**Dual common source MOSFET Power Module**

- **Symbol**
  - **V_DSS**: Drain - Source Breakdown Voltage
  - **I_D**: Continuous Drain Current
  - **I_{DM}**: Pulsed Drain current
  - **V_{GS}**: Gate - Source Voltage
  - **R_{DSon}**: Drain - Source ON Resistance
  - **P_D**: Maximum Power Dissipation
  - **I_{AR}**: Avalanche current (repetitive and non repetitive)
  - **E_{AR}**: Repetitive Avalanche Energy
  - **E_{AS}**: Single Pulse Avalanche Energy

- **Parameter**
  - **Max ratings**:
  - **Unit**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter Description</th>
<th>Max ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{DSS}</td>
<td>Drain - Source Breakdown Voltage</td>
<td>200</td>
<td>V</td>
</tr>
<tr>
<td>I_D</td>
<td>Continuous Drain Current</td>
<td>372</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>T_c = 25°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I_{DM}</td>
<td>Pulsed Drain current</td>
<td>1488</td>
<td>A</td>
</tr>
<tr>
<td>V_{GS}</td>
<td>Gate - Source Voltage</td>
<td>±30</td>
<td>V</td>
</tr>
<tr>
<td>R_{DSon}</td>
<td>Drain - Source ON Resistance</td>
<td>4</td>
<td>mΩ</td>
</tr>
<tr>
<td>P_D</td>
<td>Maximum Power Dissipation</td>
<td>1250</td>
<td>W</td>
</tr>
<tr>
<td>I_{AR}</td>
<td>Avalanche current (repetitive and non repetitive)</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>E_{AR}</td>
<td>Repetitive Avalanche Energy</td>
<td>50</td>
<td>mJ</td>
</tr>
<tr>
<td>E_{AS}</td>
<td>Single Pulse Avalanche Energy</td>
<td>3000</td>
<td>mJ</td>
</tr>
</tbody>
</table>

- **CAUTION**: These Devices are sensitive to Electrostatic Discharge. Proper Handing Procedures Should Be Followed.

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

**Features**
- Power MOS 7® 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
  - M5 power connectors
- High level of integration

**Benefits**
- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Low profile
### Electrical Characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Characteristic</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BV_DSS</td>
<td>Drain - Source Breakdown Voltage</td>
<td>V GS = 0V, I D = 500µA</td>
<td>200</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>I_DSS</td>
<td>Zero Gate Voltage Drain Current</td>
<td>V GS = 0V, V DS = 200V</td>
<td>200</td>
<td></td>
<td></td>
<td>µA</td>
</tr>
<tr>
<td>R_D(on)</td>
<td>Drain – Source on Resistance</td>
<td>V GS = 10V, I D = 186A</td>
<td>4</td>
<td></td>
<td></td>
<td>mΩ</td>
</tr>
<tr>
<td>V_GS(th)</td>
<td>Gate Threshold Voltage</td>
<td>V GS = V DS, I D = 10mA</td>
<td>3</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>I_GS</td>
<td>Gate – Source Leakage Current</td>
<td>V GS = ±30 V, V DS = 0V</td>
<td>±200</td>
<td></td>
<td></td>
<td>nA</td>
</tr>
</tbody>
</table>

