N-CHANNEL ENHANCEMENT MODE MOSFET
POWERDI®

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max T_A = 25°C
30V	11mΩ @ V_{GS} = 10V	10.5A
	15mΩ @ V_{GS} = 4.5V	9.2A

Features and Benefits

- 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
- **" Green" component and RoHS compliant (Note 1)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Description and Applications

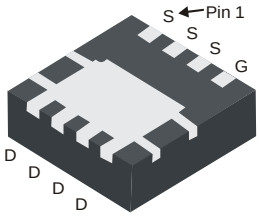
This MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Backlighting
- Power Management Functions
- DC-DC Converters

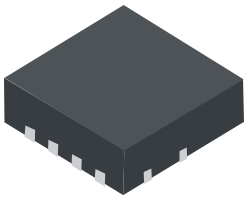
Mechanical Data

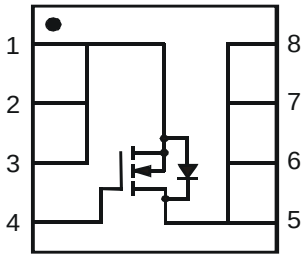
- Case: POWERDI®3333-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.072 grams (approximate)

POWERDI®3333-8



Bottom View


Top View



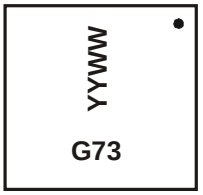
Top View
Internal Schematic

Ordering Information (Note 2)

Part Number	Case	Packaging
DMG7430LFG-7	POWERDI®3333-8	2000/Tape & Reel
DMG7430LFG-13	POWERDI®3333-8	3000/Tape & Reel

Notes: 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2). All applicable RoHS exemptions applied.
2. For packaging details, go to our website at http://www.diodes.com.

Marking Information



G73 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last digit of year (ex: 11 = 2011)
WW = Week code (01 ~ 53)

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 4) V_{GS} = 10V	Steady State	T_A = 25°C T_A = 70°C	I_D	10.5 8.5	A
	t<10s	T_A = 25°C T_A = 70°C	I_D	14 11	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	90	A
Maximum Continuous Body Diode Forward Current (Note 4)			I_S	3.0	A
Avalanche Current (Note 5) L = 0.1mH			I_{AR}	22	A
Repetitive Avalanche Energy (Note 5) L = 0.1mH			E_{AR}	24	mJ

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 3)	Steady state	P_D	0.9	W
	t<10s		1.5	
Thermal Resistance, Junction to Ambient (Note 3)	Steady state	$R_{\theta JA}$	142	°C/W
	t<10s		78	
Total Power Dissipation (Note 4)	Steady state	P_D	2.2	W
	t<10s		3.5	
Thermal Resistance, Junction to Ambient (Note 4)	Steady state	$R_{\theta JA}$	59	°C/W
	t<10s		33	
Thermal Resistance, Junction to Case (Note 4)		$R_{\theta JC}$	11	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

