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

Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D T_C = +25°C
100V	5mΩ @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.

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)**

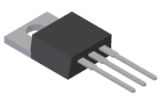
Applications

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

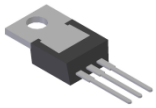
Mechanical Data

- 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)

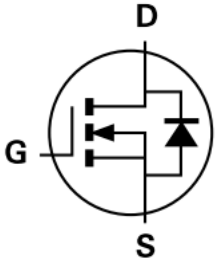
TO220AB



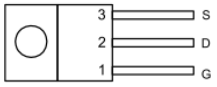
Top View



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.
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
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)

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Maximum Ratings (@T_A = +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°C T_C = +100°C	I_D	140 99	A
Maximum Continuous Body Diode Forward Current	T_C = +25°C	I_S	100	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I_{DM}	150	A
Avalanche Current, L = 3mH (Note 7)		I_{AS}	19	A
Avalanche Energy, L = 3mH (Note 7)		E_{AS}	542	mJ
Avalanche Current, L = 0.1mH		I_{AS}	25	A
Avalanche Energy, L = 0.1mH		E_{AS}	31.2	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Units
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°C	P_D	187	W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	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	Typ	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} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(TH)}$	1.4	1.9	3.5	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	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	C_{iss}	—	3688	—	pF	V_{DS} = 50V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	1494	—		
Reverse Transfer Capacitance	C_{rss}	—	48	—		
Gate Resistance	R_G	—	0.75	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_G	—	114	—	nC	V_{DD} = 50V, I_D = 13A, V_{GS} = 10V
Gate-Source Charge	Q_{GS}	—	22.5	—		
Gate-Drain Charge	Q_{GD}	—	17.6	—		
Turn-On Delay Time	$t_{D(ON)}$	—	25	—	ns	V_{DD} = 50V, V_{GS} = 10V, I_D = 13A, R_G = 6Ω
Turn-On Rise Time	t_R	—	26.9	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	83.6	—		
Turn-Off Fall Time	t_F	—	53.1	—		
Reverse Recovery Time	t_{RR}	—	65.5	—	ns	I_F = 13A, di/dt = 100A/µs
Reverse Recovery Charge	Q_{RR}	—	155.9	—	nC	

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

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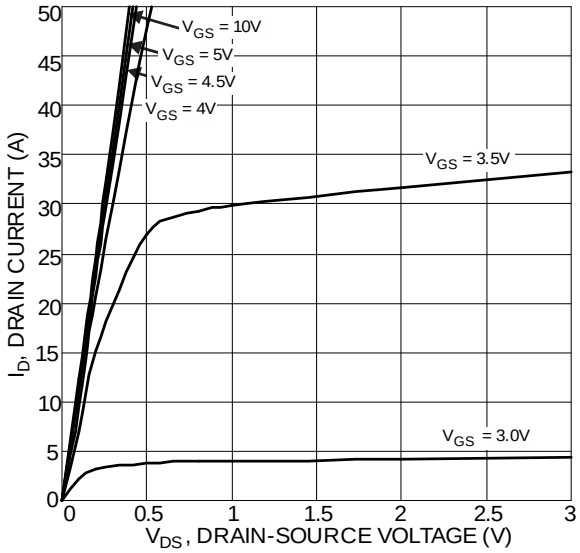


