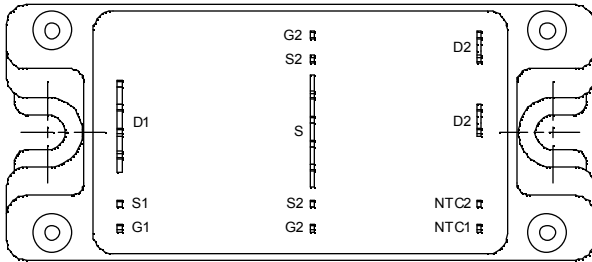
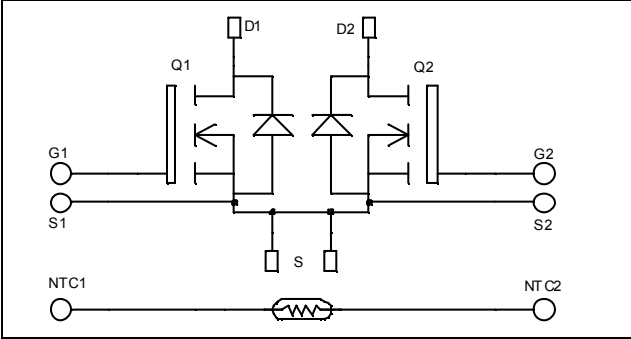


## Dual common source MOSFET Power Module

$V_{DSS} = 200V$   
 $R_{DSon} = 10m\Omega \text{ typ @ } T_j = 25^\circ C$   
 $I_D = 175A \text{ @ } T_c = 25^\circ C$



### Application

- AC Switches
- Switched Mode Power Supplies
- Uninterruptible Power Supplies

### Features

- Power MOS 7<sup>®</sup> MOSFETs
  - Low  $R_{DSon}$
  - Low input and Miller capacitance
  - Low gate charge
  - Avalanche energy rated
  - Very rugged
- Kelvin source for easy drive
- Very low stray inductance
  - Symmetrical design
  - Lead frames for power connections
- Internal thermistor for temperature monitoring
- High level of integration

### Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- 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                          | $T_c = 25^\circ C$ | 175       |
|            |   | $T_c = 80^\circ C$ | 131       |
| $I_{DM}$   | Pulsed Drain current                              | 700                |           |
| $V_{GS}$   | Gate - Source Voltage                             | $\pm 30$           | V         |
| $R_{DSon}$ | Drain - Source ON Resistance                      | 12                 | $m\Omega$ |
| $P_D$      | Maximum Power Dissipation                         | $T_c = 25^\circ C$ | 694       |
| $I_{AR}$   | Avalanche current (repetitive and non repetitive) | 89                 | A         |
| $E_{AR}$   | Repetitive Avalanche Energy                       | 50                 | mJ        |
| $E_{AS}$   | Single Pulse Avalanche Energy                     | 2500               |           |

**CAUTION:** These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on [www.microsemi.com](http://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 | $V_{GS} = 0\text{V}, V_{DS} = 200\text{V}$    |     |     | 200       | $\mu\text{A}$    |
|              |                                 | $V_{GS} = 0\text{V}, V_{DS} = 160\text{V}$    |     |     | 1000      |                  |
| $R_{DS(on)}$ | Drain – Source on Resistance    | $V_{GS} = 10\text{V}, I_D = 87.5\text{A}$     |     | 10  | 12        | $\text{m}\Omega$ |
| $V_{GS(th)}$ | Gate Threshold Voltage          | $V_{GS} = V_{DS}, I_D = 5\text{mA}$           | 3   |     | 5         | V                |
| $I_{GSS}$    | Gate – Source Leakage Current   | $V_{GS} = \pm 30\text{V}, V_{DS} = 0\text{V}$ |     |     | $\pm 150$ | nA               |

