

## 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/>

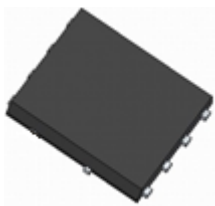
## Mechanical Data

- 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 <sup>Ⓔ</sup>
- Weight: 0.097 grams (Approximate)

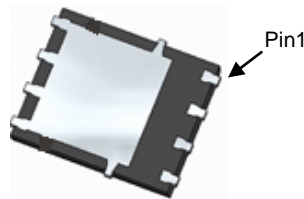
## Applications

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

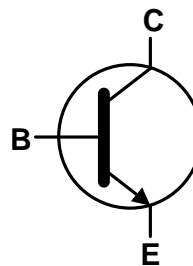
PowerDI5060-8 (SWP) (Type Q)



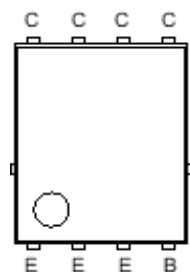
Top View



Bottom View



Internal Schematic

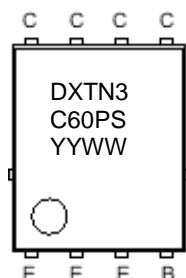

 Top View  
Pin Configuration

## 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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	60	V
Collector-Emitter Voltage	V <sub>CEO</sub>	60	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Base Current	I <sub>B</sub>	500	mA
Continuous Collector Current	I <sub>C</sub>	3	A
Peak Pulse Collector Current	I <sub>CM</sub>	8	A

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

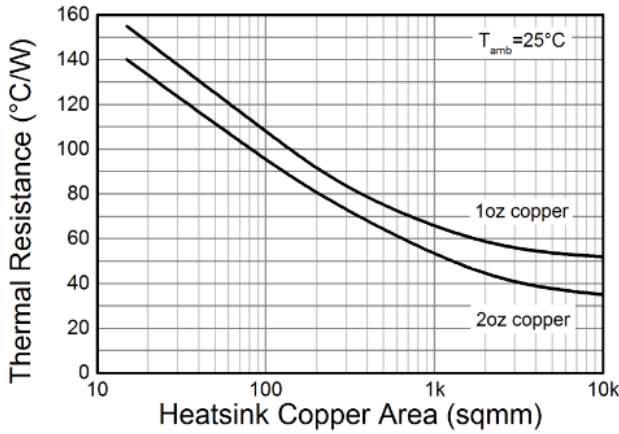
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	2.5	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	60	°C/W
		140 (Note 6)	
Thermal Resistance, Junction to Lead (Note 7)	R <sub>θJL</sub>	5.7	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175	°C

**ESD Ratings** (Note 8)

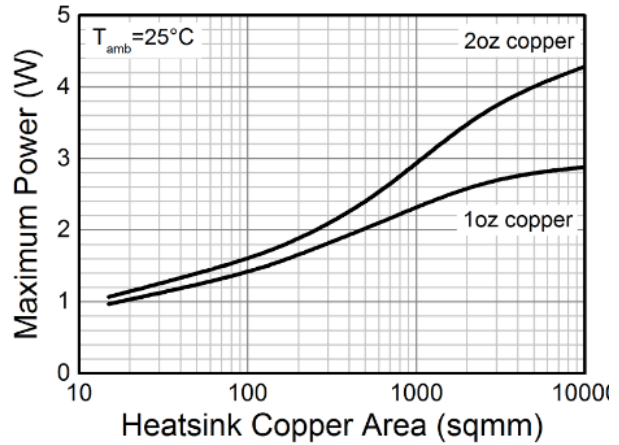
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- 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.

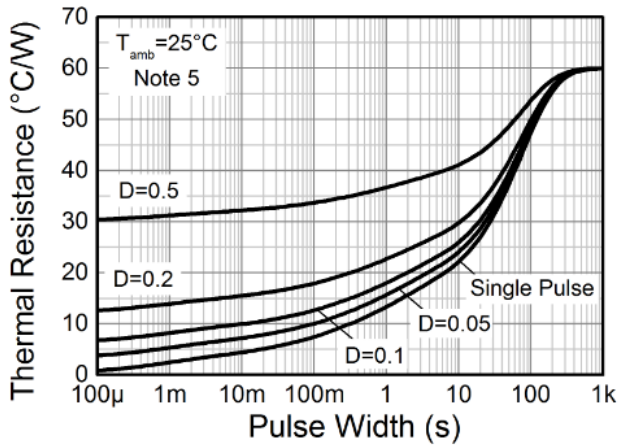
**Typical Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



