30V P-CHANNEL ENHANCEMENT MODE MOSFET
POWERDI®

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max T_A = 25°C
-30V	20mΩ @ V_{GS} = -10V	-9.5 A
	29mΩ @ V_{GS} = -5V	-8.5 A

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
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

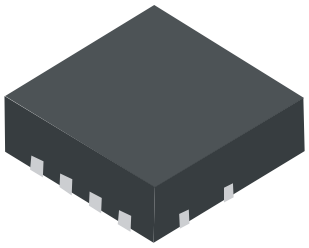
Description and Applications

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.

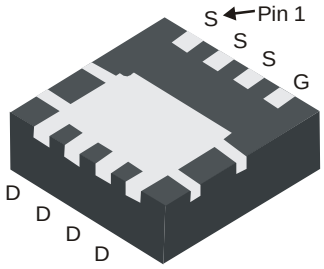
- Backlighting
- Power Management Functions
- DC-DC Converters

Mechanical Data

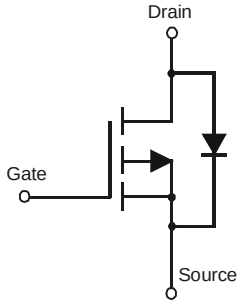
- Case: POWERDI3333-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.072 grams (approximate)



Top View



Bottom View



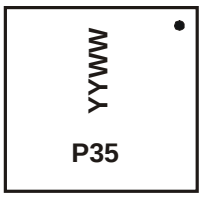
Internal Schematic

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3035SFG-7	POWERDI3333-8	2000/Tape & Reel
DMP3035SFG-13	POWERDI3333-8	3000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at http://www.diodes.com.

Marking Information



P35 = 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}	±25	V
Continuous Drain Current (Note 6) V_{GS} = -10V	Steady State	T_A = 25°C T_A = 70°C	I_D	-8.5 -6.7	A
	t<10s	T_A = 25°C T_A = 70°C	I_D	-12.5 -10.0	A
Continuous Drain Current (Note 6) V_{GS} = -5V	Steady State	T_A = 25°C T_A = 70°C	I_D	-7.0 -5.5	A
	t<10s	T_A = 25°C T_A = 70°C	I_D	-10.0 -8.0	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	-70	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	-3.6	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)		P_D	0.95	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	135	°C/W
	t<10s		65	°C/W
Total Power Dissipation (Note 6)		P_D	2.3	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	$R_{\theta JA}$	55	°C/W
	t<10s		26	°C/W
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	6.14	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

