

Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirement of Automotive Applications

Features

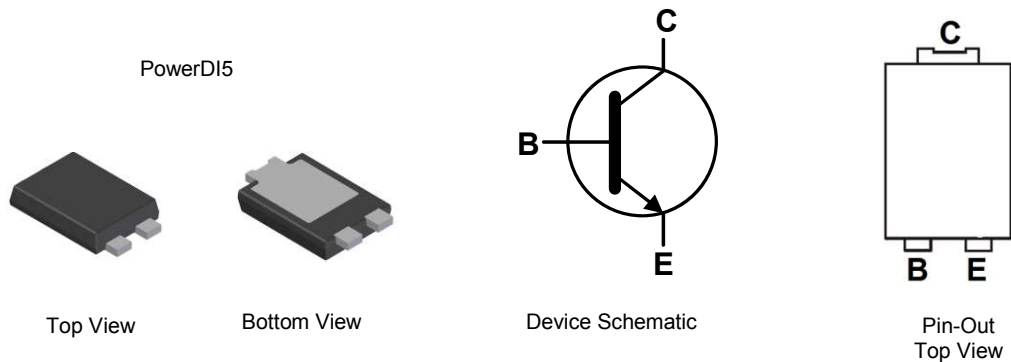
- $BV_{CEO} > 100V$
- $I_C = 6A$ High Continuous Collector Current
- $I_{CM} = 10A$ Peak Collector Current
- P_D up to 3.2W
- 43% Smaller than SOT223; 60% Smaller than TO252
- Maximum Height just 1.1mm
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

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 [Ⓔ]
- Weight: 0.093 grams (Approximate)

Applications

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



Ordering Information (Note 5)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DXT2011P5Q-13	Automotive	DXT2011	13	16	5,000

- 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html.
 5. 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: 17 for 2017)
 WW = Week Code (01 to 53)

