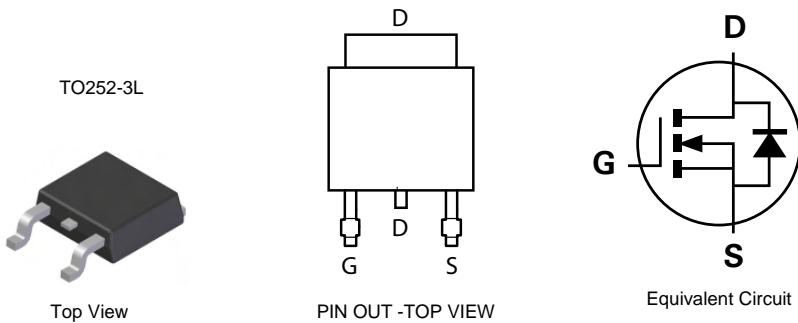


Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 1)**
- "Green" Device (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

- Case: TO252-3L
- Case Material: Molded Plastic, "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 0.33 grams (approximate)



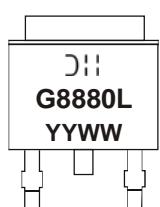
Ordering Information (Note 3)

| Part Number | Case | Packaging |
|---------------|----------|--------------------|
| DMG8880LK3-13 | TO252-3L | 2500 / Tape & Reel |

Notes:

1. No purposefully added lead.
2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
3. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



G8880L = Product Type Marking Code
 DII = Manufacturer's Marking
 YYWW = Date Code Marking
 YY = Year (ex: 09 = 2009)
 WW = Week (01 ~ 53)

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | | | Symbol | Value | Unit |
|---------------------------------------------------------|--------------|------------------------------------------------------|-----------|------------|------|
| Drain-Source Voltage | | | V_{DSS} | 30 | V |
| Gate-Source Voltage | | | V_{GSS} | ± 20 | V |
| Continuous Drain Current (Note 4) $V_{GS} = 10\text{V}$ | Steady State | $T_A = 25^\circ\text{C}$ $T_A = 85^\circ\text{C}$ | I_D | 11 8 | A |
| Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$ | Steady State | $T_A = 25^\circ\text{C}$ $T_A = 85^\circ\text{C}$ | I_D | 16.5 12 | A |
| Pulsed Drain Current (Note 6) | | | I_{DM} | 48 | A |

Thermal Characteristics

| Characteristic | | | Symbol | Value | Unit |
|-----------------------------------------------------------------------------|--|--|-----------------|-------------|---------------------------|
| Power Dissipation (Note 4) | | | P_D | 1.68 | W |
| Thermal Resistance, Junction to Ambient @ $T_A = 25^\circ\text{C}$ (Note 4) | | | $R_{\theta JA}$ | 74.3 | $^\circ\text{C}/\text{W}$ |
| Power Dissipation (Note 5) | | | P_D | 4.1 | W |
| Thermal Resistance, Junction to Ambient @ $T_A = 25^\circ\text{C}$ (Note 5) | | | $R_{\theta JA}$ | 30.8 | $^\circ\text{C}/\text{W}$ |
| Operating and Storage Temperature Range | | | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|----------------------------------------------------------|---------------------|-----|--------|-----------|------------------|-------------------------------------------------------------------------------------------------|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | 30 | - | - | V | $V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$ |
| Zero Gate Voltage Drain Current $T_J = 25^\circ\text{C}$ | I_{DSS} | - | - | 1.0 | μA | $V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Source Leakage | I_{GSS} | - | - | ± 100 | nA | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | 1.2 | 1.5 | 2.3 | V | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(\text{ON})}$ | - | 5 8 | 7.5 12 | $\text{m}\Omega$ | $V_{GS} = 10\text{V}, I_D = 11.6\text{A}$ $V_{GS} = 4.5\text{V}, I_D = 10.7\text{A}$ |
| Forward Transfer Admittance | $ Y_{fs} $ | - | 22 | - | S | $V_{DS} = 15\text{V}, I_D = 15\text{A}$ |
| Diode Forward Voltage | V_{SD} | - | 0.7 | 1.0 | V | $V_{GS} = 0\text{V}, I_{SD} = 2.1\text{A}$ |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C_{iss} | - | 1289 | - | pF | $V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$ |
| Output Capacitance | C_{oss} | - | 187 | - | pF | |
| Reverse Transfer Capacitance | C_{rss} | - | 162 | - | pF | |
| Gate Resistance | R_g | - | 0.97 | - | Ω | $V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$ |
| Total Gate Charge at 10V | Q_g | - | 27.6 | - | nC | $V_{GS} = 10\text{V}, V_{DS} = 15\text{V}, I_D = 11.6\text{A}, I_g = 1.0\text{mA}$ |
| Total Gate Charge at 5V | Q_g | - | 14.4 | - | nC | $V_{GS} = 5\text{V}, V_{DS} = 15\text{V}, I_D = 11.6\text{A}$ |
| Gate-Source Charge | Q_{gs} | - | 3.6 | - | nC | |
| Gate-Drain Charge | Q_{gd} | - | 4.9 | - | nC | |
| Turn-On Delay Time | $t_{D(on)}$ | - | 7.04 | - | ns | $V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_G = 11\Omega, I_D = 11.6\text{A}, R_L = 1.3\Omega$ |
| Turn-On Rise Time | t_r | - | 17.52 | - | ns | |
| Turn-Off Delay Time | $t_{D(off)}$ | - | 36.13 | - | ns | |
| Turn-Off Fall Time | t_f | - | 19.67 | - | ns | |
| Body Diode Reverse Recovery Time | t_{rr} | - | 17.6 | - | ns | $I_F = 20\text{A}, dI/dt = 500\text{A}/\mu\text{s}$ |
| Body Diode Reverse Recovery Charge | Q_{rr} | - | 65.9 | - | nC | $I_F = 20\text{A}, dI/dt = 500\text{A}/\mu\text{s}$ |