Figure 1 Typical Output Characteristic

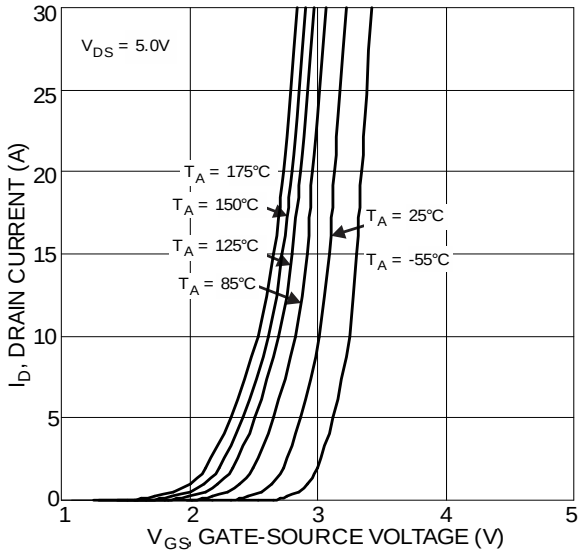


Figure 2 Typical Transfer Characteristics

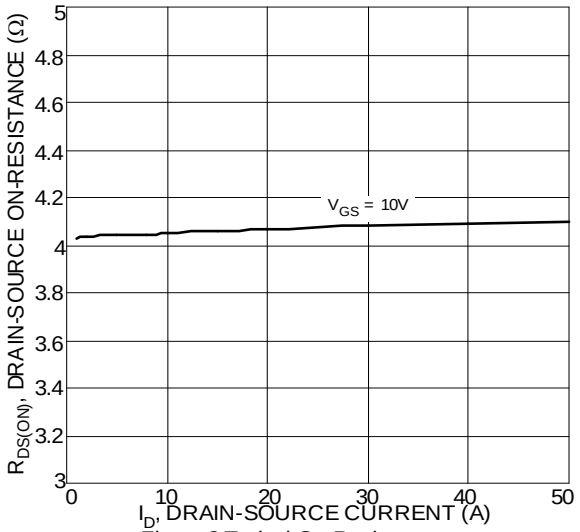


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

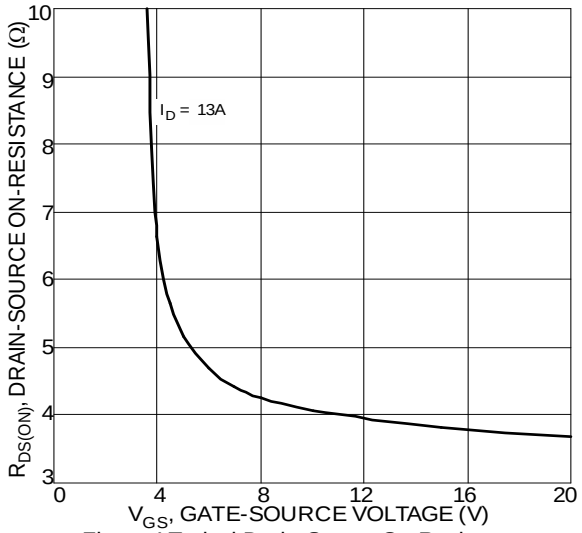


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

