N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	Package	I_D T_C = 25°C
650V	3.0Ω@V_{GS} = 10V	ITO220-3	4.0 A

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**

Description

This new generation complementary MOSFET features low on-resistance and fast switching, making it ideal for high efficiency power management applications.

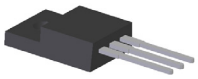
Mechanical Data

- Case: ITO220-AB
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish-Matte Tin annealed over Copper Leadframe Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram Below
- Weight: 0.008 grams (approximate)

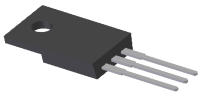
Applications

- Motor control
- Backlighting
- DC-DC Converters
- Power management functions

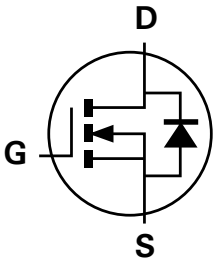
ITO-220AB



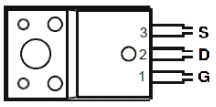
Top View



Bottom View



Equivalent Circuit



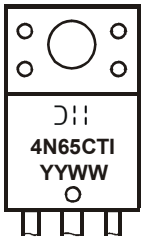
Top View
Pin Out Configuration

Ordering Information (Note 4)

Part Number	Case	Packaging
DMG4N65CTI	ITO220-AB	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 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.

Marking Information



4N65CTI = Product Type Marking Code
YYWW = Date Code Marking
YY = Last two digits of year (ex: 12 = 2012)
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 (Note 5,6) V_{GS} = 10V	Steady State	T_C = +25°C T_C = +70°C	I_D	4.0 3.0	A
Pulsed Drain Current (Note 7)			I_{DM}	6	A
Avalanche Current (Note 8) V_{DD} = 100V, V_{GS} = 10V, L = 60mH			I_{AS}	3.9	A
Repetitive avalanche energy (Note 7)			E_{AS}	456	mJ

Thermal Characteristics

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 5)	P_D	8.35	W
Thermal Resistance, Junction to Ambient @T_A = +25°C (Note 5)	$R_{\theta JA}$	12.36	°C/W
Thermal Resistance, Junction to Case @T_A = +25°C (Note 5)	$R_{\theta JC}$	10.69	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics @ T_A = 25°C unless otherwise stated

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	$R_{DS\ (ON)}$	-	2.1	3.0	Ω	V_{GS} = 10V, I_D = 2A
Forward Transfer Admittance	$\|Y_{fs}\|$	-	3.7	-	S	V_{DS} = 40V, I_D = 2A
Diode Forward Voltage	V_{SD}	-	0.7	1.0	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	-	900	-	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	50	-		
Reverse Transfer Capacitance	C_{rss}	-	1.1	-		
Gate Resistance	R_g	-	2.4	-	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge V_{GS} = 10V	Q_g	-	13.5	-	nC	V_{GS} = 10V, V_{DS} = 520V, I_D = 4A
Gate-Source Charge	Q_{gs}	-	2.7	-		
Gate-Drain Charge	Q_{gd}	-	3.8	-		
Turn-On Delay Time	$t_{D(on)}$	-	15.1	-	ns	V_{GS} = 10V, V_{DS} = 325V, R_G = 25Ω, I_D = 4A
Turn-On Rise Time	t_r	-	13.8	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	40	-	ns	
Turn-Off Fall Time	t_f	-	16	-	ns	
Body Diode Reverse Recovery Time	t_{rr}	-	515	-	ns	dI/dt = 100A/µs, V_{DS} = 100V, I_F = 4A
Body Diode Reverse Recovery Charge	Q_{rr}	-	2330	-	nC	

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_{AS} and E_{AS} 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.

