	2DB1184Q	13	16	2,500

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



2DB1184Q = Product Type Marking Code  
 DII = Manufacturers' code marking  
 YYWW = Date Code Marking  
 YY = Last Digit of Year, (ex: 14 = 2014)  
 WW = Week Code 01-52

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-60	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-50	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5	V
Continuous Collector Current	I <sub>C</sub>	-3	A
Peak Pulse Collector Current	I <sub>CM</sub>	-4.5	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

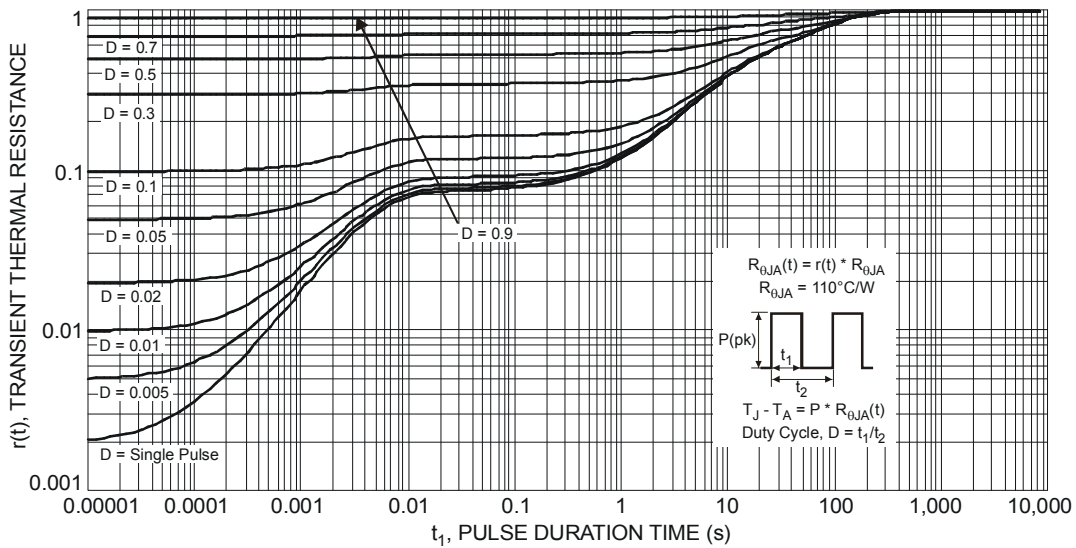
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	1.2	W
Power Dissipation @T <sub>L</sub> = +25°C (Note 6)	P <sub>D</sub>	15	W
Thermal Resistance, Junction to Lead (Note 5)	R <sub>θJA</sub>	104	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJL</sub>	8.3	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 7)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Note:
- For a device mounted with the exposed collector pad on minimum recommended pad (MRP) layout 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  - Thermal resistance from junction to solder-point (on the exposed collector pad).
  - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics**



**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 8)</b>						
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	-60	—	—	V	I <sub>C</sub> = -50μA, I <sub>E</sub> = 0
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	-50	—	—	V	I <sub>C</sub> = -1mA, I <sub>B</sub> = 0
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-5	—	—	V	I <sub>E</sub> = -50μA, I <sub>C</sub> = 0
Collector Cutoff Current	I <sub>CBO</sub>	—	—	-1	μA	V <sub>CB</sub> = -40V, I <sub>E</sub> = 0
Emitter Cutoff Current	I <sub>EBO</sub>	—	—	-1	μA	V <sub>EB</sub> = -4V, I <sub>C</sub> = 0
<b>ON CHARACTERISTICS (Note 8)</b>						
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	—	-1	V	I <sub>C</sub> = -2A, I <sub>B</sub> = -0.2A
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	—	—	-1.2	V	I <sub>C</sub> = -1.5A, I <sub>B</sub> = -0.15A
DC Current Gain	h <sub>FE</sub>	120	—	270	—	V <sub>CE</sub> = -3V, I <sub>C</sub> = -0.5A
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	f <sub>T</sub>	—	110	—	MHZ	V <sub>CE</sub> = -5V, I <sub>C</sub> = -0.1A, f = 30MHZ
Output Capacitance	C <sub>obo</sub>	—	26	—	pF	V <sub>CB</sub> = -10V, f = 1MHZ
Turn-On Time	t <sub>on</sub>	—	109	—	ns	V <sub>CC</sub> = 30V I <sub>CC</sub> = 150mA I <sub>B1</sub> = -I <sub>B2</sub> = 15mA
Delay Time	t <sub>d</sub>	—	60	—	ns	
Rise Time	t <sub>r</sub>	—	49	—	ns	
Turn-Off Time	t <sub>off</sub>	—	280	—	ns	
Storage Time	t <sub>s</sub>	—	246	—	ns	
Fall Time	t <sub>f</sub>	—	34	—	ns	

