



40V +175°C N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	Rds(on)	Ι _D T _C = +25°C	
40V	4.0mΩ @ V _{GS} = 10V	150A	

Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

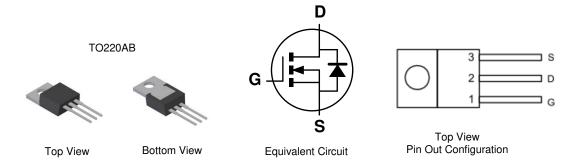
- Motor Control
- Backlighting
- **DC-DC Converters**
- **Power Management Functions**

Features

- 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
- PPAP Capable (Note 4)

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)



Ordering Information (Note 5)

Part Number DMNH4005SCTQ		Case	Packaging 50 Pieces/Tube				
		TO220AB					
Notes:	s: 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.						

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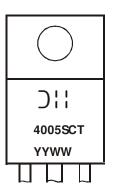
2. See http://www.diodes.com/guality/lead free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.

3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + CI) and <1000ppm antimony compounds.

4. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html.

5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



4005SCT = Product Type Marking Code YYWW = Date Code Marking YY = Last Two Digits of Year (ex: 16 = 2016) WW = Week (01 to 53)



Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit		
Drain-Source Voltage	V _{DSS}	40	V		
Gate-Source Voltage	V _{GSS}	20	V		
Continuous Drain Current V _{GS} = 10V	Steady State	$T_{C} = +25^{\circ}C$ $T_{C} = +100^{\circ}C$	ID	150 100	А
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	90	A		
Maximum Continuous Body Diode Forward Current	Is	80	A		
Avalanche Current (Note 7) L=1mH	las	30	A		
Avalanche Energy (Note 7) L=1mH	E _{AS}	500	mJ		

Thermal Characteristics

Characteristic		Symbol	Value	Unit	
Dower Dissinction	$T_{\rm C} = +25^{\circ}{\rm C}$	D	165	w	
Power Dissipation	T _C = +70°C	PD	100	vv	
Thermal Resistance, Junction to Case		R _{eJC}	0.9	°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 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	40	—		V	$V_{GS} = 0V, I_D = 250 \mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	—	1	μΑ	$V_{DS}=32V,V_{GS}=0V$	
Gate-Source Leakage	I _{GSS}	_	—	±100	nA	$V_{GS}=\pm 16V, \ V_{DS}=0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	V _{GS(TH)}	1	_	3	V	$V_{DS} = V_{GS}, I_D = 250 \mu A$	
Static Drain-Source On-Resistance	R _{DS(ON)}	—	3.4	4.0	mΩ	$V_{GS} = 10V, I_D = 20A$	
Diode Forward Voltage	V _{SD}	_	-	1.2	V	$V_{GS} = 0V, I_S = 1A$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	Ciss	—	2,846	—			
Output Capacitance	Coss	_	742	_	pF	$V_{DS} = 20V, V_{GS} = 0V$ f = 1.0MHz	
Reverse Transfer Capacitance	C _{rss}	_	242	_			
Gate Resistance	R _G	_	1.9	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$	
Total Gate Charge (V _{GS} = 10V)	Qg	_	48	_		$V_{DD} = 20V, I_D = 20A$	
Total Gate Charge (V _{GS} = 4.5V)	Qg	—	23	—	nC		
Gate-Source Charge	Q _{gs}	_	9.5	_	10		
Gate-Drain Charge	Q _{gd}	_	11.5	_			
Turn-On Delay Time	t _{D(ON)}	_	6.6	_		$\label{eq:VDD} \begin{split} V_{DD} &= 20V, \ V_{GS} = 10V, \\ R_G &= 1\Omega, \ I_D = 20A \end{split}$	
Turn-On Rise Time	t _R	_	12.1	_			
Turn-Off Delay Time	tD(OFF)	_	18.3		ns		
Turn-Off Fall Time	t _F	_	4.9	_	<u> </u>		
Reverse Recovery Time	t _{RR}	—	29		ns		
Reverse Recovery Charge	Q _{RR}	—	24		nC	I _F = 15A, di/dt = 100A/μs	

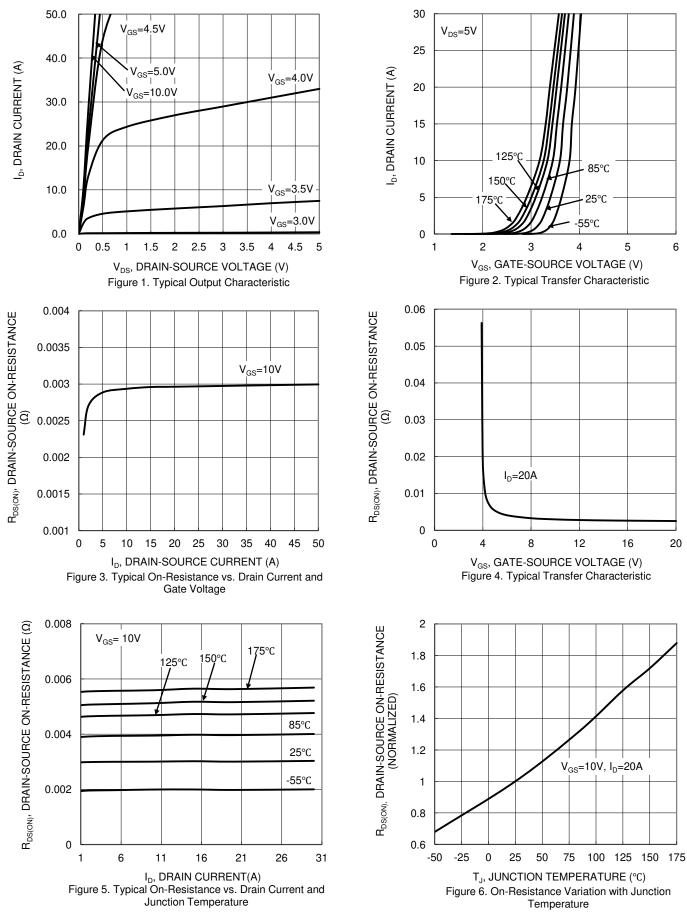
Notes:

