



60V 175°C N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _C = +25°C
60V	$6m\Omega @ V_{GS} = 10V$	100A
	$10m\Omega @ V_{GS} = 4.5V$	85A

Description and Applications

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

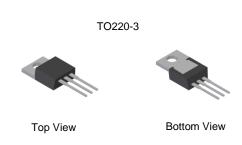
- Engine Management Systems
- Body Control Electronics
- DC-DC Converters

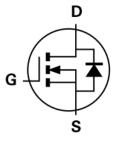
Features

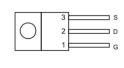
- Rated to +175°C Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching Ensures more Reliable and Robust End Application
- Low Input Capacitance
- Low Input/Output Leakage
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

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 [®]
- Terminal Connections: See Diagram Below
- Weight: 1.85 grams (Approximate)







Equivalent Circuit

Top View Pin Out Configuration

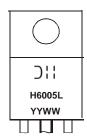
Ordering Information (Note 4)

- 1			
	Part Number	Case	Packaging
	DMTH6005LCT	TO220-3	50 Pieces/Tube

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



D::I=Manufacturer's Marking
H6005L = Product Type Marking Code
YYWW = Date Code Marking
YY or YY = Last Two Digits of Year (ex: 16 = 2016)
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 Prair Current (Note 6)	T _C = +25°C	I _D	100	А
Continuous Drain Current (Note 6)	T _C = +100°C		78	
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=1mH	I _{AS}	14.8	Α	
Avalanche Energy, L=1mH	E _{AS}	98	mJ	

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25^{\circ}C$	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)		$R_{\theta JC}$	1.2	°C/W
Operating and Storage Temperature Range		$T_{J_i}T_{STG}$	-55 to +175	°C

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

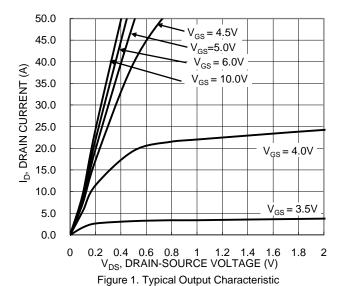
Characteristic	Symbol	Min	Tyro	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)	Syllibol	IVIIII	Тур	IVIAX	Unit	rest Condition	
` ,	DV	60	I _		V	N/ 01/ 1 4 m A	
Drain-Source Breakdown Voltage	BV _{DSS}	60				$V_{GS} = 0V$, $I_D = 1mA$	
Zero Gate Voltage Drain Current	IDSS			1	μΑ	$V_{DS} = 48V$, $V_{GS} = 0V$	
Gate-Source Leakage	I_{GSS}		_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	V _{GS(TH)}	1	_	3	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance		_	4.5	6	mΩ	$V_{GS} = 10V, I_D = 20A$	
Static Dialif-Cource Off-Resistance	R _{DS(ON)}	_	8.8	10	mΩ	$V_{GS} = 4.5V, I_D = 12.5A$	
Diode Forward Voltage	V _{SD}	_	_	1.2	V	$V_{GS} = 0V, I_{S} = 20A$	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	C _{iss}	_	2962	_		$V_{DS} = 30V, V_{GS} = 0V,$ f = 1MHz	
Output Capacitance	Coss	_	965.2	_	pF		
Reverse Transfer Capacitance	C _{rss}	_	59.8	_			
Gate Resistance	R_{g}	_	0.66	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 10V)	Qg	_	47.1	_		Vpp = 30V. lp = 50A	
Total Gate Charge (V _{GS} = 4.5V)	Q_{g}	_	23.1	_	nC		
Gate-Source Charge	Q_{gs}	_	10.2	_	lic	V _{DD} = 30V, I _D = 50A	
Gate-Drain Charge	Q_{gd}	_	12.5	_			
Turn-On Delay Time	t _{D(ON)}	_	8.3	_		$V_{DD} = 30V, V_{GS} = 10V,$ $I_{D} = 30A, R_{g} = 3.3\Omega$	
Turn-On Rise Time	t _R	_	9.4	_	no		
Turn-Off Delay Time	t _{D(OFF)}	_	22	_	ns		
Turn-Off Fall Time	t _F	_	8.9	_			
Reverse Recovery Time	t _{RR}	_	40.4	_	ns	I_ 20A di/dt 100A/va	
Reverse Recovery Charge	Q_{RR}	_	49.7	_	nC	$I_F = 30A$, di/dt = 100A/ μ s	

5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.

- 6. Device mounted on infinite heat sink.
- 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to product testing.