**Dynamic Characteristics**

| Symbol       | Characteristic               | Test Conditions   | Min | Typ  | Max | Unit          |
|--------------|------------------------------|---|-----|------|-----|---------------|
| $C_{iss}$    | Input Capacitance            | $V_{GS} = 0\text{V}$<br>$V_{DS} = 25\text{V}$<br>$f = 1\text{MHz}$  |     | 13.7 |     | nF            |
| $C_{oss}$    | Output Capacitance           |   |     | 4.36 |     |               |
| $C_{rss}$    | Reverse Transfer Capacitance |   |     | 0.19 |     |               |
| $Q_g$        | Total gate Charge            | $V_{GS} = 10\text{V}$<br>$V_{Bus} = 100\text{V}$<br>$I_D = 150\text{A}$   |     | 224  |     | nC            |
| $Q_{gs}$     | Gate – Source Charge         |   |     | 86   |     |               |
| $Q_{gd}$     | Gate – Drain Charge          |   |     | 94   |     |               |
| $T_{d(on)}$  | Turn-on Delay Time           | <b>Inductive switching @ <math>125^\circ\text{C}</math></b><br>$V_{GS} = 15\text{V}$<br>$V_{Bus} = 133\text{V}$<br>$I_D = 150\text{A}$<br>$R_G = 2.5\Omega$ |     | 28   |     | ns            |
| $T_r$        | Rise Time                    |   |     | 56   |     |               |
| $T_{d(off)}$ | Turn-off Delay Time          |   |     | 81   |     |               |
| $T_f$        | Fall Time                    |   |     | 99   |     |               |
| $E_{on}$     | Turn-on Switching Energy     | <b>Inductive switching @ <math>25^\circ\text{C}</math></b><br>$V_{GS} = 15\text{V}, V_{Bus} = 133\text{V}$<br>$I_D = 150\text{A}, R_G = 2.5\Omega$          |     | 926  |     | $\mu\text{J}$ |
| $E_{off}$    | Turn-off Switching Energy    |   |     | 910  |     |               |
| $E_{on}$     | Turn-on Switching Energy     | <b>Inductive switching @ <math>125^\circ\text{C}</math></b><br>$V_{GS} = 15\text{V}, V_{Bus} = 133\text{V}$<br>$I_D = 150\text{A}, R_G = 2.5\Omega$         |     | 1216 |     | $\mu\text{J}$ |
| $E_{off}$    | Turn-off Switching Energy    |   |     | 1062 |     |               |

