



**THE DATASHEET OF  
DXT13003EK-13**

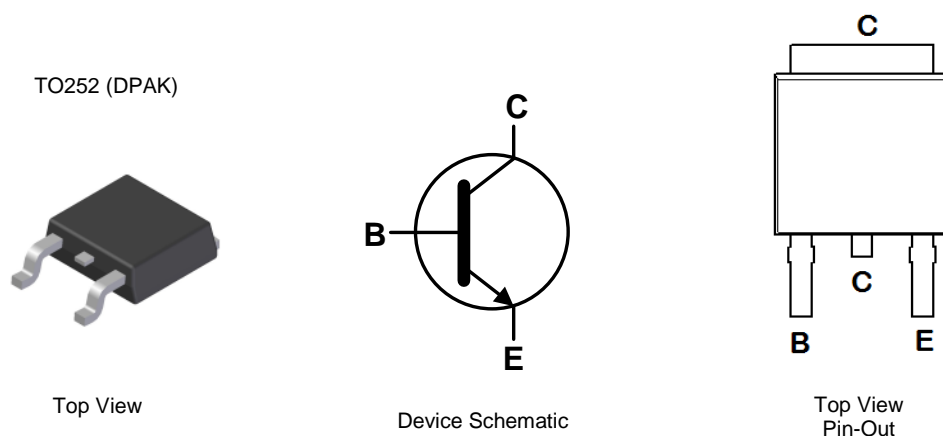


## Features

- $BV_{CEO} > 460V$
- $BV_{CES} > 700V$
- $BV_{EBO} > 9V$
- $I_C = 1.5A$  High Continuous Collector Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: TO252
- 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: 0.34 grams (Approximate)

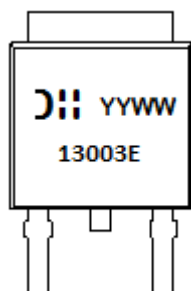


## Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DXT13003EK-13	Standard	13003E	13	16	2,500

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



- 13003E = Product Type Marking Code
- = Manufacturer's Code Marking
- YYWW = Date Code Marking
- YY = Last Two Digits of Year (ex: 19 = 2019)
- WW = Week Code (01 to 53)

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage (V <sub>BE</sub> = 0V)	V <sub>CES</sub>	700	V
Collector-Emitter Voltage	V <sub>CEO</sub>	460	V
Emitter-Base Voltage	V <sub>EBO</sub>	9	V
Continuous Collector Current	I <sub>C</sub>	1.5	A
Peak Pulse Collector Current (Note 5)	I <sub>CM</sub>	3	A
Continuous Base Current	I <sub>B</sub>	0.75	A
Peak Pulse Base Current (Note 5)	I <sub>BM</sub>	1.5	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

