N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	Package	I_D T_C = +25°C
650V	1.3Ω @ V_{GS} = 10V	ITO-220AB	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

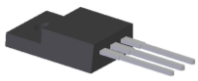
Features

- Low Input Capacitance
- High BVDss 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**

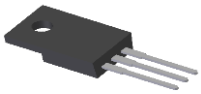
Mechanical Data

- Case: ITO-220AB
- 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: ITO-220AB – 1.85 grams (Approximate)

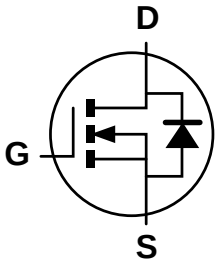
ITO-220AB



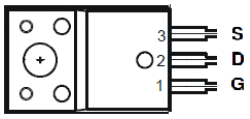
Top View



Bottom View



Equivalent Circuit



Top View
Pin Out Configuration

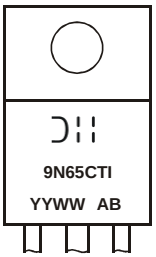
Ordering Information (Note 4)

Part Number	Case	Packaging
DMG9N65CTI	ITO-220AB	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

ITO-220AB



9N65CTI = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 13 = 2013)
WW = Week (01 - 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 (Notes 5 & 6) V_{GS} = 10V	Steady State	T_C = +25°C T_C = +70°C	I_D	9.0 7.0	A
Pulsed Drain Current (Note 7) 10µs pulse, pulse duty cycle<=1%			I_{DM}	30	A
Avalanche Current (Note 8) V_{DD} = 100V, V_{GS} = 10V, L = 60mH			I_{AR}	2.7	A
Repetitive avalanche energy (Note 8) 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	13 8	W
Thermal Resistance, Junction to Case (Note 5)	T_C = +25°C	$R_{\theta JC}$	8.84	°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 9)						
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 9)						
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 10)						
Input Capacitance	C_{iss}	-	2310	-	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 V_{GS} = 10V	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. Drain current limited by maximum junction temperature.
7. Repetitive rating, pulse width limited by junction temperature.
8. I_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep T_J = +25°C.
9. Short duration pulse test used to minimize self-heating effect.
10. Guaranteed by design. Not subject to production testing.

