



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



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Features

- $BV_{CEO} > -60V$
- $I_C = -3A$ Continuous Collector Current
- $I_{CM} = -8A$ Peak Pulse Current
- $R_{CE(SAT)} < 120\ m\Omega$
- Rated to +175°C—Ideal for High Ambient Temperature Environments
- Complementary Part DXTN3C60PS
- Meets Stringent Requirements of Automotive Applications
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

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 **Ⓔ3**
- Weight: 0.097 grams (Approximate)

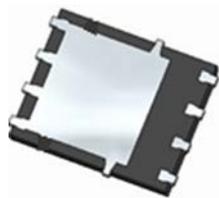
Applications

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

PowerDI5060-8

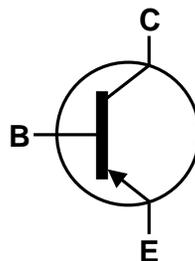


Top View

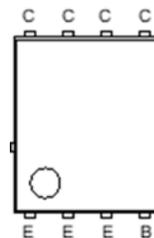


Bottom View

Pin1



Internal Schematic



Top View
Pin Configuration

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	-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.)

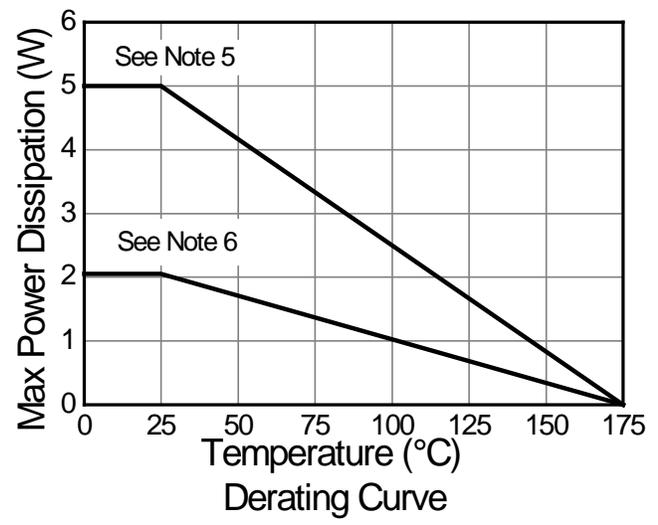
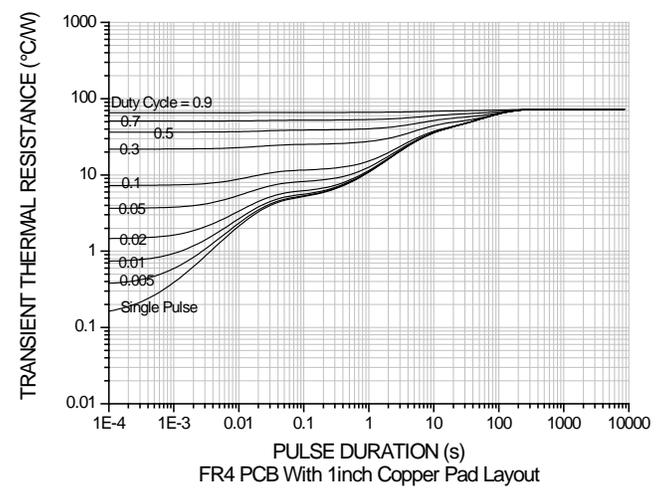
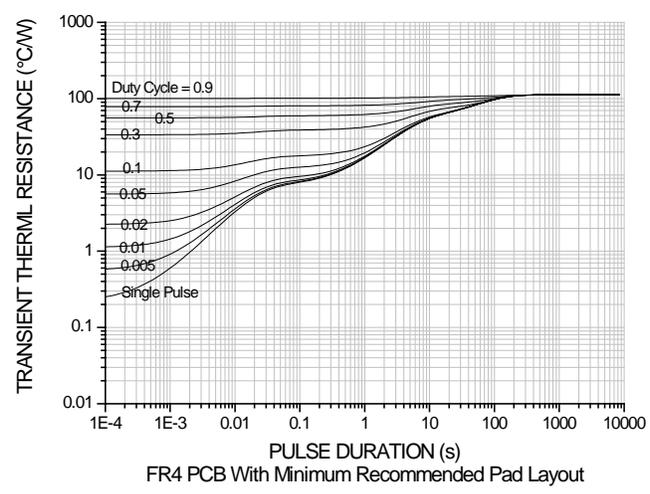
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	5	W
Thermal Resistance, Junction to Ambient	R _{θJA}	40	°C/W
Thermal Resistance, Junction to Case	R _{θJC}	120	°C/W
		2	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +175	°C