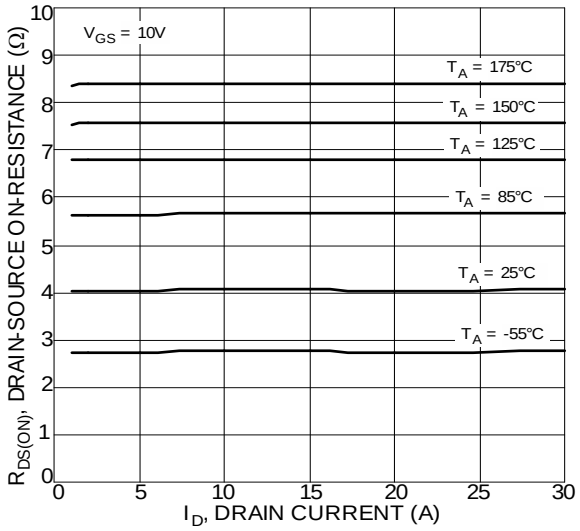


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

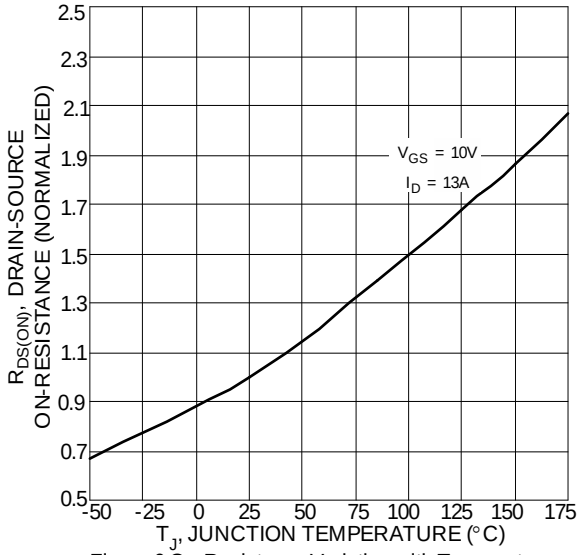


Figure 6 On-Resistance Variation with Temperature

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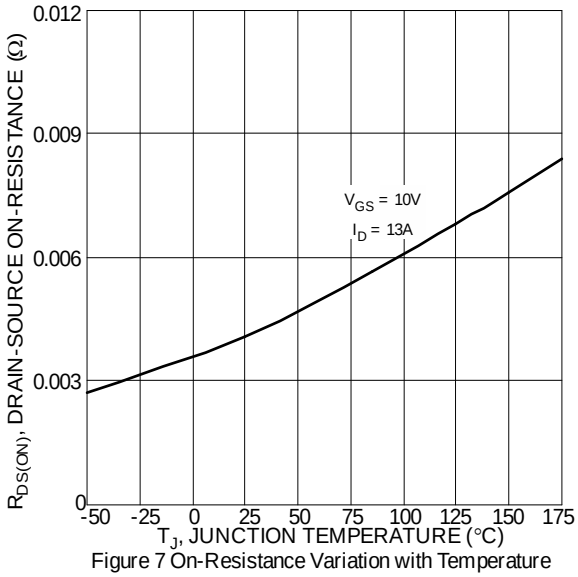


