

DXT690BP5

45V NPN HIGH GAIN TRANSISTOR
PowerDI®5

Features

- 43% smaller than SOT223; 60% smaller than TO252
- Maximum height just 1.1mm
- Rated up to 3.2W
- $V_{CE0} = 45V$
- $I_C = 3A$; $I_{CM} = 6A$
- Low Saturation, high gain transistor,
- **Lead, Halogen, and Antimony Free/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

Applications

- LED driver
- Motor driver

Mechanical Data

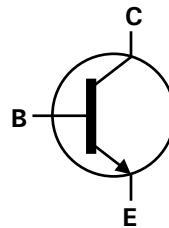
- Case: PowerDI®5
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe.
Solderable per MIL-STD-202, Method 208 Ⓔ3
- Weight: 0.093 grams (approximate)



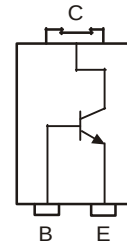
Top View



Bottom View



Device Schematic



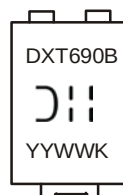
Pin Configuration

Ordering Information (Note 3)

Part Number	Case	Packaging
DXT690BP5-13	PowerDI®5	5000/Tape & Reel

- Notes:
1. No purposefully added lead. Halogen and Antimony Free.
 2. Diodes Inc's "Green" Policy can be found on our website at <http://www.diodes.com>
 3. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



DXT690B = Product Type Marking Code
 DII = 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)

