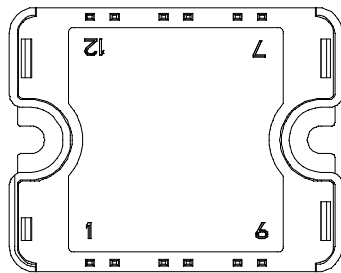
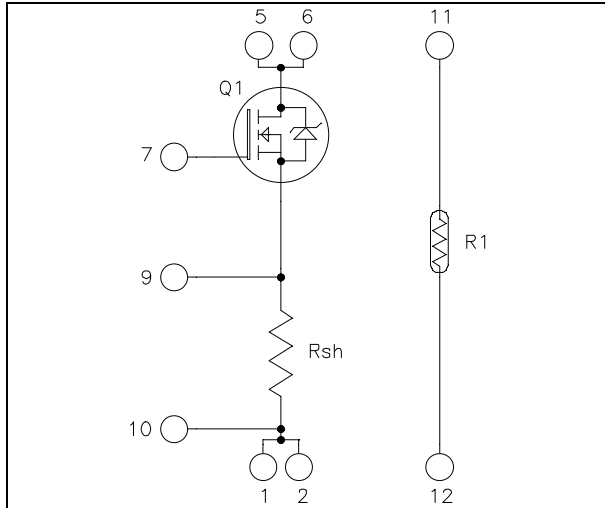


Linear MOSFET Power Module

$V_{DSS} = 200V$
 $R_{DSon} = 18m\Omega \text{ typ @ } T_j = 25^\circ C$
 $I_D = 109A^* \text{ @ } T_c = 25^\circ C$



Pins 1/2 ; 5/6 must be shorted together

Application

- Electronic load dedicated to power supplies and battery discharge testing

Features

- Linear MOSFET
- Very low stray inductance
- Internal thermistor for temperature monitoring
- High level of integration
- AlN substrate for improved thermal performance

Benefits

- Direct mounting to heatsink (isolated package)
- easy series and parallels combinations for power and voltage improvements
- Low junction to case thermal resistance
- Solderable terminals both for power and signal for easy PCB mounting
- Low profile
- RoHS Compliant

Absolute maximum ratings

| Symbol | Parameter | Max ratings | Unit |
|------------|---|--------------------|------------|
| V_{DSS} | Drain - Source Breakdown Voltage | 200 | V |
| I_D | Continuous Drain Current | $T_c = 25^\circ C$ | 109* |
| | | $T_c = 80^\circ C$ | 81* |
| I_{DM} | Pulsed Drain current | 400 | A |
| V_{GS} | Gate - Source Voltage | ± 30 | V |
| R_{DSon} | Drain - Source ON Resistance | 19 | m Ω |
| P_D | Maximum Power Dissipation ① | $T_c = 25^\circ C$ | 480 |
| I_{AR} | Avalanche current (repetitive and non repetitive) | 100 | A |
| E_{AR} | Repetitive Avalanche Energy | 50 | mJ |
| E_{AS} | Single Pulse Avalanche Energy | 3000 | |

* Output current must be limited to 44A @ $T_c=25^\circ C$ and 31A @ $T_c=80^\circ C$ to not exceed the shunt specification.

① In saturation mode

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on www.microsemi.com



All ratings @ $T_j = 25^\circ\text{C}$ unless otherwise specified

Electrical Characteristics

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|--------------|---------------------------------|--|-----|-----|-----------|------------------|
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS} = 200\text{V}; V_{GS} = 0\text{V}$ $T_j = 25^\circ\text{C}$ | | | 25 | μA |
| | | $V_{DS} = 160\text{V}; V_{GS} = 0\text{V}$ $T_j = 125^\circ\text{C}$ | | | 250 | |
| $R_{DS(on)}$ | Drain – Source on Resistance | $V_{GS} = 10\text{V}, I_D = 50\text{A}$ | | 18 | 19 | $\text{m}\Omega$ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS} = V_{DS}, I_D = 2.5\text{mA}$ | 2 | | 4 | V |
| I_{GSS} | Gate – Source Leakage Current | $V_{GS} = \pm 30\text{V}$ | | | ± 100 | nA |

Dynamic Characteristics

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|-----------|------------------------------|--|-----|------|-----|------|
| C_{iss} | Input Capacitance | $V_{GS} = 0\text{V}$ $V_{DS} = 25\text{V}$ $f = 1\text{MHz}$ | | 9880 | | pF |
| C_{oss} | Output Capacitance | | | 2320 | | |
| C_{rss} | Reverse Transfer Capacitance | | | 700 | | |

