



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

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON) Max}$	$I_{D Max}$ $T_A = +25^{\circ}C$
30V	18m Ω @ $V_{GS} = 10V$	7.5A
	28m Ω @ $V_{GS} = 4.5V$	6.1A

Description

This MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

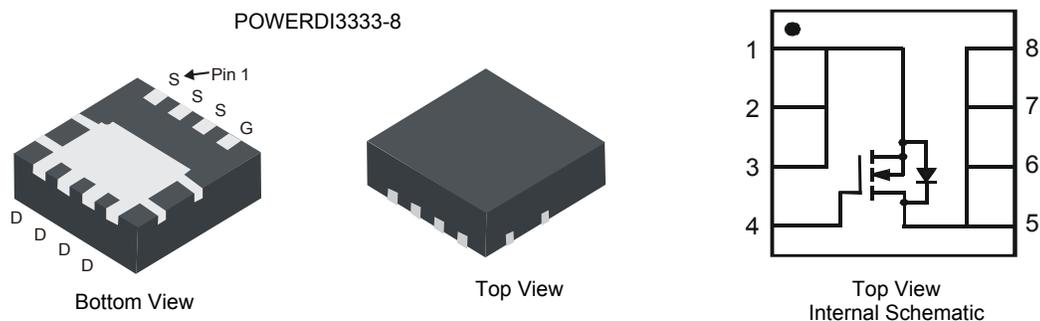
- Backlighting
- Power Management Functions
- DC-DC Converters

Features

- Low $R_{DS(ON)}$ – ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- Occupies just 33% of the board area occupied by SO-8 enabling smaller end product
- 100% Unclamped Inductive Switch (UIS) test in production

Mechanical Data

- Case: POWERDI3333-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 $\text{\textcircled{E3}}$
- Weight: 0.072 grams (approximate)



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

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V _{DSS}	30	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Note 5) V _{GS} = 10V	I _D	T _A = +25°C	7.5
		T _A = +70°C	6.1
	I _D	T _A = +25°C	10
		T _A = +70°C	7.8
Maximum Continuous Body Diode Forward Current (Note 5)	I _S	2.5	A
Pulsed Drain Current (10μs pulse, duty cycle = 1%)	I _{DM}	60	A
Avalanche Current (Note 6) L = 0.1mH	I _{AR}	14	A
Avalanche Energy (Note 6) L = 0.1mH	E _{AR}	10	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P _D	T _A = +25°C	2.0
		T _A = +70°C	1.3
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	Steady State	61
		t < 10s	37
Thermal Resistance, Junction to Case	R _{θJC}	6.4	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±1	μA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	0.8	—	2.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	14	18	mΩ	V _{GS} = 10V, I _D = 7.8A
		—	23	28		V _{GS} = 4.5V, I _D = 7.0A
Forward Transfer Admittance	Y _{fs}	—	9	-	S	V _{DS} = 10V, I _D = 7.8A
Diode Forward Voltage	V _{SD}	—	0.70	1.0	V	V _{GS} = 0V, I _S = 6.3A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	605	—	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	74	—		
Reverse Transfer Capacitance	C _{rss}	—	58	—		
Gate resistance	R _g	—	1.5	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	5.3	—	nC	V _{DS} = 15V, I _D = 7.8A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	11.6	—		
Gate-Source Charge	Q _{gs}	—	2	—		
Gate-Drain Charge	Q _{gd}	—	2.4	—		
Turn-On Delay Time	t _{D(on)}	—	3.8	—	ns	V _{DD} = 15V, V _{GS} = 4.5V, R _L = 2.4Ω, R _G = 1Ω,
Turn-On Rise Time	t _r	—	4.1	—		
Turn-Off Delay Time	t _{D(off)}	—	17.9	—		
Turn-Off Fall Time	t _f	—	4.7	—		
Reverse Recovery Time	t _{rr}	—	5.5	—	ns	I _F = 12A, di/dt = 500A/μs
Reverse Recovery Charge	Q _{rr}	—	2.6	—	nC	

- Notes:
5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 6. I_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep T_J = +25°C
 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to product testing.