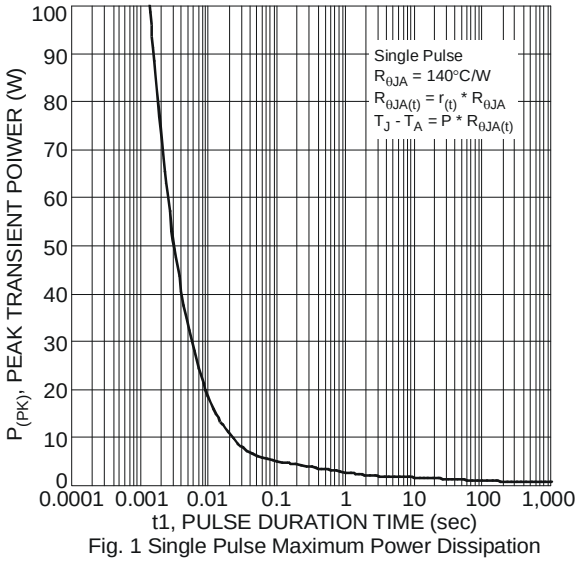


Fig. 1 Single Pulse Maximum Power Dissipation

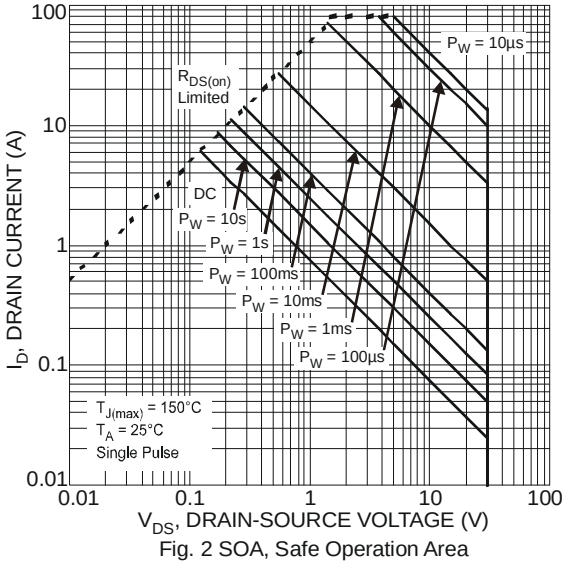


Fig. 2 SOA, Safe Operation Area

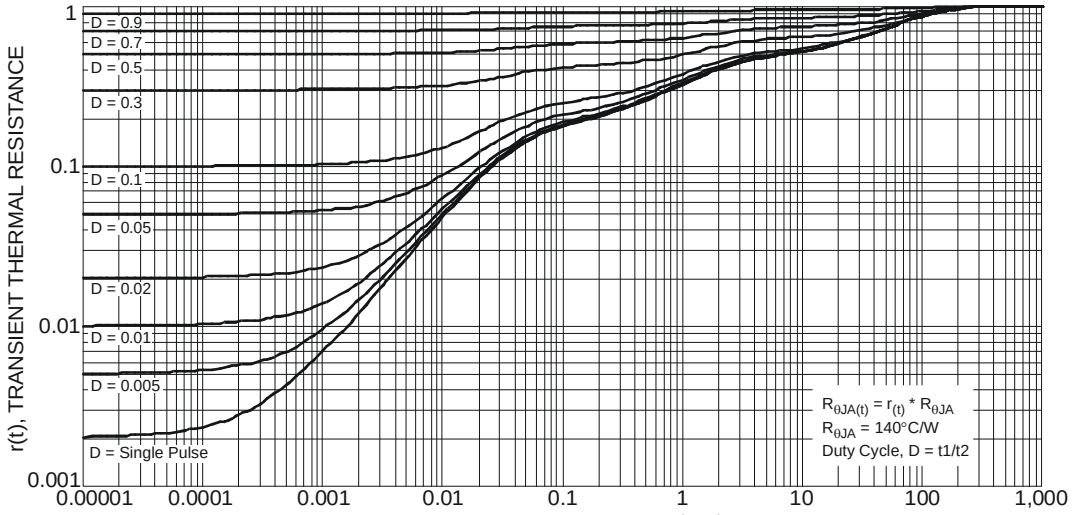


Fig. 3 Transient Thermal Resistance

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} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	1.4	-	2.5	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	-	7	11	mΩ	V_{GS} = 10V, I_D = 20A
		-	11	15		V_{GS} = 4.5V, I_D = 20A
Forward Transfer Admittance	$\|Y_{fs}\|$	-	74	-	S	V_{DS} = 5V, I_D = 20A
Diode Forward Voltage	V_{SD}	-	0.75	1.0	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	-	1281	-	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	145	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	125	-	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	-	12.5	-	nC	V_{DS} = 15V, I_D = 12A
Total Gate Charge (V_{GS} = 10V)	Q_g	-	26.7	-	nC	
Gate-Source Charge	Q_{gs}	-	3.6	-	nC	
Gate-Drain Charge	Q_{gd}	-	4.4	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	5.2	-	ns	V_{DD} = 15V, V_{GS} = 10V, R_L = 1.25Ω, R_G = 3Ω,
Turn-On Rise Time	t_r	-	21.2	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	22.3	-	ns	
Turn-Off Fall Time	t_f	-	5.1	-	ns	
Reverse Recovery Time	T_{rr}	-	8.5	-	ns	I_F = 12A, di/dt = 500A/μs
Reverse Recovery Charge	Q_{rr}	-	7.0	-	nC	I_F = 12A, di/dt = 500A/μs