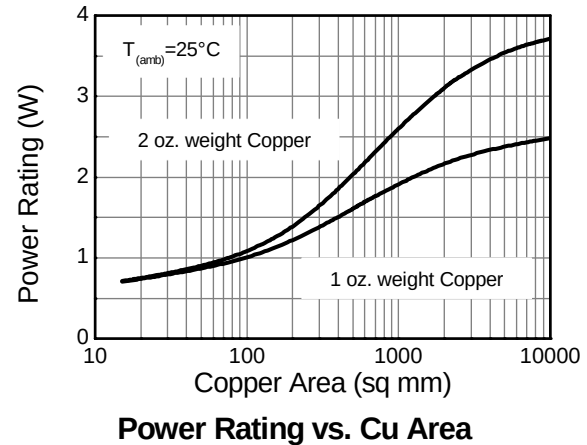
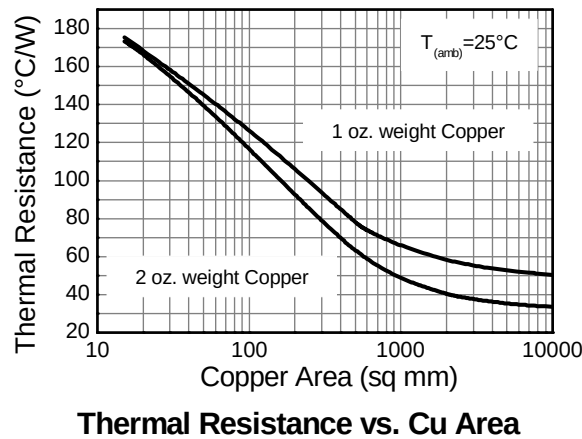
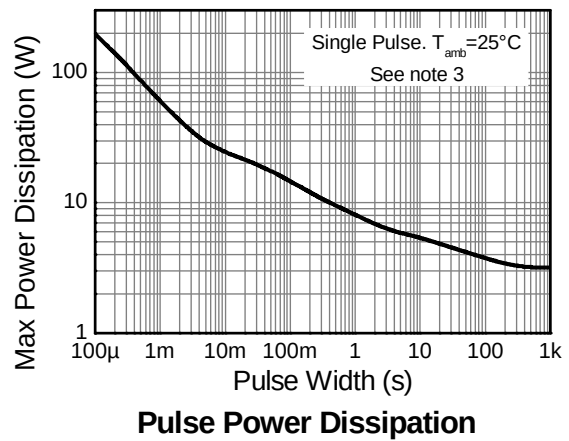
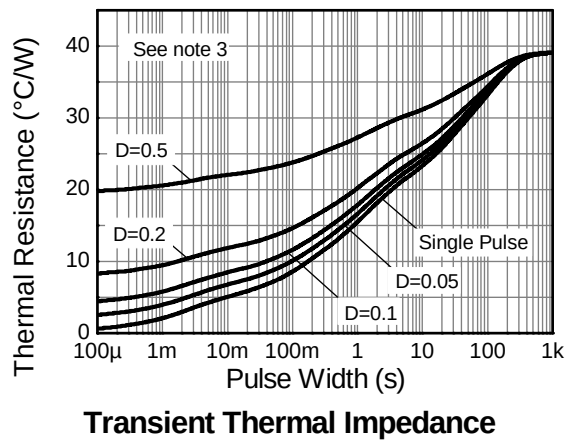
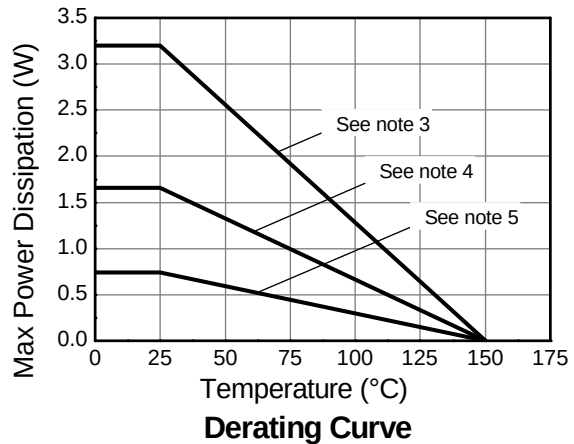
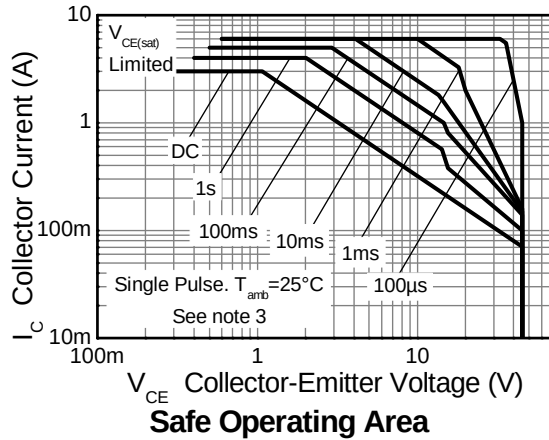
Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	60	V
Collector-Emitter Voltage	V _{CEO}	45	V
Emitter-Base Voltage	V _{EBO}	5	V
Continuous Collector Current	I _C	3	A
Peak Pulse Current	I _{CM}	6	A
Base Current	I _B	0.5	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @ T _A = 25°C (Note 4)	P _D	3.2	W
Thermal Resistance, Junction to Ambient Air (Note 4) @T _A = 25°C	R _{θJA}	39	°C/W
Power Dissipation @ T _A = 25°C (Note 5)	P _D	1.7	W
Thermal Resistance, Junction to Ambient Air (Note 5) @T _A = 25°C	R _{θJA}	75	°C/W
Power Dissipation @ T _A = 25°C (Note 6)	P _D	0.74	W
Thermal Resistance, Junction to Ambient Air (Note 6) @T _A = 25°C	R _{θJA}	169	°C/W
Thermal Resistance, Junction to Collector Terminal	R _{θJT}	8.9	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

- Notes:
- Device mounted on 1.6mm FR-4 PCB, single sided 2 oz. copper, collector pad dimensions 50mm x 50mm.
 - Device mounted on 1.6mm FR-4 PCB, single sided 1 oz. copper, collector pad dimensions 25mm x 25mm.
 - Device mounted on 1.6mm FR-4 PCB, single sided 1 oz. copper, minimum recommended pad layout.

