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

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current V_{GS} = 10V	T_A = +25°C T_A = +70°C	I_D	12 10	A
	T_C = +25°C T_C = +70°C	I_D	50 37	A
Maximum Continuous Body Diode Forward Current (Note 5)		I_S	3	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I_{DM}	90	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)		I_{SM}	90	A
Avalanche Current, L = 0.1mH		I_{AS}	19	A
Avalanche Energy, L = 0.1mH		E_{AS}	19	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	2.3	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	55	°C/W
Total Power Dissipation (Note 8)	T_C = +25°C	P_D	35.7	W
Thermal Resistance, Junction to Case (Note 8)	Steady State	$R_{\theta JC}$	3.5	°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 6)						
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} = 24V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±100	nA	V_{GS} = ±16V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	-	3	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	6.6	11	mΩ	V_{GS} = 10V, I_D = 14.4A
		-	10.5	13		V_{GS} = 4.5V, I_D = 7A
		-	13.4	20		V_{GS} = 3.8V, I_D = 5A
Diode Forward Voltage	V_{SD}	-	0.8	1.2	V	V_{GS} = 0V, I_S = 10A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	-	823	-	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	352	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	52	-	pF	
Gate Resistance	R_g	-	1.2	-	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	-	5.8	-	nC	V_{DS} = 15V, I_D = 14.4A
Total Gate Charge (V_{GS} = 10V)	Q_g	-	12	-	nC	
Gate-Source Charge	Q_{gs}	-	1.7	-	nC	
Gate-Drain Charge	Q_{gd}	-	2.4	-	nC	
Turn-On Delay Time	$t_{D(ON)}$	-	3.2	-	ns	V_{GS} = 10V, V_{DD} = 15V, R_G = 1Ω, I_D = 10A
Turn-On Rise Time	t_R	-	5.2	-	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	-	8.9	-	ns	
Turn-Off Fall Time	t_F	-	1.5	-	ns	
Body Diode Reverse Recovery Time	t_{RR}	-	16.4	-	ns	I_F = 10A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{RR}	-	5.9	-	nC	

