优尚

YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

0755-83047638
ysbdt@szyoushang.cn
www.szyoushang.cn

企业微信二维码

企业QQ二维码

Features

- BV_{CEO} > 60V
- I_C= 3A Continuous Collector Current
- I_{CM} = 8A Peak Pulse Current
- $R_{CE(sat)}$ <90mΩ
- Rated to +175°C – Ideal for High Ambient Temperature Environments
- Wettable Flank for Improved Optical Inspection

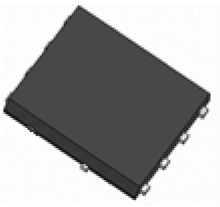
Mechanical Data

- Case: PowerDI® 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)

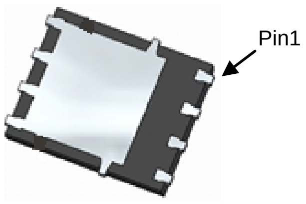
Applications

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

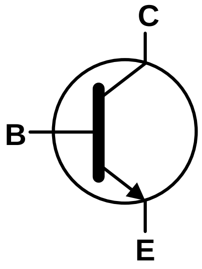
PowerDI5060-8 (SWP) (Type Q)



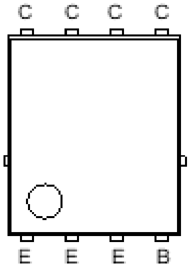
Top View



Bottom View



Internal Schematic



Top View
Pin Configuration

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	500	mA
Continuous Collector Current	I_C	3	A
Peak Pulse Collector Current	I_{CM}	8	A

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

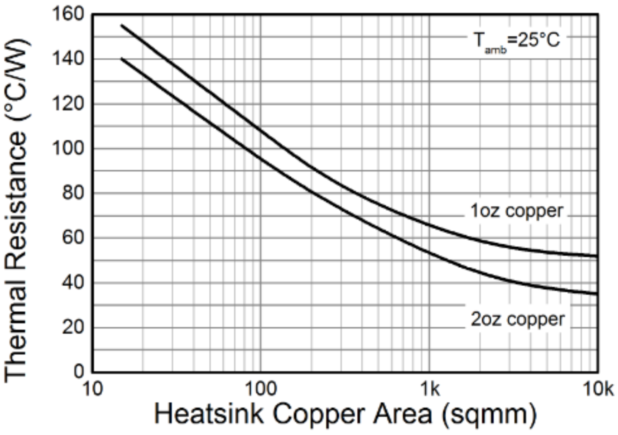
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2.5	W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	60	°C/W
	(Note 6)		140	
Thermal Resistance, Junction to Lead	(Note 7)	$R_{\theta JL}$	5.7	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +175	°C

ESD Ratings (Note 8)

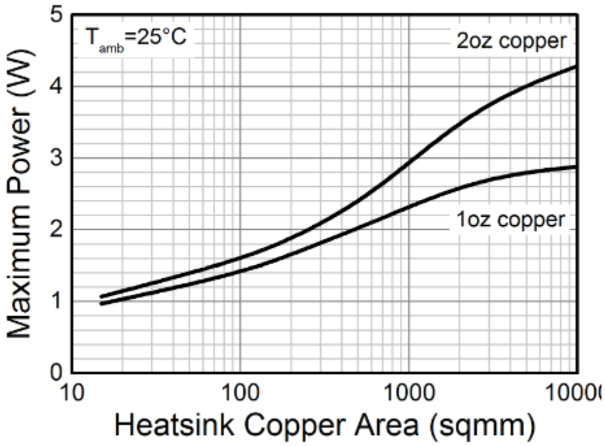
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

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.

