Product Summary

BV_{DSS}	$R_{DS(ON)\ MAX}$	Package	$I_{D\ MAX}$ T_C = +25°C
650V	1.3Ω @ V_{GS} = 10V	TO220AB	9.0A

Description

This new generation complementary dual 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

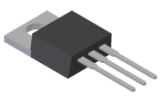
Features

- 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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

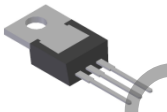
Mechanical Data

- 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 e3
- Terminal Connections: See Diagram Below
- Weight: TO220AB = 1.85 grams (Approximate)

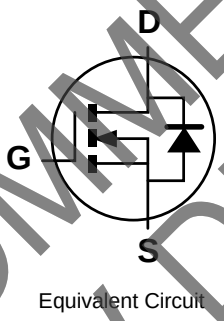
TO220AB



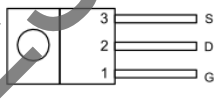
Top View



Bottom View



Equivalent Circuit



Top View
Pin Out Configuration

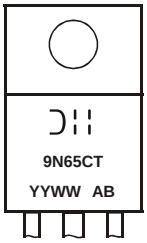
Ordering Information (Note 4)

Part Number	Case	Packaging
DMG9N65CT	TO220AB	50 Pieces/Tube

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ 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

TO220AB



9N65CT = Product Type Marking Code
AB = Foundry and Assembly Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 19 = 2019)
WW = Week (01 to 53)

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

Characteristic			Symbol	Value	Unit
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°C T_C = +70°C	I_D	9.0 7.0	A
Pulsed Drain Current (Note 6) 10µs Pulse, Pulse Duty Cycle<=1%			I_{DM}	30	A
Avalanche Current (Note 7) V_{DD} = 100V, V_{GS} = 10V, L = 60mH			I_{AR}	2.7	A
Repetitive Avalanche Energy (Note 7) V_{DD} = 100V, V_{GS} = 10V, L = 60mH			E_{AR}	260	mJ

Thermal Characteristics

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 5) T_C = +25°C T_C = +70°C	P_D	165 100	W
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	0.7	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	650	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	1.0	µA	V_{DS} = 650V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±30V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	3	—	5	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	0.7	1.3	Ω	V_{GS} = 10V, I_D = 4.5A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	8.5	—	S	V_{DS} = 40V, I_D = 4.5A
Diode Forward Voltage	V_{SD}	—	0.7	1.0	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	2,310	—	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	122	—		
Reverse Transfer Capacitance	C_{rss}	—	2.2	—		
Gate Resistance	R_g	—	2.2	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_g	—	39	—	nC	V_{GS} = 10V, V_{DS} = 520V, I_D = 8A
Gate-Source Charge	Q_{gs}	—	8.5	—		
Gate-Drain Charge	Q_{gd}	—	11.9	—		
Turn-On Delay Time	$t_{D(ON)}$	—	39	—	ns	V_{GS} = 10V, V_{DS} = 325V, R_g = 25Ω, I_D = 8A
Turn-On Rise Time	t_R	—	29	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	122	—	ns	
Turn-Off Fall Time	t_F	—	28	—	ns	
Body Diode Reverse Recovery Time	t_{RR}	—	570	—	ns	dI/dt = 100A/µs, V_{DS} = 100V, I_F = 8A
Body Diode Reverse Recovery Charge	Q_{RR}	—	4.17	—	µC	

Notes:
5. Device mounted on an infinite heatsink.
6. Repetitive rating, pulse width limited by junction temperature.
7. I_{AR} and E_{AR} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to production testing.

