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DMG9N65CT

N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | Package | I_D $T_C = +25^\circ C$ |
|---------------|-----------------------|----------|------------------------------|
| 650V | 1.3Ω @ $V_{GS} = 10V$ | TO-220AB | 9.0 A |

Description

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

Applications

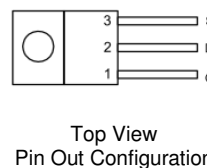
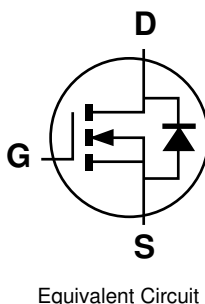
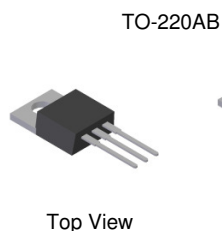
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

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: TO-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: TO-220AB – 1.85 grams (Approximate)



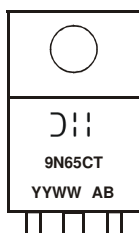
Ordering Information (Note 4)

| Part Number | Case | Packaging |
|-------------|----------|----------------|
| DMG9N65CT | TO-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

TO-220AB



9N65CT = Product Type Marking Code
 AB = Foundry and Assembly Code
 YYWW = Date Code Marking
 YY = Last two digits of year (ex: 11 = 2011)
 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) V _{GS} = 10V | Steady State | T _C = +25 °C | I _D | 9.0 | A |
| | | T _C = +70 °C | | 7.0 | |
| Pulsed Drain Current (Note 6) 10us 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 | W |
| | | 100 | |
| Thermal Resistance, Junction to Case (Note 5) | R _{θJC} | 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 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:
- Device mounted on an infinite heatsink.
 - Repetitive rating, pulse width limited by junction temperature.
 - I_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep T_J = +25 °C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

