


## Features

- NPN Transistor:
  - $BV_{CEO} > 100V$
  - $I_C = 3A$  Continuous Collector Current
  - $I_{CM} = 8A$  Peak Pulse Current
  - $R_{CE(sat)} = 90m\Omega$  (Typ)
- PNP Transistor
  - $BV_{CEO} > -100V$
  - $I_C = -3A$  Continuous Collector Current
  - $I_{CM} = -8A$  Peak Pulse Current
  - $R_{CE(sat)} = 110m\Omega$  (Typ)
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DXTC3C100PDQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**

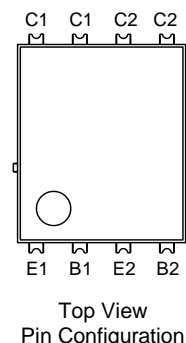
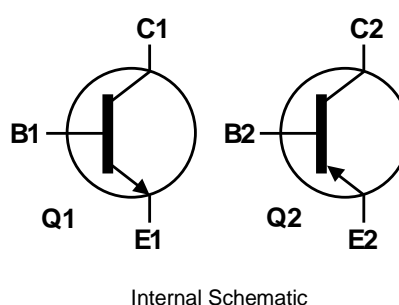
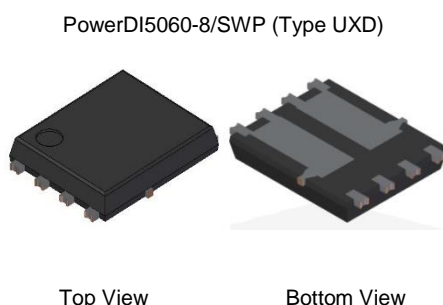
<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

- Package: PowerDI5060-8/SWP (Type UXD)
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish - Matte Tin Annealed over Copper Lead-Frame; Solderable per MIL-STD-202, Method 208 
- Weight: 0.097 grams (Approximate)

## Applications

- Power Management
- Load Switches
- MOSFET and IGBT Gate Drivers



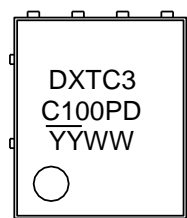
## Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
DXTC3C100PDQ-13	Automotive	DXTC3C100PD	13	12	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

PowerDI5060-8/SWP



DXTC3 = Product Type Marking Code  
C100PD = Product Type Marking Code  
YYWW = Date Code Marking  
YY = Last Digit of Year (ex: 21 = 2021)  
WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	100	V
Collector-Emitter Voltage	$V_{CEO}$	100	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Base Current	$I_B$	500	mA
Continuous Collector Current	$I_C$	3	A
Peak Pulse Collector Current	$I_{CM}$	8	A

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-100	V
Collector-Emitter Voltage	$V_{CEO}$	-100	V
Emitter-Base Voltage	$V_{EBO}$	-7	V
Base Current	$I_B$	-500	mA
Continuous Collector Current	$I_C$	-3	A
Peak Pulse Collector Current	$I_{CM}$	-8	A

