

Features

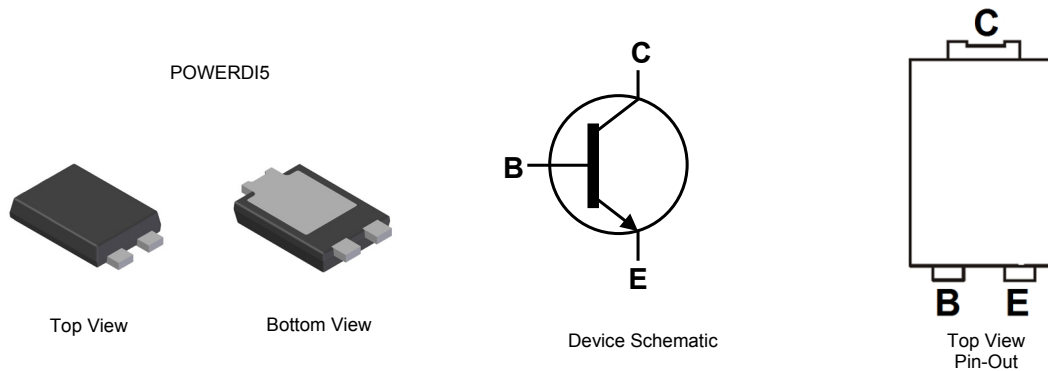
- $BV_{CEO} > 45V$
- $I_C = 3A$ High Continuous Collector Current
- $I_{CM} = 6A$ Peak Collector Current
- High gain device $>400 @1A$
- $R_{CE(sat)} = 77m\Omega$ for low equivalent On-Resistance
- h_{FE} specified up to 6A for a high gain hold up
- 43% smaller than SOT223; 60% smaller than TO252
- Maximum 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: PowerDI5
- 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 annealed over Copper leadframe
Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.093 grams (approximate)

Applications

- LED driver
- Motor driver
- Power Switches
- DC-DC Converters
- IGBT & MOSFET Gate Drivers
- Automotive Circuits

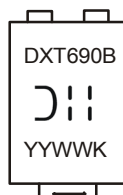


Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DXT690BP5-13	AEC-Q101	DXT690B	13	16	5,000
DXT690BP5Q-13	Automotive	DXT690B	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. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>

Marking Information



- DXT690B = Product Type Marking Code
- J11 = Manufacturers' Code Marking
- K = Factory Designator
- YYWW = Date Code Marking
- YY = Last Two Digits of Year (ex: 09 for 2009)
- WW = Week code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	60	V
Collector-Emitter Voltage	V _{CEO}	45	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	3	A
Peak Pulse Current	I _{CM}	6	A
Base Current	I _B	0.5	A

