50V PNP MEDIUM POWER TRANSISTOR IN TO252

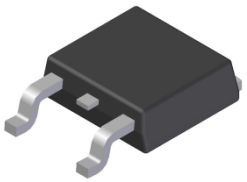
Features

- 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**

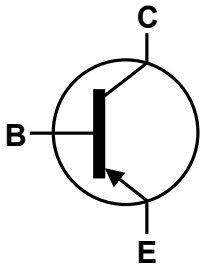
Mechanical Data

- 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 (e3)
- Weight: 0.34 grams (approximate)

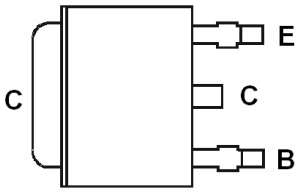
TO252 (DPAK)



Top View



Device Schematic



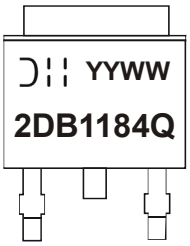
Pin Out Configuration
Top view

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

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Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-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°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1.2	W
Power Dissipation @T_L = +25°C	(Note 6)	P_D	15	W
Thermal Resistance, Junction to Lead	(Note 5)	$R_{\theta JA}$	104	°C/W
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JL}$	8.3	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-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: 5. 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.
6. Thermal resistance from junction to solder-point (on the exposed collector pad).
7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics