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

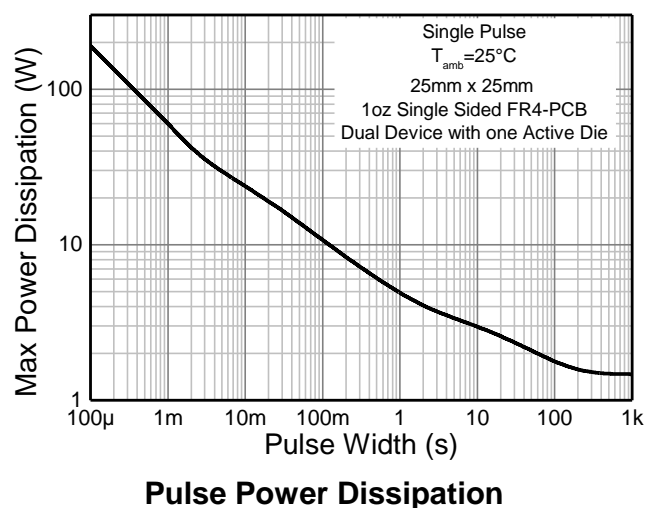
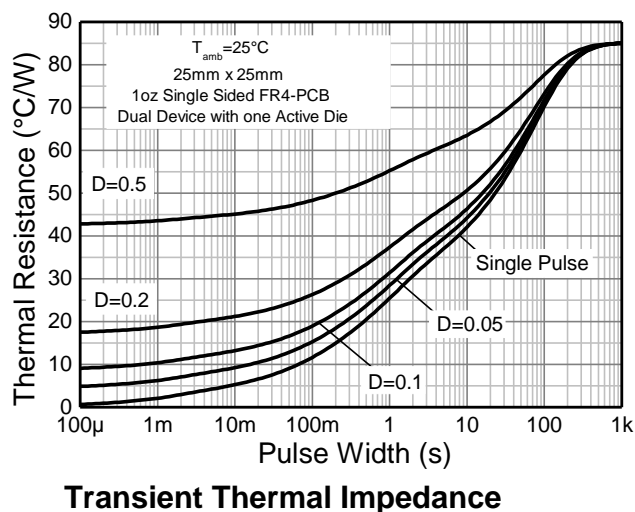
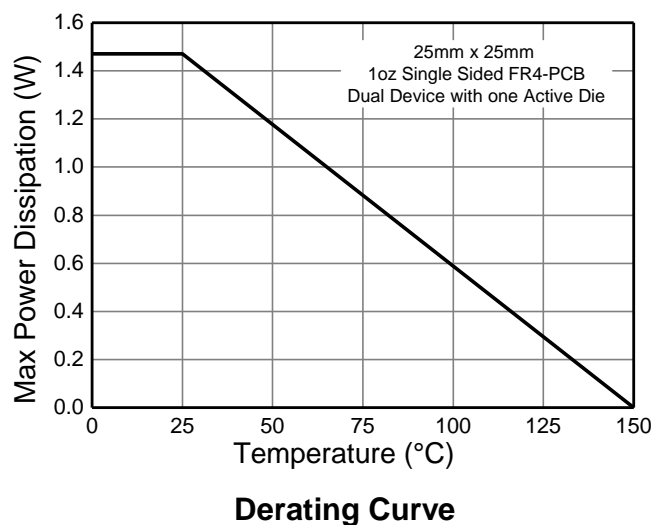
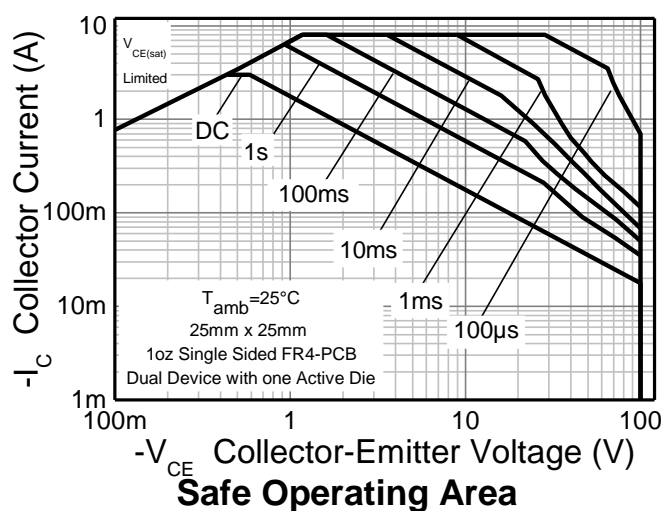
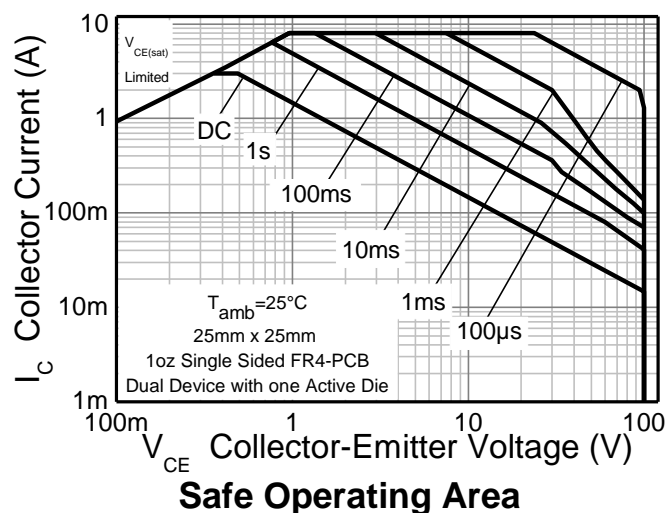
Characteristic	Symbol	Value	Unit
Power Dissipation	$P_D$	1.47	W
Linear Derating Factor		11.76	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	85	$^\circ\text{C/W}$
		37	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	5.7	$^\circ\text{C}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	

**ESD Ratings** (Note 9)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge – Charged Device Model	ESD CDM	1000	V	C3

- Notes:
- For a device mounted with the collector lead on 25mm x 25mm 1oz copper that is on single-sided 1.6mm FR4 PCB; device with one active die is measured under still air conditions whilst operating in a steady-state.
  - Same as Note 5, except the device is measured at  $t \leq 5$  sec.
  - For a dual device with one active die.
  - Thermal resistance from junction to solder-point (at the end of the collector lead).
  - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

