



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

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _C = +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

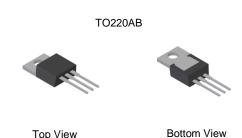
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

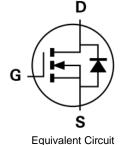
Features

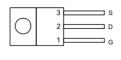
- Rated to +175°C Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching Ensures More Reliable and Robust End Application
- Low Input Capacitance
- High BV_{DSS} Rating for Power Application
- Low Input/Output Leakage
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen 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 (3)
- Terminal Connections: See Diagram Below
- Weight: 1.85 grams (Approximate)







Top View Pin Out Configuration

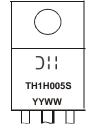
Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH10H005SCT	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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



TH1H005S = Product Type Marking Code
YYWW = Date Code Marking
YY or YY = Last Two Digits of Year (ex: 17 = 2017)
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}	100	V	
Gate-Source Voltage	V_{GSS}	±20	V	
Continuous Drain Current $ T_{C} = +25^{\circ}C $ $ T_{C} = +100^{\circ}C $		ΙD	140 99	А
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I _{DM}	400	Α
Maximum Continuous Body Diode Forward Current $T_C = +25^{\circ}C$		Is	100	Α
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)	I _{SM}	400	Α	
Avalanche Current, L = 3mH (Note 7)	I _{AS}	19	Α	
Avalanche Energy, L = 3mH (Note 7)	Eas	542	mJ	
Avalanche Current, L = 0.1mH	I _{AS}	25	Α	
Avalanche Energy, L = 0.1mH	E _{AS}	31.2	mJ	

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25$ °C	P_D	2.9	W
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	51	°C/W
Total Power Dissipation	$T_C = +25^{\circ}C$	P_{D}	187	W
Thermal Resistance, Junction to Case		$R_{ heta JC}$	0.8	°C/W
Operating and Storage Temperature Range		T _{J,} T _{STG}	-55 to +175	°C

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

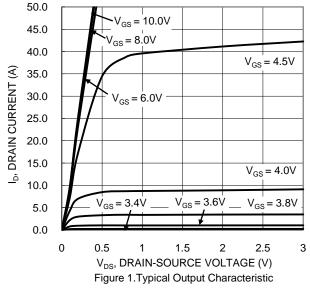
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 6)							
Drain-Source Breakdown Voltage	BV _{DSS}	100	_	_	V	$V_{GS} = 0V$, $I_D = 1mA$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μA	V _{DS} = 80V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 6)							
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)}	_	3.8	5	mΩ	$V_{GS} = 10V, I_D = 13A$	
Diode Forward Voltage	V _{SD}	_	_	1.3	V	V _{GS} = 0V, I _S = 13A	
DYNAMIC CHARACTERISTICS (Note 7)							
Input Capacitance	CISS	_	8,474	_	pF	$V_{DS} = 50V$, $V_{GS} = 0V$ f = 1MHz	
Output Capacitance	Coss	_	1,608	_			
Reverse Transfer Capacitance	C _{RSS}	_	78	_			
Gate Resistance	R_g	_	0.41	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge	Q_{G}	_	111.7	_		V _{DD} = 50V, I _D = 13A, V _{GS} = 10V	
Gate-Source Charge	Q _{GS}	_	28.9	_	nC		
Gate-Drain Charge	Q_GD	_	21.3	_			
Turn-On Delay Time	t _{D(ON)}	_	29.9	_		$V_{DD} = 50V, V_{GS} = 10V,$ $I_{D} = 13A, R_{g} = 6\Omega$	
Turn-On Rise Time	t _R	_	30.3	_			
Turn-Off Delay Time	t _{D(OFF)}	_	79.7	_	ns		
Turn-Off Fall Time	t _F	_	41.6				
Reverse Recovery Time	t _{RR}	_	70	_	ns	1 404 31/31 4004/	
Reverse Recovery Charge	Q _{RR}	_	181	_	$_{\rm nC}$ $I_{\rm F} = 13A$, $di/dt = 100A/\mu s$		

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.







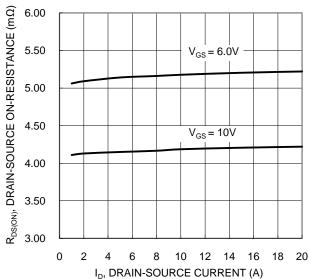


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

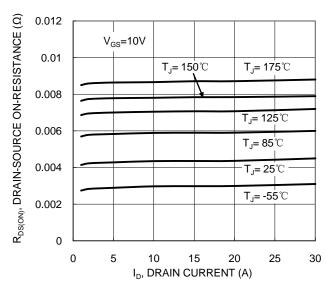


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

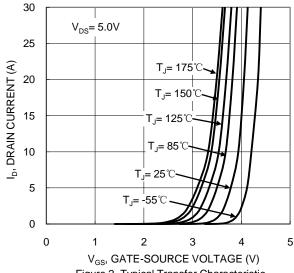
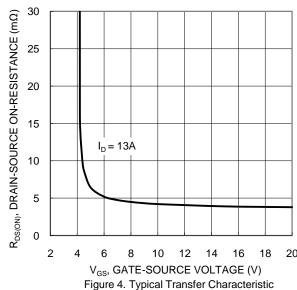


