

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 6) V _{GS} = 10V	T _C = +25°C T _C = +70°C	I _D	100 90	A
Continuous Drain Current (Note 5) V _{GS} = 10V	T _A = +25°C T _A = +70°C	I _D	22 18	A
Maximum Continuous Body Diode Forward Current (Note 5)		I _S	3	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)		I _{DM}	100	A
Avalanche Current, L=1mH		I _{AS}	16	A
Avalanche Energy, L=1mH		E _{AS}	250	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5) T _A = +25°C	P _D	2.4	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	52	°C/W
Total Power Dissipation (Note 5) T _C = +25°C	P _D	62	W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	2	°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 = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 24V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = +20V, V _{DS} = 0V V _{GS} = -16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	2.4	3.2	mΩ	V _{GS} = 10V, I _D = 20A
		—	4	5.5		V _{GS} = 4.5V, I _D = 15A
Diode Forward Voltage	V _{SD}	—	0.75	1	V	V _{GS} = 0V, I _S = 10A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{ISS}	—	2,370	—	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{OSS}	—	1,360	—		
Reverse Transfer Capacitance	C _{RSS}	—	240	—		
Gate Resistance	R _G	—	0.6	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _G	—	20	—	nC	V _{DS} = 15V, I _D = 20A
Total Gate Charge (V _{GS} = 10V)	Q _G	—	44	—		
Gate-Source Charge	Q _{GS}	—	7	—		
Gate-Drain Charge	Q _{GD}	—	8	—		
Turn-On Delay Time	t _{D(ON)}	—	6.2	—	ns	V _{DD} = 15V, V _{GS} = 10V, R _L = 0.75Ω, R _G = 3Ω, I _D = 20A
Turn-On Rise Time	t _R	—	4.3	—		
Turn-Off Delay Time	t _{D(OFF)}	—	21	—		
Turn-Off Fall Time	t _F	—	8	—		
Body Diode Reverse Recovery Time	t _{RR}	—	25	—	ns	I _F = 15A, di/dt = 500A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	37	—	nC	

- Notes:
5. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
 6. Thermal resistance from junction to soldering point (on the exposed drain pad).
 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to product testing.

