



60V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = 25°C		
00)/	$6m\Omega$ @ $V_{GS} = 10V$	13.5A		
60V	8.9mΩ @ V _{GS} = 4.5V	11.3A		

Description and Applications

This 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.

- High Frequency Switching
- Synchronous Rectification
- DC-DC Converters

Features and Benefits

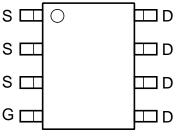
- High Conversion Efficiency
- Low R_{DS(ON)} Minimizes On-State Losses
- Low Input Capacitance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

Mechanical Data

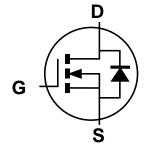
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish Matte Tin Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.074 grams (Approximate)







Top View Internal Schematic



Equivalent circuit

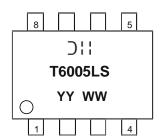
Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6005LSS-13	SO-8	2,500/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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



J;; = Manufacturer's Marking
T6005LS = Product Type Marking Code
YYWW = Date Code Marking
YY or YY = Year (ex: 15 = 2015)
WW = Week (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) \/ 40\/	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	13.5 10.8	А
Continuous Drain Current (Note 6) V _{GS} = 10V	t<10s	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	18.1 14.4	А
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	3	Α
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	80	Α
Avalanche Current, L = 1mH			I _{AS}	14.8	Α
Avalanche Energy, L = 1mH			Eas	98	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P_D	1.3	W
Thermal Resistance, Junction to Ambient (Note 5)		-	93	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	53	°C/W
Total Power Dissipation (Note 6)		P_D	1.7	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	D	73	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	41	°C/W
Thermal Resistance, Junction to Case (Note 6)		$R_{ heta JC}$	12.7	°C/W
Operating and Storage Temperature Range		$T_{J_i}T_{STG}$	-55 to +150	°C

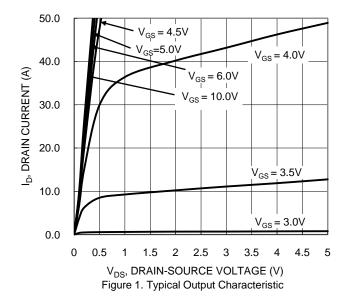
Electrical Characteristics ($T_A = +25$ °C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV _{DSS}	60	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}		_	1	μA	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	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
	R _{DS(ON)}	-	5	6	mΩ	V _{GS} = 10V, I _D = 20A	
Static Drain-Source On-Resistance		_	5.7	7.2		$V_{GS} = 6V, I_D = 20A$	
	, ,	-	6.7	8.9		V _{GS} = 4.5V, I _D = 12.5A	
Diode Forward Voltage	V _{SD}	_	0.9	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	_	pF		
Reverse Transfer Capacitance	C _{rss}	_	60				
Gate Resistance	Rg		0.66		Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 10V)	Qg	_	47.1	_			
Total Gate Charge (V _{GS} = 4.5V)	Qg	_	23.1	_	nC	V _{DD} = 30V, I _D = 20A	
Gate-Source Charge	Q_{gs}	_	10.2	_	IIC		
Gate-Drain Charge	Q_{gd}	_	12.5	_			
Turn-On Delay Time	t _{D(ON)}	_	8.3	_		$V_{DD} = 30V, V_{GS} = 10V,$ $I_{D} = 20A, R_{g} = 3.3\Omega$	
Turn-On Rise Time	t _R	_	9.4	_	C		
Turn-Off Delay Time	t _{D(OFF)}	_	22	_	nS		
Turn-Off Fall Time	t _F	I	8.9				
Body Diode Reverse Recovery Time	t _{RR}	-	40.4	_	nS	I_ = 20A di/dt = 100A/us	
Body Diode Reverse Recovery Charge	Q _{RR}	_	49.7	_	nC	$I_F = 20A$, di/dt = 100A/ μ s	

5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout. Notes:

Device mounted on FR-4 substrate PC board, 20z copper, with 1inch square copper plate.
 Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to product testing.





