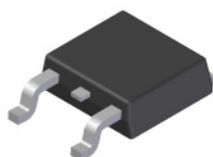


450V NPN HIGH VOLTAGE POWER TRANSISTOR IN TO252
Features

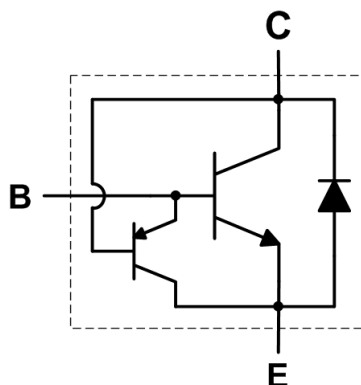
- $BV_{CEO} > 450V$
- $BV_{CES} > 700V$
- $BV_{EBO} > 9V$
- $I_C = 1.5A$ high Continuous Collector Current
- Integrated Anti-Parallel Diode to act as free-wheeling diode
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

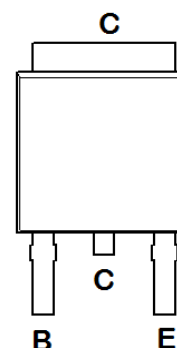
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.34 grams (approximate)

 TO252
(DPAK)


Top View



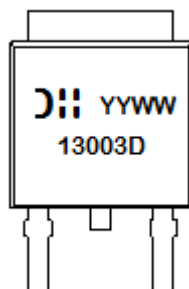
Device Schematic


 Top View
Pin-Out

Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DXT13003DK-13	Standard	13003D	13	16	2,500

- 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


13003D = Product Type Marking Code
 Ⓜ = Manufacturer's Code Marking
 YYWW = Date Code Marking
 YY = Last Digit of Year (ex: 14 = 2014)
 WW = Week Code (01-53)

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

Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage (V _{BE} = 0V)	V _{CES}	700	V
Collector-Emitter Voltage	V _{CEO}	450	V
Emitter-Base Voltage	V _{EBO}	9	V
Continuous Collector Current	I _C	1.5	A
Peak Pulse Collector Current (Note 5)	I _{CM}	3	A
Continuous Base Current	I _B	0.75	A
Peak Pulse Base Current (Note 5)	I _{BM}	1.5	A