# Thermal Characteristics and Derating Information

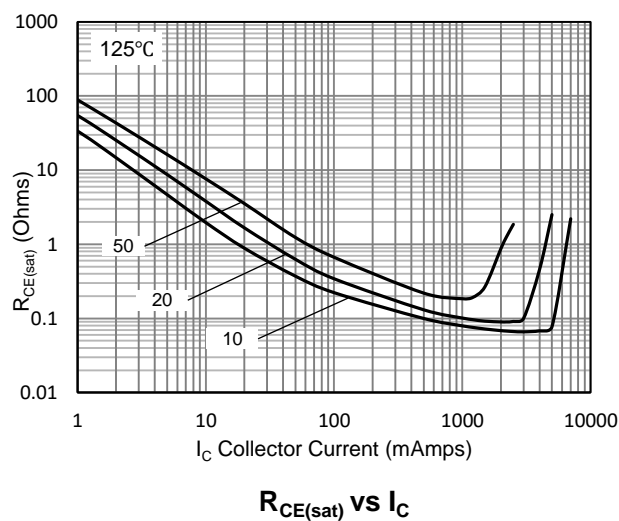
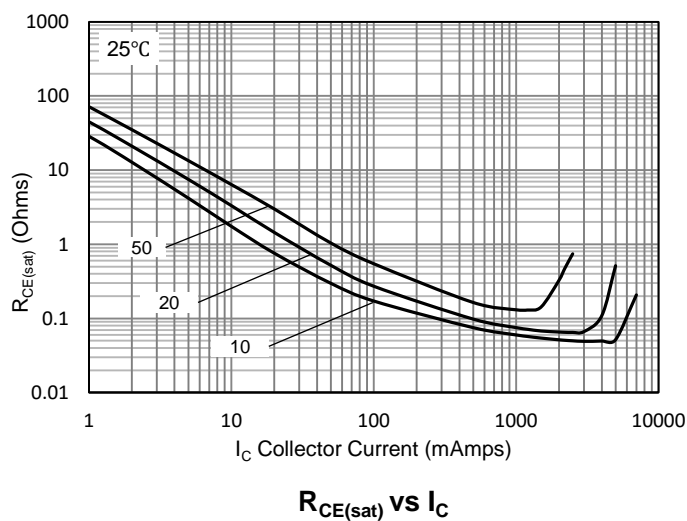