**Source - Drain diode ratings and characteristics**

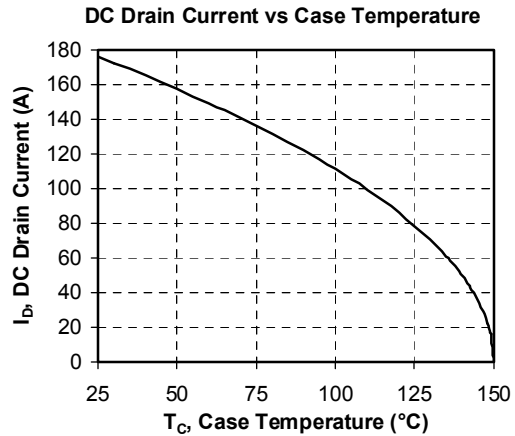
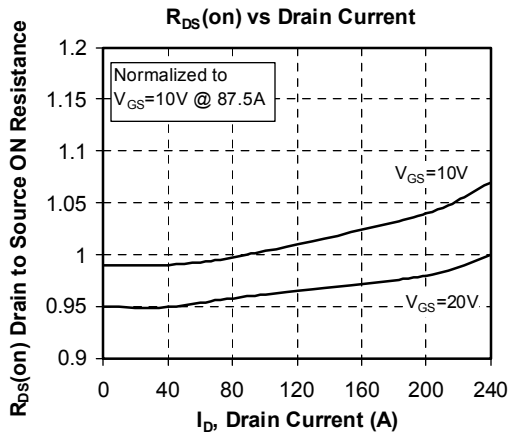
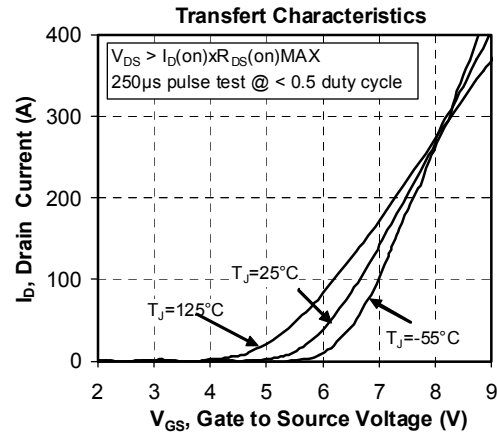
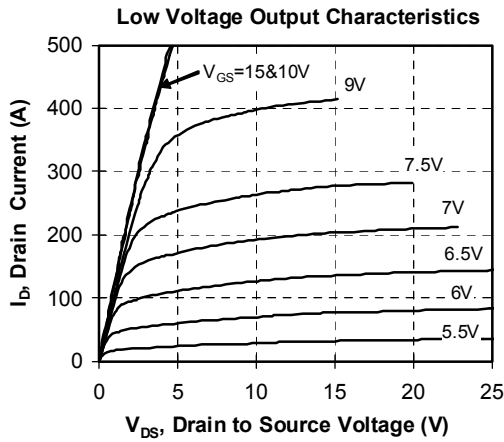
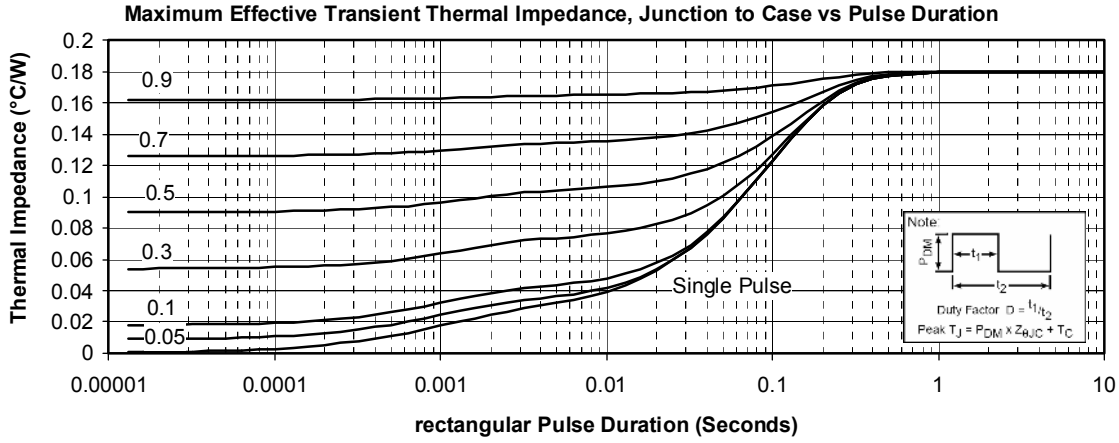
| Symbol   | Characteristic                         | Test Conditions                          | Min                      | Typ | Max | Unit          |
|----------|--|--|--------------------------|-----|-----|---------------|
| $I_S$    | Continuous Source current (Body diode) |  | $T_c = 25^\circ\text{C}$ |     | 175 | A             |
|          |  |  | $T_c = 80^\circ\text{C}$ |     | 131 |               |
| $V_{SD}$ | Diode Forward Voltage                  | $V_{GS} = 0\text{V}, I_S = -150\text{A}$ |                          |     | 1.3 | V             |
| $dv/dt$  | Peak Diode Recovery ①                  |  |                          |     | 5   | V/ns          |
| $t_{rr}$ | Reverse Recovery Time                  | $I_S = -150\text{A}, V_R = 133\text{V}$  |                          | 284 |     | ns            |
| $Q_{rr}$ | Reverse Recovery Charge                | $di/dt = 200\text{A}/\mu\text{s}$        |                          | 6.1 |     | $\mu\text{C}$ |