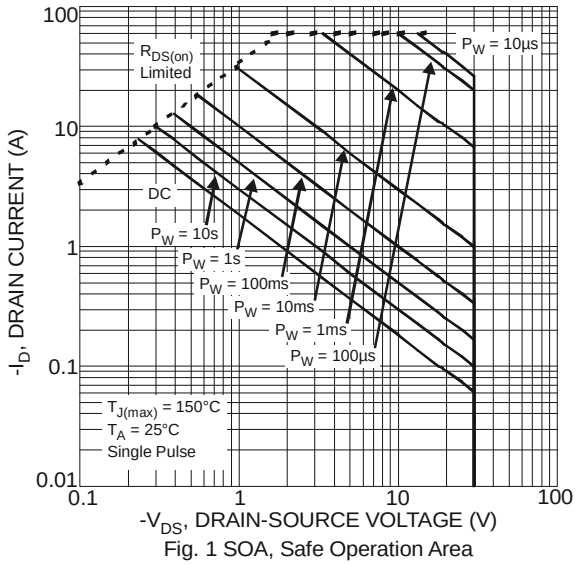


Fig. 1 SOA, Safe Operation Area

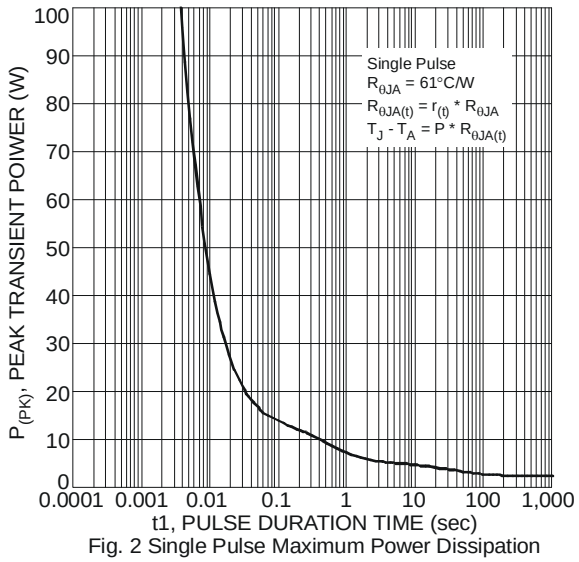


Fig. 2 Single Pulse Maximum Power Dissipation

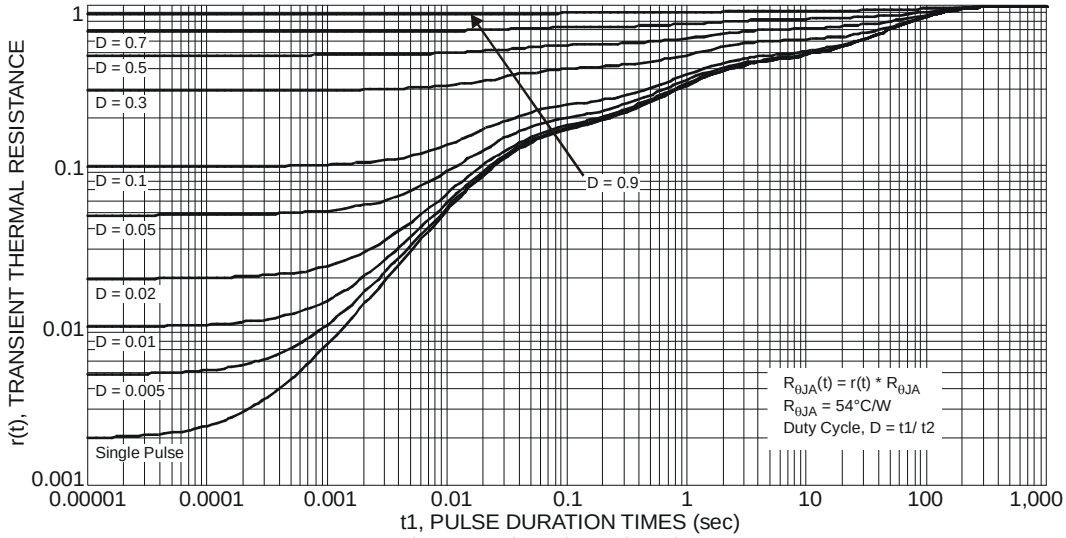


Fig. 3 Transient Thermal Resistance

Electrical Characteristics T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	-	-	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-1.0	µA	V_{DS} = -30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±100	nA	V_{GS} = ±25V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	-1.7	-2.5	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	-	15	20	mΩ	V_{GS} = -10V, I_D = -8A
		-	21	29		V_{GS} = -5V, I_D = -5A
Forward Transfer Admittance	$\|Y_{fs}\|$	-	22	-	S	V_{DS} = -5V, I_D = -10.0A
Diode Forward Voltage	V_{SD}	-	-0.74	-1.0	V	V_{GS} = 0V, I_S = -1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	1633	-	pF	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	459	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	214	-	pF	
Gate Resistance	R_g	-	6.5	13	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge V_{GS} = -4.5V	Q_g	-	17	-	nC	V_{DS} = -15V, V_{GS} = -10V, I_D = 8A
Total Gate Charge V_{GS} = -10V	Q_g	-	35.5	-	nC	
Gate-Source Charge	Q_{gs}	-	4.6	-	nC	
Gate-Drain Charge	Q_{gd}	-	5.7	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	8.5	-	ns	V_{GEN} = -10V, V_{DD} = -15V, R_{GEN} = 3Ω, I_D = -15A
Turn-On Rise Time	t_r	-	14	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	50	-	ns	
Turn-Off Fall Time	t_f	-	25.8	-	ns	

