



P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)} Max	
(=)===	()	T _C = +25°C
40\/	$11m\Omega @ V_{GS} = -10V$	-35A
-40V	15mΩ @ V_{GS} = -4.5V	-30A

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

- DC-DC Converters
- Power Management Functions
- Backlighting

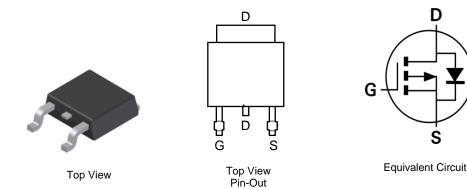
Features and Benefits

- 100% Unclamped Inductive Switch (UIS) Test In Production
- Low On-Resistance
- Fast Switching Speed
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

Mechanical Data

- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.33 grams (Approximate)

TO252 (DPAK)



Ordering Information (Notes 4 & 5)

Part Number		Compliance	Case	Packaging	
DMP4015SK3Q-13 Automotive		TO252 (DPAK)	2,500/Tape & Reel		
Notes: 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.					

1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied. 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green"

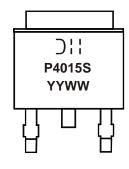
and Lead-free. 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

4. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/quality/product_compliance_definitions/.

5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.



Marking Information



Dil = Manufacturer's Marking P4015S = Product Type Marking Code YYWW = Date Code Marking YY = Year (ex: 13 = 2013) WW = Week (01 - 53)

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

Characteristic	Symbol	Value	Units		
Drain-Source Voltage	V _{DSS}	-40	V		
Gate-Source Voltage			V _{GSS}	±25	V
Continuous Drain Current (Note 6) V_{GS} = -10V	Steady State	T _C = +25°C T _C = +70°C	ID	-35 -27	А
Continuous Drain Current (Note 6) \/ 10\/	Steady State	T _A = +25°C T _A = +70°C	ID	-14 -11	A
Continuous Drain Current (Note 6) V _{GS} = -10V	t<10s	T _A = +25°C T _A = +70°C	ID	-22 -18	А
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I _{DM}	-100	A
Maximum Body Diode Forward Current (Note 6)			ls	-5.5	A
Avalanche Current (Note 7)			I _{AS}	-22	A
Avalanche Energy (Note 7)			E _{AS}	242	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 6)	T _A = +25°C	D -	3.5	W
	T _A = +70°C	PD	2.2	
Thermal Desistance, Junction to Ambient (Note C)	Steady State	D	36	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	R _{θJA}	15	
Thermal Resistance, Junction to Case (Note 6)	Steady State	$R_{\theta JC}$	4.5	
Operating and Storage Temperature Range		TJ, TSTG	-55 to +150	°C

Notes: 6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate. 7. UIS in production with L = 0.1mH, $T_J = +25^{\circ}C$.



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

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	-40	_		V	$V_{GS} = 0V, I_D = -250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}			-1	μA	$V_{DS} = -40V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_		±100	nA	$V_{GS} = \pm 25 V$, $V_{DS} = 0 V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	V _{GS(th)}	-1.5	-2	-2.5	V	$V_{DS} = V_{GS}$, $I_D = -250 \mu A$	
Static Drain-Source On-Resistance	Passa		7	11	mΩ	$V_{GS} = -10V, I_D = -9.8A$	
	R _{DS(ON)}	_	9	15	11152	$V_{GS} = -4.5V, I_D = -9.8A$	
Forward Transfer Admittance	Y _{fs}	_	26		S	$V_{DS} = -20V, I_{D} = -9.8A$	
Diode Forward Voltage	V _{SD}		-0.7	-1	V	$V_{GS} = 0V, I_{S} = -1A$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C _{iss}		4,234			$V_{DS} = -20V, V_{GS} = 0V$ f = 1MHz	
Output Capacitance	Coss		1,036		pF		
Reverse Transfer Capacitance	C _{rss}	_	526				
Gate Resistance	R _G	_	7.77		Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$	
Total Gate Charge	Qg	_	47.5				
Gate-Source Charge	Q _{gs}	_	14.2		nC	V _{DS} = -20V, V _{GS} = -5V I _D = -9.8A	
Gate-Drain Charge	Q _{gd}	_	13.5				
Turn-On Delay Time	t _{D(on)}		13.2			V _{GS} = -10V, V _{DD} = -20V,	
Turn-On Rise Time	tr		10		nS		
Turn-Off Delay Time	t _{D(off)}		302.7		115	$R_G = 6\Omega, I_D = -1A$	
Turn-Off Fall Time	t _f	_	137.9				