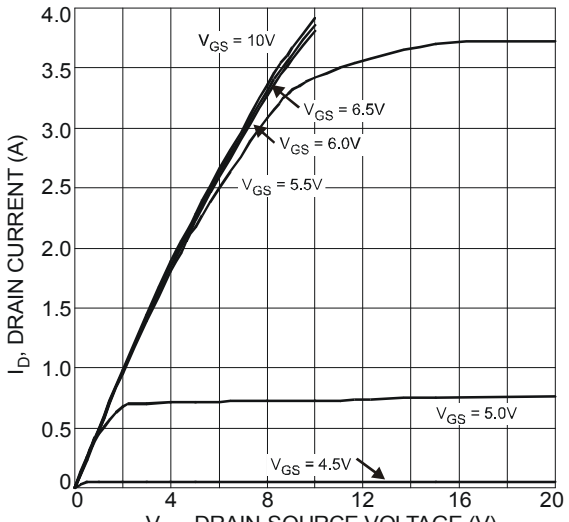


Figure 1 Typical Output Characteristic

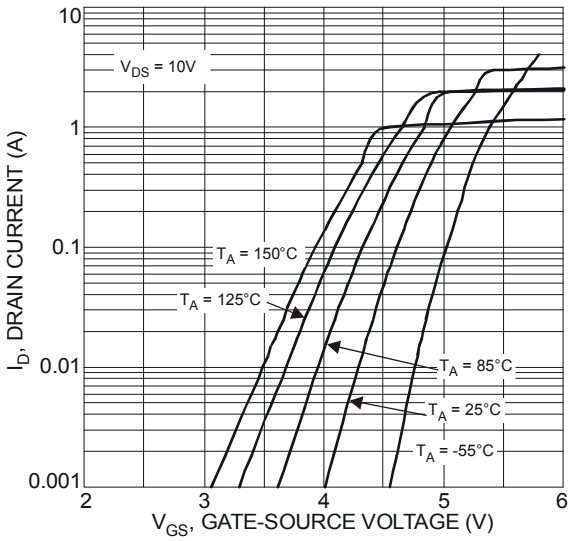


Figure 2 Typical Transfer Characteristics

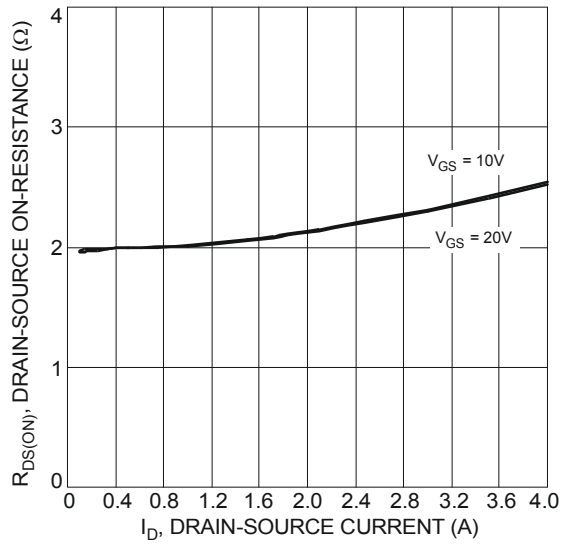


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

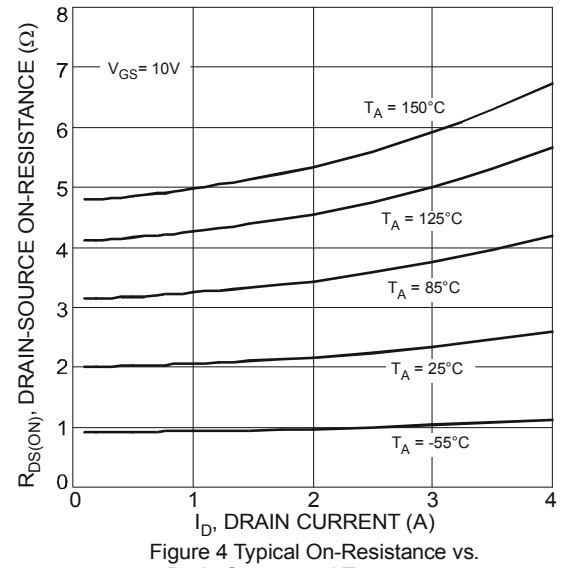


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

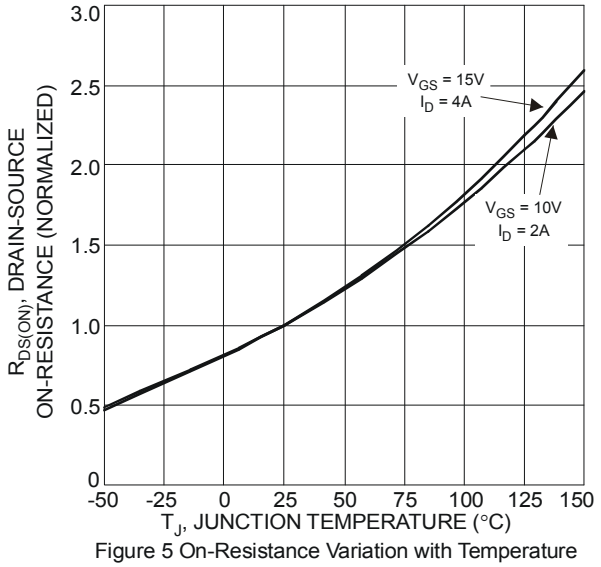


Figure 5 On-Resistance Variation with Temperature

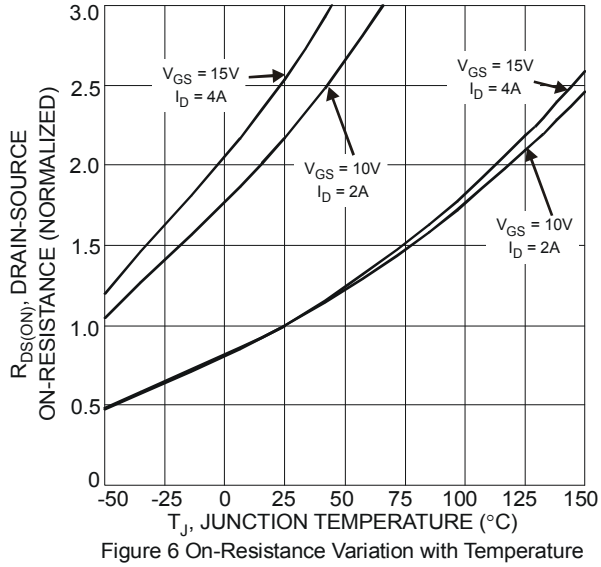