Notes:

4. Device mounted on FR-4 PCB, with minimum recommended pad layout, single sided.
5. Device mounted on 2" x 2" FR-4 PCB with high coverage 2oz. copper, single sided.
6. Repetitive rating, pulse width limited by junction temperature and current limited by package.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

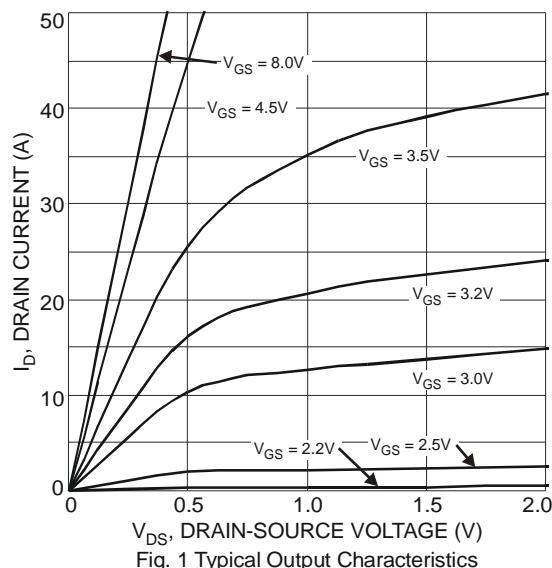


Fig. 1 Typical Output Characteristics

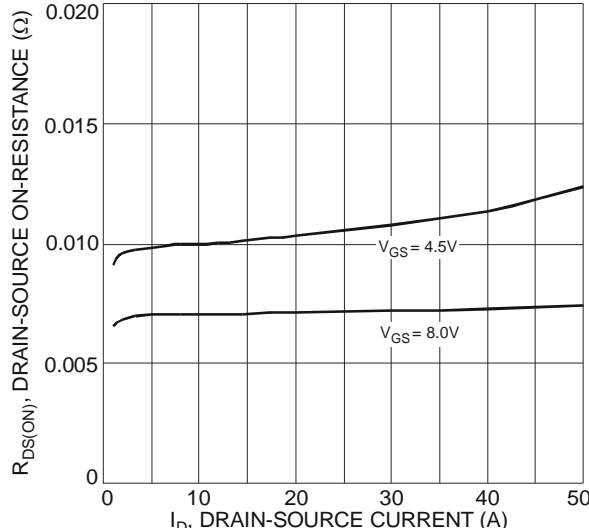


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

