



60V 175°C N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _C = +25°C	
60V	$7.2m\Omega @ V_{GS} = 10V$	100A	

Description

This new generation MOSFET features low on-resistance and fast switching, making it ideal for high efficiency power management applications.

Applications

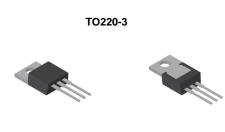
- **Power Supplies**
- Motor Control
- DC-DC Converters

Features

- Rated to +175°C Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching Ensures More Reliable and Robust End Application
- Low Input Capacitance
- Low Input/Output Leakage
- Lead-Free Finish; RoHS compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

Mechanical Data

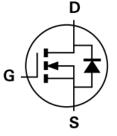
- Case: TO220-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 @3
- Weight: 1.85 grams (Approximate)



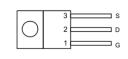
Top View



Bottom View



Equivalent Circuit



Top View Pin Out Configuration

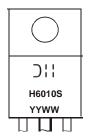
Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH6010SCT	TO220-3	50 Pieces/Tube

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



⊃ ∷=Manufacturer's Marking H6010S = Product Type Marking Code YYWW = Date Code Marking YY or YY = Last Two Digits of Year (ex: 15 = 2015) WW or WW = Week Code (01 to 53)



Maximum Ratings (@T_A = +25°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 6)	$T_C = +25^{\circ}C$		100	Α
Continuous Diain Current (Note 6)	$T_{C} = +100^{\circ}C$	ID	76	
Maximum Continuous Body Diode Forward Current (Note 6)	$T_C = +25$ °C	Is	100	Α
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	160	Α	
Avalanche Current, L=0.1mH	I _{AS}	20	А	
Avalanche Energy, L=0.1mH	E _{AS}	20	mJ	

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25$ °C	P_{D}	2.8	W
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	52.8	°C/W
Total Power Dissipation (Note 6)	$T_C = +25^{\circ}C$	P_{D}	125	W
Thermal Resistance, Junction to Case (Note 6)		R _{eJC}	1.2	°C/W
Operating and Storage Temperature Range		T _{J,} T _{STG}	-55 to +175	°C

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

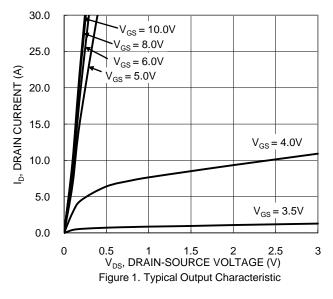
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV _{DSS}	60	_	_	V	$V_{GS} = 0V$, $I_D = 1mA$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μΑ	$V_{DS} = 48V, V_{GS} = 0V$	
Gate-Source Leakage	IGSS	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
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)}	_	5.5	7.2	mΩ	$V_{GS} = 10V, I_{D} = 20A$	
Diode Forward Voltage	V_{SD}	_	_	1.3	V	$V_{GS} = 0V, I_{S} = 20A$	
DYNAMIC CHARACTERISTICS (Note 8)		,					
Input Capacitance	C _{iss}	_	1940	_		$V_{DS} = 30V$, $V_{GS} = 0V$, $f = 1MHz$	
Output Capacitance	Coss	_	759	_	pF		
Reverse Transfer Capacitance	Crss	_	85	_			
Gate Resistance	Rq	_	0.55	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge	Qg	_	36.3	_		V _{DS} = 30V, I _D = 20A, V _{GS} = 10V	
Gate-Source Charge	Q _{gs}	_	7.5	_	nC		
Gate-Drain Charge	Q_{gd}	_	10.5	_			
Turn-On Delay Time	t _{D(ON)}	_	5.7	_		$V_{DD} = 30V, V_{GS} = 10V,$ $I_{D} = 20A, R_{G} = 3\Omega$	
Turn-On Rise Time	t _R	_	10.4	_	ns		
Turn-Off Delay Time	t _{D(OFF)}	_	16.3	_	ns		
Turn-Off Fall Time	t _F	_	11.2	_			
Reverse Recovery Time	t _{RR}	_	35.6	_	ns	1 200 4:/44 4000/	
Reverse Recovery Charge	Q _{RR}	_	37.9		nC	I _F = 20A, di/dt = 100A/μs	

Notes:

- 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
- Device mounted on infinite heat sink.
 Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to product testing.