Notes:
5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

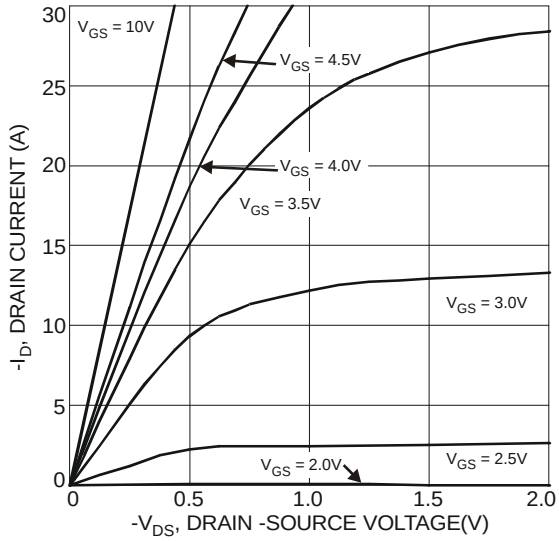


Fig. 4 Typical Output Characteristics

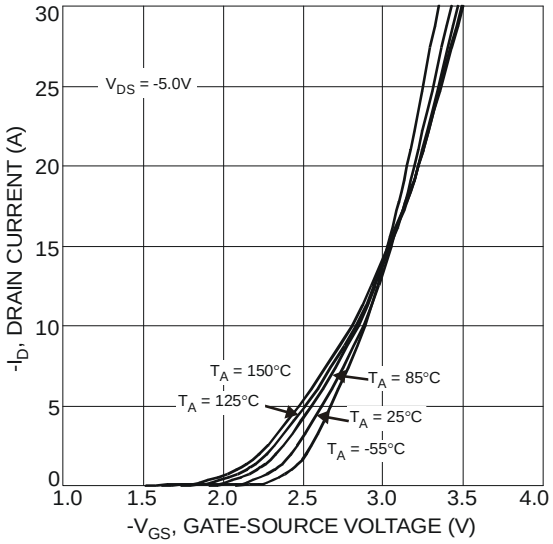


Fig. 5 Typical Transfer Characteristics

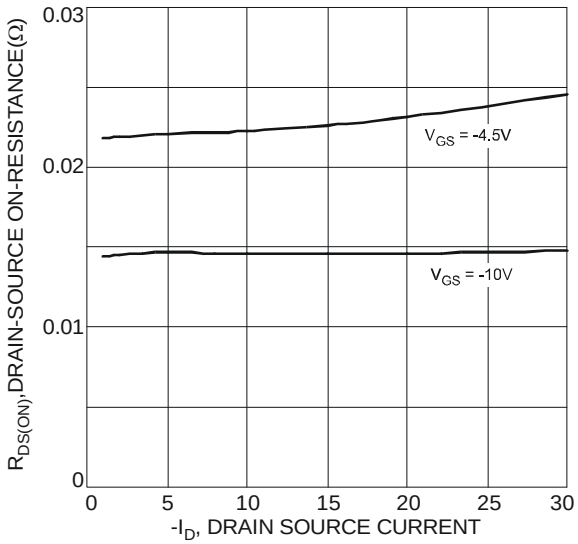


Fig. 6 Typical On-Resistance vs. Drain Current and Gate Voltage

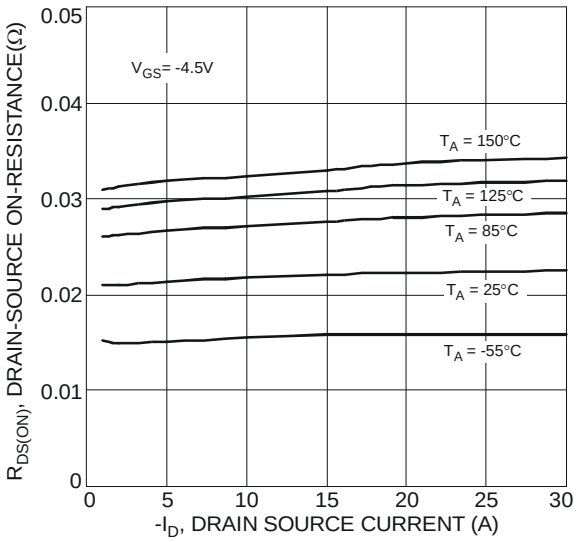


Fig. 7 Typical On-Resistance vs. Drain Current and Temperature