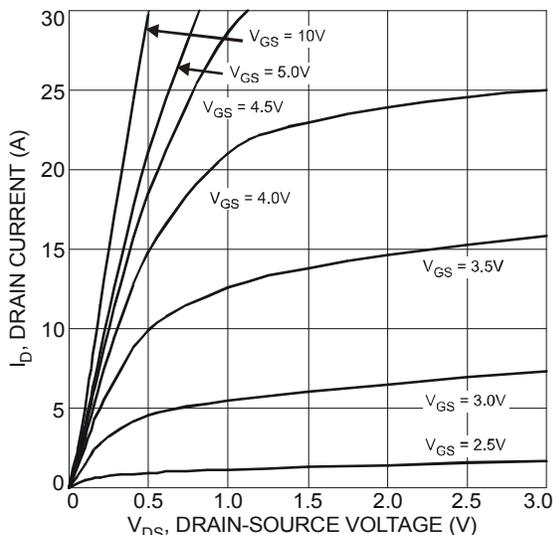


Figure 1 Typical Output Characteristic

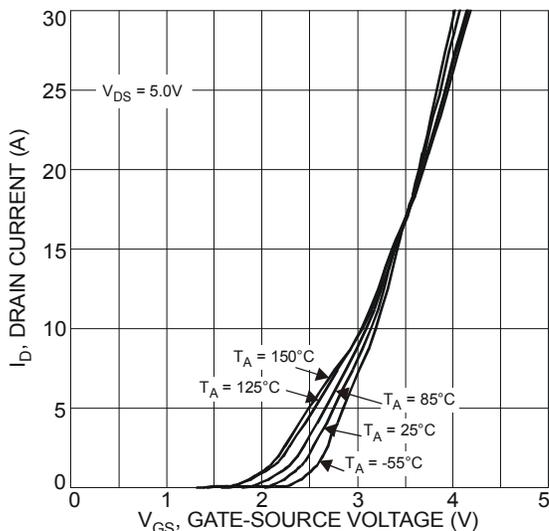


Figure 2 Typical Transfer Characteristics

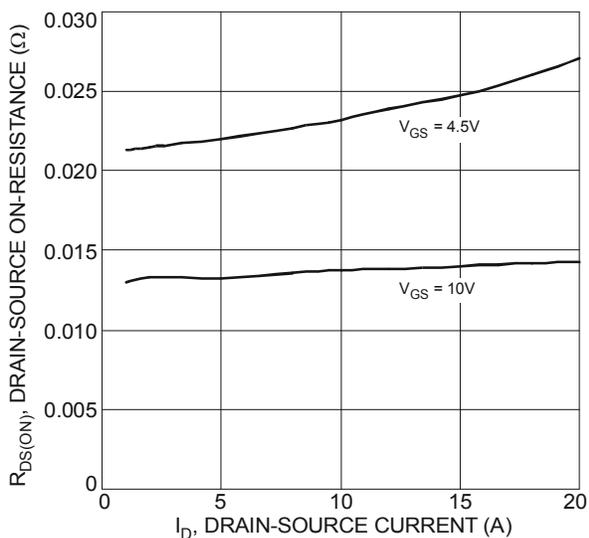


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

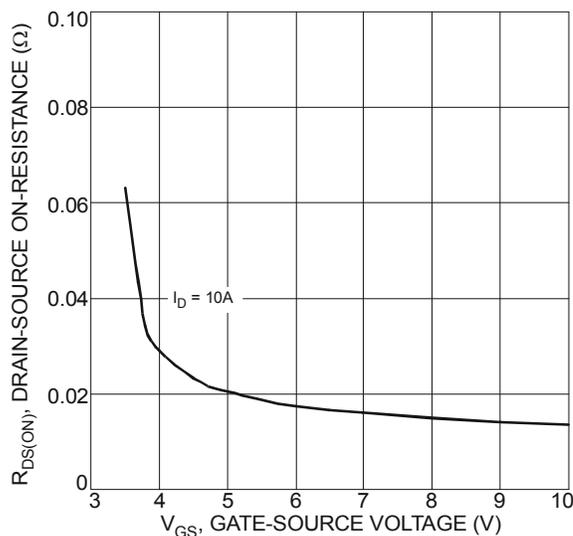


Figure 4 Typical On-Resistance vs. Drain Current and Gate Voltage

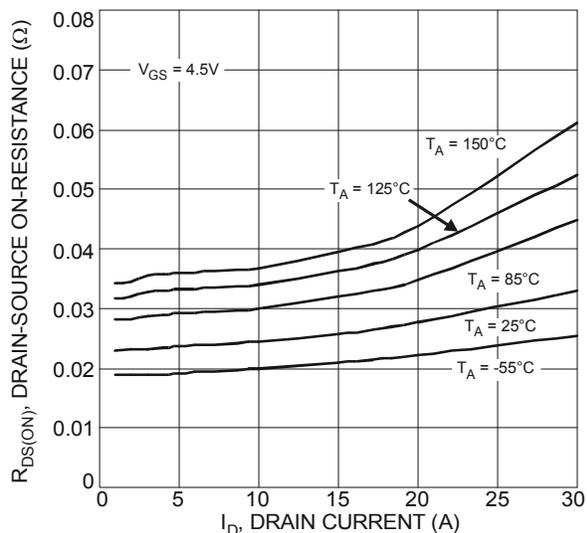