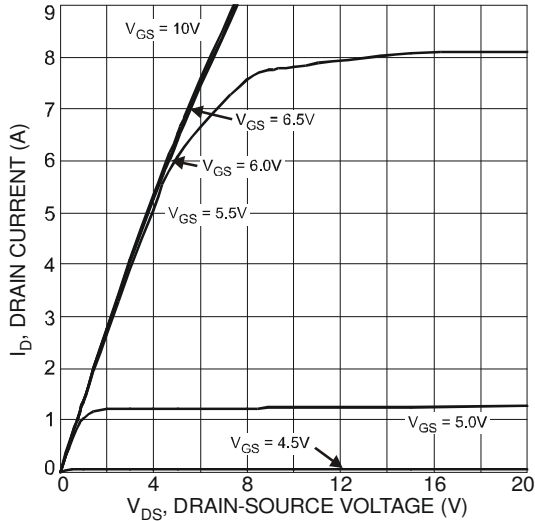


Fig. 1 Typical Output Characteristic

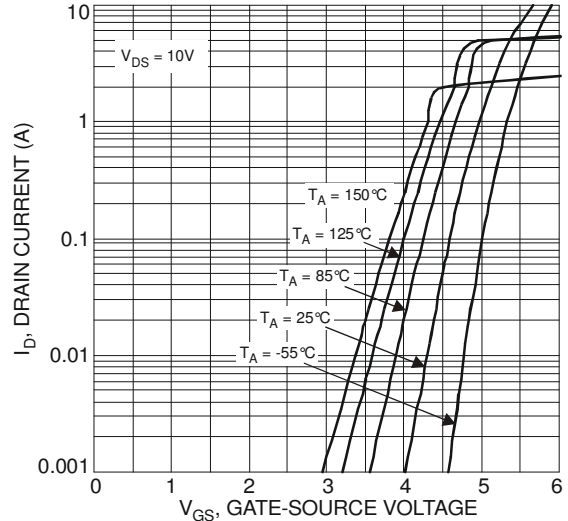


Fig. 2 Typical Transfer Characteristics

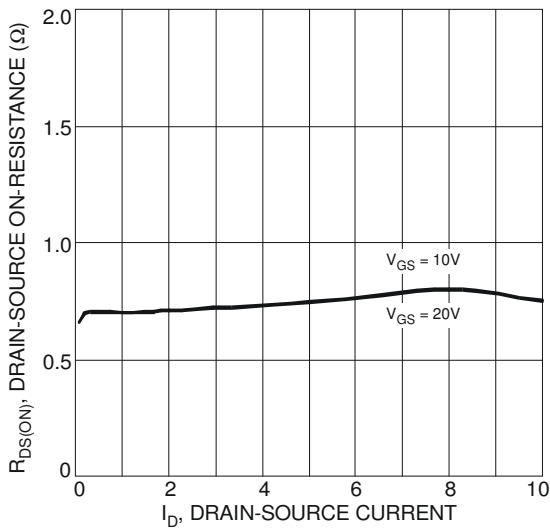


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

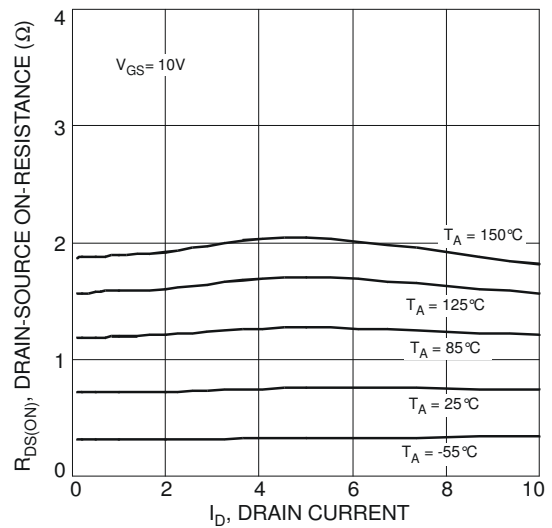


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

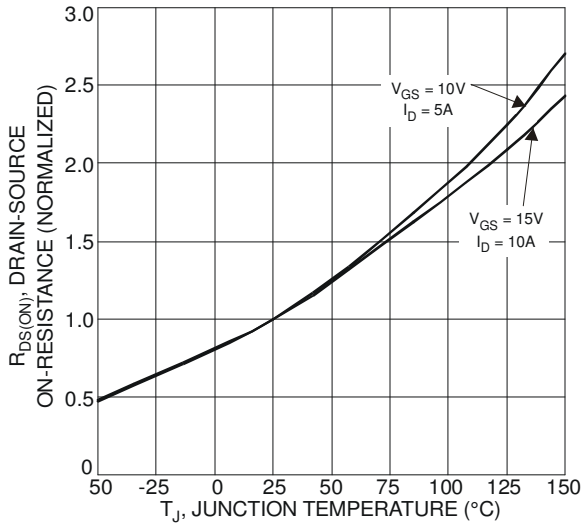


Fig. 5 On-Resistance Variation with Temperature

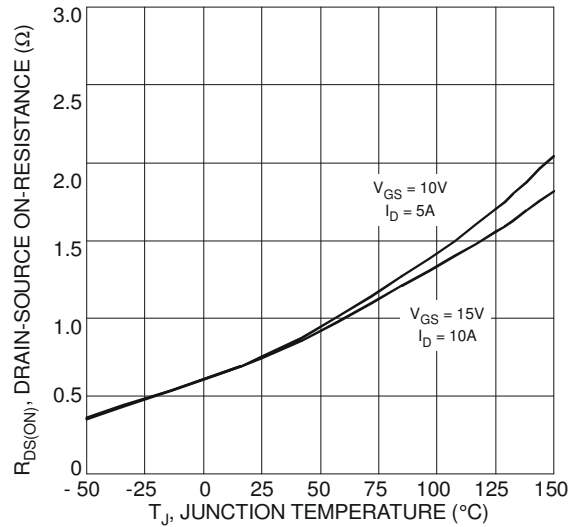


Fig. 6 On-Resistance Variation with Temperature

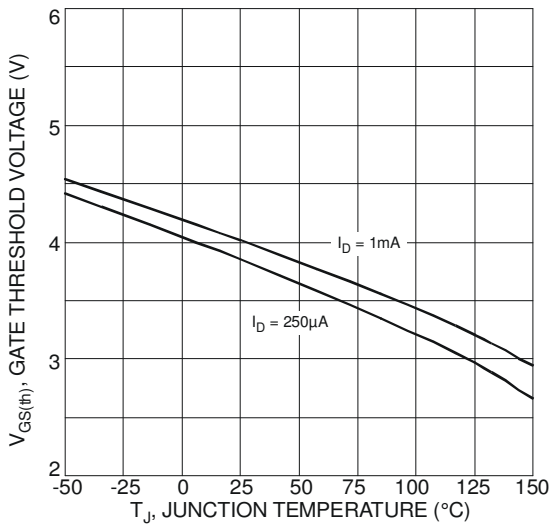


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

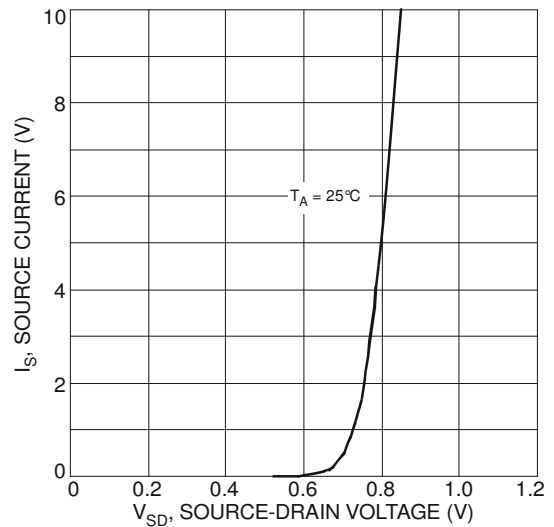


Fig. 8 Diode Forward Voltage vs. Current



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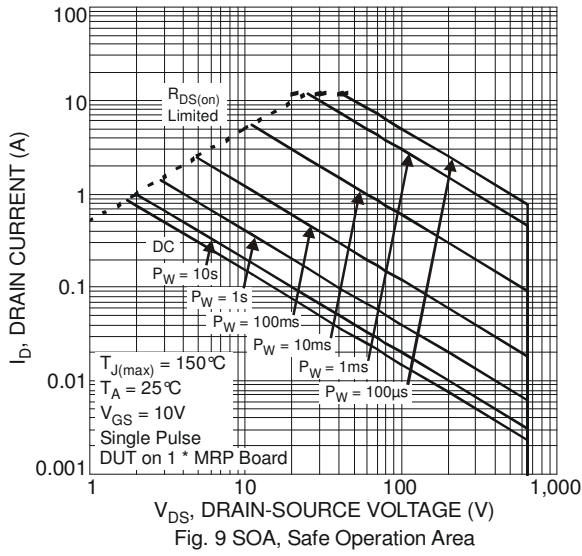


