

## Features

- $BV_{CEO} > 60V$
- $I_C = 3A$  Continuous Collector Current
- $I_{CM} = 8A$  Peak Pulse Current
- $R_{CE(sat)} < 90m\Omega$
- Rated to  $+175^\circ C$  – Ideal for High Ambient Temperature Environments
- Wettable Flank for Improved Optical Inspection
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- The DXTN3C60PSQ is suitable for automotive applications requiring specific change control; it is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.
- <https://www.diodes.com/quality/product-definitions/>

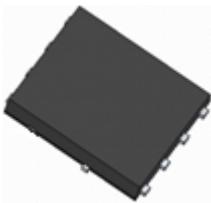
## Mechanical Data

- Case: PowerDI<sup>®</sup> 5060-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.097 grams (Approximate)

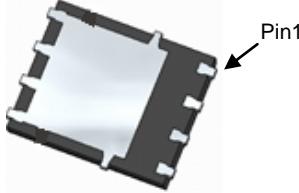
## Applications

- Power Management
- Load Switch
- Linear Mode Voltage Regulator
- Backlighting Applications

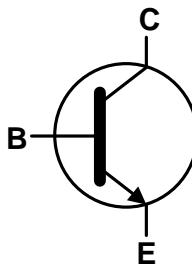
PowerDI5060-8 (SWP) (Type Q)



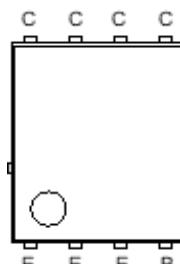
Top View



Bottom View



Internal Schematic



Top View  
Pin Configuration

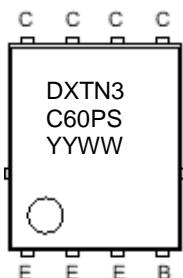
## Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DXTN3C60PSQ-13	Automotive	DXTN3C60PS	13	12	2,500

Notes:

1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
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



DXTN3 = Product Type Marking Code  
 C60PS = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 19 = 2019)  
 WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	60	V
Collector-Emitter Voltage	$V_{CEO}$	60	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	$P_D$	2.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	°C/W
		140	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	5.7	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +175	°C