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

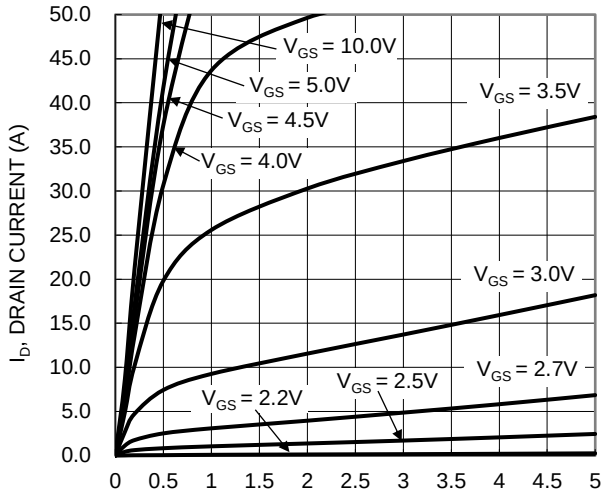

Figure 1.Typical Output Characteristic

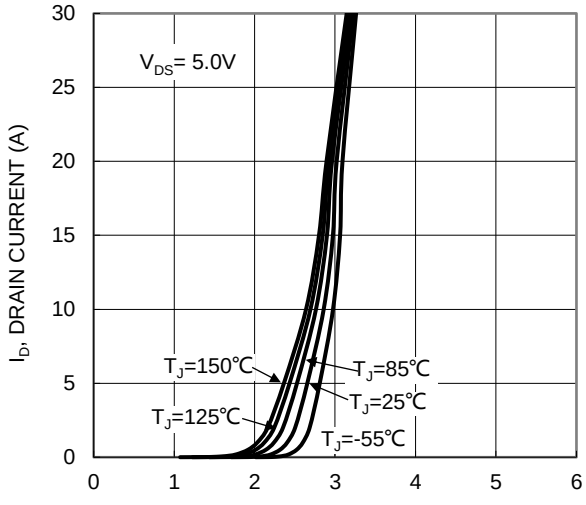

Figure 2. Typical Transfer Characteristic

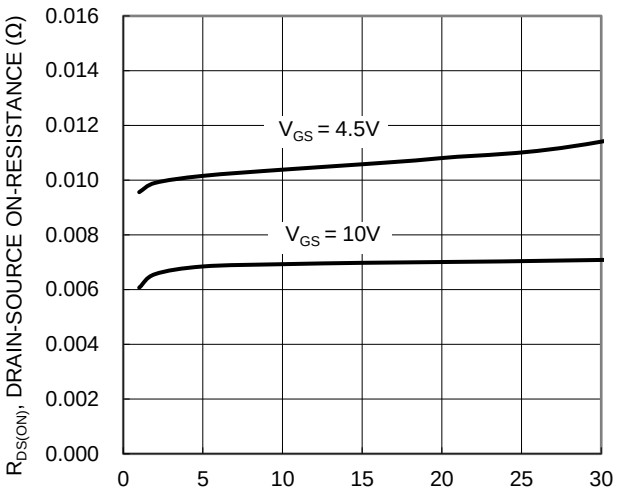

Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

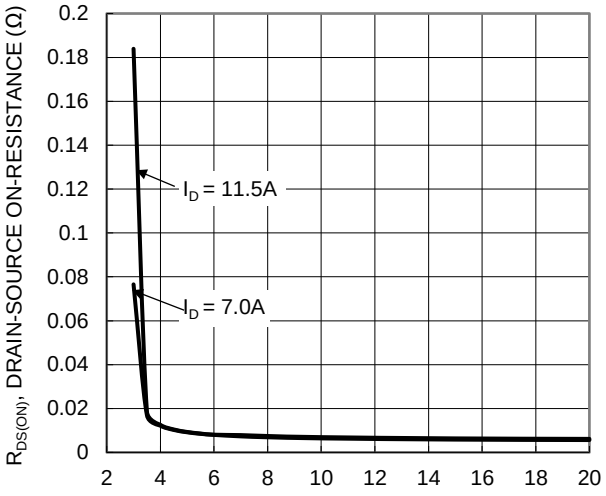

Figure 4. Typical Transfer Characteristic

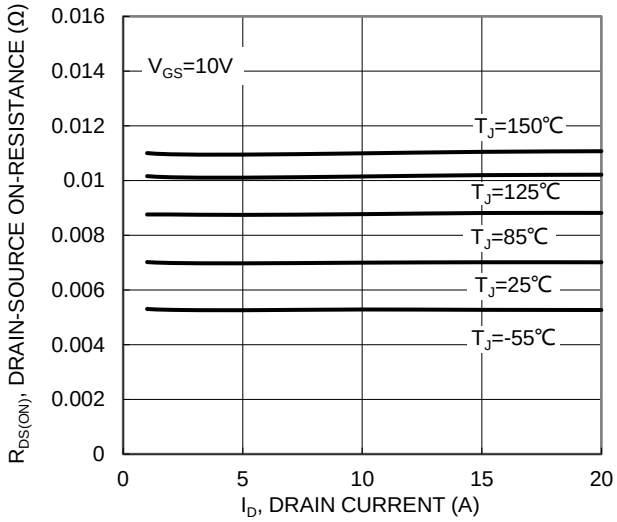

