

**N-CHANNEL ENHANCEMENT MODE MOSFET**

**Product Summary**

$V_{(BR)DSS}$	$R_{DS(ON)}$	Package	$I_D$ $T_C = +25^\circ\text{C}$
650V	$1.3\Omega$ @ $V_{GS} = 10\text{V}$	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**

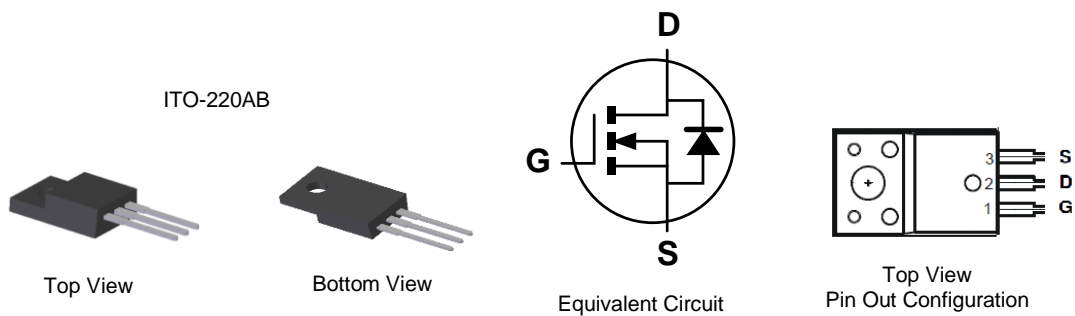
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

**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 
- Terminal Connections: See Diagram Below
- Weight: ITO-220AB – 1.85 grams (Approximate)

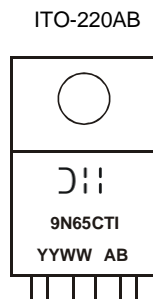


**Ordering Information (Note 4)**

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](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**



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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit	
Drain-Source Voltage			V <sub>DSS</sub>	650	V	
Gate-Source Voltage			V <sub>GSS</sub>	±30	V	
Continuous Drain Current (Notes 5 & 6) V <sub>GS</sub> = 10V	Steady State	T <sub>C</sub> = +25°C	I <sub>D</sub>	9.0	A	
		T <sub>C</sub> = +70°C		7.0		
Pulsed Drain Current (Note 7) 10μs pulse, pulse duty cycle≤1%			I <sub>DM</sub>	30	A	
Avalanche Current (Note 8) V <sub>DD</sub> = 100V, V <sub>GS</sub> = 10V, L = 60mH			I <sub>AR</sub>	2.7	A	
Repetitive avalanche energy (Note 8) V <sub>DD</sub> = 100V, V <sub>GS</sub> = 10V, L = 60mH			E <sub>AR</sub>	260	mJ	