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

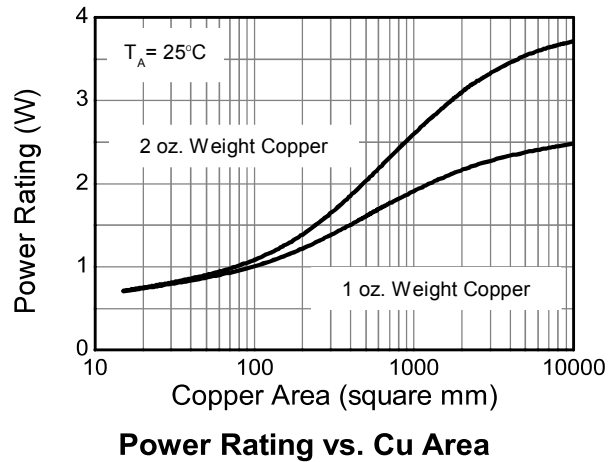
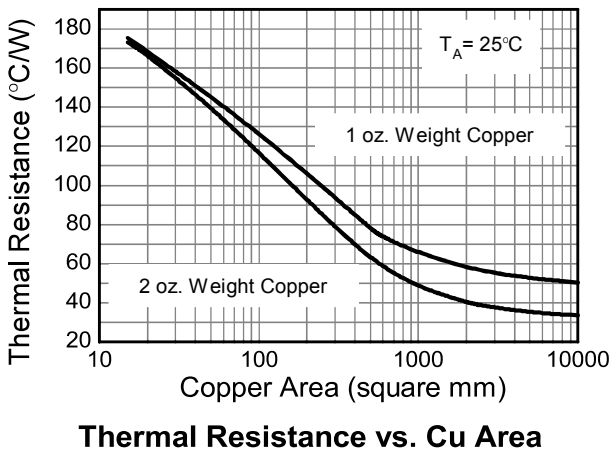
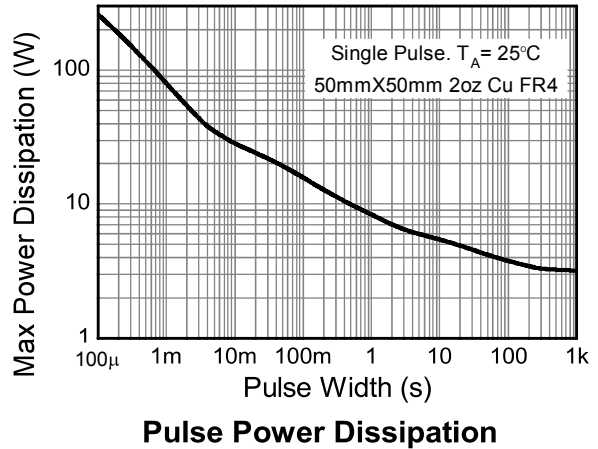
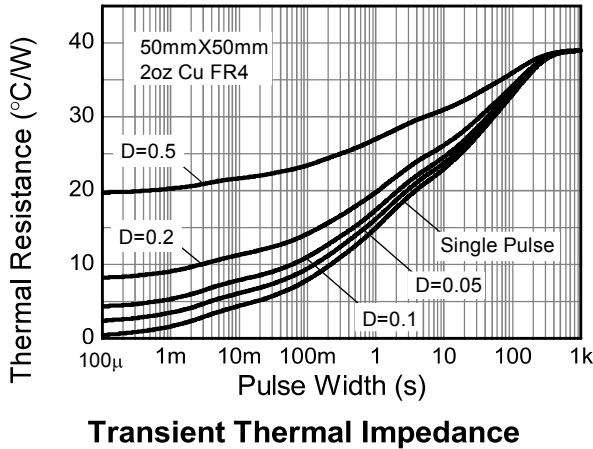
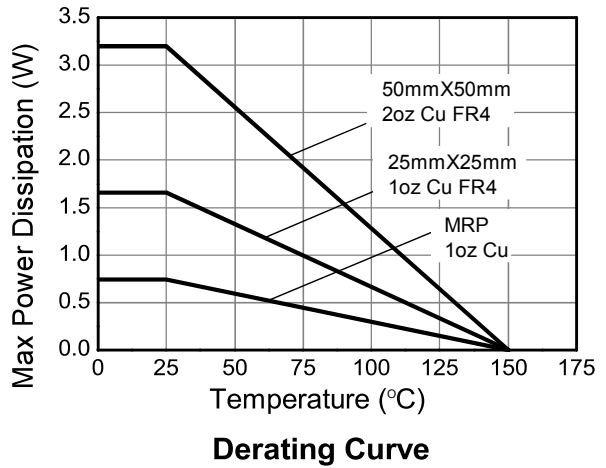
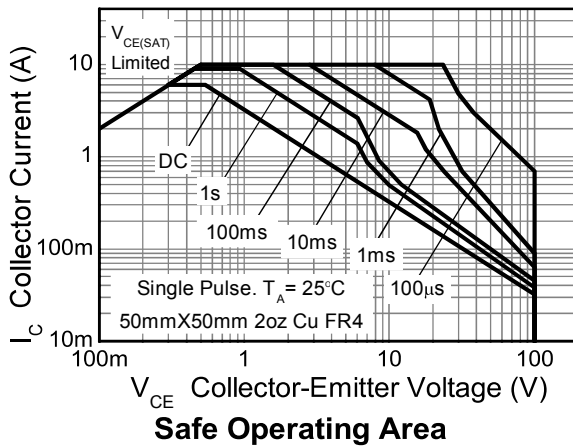
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	3.2	W
		1.7	
		0.74	
Thermal Resistance, Junction to Ambient Air	R _{θJA}	39	°C/W
		75	
		169	
Thermal Resistance, Junction to Leads	R _{θJL}	5.6	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 10)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
6. For a device mounted with the exposed collector pad on 50mm x 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.
 7. Same as note (6), except mounted on 25mm x 25mm 1oz copper.
 8. Same as note (6), except mounted on minimum recommended pad (MRP) layout.
 9. Thermal resistance from junction to solder-point (on the exposed collector pad).
 10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

