DMG4N65CT

N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV_{DSS}	$R_{DS(ON)\ MAX}$	Package	$I_{D\ MAX}$ T_C = +25°C
650V	3.0Ω@V_{GS} = 10V	TO220-3	4.0A

Description

This new generation complementary 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

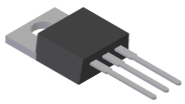
Features

- 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**

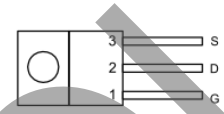
Mechanical Data

- Case: TO220-3
- 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)

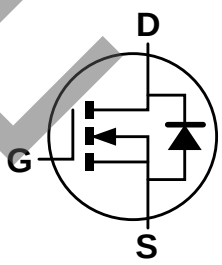
TO220-3



Top View



Top View
Pin Out Configuration



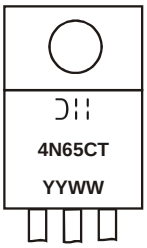
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMG4N65CT	TO220-3	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



= Manufacturer's Marking
4N65CT = Product Type Marking 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	I_D	4.0	A
		T_C = +70°C		3.0	
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	2.19	W
Thermal Resistance, Junction to Ambient @T_A = +25°C (Note 5)	$R_{\theta JA}$	58.5	°C/W
Power Dissipation (Note 6)	P_D	9.14	W
Thermal Resistance, Junction to Ambient @T_A = +25°C (Note 6)	$R_{\theta JA}$	2.85	°C/W
Thermal Resistance, Junction to Case @T_A = +25°C (Note 6)	$R_{\theta JC}$	0.86	°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	$R_{DS\ (ON)}$	—	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	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 FR-4 PCB with minimum recommended pad layout, single sided.
6. Device mounted on an infinite heatsink
7. Repetitive rating, pulse width limited by junction temperature.
8. I_{AS} and E_{AS} ratings 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.

