



### 100V +175°C N-CHANNEL ENHANCEMENT MODE MOSFET

# **Product Summary**

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>C</sub> = +25°C	
100V	$5m\Omega @V_{GS} = 10V$	140A	

## **Description**

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

## **Applications**

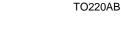
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

## **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
- High BV<sub>DSS</sub> Rating for Power Application
- Low Input/Output Leakage
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

### **Mechanical Data**

- Case: TO220AB
- 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 <sup>®</sup>
- Terminal Connections: See Diagram Below
- Weight: 1.85 grams (Approximate)

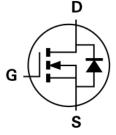




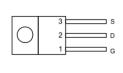




Bottom View



**Equivalent Circuit** 



Top View Pin Out Configuration

# Ordering Information (Note 4)

Part Number	Case	Packaging	
DMTH10H005LCT	TO220AB	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**



O | | = Manufacturer's Marking
H10H005 = 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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Drain-Source Voltage	$V_{DSS}$	100	V	
Gate-Source Voltage	$V_{GSS}$	±20	V	
Continuous Drain Current	$T_{C} = +25^{\circ}C$ $T_{C} = +100^{\circ}C$	I <sub>D</sub>	140 99	А
Maximum Continuous Body Diode Forward Current	$T_{C} = +25^{\circ}C$	Is	100	Α
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	150	Α	
Avalanche Current, L = 3mH (Note 7)	I <sub>AS</sub>	19	Α	
Avalanche Energy, L = 3mH (Note 7)	Eas	542	mJ	
Avalanche Current, L = 0.1mH	I <sub>AS</sub>	25	А	
Avalanche Energy, L = 0.1mH	E <sub>AS</sub>	31.2	mJ	

# **Thermal Characteristics**

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T <sub>A</sub> = +25°C	$P_{D}$	2.9	W
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	51	°C/W
Total Power Dissipation	T <sub>C</sub> = +25°C	P <sub>D</sub>	187	W
Thermal Resistance, Junction to Case		R <sub>0JC</sub>	0.8	°C/W
Operating and Storage Temperature Range	T <sub>J,</sub> T <sub>STG</sub>	-55 to +175	°C	

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

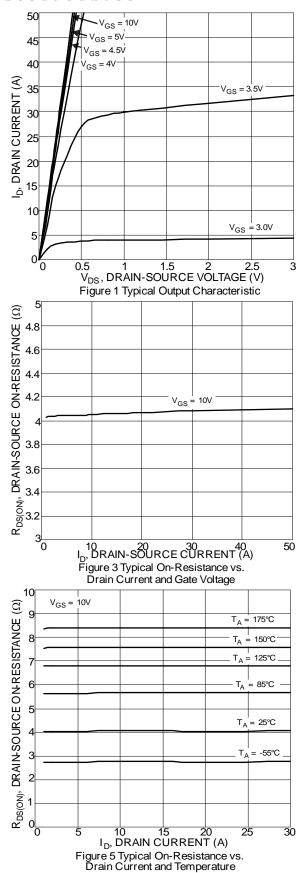
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 6)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	100	_	_	V	$V_{GS} = 0V$ , $I_D = 1mA$	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	l	_	1	μΑ	$V_{DS} = 80V, V_{GS} = 0V$	
Gate-Source Leakage	IGSS		_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 6)							
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.4	1.9	3.5	V	$V_{DS} = V_{GS}$ , $I_D = 250\mu A$	
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	l	4	5	mΩ	$V_{GS} = 10V, I_D = 13A$	
Diode Forward Voltage	$V_{SD}$		0.8	1.3	V	$V_{GS} = 0V, I_{S} = 13A$	
DYNAMIC CHARACTERISTICS (Note 7)							
Input Capacitance	Ciss	1	3688	_		$V_{DS} = 50V$ , $V_{GS} = 0V$ f = 1MHz	
Output Capacitance	Coss		1494	_	pF		
Reverse Transfer Capacitance	C <sub>rss</sub>	I	48	_			
Gate Resistance	R <sub>G</sub>	-	0.75	_	Ω	$V_{DS} = 0V$ , $V_{GS} = 0V$ , $f = 1MHz$	
Total Gate Charge	$Q_{G}$	_	114	_		$V_{DD} = 50V$ , $I_D = 13A$ , $V_{GS} = 10V$	
Gate-Source Charge	$Q_GS$	I	22.5	_	nC		
Gate-Drain Charge	$Q_{GD}$	l	17.6	_			
Turn-On Delay Time	t <sub>D(ON)</sub>	l	25	_		$V_{DD} = 50V, V_{GS} = 10V,$ $I_{D} = 13A, R_{G} = 6\Omega$	
Turn-On Rise Time	t <sub>R</sub>	l	26.9	_	ns		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	l	83.6	_	115		
Turn-Off Fall Time	t <sub>F</sub>	1	53.1	_			
Reverse Recovery Time	t <sub>RR</sub>		65.5		ns	I 13	
Reverse Recovery Charge	$Q_{RR}$	_	155.9	_	nC	-I <sub>F</sub> = 13A, di/dt = 100A/μs	

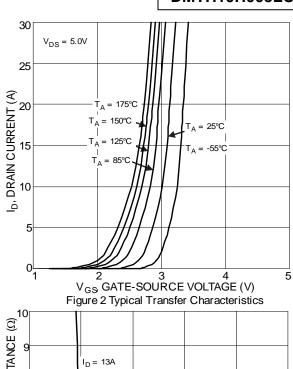
Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.