Fig. 9 SOA, Safe Operation Area

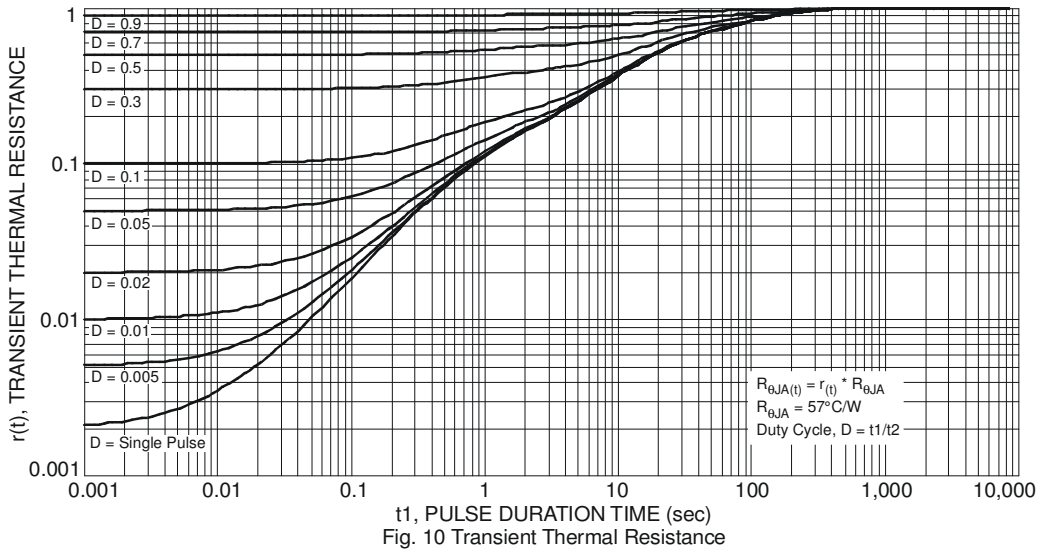
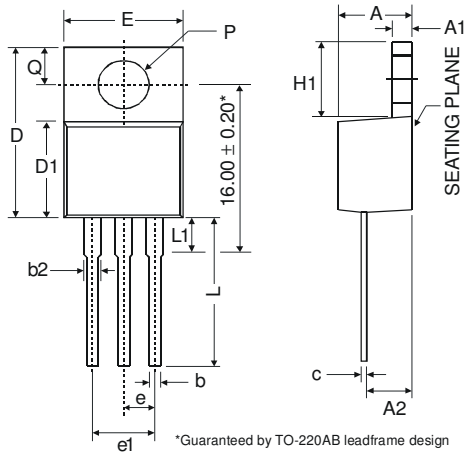


Fig. 10 Transient Thermal Resistance

Package Outline Dimensions

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



| TO220AB | | | |
|-----------------------------|-------|------|-------|
| Dim | Min | Typ | Max |
| A | 3.56 | - | 4.82 |
| A1 | 0.51 | - | 1.39 |
| A2 | 2.04 | - | 2.92 |
| b | 0.39 | 0.81 | 1.01 |
| b2 | 1.15 | 1.24 | 1.77 |
| c | 0.356 | - | 0.61 |
| D | 14.22 | - | 16.51 |
| D1 | 8.39 | - | 9.01 |
| e | 2.54 | | |
| e1 | 5.08 | | |
| E | 9.66 | - | 10.66 |
| H1 | 5.85 | - | 6.85 |
| L | 12.70 | - | 14.73 |
| L1 | - | - | 6.35 |
| P | 3.54 | - | 4.08 |
| Q | 2.54 | - | 3.42 |
| All Dimensions in mm | | | |

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