

Features

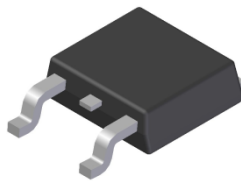
- $BV_{CEO} > -50V$
- $I_C = -3A$ High Continuous Collector Current
- $I_{CM} = -4.5A$ Peak Pulse Current
- Epitaxial Planar Die Construction
- Low Collector-Emitter Saturation Voltage
- Ideal for Medium Power Switching or Amplification Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The 2DB1184Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

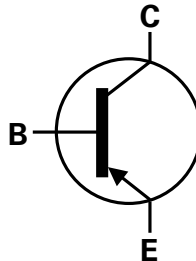
Mechanical Data

- Package: TO252
- Package 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)

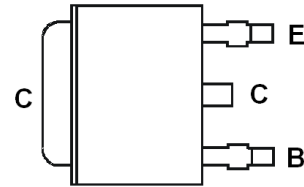
TO252 (DPAK)



Top View



Device Schematic



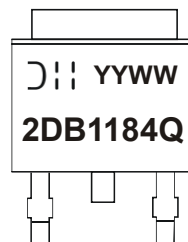
Pinout Configuration
Top view

Ordering Information (Note 4)

Orderable Part Number	Marking	Package	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
2DB1184Q-13	2DB1184Q	TO252 (DPAK)	13	16	2,500	Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



2DB1184Q = Product Type Marking Code
 DII = Manufacturer's Code Marking
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 26 = 2026)
 WW = Week Code 01 to 52

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.)

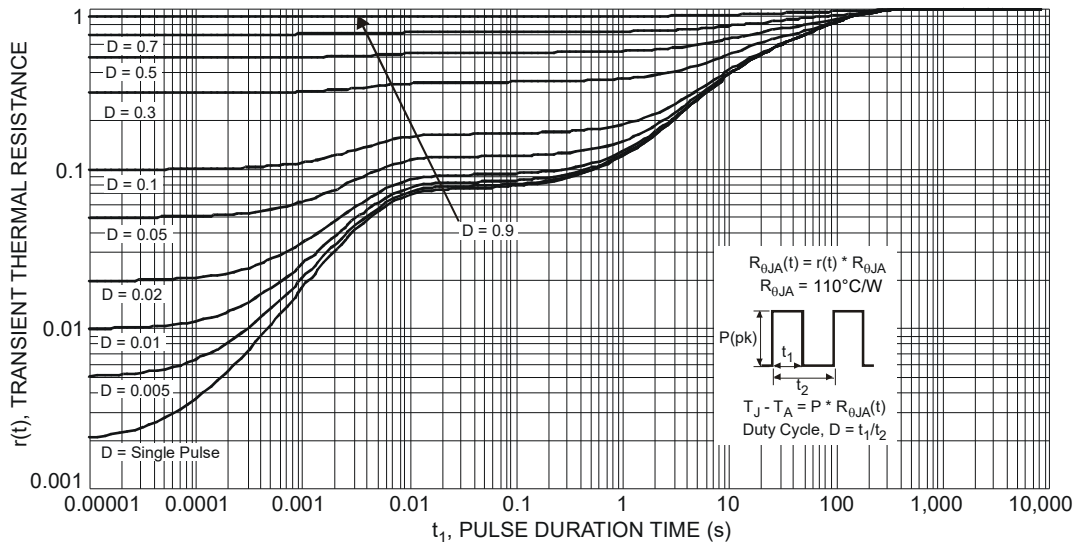
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	1.2	W
Power Dissipation @T _L = +25°C (Note 6)	P _D	15	W
Thermal Resistance, Junction to Lead (Note 5)	R _{θJA}	104	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJL}	8.3	°C/W
Operating and Storage Temperature Range	T _J , T _{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

Notes: 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 specifications JESD22-A114 and JESD22-A115.

Thermal Characteristics



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%.