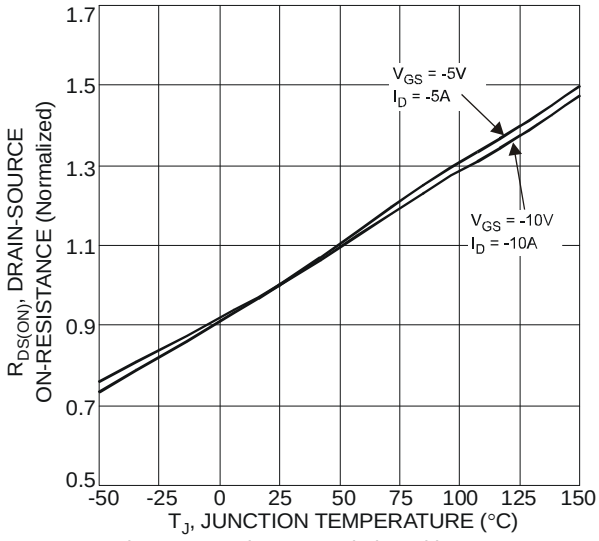


Fig. 8 On-Resistance Variation with Temperature

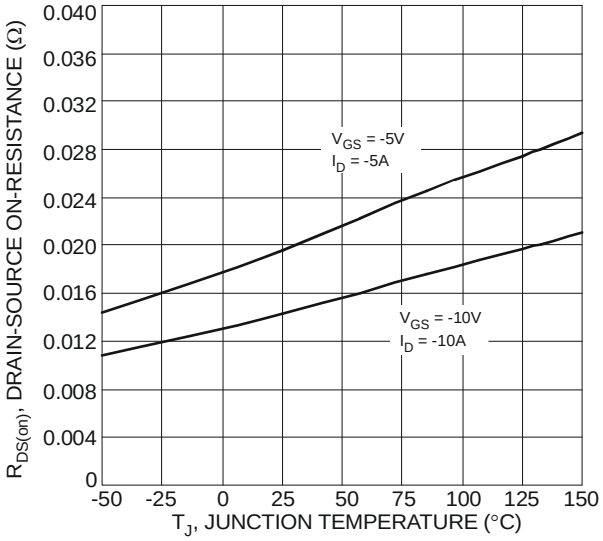


Fig. 9 On-Resistance Variation with Temperature

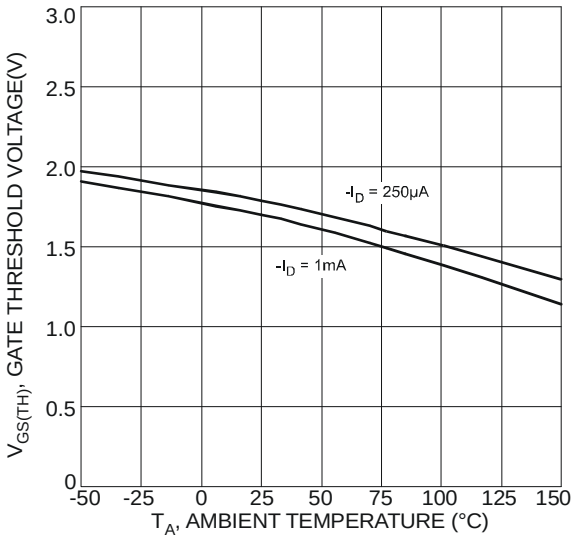


Fig. 10 Gate Threshold Variation vs. Ambient Temperature

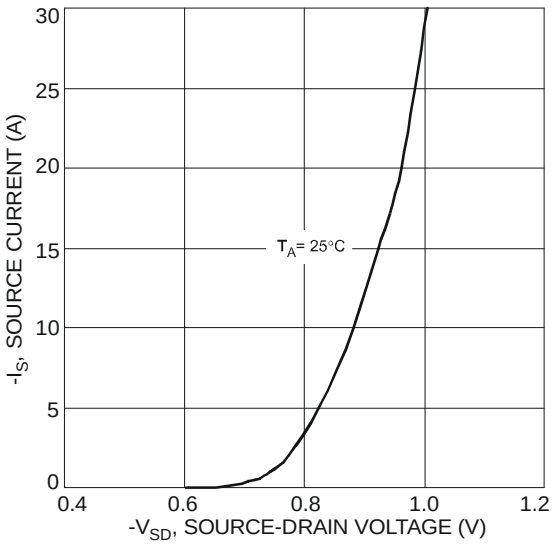


Fig. 11 Diode Forward Voltage vs. Current

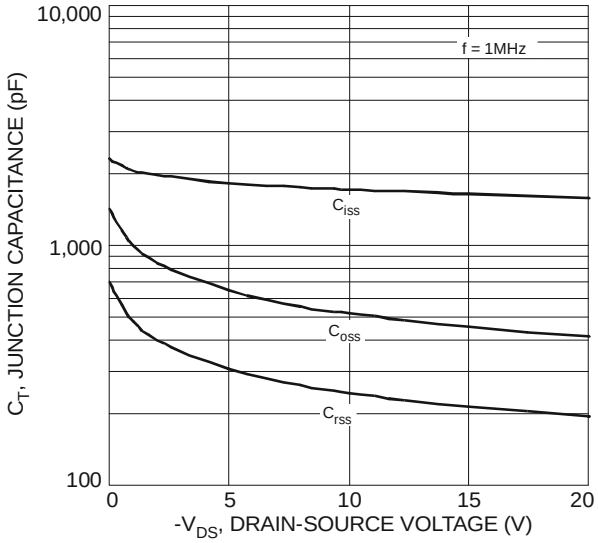