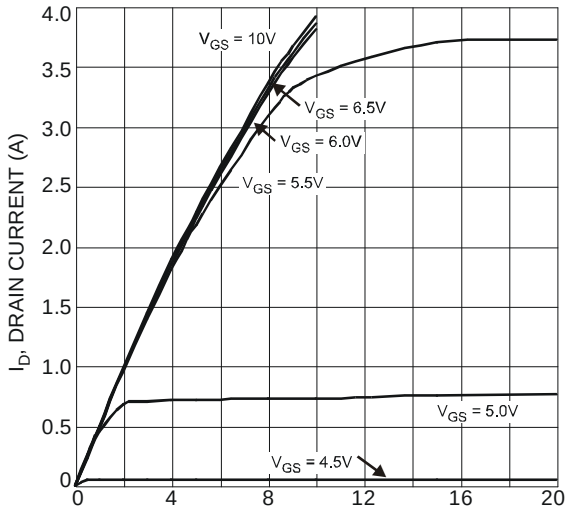


Fig.1 Typical Output Characteristic

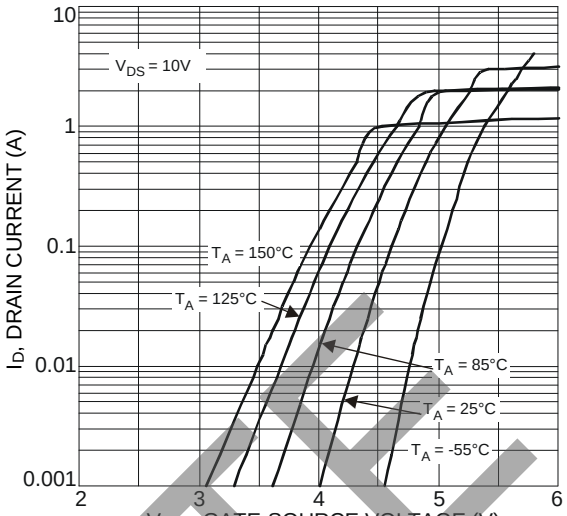


Fig. 2 Typical Transfer Characteristics

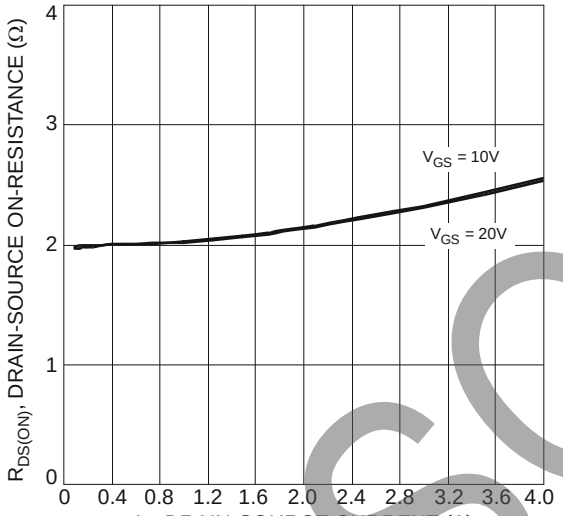


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

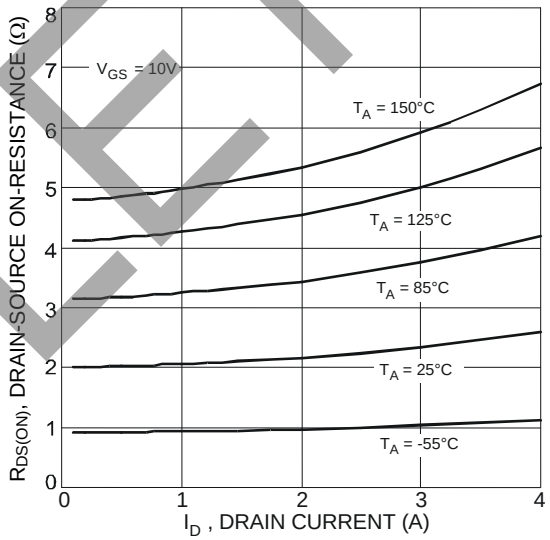


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

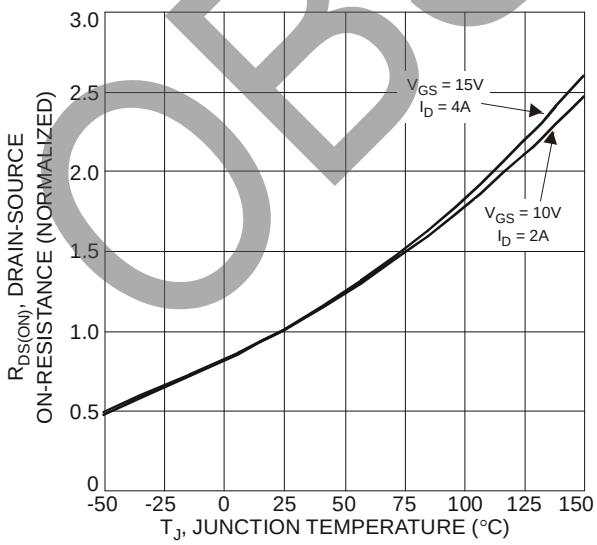


Fig. 5 On-Resistance Variation with Temperature

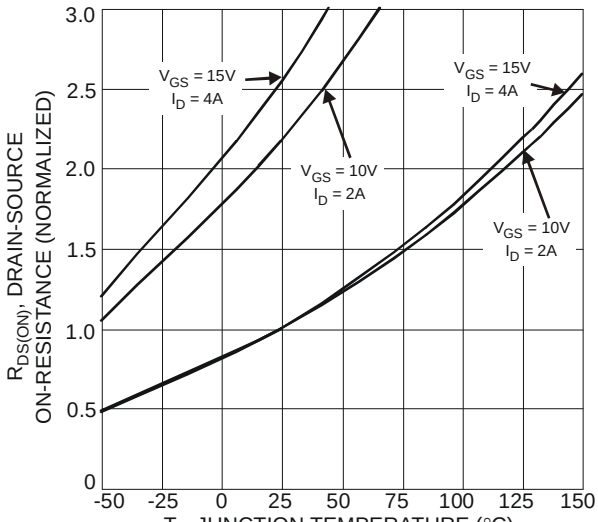


Fig. 6 On-Resistance Variation with Temperature

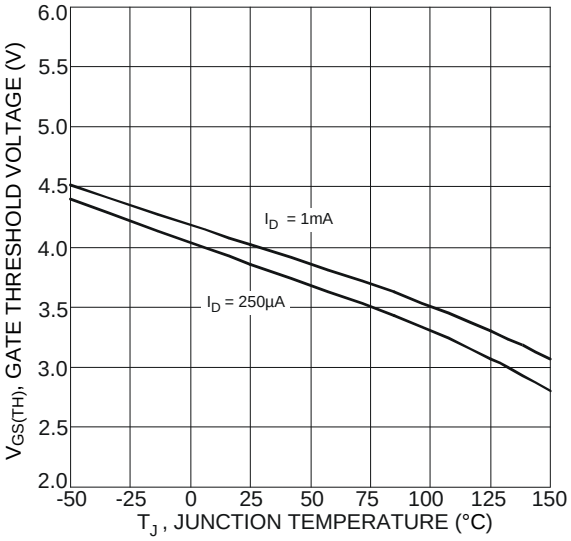


Fig. 7 Gate Threshold Variation vs. Junction Temperature

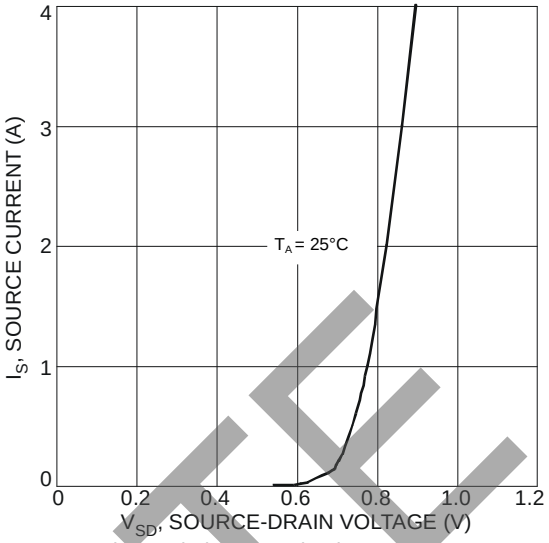