8. Short duration pulse test used to minimize self-heating effect.9. Guaranteed by design. Not subject to production testing. Notes:





T_A = 25°C

5

4 4.5

T_A = 150°C

T_A = 25°C

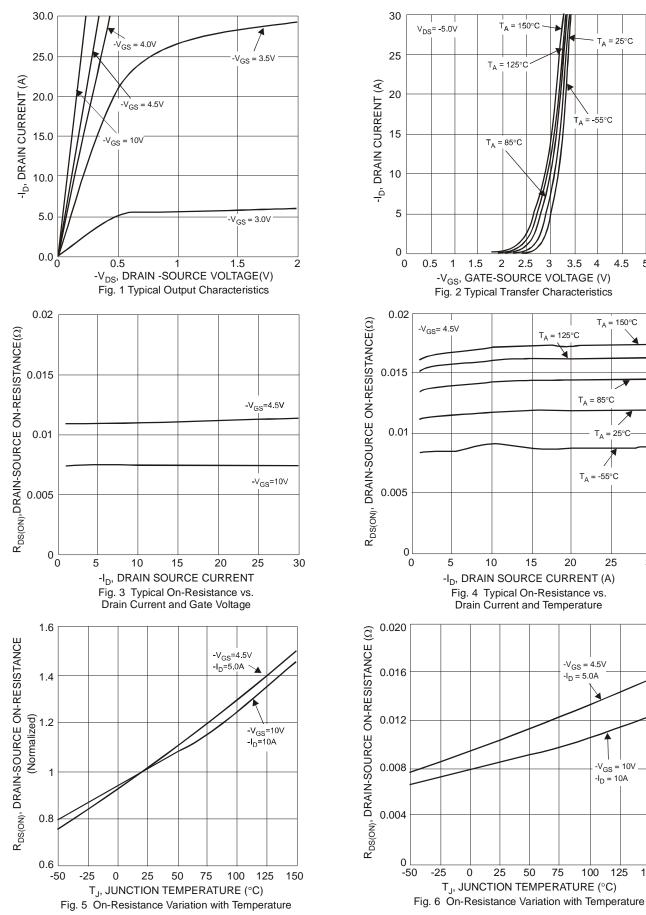
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-V_{GS} = 10V

125

-I_D = 10A

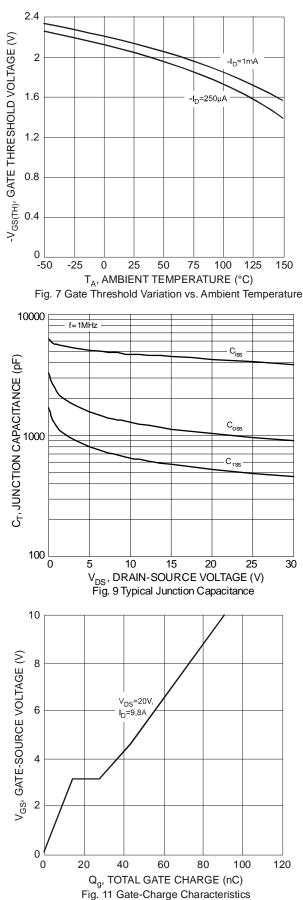
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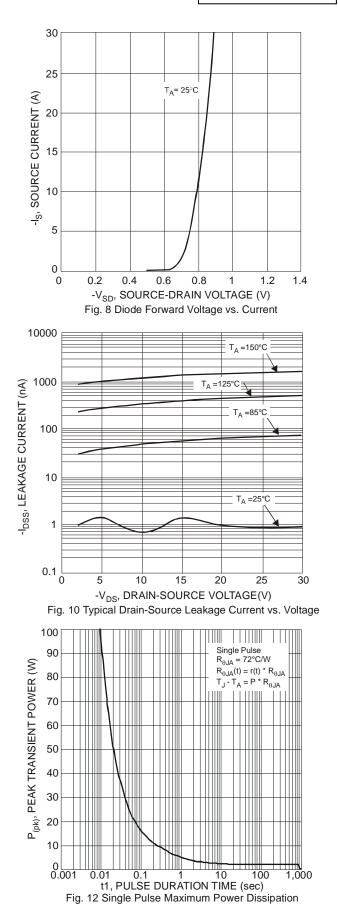