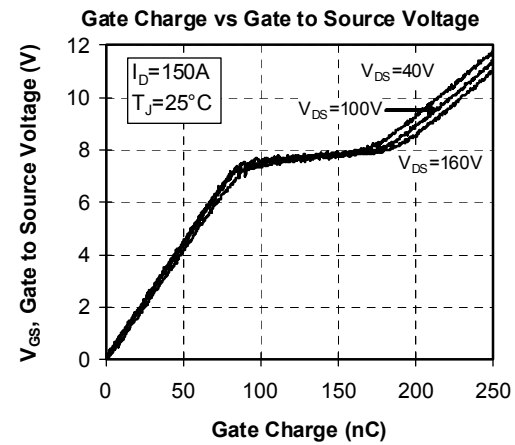
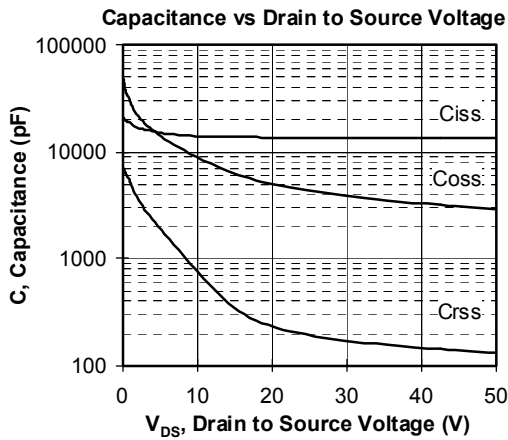
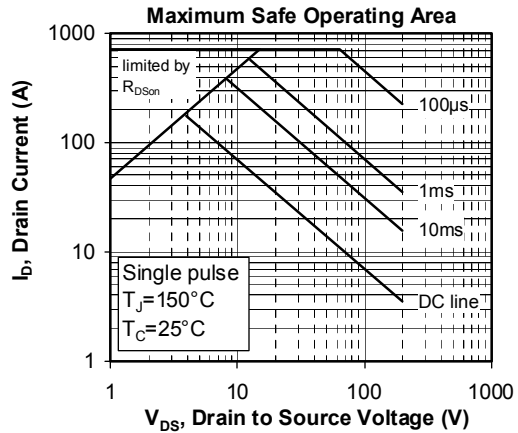
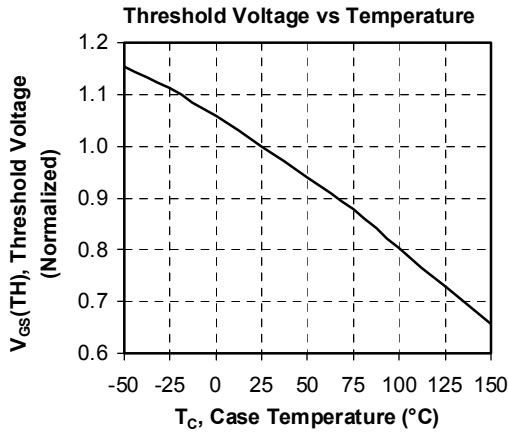
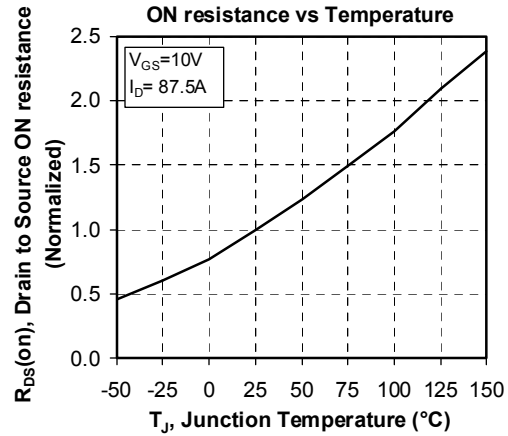
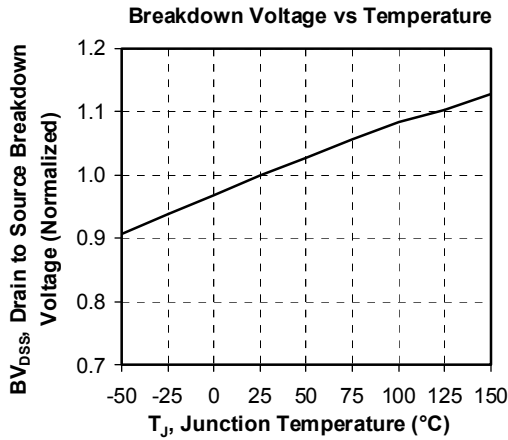
 ①  $dv/dt$  numbers reflect the limitations of the circuit rather than the device itself.

$$I_S \leq -175\text{A} \quad di/dt \leq 700\text{A}/\mu\text{s} \quad V_R \leq V_{DSS} \quad T_j \leq 150^\circ\text{C}$$