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

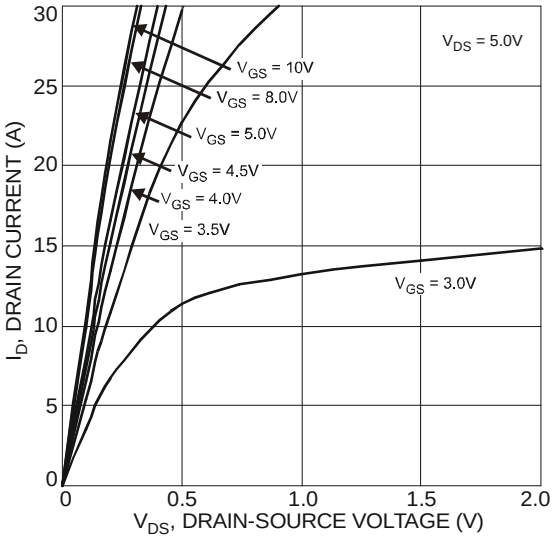


Fig.4 Typical Output Characteristic

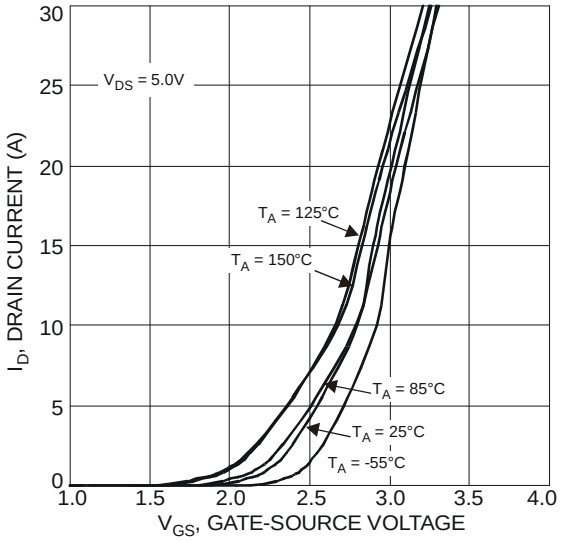


Fig. 5 Typical Transfer Characteristics

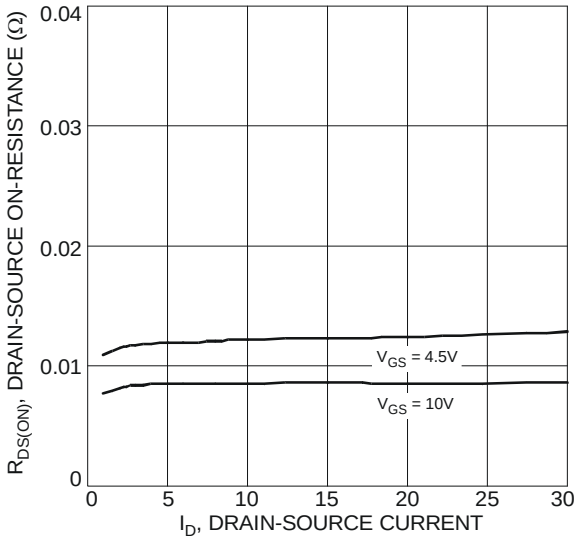


Fig. 6 Typical On-Resistance vs. Drain Current and Gate Voltage

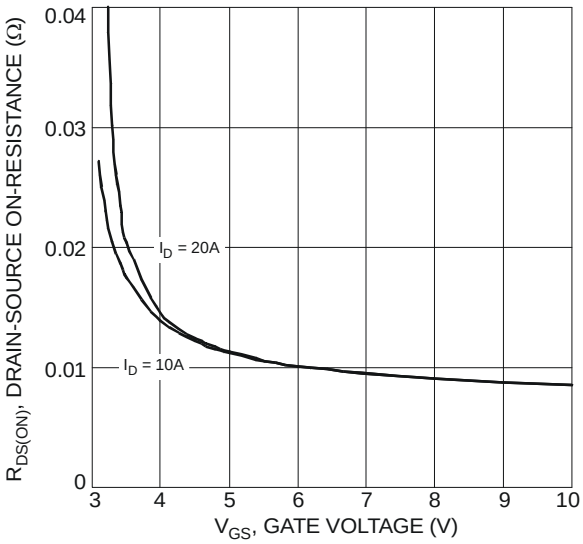


Fig. 7 Typical On-Resistance vs. Gate Voltage

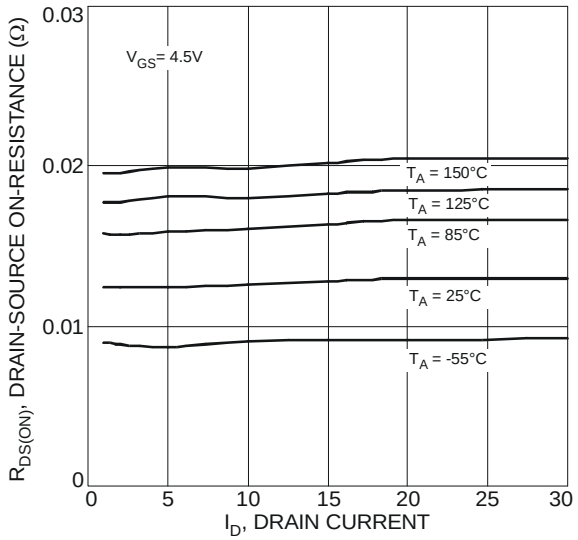