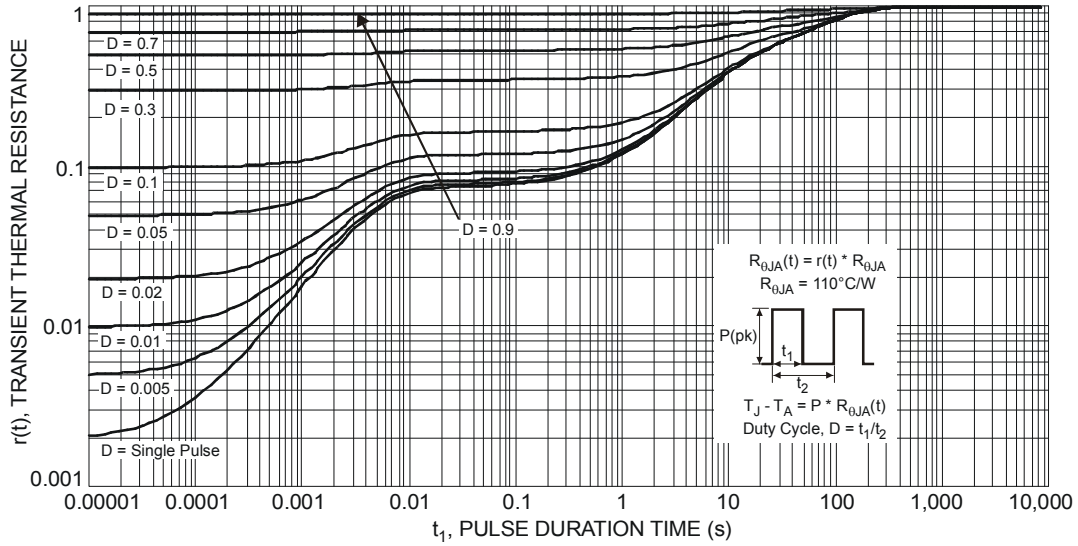

Figure 1 Transient Thermal Response

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Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Collector-Base Breakdown Voltage	BV_{CBO}	-60	—	—	V	I_C = -50μA, I_E = 0
Collector-Emitter Breakdown Voltage	BV_{CEO}	-50	—	—	V	I_C = -1mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	—	—	V	I_E = -50μA, I_C = 0
Collector Cutoff Current	I_{CBO}	—	—	-1	μA	V_{CB} = -40V, I_E = 0
Emitter Cutoff Current	I_{EBO}	—	—	-1	μA	V_{EB} = - 4V, I_C = 0
ON CHARACTERISTICS (Note 8)						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	-1	V	I_C = -2A, I_B = -0.2A
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-1.2	V	I_C = -1.5A, I_B = -0.15A
DC Current Gain	h_{FE}	120	—	270	—	V_{CE} = -3V, I_C = -0.5A
SMALL SIGNAL CHARACTERISTICS						
Current Gain-Bandwidth Product	f_T	—	110	—	MHz	V_{CE} = -5V, I_C = -0.1A, f = 30MHz
Output Capacitance	C_{obo}	—	26	—	pF	V_{CB} = -10V, f = 1MHz
Turn-On Time	t_{on}	—	109	—	ns	V_{CC} = 30V I_{CC} = 150mA I_{B1} = - I_{B2} = 15mA
Delay Time	t_d	—	60	—	ns	
Rise Time	t_r	—	49	—	ns	
Turn-Off Time	t_{off}	—	280	—	ns	
Storage Time	t_s	—	246	—	ns	
Fall Time	t_f	—	34	—	ns	

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

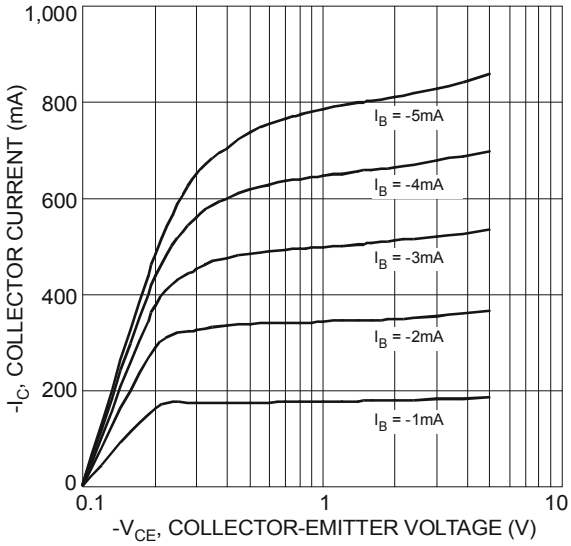

Figure 2 Typical Collector Current vs. Collector-Emitter Voltage

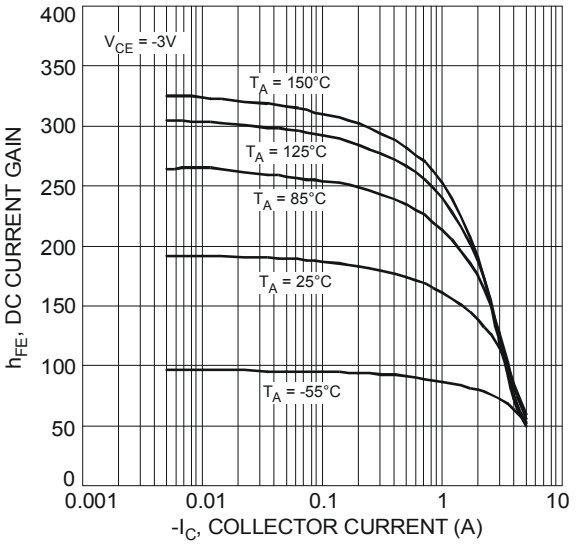

Figure 3 Typical DC Current Gain vs. Collector Current

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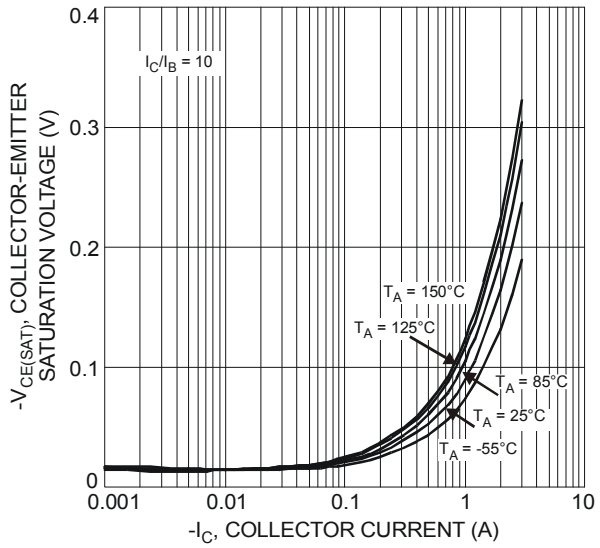