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

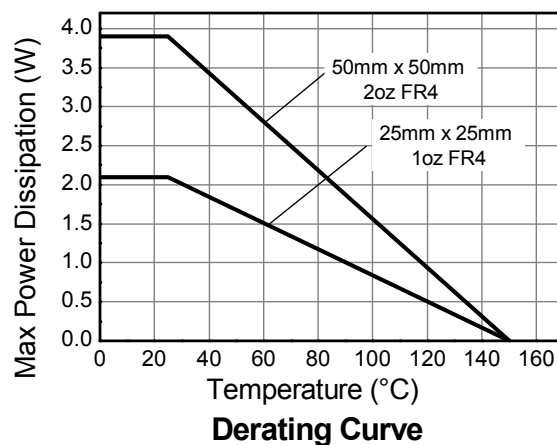
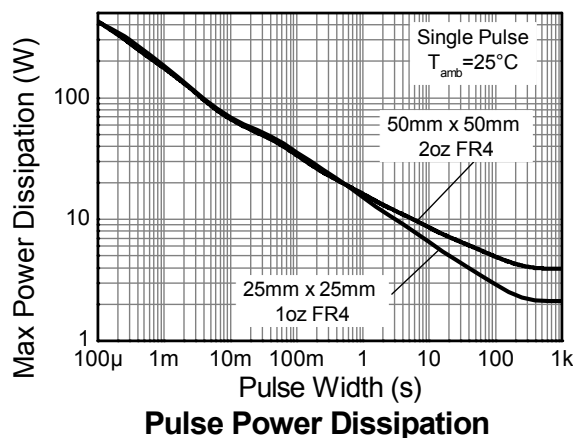
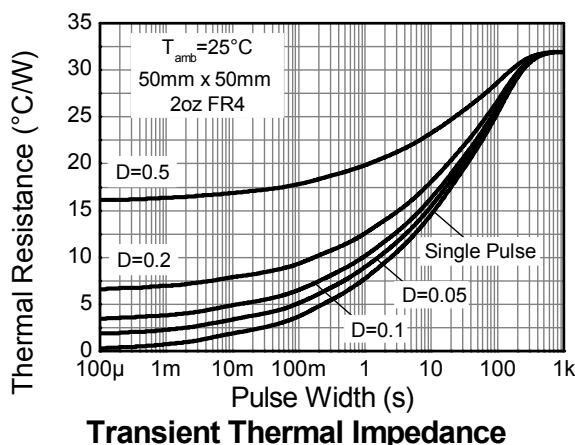
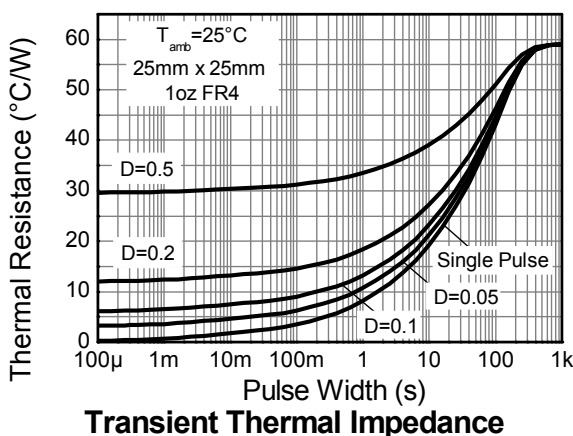
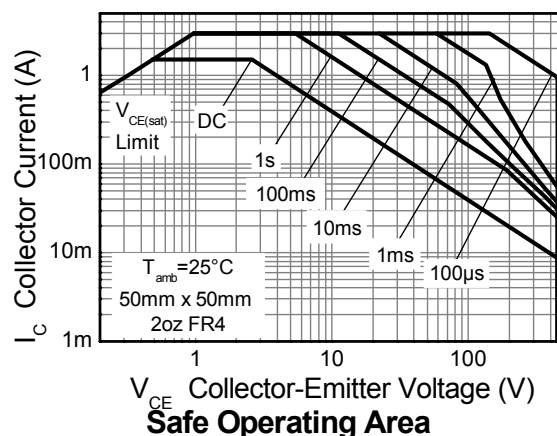
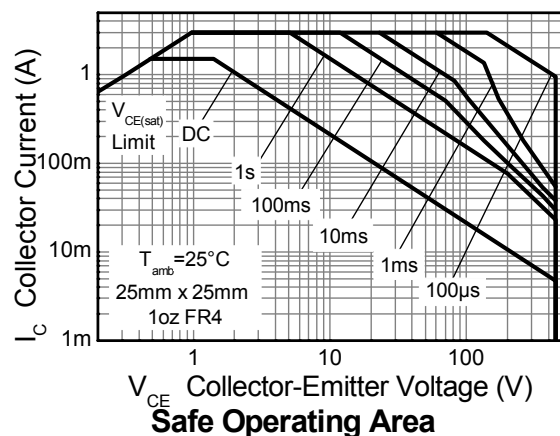
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	3.9	W
		2.5	
		2.1	
		1.6	
Thermal Resistance, Junction to Ambient Air	R _{θJA}	32	°C/W
		51	
		59	
		80	
Thermal Resistance, Junction to Leads	R _{θJL}	3	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 11)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- Pulse test for pulse width < 5ms, duty cycle ≤ 10%.
 - 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.
 - Same as note (6), except the device is surface mounted on 25mm x 25mm 2oz copper.
 - Same as note (6), except the device is surface mounted on 25mm x 25mm 1oz copper.
 - Same as note (6), except mounted on minimum recommended pad (MRP) layout.
 - Thermal resistance from junction to solder-point (on the exposed collector pad).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