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

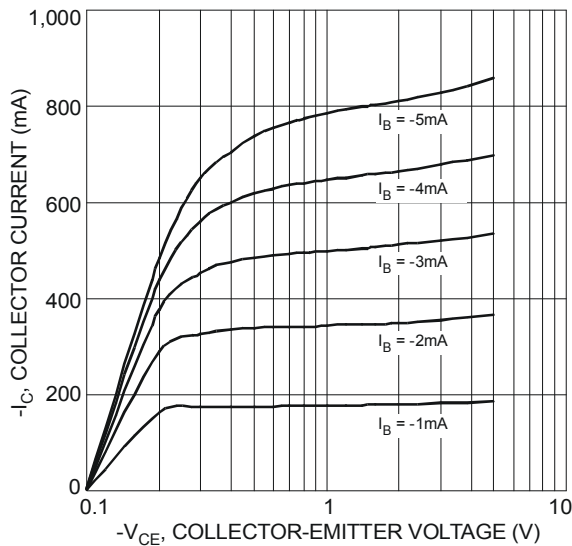


Figure 2 Typical Collector Current vs. Collector-Emitter Voltage

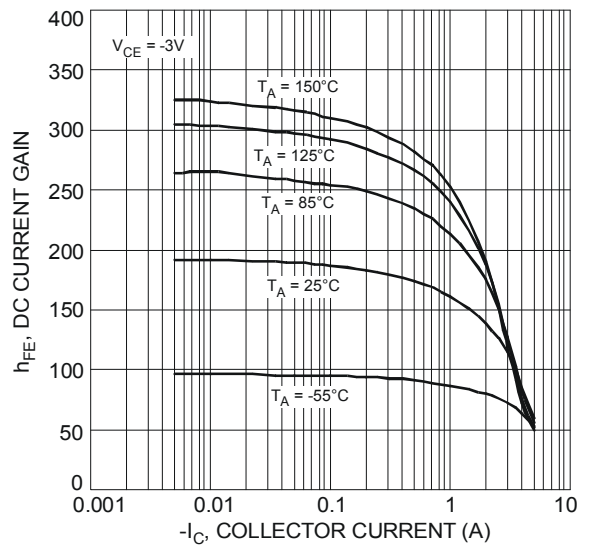


Figure 3 Typical DC Current Gain vs. Collector Current

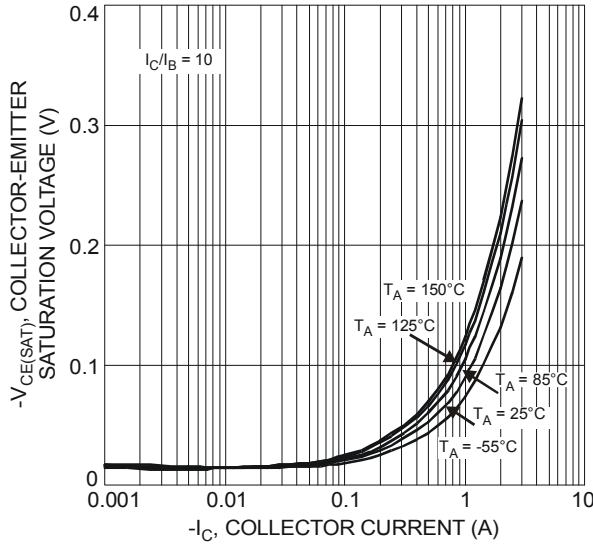


Figure 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

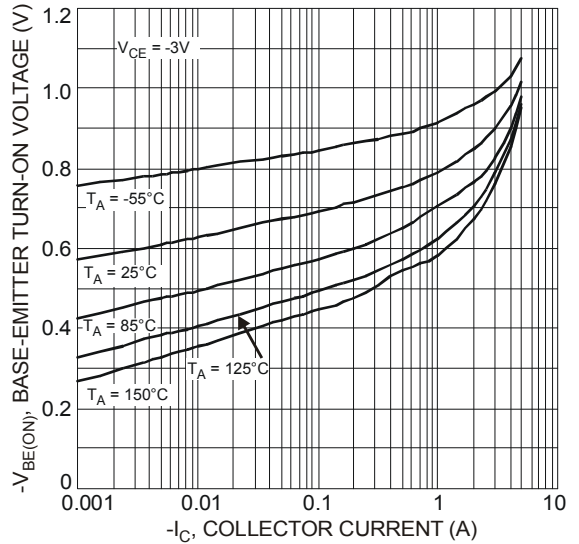