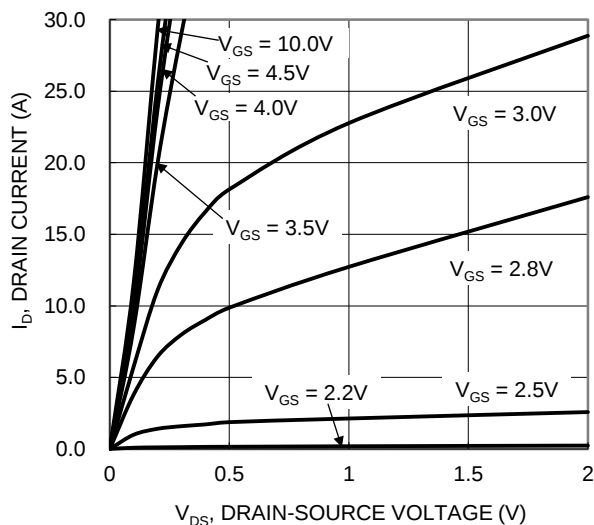


Figure 1. Typical Output Characteristic

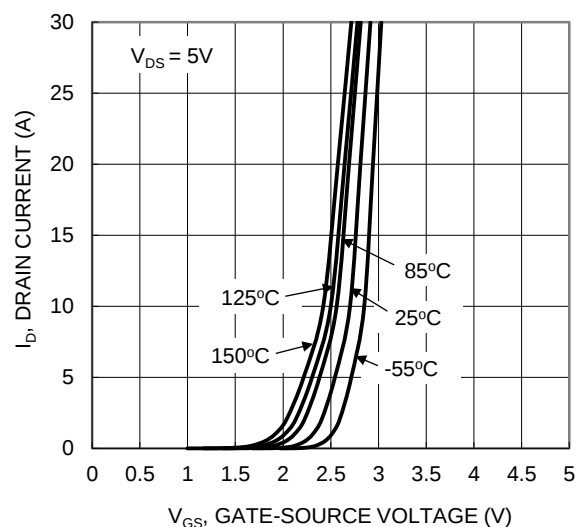


Figure 2. Typical Transfer Characteristic

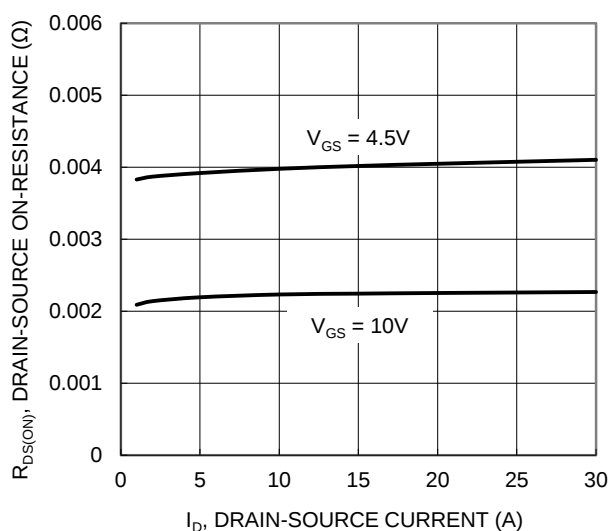


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

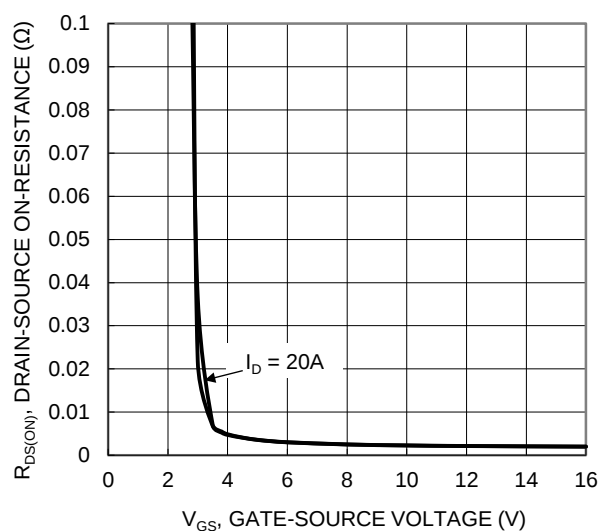


Figure 4. Typical Transfer Characteristic

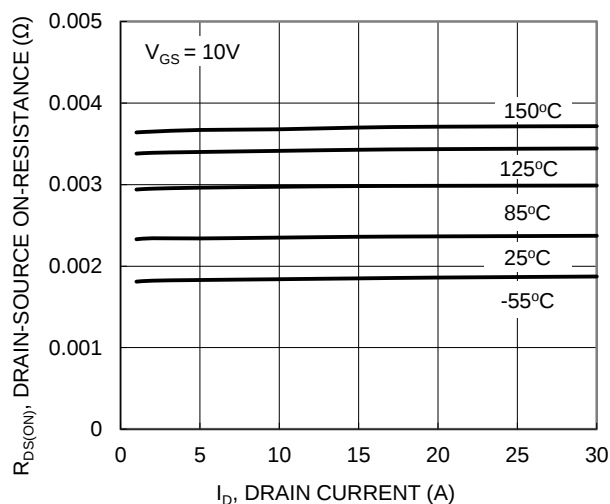


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