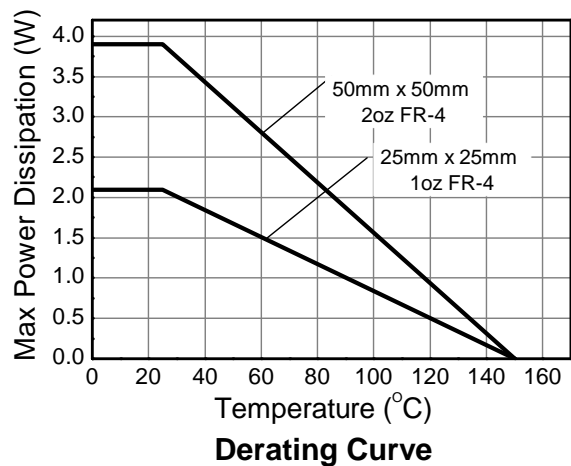
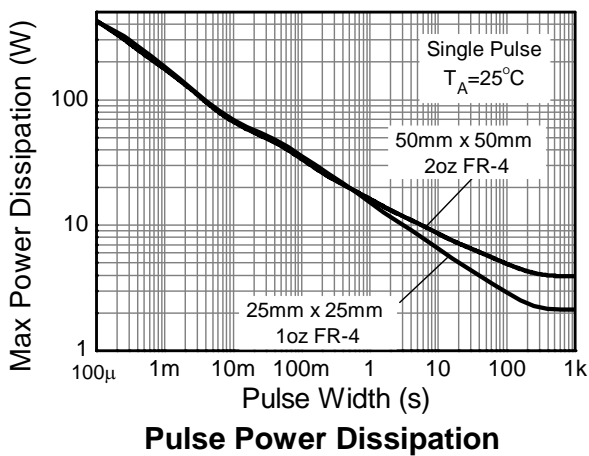
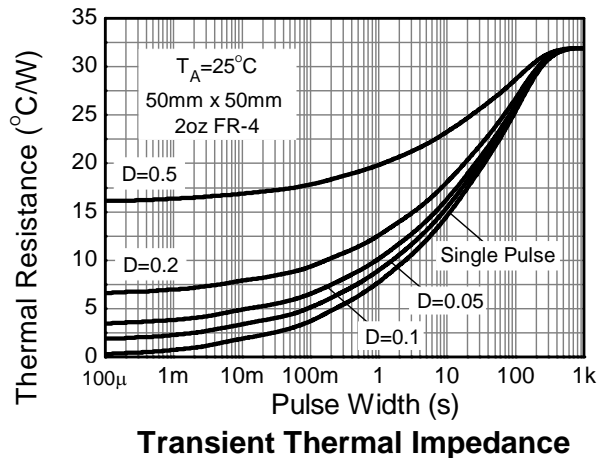
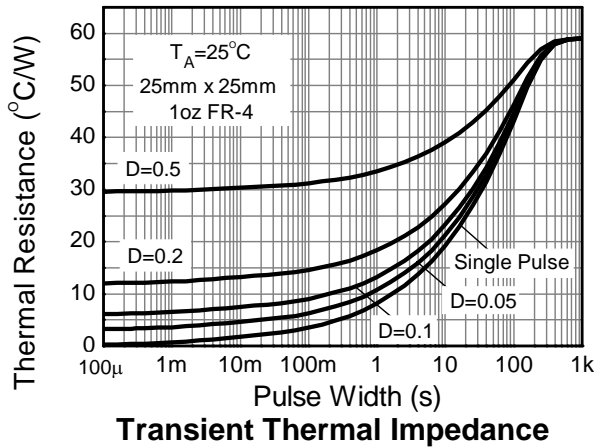
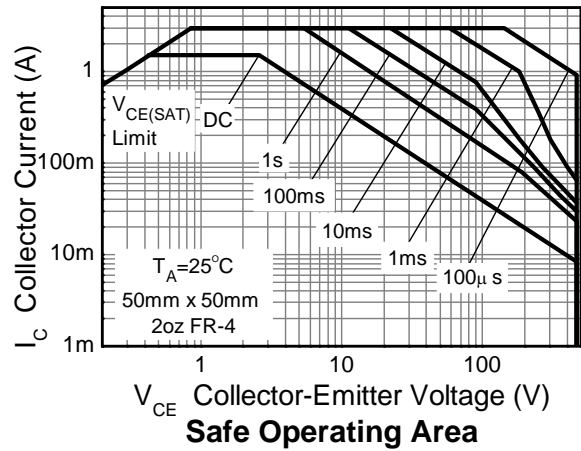
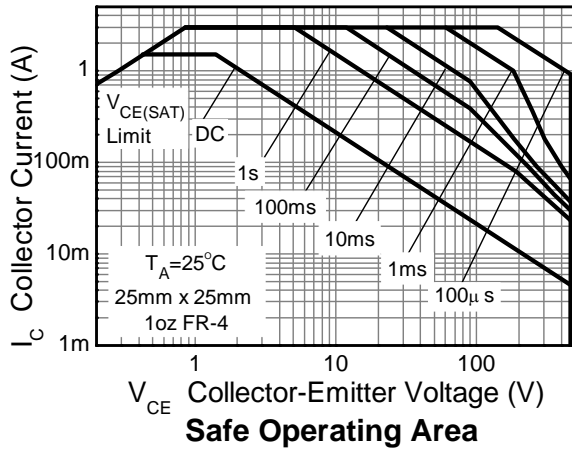
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 6)	3.9
		(Note 7)	2.5
		(Note 8)	2.1
		(Note 9)	1.6
Thermal Resistance, Junction to Ambient Air	R <sub>θJA</sub>	(Note 6)	32
		(Note 7)	51
		(Note 8)	59
Thermal Resistance, Junction to Leads	R <sub>θJL</sub>	80	°C/W
(Note 9)	3		
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-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:
5. Pulse test for pulse width < 5ms, duty cycle ≤ 10%.
  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 the device is surface mounted on 25mm x 25mm 2oz copper.
  8. Same as note (6), except the device is surface mounted on 25mm x 25mm 1oz copper.
  9. Same as note (6), except mounted on minimum recommended pad (MRP) layout.
  10. Thermal resistance from junction to solder-point (on the exposed collector pad).
  11. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

