60V 175°C PNP LOW SAT MEDIUM POWER TRANSISTOR IN POWERDI5060-8

Features

- BV_{CEO} > -60V
- I_C = -3A Continuous Collector Current
- I_{CM} = -8A Peak Pulse Current
- $R_{CE(SAT)}$ < 120 mΩ
- Rated to +175°C—Ideal for High Ambient Temperature Environments
- Complementary Part DXTN3C60PS
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

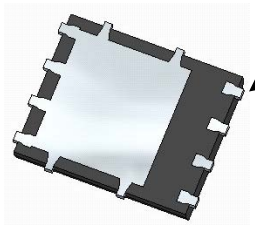
- Case: PowerDI®5060-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish—Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.097 grams (Approximate)

Applications

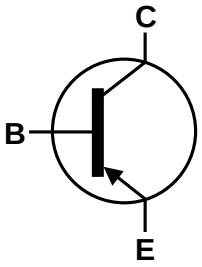
- Power Management
- Load Switch
- Linear Mode Voltage Regulator
- Backlighting Applications

PowerDI5060-8

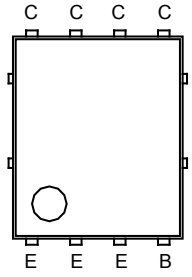
Top View



Bottom View



Internal Schematic



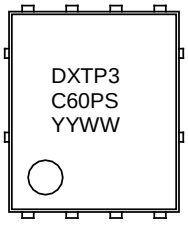
Top View
Pin Configuration

Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DXTP3C60PS-13	AEC-Q101	DXTP3C60PS	13	12	1000

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, see http://www.diodes.com/products/packages.html.

Marking Information



DXTP3 = Product Type Marking Code
C60PS = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Digit of Year (ex: 18 = 2018)
WW = Week Code (01 to 53)

PowerDI is a registered trademark of Diodes Incorporated

Absolute Maximum Ratings (@T_A = +25°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	-1	A
Continuous Collector Current	I_C	-3	A
Peak Pulse Collector Current	I_{CM}	-8	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

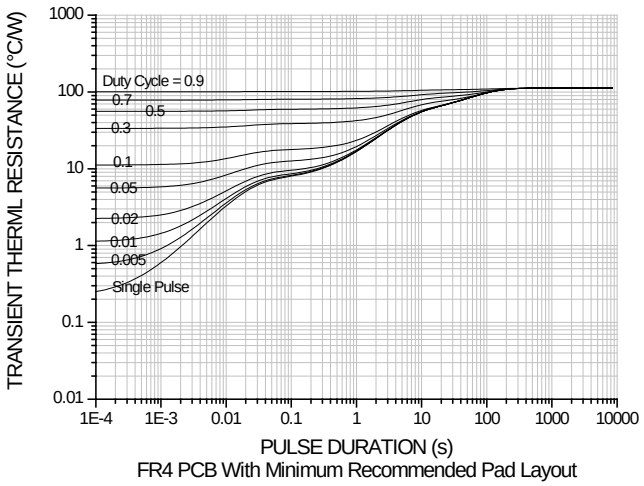
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	5	W
Thermal Resistance, Junction to Lead	(Note 5)	$R_{\Theta JL}$	5.6	°C/W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\Theta JA}$	73	°C/W
	(Note 6)		30	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +175	°C

ESD Ratings (Note 7)

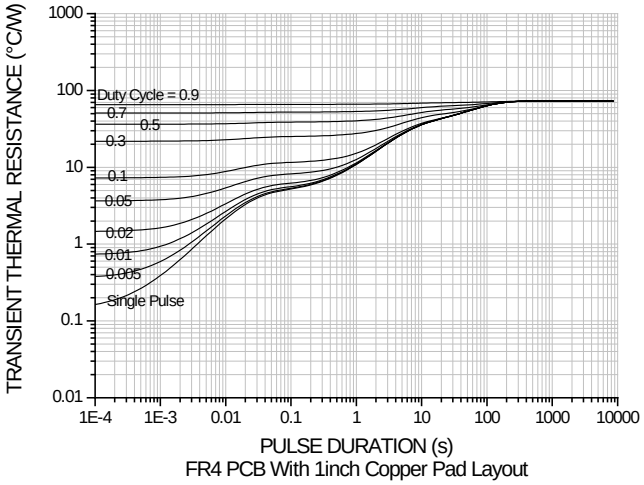
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the collector lead on 25mm × 25mm 1oz copper that is on 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 the device is measured at t ≤ 5 sec.
7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information