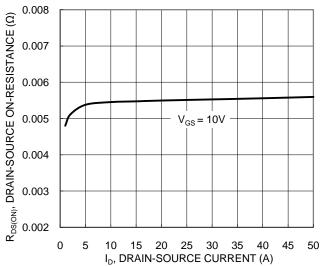


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

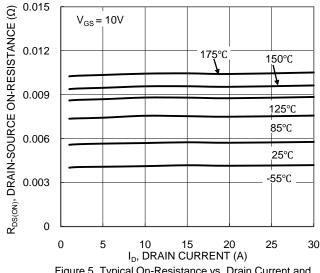
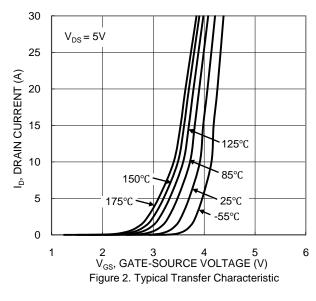
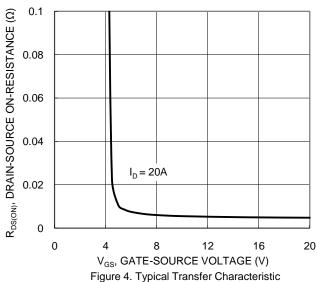
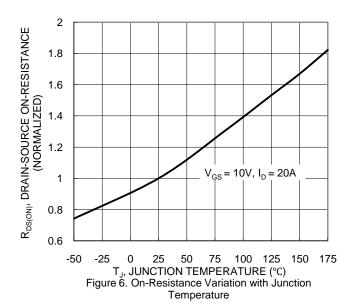


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature











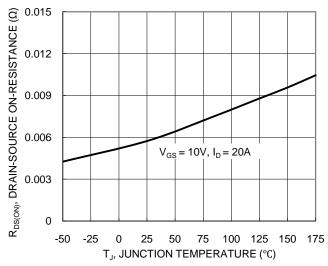
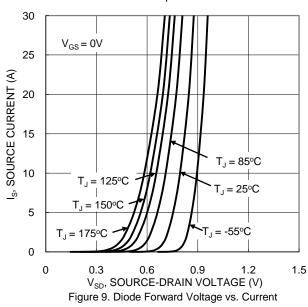
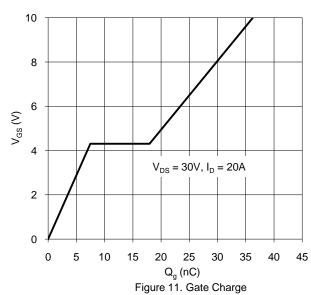


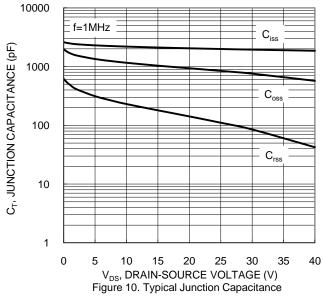
Figure 7. On-Resistance Variation with Junction Temperature

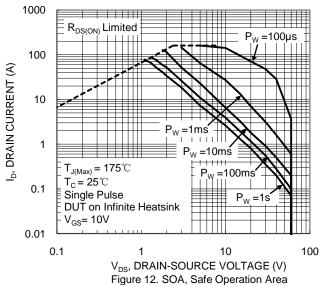




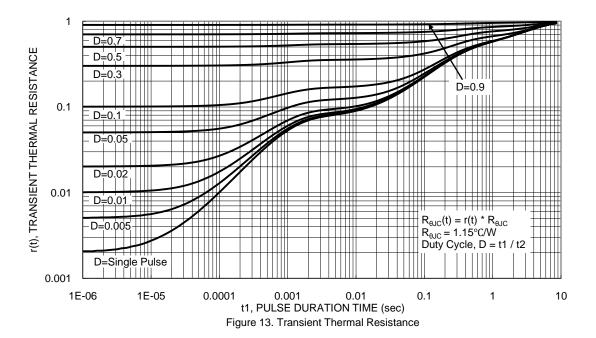
4 $V_{\text{GS}(TH)}$, GATE THRESHOLD VOLTAGE (V) 3.5 3 $I_D = 1mA$ 2.5 2 $I_{D} = 250 \mu A$ 1.5 1 0.5 0 -50 25 50 75 100 125 150 175 T_J, JUNCTION TEMPERATURE (°C)

Figure 8. Gate Threshold Variation vs. Junction Temperature







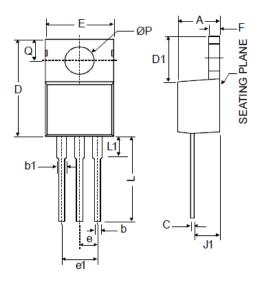




Package Outline Dimensions

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

TO220-3



TO220-3				
Dim	Min	Max		
Α	3.55	4.85		
þ	0.51	1.14		
b1	1.14	1.78		
C	0.31	1.14		
D	14.20	16.50		
D1	5.84	6.86		
Е	9.70	10.70		
е	2.79	2.99		
e1	4.83	5.33		
F	0.51	1.40		
J1	2.03	2.92		
L	12.72	14.72		
L1	3.66	6.35		
Р	3.53	4.09		
Ø	2.54	3.43		
All Dimensions in mm				



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