Figure 7 On-Resistance Variation with Temperature

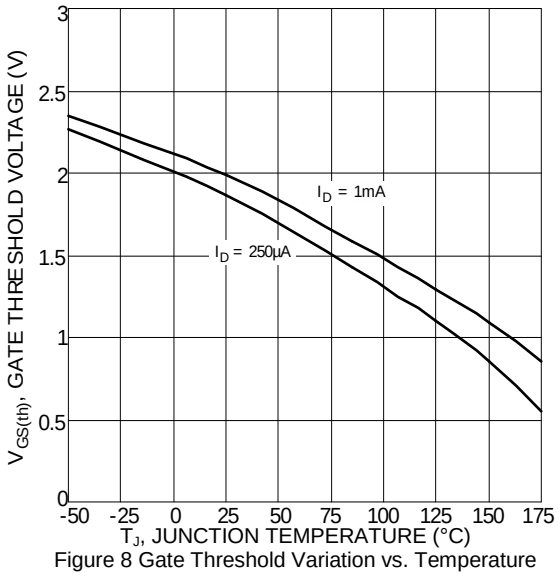


Figure 8 Gate Threshold Variation vs. Temperature

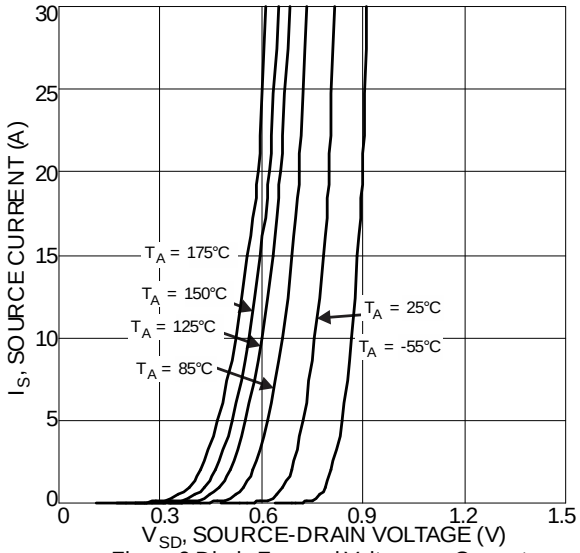


Figure 9 Diode Forward Voltage vs. Current

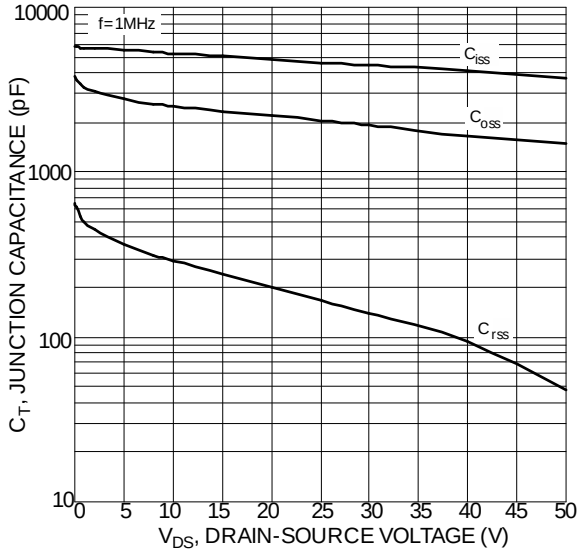


Figure 10 Typical Junction Capacitance

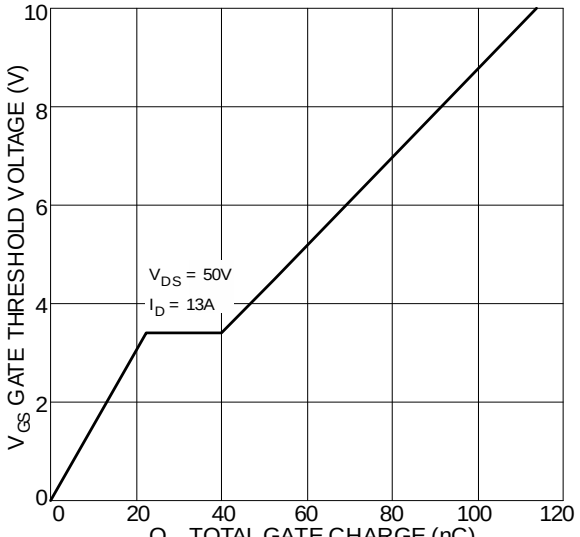


Figure 11 Gate Charge

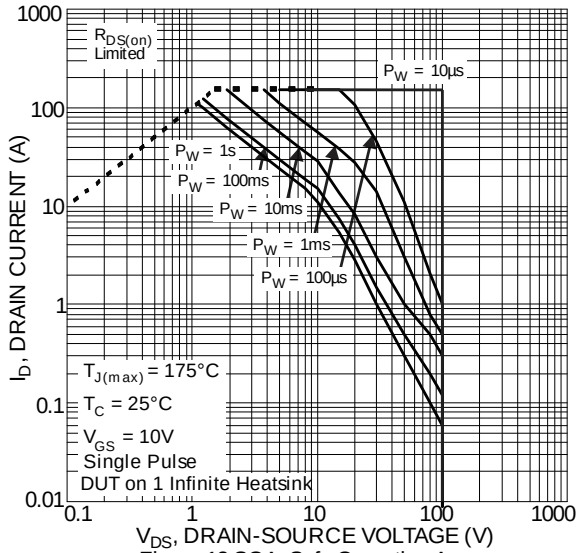


Figure 12 SOA, Safe Operation Area

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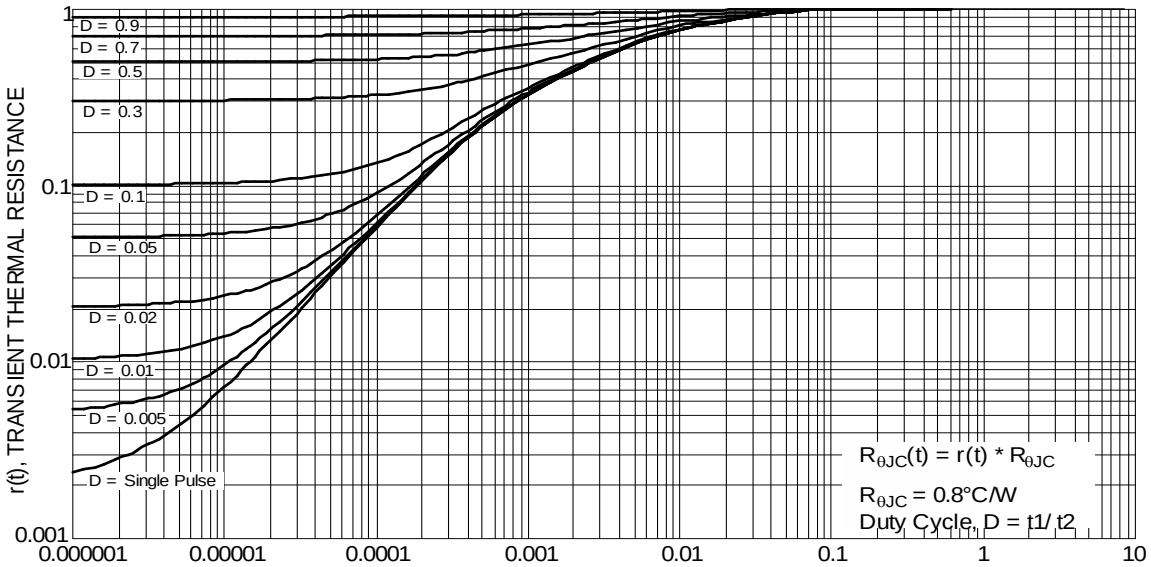