### Dynamic Characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Characteristic</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_iss</td>
<td>Input Capacitance</td>
<td>V GS = 0V</td>
<td>28.9</td>
<td></td>
<td></td>
<td>nF</td>
</tr>
<tr>
<td>C_os</td>
<td>Output Capacitance</td>
<td>V DS = 25V</td>
<td>9.32</td>
<td></td>
<td></td>
<td>nF</td>
</tr>
<tr>
<td>Crss</td>
<td>Reverse Transfer Capacitance</td>
<td>f = 1MHz</td>
<td>0.58</td>
<td></td>
<td></td>
<td>nF</td>
</tr>
<tr>
<td>Q_g</td>
<td>Total gate Charge</td>
<td>V GS = 10V</td>
<td>560</td>
<td></td>
<td></td>
<td>nC</td>
</tr>
<tr>
<td>Q_gs</td>
<td>Gate – Source Charge</td>
<td>V Bus = 100V</td>
<td>212</td>
<td></td>
<td></td>
<td>nC</td>
</tr>
<tr>
<td>Q_gd</td>
<td>Gate – Drain Charge</td>
<td>I D = 372A</td>
<td>268</td>
<td></td>
<td></td>
<td>nC</td>
</tr>
<tr>
<td>T_d(on)</td>
<td>Turn-on Delay Time</td>
<td>Inductive switching @ 125°C</td>
<td>32</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>T_r</td>
<td>Rise Time</td>
<td>V GS = 15V, V Bus = 133V</td>
<td>64</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>T_d(off)</td>
<td>Turn-off Delay Time</td>
<td>I D = 372A</td>
<td>88</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>T_f</td>
<td>Fall Time</td>
<td>R G = 1.2Ω</td>
<td>116</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>E_on</td>
<td>Turn-on Switching Energy</td>
<td>Inductive switching @ 25°C</td>
<td>3396</td>
<td></td>
<td></td>
<td>µJ</td>
</tr>
<tr>
<td>E_off</td>
<td>Turn-off Switching Energy</td>
<td>Inductive switching @ 125°C</td>
<td>3716</td>
<td></td>
<td></td>
<td>µJ</td>
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<tr>
<td>E_on</td>
<td>Turn-on Switching Energy</td>
<td>Inductive switching @ 25°C</td>
<td>3744</td>
<td></td>
<td></td>
<td>µJ</td>
</tr>
<tr>
<td>E_off</td>
<td>Turn-off Switching Energy</td>
<td>Inductive switching @ 125°C</td>
<td>3944</td>
<td></td>
<td></td>
<td>µJ</td>
</tr>
</tbody>
</table>

### Source - Drain diode ratings and characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Characteristic</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_S</td>
<td>Continuous Source current (Body diode)</td>
<td>Tc = 25°C</td>
<td>372</td>
<td></td>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tc = 80°C</td>
<td>278</td>
<td></td>
<td></td>
<td>A</td>
</tr>
<tr>
<td>V_SD</td>
<td>Diode Forward Voltage</td>
<td>V GS = 0V, I S = - 372A</td>
<td>1.3</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>dv/dt</td>
<td>Peak Diode Recovery</td>
<td>I S = -372A</td>
<td>5</td>
<td></td>
<td></td>
<td>V/ns</td>
</tr>
<tr>
<td>t_r</td>
<td>Reverse Recovery Time</td>
<td>I S = -372A</td>
<td>360</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>Q_r</td>
<td>Reverse Recovery Charge</td>
<td>I S = -372A</td>
<td>26.8</td>
<td></td>
<td></td>
<td>µC</td>
</tr>
</tbody>
</table>

1. E_on includes diode reverse recovery.
2. In accordance with JEDEC standard JESD24-1.
3. dv/dt numbers reflect the limitations of the circuit rather than the device itself.

I_S ≤ -372A \hspace{1em} \text{di/dt} ≤ 700A/µs \hspace{1em} V_R ≤ V_DSS \hspace{1em} T_j ≤ 150°C
### Thermal and package characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Characteristic</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_{thJC}$</td>
<td>Junction to Case</td>
<td></td>
<td></td>
<td></td>
<td>°C/W</td>
</tr>
<tr>
<td>$V_{ISOL}$</td>
<td>RMS Isolation Voltage, any terminal to case $t = 1 \text{ min}$, $I_{isol} &lt; 1 \text{ mA}, 50/60\text{Hz}$</td>
<td></td>
<td></td>
<td>2500</td>
<td>V</td>
</tr>
<tr>
<td>$T_J$</td>
<td>Operating junction temperature range</td>
<td>-40</td>
<td></td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{STG}$</td>
<td>Storage Temperature Range</td>
<td>-40</td>
<td></td>
<td>125</td>
<td>°C</td>
</tr>
<tr>
<td>$T_C$</td>
<td>Operating Case Temperature</td>
<td>-40</td>
<td></td>
<td>100</td>
<td>°C</td>
</tr>
<tr>
<td>Torque</td>
<td>Mounting torque</td>
<td></td>
<td></td>
<td></td>
<td>N.m</td>
</tr>
<tr>
<td>Wt</td>
<td>Package Weight</td>
<td></td>
<td></td>
<td>280</td>
<td>g</td>
</tr>
</tbody>
</table>