Figure 2. Typical Transfer Characteristic



2.2 2 1.8 NOWALIZED 1.6 OBANALIZED 1.4 NGS = 10V, I_D = 13A V_{GS} = 6.0V, I_D = 13A V_{GS} = 6.0V, I_D = 13A

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 T_J , JUNCTION TEMPERATURE (${}^{\circlearrowright}$) Figure 6. On-Resistance Variation with Temperature

-50 -25

50 75 100 125 150 175



DMTH10H005SCT

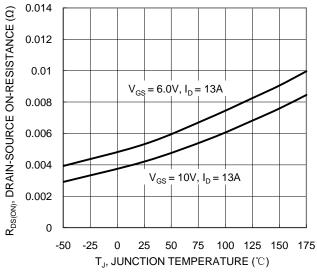


Figure 7. On-Resistance Variation with Temperature

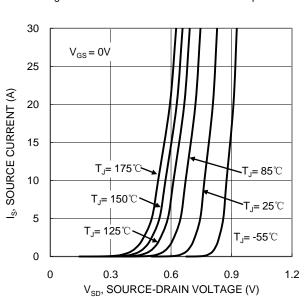
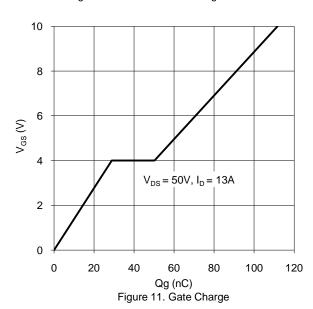


Figure 9. Diode Forward Voltage vs. Current



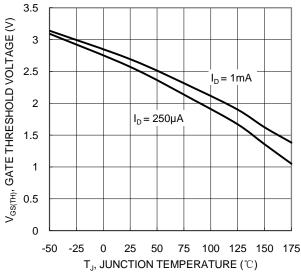
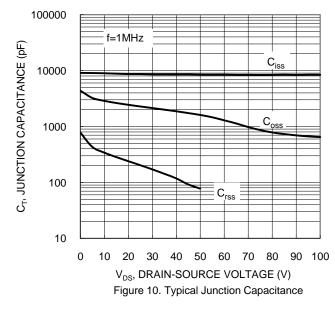
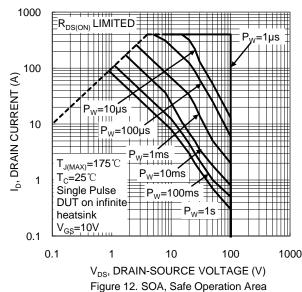


Figure 8. Gate Threshold Variation vs. Temperature







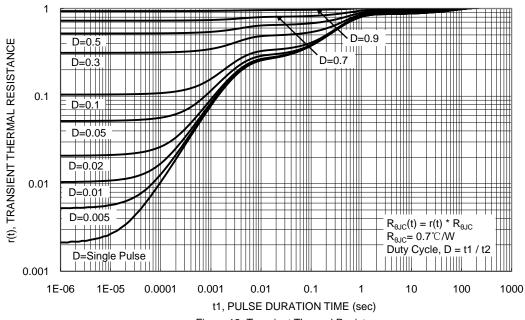
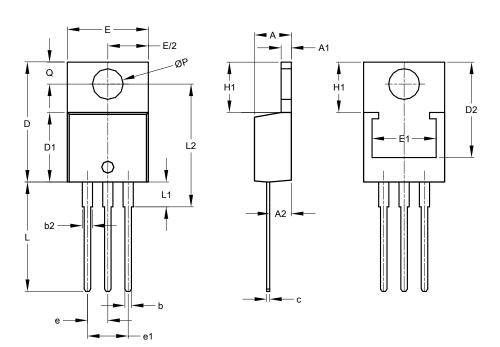


Figure 13. Transient Thermal Resistance

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	-		
A1	0.51	1.39	-		
A2	2.04	2.92	-		
b	0.39	1.01	0.81		
b2	1.15	1.77	1.24		
C	0.356	0.61	-		
ם	14.22	16.51	1		
D1	8.39	9.01	-		
D2	11.45	12.87	-		
е	-	-	2.54		
e1	-	-	5.08		
Е	9.66	10.66	-		
E1	6.86	8.89	1		
Ħ	5.85	6.85	1		
ш	12.70	14.73	1		
L1	-	4.42	-		
L2	15.80	17.51	16.00		
P	3.54	4.08	-		
ø	2.54	3.42	-		
All Dimensions in mm					



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