Figure 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

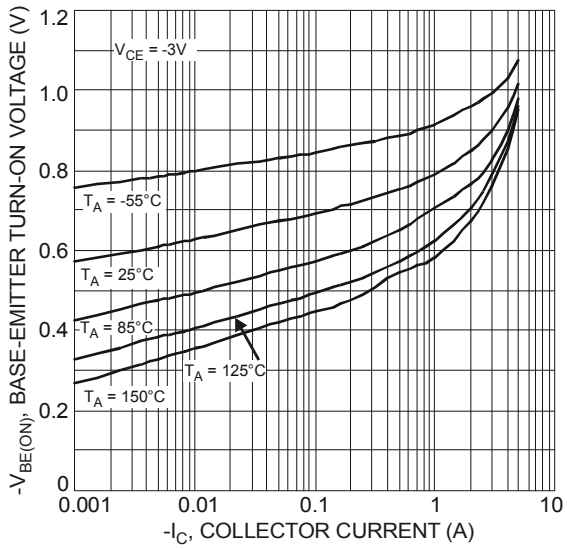

Figure 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

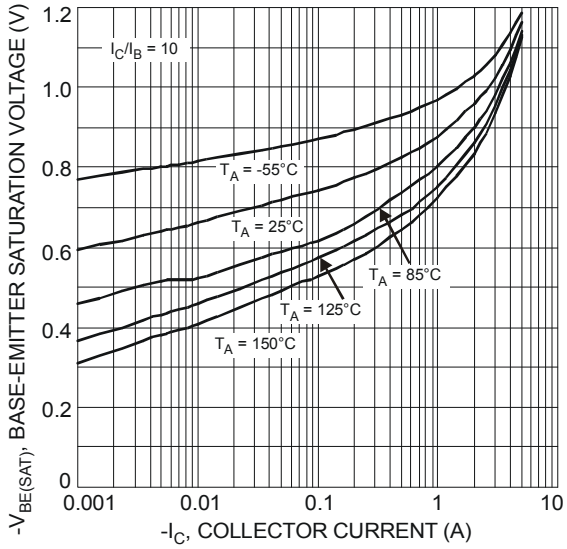

Figure 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

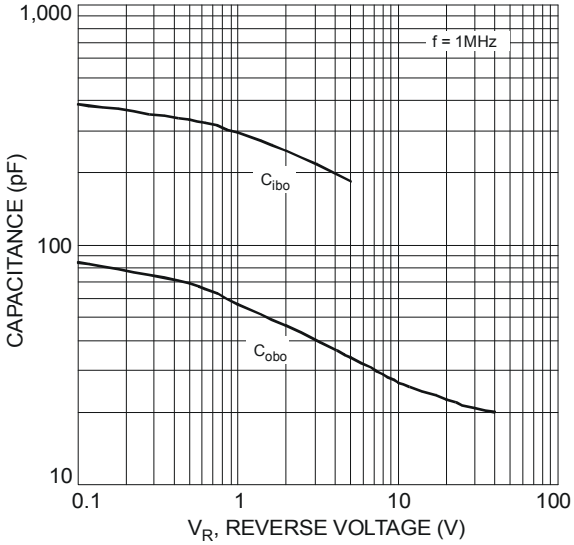

Figure 7 Typical Capacitance Characteristics

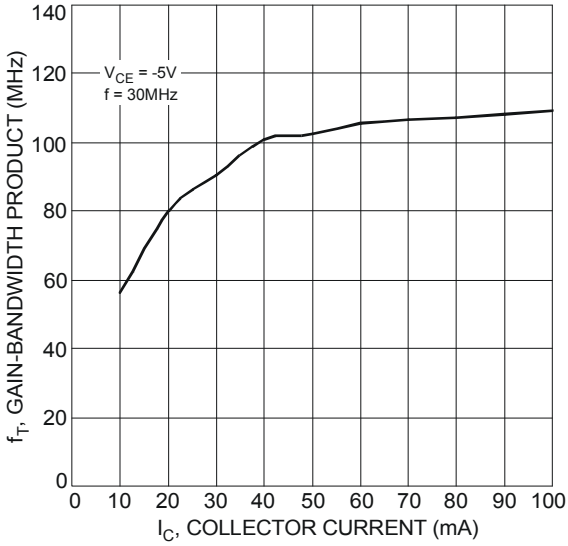

Figure 8 Typical Gain-Bandwidth Product vs. Collector Current