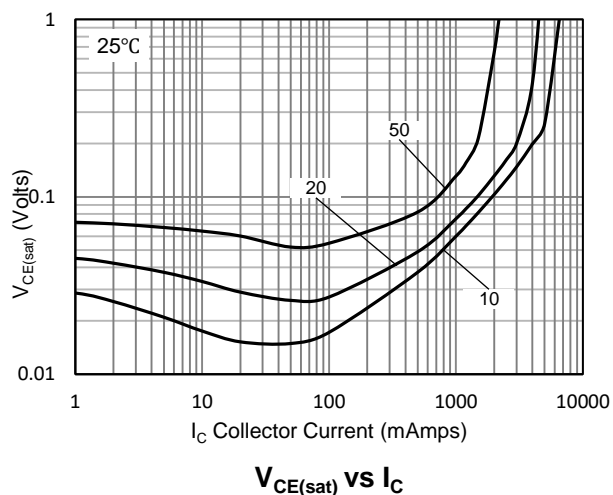
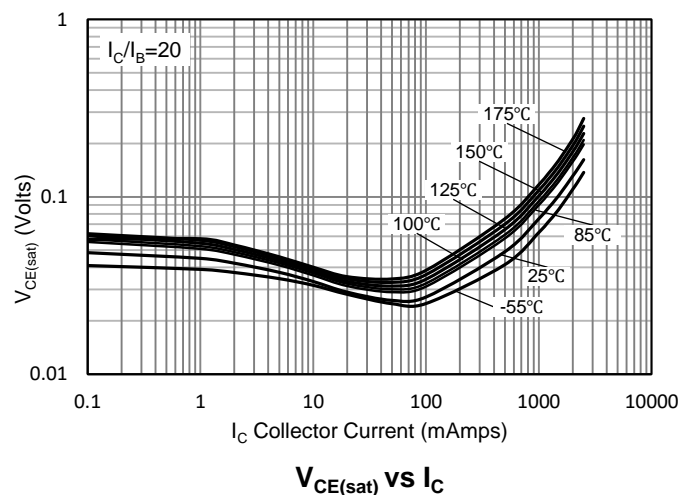
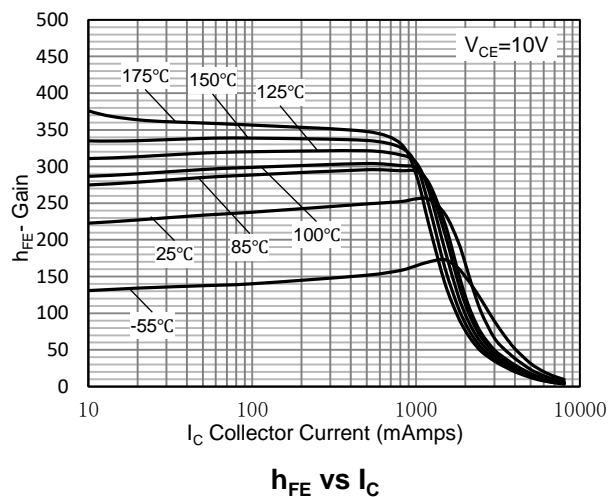
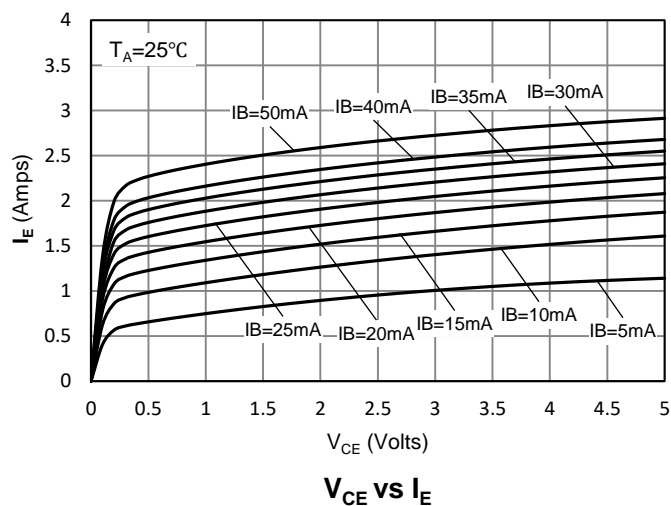