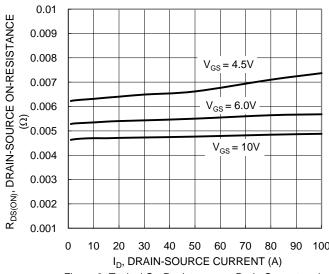


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

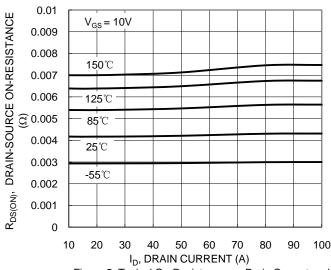


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

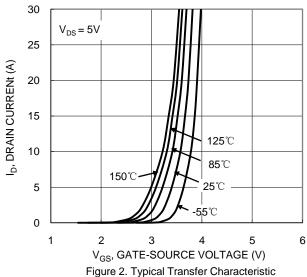


Figure 2. Typical Transfer Characteristic

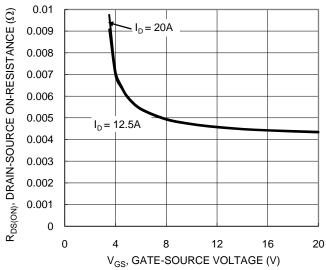


Figure 4. Typical Transfer Characteristic

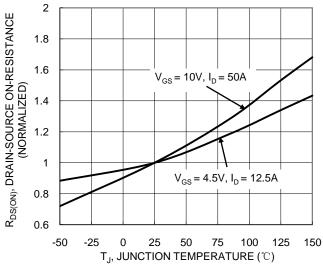


Figure 6. On-Resistance Variation with Junction Temperature



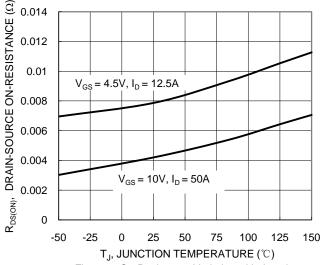
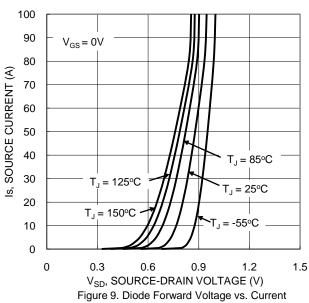
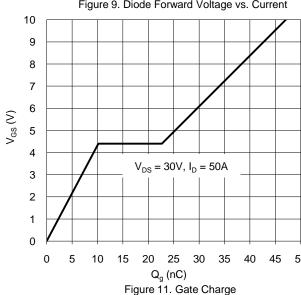


Figure 7. On-Resistance Variation with Junction Temperature





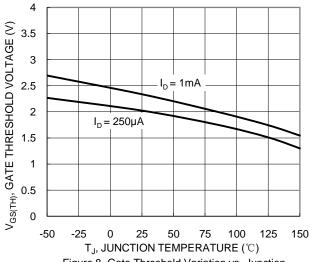
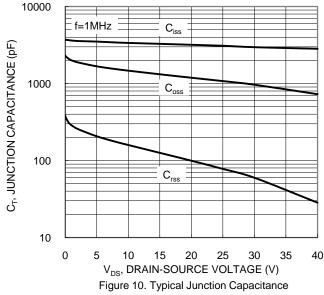
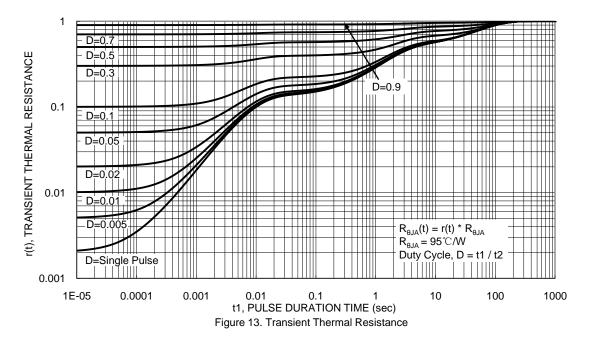


Figure 8. Gate Threshold Variation vs. Junction Temperature



100 $R_{DS(ON)}$ Limited 10 ID, DRAIN CURRENT (A) 1 P_W =1ms ^{...} P_w =10ms 0.1 $T_{J(Max)} = 150^{\circ}C \quad T_C = 25^{\circ}C$ Single Pulse DUT on 1*MRP Board $V_{GS} = 10V$ 0.01 0.01 100 V_{DS} , DRAIN-SOURCE VOLTAGE (V) Figure 12. SOA, Safe Operation Area





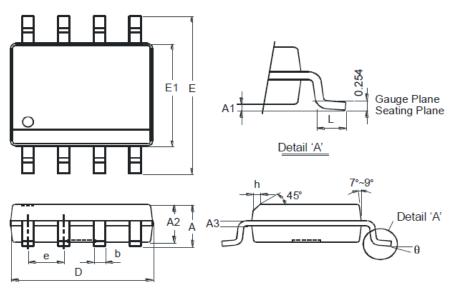


Package Outline Dimensions

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



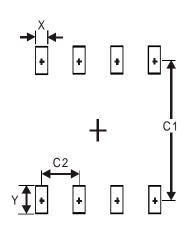
SO-8



SO-8				
Dim	Min	Max		
Α	-	1.75		
A 1	0.10	0.20		
A2	1.30	1.50		
А3	0.15	0.25		
b	0.3	0.5		
D	4.85	4.95		
Е	5.90	6.10		
E1	3.85	3.95		
е	1.27 Typ			
h	-	0.35		
L	0.62	0.82		
θ	0°	8°		
All Dimensions in mm				

Suggested Pad Layout

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



Dimensions	Value (in mm)
X	0.60
Y	1.55
C1	5.4
C2	1 27

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