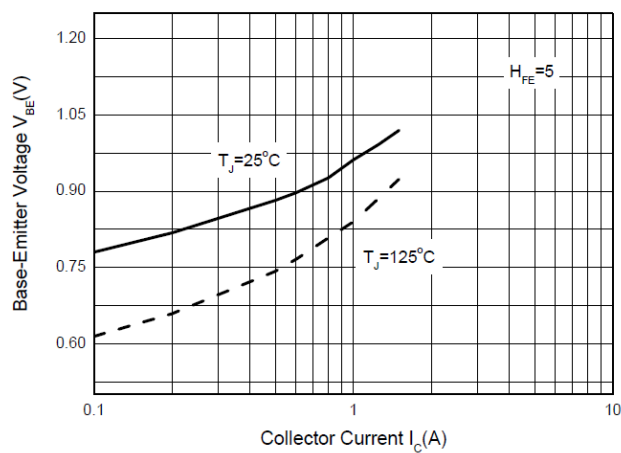
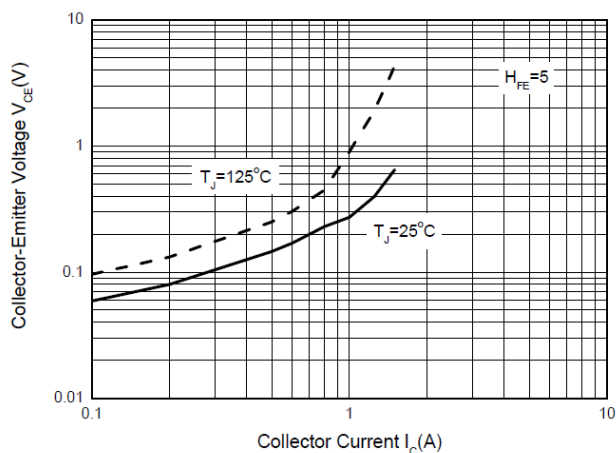
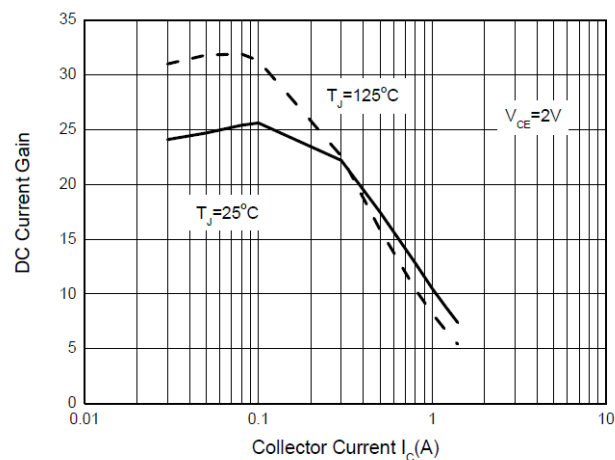
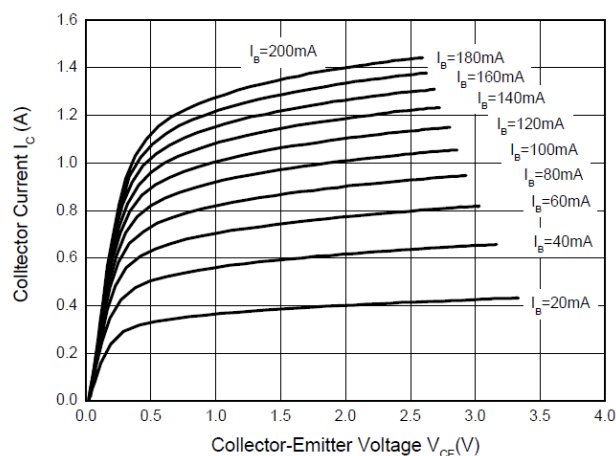
Thermal Characteristics and Derating Information