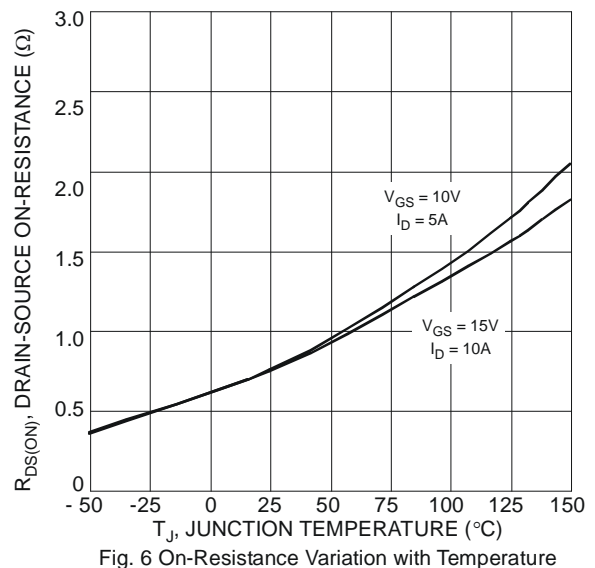
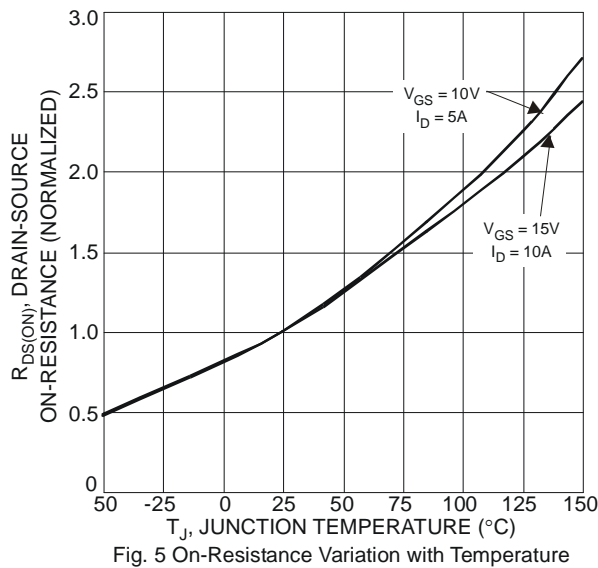
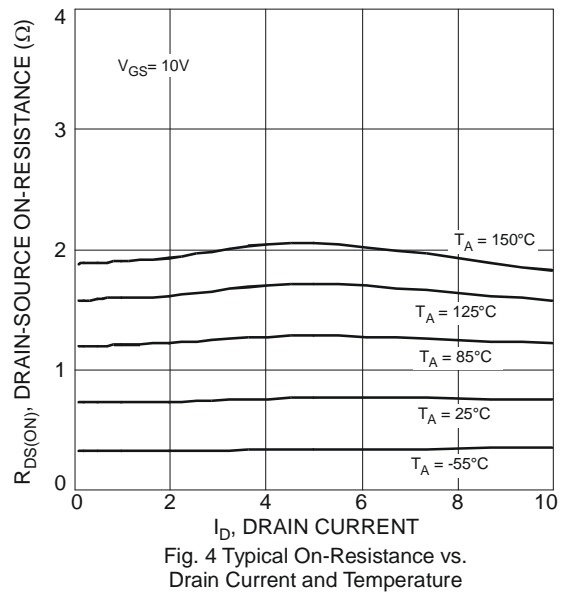
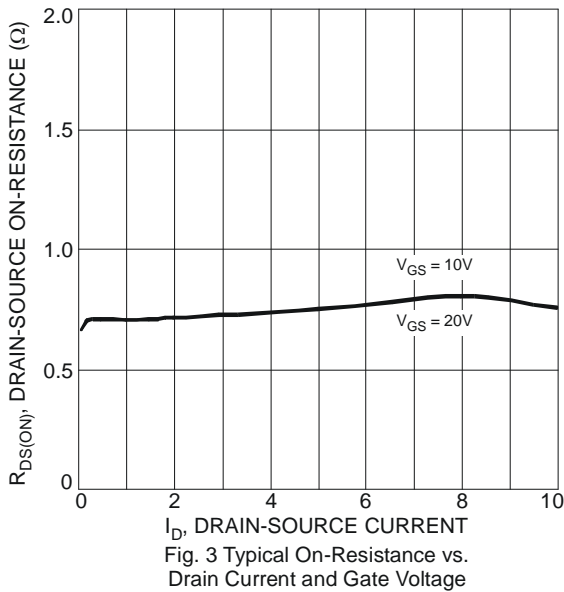
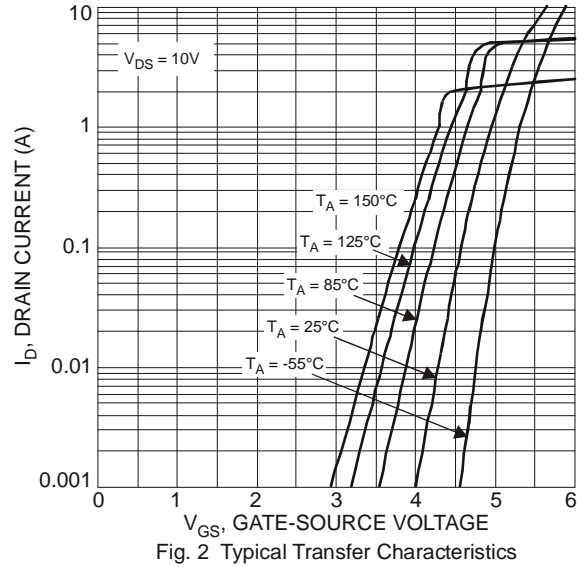
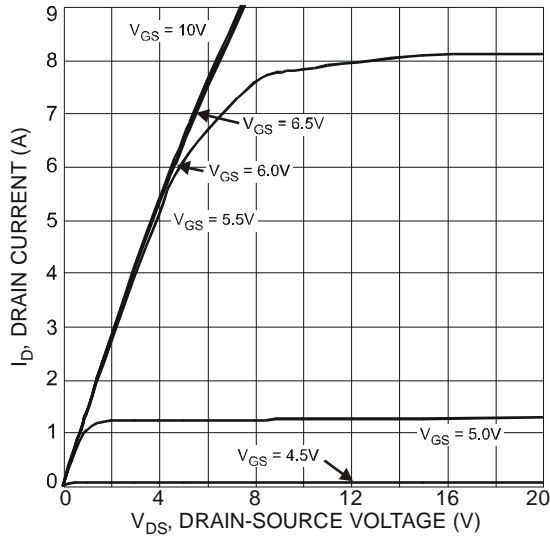
**Thermal Characteristics**