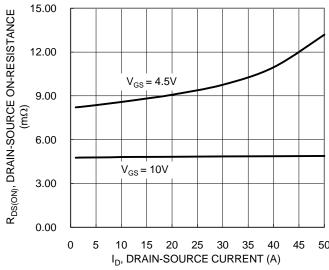
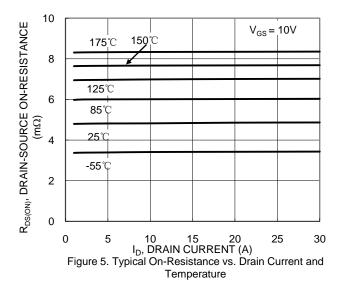
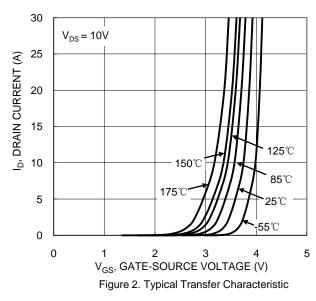
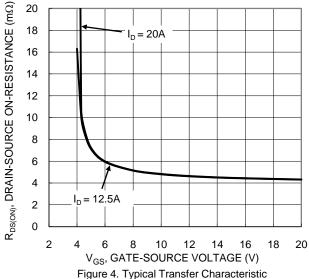
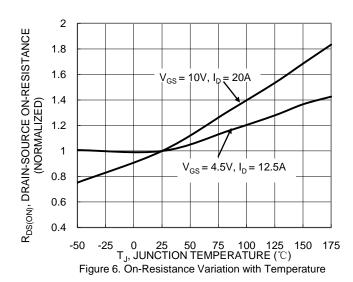


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

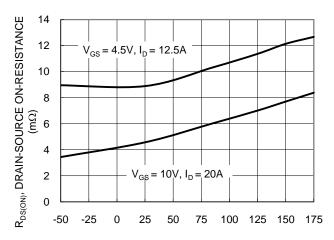












 $T_J, JUNCTION TEMPERATURE (^{\mathbb{C}})$ Figure 7. On-Resistance Variation with Temperature

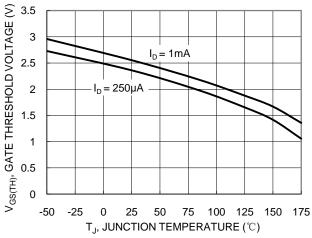
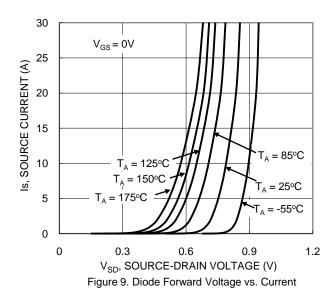


Figure 8. Gate Threshold Variation vs. Junction Temperature



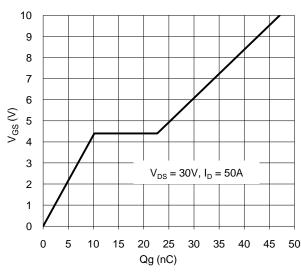


Figure 11. Gate Charge

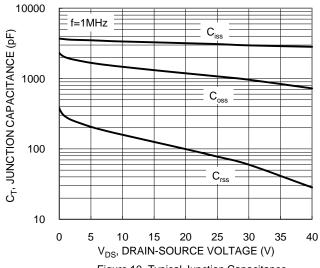
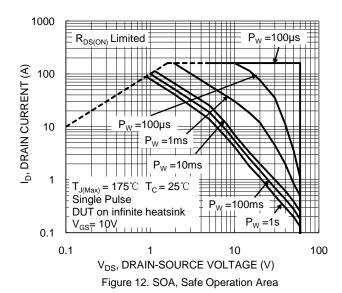
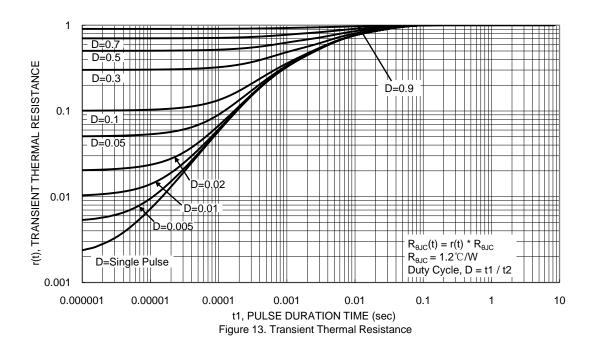


Figure 10. Typical Junction Capacitance



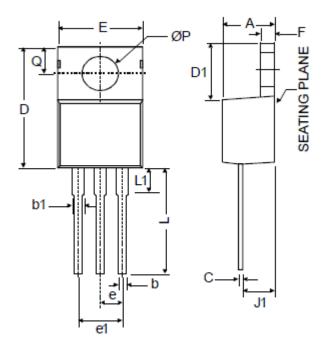




Package Outline Dimensions

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			
b	0.51	1.14			
b1	1.14	1.78			
С	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			
Q	2.54	3.43			
All Dimensions in mm					



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