6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided. 7. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep $T_J = +25^{\circ}C$.

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



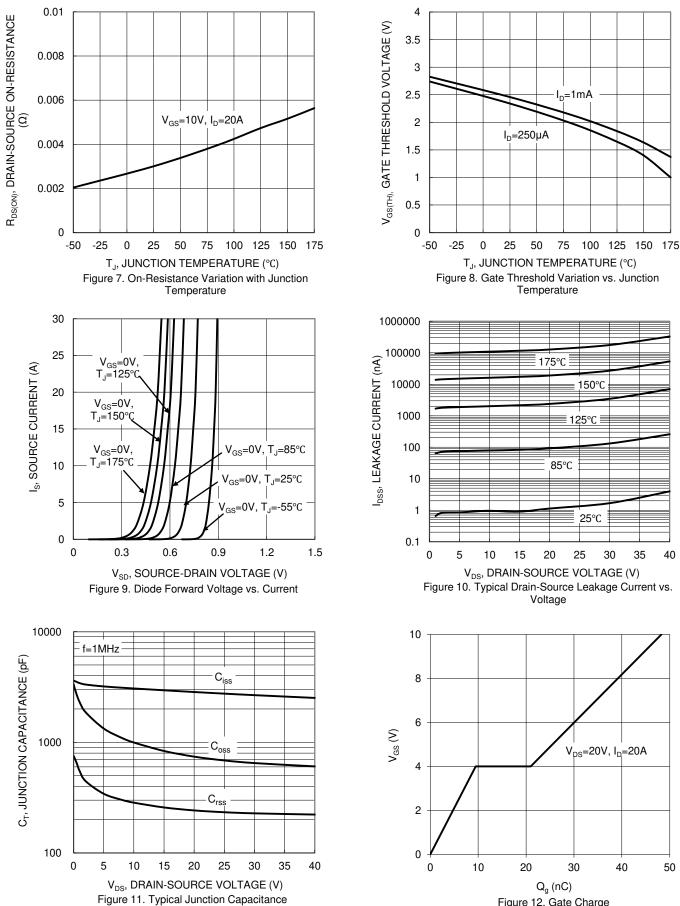
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DMNH4005SCTQ Document number: DS38859 Rev. 1 - 2



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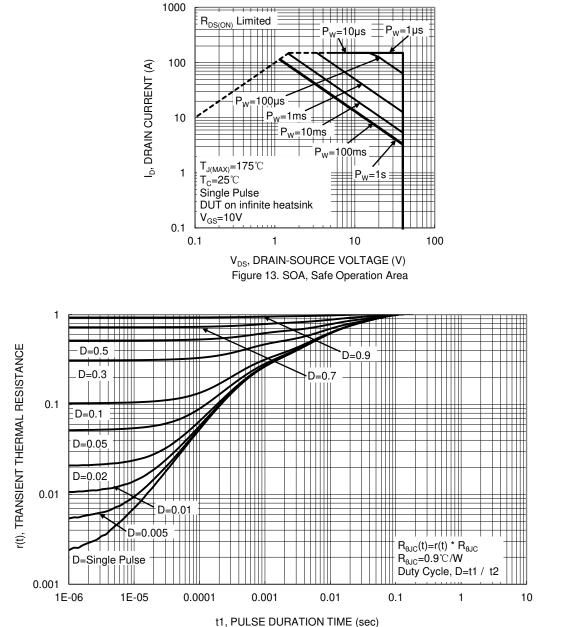
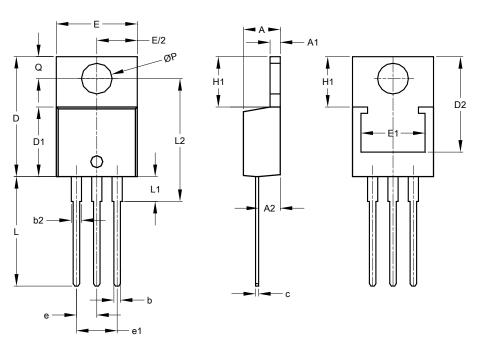


Figure 14. Transient Thermal Resistance



Package Outline Dimensions

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



TO220AB						
Dim	Min	Max	Тур			
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			
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	-			
E1	6.86	8.89	-			
H1	5.85	6.85	-			
L	12.70	14.73	-			
L1	-	6.35	-			
L2	15.80	16.20	16.00			
Ρ	3.54	4.08	-			
Q	2.54	3.42	-			
All Dimensions in mm						

TO220AB



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