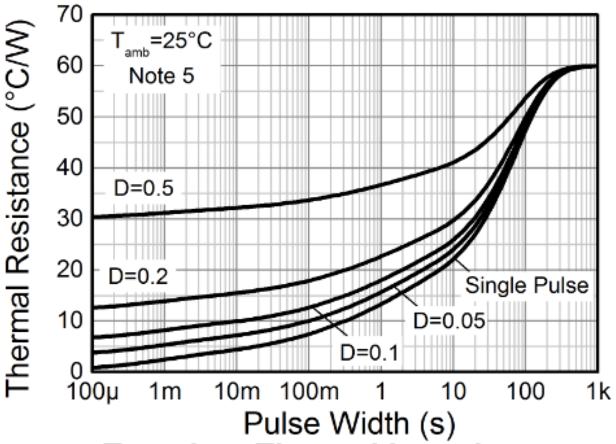
Typical Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)



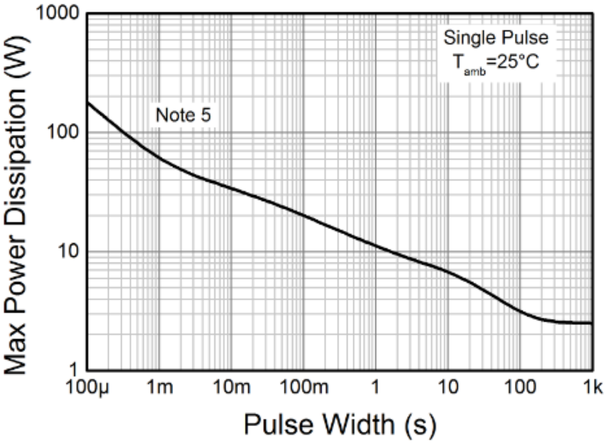
Thermal Resistance vs. Copper Area



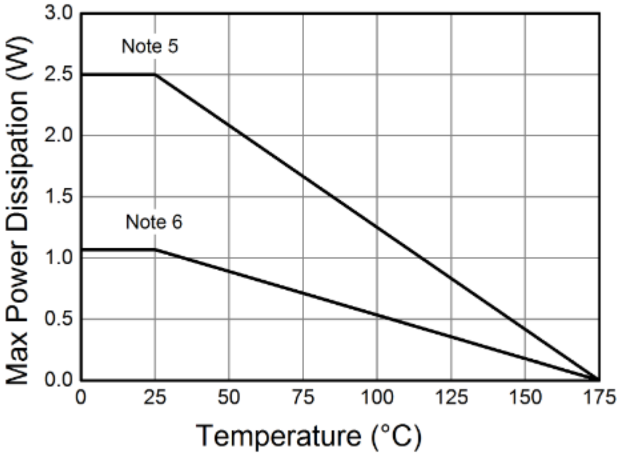
Max Power Dissipation vs. Copper Area



Transient Thermal Impedance



Pulse Power Dissipation



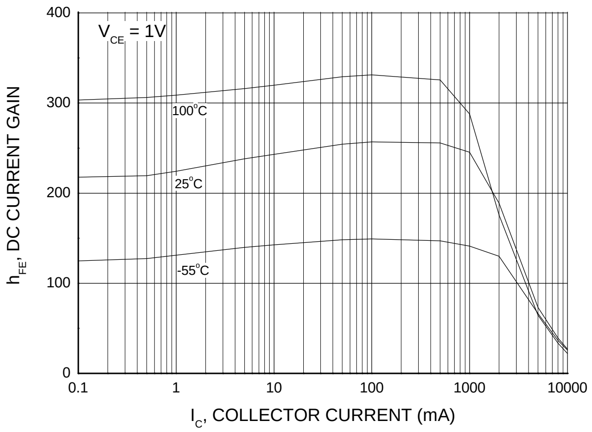
Derating Curve

Electrical Characteristics (@T_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 9)	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 @T_J = +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}	200	400	—	—	I_C = 500mA, V_{CE} = 2V
		200	330	—		I_C = 1A, V_{CE} = 2V
		100	180	—		I_C = 2A, V_{CE} = 2V
		50	100	—		I_C = 3A, V_{CE} = 2V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	70	120	mV	I_C = 1A, I_B = 50mA
		—	180	270	mV	I_C = 3A, I_B = 300mA
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	—	60	90	mΩ	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	0.86	1.0	V	I_C = 1A, I_B = 100mA
		—	1.0	1.2		I_C = 2A, I_B = 200mA
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	—	0.65	0.85	V	I_C = 0.1A, V_{CE} = 2V
SMALL SIGNAL CHARACTERISTICS						
Current Gain-Bandwidth Product	f_T	—	140	—	MHz	V_{CE} = 10V, I_C = 100mA, f = 10MHz
Output Capacitance	C_{obo}	—	17	—	pF	V_{CB} = 10V, f = 1MHz
Delay Time	t_d	—	15	—	ns	V_{CC} = 12.5V, I_C = 1A I_{B1} = $-I_{B2}$ = 0.05A
Rise Time	t_r	—	120	—	ns	
Turn-On Time	$t_{(on)}$	—	135	—	ns	
Storage Time	t_s	—	800	—	ns	
Fall Time	t_f	—	300	—	ns	
Turn-Off Time	$t_{(off)}$	—	1100	—	ns	