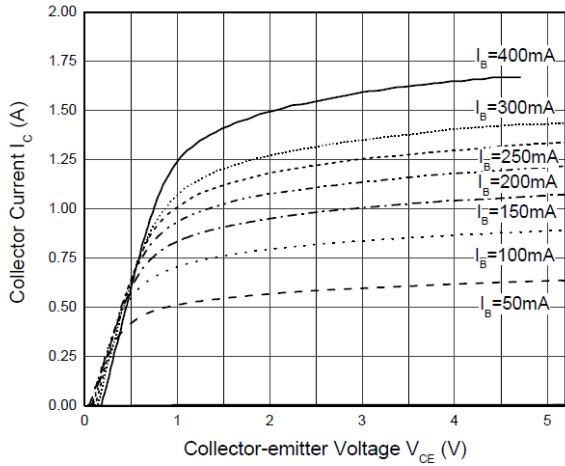


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

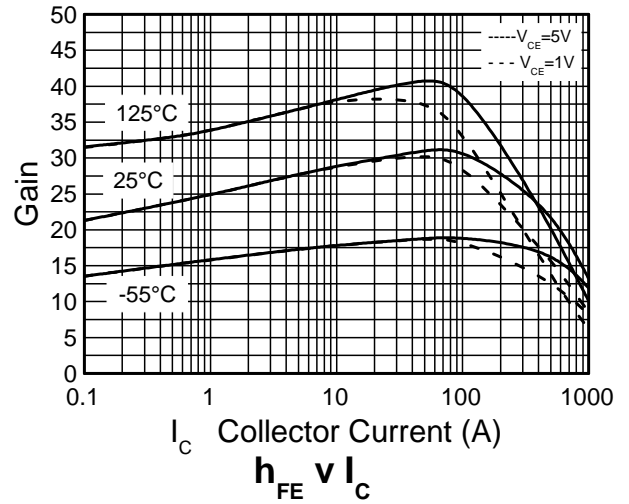
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Emitter Breakdown Voltage	BV <sub>CES</sub>	700	—	—	V	I <sub>C</sub> = 100μA, V <sub>BE</sub> = 0V
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	460	—	—	V	I <sub>C</sub> = 100μA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	9	—	—	V	I <sub>E</sub> = 100μA
Collector Cutoff Current	I <sub>CEV</sub>	—	—	10	μA	V <sub>CE</sub> = 700V, V <sub>BE</sub> = -1.5V
DC Current Transfer Static Ratio (Note 12)	h <sub>FE</sub>	15	—	—	—	I <sub>C</sub> = 0.3A, V <sub>CE</sub> = 2V
		14	17	30	—	I <sub>C</sub> = 0.5A, V <sub>CE</sub> = 2V
		5	—	25	—	I <sub>C</sub> = 1.0A, V <sub>CE</sub> = 2V
Collector-Emitter Saturation Voltage (Note 12)	V <sub>CE(SAT)</sub>	—	0.17	0.3	V	I <sub>C</sub> = 0.5A, I <sub>B</sub> = 0.1A
		—	0.29	0.4		I <sub>C</sub> = 1A, I <sub>B</sub> = 0.25A
Base-Emitter Saturation Voltage (Note 12)	V <sub>BE(SAT)</sub>	—	—	1.0	V	I <sub>C</sub> = 0.5A, I <sub>B</sub> = 0.1A
		—	—	1.2		I <sub>C</sub> = 1A, I <sub>B</sub> = 0.25A
Output Capacitance	C <sub>ob</sub>	—	16	—	pF	V <sub>CB</sub> = 10V, f = 0.1MHz
Transition Frequency	f <sub>T</sub>	4	—	—	MHz	I <sub>C</sub> = 0.1A, V <sub>CE</sub> = 10V
Turn-on Time with Resistive Load	t <sub>ON</sub>	—	0.43	—	μs	I <sub>C</sub> = 1A, V <sub>CC</sub> = 125V, I <sub>B1</sub> = 0.2A, I <sub>B2</sub> = -0.2A
Storage Time with Resistive Load	t <sub>S</sub>	—	1.64	—		
Fall Time with Resistive Load	t <sub>F</sub>	—	0.28	—		

Note: 12. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

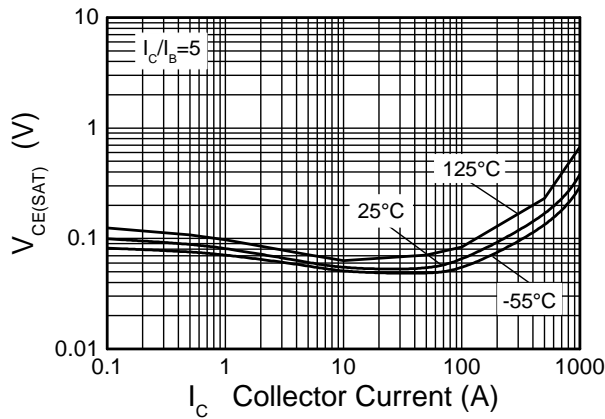
**Typical Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)