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

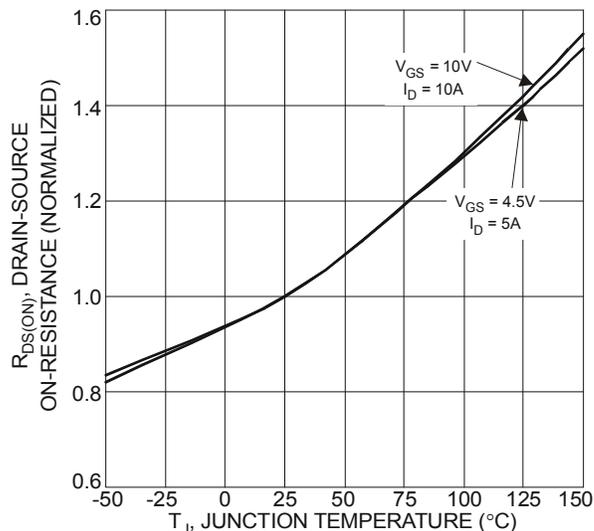


Figure 6 On-Resistance Variation with Temperature

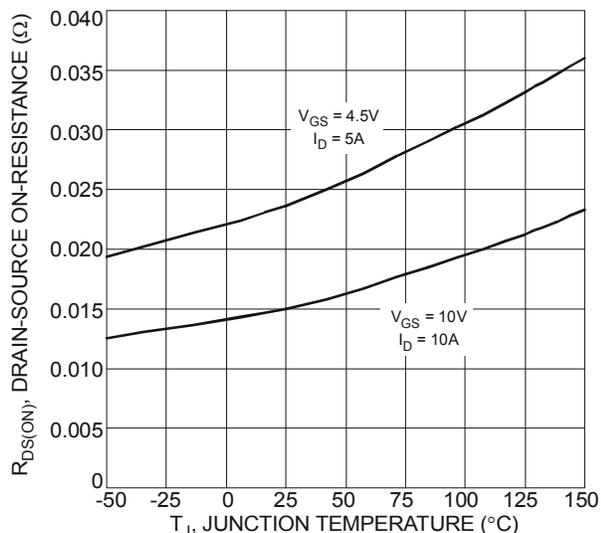


Figure 7 On-Resistance Variation with Temperature

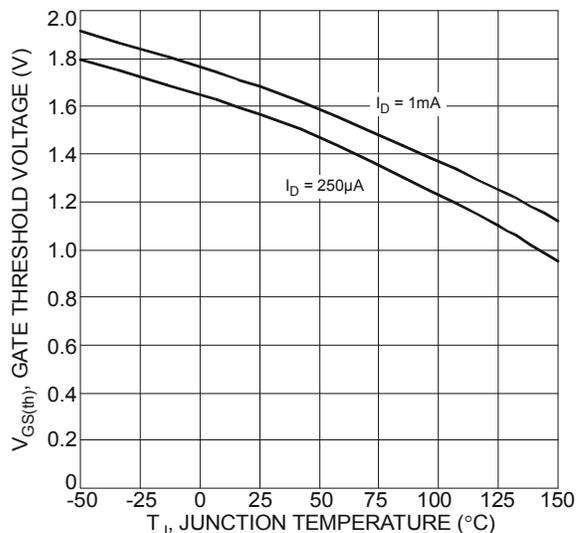


Figure 8 Gate Threshold Variation vs. Ambient Temperature

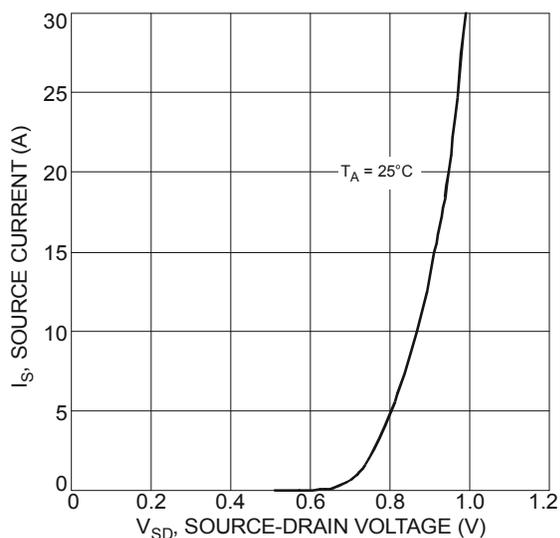