Fig. 8 Typical On-Resistance vs. Drain Current and Temperature

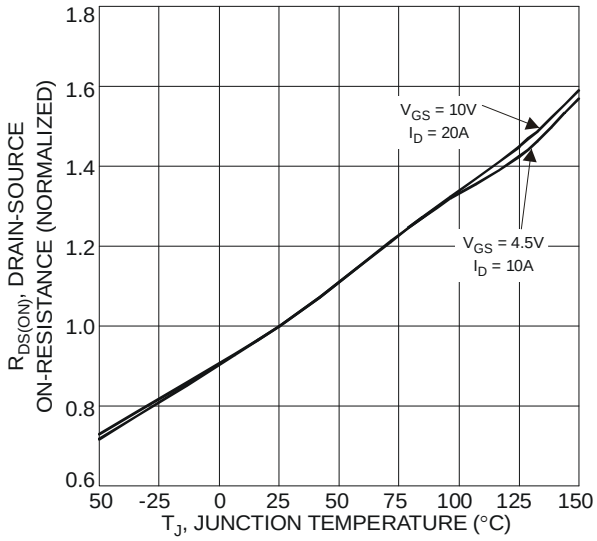


Fig. 9 On-Resistance Variation with Temperature

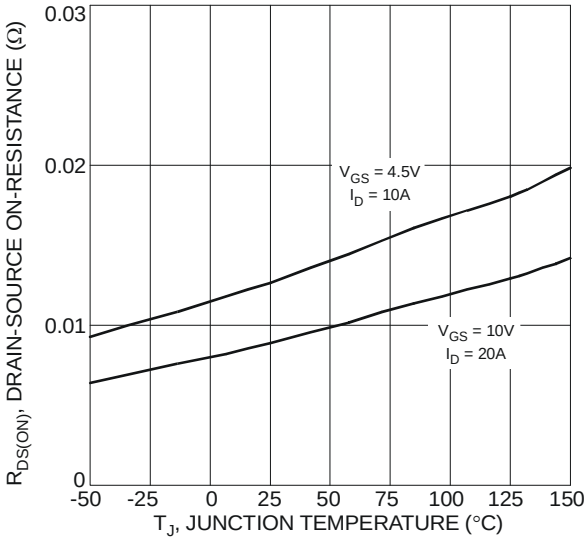


Fig. 10 On-Resistance Variation with Temperature

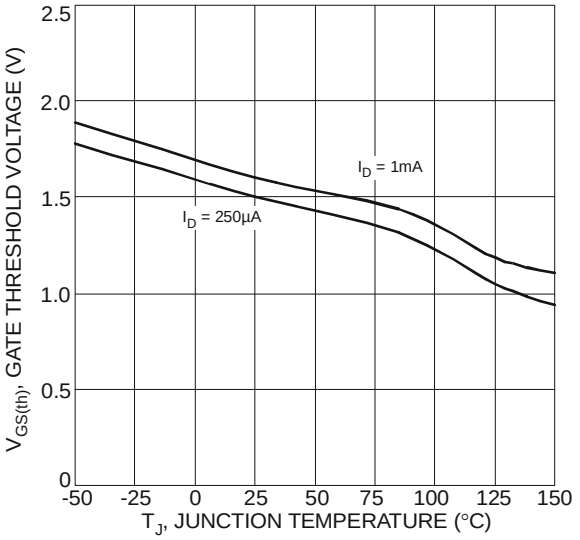


Fig. 11 Gate Threshold Variation vs. Ambient Temperature

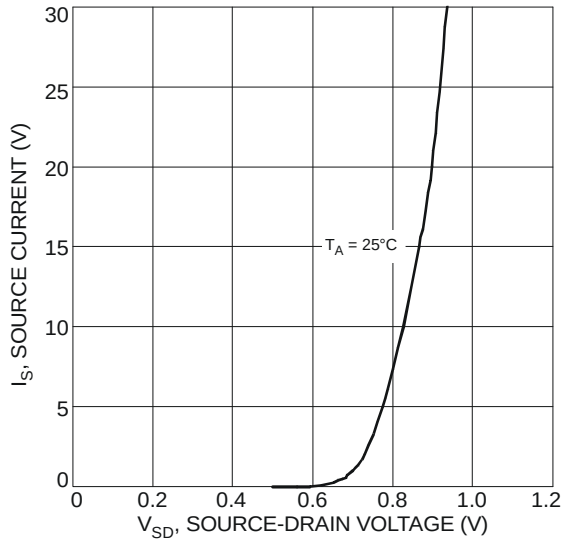


Fig.12 Diode Forward Voltage vs. Current

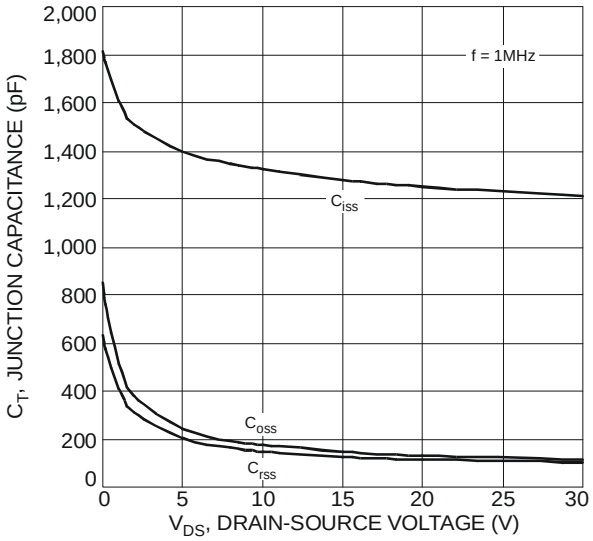


