

Description

This bipolar junction transistor (BJT) is designed to meet the stringent requirement of automotive applications

Features

- $BV_{CEO} > 100V$
- $I_C = 6A$ High Continuous Collector Current
- $I_{CM} = 10A$ Peak Collector Current
- P_D up to 3.2W
- 43% Smaller than SOT223; 60% Smaller than TO252
- Maximum Height just 1.1mm
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DXT2011P5Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

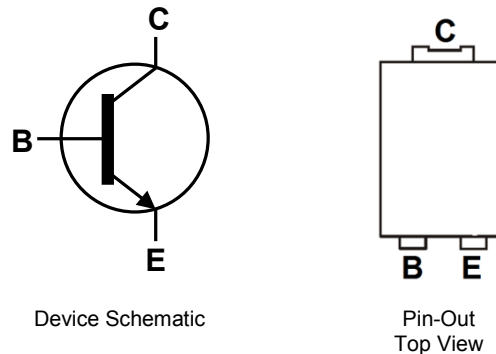
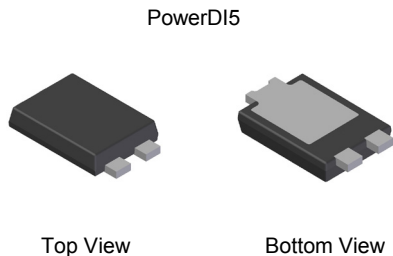
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Case: PowerDI[®]5
- 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 @3
- Weight: 0.093 grams (Approximate)

Applications

- Motor Drive
- Voltage Regulator Using Emitter-Follower
- DC-DC Converter
- Telecoms
- Power Management



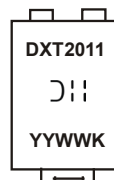
Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DXT2011P5Q-13	Automotive	DXT2011	13	16	5000

- 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

PowerDI5



DXT2011 = Product Type Marking Code
 = Manufacturers' Code Marking
 K = Factory Designator
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 19 for 2019)
 WW = Week Code (01 to 53)

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	200	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	6	A
Peak Pulse Current	I_{CM}	10	A