Figure 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

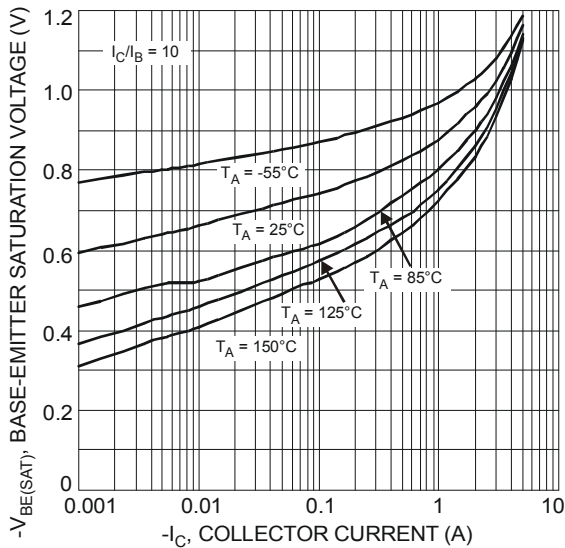


Figure 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

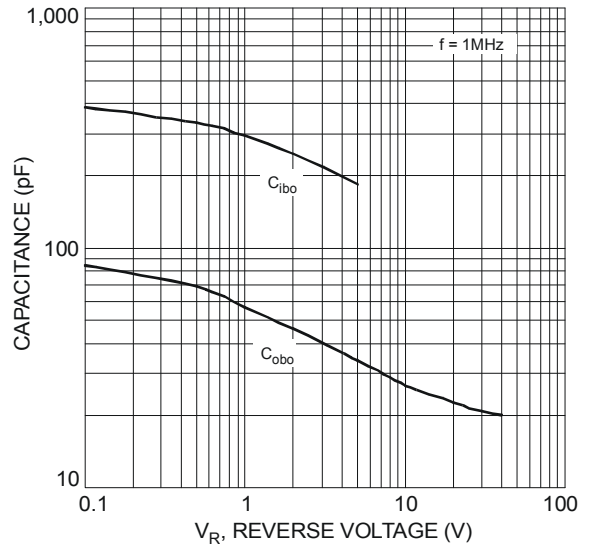


Figure 7 Typical Capacitance Characteristics

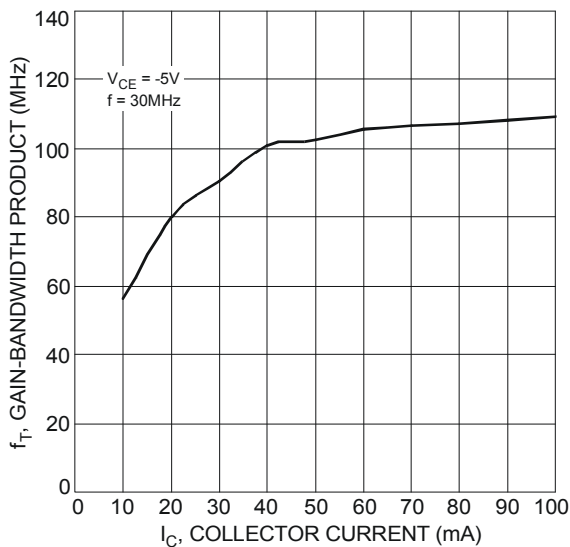


Figure 8 Typical Gain-Bandwidth Product vs. Collector Current

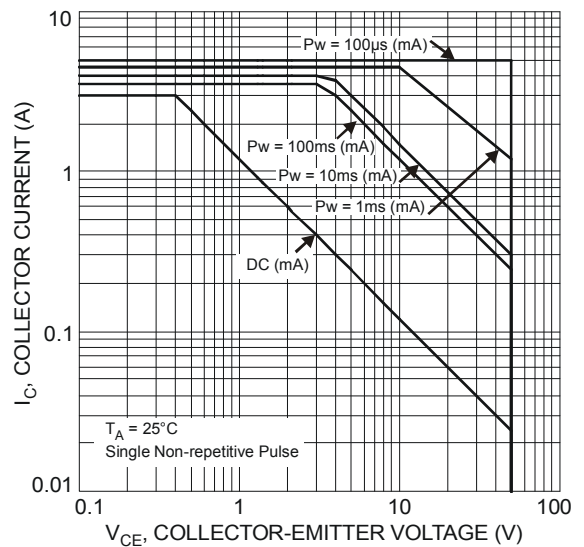