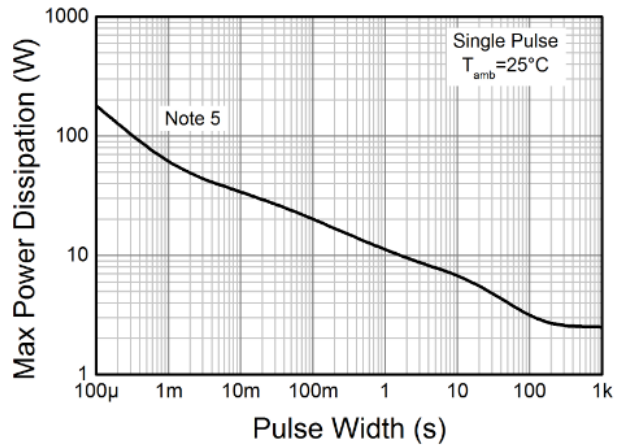
**Thermal Resistance vs. Copper Area**



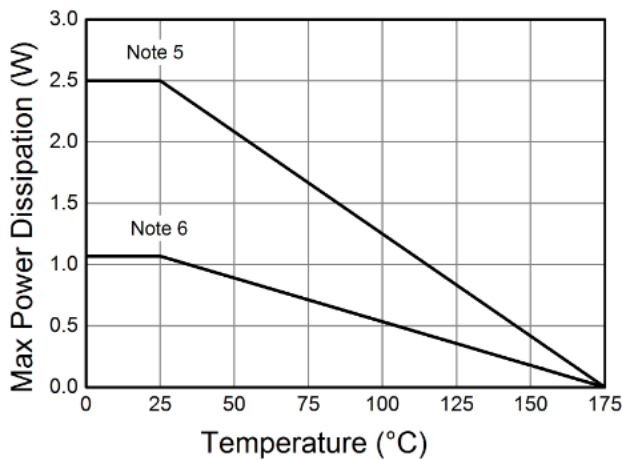
**Max Power Dissipation vs. Copper Area**