ESD Ratings (Note 8)

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

- Notes:
5. For a device mounted with the collector lead on 25mm × 25mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; the device is measured under still air conditions whilst operating in a steady-state.
 6. Same as Note 6 except mounted on minimum recommended pad layout.
 7. Thermal resistance from junction to the top of the case.
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

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

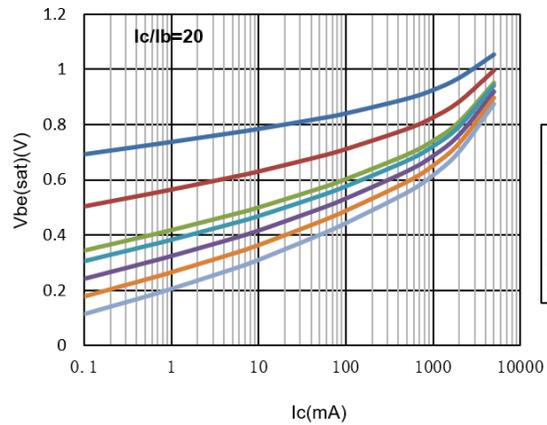
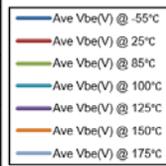
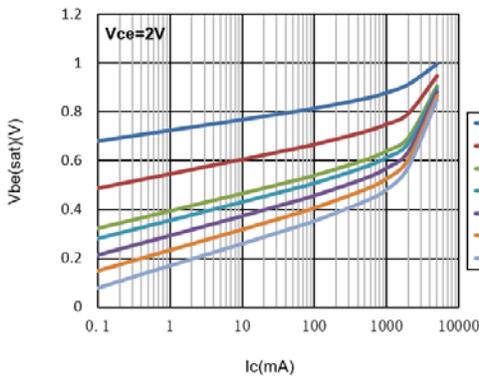
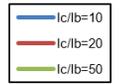
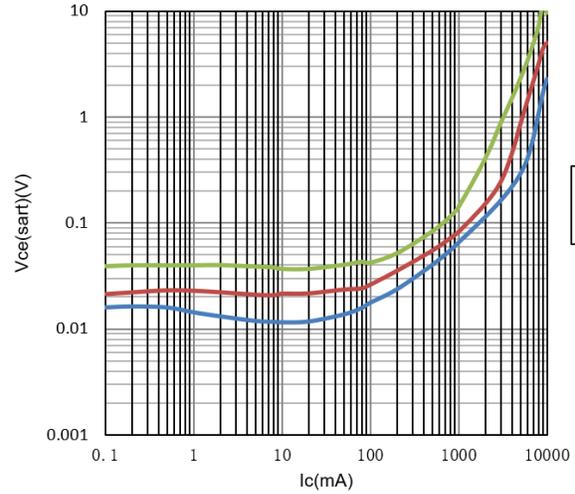
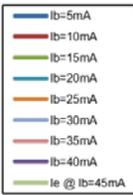
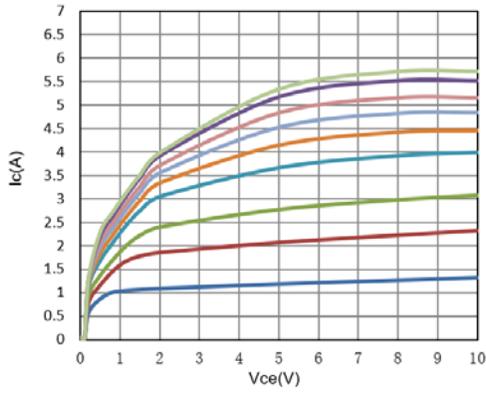
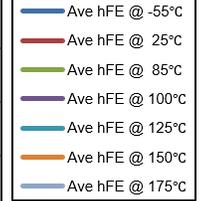
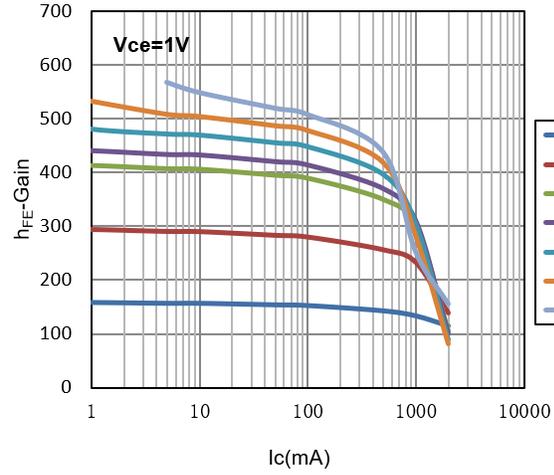
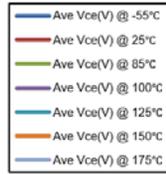
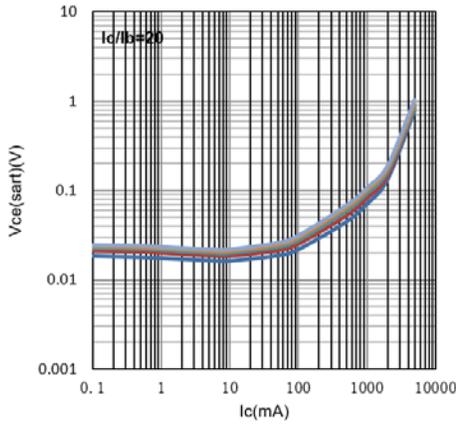