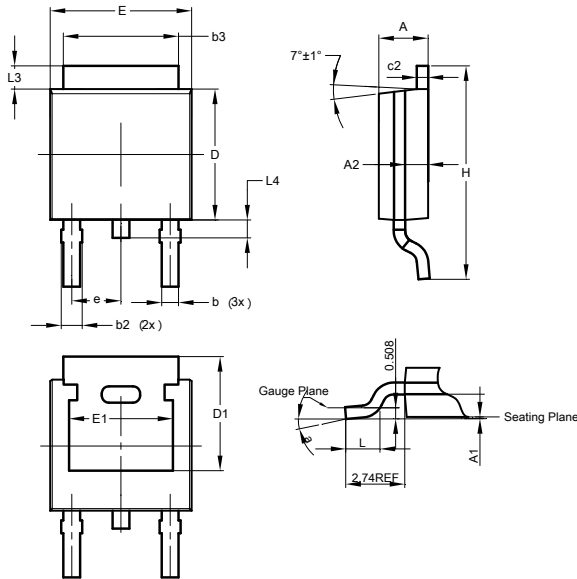


Figure 9 Safe Operating Area (Note 3)

**Package Outline Dimensions**

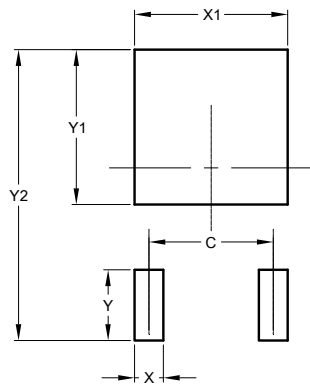
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



T0252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c2	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	-
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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