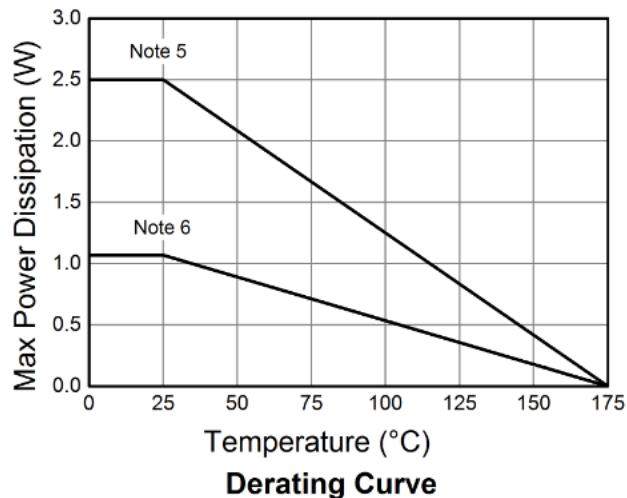
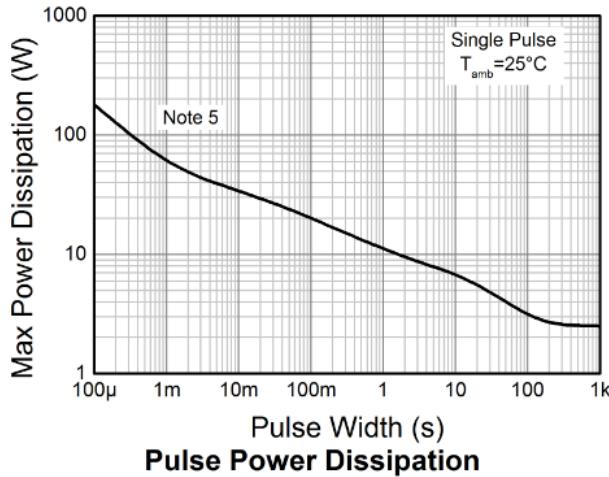
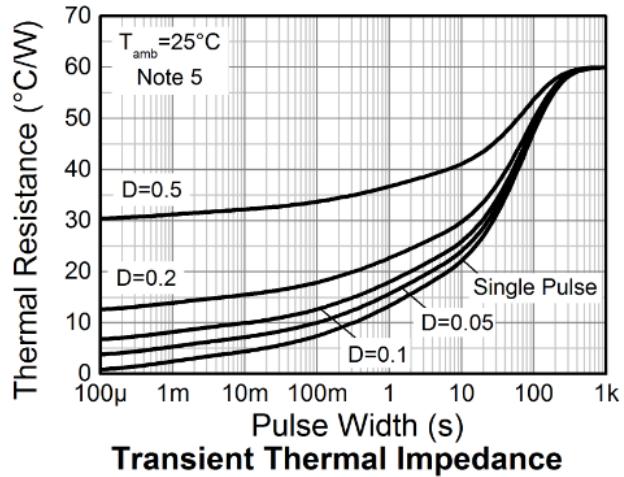
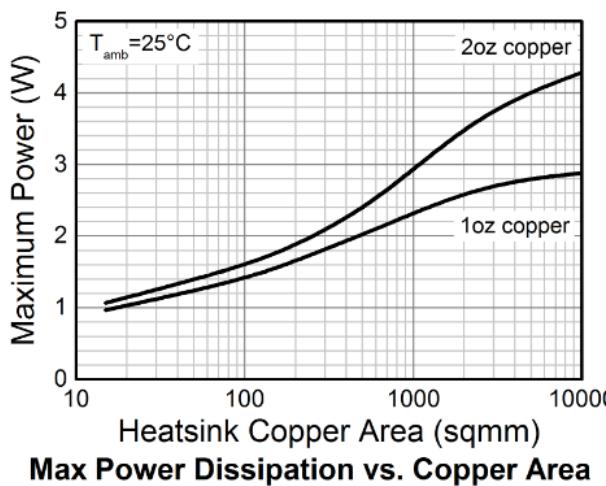
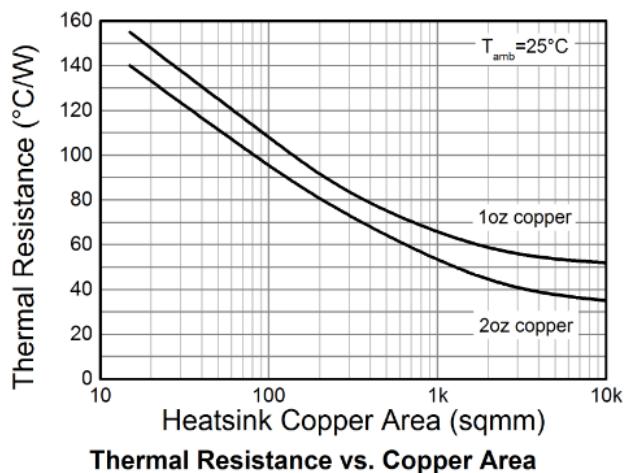
**ESD Ratings** (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:

- 5. For a device mounted with the collector lead on 25mm x 25mm 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 mounted on minimum recommended pad layout.
- 7. Thermal resistance from junction to solder point (at the collector tab).
- 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