Figure 5. Typical On-Resistance vs. Drain Current and Temperature

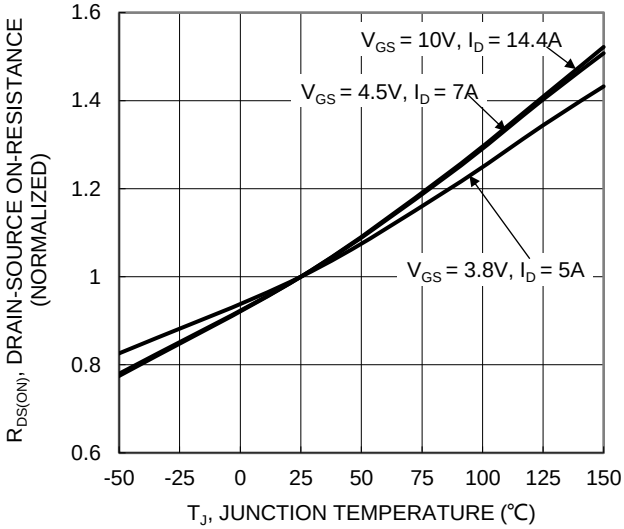

Figure 6. On-Resistance Variation with Temperature

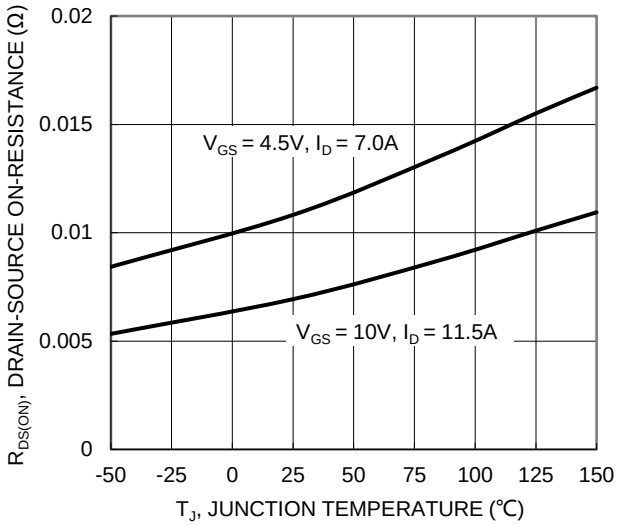

Figure 7. On-Resistance Variation with Temperature

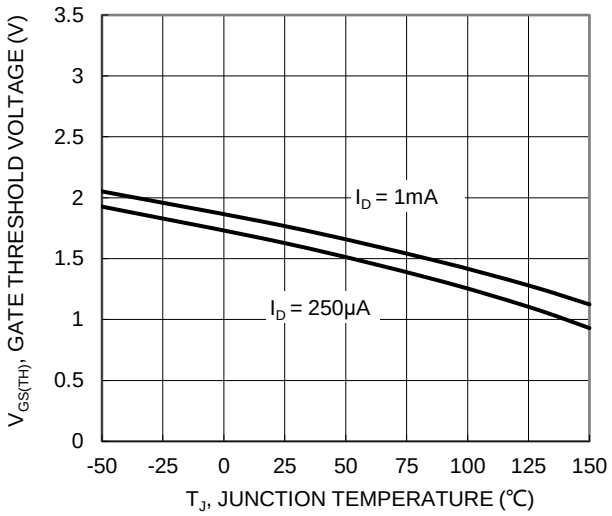

Figure 8. Gate Threshold Variation vs Junction Temperature

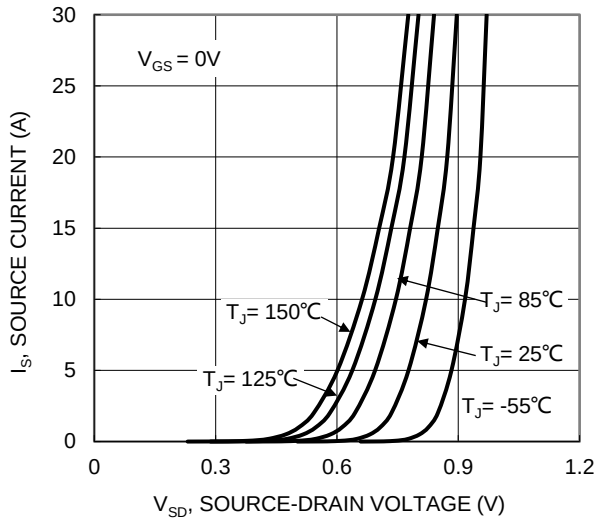

Figure 9. Diode Forward Voltage vs. Current

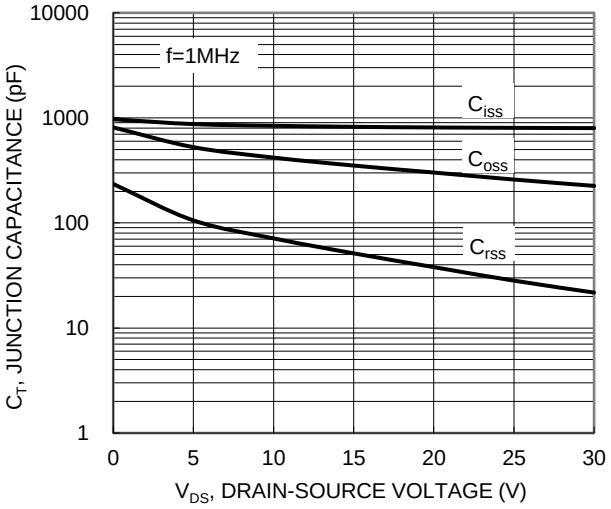

