



COMPLEMENTARY PAIR ENHANCEMENT MODE MOSFET PowerDI

Product Summary

Device	V _{(BR)DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
Q1	30V	12mΩ @ V _{GS} = 10V	21A
QI	301	$17m\Omega @ V_{GS} = 4.5V$	18A
Q2	2 -30V	$25m\Omega$ @ $V_{GS} = -10V$	-15A
Q2		$38m\Omega$ @ $V_{GS} = -4.5V$	-12A

Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Complementary Pair MOSFET
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

Description

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

Applications

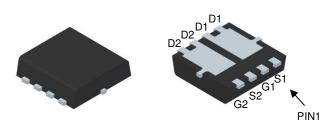
- Power Management Functions
- Analog Switch

PowerDI3333-8 (Type UXC)

Mechanical Data

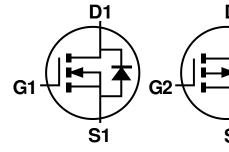
- Case: PowerDI3333-8 (Type UXC)
- Case Material: Molded Plastic, "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish Matte Tin Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 (§3)
- Weight: 0.072 grams (Approximate)

Equivalent Circuit





Bottom View



N-Channel MOSFET

P-Channel MOSFET

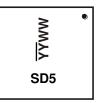
Ordering Information (Note 4)

Part Number	Case	Packaging
DMC3016LDV-7	PowerDI3333-8 (Type UXC)	2,000/Tape & Reel
DMC3016LDV-13	PowerDI3333-8 (Type UXC)	3,000/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/quality/lead_free.html 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/products/packages.html.

Marking Information



SD5 = Product Type Marking Code

YYWW = Date Code Marking

YY = Last Digit of Year (ex: 16 for 2016)

WW = Week Code (01 ~ 53)



Maximum Ratings Q1 - N-Channel (@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, $V_{GS} = 10V$ (Note 7) Steady $T_C = +25^{\circ}C$ State $T_C = +70^{\circ}C$			I _D	21 17	А
Maximum Body Diode Forward Current (Note 6)	Is	2	Α		
Pulsed Drain Current (380µs pulse, Duty cycle = 1%)	I _{DM}	70	Α		
Avalanche Current (L = 0.1mH) (Note 8)	I _{AS}	22	Α		
Avalanche Energy (L = 0.1mH) (Note 8)	Eas	24	mJ		

Maximum Ratings Q2 – P-Channel (@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, $V_{GS} = -10V$ (Note 7) Steady $T_C = +25^{\circ}C$ State $T_C = +70^{\circ}C$			I _D	-15 -12	А
Maximum Body Diode Forward Current (Note 6)	I _S	-2	Α		
Pulsed Drain Current (380µs Pulse, Duty Cycle = 1%)	I _{DM}	-40	Α		
Avalanche Current (L = 0.1mH) (Note 8)			I _{AS}	-22	Α
Avalanche Energy (L = 0.1mH) (Note 8)	, , , ,				mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P _D	0.9	W
Thermal Decistores, Junction to Ambient (Note 5)	Steady State	-	136	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	78	
Total Power Dissipation (Note 6)		P_{D}	1.8	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	Б	70	
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	41	°C/W
Thermal Resistance, Junction to Case (Note 7)		ReJC	15	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Notes:

- 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
- 6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
- 7. Thermal resistance from junction to soldering point (on the exposed drain pad).
- 8. I_{AS} and E_{AS} rating are based on low frequency and duty cycles to keep $T_J = +25$ °C.



Electrical Characteristics Q1 – N-Channel (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV _{DSS}	30	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	_	_	1	μΑ	$V_{DS} = 30V$, $V_{GS} = 0V$
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	V _{GS(TH)}	1.4	_	2.0	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$
Static Drain-Source On-Resistance			9.5	12	mΩ	$V_{GS} = 10V, I_D = 7A$
Static Diami-Source Off-Nesistance	R _{DS(ON)}	_	14	17	11122	$V_{GS} = 4.5V, I_D = 7A$
Diode Forward Voltage	V_{SD}	_	0.70	1.0	V	$V_{GS} = 0V, I_{S} = 1A$
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{ISS}		1,184	_		V 15V V 0V
Output Capacitance	Coss		137	_	pF	$V_{DS} = 15V, V_{GS} = 0V,$ f = 1.0MHz
Reverse Transfer Capacitance	C _{RSS}	_	107	_		
Gate Resistance	R_{G}	_	3.0	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
Total Gate Charge (V _{GS} = 4.5V)	Q_{G}	_	9.5	_		
Total Gate Charge (V _{GS} = 10V)	Q_{G}	_	21	_	nC	V 15V L 10A
Gate-Source Charge	Q _{GS}	_	3.8	_	IIC	$V_{DS} = 15V, I_D = 12A$
Gate-Drain Charge	Q_{GD}	_	4.1	_		
Turn-On Delay Time	t _{D(ON)}	_	4.5	_		
Turn-On Rise Time	t _R	_	3.3	_		$V_{DD} = 15V, V_{GS} = 10V,$
Turn-Off Delay Time	t _{D(OFF)}	_	14	_	ns	$R_L = 1.5\Omega$, $R_G = 3\Omega$
Turn-Off Fall Time	t _F	_	3.6	_		
Reverse Recovery Time	t _{RR}	_	9.3	_	ns	1 404 11/14 5004/
Reverse Recovery Charge	Q _{RR}	_	2.5	_	nC	I _F = 12A, di/dt = 500A/μs