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

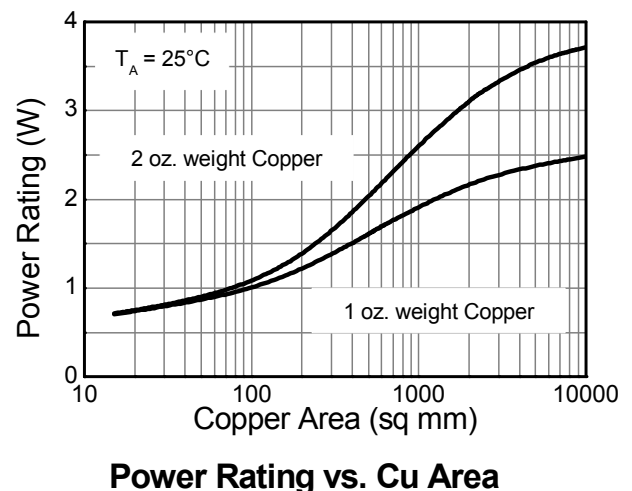
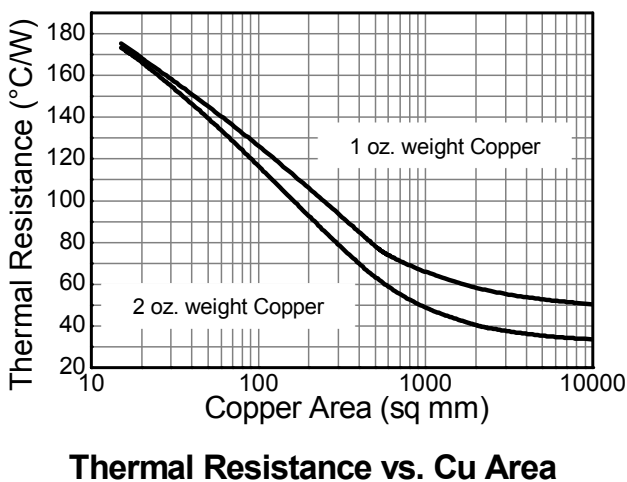
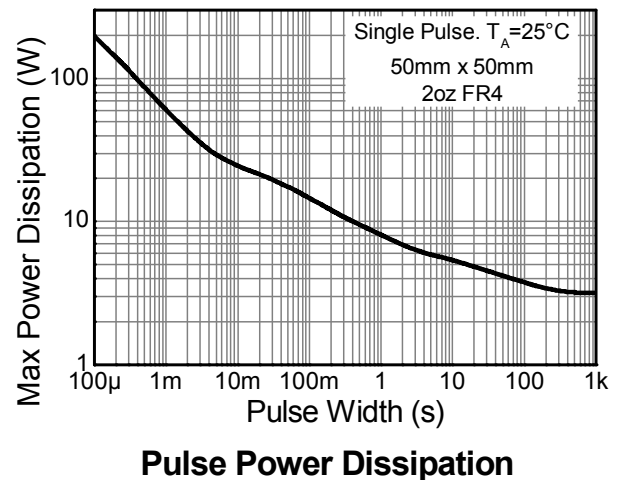
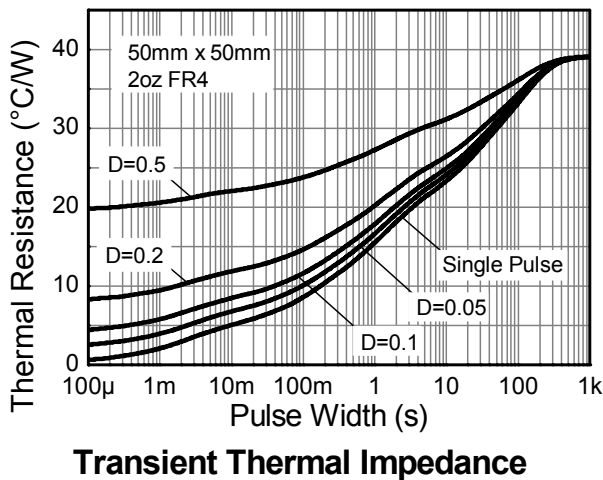
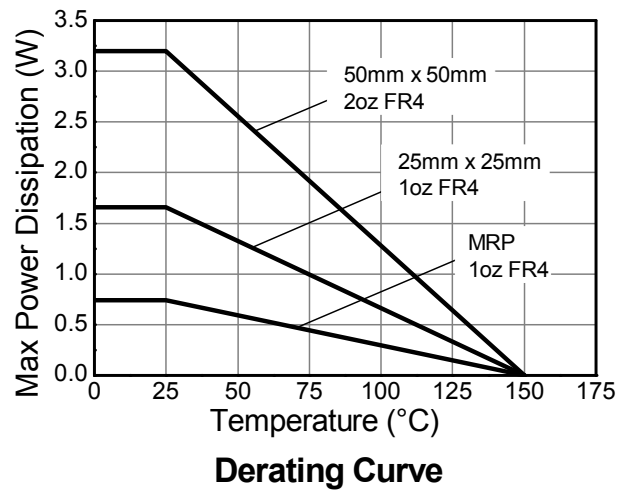
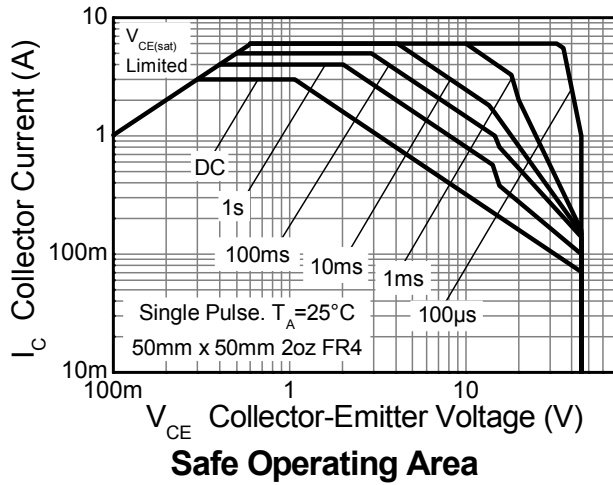
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 6)	3.2
		(Note 7)	1.7
		(Note 8)	0.74
Thermal Resistance, Junction to Ambient Air	R _{θJA}	(Note 6)	39
		(Note 7)	75
		(Note 8)	169
Thermal Resistance, Junction to Leads	R _{θJL}	9	°C/W
Thermal Resistance, Junction to Case	R _{θJC}	10	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 11)

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 FR4 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. Thermal resistance from junction to the top of the case.
 11. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