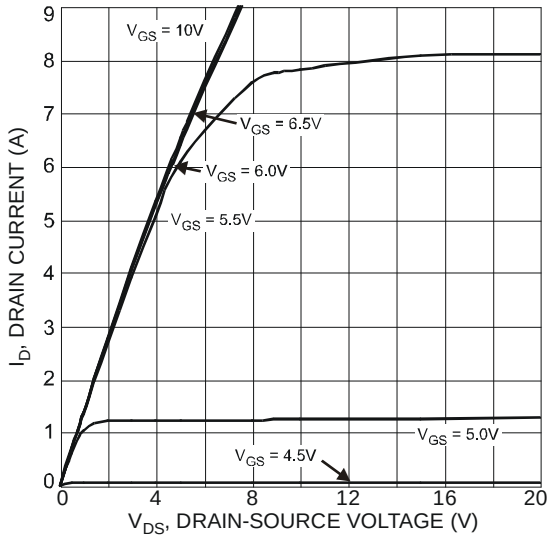


Fig. 1 Typical Output Characteristic

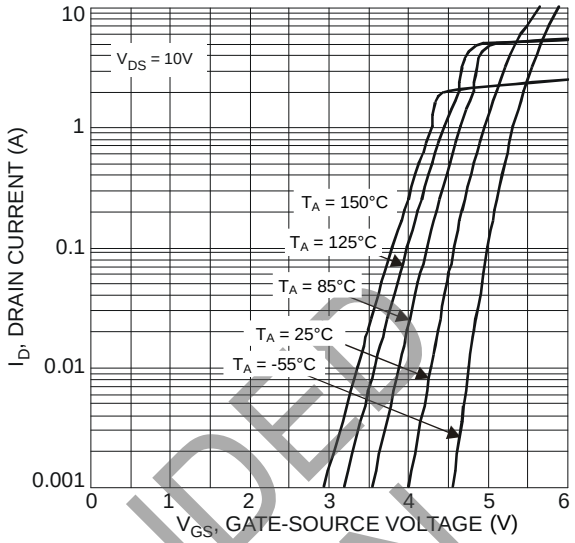


Fig. 2 Typical Transfer Characteristics

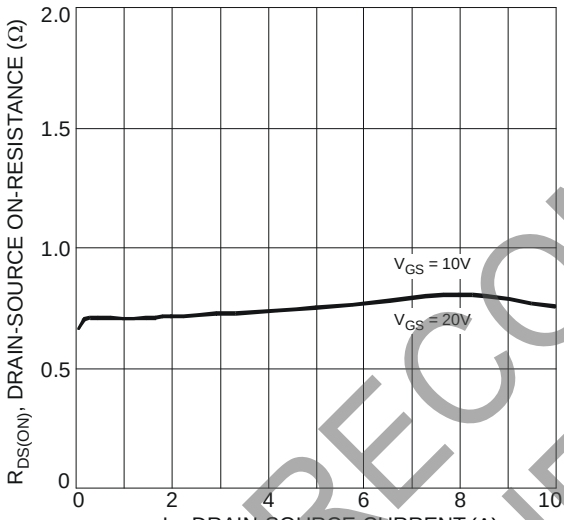


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

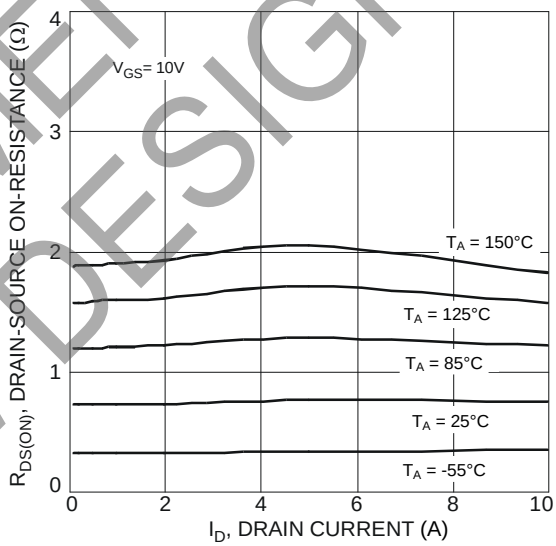


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