Shunt Electrical Characteristics

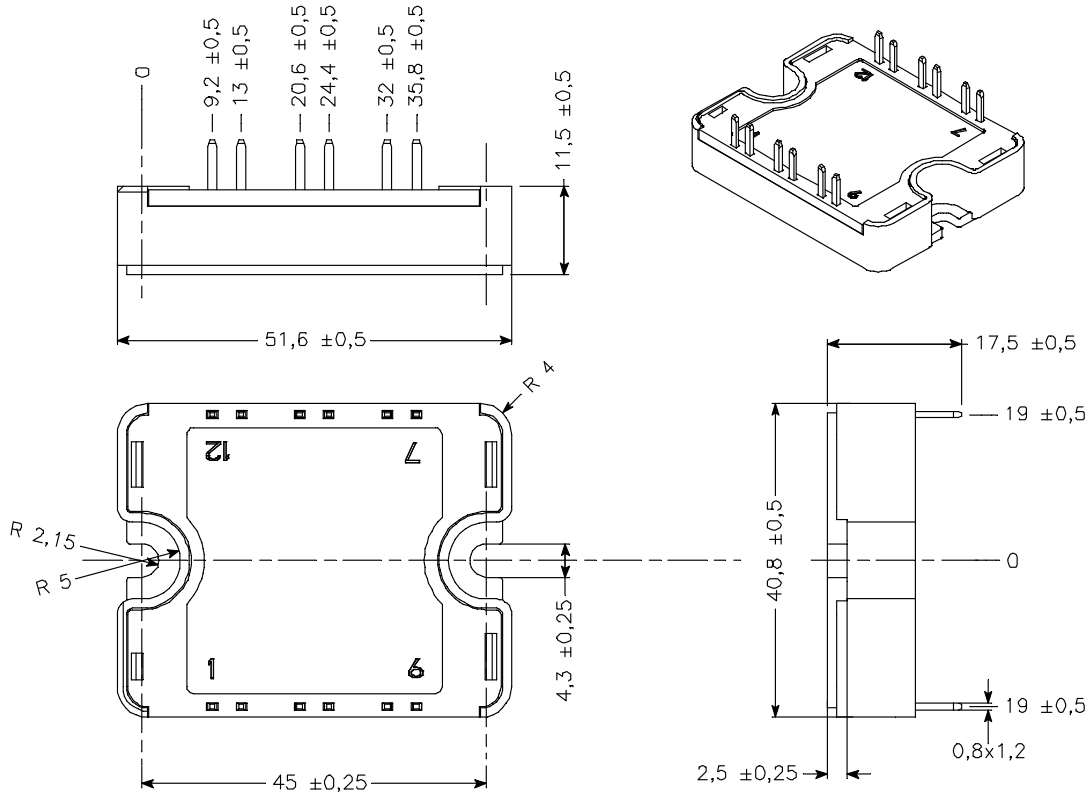
| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|----------|------------------|--------------------------|-----|-----|-----|------------------|
| R_{sh} | Resistance value | | | 10 | | $\text{m}\Omega$ |
| T_{sh} | Tolerance | | | 2 | | % |
| P_{sh} | Load capacity | $T_C = 25^\circ\text{C}$ | | | 20 | W |
| | | $T_C = 80^\circ\text{C}$ | | | 10 | |
| I_{sh} | Current capacity | $T_C = 25^\circ\text{C}$ | | | 44 | A |
| | | $T_C = 80^\circ\text{C}$ | | | 31 | |

Temperature sensor PTC

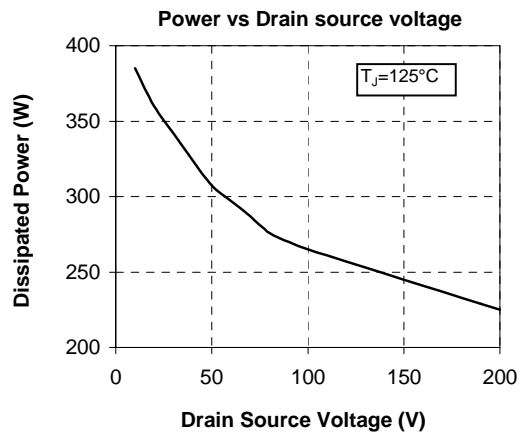
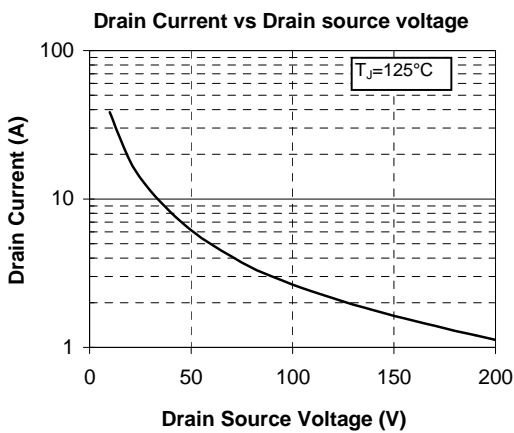
| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|------------------|---------------------------------|---|-------|-------|-------|----------|
| R_{25} | Resistance @ 25°C | | 1980 | | 2020 | Ω |
| R_{100}/R_{25} | Resistance ratio | $T_{amb} = 100^\circ\text{C} \ \& \ 25^\circ\text{C}$ | 1.676 | 1.696 | 1.716 | |
| R_{-55}/R_{25} | Resistance ratio | $T_{amb} = -55^\circ\text{C} \ \& \ 25^\circ\text{C}$ | 0.48 | 0.49 | 0.50 | |
| B | Temperature coefficient | | | 7900 | | ppm/K |

Thermal and package characteristics

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|------------|---|-------------------|------|-----|------|---------------------------|
| R_{thJC} | Junction to Case Thermal Resistance | MOSFET | | | 0.26 | $^\circ\text{C}/\text{W}$ |
| V_{ISOL} | RMS Isolation Voltage, any terminal to case $t = 1\text{min}$, $I_{isol} < 1\text{mA}$, 50/60Hz | | 4000 | | | V |
| T_j | Operating junction temperature range | | -40 | | 150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | | -40 | | 125 | |
| T_C | Operating Case Temperature | | -40 | | 100 | |
| Torque | Mounting torque | To heatsink M4 | 2.5 | | 4.7 | N.m |
| Wt | Package Weight | | | | 80 | g |

SP1 Package outline (dimensions in mm)


See application note 1904 - Mounting Instructions for SP1 Power Modules on www.microsemi.com

Typical Performance Curve (linear mode)


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