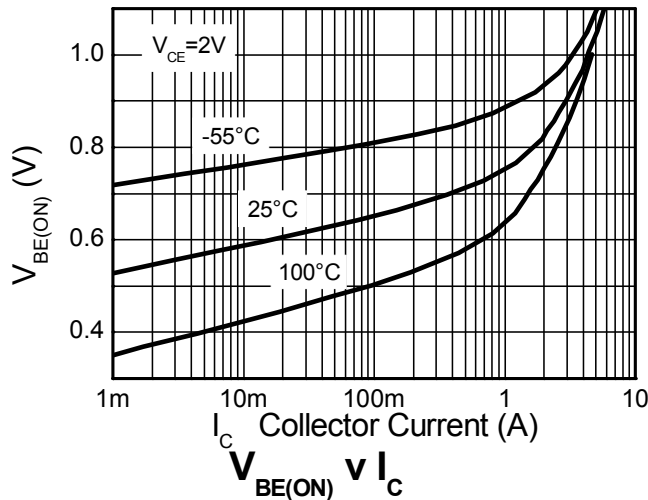
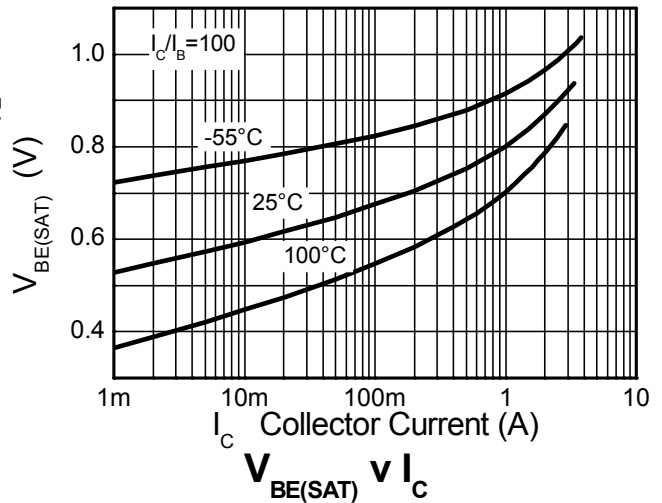
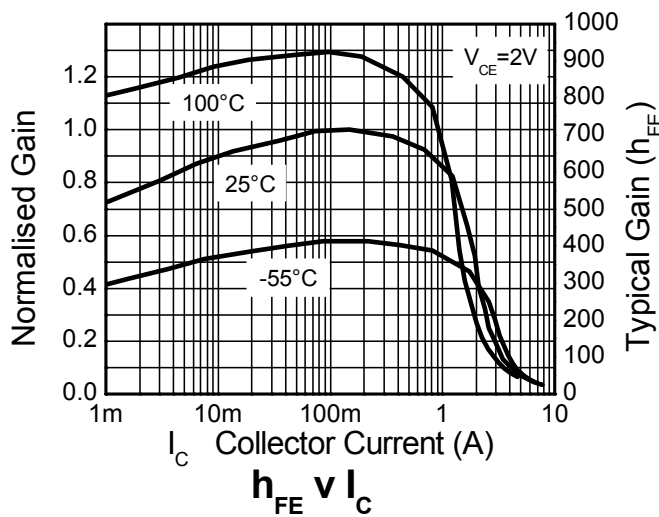
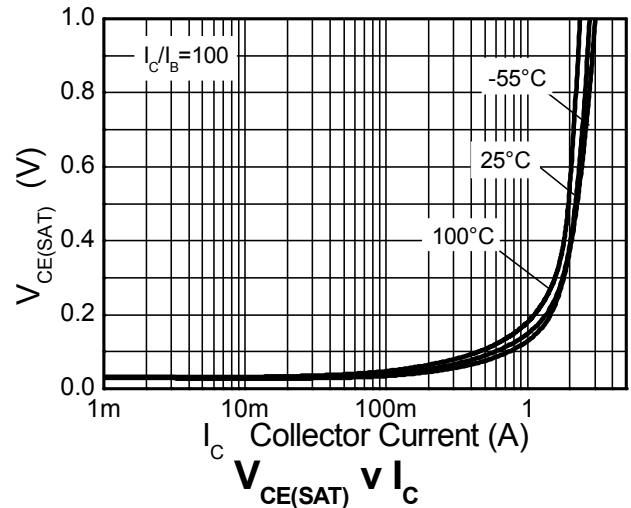
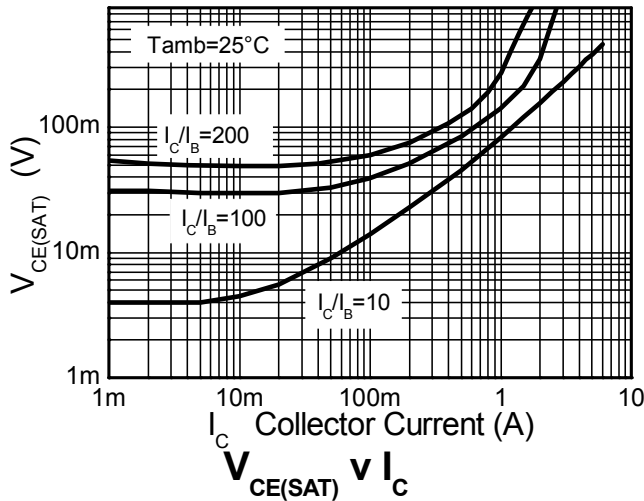