**NPN Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

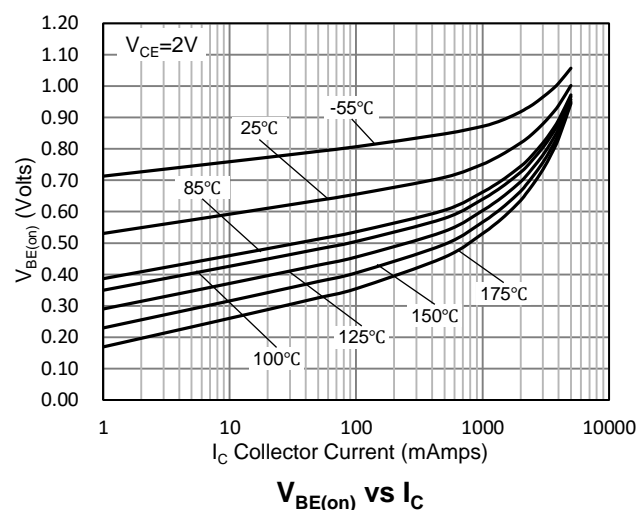
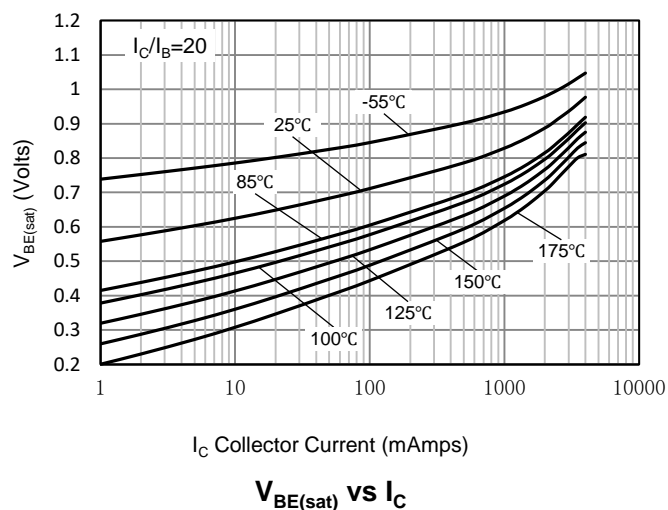
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$BV_{CBO}$	100	—	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	$BV_{CEO}$	100	—	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	7	—	—	V	$I_E = 100\mu\text{A}$
Collector-Base Cutoff Current	$I_{CBO}$	—	—	100	nA	$V_{CB} = 80\text{V}$
		—	—	50	$\mu\text{A}$	$V_{CB} = 80\text{V}$ @ $T_j = 150^\circ\text{C}$
Emitter Cutoff Current	$I_{EBO}$	—	—	100	nA	$V_{EB} = 7\text{V}$
Collector-Emitter Cutoff Current	$I_{CES}$	—	—	100	nA	$V_{CES} = 80\text{V}$
<b>ON CHARACTERISTICS</b> (Note 10)						
DC Current Gain	$h_{FE}$	150	250	—	—	$I_C = 500\text{mA}$ , $V_{CE} = 10\text{V}$
		80	250	—		$I_C = 1\text{A}$ , $V_{CE} = 10\text{V}$
		20	100	—		$I_C = 2\text{A}$ , $V_{CE} = 10\text{V}$
		10	40	—		$I_C = 3\text{A}$ , $V_{CE} = 10\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	90	150	mV	$I_C = 1\text{A}$ , $I_B = 50\text{mA}$
		—	225	330	mV	$I_C = 3\text{A}$ , $I_B = 300\text{mA}$
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	—	90	150	m $\Omega$	$I_C = 1\text{A}$ , $I_B = 50\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	0.86	1.0	V	$I_C = 1\text{A}$ , $I_B = 50\text{mA}$
		—	1.0	1.2		$I_C = 2\text{A}$ , $I_B = 200\text{mA}$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	—	0.67	0.85	V	$I_C = 0.1\text{A}$ , $V_{CE} = 2\text{V}$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	$f_T$	—	130	—	MHz	$V_{CE} = 10\text{V}$ , $I_C = 100\text{mA}$ , $f = 100\text{MHz}$
Output Capacitance	$C_{obo}$	—	11	—	pF	$V_{CB} = 10\text{V}$ , $f = 1\text{MHz}$
Delay Time	$t_d$	—	40	—	ns	$V_{CC} = 12.5\text{V}$ , $I_C = 1\text{A}$ $I_{B1} = -I_{B2} = 0.05\text{A}$
Rise Time	$t_r$	—	20	—	ns	
Turn-On Time	$t_{on}$	—	60	—	ns	
Storage Time	$t_s$	—	620	—	ns	
Fall Time	$t_f$	—	40	—	ns	
Turn-Off Time	$t_{off}$	—	660	—	ns	

Note: 10. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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