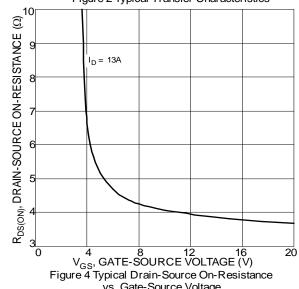
Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to product testing.

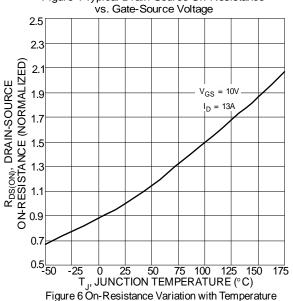






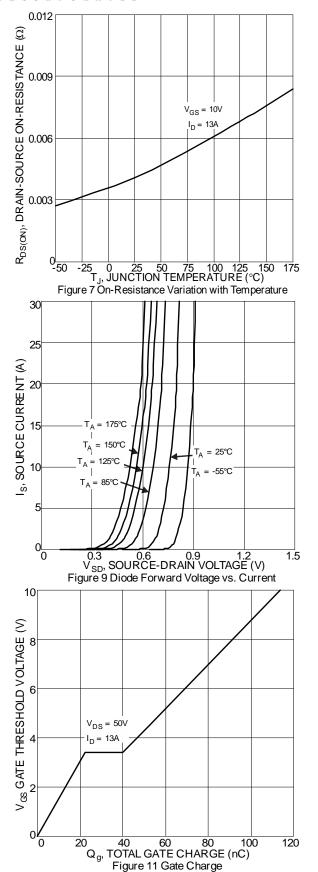


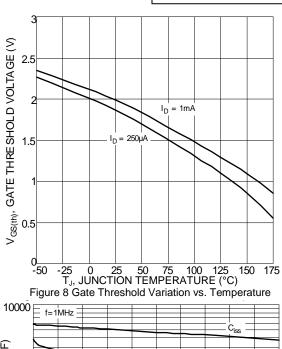


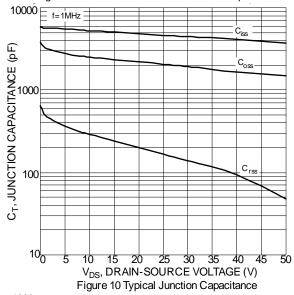


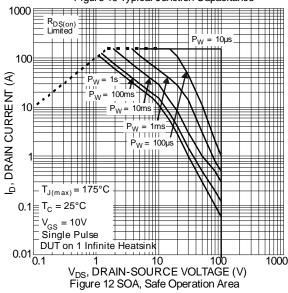




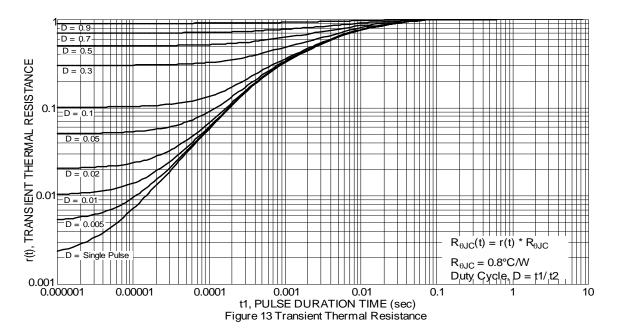










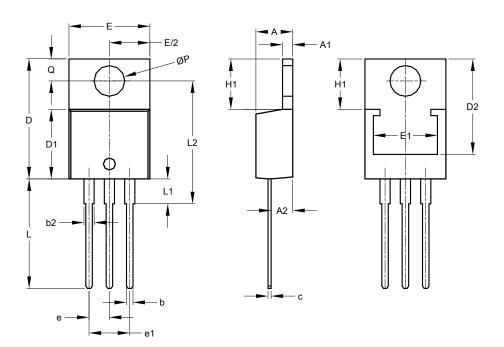




# **Package Outline Dimensions**

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

#### **TO220AB**



	TO220AB					
Dim	Min	Max	Тур			
Α	3.56	4.82	-			
<b>A</b> 1	0.51	1.39	-			
A2	2.04	2.92	-			
b	0.39	1.01	0.81			
b2	1.15	1.77	1.24			
С	0.356	0.61	-			
D	14.22	16.51	-			
D1	8.39	9.01	-			
D2	11.45	12.87	-			
е	•	•	2.54			
e1	-	-	5.08			
Е	9.66	10.66	ı			
E1	6.86	8.89	-			
H1	5.85	6.85	ı			
L	12.70	14.73	-			
L1	-	4.42	-			
L2	15.80	17.51	16.00			
Р	3.54	4.08	-			
Q	2.54	3.42	-			
All Dimensions in mm						



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