150

DMP4015SK3Q

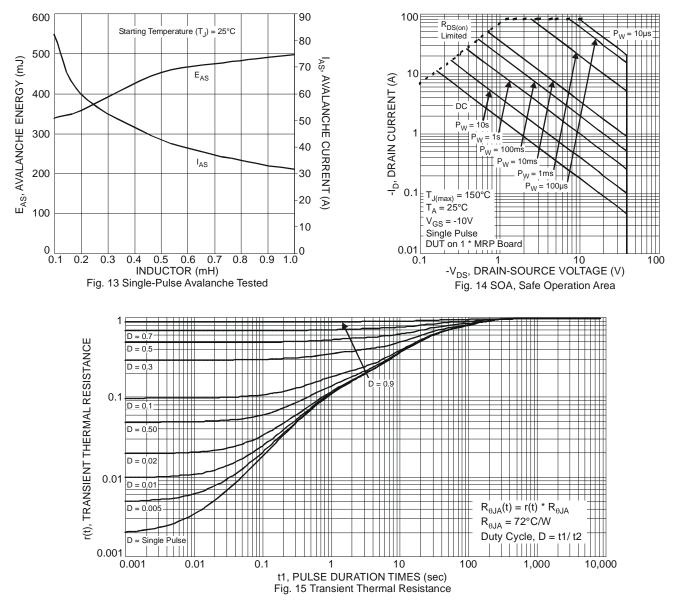








DMP4015SK3Q

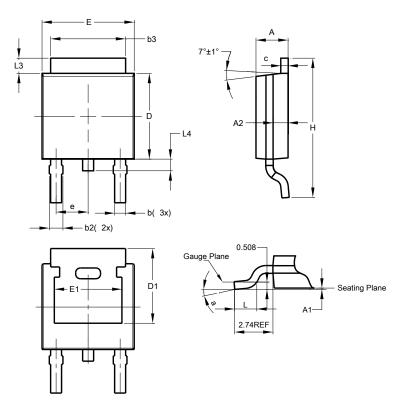




Package Outline Dimensions

Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.

TO252 (DPAK)

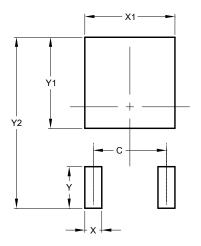


TO252 (DPAK)					
Dim	Min	Max	Тур		
Α	2.19	2.39	2.29		
A1	0.00	0.13	0.08		
A2	0.97	1.17	1.07		
p	0.64	0.88	0.783		
b2	0.76	1.14	0.95		
b3	5.21	5.46	5.33		
С	0.45	0.58	0.531		
D	6.00	6.20	6.10		
D1	5.21	_	_		
е	_	_	2.286		
Е	6.45	6.70	6.58		
E1	4.32				
Η	9.40	10.41 9.9			
L	1.40	1.78	1.59		
L3	0.88	1.27	1.08		
L4	0.64	1.02	0.83		
а	0°	10° —			
All Dimensions in mm					

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.

TO252 (DPAK)



Dimensions	Value (in mm)
С	4.572
Х	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700



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