DXT790AP5

40V PNP HIGH GAIN TRANSISTOR POWERDI®

Features

- BV_{CEO} > -40V
- I_C = -3A high Continuous Collector Current
- I_{CM} = -6A Peak Pulse Current
- 43% smaller than SOT223; 60% smaller than TO252
- Maximum Height Just 1.1mm
- Rated up to 3.2W
- Low Saturation, High Gain Transistor,
- **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**

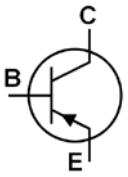
Mechanical Data

- 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 e3
- Weight: 0.093 grams (approximate)

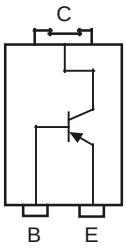
POWERDI5

Top View

Bottom View



Device Schematic



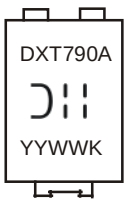
Top View
Pin Out

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DXT790AP5-13	DXT790A	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. For packaging details, go to our website at http://www.diodes.com/products/packages.html

Marking Information



DXT790A = Product Type Marking Code
= 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.)

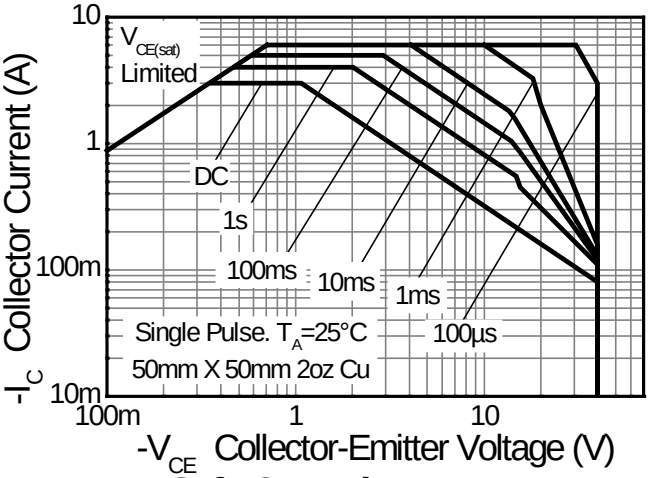
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-6	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Current	I_{CM}	-6	A
Base Current	I_B	-0.5	A

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

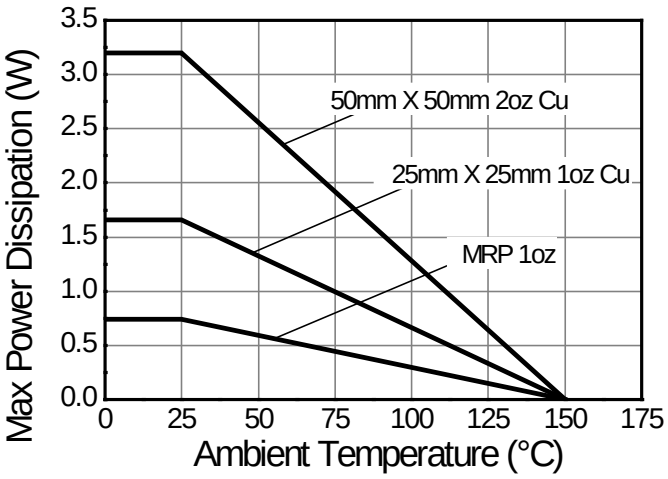
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	3.2	W
	(Note 6)		1.7	
	(Note 7)		0.74	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	39	°C/W
	(Note 6)		75	
	(Note 7)		169	
Thermal Resistance, Junction to Lead	(Note 8)	$R_{\theta JL}$	8.9	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
5. 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.
6. Same as note (5), except the device is mounted on 25mm x 25mm 1oz copper.
7. Same as note (5), except the device is mounted on minimum recommended pad (MRP) layout 1oz copper.
8. Thermal resistance from junction to solder-point (on the exposed collector pad).