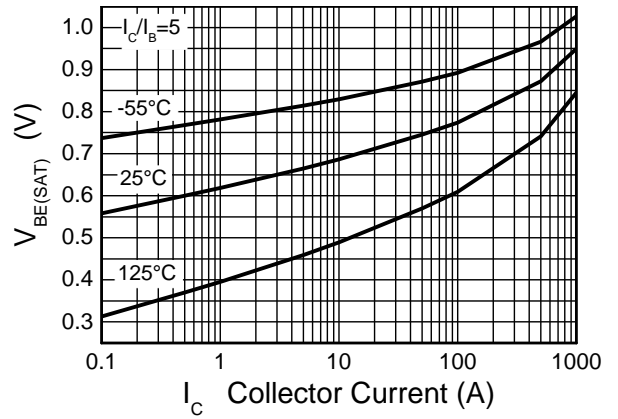
Static Characteristics



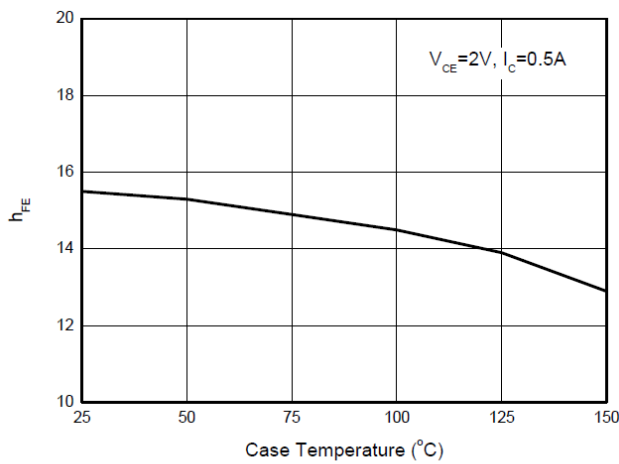
$h_{FE} \ v \ I_C$



$V_{CE(SAT)} \ v \ I_C$



$V_{BE(SAT)} \ v \ I_C$

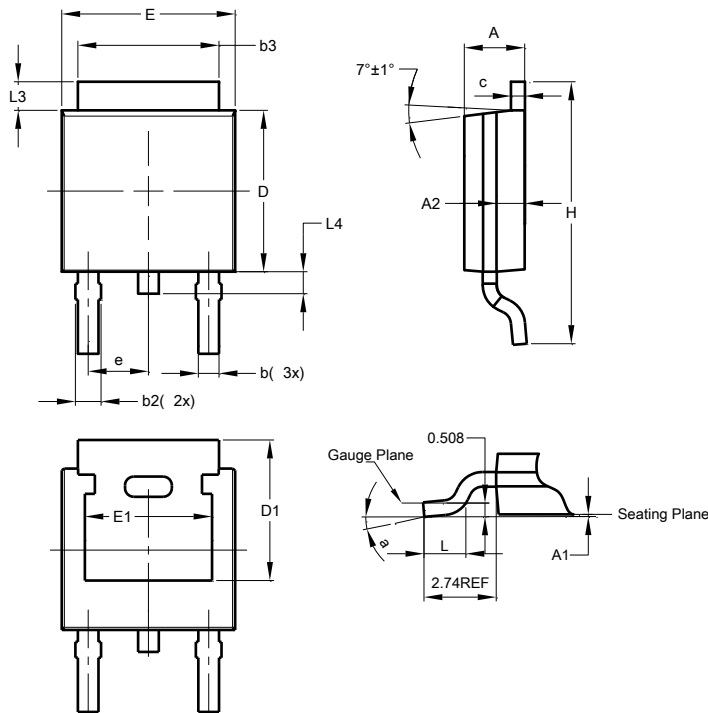


$h_{FE}$  vs. Case Temperature

## Package Outline Dimensions

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

**TO252 (DPAK)**

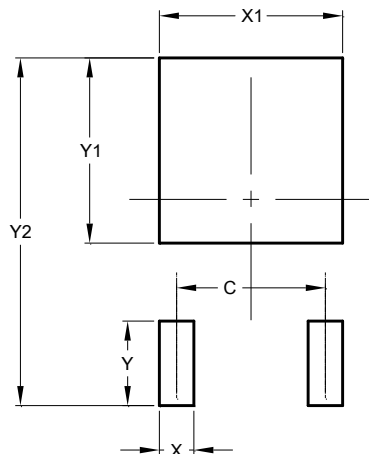


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	—	—
e	—	—	2.286
E	6.45	6.70	6.58
E1	4.32	—	—
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	—
All Dimensions in mm			

## Suggested Pad Layout

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

**TO252 (DPAK)**



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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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