

Features

- Low On-Resistance
 - 7.5mΩ @ $V_{GS} = -10V$
 - 10.2mΩ @ $V_{GS} = -4.5V$
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Lead Free By Design/RoHS Compliant (Note 2)**
- "Green" Device (Note 4)**
- Qualified to AEC-Q101 Standards for High Reliability**

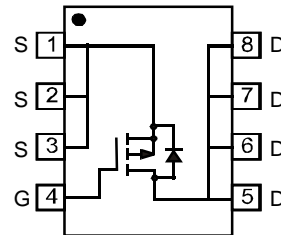
Mechanical Data

- Case: SOP-8L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 2
- Ordering Information: See Page 2
- Weight: 0.072g (approximate)



TOP VIEW

SOP-8L


TOP VIEW
Internal Schematic

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

| Characteristic | | | Symbol | Value | Units |
|-------------------------------|--------------|-----------------------|------------------|-------|-------|
| Drain-Source Voltage | | | V _{DSS} | -30 | V |
| Gate-Source Voltage | | | V _{GSS} | ±20 | V |
| Drain Current (Note 1) | Steady State | T _A = 25°C | I _D | -10.5 | A |
| | | T _A = 70°C | | -8.3 | |
| Pulsed Drain Current (Note 3) | | | I _{DM} | -40 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------------|--------------|
| Total Power Dissipation (Note 1) | P_D | 2.5 | W |
| Thermal Resistance, Junction to Ambient (Note 1) | $R_{\theta JA}$ | 50 | $^\circ C/W$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ C$ |

- Notes:
- Device mounted on 1" x 1" 2 oz. Copper pads on 2" x 2" FR-4 PCB.
 - No purposefully added lead.
 - Pulse width $\leq 10\mu S$, Duty Cycle $\leq 1\%$.
 - Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.

Electrical Characteristics @T_A = 25°C unless otherwise specified

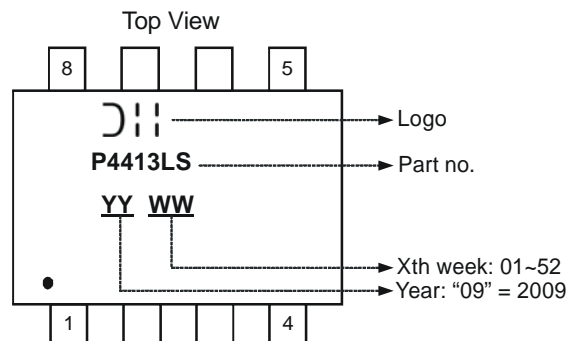
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------------------|---------------------|------|------------|-------------|------|---|
| OFF CHARACTERISTICS (Note 5) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -30 | — | — | V | V _{GS} = 0V, I _D = -250μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | -1 | μA | V _{DS} = -30V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±1 | μA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 5) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | -1.1 | 1.6 | -2.1 | V | V _{DS} = V _{GS} , I _D = -250μA |
| Static Drain-Source On-Resistance | R _{DS(on)} | — | 6.3 7.9 | 7.5 10.2 | mΩ | V _{GS} = -10V, I _D = -13A V _{GS} = -4.5V, I _D = -10A |
| Forward Transconductance | g _{fs} | — | 26 | — | S | V _{DS} = -15V, I _D = -13A |
| Diode Forward Voltage (Note 5) | V _{SD} | — | -0.7 | -1.0 | V | V _{GS} = 0V, I _S = -2.7A |
| DYNAMIC CHARACTERISTICS | | | | | | |
| Input Capacitance | C _{iss} | — | 4965 | — | pF | V _{DS} = -15V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 1487 | — | pF | |
| Reverse Transfer Capacitance | C _{rss} | — | 711 | — | pF | |
| Gate Resistance | R _G | — | 7.3 | — | Ω | V _{DS} = 0V, V _{GS} = 0V f = 1.0MHz |
| SWITCHING CHARACTERISTICS | | | | | | |
| Total Gate Charge | Q _G | — | 46 | — | nC | V _{DS} = -15V, V _{GS} = -5V I _D = -13A |
| Gate-Source Charge | Q _{GS} | — | 17 | — | | |
| Gate-Drain Charge | Q _{GD} | — | 16 | — | | |
| Turn-On Delay Time | t _{d(on)} | — | 15 | — | ns | V _{DS} = -15V, V _{GS} = -10V, I _D = -1A, R _G = 6.0Ω |
| Rise Time | t _r | — | 9 | — | | |
| Turn-Off Delay Time | t _{d(off)} | — | 160 | — | | |
| Fall Time | t _f | — | 66 | — | | |

Notes: 5. Short duration pulse test used to minimize self-heating effect.

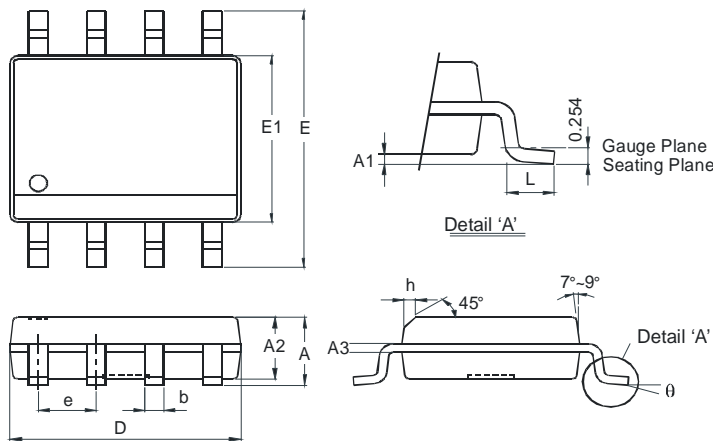
Ordering Information (Note 6)

| Part Number | Case | Packaging |
|---------------|--------|------------------|
| DMG4413LSS-13 | SOP-8L | 2500/Tape & Reel |

 Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

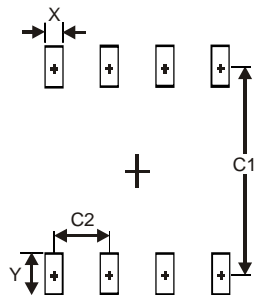
Marking Information


Package Outline Dimensions



| SOP-8L | | |
|----------------------|----------|------|
| Dim | Min | Max |
| A | - | 1.75 |
| A1 | 0.10 | 0.20 |
| A2 | 1.30 | 1.50 |
| A3 | 0.15 | 0.25 |
| b | 0.3 | 0.5 |
| D | 4.85 | 4.95 |
| E | 5.90 | 6.10 |
| E1 | 3.85 | 3.95 |
| e | 1.27 Typ | |
| h | - | 0.35 |
| L | 0.62 | 0.82 |
| θ | 0° | 8° |
| All Dimensions in mm | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| X | 0.60 |
| Y | 1.55 |
| C1 | 5.4 |
| C2 | 1.27 |

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