Characteristic		Symbol	Max	Unit
Power Dissipation (Note 5)	T <sub>C</sub> = +25°C	P <sub>D</sub>	13	W
	T <sub>C</sub> = +70°C		8	
Thermal Resistance, Junction to Case (Note 5)	T <sub>C</sub> = +25°C	R <sub>θJC</sub>	8.84	°C/W
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 9)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	650	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	-	-	1.0	µA	V <sub>DS</sub> = 650V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	3	-	5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	0.7	1.3	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 4.5A
Forward Transfer Admittance	Y <sub>fs</sub>	-	8.5	-	S	V <sub>DS</sub> = 40V, I <sub>D</sub> = 4.5A
Diode Forward Voltage	V <sub>SD</sub>	-	0.7	1.0	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	C <sub>iSS</sub>	-	2310	-	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	122	-		
Reverse Transfer Capacitance	C <sub>rSS</sub>	-	2.2	-		
Gate Resistance	R <sub>g</sub>	-	2.2	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge V <sub>GS</sub> = 10V	Q <sub>g</sub>	-	39	-	nC	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 520V, I <sub>D</sub> = 8A
Gate-Source Charge	Q <sub>gs</sub>	-	8.5	-		
Gate-Drain Charge	Q <sub>gd</sub>	-	11.9	-		
Turn-On Delay Time	t <sub>D(on)</sub>	-	39	-	ns	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 325V, R <sub>G</sub> = 25Ω, I <sub>D</sub> = 8A
Turn-On Rise Time	t <sub>r</sub>	-	29	-	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	122	-	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	28	-	ns	dl/dt = 100A/µs, V <sub>DS</sub> = 100V, I <sub>F</sub> = 8A
Body Diode Reverse Recovery Time	t <sub>rr</sub>	-	570	-	ns	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	-	4.17	-	µC	

- Notes:
- Device mounted on an infinite heatsink.
  - Drain current limited by maximum junction temperature.
  - Repetitive rating, pulse width limited by junction temperature.
  - I<sub>AR</sub> and E<sub>AR</sub> rating are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.



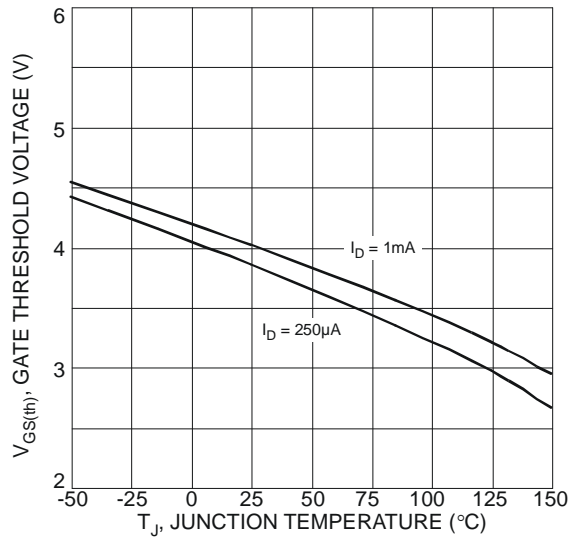


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

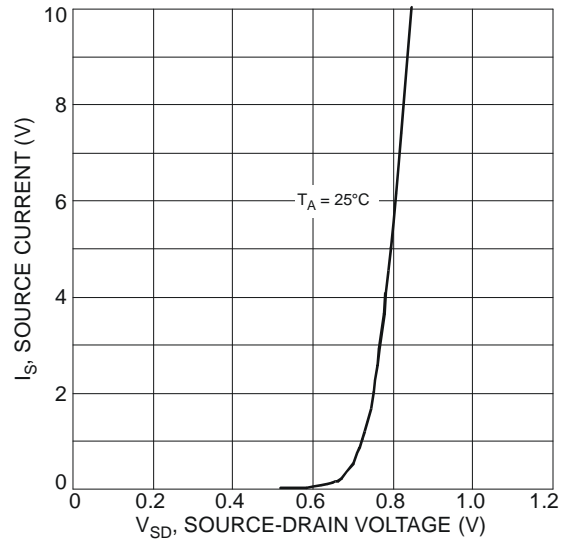
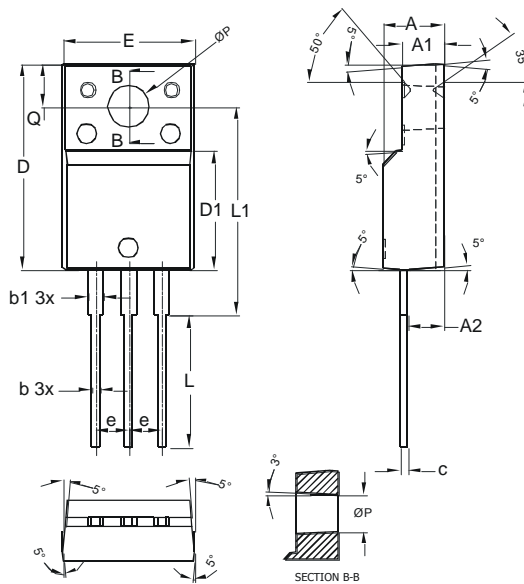


Fig. 8 Diode Forward Voltage vs. Current

## 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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