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

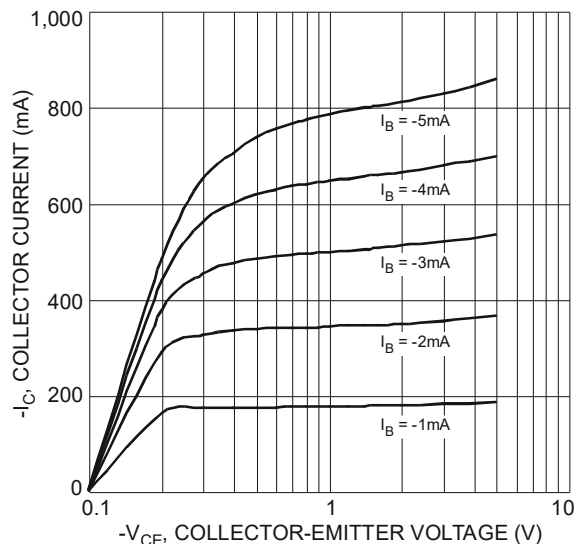


Figure 2 Typical Collector Current vs. Collector-Emitter Voltage

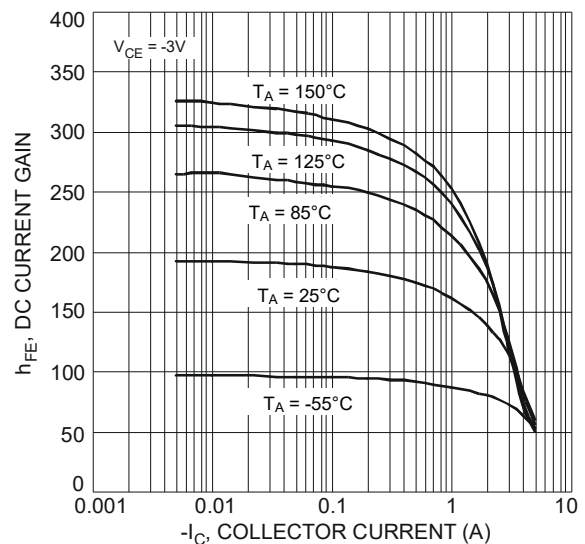


Figure 3 Typical DC Current Gain vs. Collector Current

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.) (continued)