Fig. 12 Typical Junction Capacitance

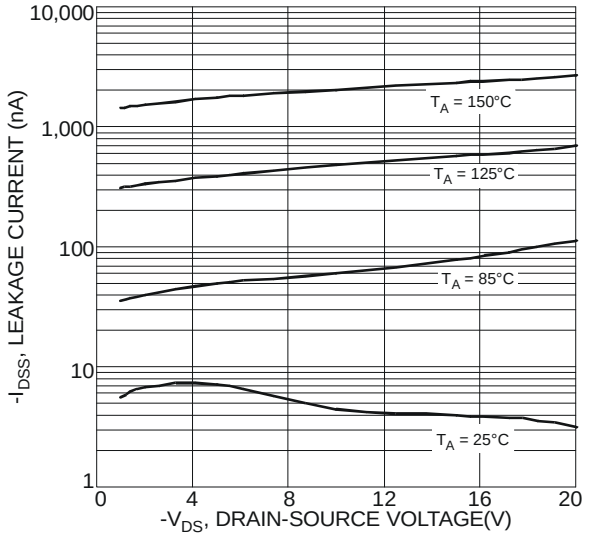


Fig. 13 Typical Drain-Source Leakage Current vs. Voltage

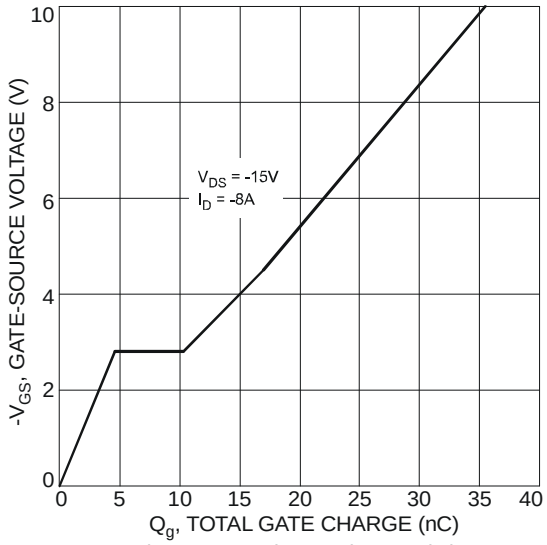
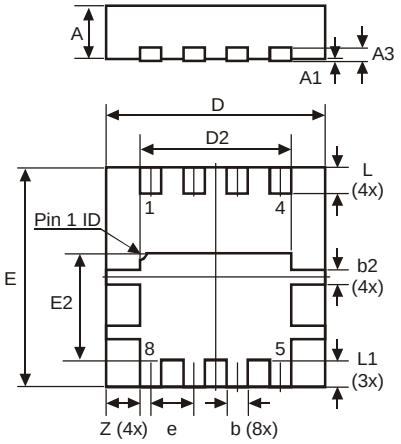


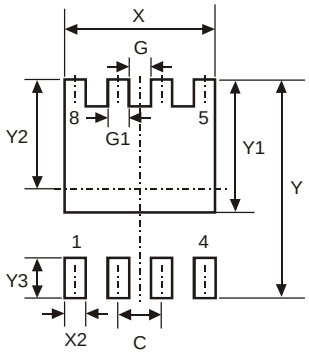
Fig. 14 Gate-Charge Characteristics

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

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