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

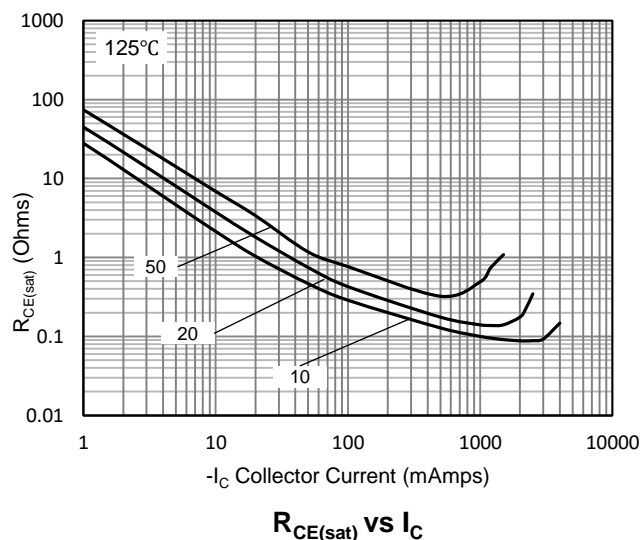
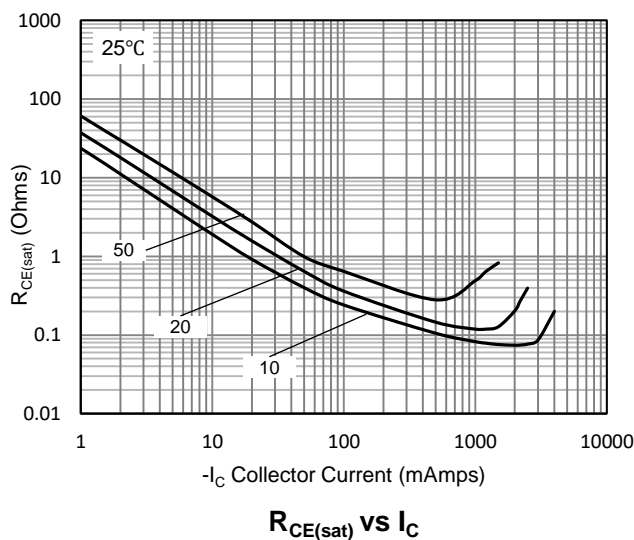
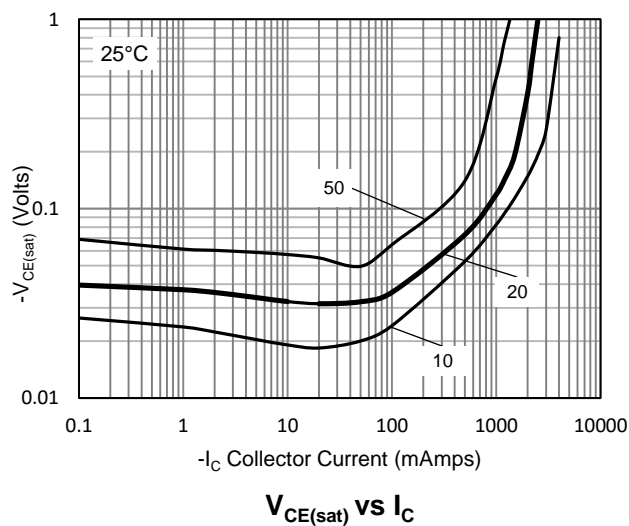
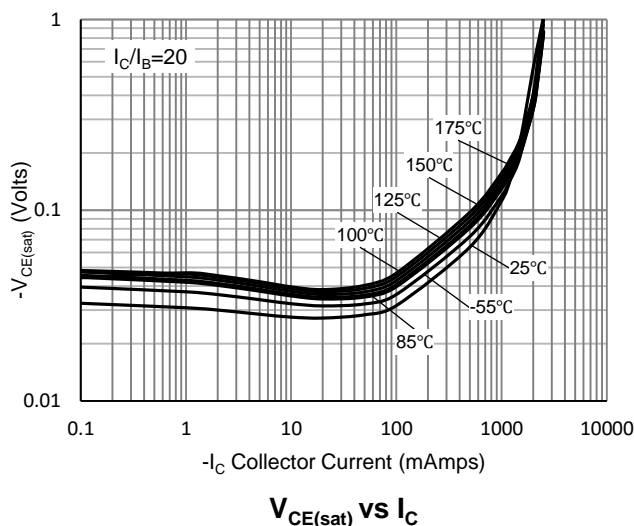
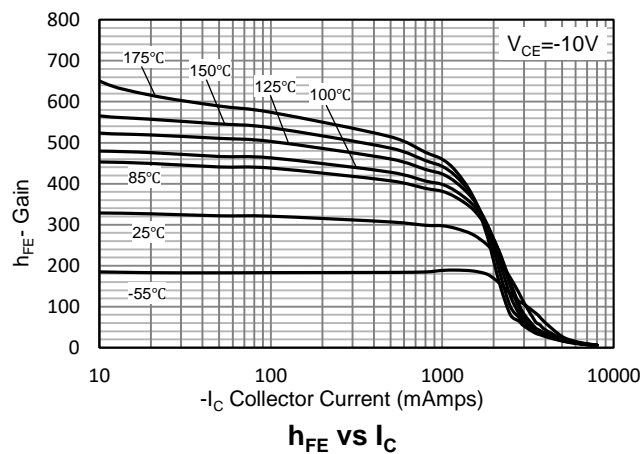
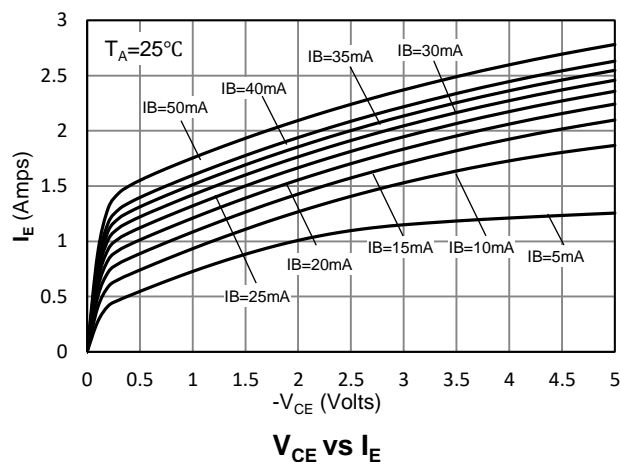