**Transient Thermal Impedance**



**Pulse Power Dissipation**



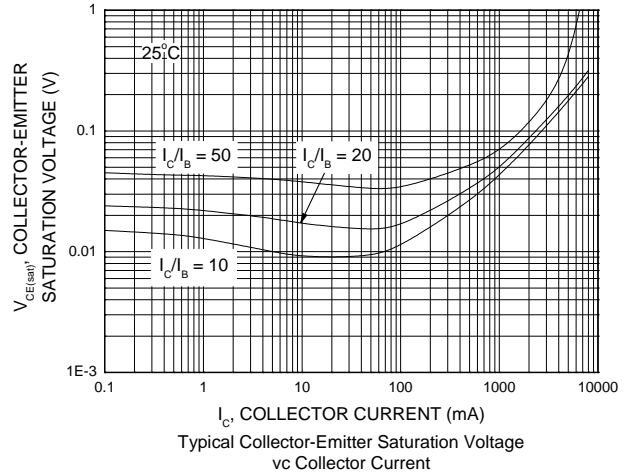
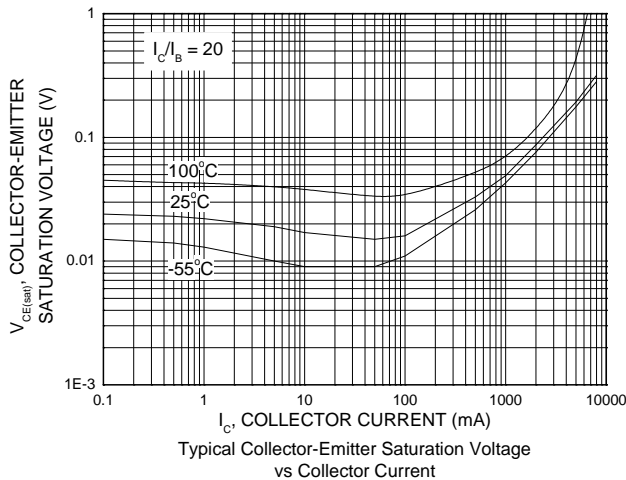
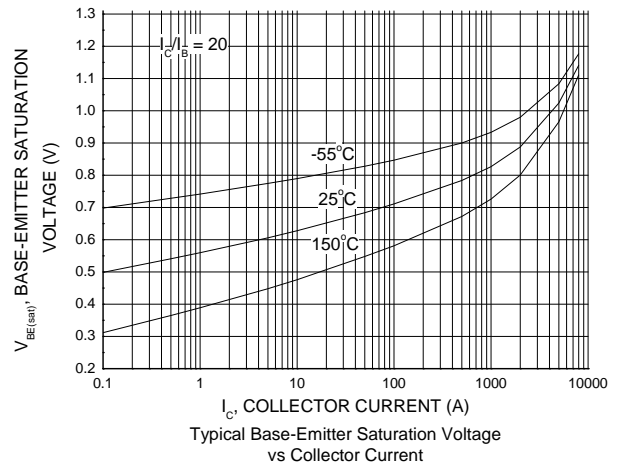
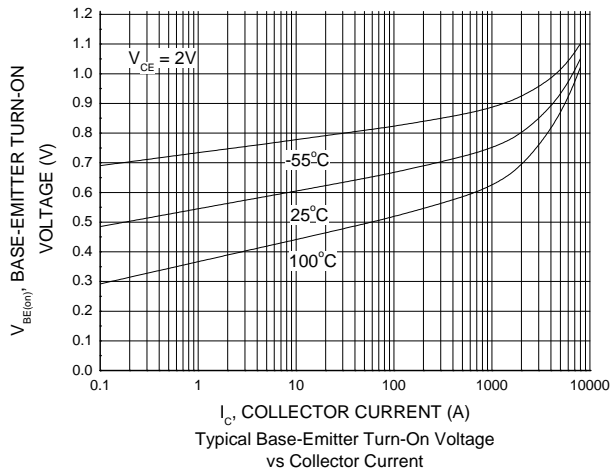
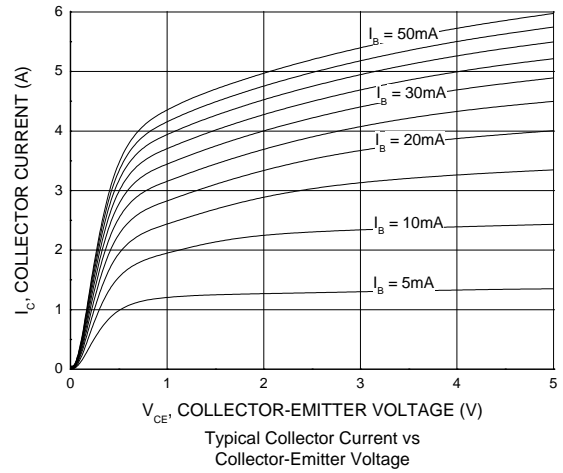
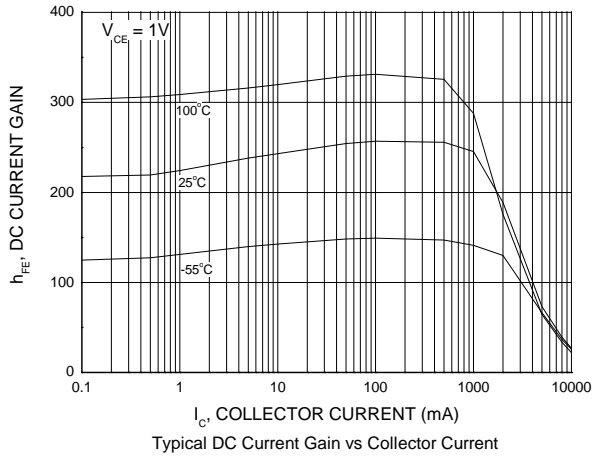
**Derating Curve**

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	60	—	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	60	—	—	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	—	—	V	I <sub>E</sub> = 100μA
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	—	100	nA	V <sub>CB</sub> = 48V
		—	—	50	μA	V <sub>CB</sub> = 48V @T <sub>J</sub> = +150°C
Emitter Cutoff Current	I <sub>EBO</sub>	—	—	100	nA	V <sub>EB</sub> = 7V
Collector-Emitter Cutoff Current	I <sub>CES</sub>	—	—	100	nA	V <sub>CES</sub> = 48V
<b>ON CHARACTERISTICS (Note 9)</b>						
DC Current Gain	h <sub>FE</sub>	200	400	—	—	I <sub>C</sub> = 500mA, V <sub>CE</sub> = 2V
		200	330	—		I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V
		100	180	—		I <sub>C</sub> = 2A, V <sub>CE</sub> = 2V
		50	100	—		I <sub>C</sub> = 3A, V <sub>CE</sub> = 2V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	70	120	mV	I <sub>C</sub> = 1A, I <sub>B</sub> = 50mA
		—	180	270	mV	I <sub>C</sub> = 3A, I <sub>B</sub> = 300mA
Collector-Emitter Saturation Resistance	R <sub>CE(sat)</sub>	—	60	90	mΩ	I <sub>C</sub> = 3A, I <sub>B</sub> = 300mA
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	—	0.86	1.0	V	I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA
		—	1.0	1.2		I <sub>C</sub> = 2A, I <sub>B</sub> = 200mA
Base-Emitter Turn-On Voltage	V <sub>BE(on)</sub>	—	0.65	0.85	V	I <sub>C</sub> = 0.1A, V <sub>CE</sub> = 2V
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	f <sub>T</sub>	—	140	—	MHz	V <sub>CE</sub> = 10V, I <sub>C</sub> = 100mA, f = 10MHz
Output Capacitance	C <sub>obo</sub>	—	17	—	pF	V <sub>CB</sub> = 10V, f = 1MHz
Delay Time	t <sub>d</sub>	—	15	—	ns	V <sub>CC</sub> = 12.5V, I <sub>C</sub> = 1A I <sub>B1</sub> = -I <sub>B2</sub> = 0.05A
Rise Time	t <sub>r</sub>	—	120	—	ns	
Turn-On Time	t <sub>(on)</sub>	—	135	—	ns	
Storage Time	t <sub>s</sub>	—	800	—	ns	
Fall Time	t <sub>f</sub>	—	300	—	ns	
Turn-Off Time	t <sub>(off)</sub>	—	1100	—	ns	