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	60	145	—	V	$I_C = 100\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage (Note 12)	BV_{CEO}	45	65	—	V	$I_C = 10\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.2	—	V	$I_E = 100\mu\text{A}, I_C = 0$
Collector-Base Cutoff Current	I_{CBO}	—	<1	20	nA	$V_{CB} = 35\text{V}, I_E = 0$
Collector-Emitter Cutoff Current	I_{CES}	—	<1	20	nA	$V_{CB} = 35\text{V}, V_{BE} = 0$
Emitter-Base Cutoff Current	I_{EBO}	—	<1	20	nA	$V_{EB} = 5.6\text{V}, I_C = 0$
ON CHARACTERISTICS (Note 12)						
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	50	85	mV	$I_C = 100\text{mA}, I_B = 0.5\text{mA}$
		—	240	360		$I_C = 1\text{A}, I_B = 5\text{mA}$
		—	210	320		$I_C = 2\text{A}, I_B = 40\text{mA}$
		—	230	350		$I_C = 3\text{A}, I_B = 150\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	1.0	1.2	V	$I_C = 3\text{A}, I_B = 150\text{mA}$
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	—	0.9	1.1	V	$I_C = 3\text{A}, V_{CE} = 2\text{V}$
DC Current Gain	h_{FE}	500	700	—	—	$I_C = 100\text{mA}, V_{CE} = 2\text{V}$
		400	600	—		$I_C = 1\text{A}, V_{CE} = 2\text{V}$
		150	350	—		$I_C = 2\text{A}, V_{CE} = 2\text{V}$
		60	120	—		$I_C = 3\text{A}, V_{CE} = 2\text{V}$
AC CHARACTERISTICS						
Transition Frequency	f_T	150	—	—	MHz	$I_C = 50\text{mA}, V_{CE} = 5\text{V}, f = 50\text{MHz}$
Output Capacitance	C_{obo}	—	16	—	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Switching Times	t_{on}	—	33	—	ns	$V_{CC} = 10\text{V}, I_C = 500\text{mA}, I_{B1} = -I_{B2} = 50\text{mA}$
	t_{off}	—	1300	—	ns	

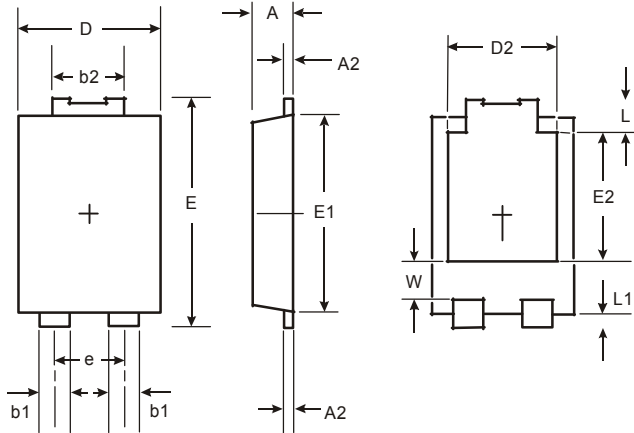
Note: 12. Pulse Test: Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2.0\%$.

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



Package Outline Dimensions

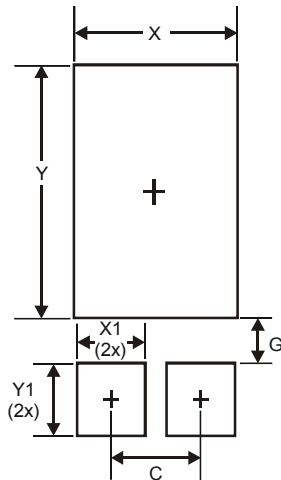
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



POWERDI5		
Dim	Min	Max
A	1.05	1.15
A2	0.33	0.43
b1	0.80	0.99
b2	1.70	1.88
D	3.90	4.05
D2	3.054 Typ	
E	6.40	6.60
e	1.84 Typ	
E1	5.30	5.45
E2	3.549 Typ	
L	0.75	0.95
L1	0.50	0.65
W	1.10	1.41
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	1.840
G	0.852
X	3.360
X1	1.390
Y	4.860
Y1	1.400

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