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

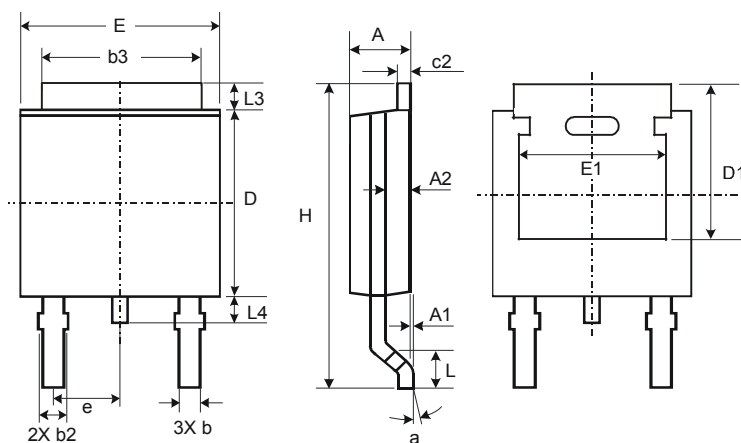
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Emitter Breakdown Voltage	BV_{CES}	700	—	—	V	$I_C = 100\mu\text{A}$, $V_{BE} = 0\text{V}$
Collector-Emitter Breakdown Voltage	BV_{CEO}	450	—	—	V	$I_C = 100\mu\text{A}$
Emitter-Base Breakdown Voltage	BV_{EBO}	9	—	—	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CEV}	—	—	10	μA	$V_{CE} = 700\text{V}$, $V_{BE} = -1.5\text{V}$
DC current transfer Static ratio (Note 12)	h_{FE}	20	—	40	—	$I_C = 20\text{mA}$, $V_{CE} = 10\text{V}$
		16	—	30	—	$I_C = 0.5\text{A}$, $V_{CE} = 2\text{V}$
		5	—	25	—	$I_C = 1.0\text{A}$, $V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 12)	$V_{CE(sat)}$	—	—	0.3	V	$I_C = 0.5\text{A}$, $I_B = 0.1\text{A}$
		—	—	0.4	V	$I_C = 1\text{A}$, $I_B = 0.25\text{A}$
Base-Emitter Saturation Voltage (Note 12)	$V_{BE(sat)}$	—	—	1.0	V	$I_C = 0.5\text{A}$, $I_B = 0.1\text{A}$
		—	—	1.2	V	$I_C = 1\text{A}$, $I_B = 0.25\text{A}$
Output Capacitance	C_{ob}	—	18	—	pF	$V_{CB} = 10\text{V}$, $f = 0.1\text{MHz}$
Transition Frequency	f_T	4	—	—	MHz	$I_C = 0.1\text{A}$, $V_{CE} = 10\text{V}$
Turn-on Time with Resistive Load	t_{on}	—	0.35	—	μs	$I_C = 1\text{A}$, $V_{CC} = 125\text{V}$, $I_{B1} = 0.2\text{A}$, $I_{B2} = -0.2\text{A}$
Storage Time with Resistive Load	t_s	—	2.31	—		
Fall Time with Resistive Load	t_f	—	0.21	—		

 Note: 12. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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


Package Outline Dimensions

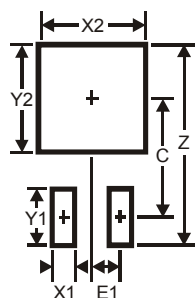
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



TO252			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c2	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	—	—
e	—	—	2.286
E	6.45	6.70	6.58
E1	4.32	—	—
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	—
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)
Z	11.6
X1	1.5
X2	7.0
Y1	2.5
Y2	7.0
C	6.9
E1	2.3

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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