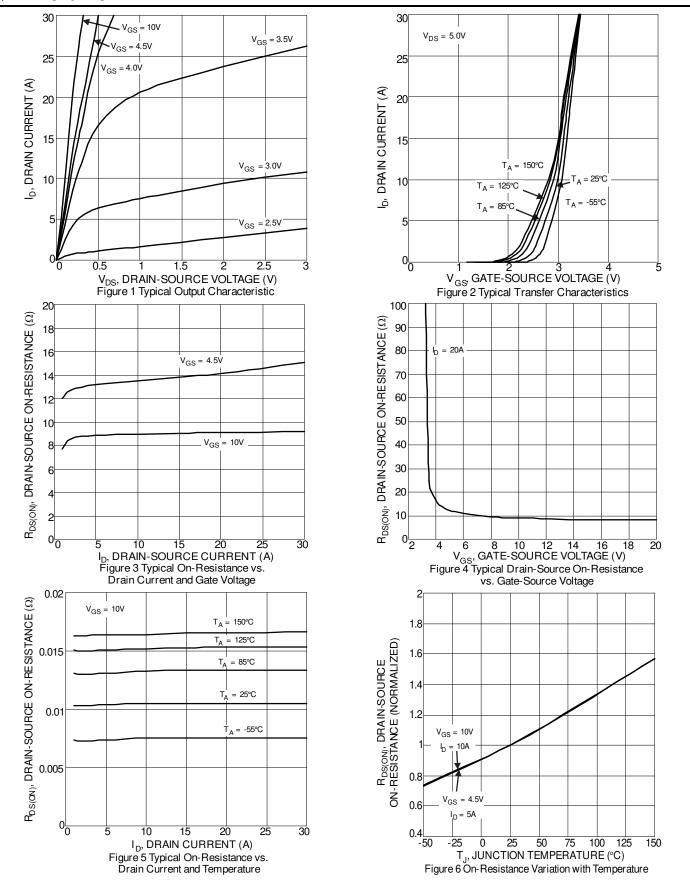
Electrical Characteristics Q2 – P-Channel (@TA = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	_	_	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	_	_	-1	μA	V _{DS} = -30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 9)		•	•			•
Gate Threshold Voltage	V _{GS(TH)}	-1.2	_	-2.4	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$
Static Drain-Source On-Resistance			21	25	mΩ	$V_{GS} = -10V, I_D = -7A$
Static Drain-Source On-Resistance	R _{DS (ON)}	_	31	38	11177	V _{GS} = -4.5V, I _D = -6.2A
Diode Forward Voltage	V _{SD}	_	-0.7	-1.2	V	$V_{GS} = 0V, I_S = -2.1A$
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{ISS}		1,188	_		45)/)/ 0)/
Output Capacitance	Coss	_	154	_	pF	$V_{DS} = -15V$, $V_{GS} = 0V$, $f = 1MHz$
Reverse Transfer Capacitance	Crss	_	116	_		
Gate Resistance	R _G	_	9	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$
Total Gate Charge (V _{GS} = -4.5V)	Q _G	_	9.5	_		
Total Gate Charge (V _{GS} = -10V)	Q _G	_	19.7	_	nC	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Gate-Source Charge	Q _{GS}	_	3.1	_	ПС	$V_{DS} = -15V, I_{D} = -7A$
Gate-Drain Charge	Q _{GD}	_	3.2	_		
Turn-On Delay Time	t _{D(ON)}	_	3.7	_		
Turn-On Rise Time	t _R	_	2.6	_		$V_{GS} = -10V, V_{DS} = -15V,$
Turn-Off Delay Time	t _{D(OFF)}	_	36	_	ns	$R_G = 6\Omega$, $I_D = -7A$
Turn-Off Fall Time	t _F	_	22	_		
Reverse Recovery Time	t _{RR}	_	10.4	_	ns	1 7A -11/-14 400A/
Reverse Recovery Charge	Q _{RR}	_	3.2	_	nC	$I_F = -7A$, di/dt = 100A/ μ s

Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to product testing.