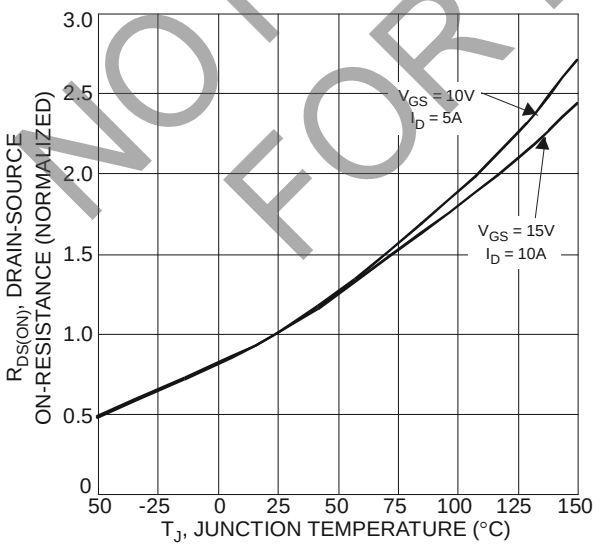


Fig. 5 On-Resistance Variation with Temperature

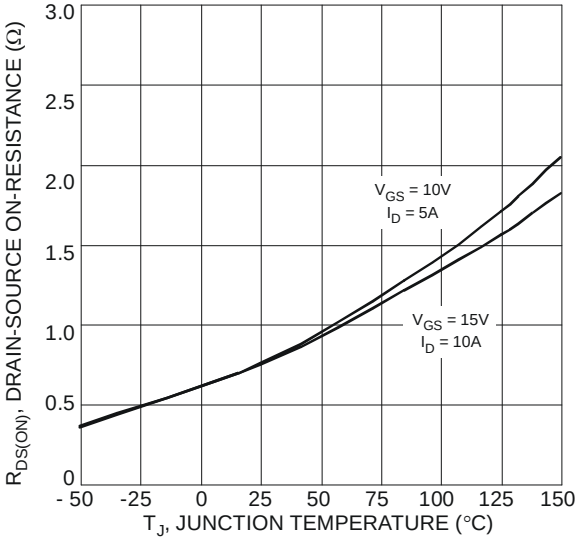


Fig. 6 On-Resistance Variation with Temperature

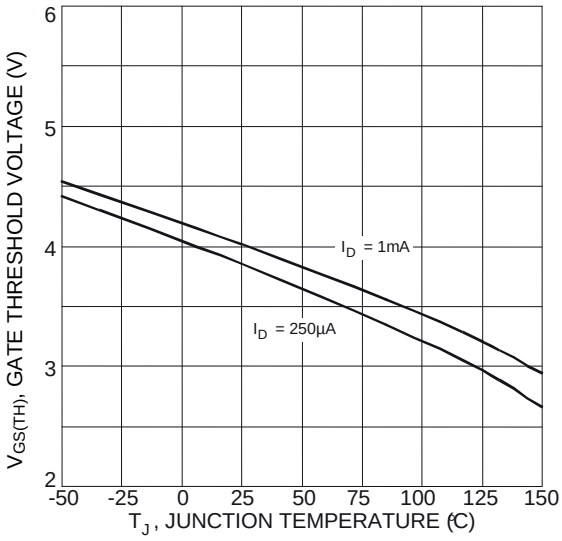


Fig. 7 Gate Threshold Variation vs. Junction Temperature

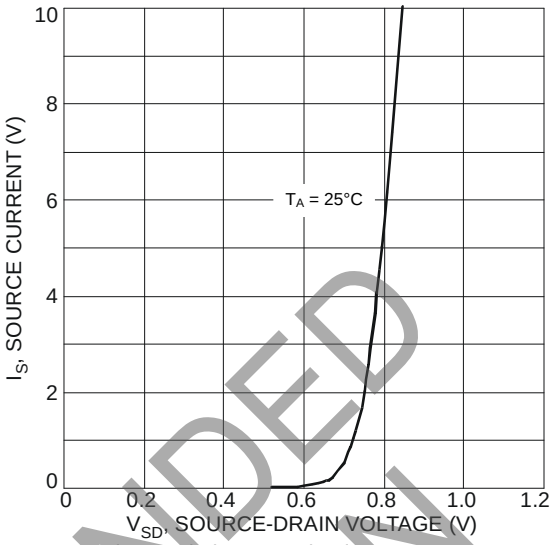


Fig. 8 Diode Forward Voltage vs. Current