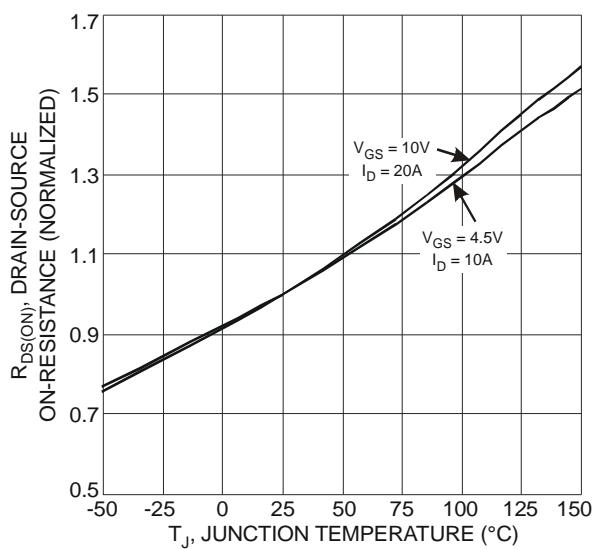


Fig. 5 On-Resistance Variation with Temperature

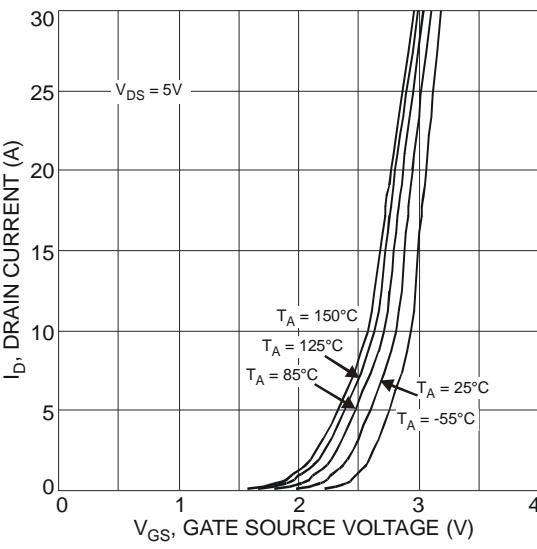


Fig. 2 Typical Transfer Characteristics

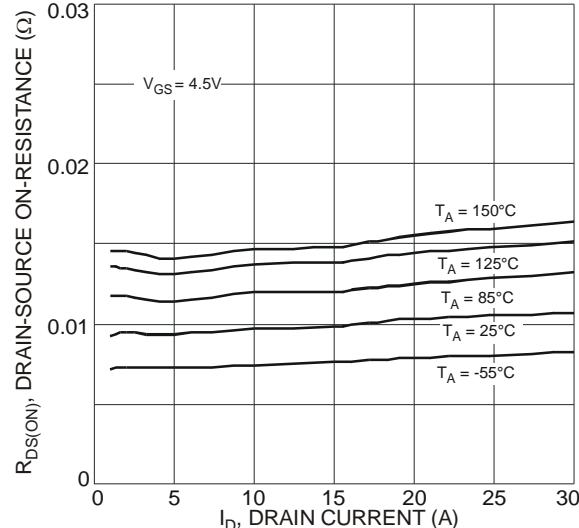


Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

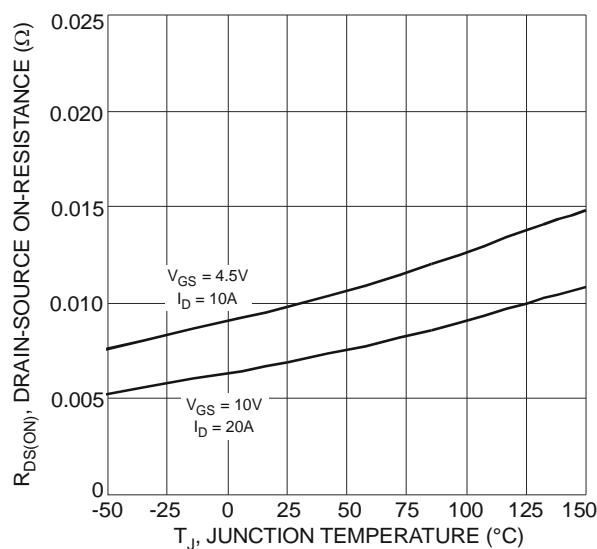


Fig. 6 On-Resistance Variation with Temperature

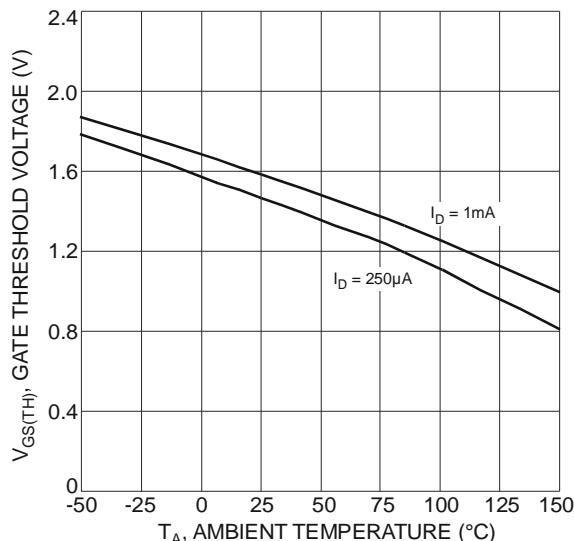


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

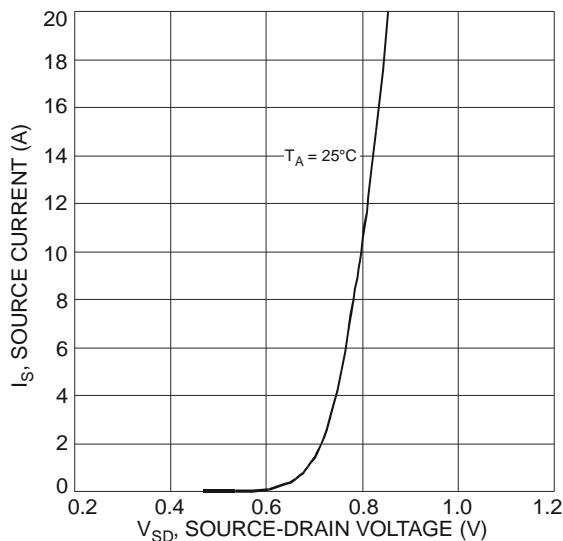


Fig. 8 Diode Forward Voltage vs. Current