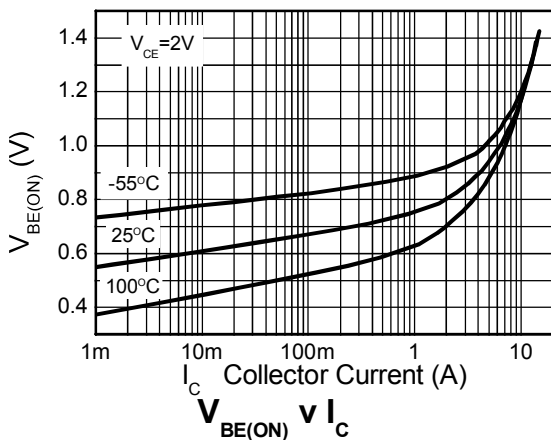
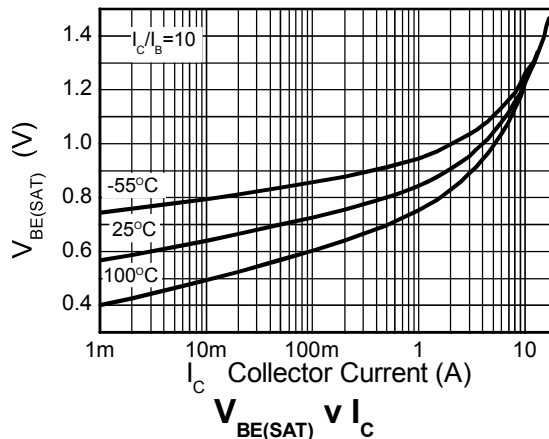
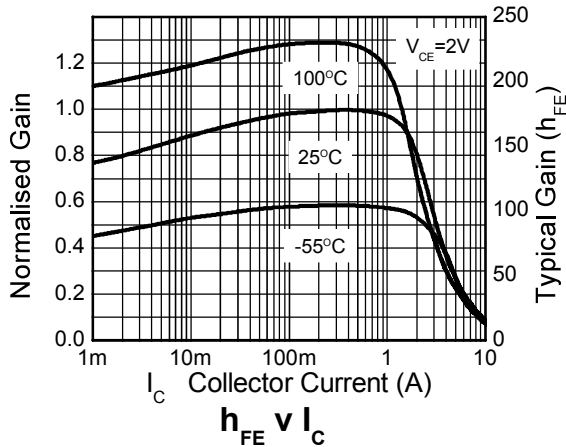
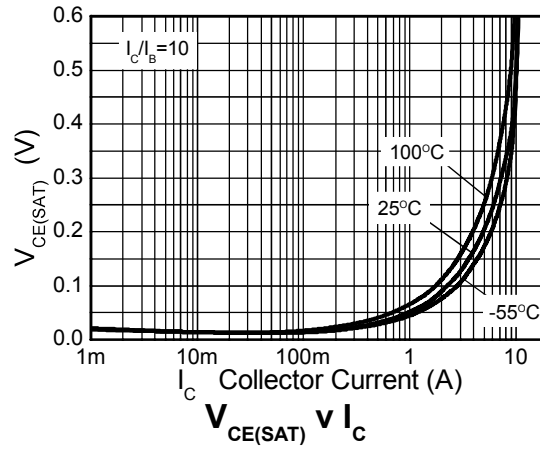
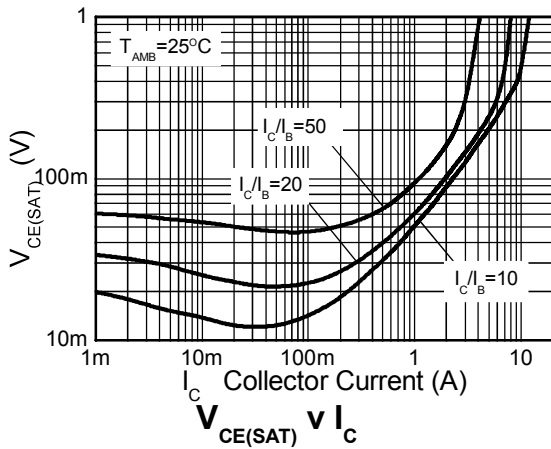