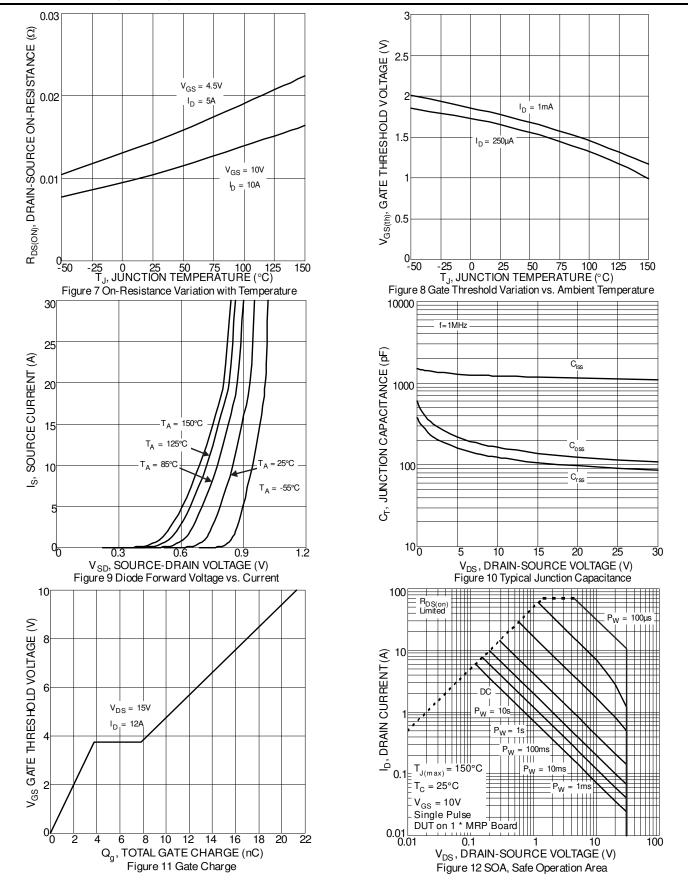


Q1 - N-Channel



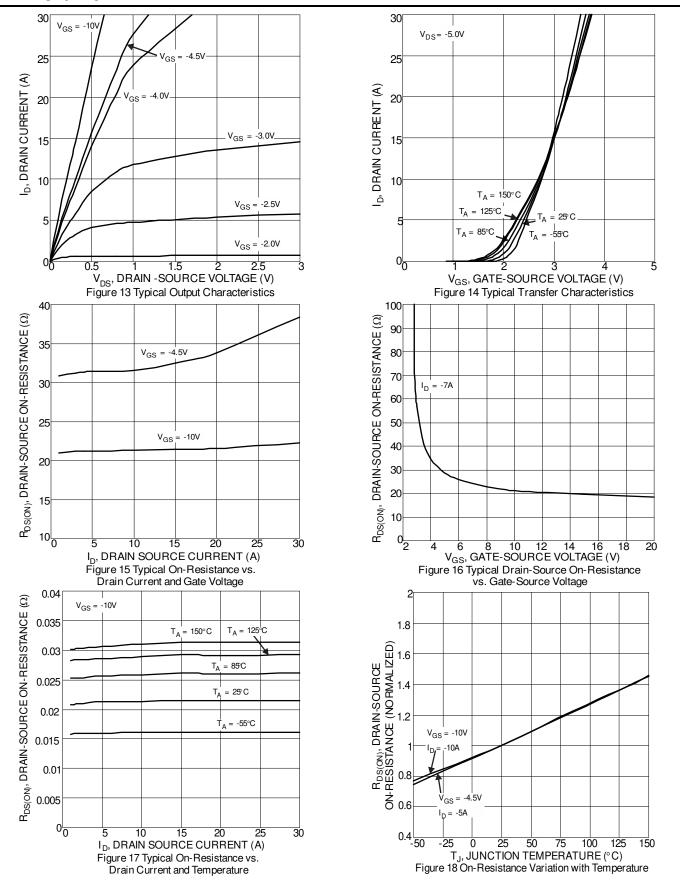


Q1 - N-Channel (Continued)