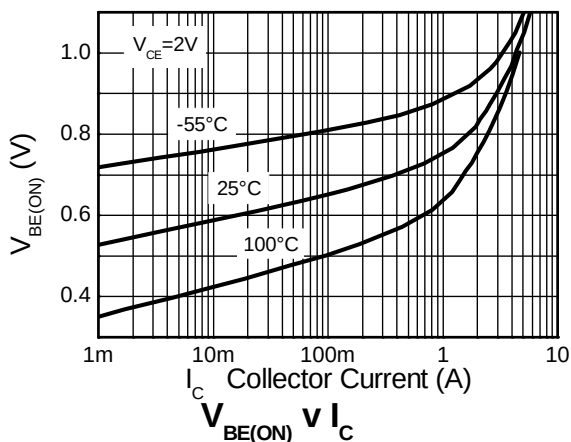
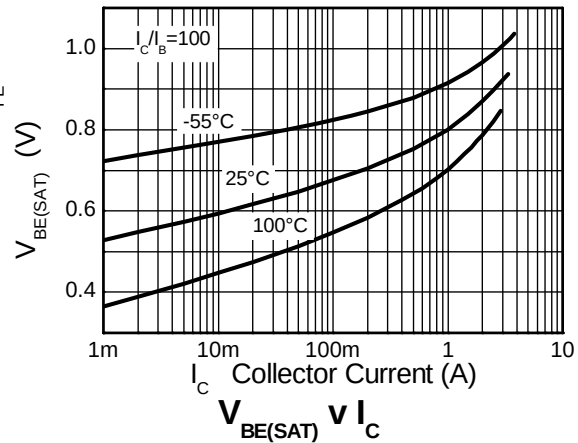
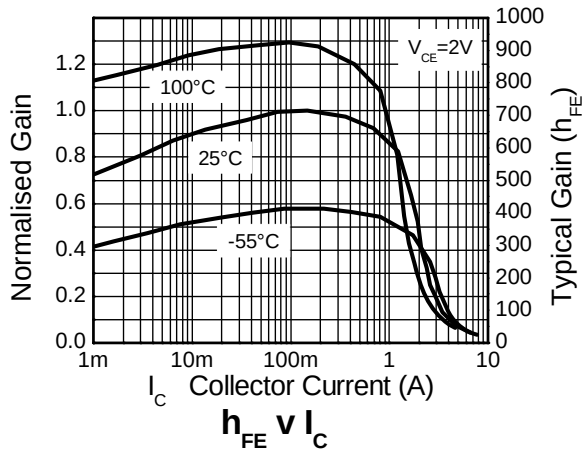
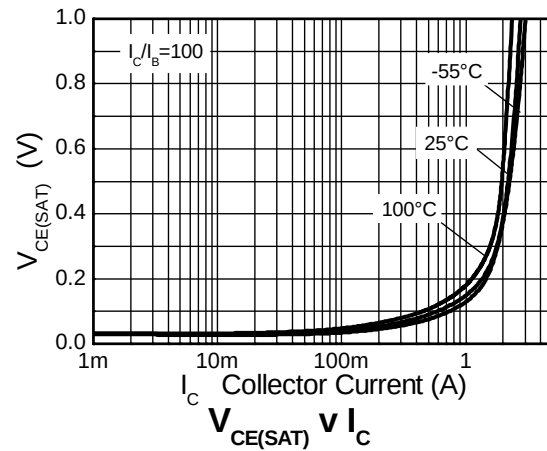
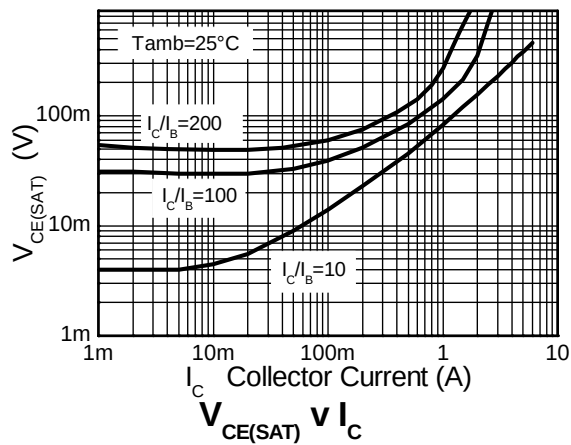


