



80V 175°C N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} max	I _D max T _C = +25°C
80V	16mΩ @ V _{GS} = 10V	50A
	21mΩ @ V _{GS} = 4.5V	43A

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.

- Synchronous Rectifier
- Backlighting
- Power Management Functions
- DC-DC Converters

Features

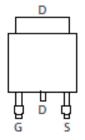
- Rated to +175°C ideal for high ambient temperature environments
- Low R_{DS(ON)} ensures on state losses are minimized
- High Conversion Efficiency
- Low Input Capacitance
- Fast Switching Speed
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

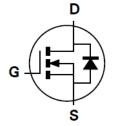
- Case: TO252
- Case Material: Molded Plastic, "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.33 grams (Approximate)







Pin Out Top View



Equivalent Circuit

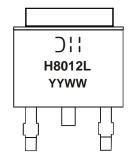
Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH8012LK3-13	TO252	2,500/Tape & Reel

Notes:

- 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
- 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



DilleManufacturer's Marking
H8012L = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 14 = 2014)
WW = Week Code (01 to 53)



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

Characteristic	Symbol	Value	Units	
Drain-Source Voltage		V_{DSS}	80	V
Gate-Source Voltage		V _{GSS}	±20	V
Continuous Drain Current (Note 6) $V_{GS} = 10V$ $ T_C = +25^{\circ}C $ $ T_C = +100^{\circ}C $		l _D	50 35	А
Maximum Continuous Body Diode Forward Current (Note 5)	I _S	3	Α	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	80	Α	
Avalanche Energy, L = 60mH	E _{AS}	147	mJ	

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

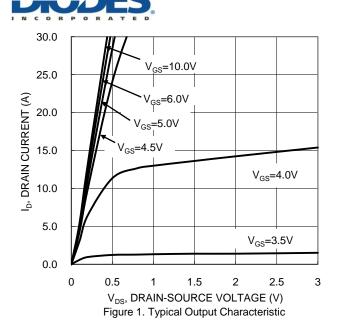
Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P _D	2.6	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	47	°C/W
Total Power Dissipation (Note 6)	P _D	60	W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	2.5	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +175	°C

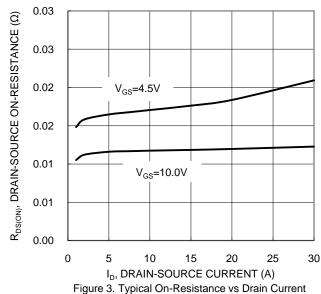
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV _{DSS}	80	-	-	V	$V_{GS} = 0V$, $I_D = 1mA$	
Zero Gate Voltage Drain Current	I _{DSS}	-	-	1	μΑ	$V_{DS} = 64V$, $V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	-	-	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	V _{GS(TH)}	1	1.3	3	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	
Static Drain-Source On-Resistance	D	-	12.1	16	mΩ	$V_{GS} = 10V, I_D = 12A$	
Static Drain-Source Off-Resistance	R _{DS(ON)}	-	14.8	21		$V_{GS} = 4.5V, I_D = 6A$	
Diode Forward Voltage	V_{SD}	-	0.9	1.2	V	$V_{GS} = 0V, I_S = 25A$	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	C _{iss}	-	1949	-		.,	
Output Capacitance	Coss	=	177	-	pF	$V_{DS} = 40V$, $V_{GS} = 0V$, $f = 1MHz$	
Reverse Transfer Capacitance	C_{rss}	=	10	-			
Gate Resistance	R_g	=	0.7	-	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Qg	-	15	-			
Total Gate Charge (V _{GS} = 10V)	Q_g	=	34	-			
Gate-Source Charge	Qgs	=	6	-	nC	$V_{DS} = 40V, I_{D} = 12A$	
Gate-Drain Charge	Q_{gd}	=	4.5	-			
Turn-On Delay Time	t _{D(ON)}	-	4.9	-			
Turn-On Rise Time	t _R	-	3.8	-	ns	$V_{DD} = 40V, V_{GS} = 10V,$ $I_{D} = 12A, R_{G} = 1.6\Omega$	
Turn-Off Delay Time	t _{D(OFF)}	-	16.5	-	115		
Turn-Off Fall Time	t _F	-	3.5	-			
Body Diode Reverse Recovery Time	t _{RR}	-	30.2	-	ns I 124 di/dt 1004/us		
Body Diode Reverse Recovery Charge	Q _{rr}	-	34.6	-	nC	I _F = 12A, di/dt = 100A/μs	

- 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
- 6. Device mounted on infinite heat sink and measured by thermal couple attached on bottom heat sink of package.
- 7. Short duration pulse test used to minimize self-heating effect.