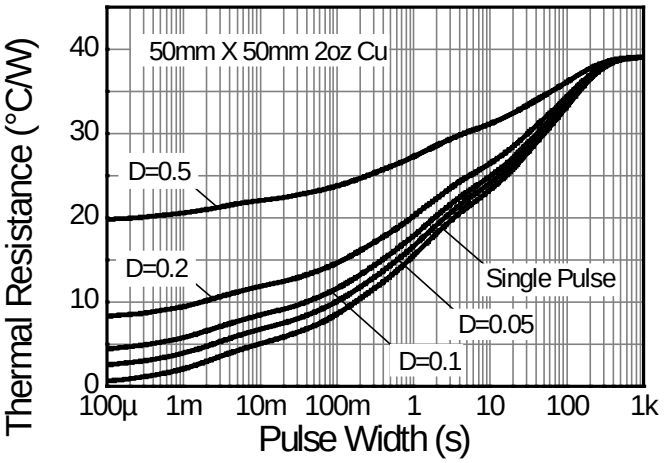
Thermal Characteristics and Derating Information



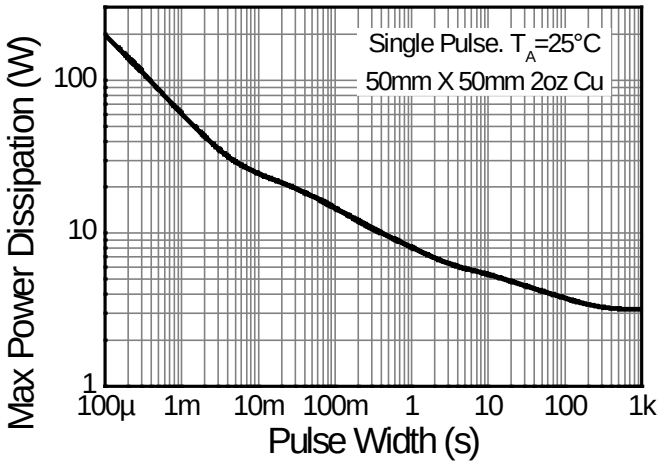
Safe Operating Area



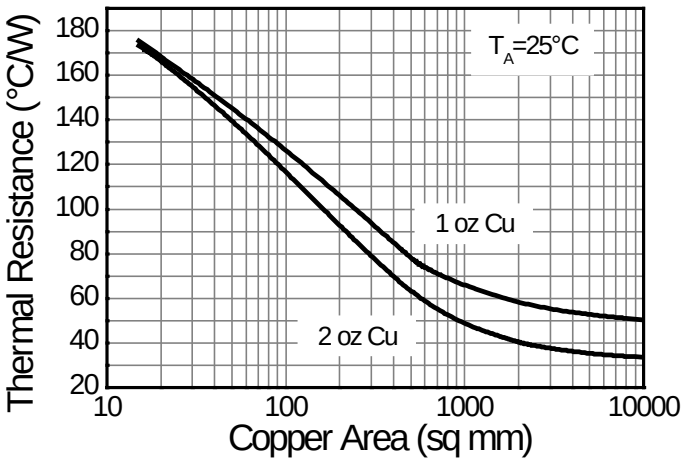
Derating Curve



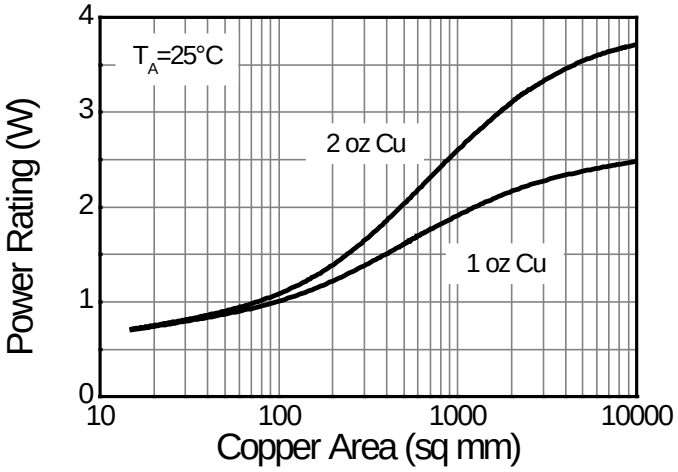
Transient Thermal Impedance



Pulse Power Dissipation



Thermal Resistance vs. Cu Area



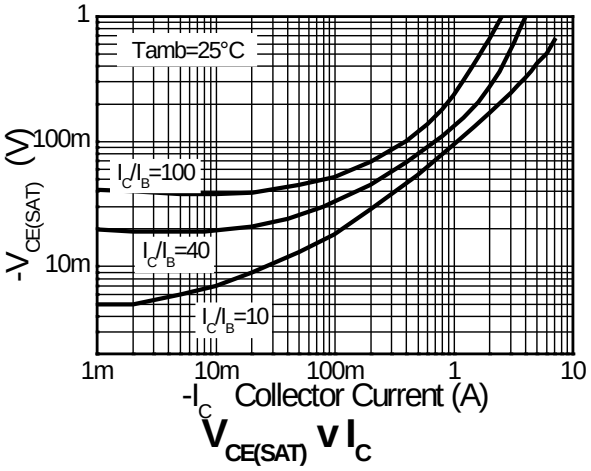
Power Rating vs. Cu Area

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

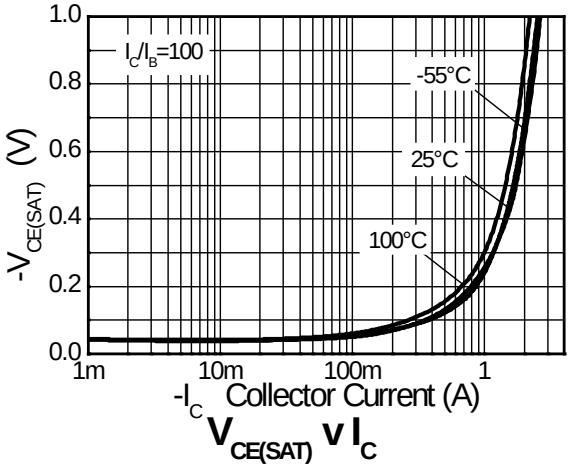
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	-50	—	—	V	I_C = -100µA, I_E = 0
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	-40	—	—	V	I_C = -10mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	-6	—	—	V	I_E = -100µA, I_C = 0
Collector Cutoff Current	I_{CBO}	—	—	-20	nA	V_{CB} = -30V, I_E = 0
Collector Cutoff Current	I_{CES}	—	—	-20	nA	V_{CB} = -30V, V_{BE} = 0
Emitter Cutoff Current	I_{EBO}	—	—	-20	nA	V_{EB} = -4V, I_C = 0
