



N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)}	Package	I _D T _C = +25°C
650V	1.4Ω@V _{GS} = 10V	TO220AB (Type TH)	7.7A

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

- 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 (Type TH)
- 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 [®]
- Terminal Connections: See Diagram Below
- Weight: 1.85 grams (Approximate)

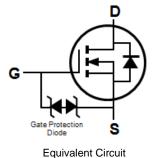
TO220AB (Type TH)

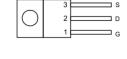












Top View
Pin Out Configuration

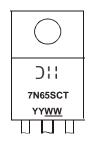
Ordering Information (Note 4)

Part Number	Case	Packaging	
DMG7N65SCT	TO220AB (Type TH)	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



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

Characteristic	Symbol	Value	Units		
Drain-Source Voltage	V _{DSS}	650	V		
Gate-Source Voltage	V _{GSS}	±30	V		
Continuous Drain Current (Note 5) V _{GS} = 10V	Steady State	$T_{C} = +25^{\circ}C$ $T_{C} = +100^{\circ}C$	I _D	7.7 4.8	А
Maximum Body Diode Forward Current (Note 5)	I _S	10	Α		
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I _{DM}	10	Α		
Avalanche Current, L = 60mH (Note 6)	I _{AS}	1.1	Α		
Avalanche Energy, L = 60mH (Note 6)			E _{AS}	42	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Units		
Total Dower Dissination (Note 5)	$T_C = +25^{\circ}C$	0	125	W	
Total Power Dissipation (Note 5)	T _C = +100°C	P_{D}	50] VV	
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	50	°C // //		
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	1	°C/W		
Operating and Storage Temperature Range	$T_{J_i}T_{STG}$	-55 to +150	°C		

Electrical Characteristics (@ $T_A = \pm 25^{\circ}C$, unless otherwise specified.)

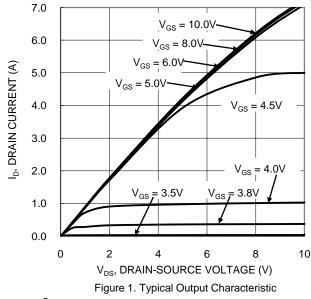
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV _{DSS}	650	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}			1	μΑ	$V_{DS} = 650V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}			10	μΑ	$V_{GS} = \pm 24V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
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)}		1.1	1.4	Ω	$V_{GS} = 10V, I_D = 2.5A$	
Diode Forward Voltage	V_{SD}	_	0.8	1.5	V	$V_{GS} = 0V, I_{S} = 5A$	
DYNAMIC CHARACTERISTICS (Note 6)							
Input Capacitance	Ciss		886	_	pF	V _{DS} = 50V, f = 1.0MHz, V _{GS} = 0	
Output Capacitance	Coss	_	63	_			
Reverse Transfer Capacitance	Crss	_	8.9	_			
Gate Resistance	R_{G}	_	1.4	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1.0MHz$	
Total Gate Charge (V _{GS} = 10V)	Qg	_	25.2	_		V _{DS} = 480V, I _D = 5A, V _{GS} = 10V	
Gate-Source Charge	Q _{gs}	_	3.5	_	nC		
Gate-Drain Charge	Q_{gd}	_	12.4	_			
Turn-On Delay Time	t _{D(ON)}	_	10	_		$V_{DS} = 300V, R_G = 4.7\Omega, I_D = 2.5A, V_{GS} = 10V$	
Turn-On Rise Time	t _R	_	11	_			
Turn-Off Delay Time	t _{D(OFF)}	_	36	_	ns		
Turn-Off Fall Time	t _F	_	15	_			
Body Diode Reverse Recovery Time	t _{RR}	_	271	_	ns	V 00V I 54 dVd 4004 (
Body Diode Reverse Recovery Charge	Q _{RR}		1908	_	μC	$V_{DS} = 60V$, $I_F = 5A$, $dI/dt = 100A/\mu s$	

Notes:

- 5. Device mounted on an infinite heatsink.
- Guaranteed by design. Not subject to production testing.
 Short duration pulse test used to minimize self-heating effect.







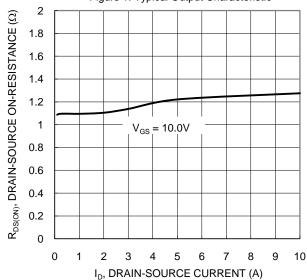
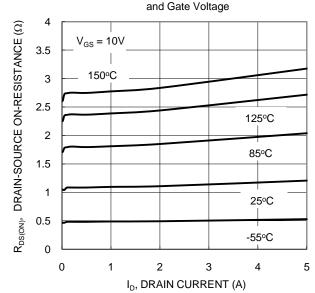