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

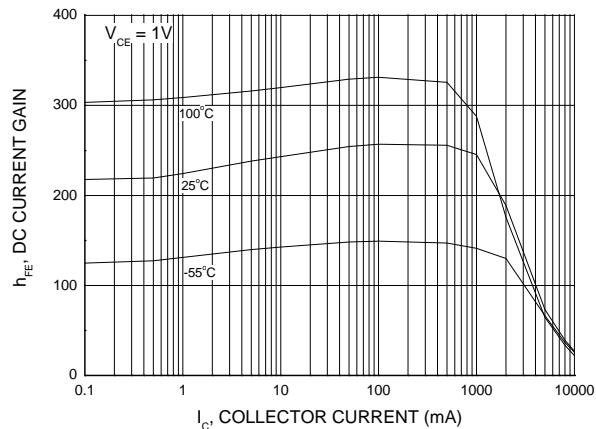


**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

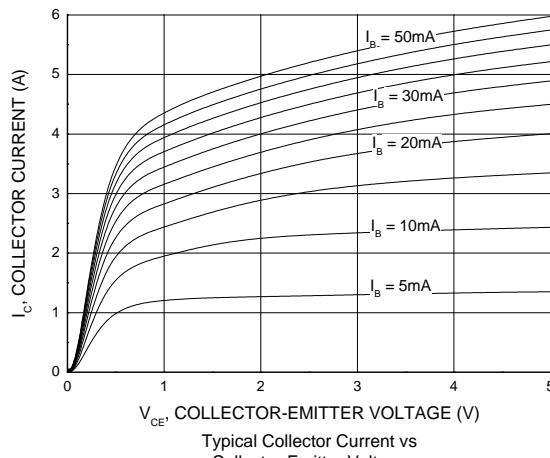
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$\text{BV}_{\text{CBO}}$	60	—	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	$\text{BV}_{\text{CEO}}$	60	—	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$\text{BV}_{\text{EBO}}$	7	—	—	V	$I_E = 100\mu\text{A}$
Collector-Base Cutoff Current	$I_{\text{CBO}}$	—	—	100	nA	$V_{\text{CB}} = 48\text{V}$
		—	—	50	$\mu\text{A}$	$V_{\text{CB}} = 48\text{V} @ T_J = +150^\circ\text{C}$
Emitter Cutoff Current	$I_{\text{EBO}}$	—	—	100	nA	$V_{\text{EB}} = 7\text{V}$
Collector-Emitter Cutoff Current	$I_{\text{CES}}$	—	—	100	nA	$V_{\text{CES}} = 48\text{V}$
<b>ON CHARACTERISTICS</b> (Note 9)						
DC Current Gain	$h_{\text{FE}}$	200	400	—	—	$I_C = 500\text{mA}, V_{\text{CE}} = 2\text{V}$
		200	330	—		$I_C = 1\text{A}, V_{\text{CE}} = 2\text{V}$
		100	180	—		$I_C = 2\text{A}, V_{\text{CE}} = 2\text{V}$
		50	100	—		$I_C = 3\text{A}, V_{\text{CE}} = 2\text{V}$
Collector-Emitter Saturation Voltage	$V_{\text{CE}(\text{sat})}$	—	70	120	mV	$I_C = 1\text{A}, I_B = 50\text{mA}$
Collector-Emitter Saturation Resistance	$R_{\text{CE}(\text{sat})}$	—	60	90	$\text{m}\Omega$	$I_C = 3\text{A}, I_B = 300\text{mA}$
Base-Emitter Saturation Voltage	$V_{\text{BE}(\text{sat})}$	—	0.86	1.0	V	$I_C = 1\text{A}, I_B = 100\text{mA}$
		—	1.0	1.2		$I_C = 2\text{A}, I_B = 200\text{mA}$
Base-Emitter Turn-On Voltage	$V_{\text{BE}(\text{on})}$	—	0.65	0.85	V	$I_C = 0.1\text{A}, V_{\text{CE}} = 2\text{V}$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	$f_T$	—	140	—	MHz	$V_{\text{CE}} = 10\text{V}, I_C = 100\text{mA}, f = 10\text{MHz}$
Output Capacitance	$C_{\text{obo}}$	—	17	—	pF	$V_{\text{CB}} = 10\text{V}, f = 1\text{MHz}$
Delay Time	$t_d$	—	15	—	ns	$V_{\text{CC}} = 12.5\text{V}, I_C = 1\text{A}$ $I_{B1} = -I_{B2} = 0.05\text{A}$
Rise Time	$t_r$	—	120	—	ns	
Turn-On Time	$t_{(\text{on})}$	—	135	—	ns	
Storage Time	$t_s$	—	800	—	ns	
Fall Time	$t_f$	—	300	—	ns	
Turn-Off Time	$t_{(\text{off})}$	—	1100	—	ns	