ON CHARACTERISTICS (Note 8)						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	— — — —	— — — —	-170 -350 -450 -450	mV	I_C = -0.5A, I_B = -5mA I_C = -1A, I_B = -10mA I_C = -2A, I_B = -50mA I_C = -3A, I_B = -300mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-1.15	V	I_C = -3A, I_B = -300mA
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	—	—	-1.0	V	I_C = -3A, V_{CE} = -2V
DC Current Gain	h_{FE}	300 250 200 150 80	— — — — —	800 — — — —	—	I_C = -10mA, V_{CE} = -2V I_C = -500mA, V_{CE} = -2V I_C = -1A, V_{CE} = -2V I_C = -2A, V_{CE} = -2V I_C = -3A, V_{CE} = -2V
AC CHARACTERISTICS						
Transition Frequency	f_T	100	—	—	MHz	I_C = -50mA, V_{CE} = -5V, f = 50MHz
Output Capacitance	C_{obo}	—	24	—	pF	V_{CB} = -10V, f = 1MHz
Switching Times	t_{on} t_{off}	— —	35 600	— —	ns ns	I_C = -500mA, V_{CC} = -10V, I_{B1} = -I_{B2} = -50mA

Notes: 8. Measured under pulsed conditions. Pulse width• 300µs. Duty cycle• 2%.

