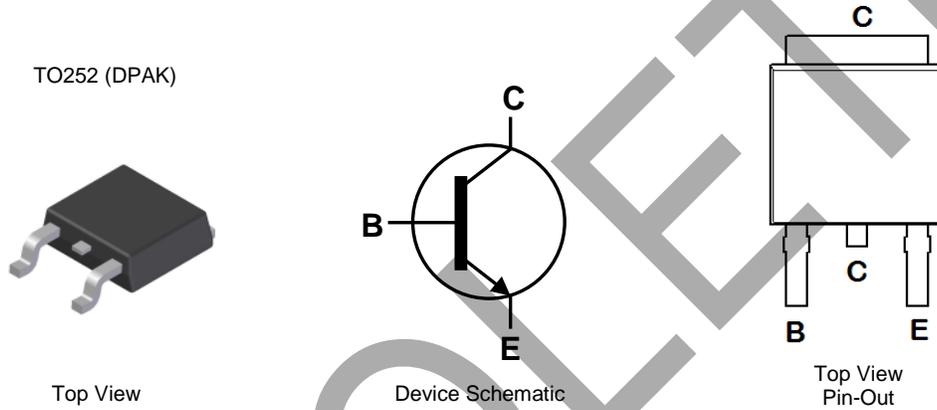


**Features**

- $BV_{CEO} > 460V$
- $BV_{CES} > 700V$
- $BV_{EBO} > 9V$
- $I_C = 1.5A$  High Continuous Collector Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

**Mechanical Data**

- Package: TO252
- Package 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 (B3)
- Weight: 0.34 grams (Approximate)

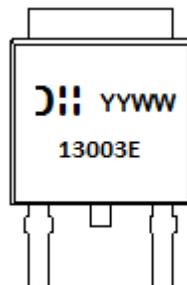


**Ordering Information** (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DXT13003EK-13	TO252 (DPAK)	13003E	13	16	2,500	Reel

- 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
- Dii** = Manufacturer's Code Marking
- YYWW = Date Code Marking
- YY = Last Two Digits of Year (ex: 23 = 2023)
- WW = Week Code (01 to 53)

**Absolute Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage ( $V_{BE} = 0\text{V}$ )	$V_{CES}$	700	V
Collector-Emitter Voltage	$V_{CEO}$	460	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** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	$P_D$	(Note 6)	3.9
		(Note 7)	2.5
		(Note 8)	2.1
		(Note 9)	1.6
Thermal Resistance, Junction to Ambient Air	$R_{\theta JA}$	(Note 6)	32
		(Note 7)	51
		(Note 8)	59
		(Note 9)	80
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	3	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

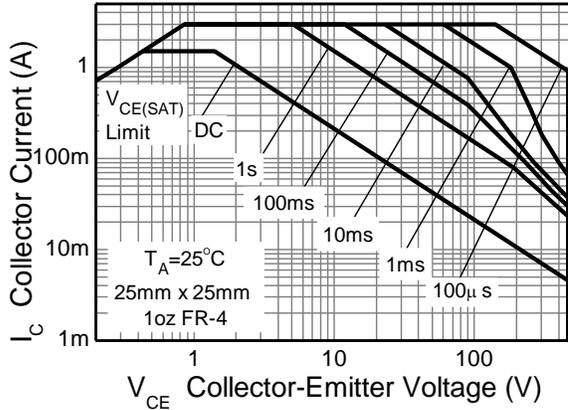
**ESD Ratings** (Note 11)

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

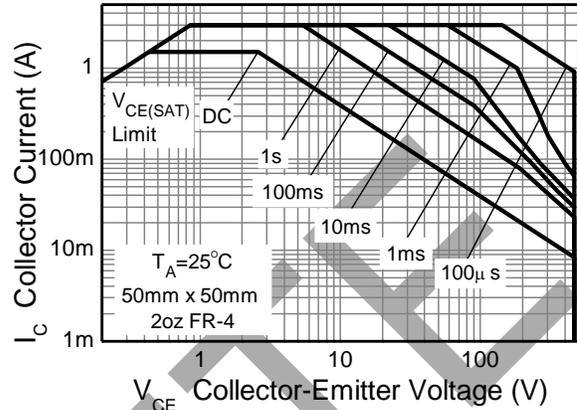
- Notes:
- Pulse test for pulse width  $< 5\text{ms}$ , duty cycle  $\leq 10\%$ .
  - For a device mounted with the exposed collector pad on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  - Same as Note 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**

