



60V 175°C N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} max	I _D max T _C = +25°C	
60V	$8m\Omega$ @ $V_{GS} = 10V$	70A	

Description and Applications

This new generation MOSFET is 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.

- Power Management Functions
- DC-DC Converters
- Backlighting

Features

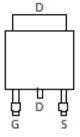
- Rated to +175°C Ideal for High Ambient Temperature Environments
- Low R_{DS(ON)} Ensures On State Losses Are Minimized
- Excellent Q_{ad x} R_{DS (ON)} Product (FOM)
- Advanced Technology for DC/DC Converters
- Small Form Factor Thermally Efficient Package Enables Higher Density End Products
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- An Automotive-Compliant Part is Available Under Separate Datasheet (DMTH6010SK3Q)

Mechanical Data

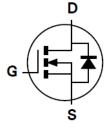
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish Matte Tin Annealed over Copper Leadframe;
 Solderable per MIL-STD-202, Method 208 (§3)
- Weight: 0.33 grams (Approximate)



Top View



Pin Out Top View



Equivalent Circuit

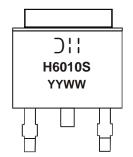
Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH6010SK3-13	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.
- 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



Dili=Manufacturer's Marking
H6010S = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 16 = 2016)
WW = Week Code (01 to 53)



Maximum Ratings ($@T_A = +25^{\circ}C$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (Note 5)	$T_A = +25$ °C $T_A = +70$ °C	I _D	16.3 13.6	А
Continuous Drain Current (Note 6)	$T_{C} = +25^{\circ}C$ $T_{C} = +100^{\circ}C$	I _D	70 49	Α
Maximum Continuous Body Diode Forward Current (Note 5)	Is	3	Α	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	80	Α	
Avalanche Current, L=0.1mH	I _{AS}	20	A	
Avalanche Energy, L=0.1mH	E _{AS}	27.7	mJ	

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	3.1	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{ heta JA}$	47	°C/W
Total Power Dissipation (Note 6)	P_{D}	59	W
Thermal Resistance, Junction to Case (Note 6)	$R_{ heta JC}$	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.)

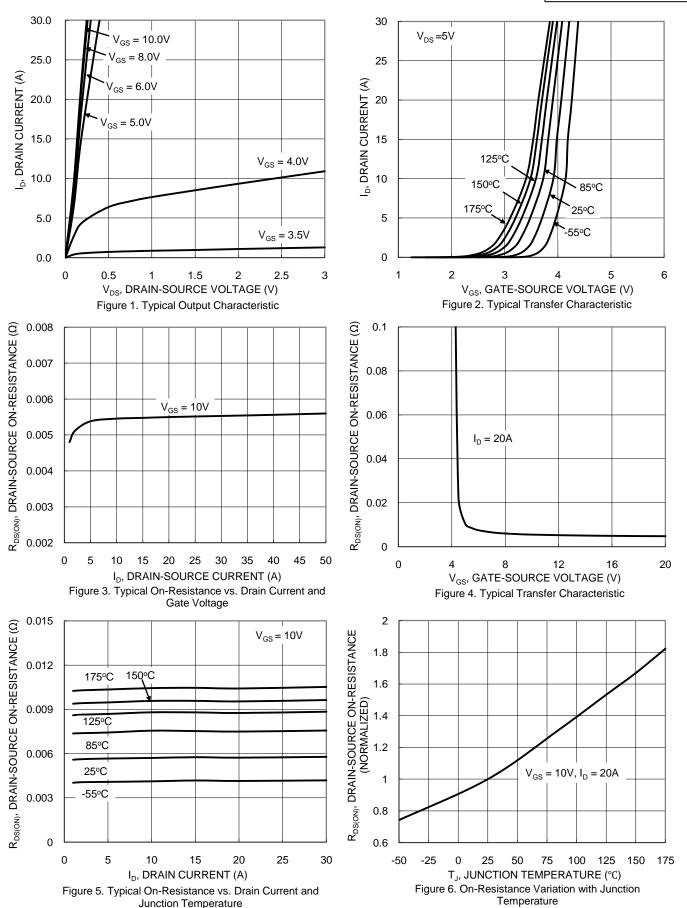
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						•
Drain-Source Breakdown Voltage	BV _{DSS}	60	-	-	V	$V_{GS} = 0V$, $I_D = 1mA$
Zero Gate Voltage Drain Current	I _{DSS}	1	1	1	μΑ	$V_{DS} = 48V, V_{GS} = 0V$
Gate-Source Leakage	I _{GSS}	-	-	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	2	-	4	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$
Static Drain-Source On-Resistance	R _{DS(ON)}	-	5.4	8	mΩ	$V_{GS} = 10V, I_D = 20A$
Diode Forward Voltage	V_{SD}	1	0.84	1.2	V	$V_{GS} = 0V, I_{S} = 20A$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	-	2841	-		$V_{DS} = 30V$, $V_{GS} = 0V$, $f = 1MHz$
Output Capacitance	Coss	-	690	-	pF	
Reverse Transfer Capacitance	C _{rss}	-	46	-		
Gate Resistance	Rg	-	0.55	-	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$
Total Gate Charge	Qg	-	38.1	-		$V_{DS} = 30V, I_D = 20A, V_{GS} = 10V$
Gate-Source Charge	Q _{qs}	-	8.3	-	nC	
Gate-Drain Charge	Q _{gd}	-	9.3	-		
Turn-On Delay Time	t _{D(ON)}	-	8.6	-		$V_{DD} = 30V, V_{GS} = 10V,$ $I_{D} = 20A, R_{G} = 3\Omega$
Turn-On Rise Time	t _R	-	8.2	-		
Turn-Off Delay Time	t _{D(OFF)}	-	17.4	-	ns	
Turn-Off Fall Time	t _F	-	5.7	-		
Body Diode Reverse Recovery Time	t _{RR}	-	33.8	-	ns	1 200 4:/4+ 4000/
Body Diode Reverse Recovery Charge	Q _{RR}	-	35.6	-	$_{\rm nC}$ I _F = 20A, 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.