FR4 PCB With Minimum Recommended Pad Layout



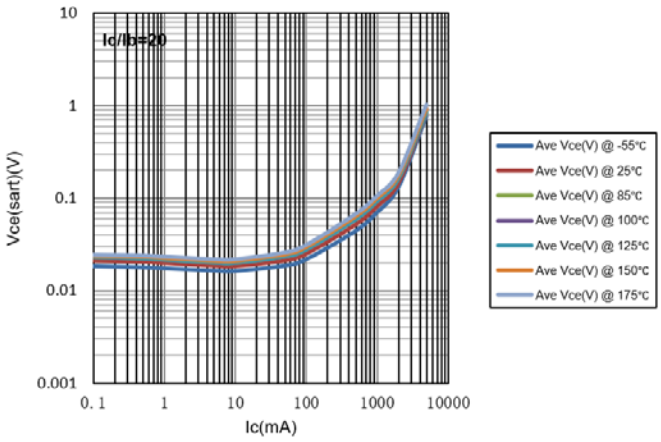
FR4 PCB With 1inch Copper Pad Layout

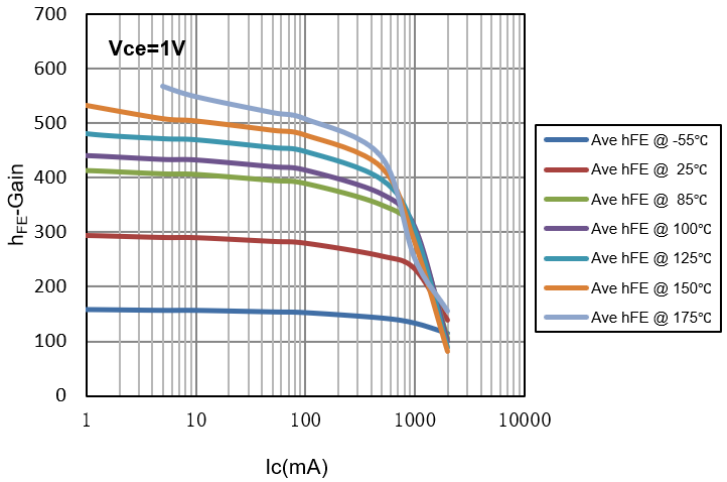
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

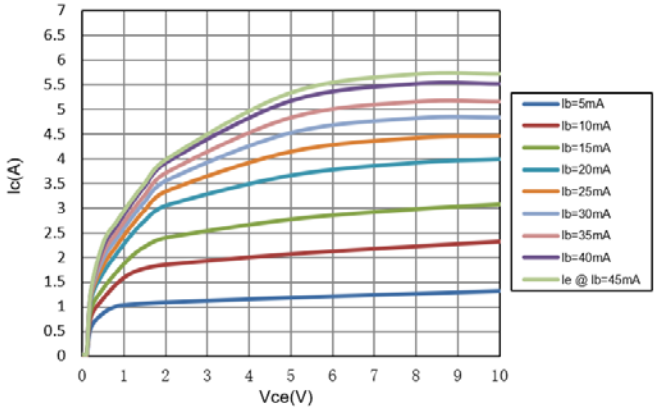
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	-60	—	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	-60	—	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	—	—	V	I_E = -100µA
Collector-Base Cutoff Current	I_{CBO}	—	—	-100	nA	V_{CB} = -48V
		—	—	-50	µA	V_{CB} = -48V @ Tj = 150°C
Emitter Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = -7V
Collector-Emitter Cutoff Current	I_{CES}	—	—	100	nA	V_{CES} = -48V
ON CHARACTERISTICS (Note 9)						
DC Current Gain	h_{FE}	150	250	—	—	I_C = -500mA, V_{CE} = -2V
		150	225	—		I_C = -1A, V_{CE} = -2V
		80	130	—		I_C = -2A, V_{CE} = -2V
		35	75	—		I_C = -3A, V_{CE} = -2V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	-100	-225	mV	I_C = -1A, I_B = -50mA
		—	-240	-360		I_C = -3A, I_B = -300mA
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	—	100	225	mΩ	I_C = -1A, I_B = -50mA
		—	80	120		I_C = -3A, I_B = -300mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	-0.8	-0.95	V	I_C = -1A, I_B = -50mA
		—	-1.02	-1.2		I_C = -2A, I_B = -200mA
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	—	-0.7	-0.8	V	I_C = -0.5A, V_{CE} = -2V
SMALL SIGNAL CHARACTERISTICS						
Current Gain-Bandwidth Product	f_T	—		—	MHz	V_{CE} = -10V, I_C = -500mA, f = 100MHz
Output Capacitance	C_{obo}	—	42	—	pF	V_{CB} = -10V, f = -1MHz
Delay Time	t_d	—	15	—	ns	V_{CC} = -12.5V, I_C = 3A I_{B1} = -I_{B2} = -0.150A
Rise Time	t_r	—	220	—	ns	
Turn-On Time	$t_{(on)}$	—	235	—	ns	
Storage Time	t_s	—	160	—	ns	
Fall Time	t_f	—	185	—	ns	
Turn-Off Time	$t_{(off)}$	—	345	—	ns	