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV _{CEO}	-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}	—	-2.5	100	nA	V _{CES} = -48V, T _A = +25°C
		—	-2.4	—		V _{CES} = -14V, T _A = +40°C
		—	-50	—		V _{CES} = -14V, T _A = +105°C
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	—	135	—	MHz	V _{CE} = -10V, I _C = -100mA, 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	

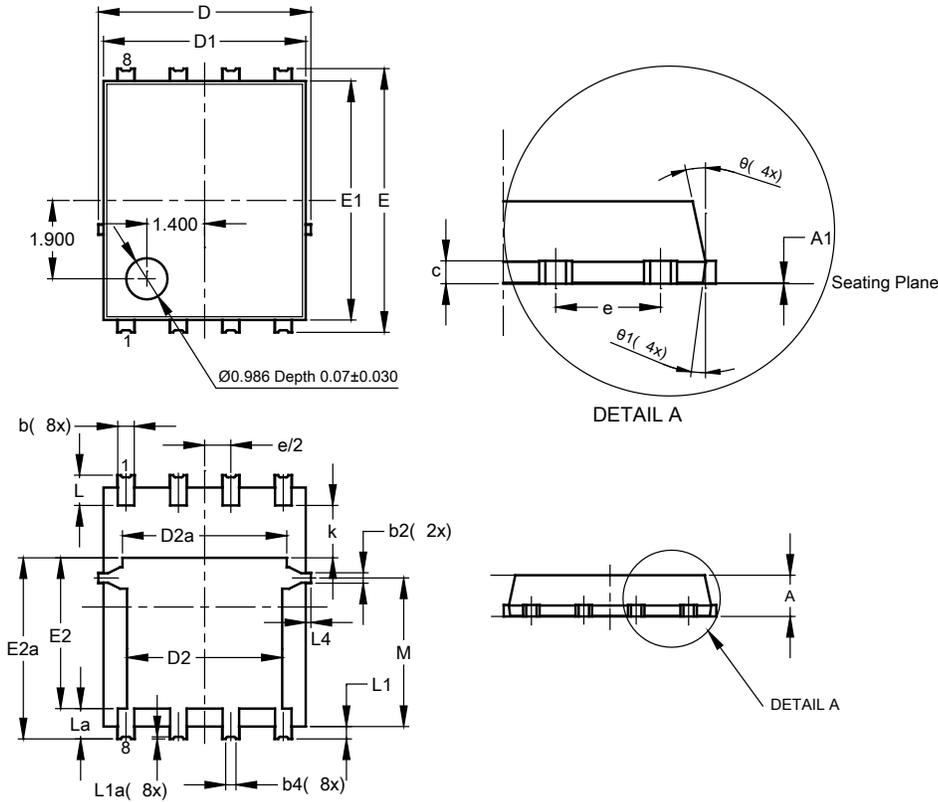
Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

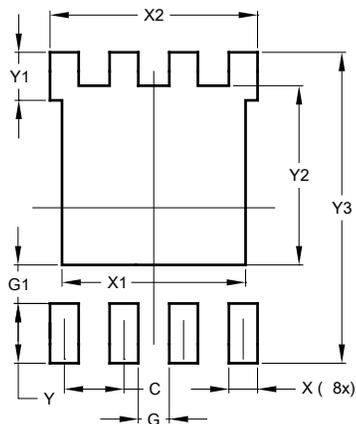
PowerDI5060-8 (SWP) (Type Q)



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