Note: 9. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

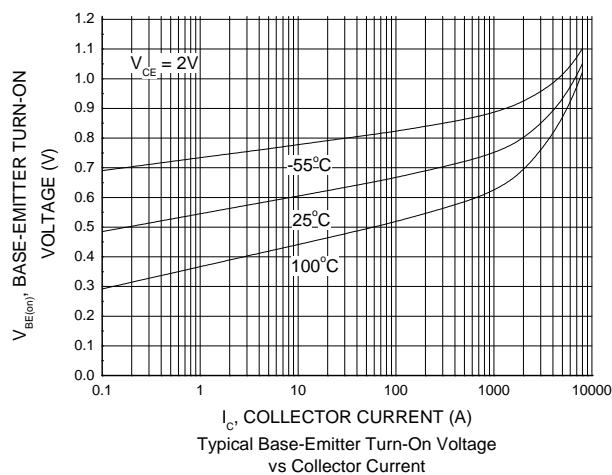
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



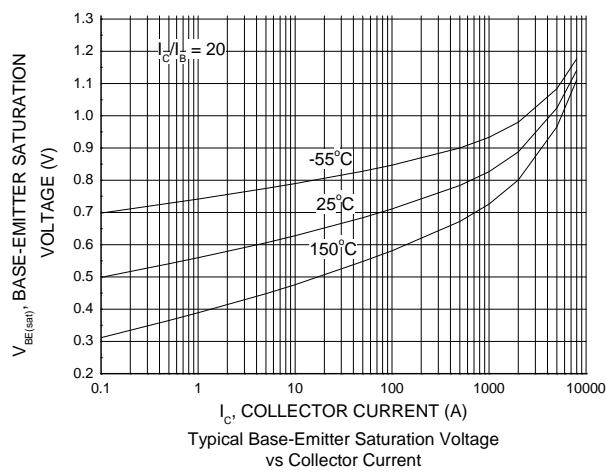
Typical DC Current Gain vs Collector Current



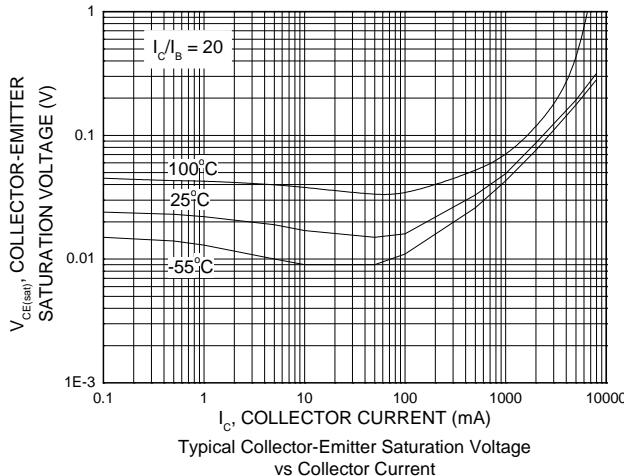
Typical Collector Current vs Collector-Emitter Voltage



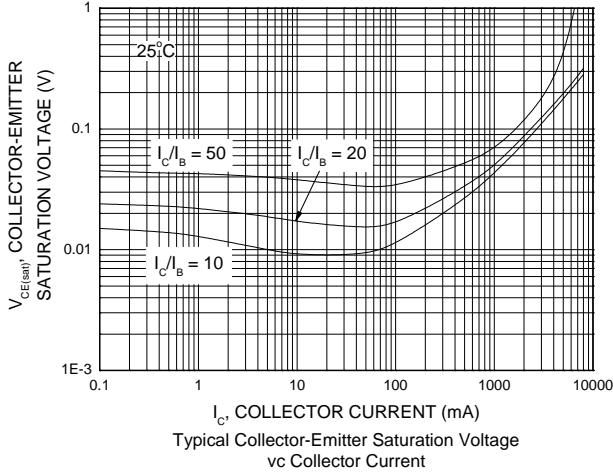
Typical Base-Emitter Turn-On Voltage vs Collector Current