Figure 9 Diode Forward Voltage vs. Current

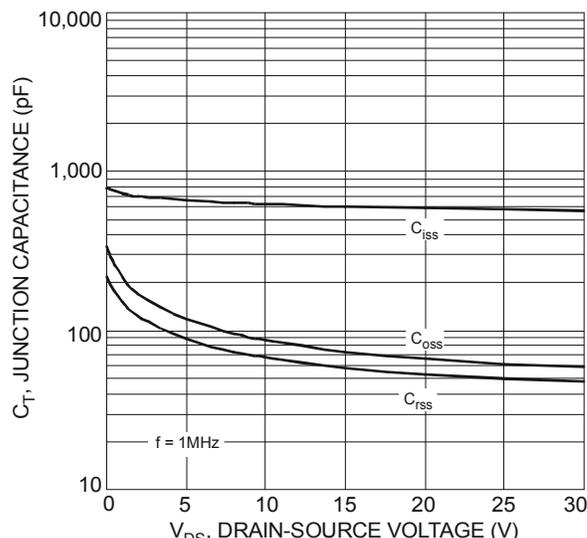


Figure 10 Typical Junction Capacitance

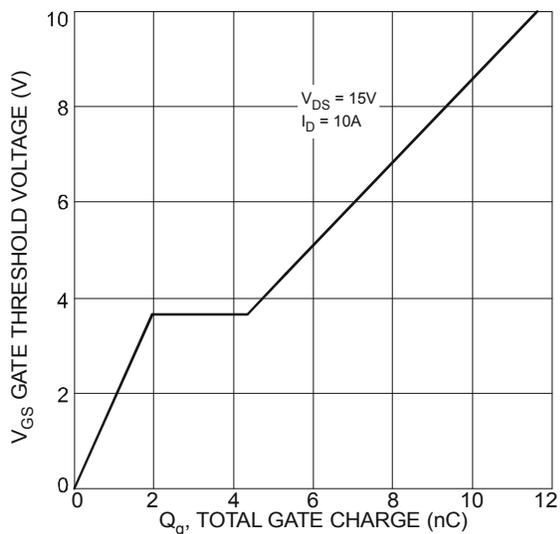


Figure 11 Gate Charge

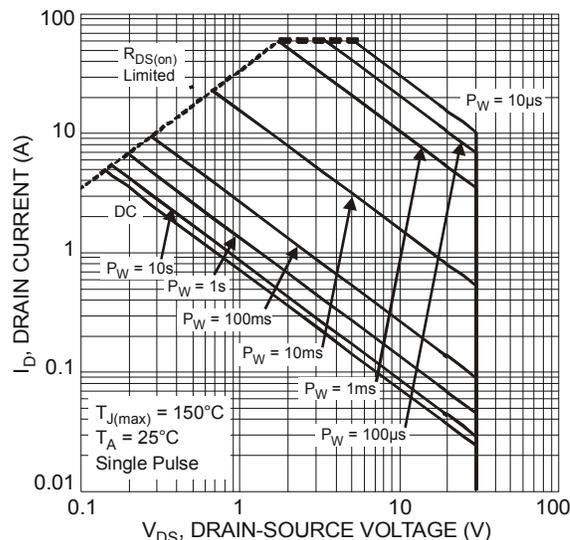


Figure 12 SOA, Safe Operation Area

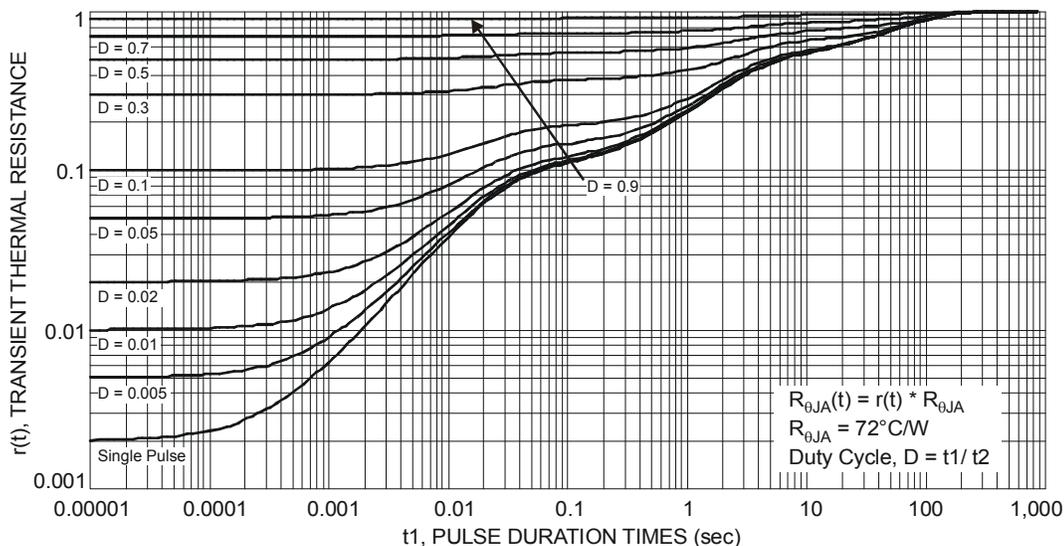
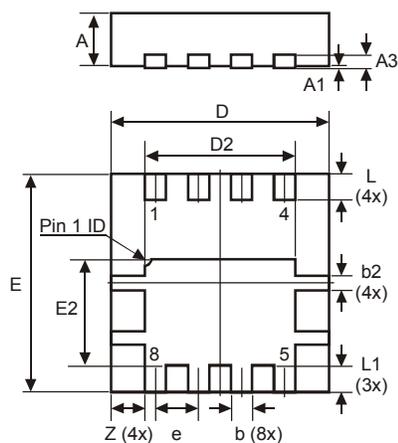


Figure 13 Transient Thermal Resistance

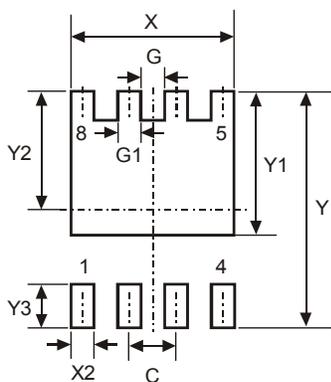
Package Outline Dimensions



POWERDI3333-8			
Dim	Min	Max	Typ
D	3.25	3.35	3.30
E	3.25	3.35	3.30
D2	2.22	2.32	2.27
E2	1.56	1.66	1.61
A	0.75	0.85	0.80
A1	0	0.05	0.02
A3	-	-	0.203
b	0.27	0.37	0.32
b2	-	-	0.20
L	0.35	0.45	0.40
L1	-	-	0.39
e	-	-	0.65
Z	-	-	0.515

All Dimensions in mm

Suggested Pad Layout



Dimensions	Value (in mm)
C	0.650
G	0.230
G1	0.420
Y	3.700
Y1	2.250
Y2	1.850
Y3	0.700
X	2.370
X2	0.420