**PNP Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$BV_{CBO}$	-100	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	$BV_{CEO}$	-100	—	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-7	—	—	V	$I_E = -100\mu\text{A}$
Collector-Base Cutoff Current	$I_{CBO}$	—	—	-100	nA	$V_{CB} = -80\text{V}$
		—	—	-50	$\mu\text{A}$	$V_{CB} = -80\text{V}$ @ $T_J = 150^\circ\text{C}$
Emitter Cutoff Current	$I_{EBO}$	—	—	-100	nA	$V_{EB} = -7\text{V}$
Collector-Emitter Cutoff Current	$I_{CES}$	—	—	-100	nA	$V_{CES} = -80\text{V}$
<b>ON CHARACTERISTICS</b> (Note 10)						
DC Current Gain	$h_{FE}$	170	305	—	—	$I_C = -500\text{mA}$ , $V_{CE} = -10\text{V}$
		160	275	—		$I_C = -1\text{A}$ , $V_{CE} = -10\text{V}$
		45	90	—		$I_C = -2\text{A}$ , $V_{CE} = -10\text{V}$
		10	20	—		$I_C = -3\text{A}$ , $V_{CE} = -10\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	-70	-110	mV	$I_C = -0.5\text{A}$ , $I_B = -50\text{mA}$
		—	-220	-325		$I_C = -2\text{A}$ , $I_B = -200\text{mA}$
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	—	110	180	m $\Omega$	$I_C = -2\text{A}$ , $I_B = -200\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	-0.91	-1	V	$I_C = -1\text{A}$ , $I_B = -50\text{mA}$
		—	-1.02	-1.2		$I_C = -2\text{A}$ , $I_B = -200\text{mA}$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	—	-0.68	-0.9	V	$I_C = -0.1\text{A}$ , $V_{CE} = -2\text{V}$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	$f_T$	—	100	—	MHz	$V_{CE} = -10\text{V}$ , $I_C = -100\text{mA}$ , $f = 100\text{MHz}$
Output Capacitance	$C_{obo}$	—	30	—	pF	$V_{CB} = -10\text{V}$ , $f = -1\text{MHz}$
Delay Time	$t_d$	—	30	—	ns	$V_{CC} = -12.5\text{V}$ , $I_C = -1\text{A}$ $I_{B1} = -I_{B2} = -50\text{mA}$
Rise Time	$t_r$	—	30	—	ns	
Turn-On Time	$t_{on}$	—	60	—	ns	
Storage Time	$t_s$	—	660	—	ns	
Fall Time	$t_f$	—	50	—	ns	
Turn-Off Time	$t_{off}$	—	710	—	ns	

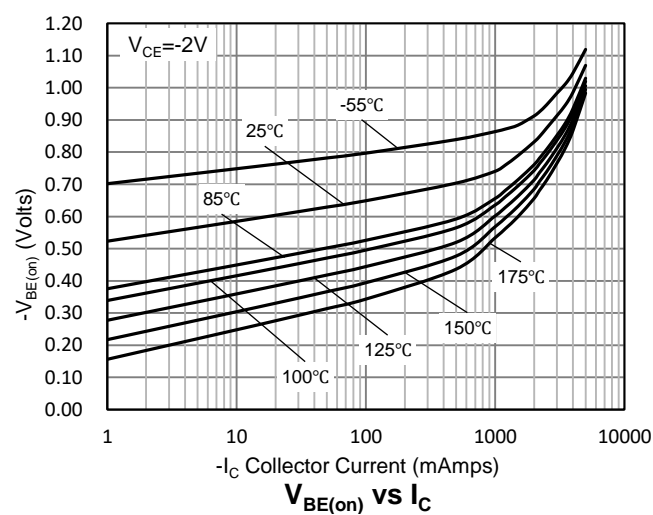
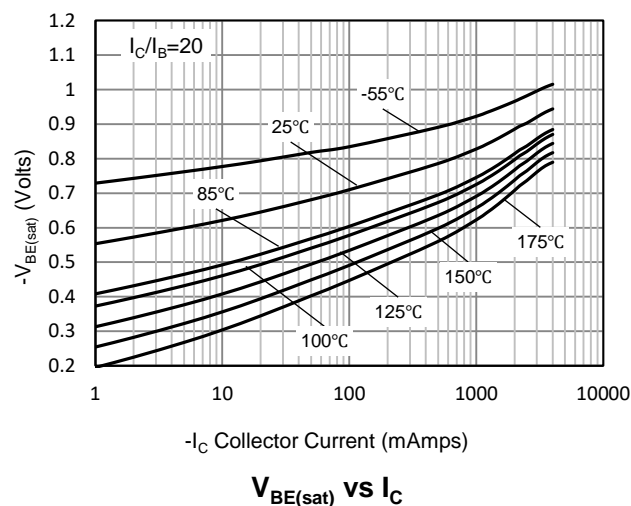
Note: 10. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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