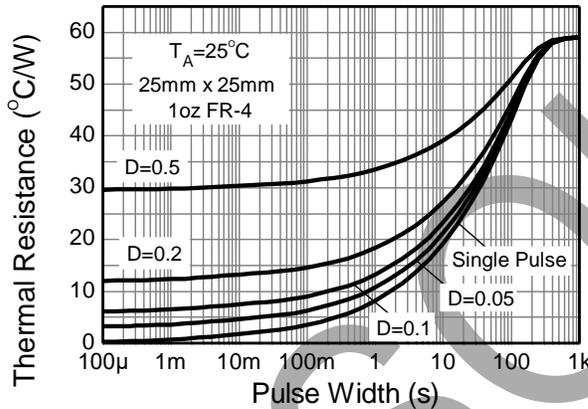
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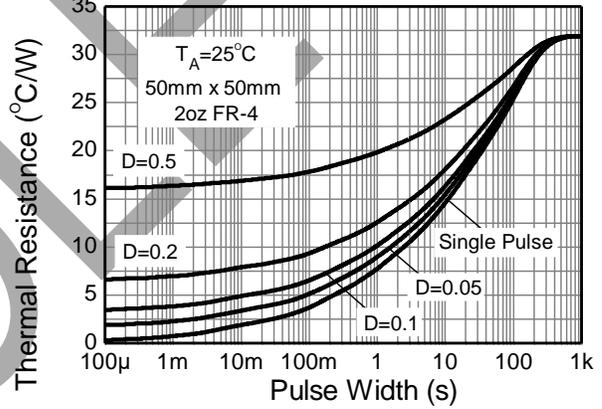
**Figure 1. Safe Operating Area**



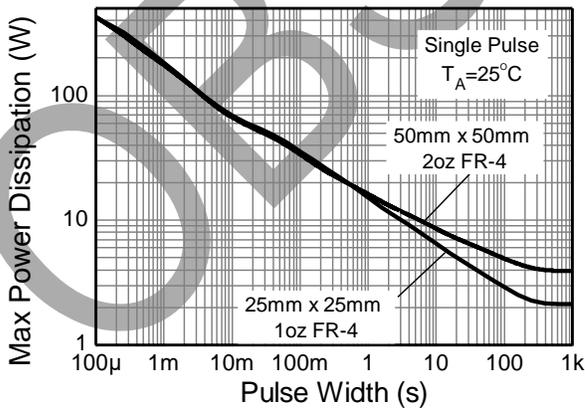
**Figure 2. Safe Operating Area**



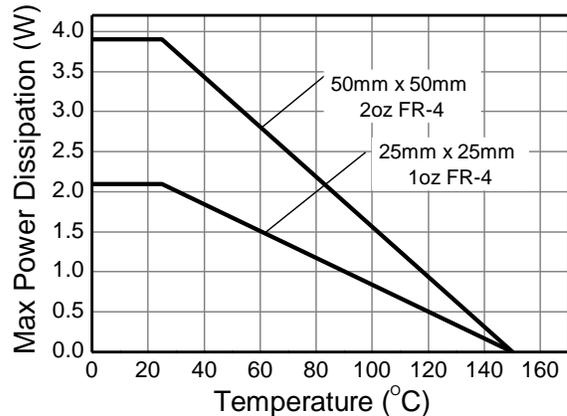
**Figure 3. Transient Thermal Impedance**



**Figure 4. Transient Thermal Impedance**



**Figure 5. Pulse Power Dissipation**



**Figure 6. Derating Curve**

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

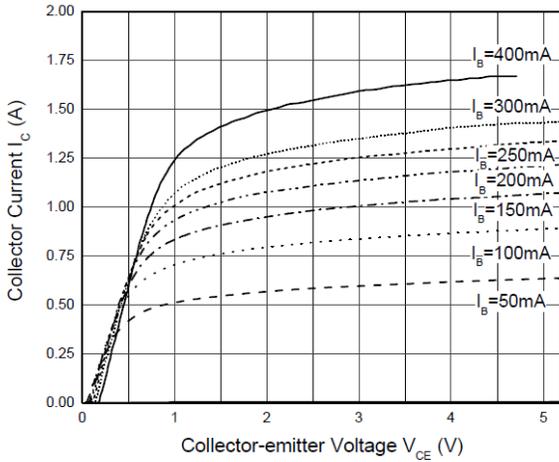
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Emitter Breakdown Voltage	BV <sub>CES</sub>	700	—	—	V	I <sub>C</sub> = 100μA, V <sub>BE</sub> = 0V
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	460	—	—	V	I <sub>C</sub> = 100μA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	9	—	—	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%.