Figure 6 On-Resistance Variation with Temperature

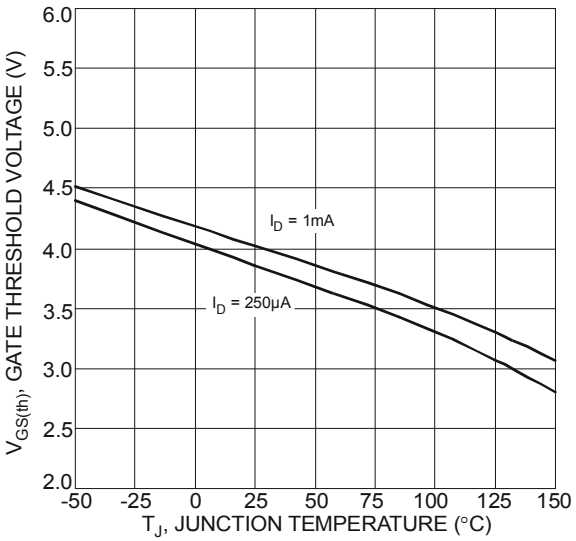


Figure 7 Gate Threshold Variation vs. Ambient Temperature

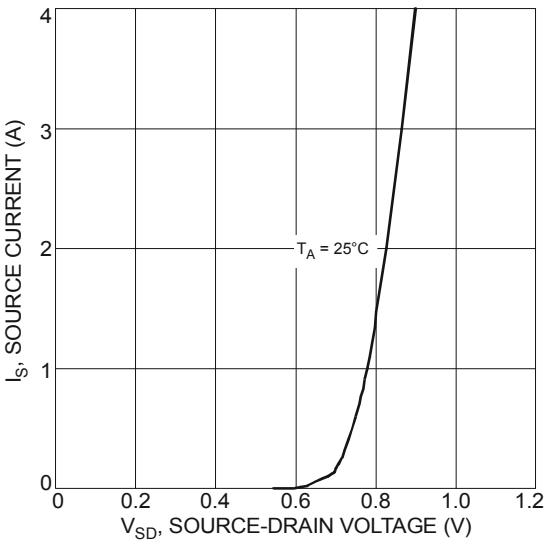


Figure 8 Diode Forward Voltage vs. Current

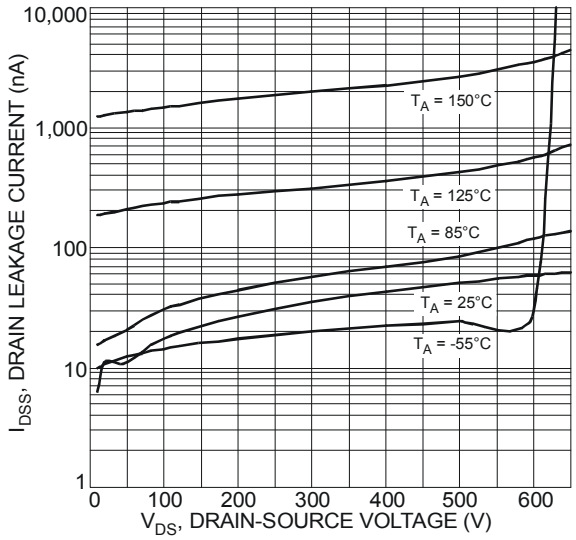
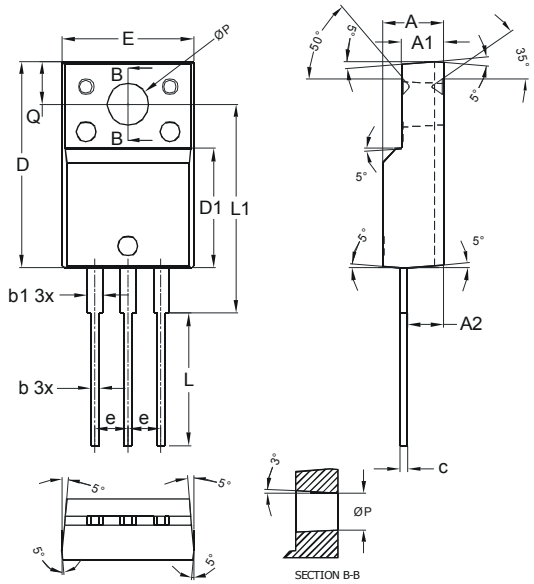


Figure 9 Typical Drain-Source Leakage Current vs. Voltage

Package Outline Dimensions

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