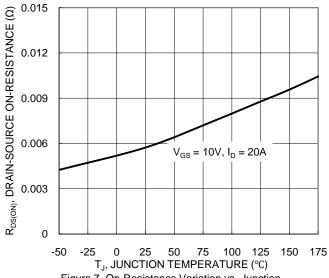


Figure 7. On-Resistance Variation vs. Junction Temperature

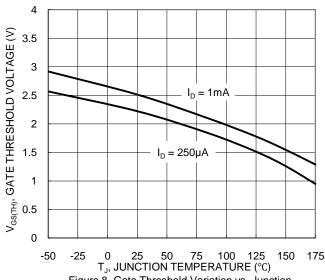


Figure 8. Gate Threshold Variation vs. Junction Temperature

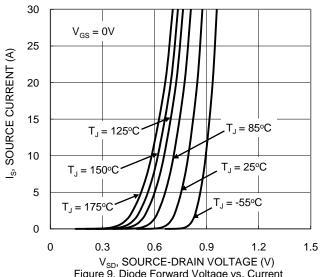
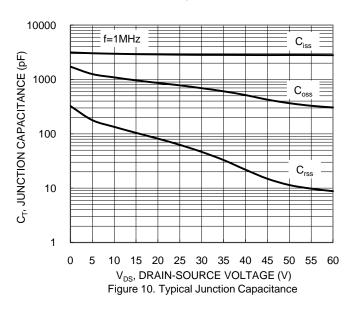
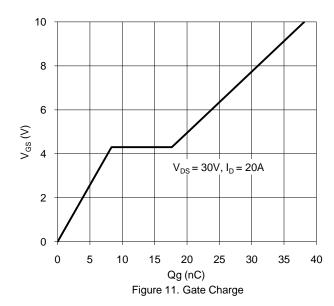
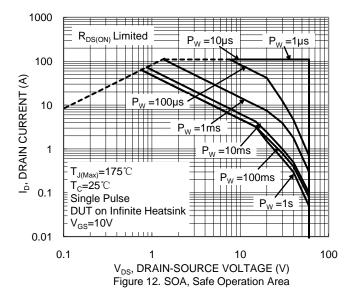


Figure 9. Diode Forward Voltage vs. Current









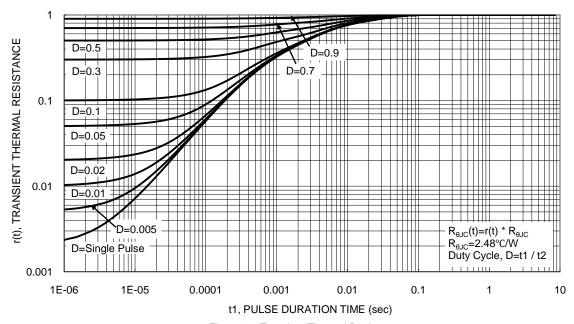
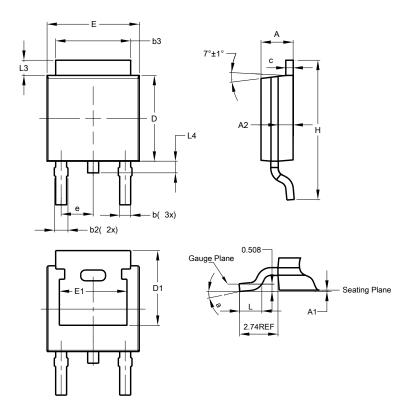


Figure 13. Transient Thermal Resistance



Package Outline Dimensions

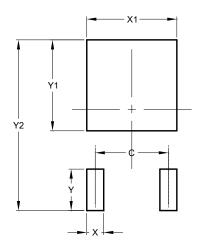
Please see http://www.diodes.com/package-outlines.html for the latest version.



TO252 (DPAK)					
Dim	Min	Max	Тур		
Α	2.19	2.39	2.29		
A 1	0.00	0.13	0.08		
A2	0.97	1.17	1.07		
q	0.64	0.88	0.783		
b2	0.76	1.14	0.95		
b3	5.21	5.46	5.33		
C	0.45	0.58	0.531		
D	6.00	6.20	6.10		
D1	5.21	-	-		
Ф	-	-	2.286		
Е	6.45	6.70	6.58		
E1	4.32	-	-		
H	9.40	10.41	9.91		
٦	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 http://www.diodes.com/package-outlines.html for the latest version.



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



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