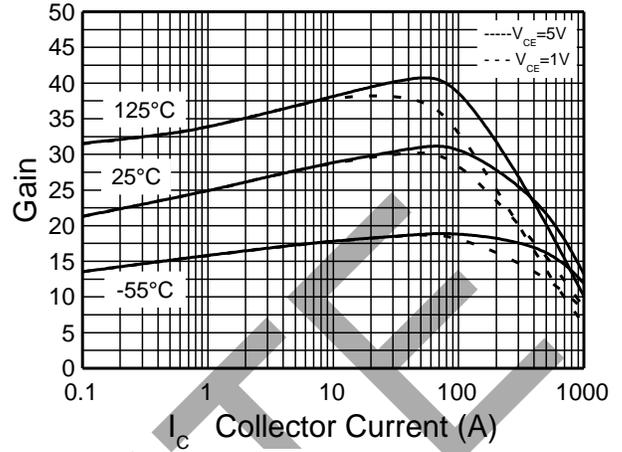
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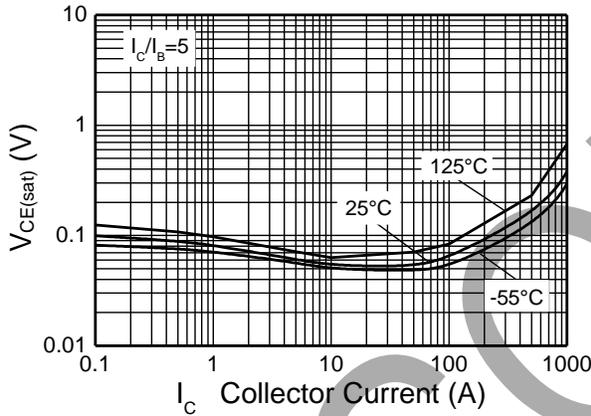
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