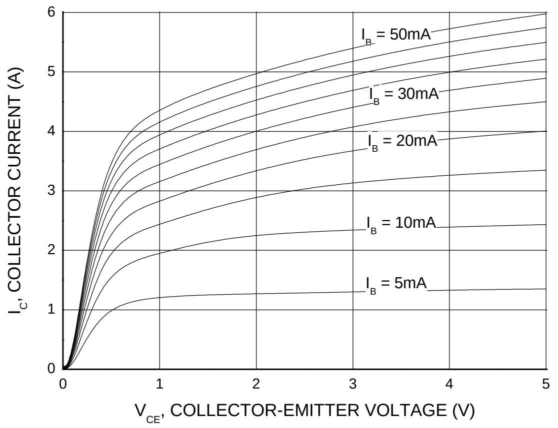
Note: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

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

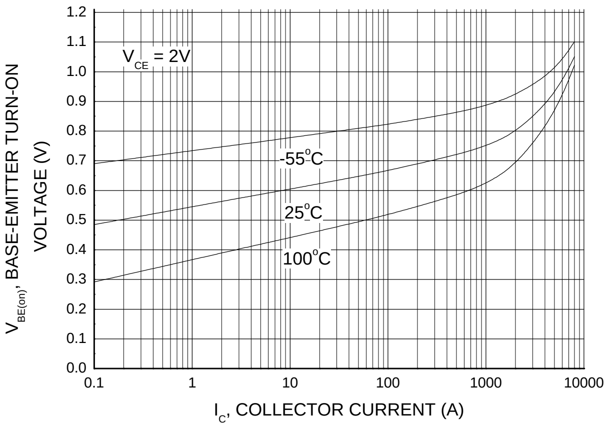


Typical DC Current vs Collector Current

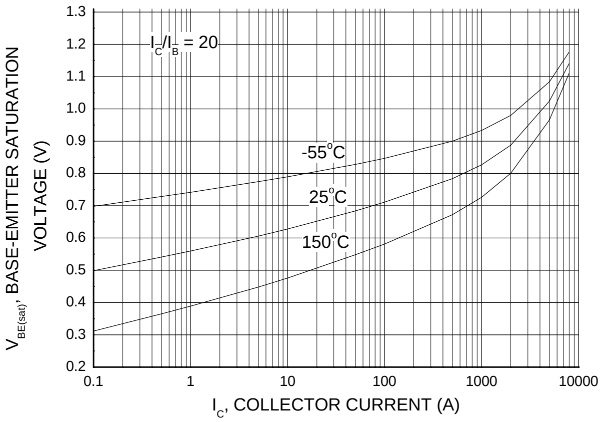
Typical DC Current Gain vs Collector Current



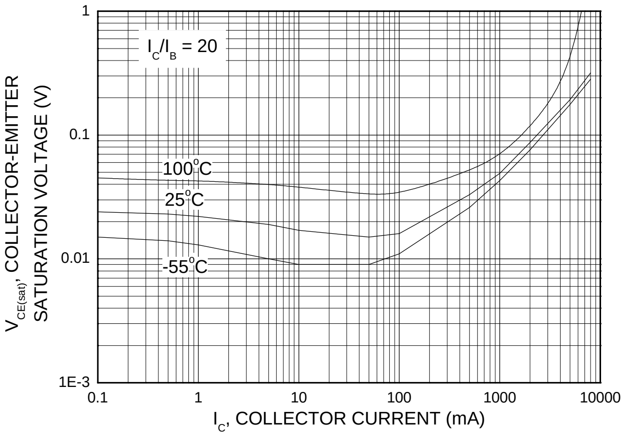
Typical Collector Current vs Collector-Emitter Voltage