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

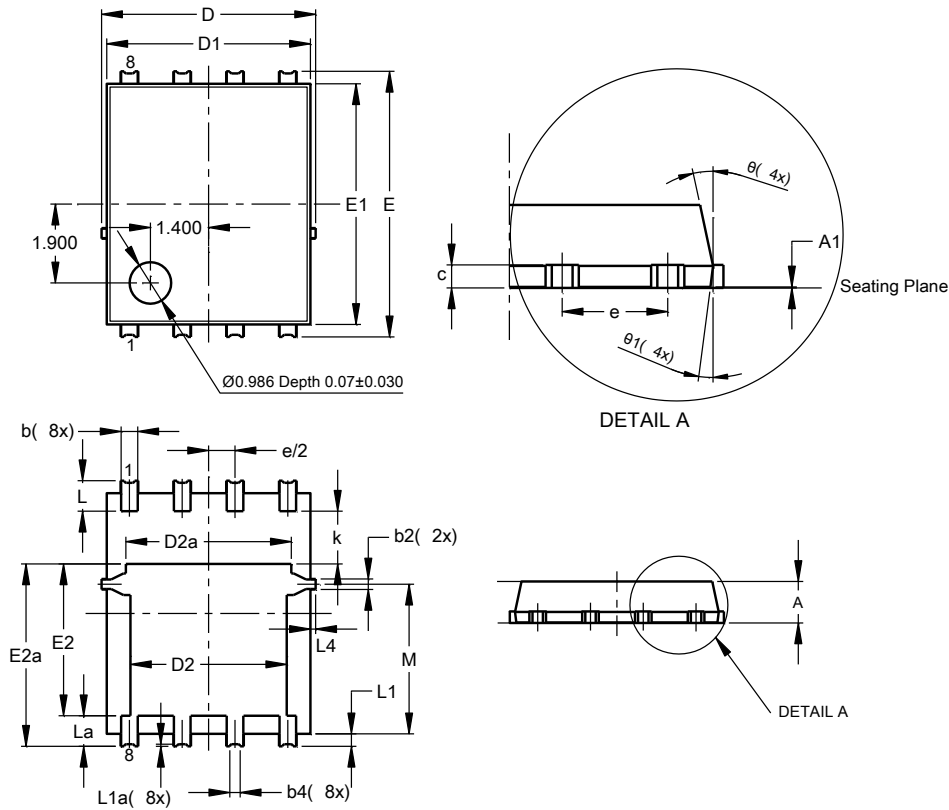
**Typical Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)



**Package Outline Dimensions**

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

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

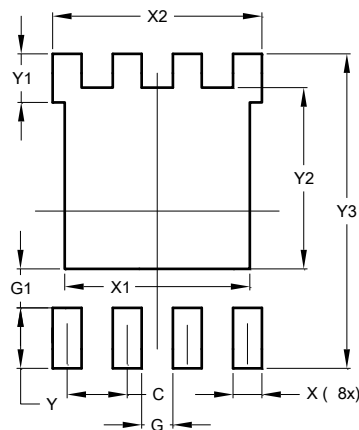


PowerDI5060-8 (SWP) (Type Q)			
Dim	Min	Max	Typ
A	0.90	1.10	1.00
A1	0	0.05	--
b	0.30	0.50	0.41
b2	0.20	0.35	0.25
b4	0.25REF		
c	0.230	0.330	0.277
D	5.15 BSC		
D1	4.70	5.10	4.90
D2	3.56	3.96	3.76
D2a	3.78	4.18	3.98
E	6.40 BSC		
E1	5.60	6.00	5.80
E2	3.46	3.86	3.66
E2a	4.195	4.595	4.395
e	1.27BSC		
k	1.05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



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

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