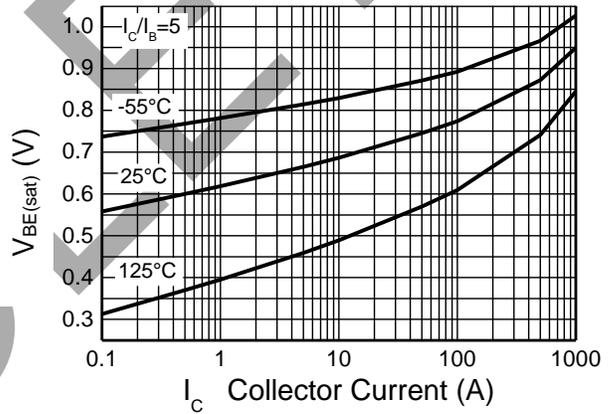
**Figure 7. Static Characteristics**



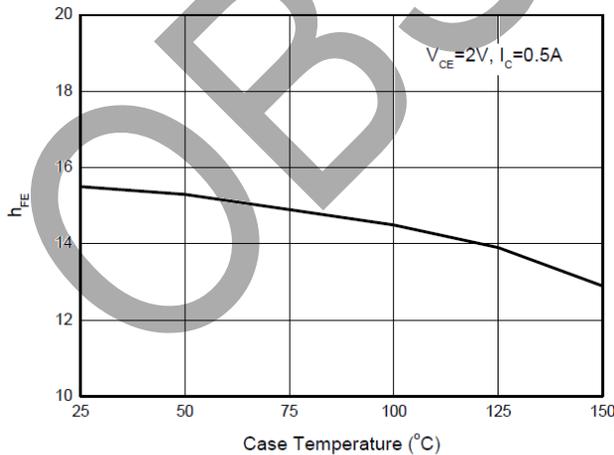
**Figure 8.  $h_{FE}$  v  $I_C$**



**Figure 9.  $V_{CE(sat)}$  v  $I_C$**



**Figure 10.  $V_{BE(sat)}$  v  $I_C$**



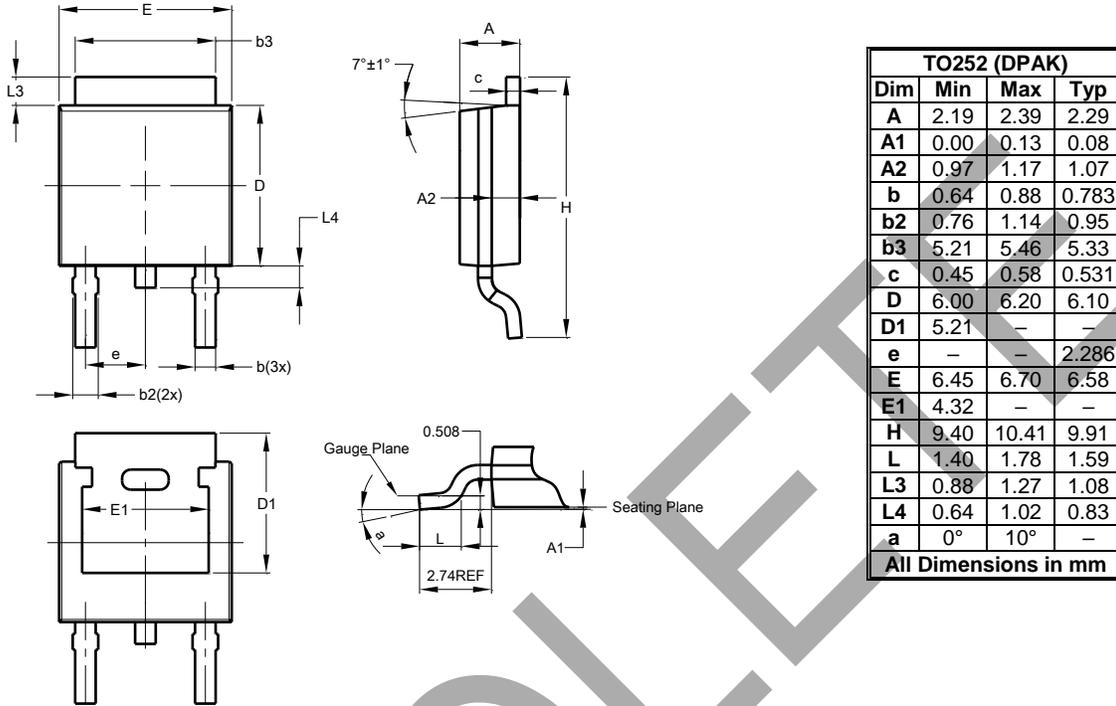
**Figure 11.  $h_{FE}$  vs. Case Temperature**

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## Package Outline Dimensions

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

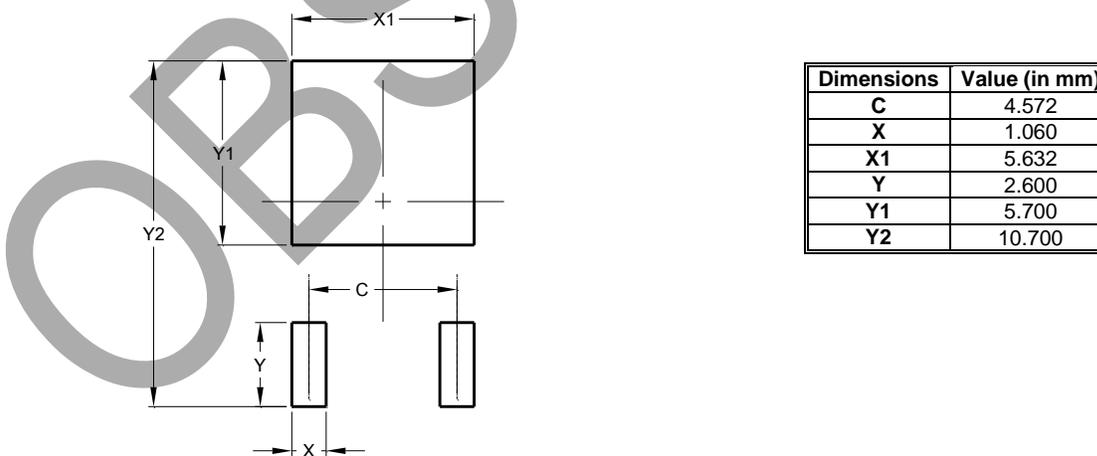
**TO252 (DPAK)**



## Suggested Pad Layout

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

**TO252 (DPAK)**



Note: 13. 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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