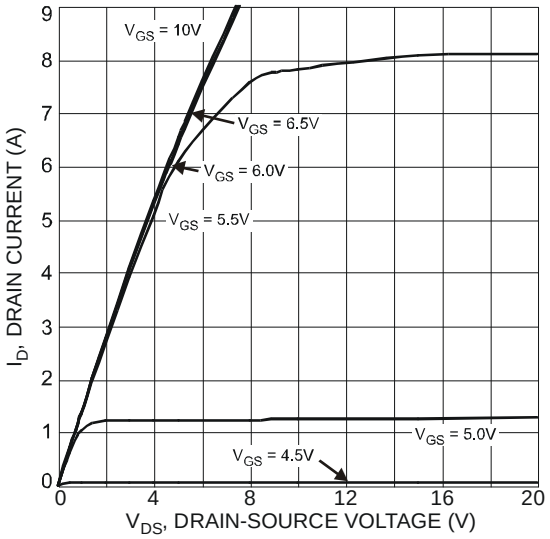


Fig. 1 Typical Output Characteristic

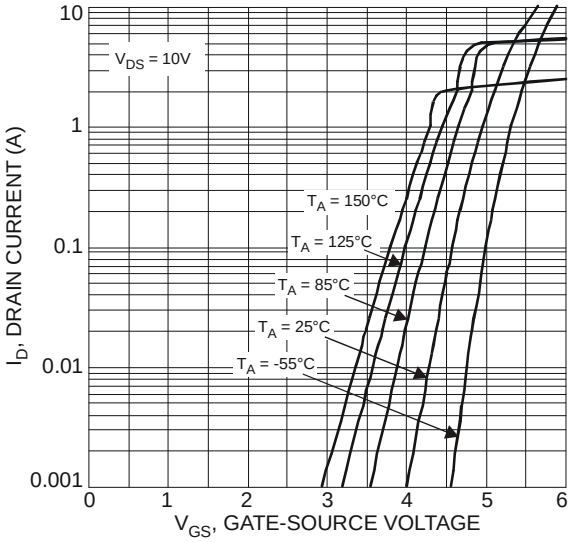


Fig. 2 Typical Transfer Characteristics

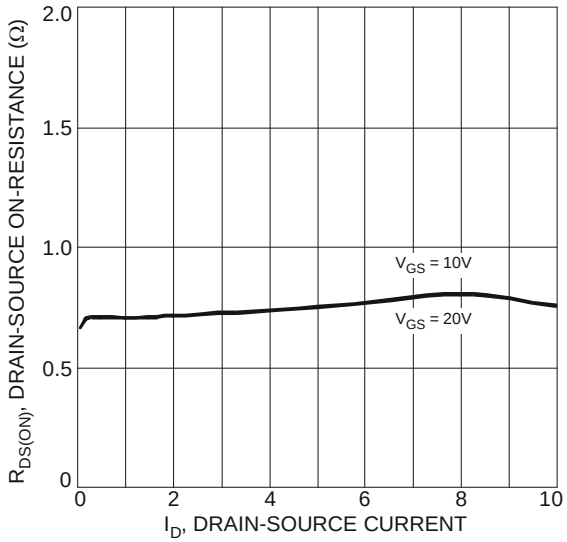


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

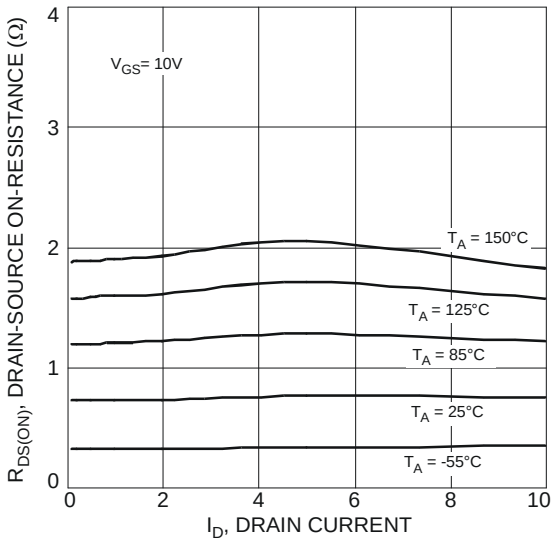


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

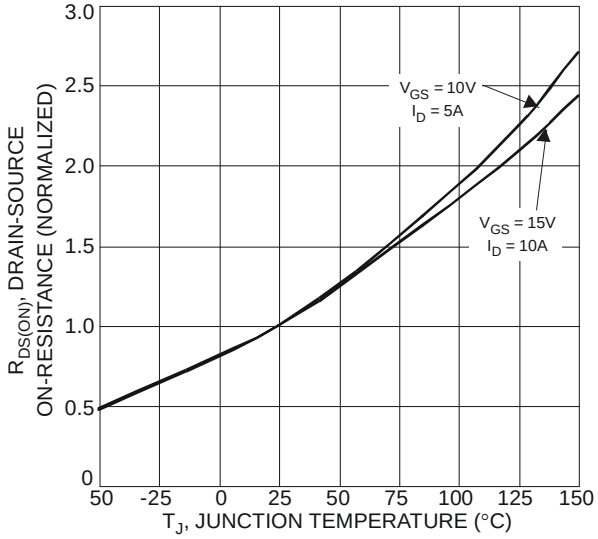


Fig. 5 On-Resistance Variation with Temperature

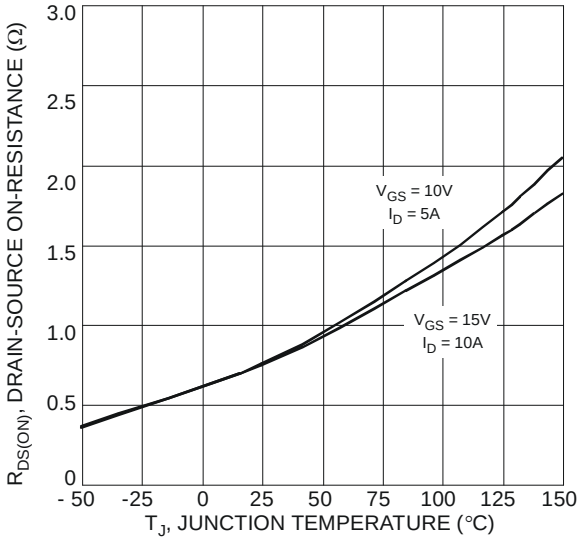


Fig. 6 On-Resistance Variation with Temperature

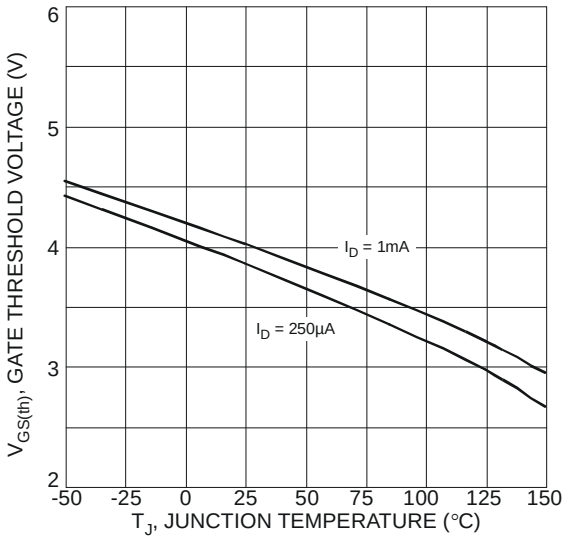