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

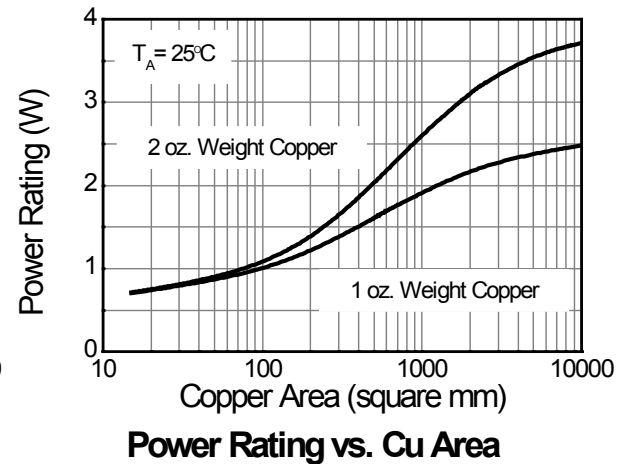
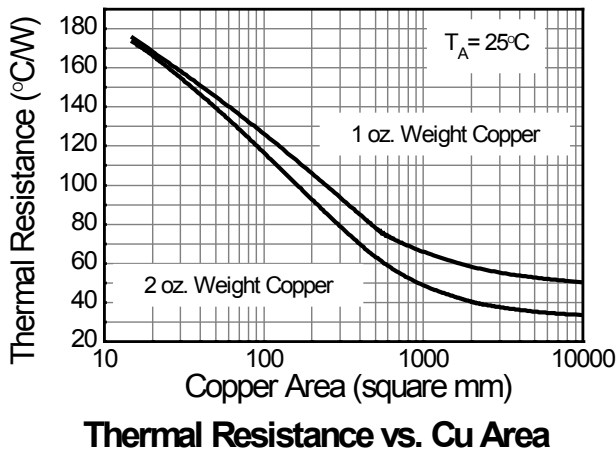
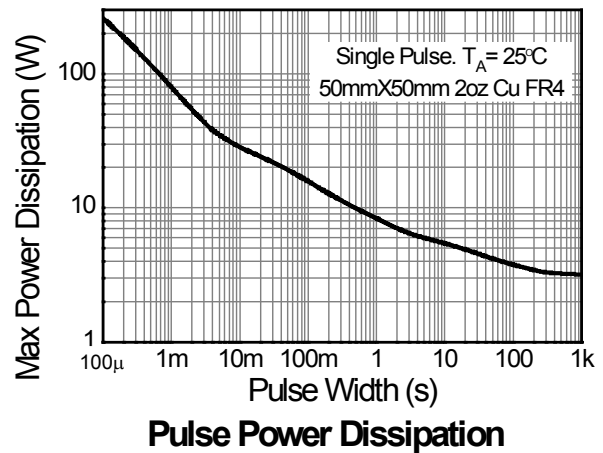
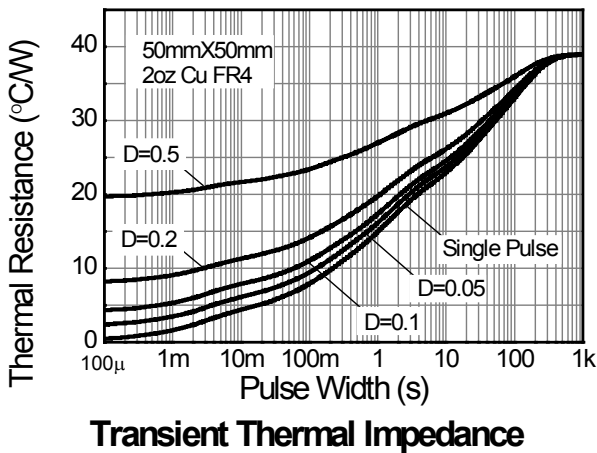
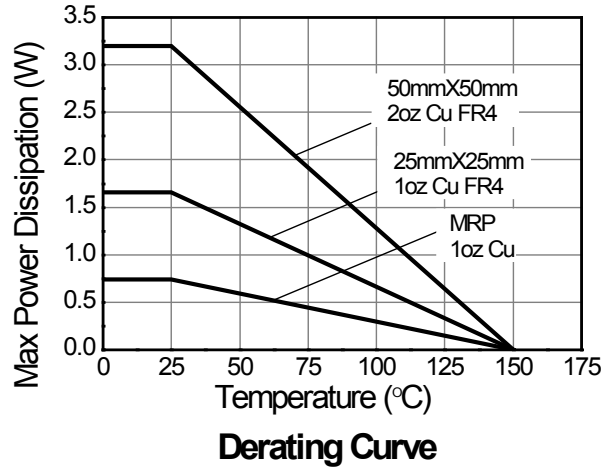
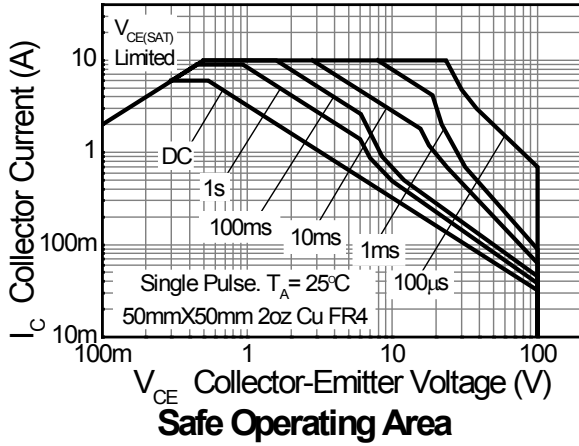
Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	(Note 5)	3.2
		(Note 6)	1.7
		(Note 7)	0.74
Thermal Resistance, Junction to Ambient Air	$R_{\theta JA}$	(Note 5)	39
		(Note 6)	75
		(Note 7)	169
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	5.6	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 9)

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 50mm × 50mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as Note 6, except mounted on 25mm × 25mm 1oz copper.
 7. Same as Note 6, except mounted on minimum recommended pad (MRP) layout.
 8. Thermal resistance from junction to solder-point (on the exposed collector pad).
 9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