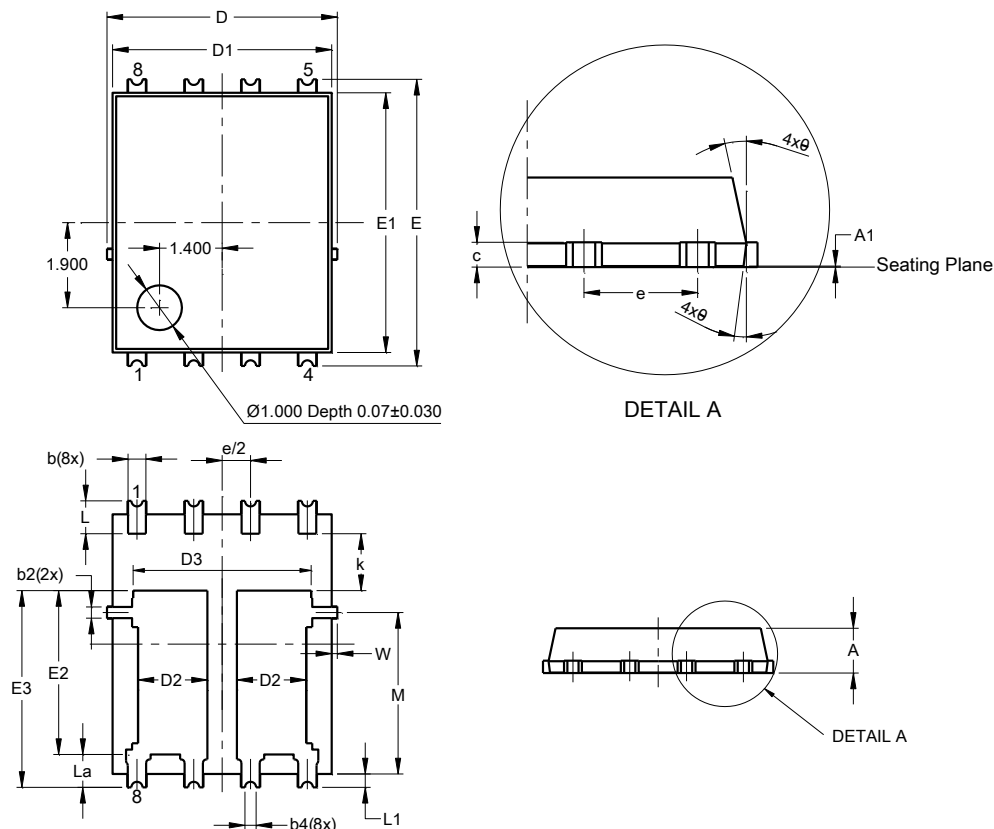
**PNP Typical Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.) (continued)



## Package Outline Dimensions

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

### PowerDI5060-8/SWP (Type UXD)

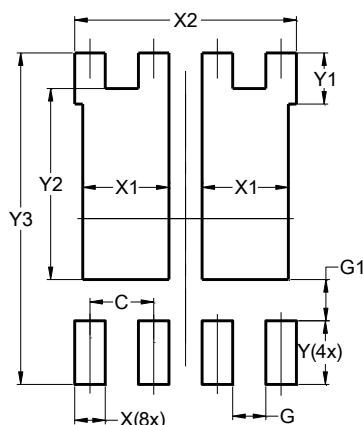


PowerDI5060-8/SWP (Type UXD)			
Dim	Min	Max	Typ
A	0.90	1.10	1.00
A1	0.00	0.05	--
b	0.30	0.50	0.41
b2	0.20	0.35	0.25
b4	0.25REF		
c	0.230	0.330	0.277
D	5.15 BSC		
D1	4.70	5.10	4.90
D2	1.46	1.66	1.55
D3	3.78	4.18	3.98
E	6.40 BSC		
E1	5.60	6.00	5.80
E2	3.46	3.86	3.66
E2a	4.195	4.595	4.395
e	1.27BSC		
k	1.05	--	--
L	0.635	0.835	0.735
La	0.635	0.835	0.735
L1	0.200	0.400	0.300
M	3.205	4.005	3.605
W	0.025	0.225	0.125
θ	10°	12°	11°
θ1	6°	8°	7°
All Dimensions in mm			

## Suggested Pad Layout

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

### PowerDI5060-8/SWP (Type UXD)



Dimensions	Value (in mm)
C	1.270
G	0.660
G1	0.820
X	0.610
X1	1.720
X2	4.420
Y	1.270
Y1	1.020
Y2	3.810
Y3	6.610

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