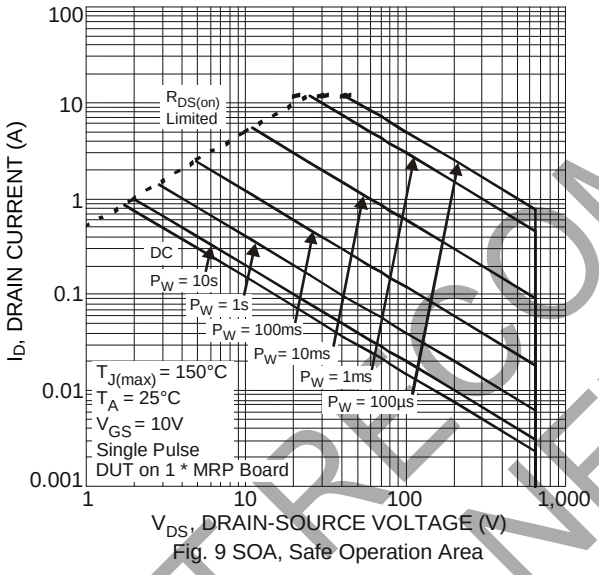


Fig. 9 SOA, Safe Operation Area

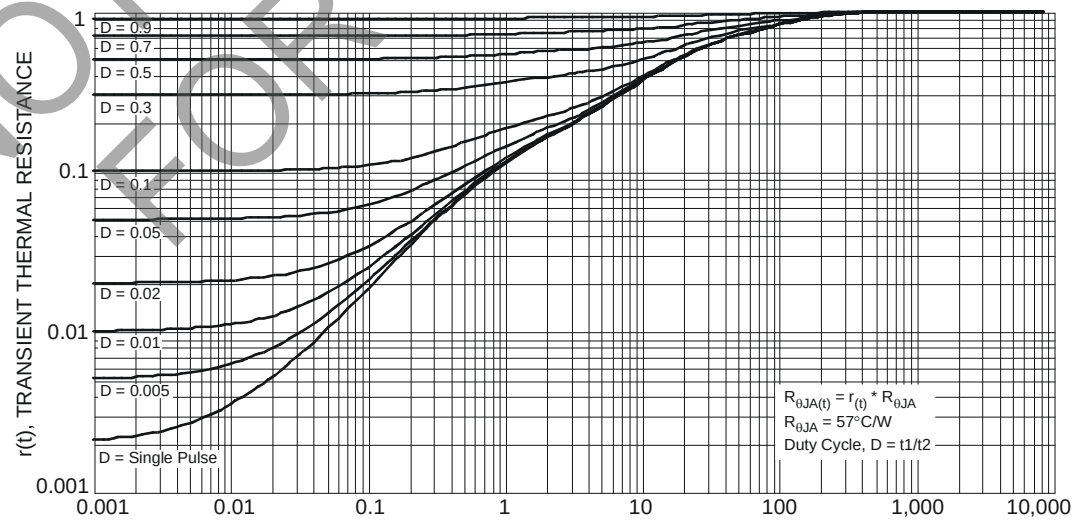
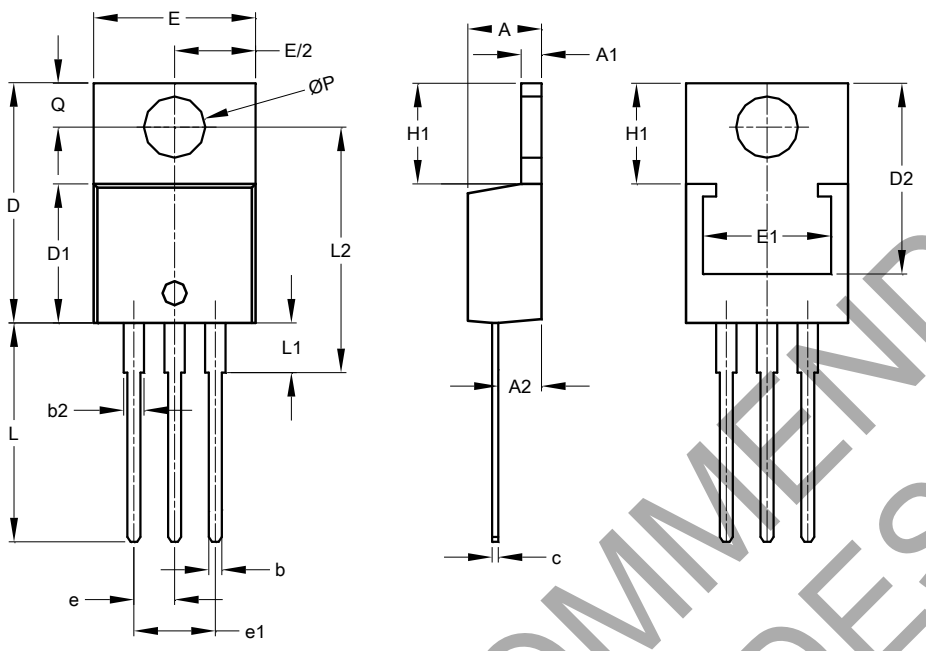


Fig. 10 Transient Thermal Resistance

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			

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance.

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