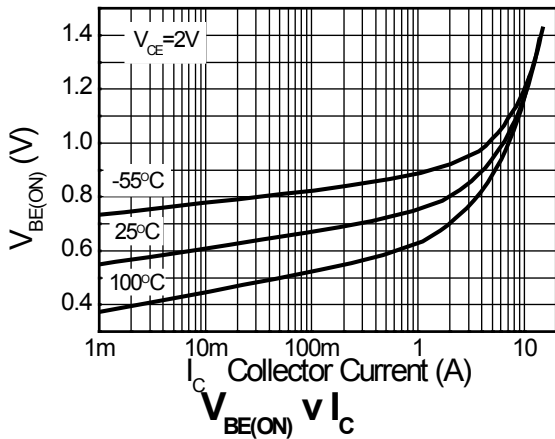
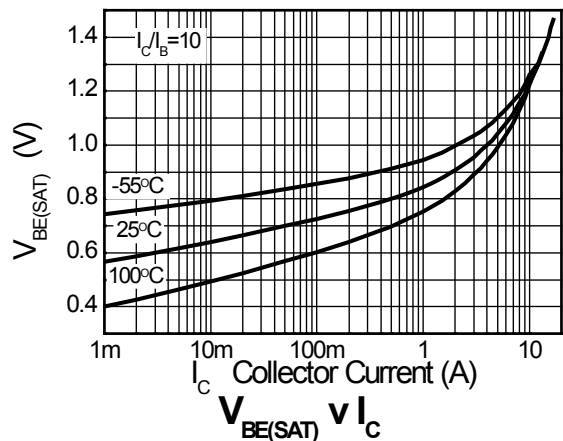
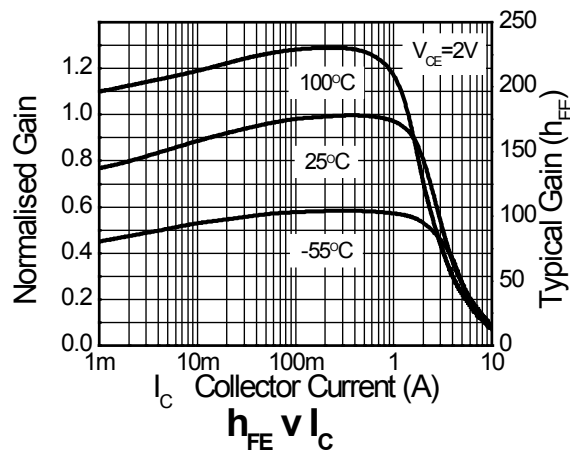
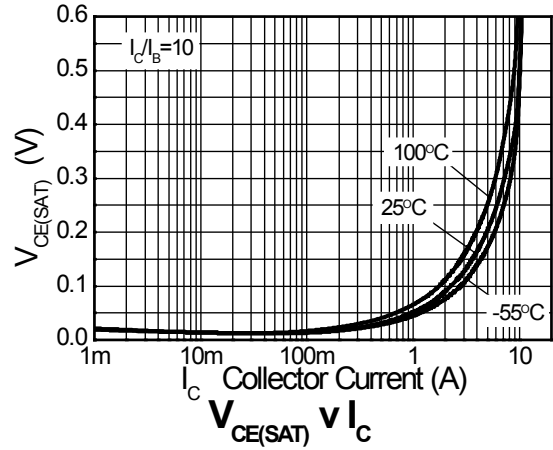
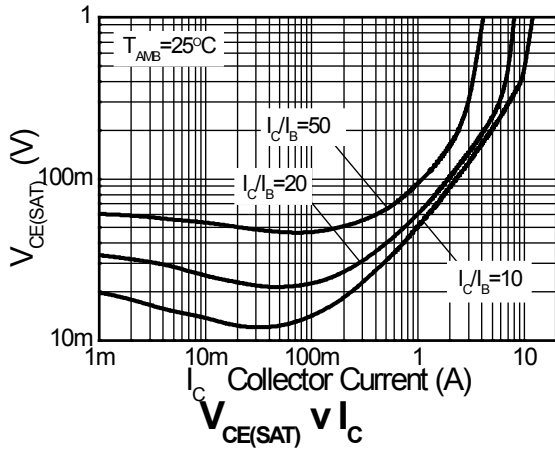