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	200	235	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	100	115	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.1	—	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	—	—	20 0.5	nA μA	$V_{CB} = 150\text{V}$ $V_{CB} = 150\text{V}, T_A = +100^\circ\text{C}$
Collector Cutoff Current	I_{CER} $R \leq 1\text{k}\Omega$	—	—	20 0.5	nA μA	$V_{CB} = 150\text{V}$ $V_{CB} = 150\text{V}, T_A = +100^\circ\text{C}$
Emitter Cutoff Current	I_{EBO}	—	—	10	nA	$V_{EB} = 6\text{V}$
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(SAT)}$	—	21 50 95 180	35 65 125 220	mV	$I_C = 0.1\text{A}, I_B = 5\text{mA}$ $I_C = 1\text{A}, I_B = 100\text{mA}$ $I_C = 2\text{A}, I_B = 100\text{mA}$ $I_C = 5\text{A}, I_B = 500\text{mA}$
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(SAT)}$	—	1020	1120	mV	$I_C = 5\text{A}, I_B = 500\text{mA}$
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(ON)}$	—	920	1000	mV	$V_{CE} = 2\text{V}, I_C = 5\text{A}$
DC Current Gain (Note 11)	h_{FE}	100 100 30 10	— — — —	— 300 — —	— — — —	$V_{CE} = 2\text{V}, I_C = 10\text{mA}$ $V_{CE} = 2\text{V}, I_C = 2\text{A}$ $V_{CE} = 2\text{V}, I_C = 5\text{A}$ $V_{CE} = 2\text{V}, I_C = 10\text{A}$
Transition Frequency	f_T	—	130	—	MHz	$V_{CE} = 10\text{V}, I_C = 100\text{mA}$, $f = 50\text{MHz}$
Output Capacitance	C_{obo}	—	26	—	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Switching Times	t_{ON} t_{OFF}	— —	41 1010	— —	ns	$V_{CC} = 10\text{V}, I_C = 1\text{A}$, $I_{B1} = -I_{B2} = 100\text{mA}$

Note: 11. Pulse Test: Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2.0\%$.

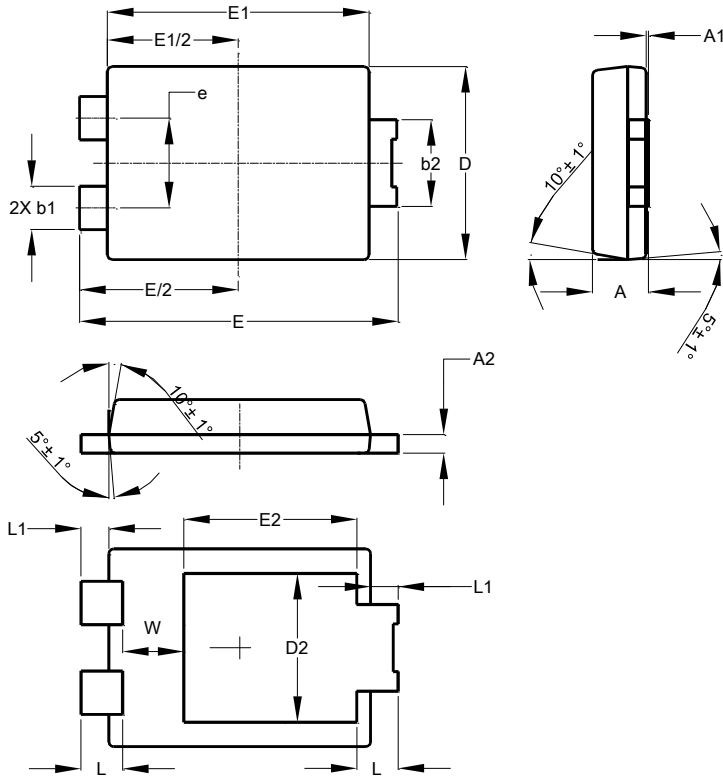
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



Package Outline Dimensions

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

PowerDI5



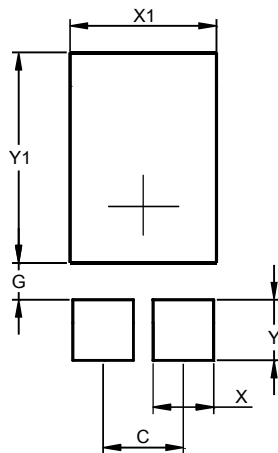
PowerDI5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A1	0.00	0.05	--
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	--	--	3.054
E	6.40	6.60	6.504
e	--	--	1.84
E1	5.30	5.45	5.37
E2	--	--	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255

All Dimensions in mm

Suggested Pad Layout

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

PowerDI5



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

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.

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