Figure 3. Typical On-Resistance vs. Drain Current



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

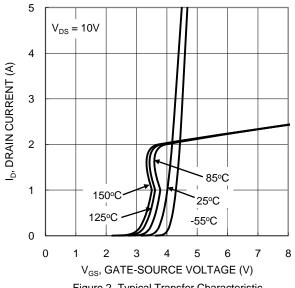


Figure 2. Typical Transfer Characteristic

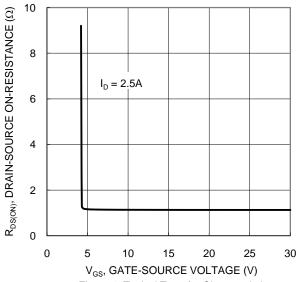


Figure 4. Typical Transfer Characteristic

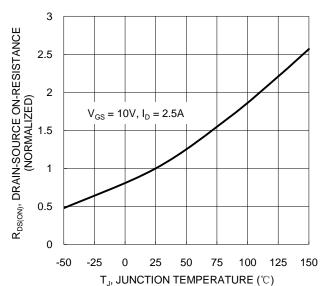


Figure 6. On-Resistance Variation with Junction Temperature





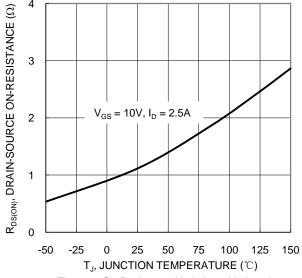
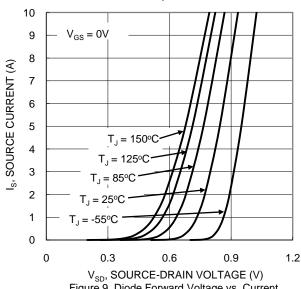
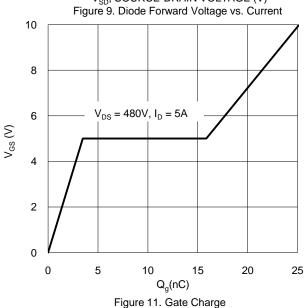


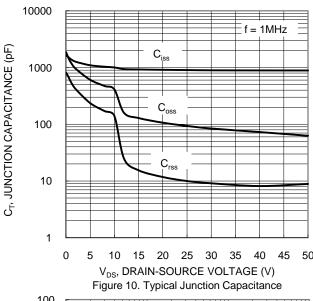
Figure 7. On-Resistance Variation with Junction Temperature

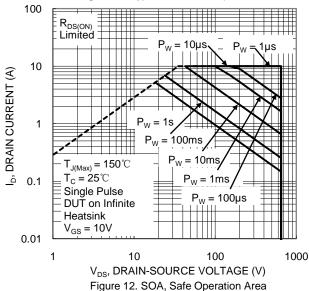




5 $V_{\text{GS(TH)}},$ GATE THRESHOLD VOLTAGE (V) 4 $I_D = 1mA$ 3 $I_{D} = 250 \mu A$ 2 1 0 -25 75 100 125 -50 0 25 50 150 T_J , JUNCTION TEMPERATURE (°C)

Figure 8. Gate Threshold Variation vs. Junction Temperature







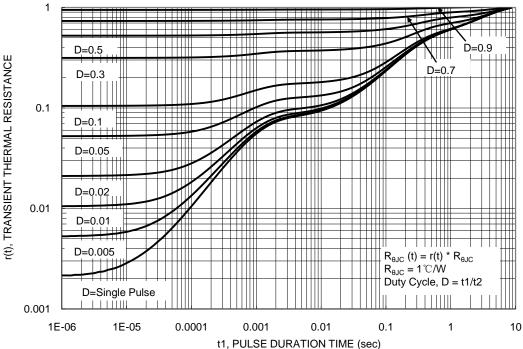


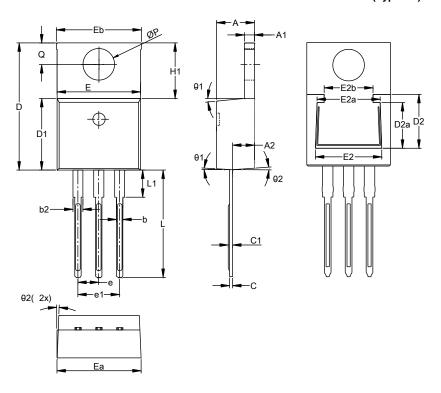
Figure 13. Transient Thermal Resistance



Package Outline Dimensions

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

TO220AB (Type TH)



TO220AB (Type TH)						
Dim	Min					
Α	4.27	4.87	4.57			
A1	1.12	1.42	1.27			
A2	2.39	2.99	2.69			
b	0.70	1.01	0.81			
b2	1.17	1.50	1.27			
С	0.30	0.53	0.38			
c1	0.38	0.72	0.56			
D	14.60	15.40	15.00			
D1	8.40	9.00	8.70			
D2	5.33	6.63	6.33			
D2a	4.54 5.84 5.54					
е	2.54 BSC					
e1		5.08 BSC				
Е	9.88	10.50	10.16			
Ea	9.90	10.45	10.10			
Eb	9.90	10.65	10.25			
E2	7.06	8.36	8.06			
E2a	6.67	7.97	7.67			
E2b	4.94	6.24	5.94			
H1	5.70	6.65	6.30			
L	13.00	13.80	13.40			
L1	-	4.10	3.75			
Q	2.50	2.99	2.74			
ØΡ	3.70	3.99	3.84			
θ1	4°	10° 7°				
θ2	0°	0° 6° 3°				
All Dimensions in mm						



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