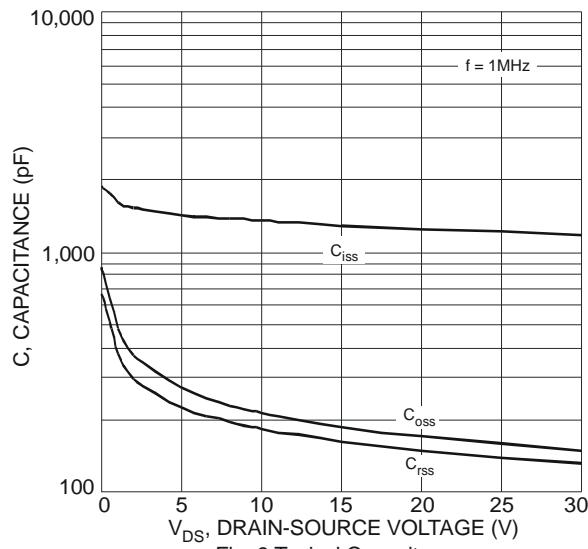


Fig. 9 Typical Capacitance

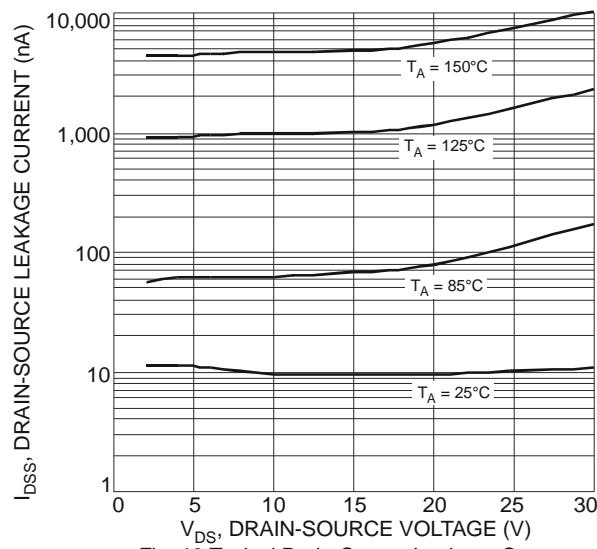


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

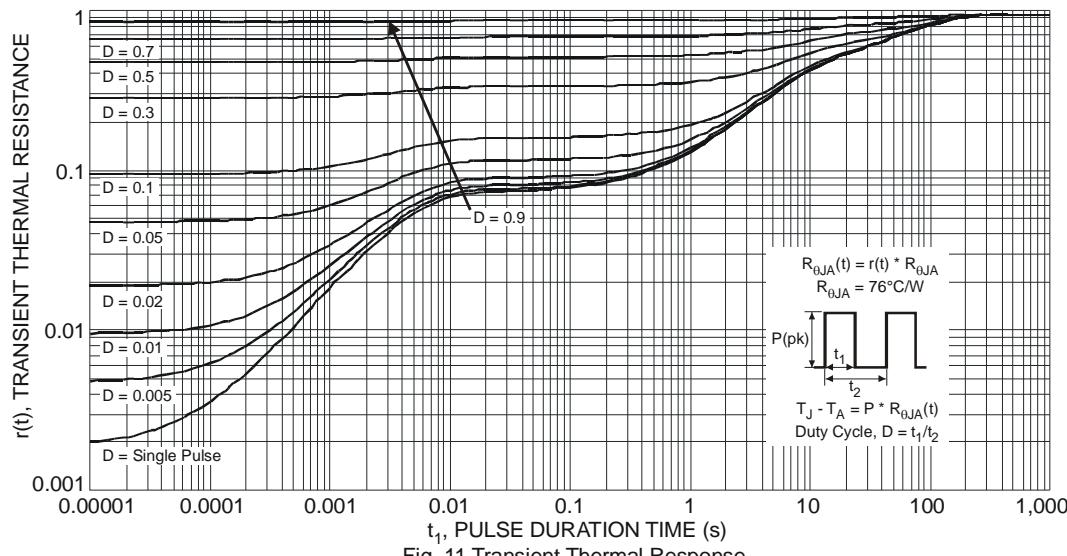
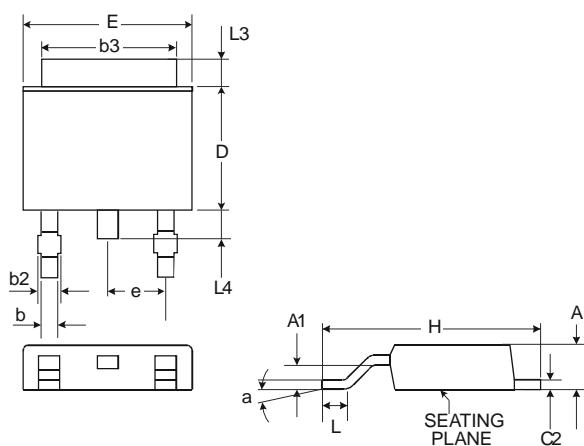


Fig. 11 Transient Thermal Response

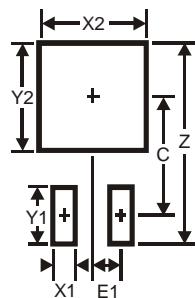
Package Outline Dimensions



| TO252-3L | | | |
|-----------|------------|------|-------|
| Dim | Min | Typ | Max |
| A | 2.19 | 2.29 | 2.39 |
| A1 | 0.97 | 1.07 | 1.17 |
| b | 0.64 | 0.76 | 0.88 |
| b2 | 0.76 | 0.95 | 1.14 |
| b3 | 5.21 | 5.33 | 5.50 |
| C2 | 0.45 | 0.51 | 0.58 |
| D | 6.00 | 6.10 | 6.20 |
| E | 6.45 | 6.58 | 6.70 |
| e | 2.286 Typ. | | |
| H | 9.40 | 9.91 | 10.41 |
| L | 1.40 | 1.59 | 1.78 |
| L3 | 0.88 | 1.08 | 1.27 |
| L4 | 0.64 | 0.83 | 1.02 |
| a | 0° | - | 10° |

All Dimensions in mm

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 11.6 |
| X1 | 1.5 |
| X2 | 7.0 |
| Y1 | 2.5 |
| Y2 | 7.0 |
| C | 6.9 |
| E1 | 2.3 |

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