 8. Guaranteed by design. Not subject to product testing.





and Gate Voltage

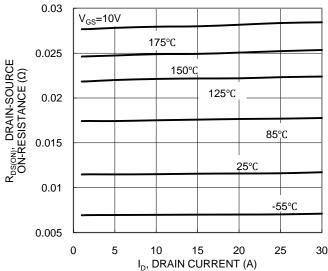
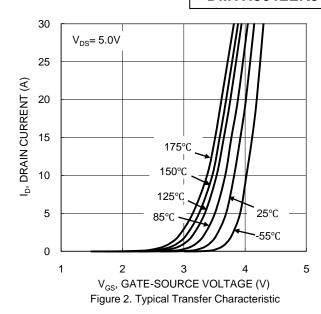
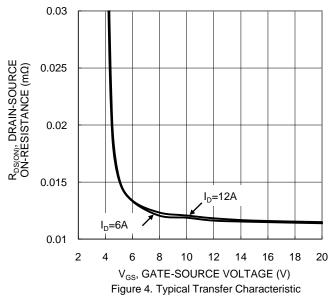


Figure 5. Typical On-Resistance vs Drain Current and Temperature





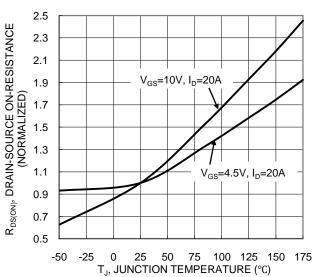
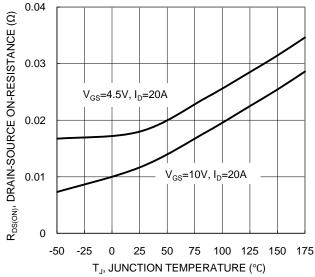
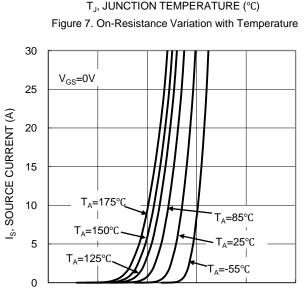


Figure 6. On-Resistance Variation with Temperature







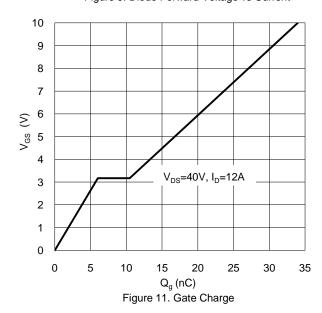
V_{SD}, SOURCE-DRAIN VOLTAGE (V) Figure 9. Diode Forward Voltage vs Current

0.9

0.6

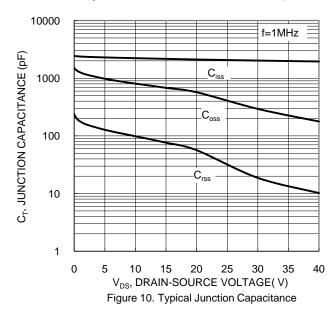
1.2

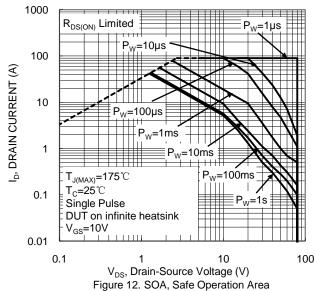
1.5



3.5 V_{GS(TH)}, GATE THRESHOLD VOLTAGE (V) 3 2.5 $I_D=1mA$ 2 $I_{D} = 250 \mu A$ 1.5 1 0.5 75 100 125 150 175 -50 -25 25 50 T_J, JUNCTION TEMPERATURE (°C)

Figure 8. Gate Threshold Variation vs Temperature





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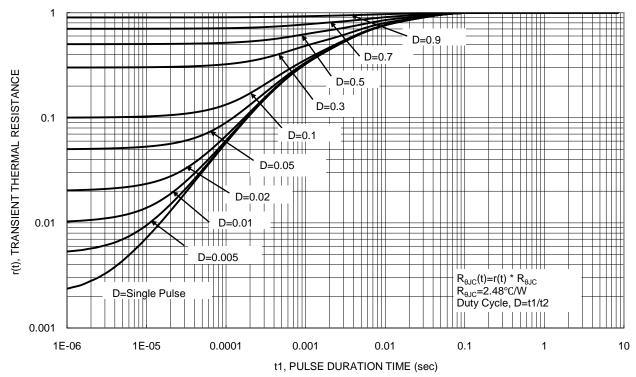
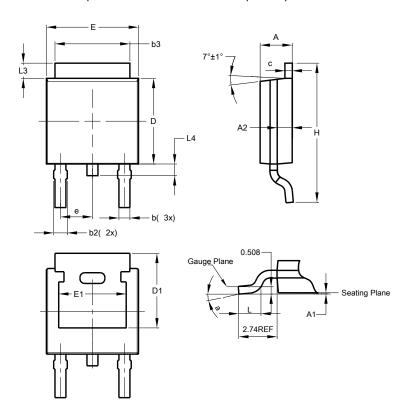


Figure 13. Transient Thermal Resistance



Package Outline Dimensions

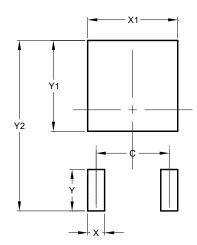
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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		
b	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	-	-		
H	9.40	10.41	9.91		
Г	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.



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



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