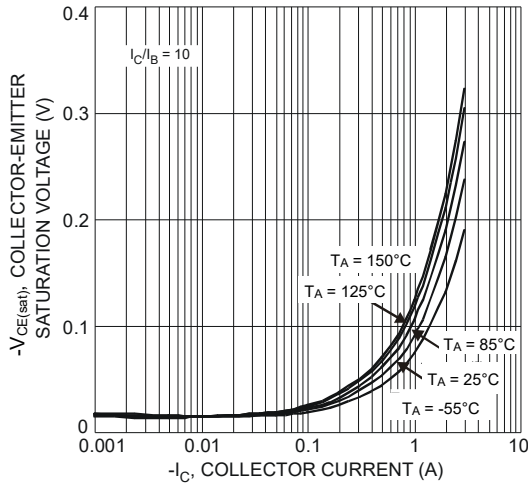


Figure 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

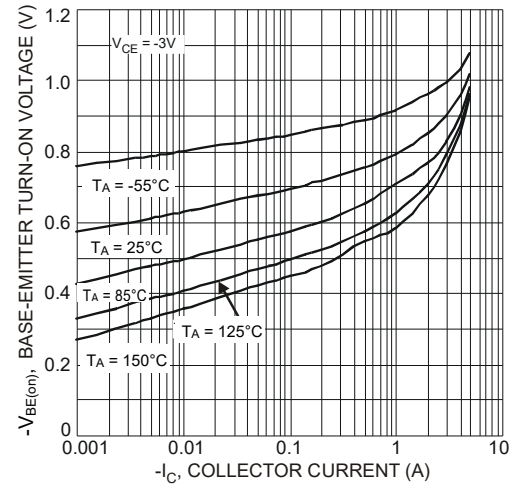


Figure 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

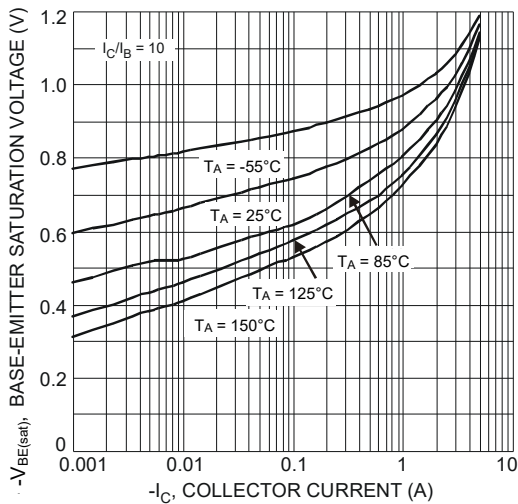


Figure 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

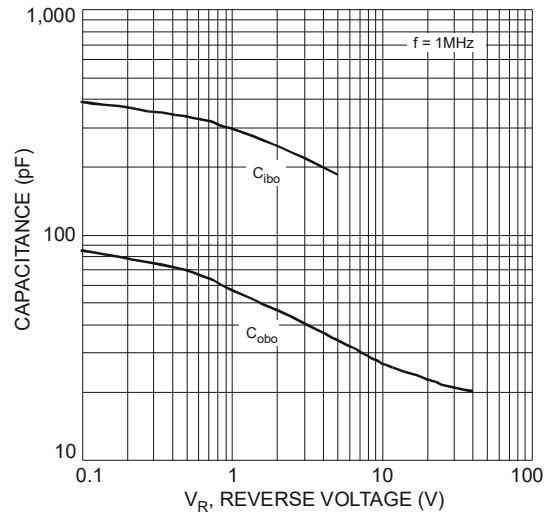


Figure 7 Typical Capacitance Characteristics

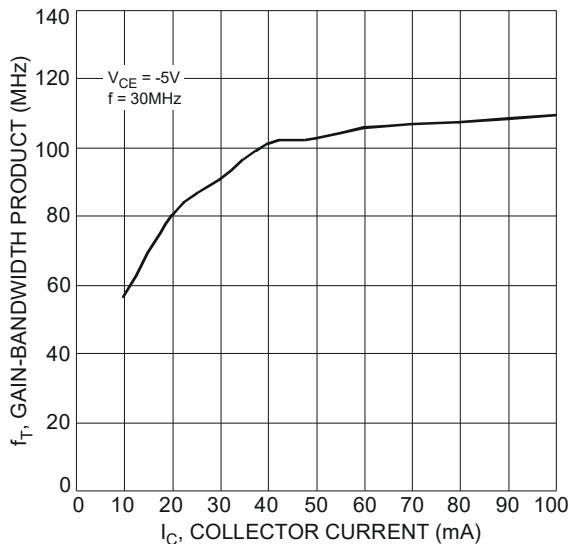


Figure 8 Typical Gain-Bandwidth Product vs. Collector Current

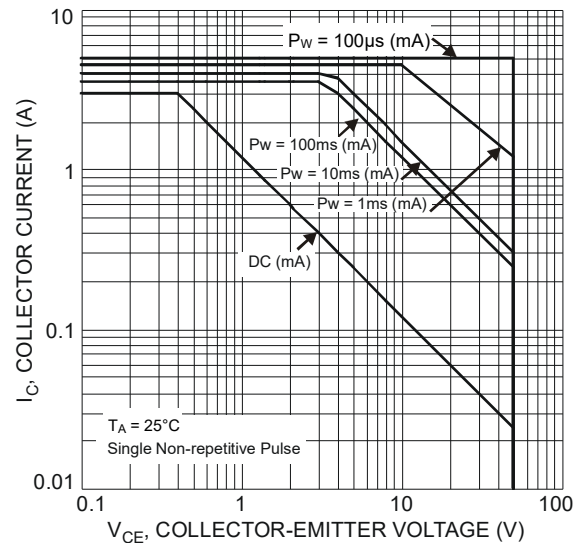
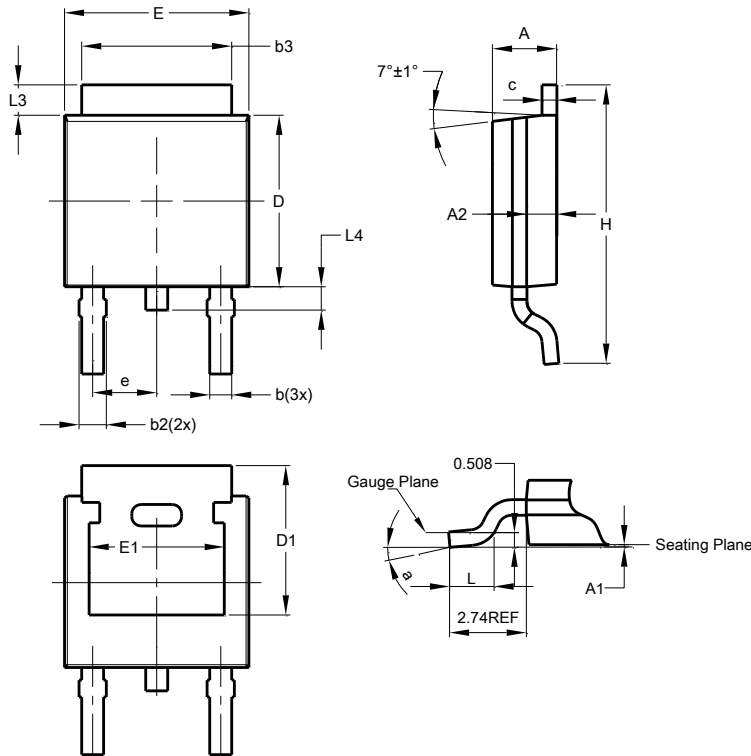


Figure 9 Safe Operating Area

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

TO252 (DPAK)

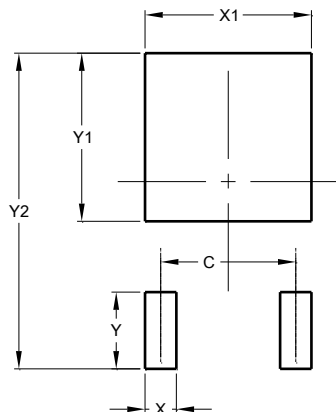


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.50	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	--	--
e	2.286 BSC		
E	6.45	6.70	6.58
E1	4.32	--	--
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	--
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

TO252 (DPAK)



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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