Fig. 13 Typical Junction Capacitance

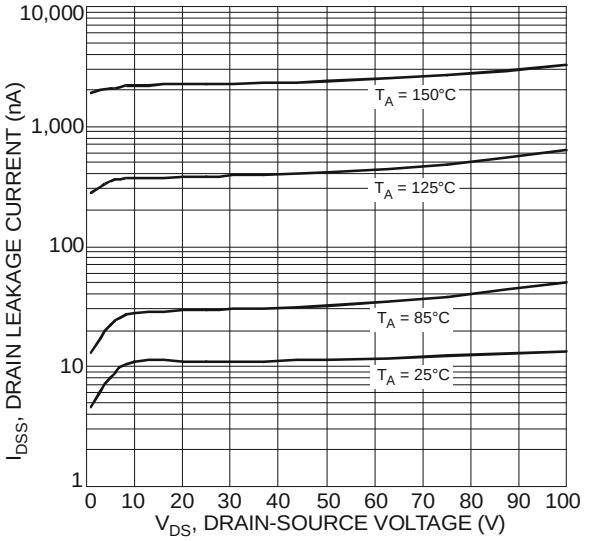


Fig. 14 Typical Drain-Source Leakage Current vs. Voltage

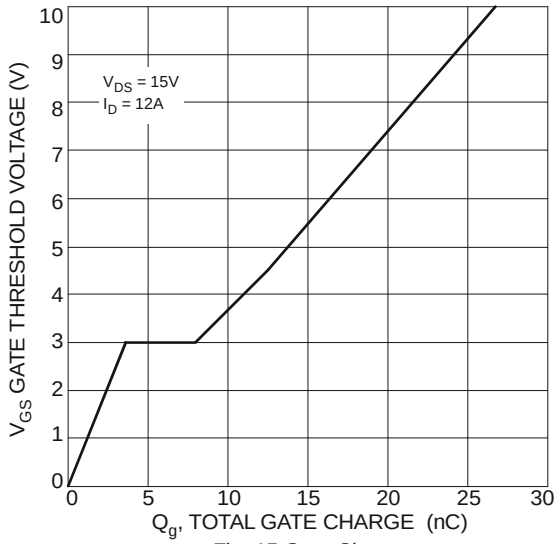
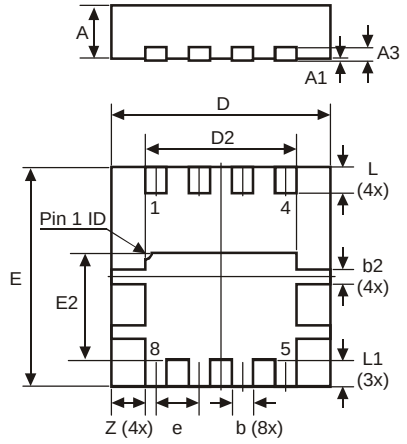


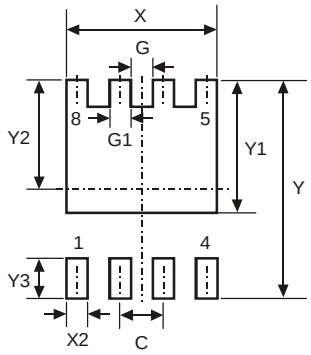
Fig. 15 Gate Charge

Package Outline Dimensions



POWERDI®3333-8			
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

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