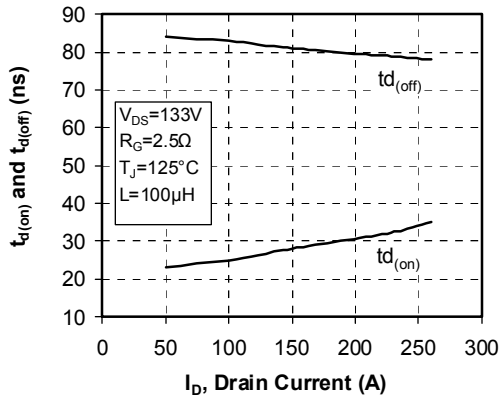


## Typical Performance Curve

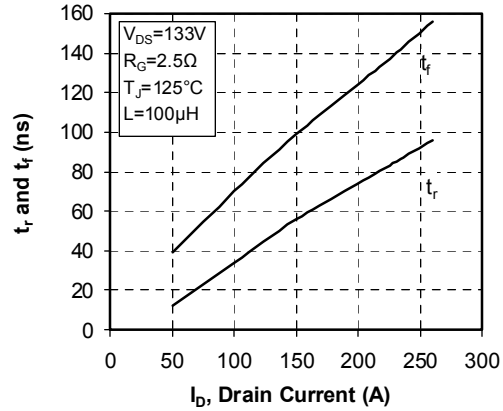




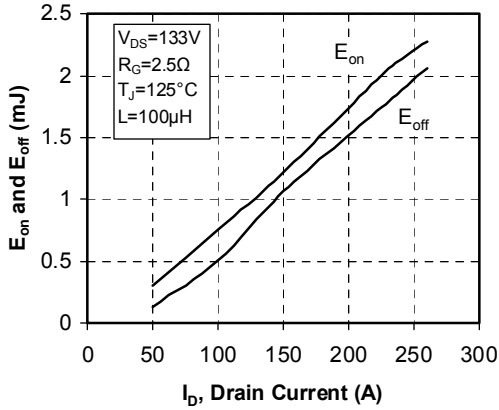
**Delay Times vs Current**



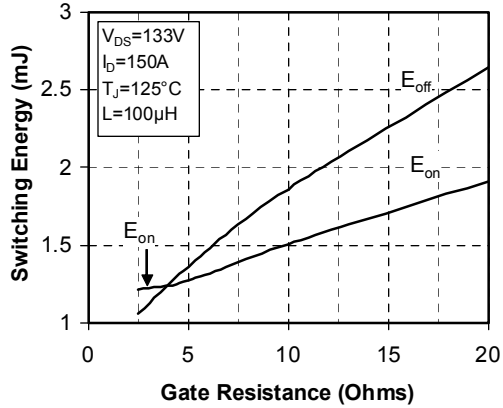
**Rise and Fall times vs Current**



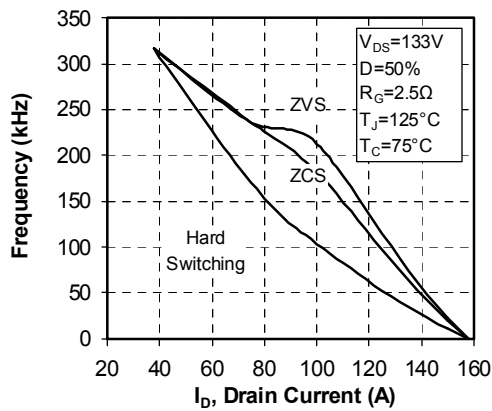
**Switching Energy vs Current**



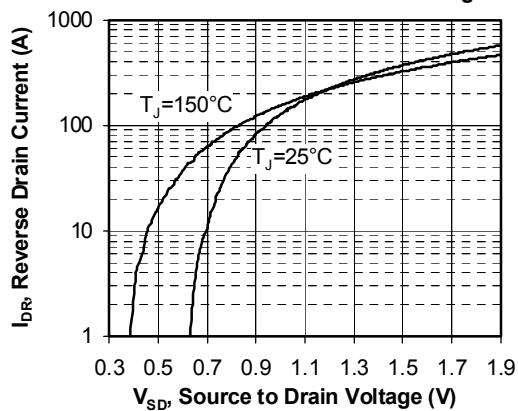
**Switching Energy vs Gate Resistance**



**Operating Frequency vs Drain Current**



**Source to Drain Diode Forward Voltage**



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