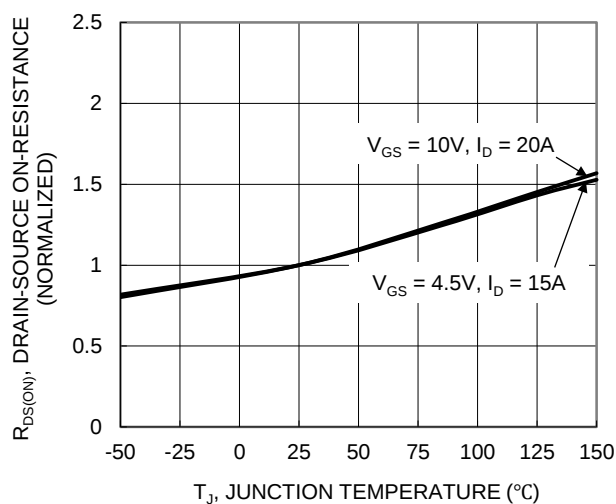


Figure 6. On-Resistance Variation with Junction Temperature

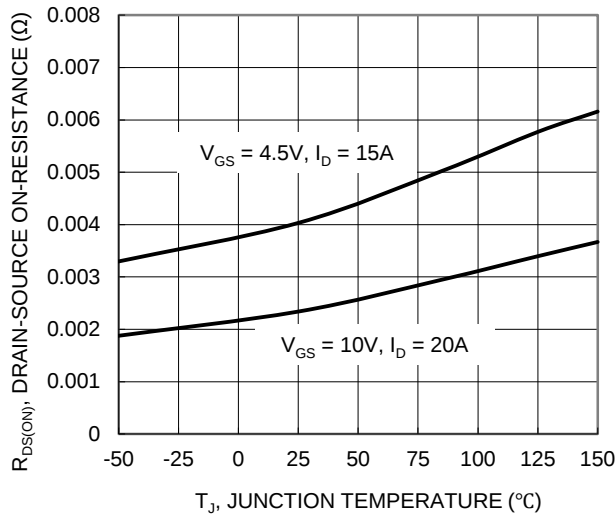


Figure 7. On-Resistance Variation with Junction Temperature

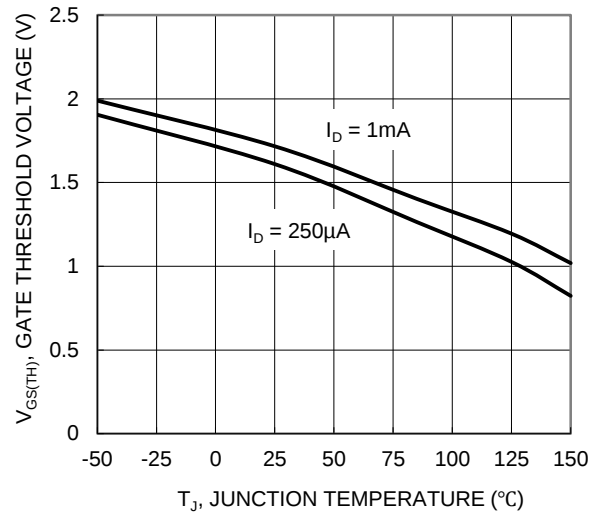


Figure 8. Gate Threshold Variation vs. Junction Temperature

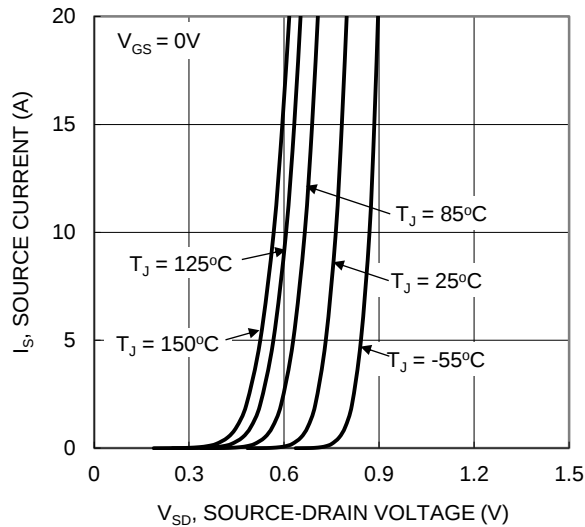


Figure 9. Diode Forward Voltage vs. Current