Electrical Characteristics @T_A = 25°C unless otherwise specified

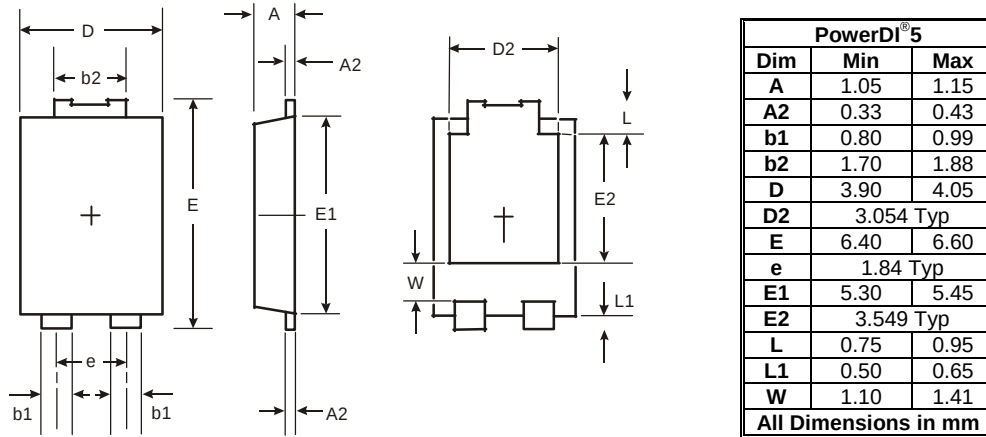
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	V _{(BR)CBO}	60	—	—	V	I _C = 100μA, I _E = 0
Collector-Emitter Breakdown Voltage (Note 7)	V _{(BR)CEO}	45	—	—	V	I _C = 10mA, I _B = 0
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	5	—	—	V	I _E = 100μA, I _C = 0
Collector Cutoff Current	I _{CBO}	—	—	20	nA	V _{CB} = 35V, I _E = 0
Collector Cutoff Current	I _{CES}	—	—	20	nA	V _{CB} = 35V, V _{BE} = 0
Emitter Cutoff Current	I _{EBO}	—	—	20	nA	V _{EB} = 4V, I _C = 0
ON CHARACTERISTICS (Note 7)						
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	—	—	85	mV	I _C = 1A, I _B = 0.5mA
		—	—	360		I _C = 1A, I _B = 5mA
		—	—	320		I _C = 2A, I _B = 40mA
		—	—	350		I _C = 3A, I _B = 150mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	—	—	1.2	V	I _C = 3A, I _B = 150mA
Base-Emitter Turn-On Voltage	V _{BE(ON)}	—	—	1.1	V	V _{CE} = 2V, I _C = 3A
DC Current Gain	h _{FE}	500	—	—	—	V _{CE} = 2V, I _C = 100mA
		400	—	—		V _{CE} = 2V, I _C = 1A
		150	—	—		V _{CE} = 2V, I _C = 2A
		60	—	—		V _{CE} = 2V, I _C = 3A
AC CHARACTERISTICS						
Transition Frequency	f _T	150	—	—	MHz	V _{CE} = 5V, I _C = 50mA, f = 50MHz
Output Capacitance	C _{obo}	—	16	—	pF	V _{CB} = 10V, f = 1MHz
Switching Times	t _{on}	—	33	—	ns	V _{CC} = 10V, I _C = 500mA, I _{B1} = I _{B2} = 50mA
	t _{off}	—	1300	—	ns	

Notes: 7. Pulse Test: Pulse width ≤300μs. Duty cycle ≤2.0%.

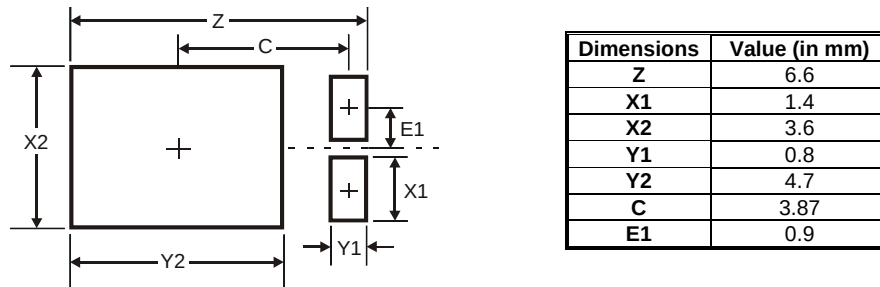
Typical Characteristic



Package Outline Dimensions



Suggested Pad Layout



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