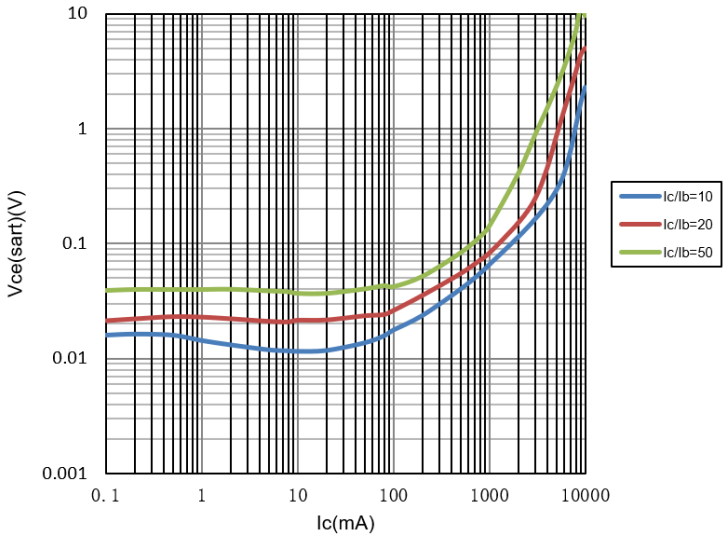
Note: 8. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

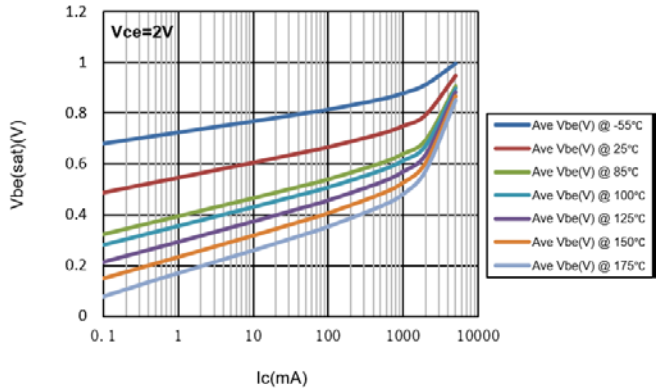
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