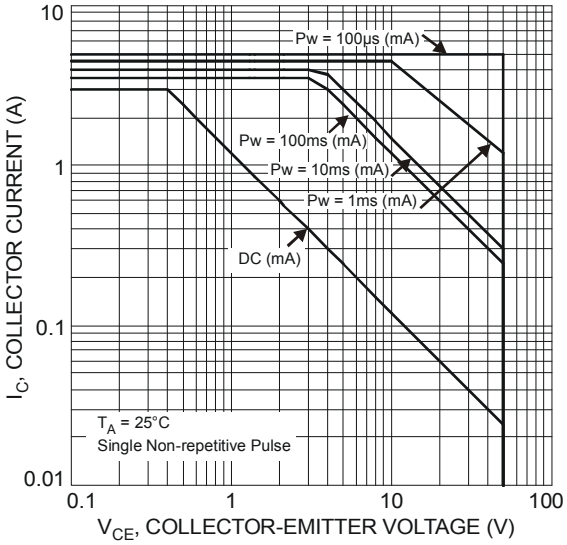

Figure 9 Safe Operating Area (Note 3)

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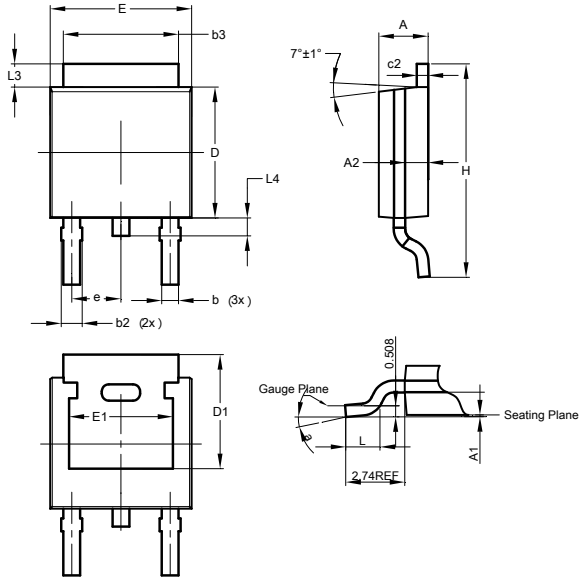
Package Outline Dimensions

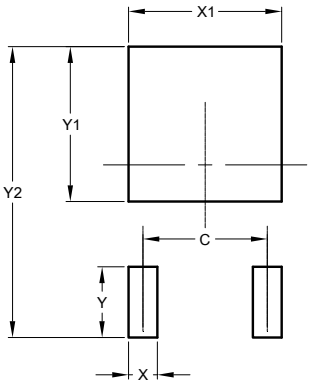
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



TO252 (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°	-
All Dimensions in mm			

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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