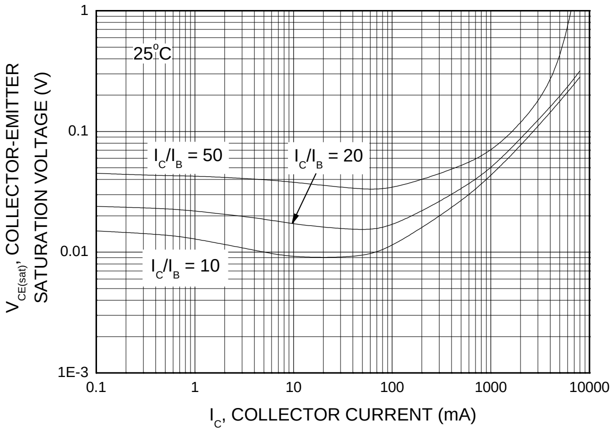
Typical Base-Emitter Turn-On Voltage vs Collector Current



Typical Base-Emitter Saturation Voltage vs Collector Current



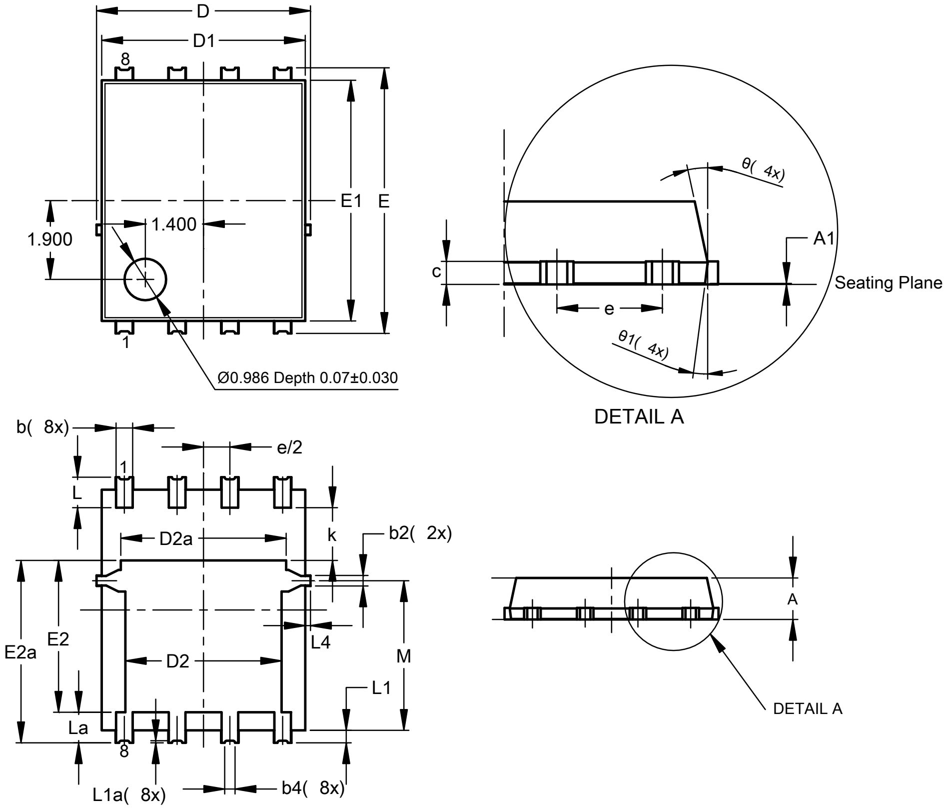
Typical Collector-Emitter Saturation Voltage vs Collector Current



Typical Collector-Emitter Saturation Voltage vc Collector Current

Package Outline Dimensions

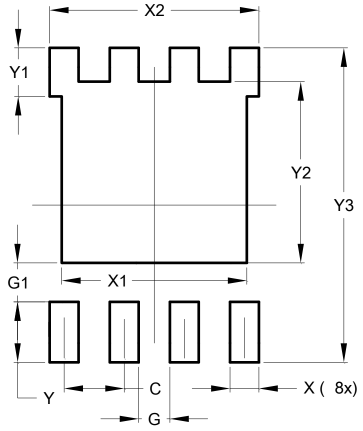
PowerDI5060-8 (SWP) (Type Q)



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

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