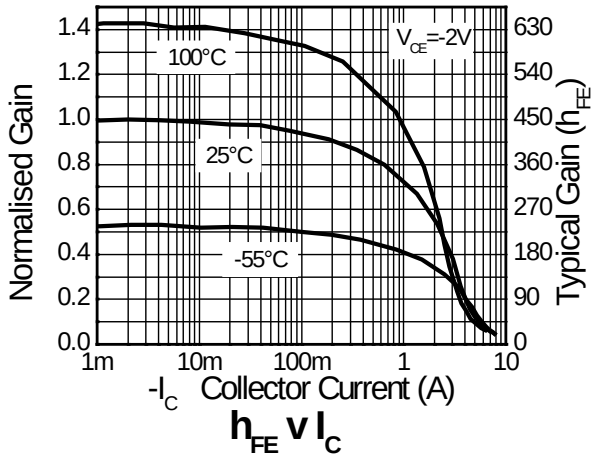
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



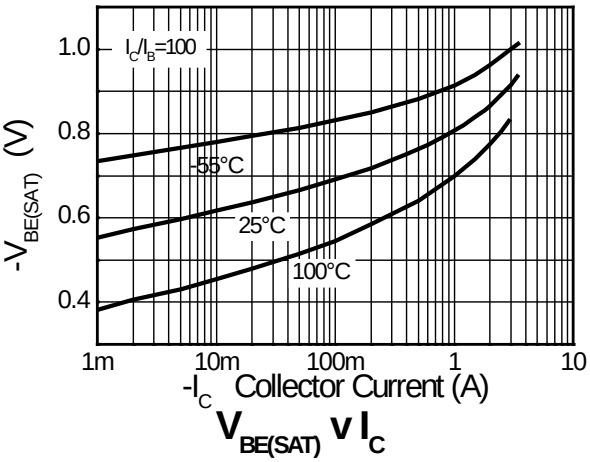
$V_{CE(SAT)}$ v I_C



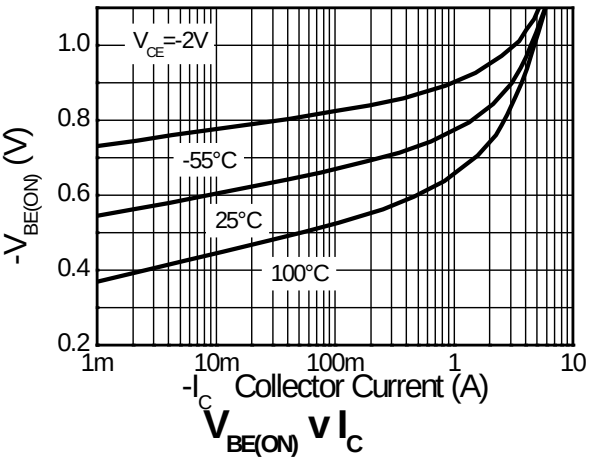
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



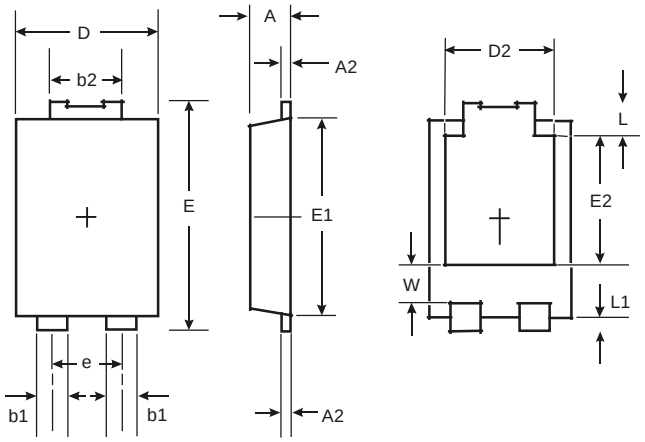
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package Outline Dimensions

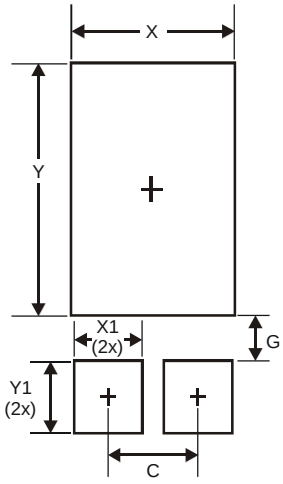
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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