Typical Base-Emitter Saturation Voltage vs Collector Current



Typical Collector-Emitter Saturation Voltage vs Collector Current

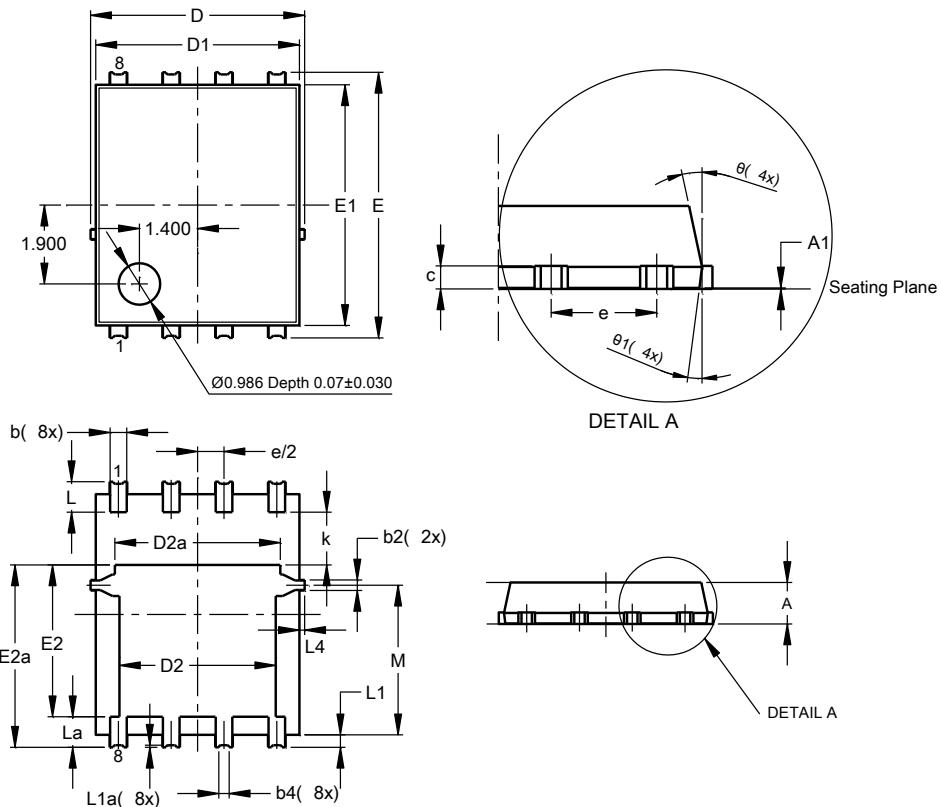


Typical Collector-Emitter Saturation Voltage vs Collector Current

## Package Outline Dimensions

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

**PowerDI5060-8 (SWP) (Type Q)**

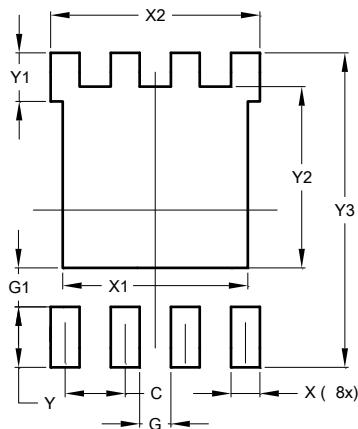


PowerDI5060-8 (SWP) (Type Q)			
Dim	Min	Max	Typ
<b>A</b>	0.90	1.10	1.00
<b>A1</b>	0	0.05	--
<b>b</b>	0.30	0.50	0.41
<b>b2</b>	0.20	0.35	0.25
<b>b4</b>	0.25REF		
<b>c</b>	0.230	0.330	0.277
<b>D</b>	5.15 BSC		
<b>D1</b>	4.70	5.10	4.90
<b>D2</b>	3.56	3.96	3.76
<b>D2a</b>	3.78	4.18	3.98
<b>E</b>	6.40 BSC		
<b>E1</b>	5.60	6.00	5.80
<b>E2</b>	3.46	3.86	3.66
<b>E2a</b>	4.195	4.595	4.395
<b>e</b>	1.27BSC		
<b>k</b>	1.05	--	--
<b>L</b>	0.635	0.835	0.735
<b>La</b>	0.635	0.835	0.735
<b>L1</b>	0.200	0.400	0.300
<b>L1a</b>	0.050REF		
<b>L4</b>	0.025	0.225	0.125
<b>M</b>	3.205	4.005	3.605
<b>θ</b>	10°	12°	11°
<b>θ1</b>	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 Q)**



Dimensions	Value (in mm)
<b>C</b>	1.270
<b>G</b>	0.660
<b>G1</b>	0.820
<b>X</b>	0.610
<b>X1</b>	4.100
<b>X2</b>	4.420
<b>Y</b>	1.270
<b>Y1</b>	1.020
<b>Y2</b>	3.810
<b>Y3</b>	6.610

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