Fig.8 Diode Forward Voltage vs. Current

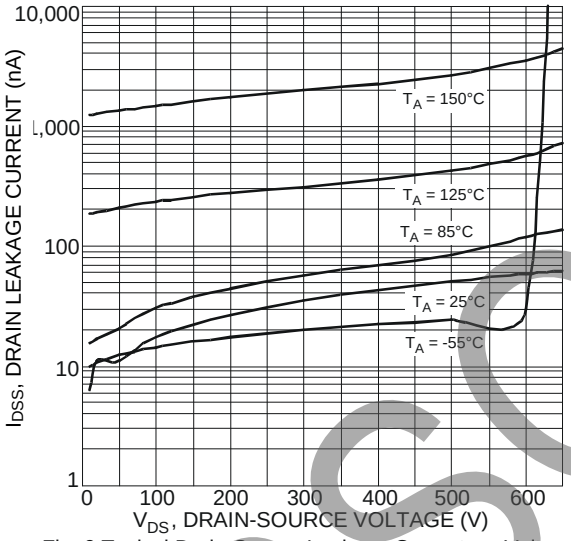


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage

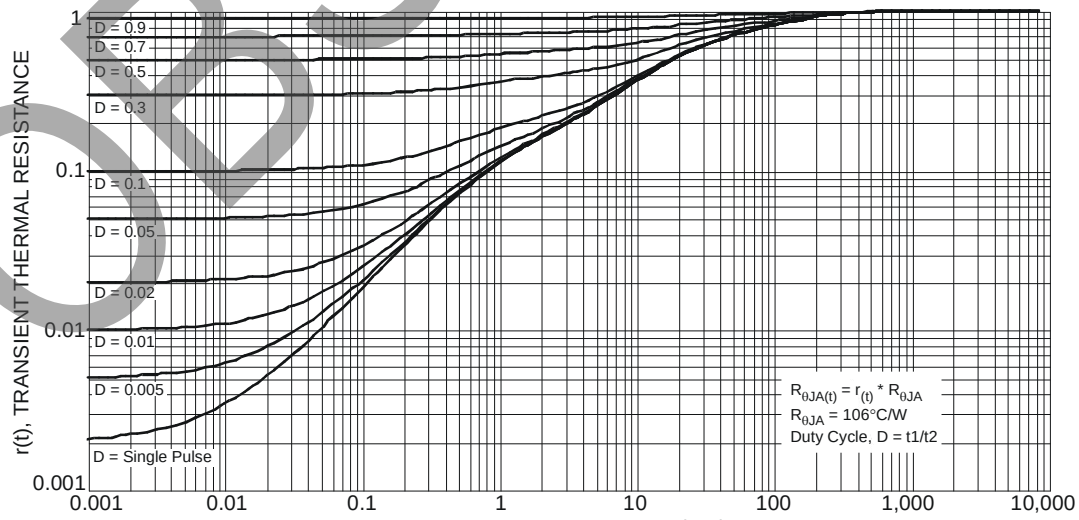
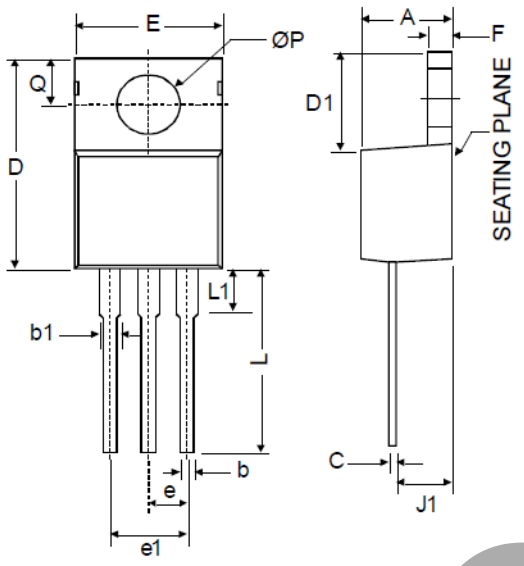


Fig. 10 Transient Thermal Resistance

Package Outline Dimensions

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

TO220-3



TO220-3		
Dim	Min	Max
A	3.55	4.85
b	0.51	1.14
b1	1.14	1.78
C	0.31	1.14
D	14.20	16.50
D1	5.84	6.86
E	9.70	10.70
e	2.79	2.99
e1	4.83	5.33
F	0.51	1.40
J1	2.03	2.92
L	12.72	14.72
L1	3.66	6.35
P	3.53	4.09
Q	2.54	3.43
All Dimensions in mm		

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