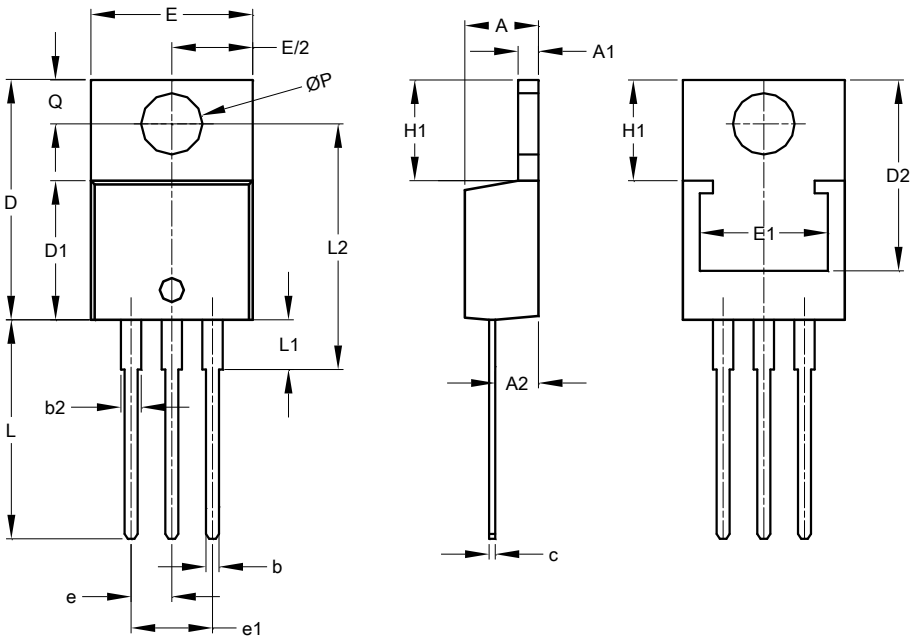
Figure 13 Transient Thermal Resistance

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Package Outline Dimensions

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

TO220AB



TO220AB			
Dim	**Min**	**Max**	**Typ**
A	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	-
D	14.22	16.51	-
D1	8.39	9.01	-
D2	11.45	12.87	-
e	-	-	2.54
e1	-	-	5.08
E	9.66	10.66	-
E1	6.86	8.89	-
H1	5.85	6.85	-
L	12.70	14.73	-
L1	-	4.42	-
L2	15.80	17.51	16.00
P	3.54	4.08	-
Q	2.54	3.42	-
All Dimensions in mm			

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