Figure 10. Typical Junction Capacitance

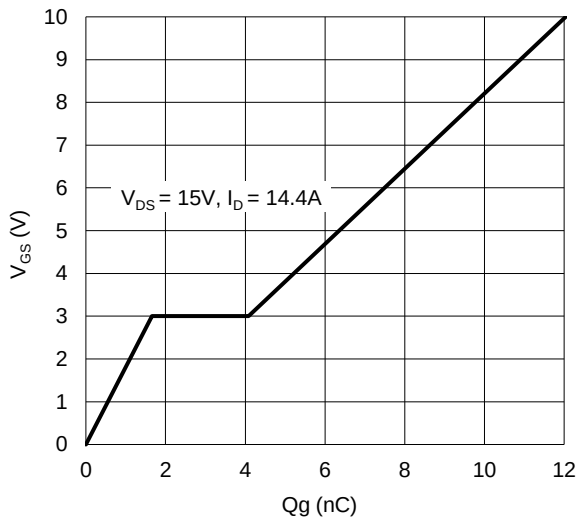

Figure 11. Gate Charge

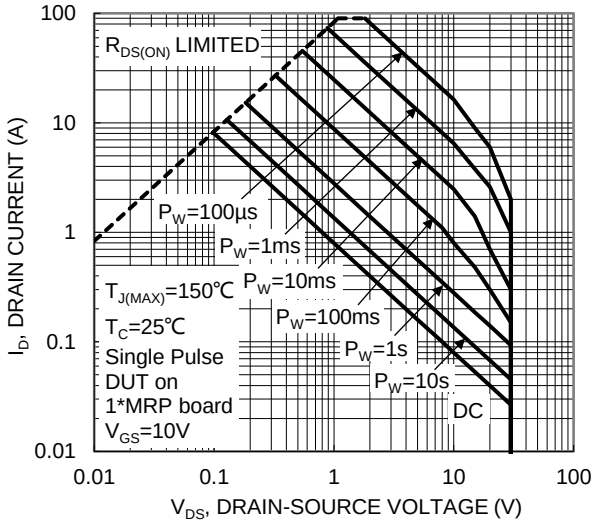

Figure 12. SOA, Safe Operation Area

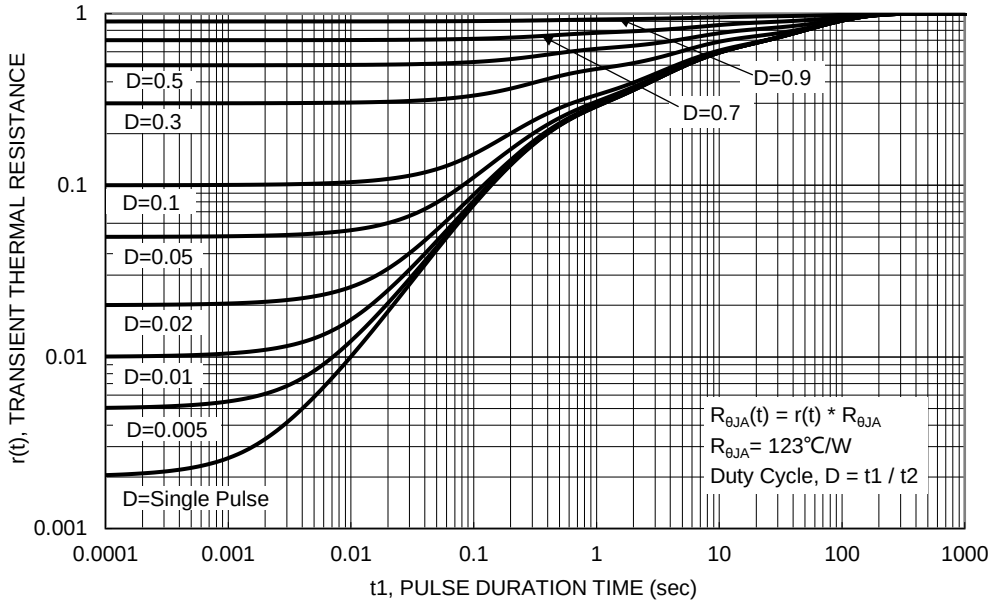

Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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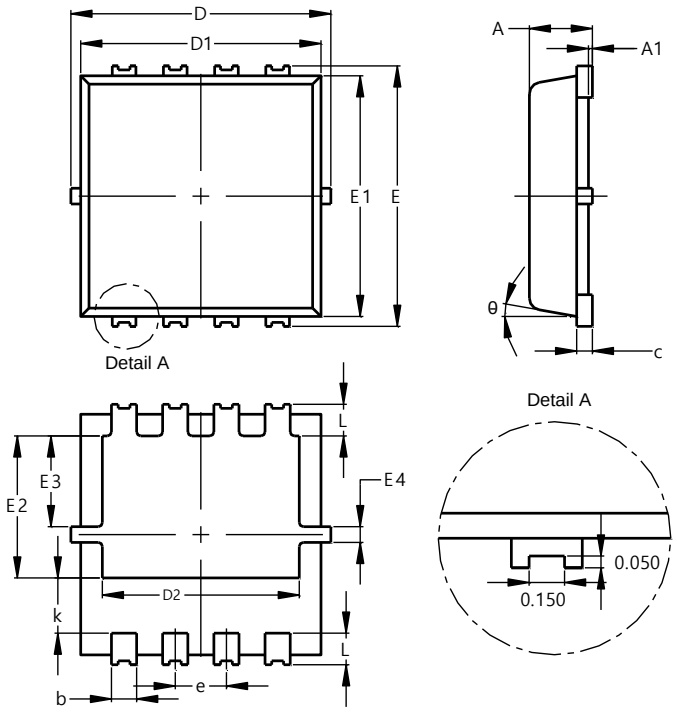
PowerDI3333-8 (SWP) (Type UX)

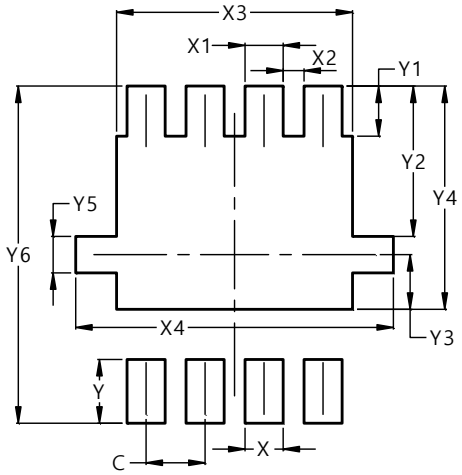


PowerDI3333-8 (SWP) (Type UX)			
Dim	**Min**	**Max**	**Typ**
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	–	–	0.65
k	0.50	0.90	0.70
L	0.30	0.50	0.40
θ	0°	12°	10°
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI3333-8 (SWP) (Type UX)



Dimensions	Value (in mm)
C	0.650
X	0.420
X1	0.420
X2	0.230
X3	2.600
X4	3.500
Y	0.700
Y1	0.550
Y2	1.650
Y3	0.600
Y4	2.450
Y5	0.400
Y6	3.700

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