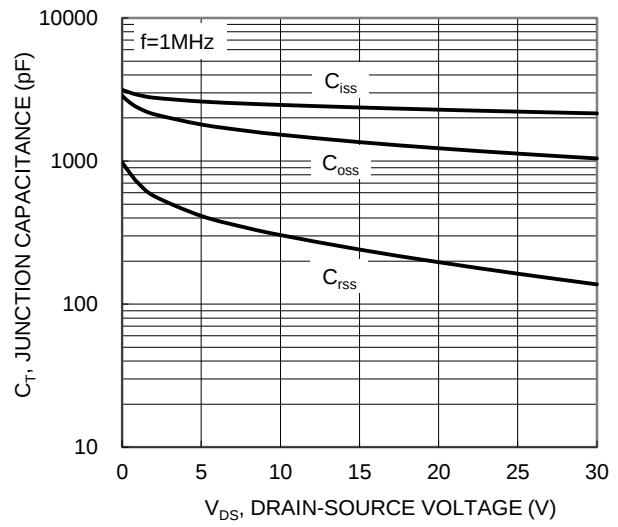


Figure 10. Typical Junction Capacitance

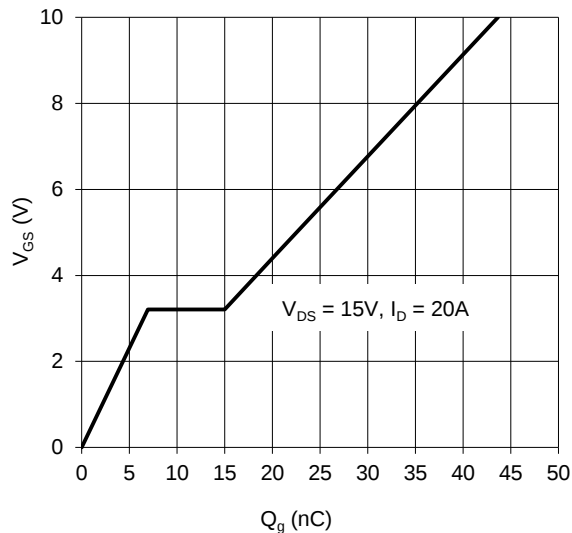


Figure 11. Gate Charge

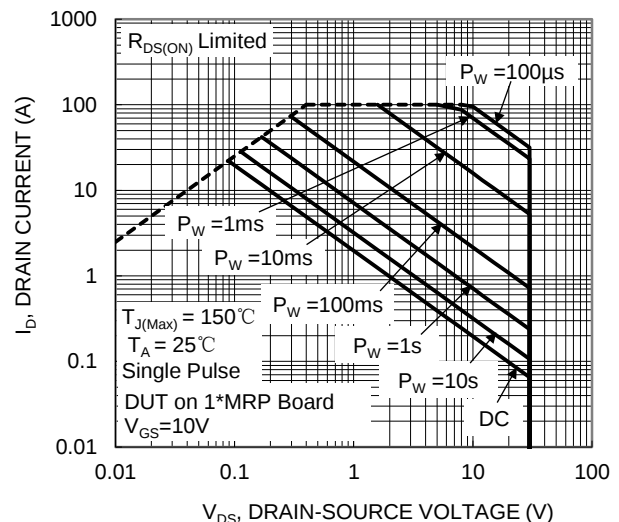


Figure 12. SOA, Safe Operation Area

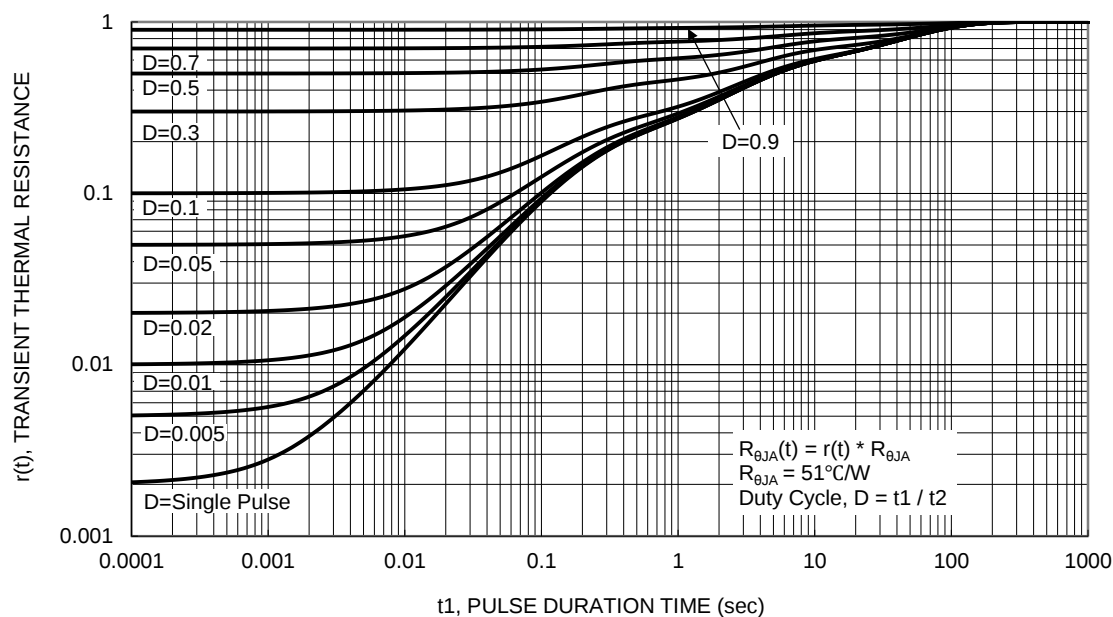
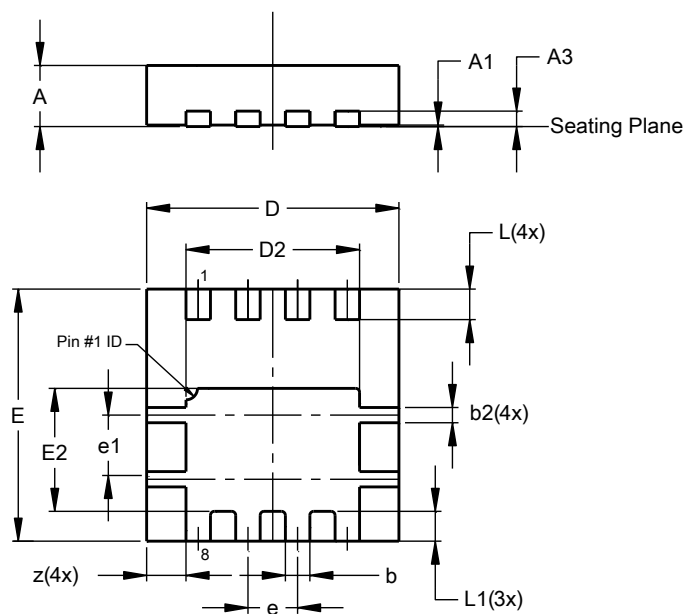


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI3333-8

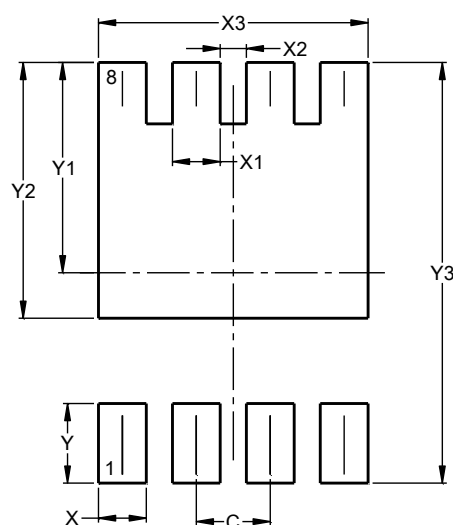


PowerDI3333-8			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	—	—	0.203
b	0.27	0.37	0.32
b2	—	—	0.20
D	3.25	3.35	3.30
D2	2.22	2.32	2.27
E	3.25	3.35	3.30
E2	1.56	1.66	1.61
e	—	—	0.65
e1	0.79	0.89	0.84
L	0.35	0.45	0.40
L1	—	—	0.39
z	—	—	0.515
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI3333-8



Dimensions	Value (in mm)
C	0.650
X	0.420
X1	0.420
X2	0.230
X3	2.370
Y	0.700
Y1	1.850
Y2	2.250
Y3	3.700

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