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	200	235	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV _{CEO}	100	115	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8.1	—	V	I _E = 100μA
Collector Cutoff Current	I _{CBO}	—	—	20 0.5	nA μA	V _{CB} = 150V V _{CB} = 150V, T _A = +100°C
Collector Cutoff Current	I _{CER} R _{≤1kΩ}	—	—	20 0.5	nA μA	V _{CB} = 150V V _{CB} = 150V, T _A = +100°C
Emitter Cutoff Current	I _{EBO}	—	—	10	nA	V _{EB} = 6V
Collector-Emitter Saturation Voltage (Note 10)	V _{CE(sat)}	—	21 50 95 180	35 65 125 220	mV	I _C = 0.1A, I _B = 5mA I _C = 1A, I _B = 100mA I _C = 2A, I _B = 100mA I _C = 5A, I _B = 500mA
Base-Emitter Saturation Voltage (Note 10)	V _{BE(sat)}	—	1020	1120	mV	I _C = 5A, I _B = 500mA
Base-Emitter Turn-On Voltage (Note 10)	V _{BE(on)}	—	920	1000	mV	V _{CE} = 2V, I _C = 5A
DC Current Gain (Note 10)	h _{FE}	100 100 30 10	— — — —	— 300 — —	—	V _{CE} = 2V, I _C = 10mA V _{CE} = 2V, I _C = 2A V _{CE} = 2V, I _C = 5A V _{CE} = 2V, I _C = 10A
Transition Frequency	f _T	—	130	—	MHz	V _{CE} = 10V, I _C = 100mA, f = 50MHz
Output Capacitance	C _{obo}	—	26	—	pF	V _{CB} = 10V, f = 1MHz
Switching Times	t _{on} t _{off}	— —	41 1010	— —	ns	V _{CC} = 10V, I _C = 1A, I _{B1} = -I _{B2} = 100mA

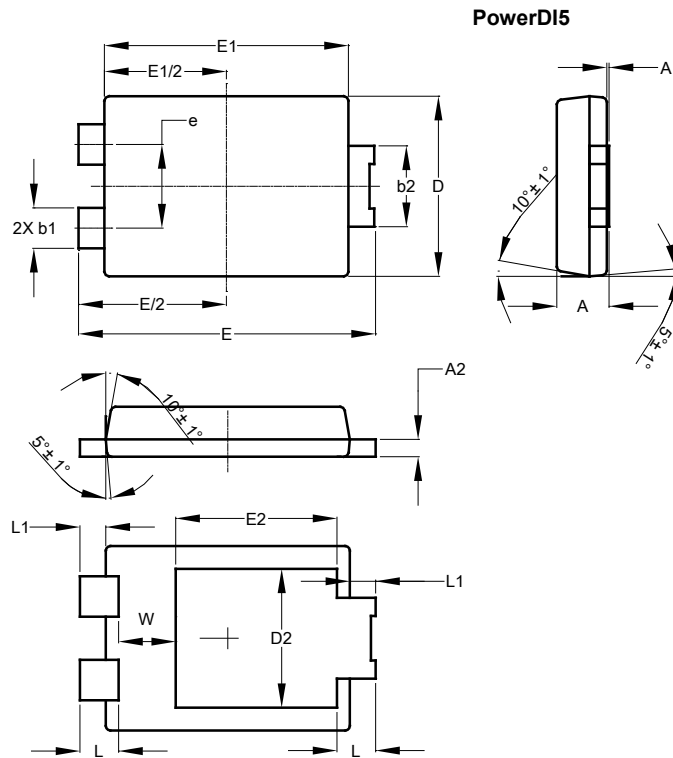
Note: 10. Pulse Test: Pulse width ≤ 300μs. Duty cycle ≤ 2.0%.

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



Package Outline Dimensions

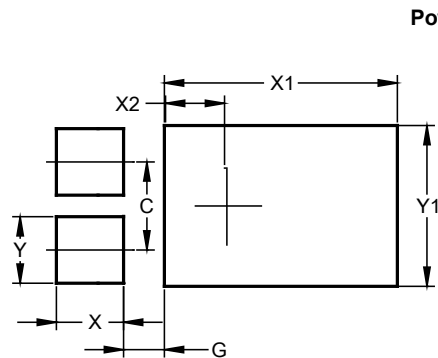
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



PowerDI5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A1	0.00	0.05	--
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	--	--	3.054
E	6.40	6.60	6.51
e	--	--	1.84
E1	5.30	5.45	5.37
E2	--	--	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255
All Dimensions in mm			

Suggested Pad Layout

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



Dimensions	Value (in mm)
C	1.840
G	0.852
X	1.400
X1	4.860
X2	1.310
Y	1.390
Y1	3.360

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2019, Diodes Incorporated

www.diodes.com