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

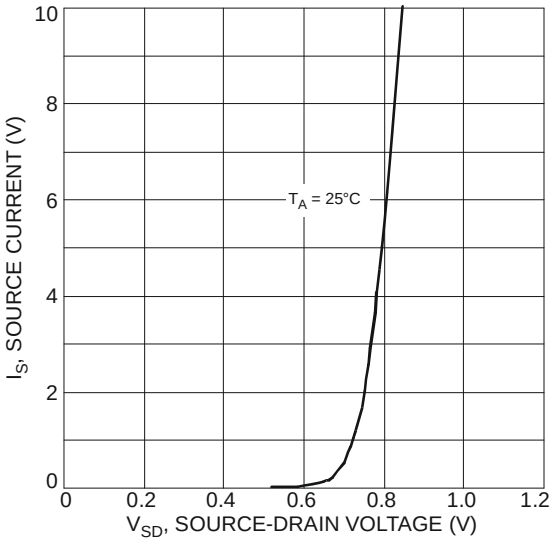
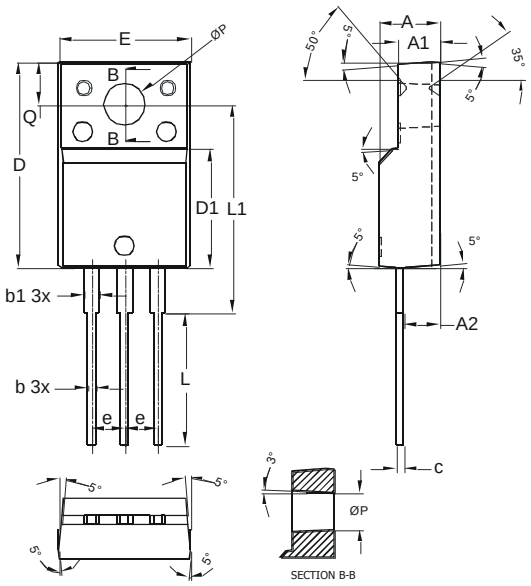


Fig. 8 Diode Forward Voltage vs. Current

Package Outline Dimensions

Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



ITO-220AB			
Dim	**Min**	**Typ**	**Max**
A	4.50	4.70	4.90
A1	3.04	3.24	3.44
A2	2.56	2.76	2.96
b	0.50	0.60	0.75
b1	1.10	1.20	1.35
c	0.50	0.60	0.70
D	15.67	15.87	16.07
D1	8.99	9.19	9.39
e		2.54	
E	9.91	10.11	10.31
L	9.45	9.75	10.05
L1	15.80	16.00	16.20
P	2.98	3.18	3.38
Q	3.10	3.30	3.50
All Dimensions in mm			

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