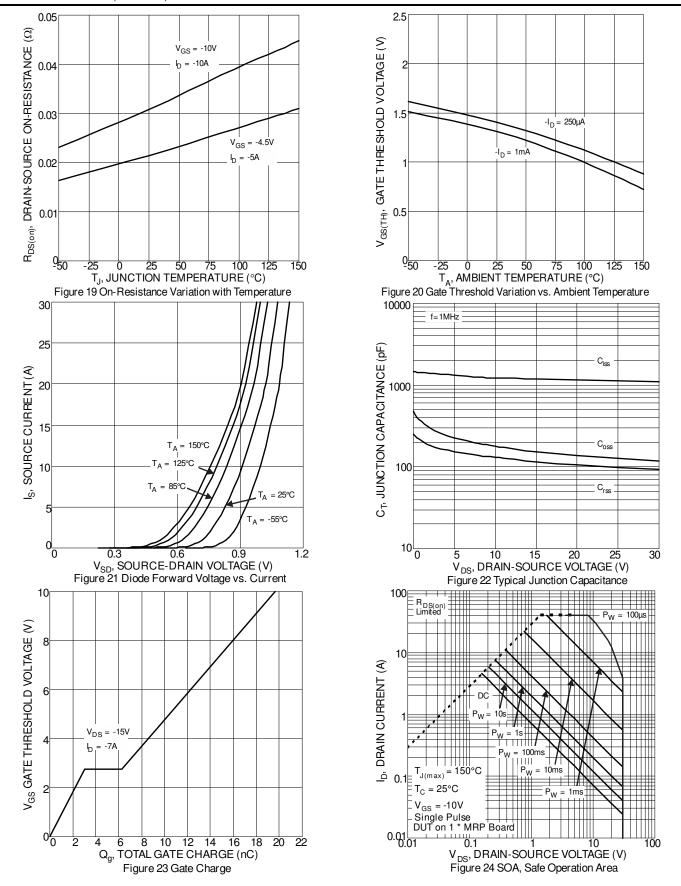


Q2 - P-Channel

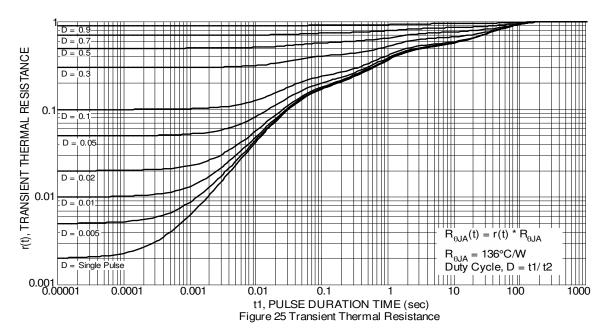




Q2 - P-Channel (Continued)



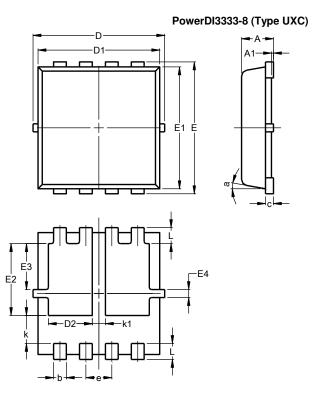






Package Outline Dimensions

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

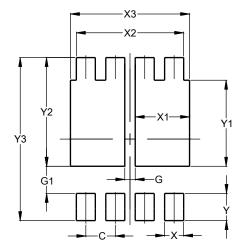


			_				
PowerDI3333-8							
(Type UXC)							
Dim	Min	Max	Тур				
Α	0.75	0.85	0.80				
A 1	0.00	0.05					
b	0.25	0.40	0.32				
С	0.10	0.25	0.15				
D	3.20	3.40	3.30				
D1	2.95	3.15	3.05				
D2	0.90	1.30	1.10				
Ε	3.20	3.40	3.30				
E1	2.95	3.15	3.05				
E2	1.60	2.00	1.80				
E3	0.95	1.35	1.15				
E4	0.10	0.30	0.20				
е	_	_	0.65				
L	0.30	0.50	0.40				
k	0.50	0.90	0.70				
k1	0.13	0.53	0.33				
а	0°	12°	10°				
All I	Dimens	sions ir	n mm				

Suggested Pad Layout

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

PowerDI3333-8 (Type UXC)



Dimensions	Value (in mm)
С	0.650
G	0.230
G1	0.600
Х	0.420
X1	1.200
X2	2.370
Х3	2.630
Υ	0.600
Y1	1.900
Y2	2.400
Y3	3.600



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