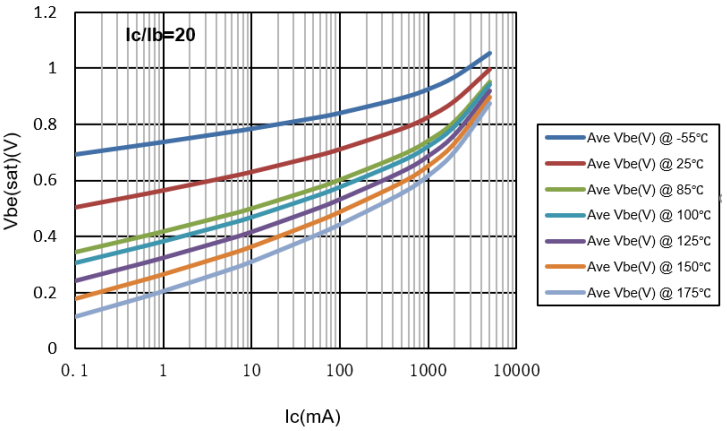








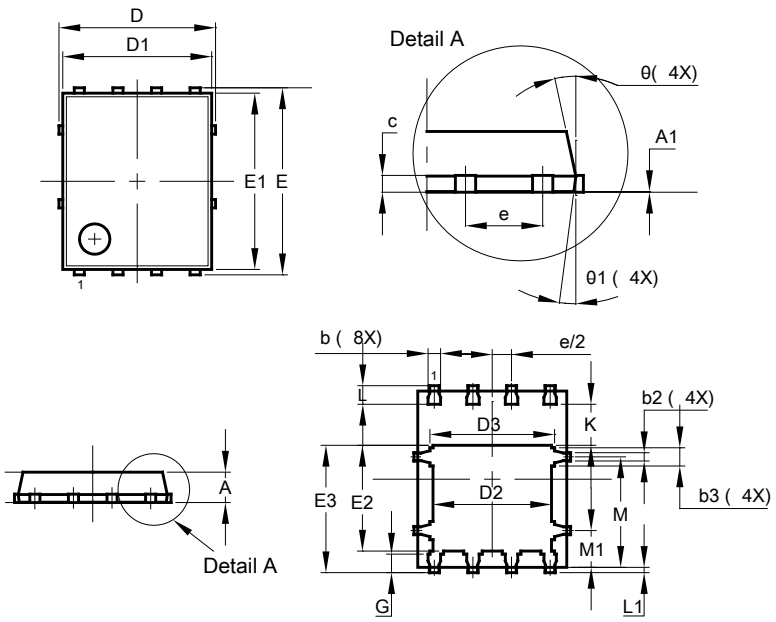




Package Outline Dimensions

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

PowerDI5060-8

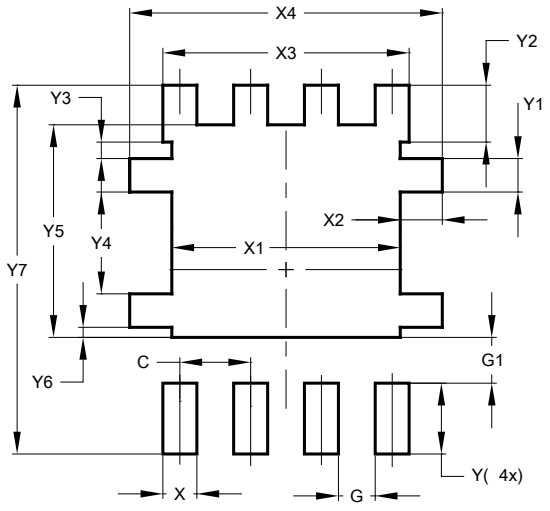


PowerDI5060-8			
Dim	**Min**	**Max**	**Typ**
A	0.90	1.10	1.00
A1	0.00	0.05	—
b	0.33	0.51	0.41
b2	0.200	0.350	0.273
b3	0.40	0.80	0.60
c	0.230	0.330	0.277
D	5.15 BSC		
D1	4.70	5.10	4.90
D2	3.70	4.10	3.90
D3	3.90	4.30	4.10
E	6.15 BSC		
E1	5.60	6.00	5.80
E2	3.28	3.68	3.48
E3	3.99	4.39	4.19
e	1.27 BSC		
G	0.51	0.71	0.61
K	0.51	—	—
L	0.51	0.71	0.61
L1	0.100	0.200	0.175
M	3.235	4.035	3.635
M1	1.00	1.40	1.21
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



Dimensions	Value (in mm)
C	1.270
G	0.660
G1	0.820
X	0.610
X1	4.100
X2	0.755
X3	4.420
X4	5.610
Y	1.270
Y1	0.600
Y2	1.020
Y3	0.295
Y4	1.825
Y5	3.810
Y6	0.180
Y7	6.610

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