#### Package outline

![Package Outline Diagram](image-url)
Typical Performance Curve

Maximum Effective Transient Thermal Impedance, Junction to Case vs Pulse Duration

Thermal Impedance (°C/W)

rectangular Pulse Duration (Seconds)

Single Pulse

Low Voltage Output Characteristics

VGS=15V

VGS=10V

VGS=9V

VGS=6.5V

VGS=8V

VGS=7V

VGS=6.5V

ID, Drain Current (A)

VDS, Drain to Source Voltage (V)

Transfert Characteristics

VGS > VDS(on) x RDS(on) MAX

250μs pulse test @ < 0.5 duty cycle

RDS(on) vs Drain Current

Normalized to VGS=10V @ 186A

RDS(on) Drain to Source ON Resistance

I_D, Drain Current (A)

DC Drain Current vs Case Temperature

I_D, DC Drain Current (A)

T_C, Case Temperature (°C)
### Breakdown Voltage vs Temperature
- **BV_{oss}, Drain to Source Breakdown Voltage (Normalized)**

![Graph showing Breakdown Voltage vs Temperature](image)

- **T_J, Junction Temperature (°C)**
- **BV_{oss}**

### ON resistance vs Temperature
- **RDS(on), Drain to Source ON resistance (Normalized)**

![Graph showing ON resistance vs Temperature](image)

- **T_J, Junction Temperature (°C)**
- **RDS(on)**

### Threshold Voltage vs Temperature
- **V_{G}(TH), Threshold Voltage (Normalized)**

![Graph showing Threshold Voltage vs Temperature](image)

- **T_C, Case Temperature (°C)**
- **V_{G}(TH)**

### Maximum Safe Operating Area
- **V_{DSS}, Drain to Source Voltage (V)**
- **I_D, Drain Current (A)**
- **T_J=150°C**

![Graph showing Maximum Safe Operating Area](image)

- **V_{DSS}**
- **I_D**

### Capacitance vs Drain to Source Voltage
- **C_{iss}, C_{iss}, C_{oss}, C_{oss,iss}**

![Graph showing Capacitance vs Drain to Source Voltage](image)

- **V_{DSS}, Drain to Source Voltage (V)**
- **C_{iss}, C_{oss,iss}, C_{oss}**

### Gate Charge vs Gate to Source Voltage
- **V_{G}, Gate to Source Voltage (V)**
- **V_{DSS}=40V, V_{DSS}=100V, V_{DSS}=160V**

![Graph showing Gate Charge vs Gate to Source Voltage](image)

- **V_{G}, Gate to Source Voltage (V)**
- **V_{DSS}**
Delay Times vs Current

- \( V_{DS} = 133 \text{V} \)
- \( R_{G} = 1.2 \Omega \)
- \( T_J = 125^\circ \text{C} \)
- \( L = 100 \mu\text{H} \)

Rise and Fall times vs Current

- \( V_{DS} = 133 \text{V} \)
- \( R_{G} = 1.2 \Omega \)
- \( T_J = 125^\circ \text{C} \)
- \( L = 100 \mu\text{H} \)

Switching Energy vs Current

- \( V_{DS} = 133 \text{V} \)
- \( R_{G} = 1.2 \Omega \)
- \( T_J = 125^\circ \text{C} \)
- \( L = 100 \mu\text{H} \)

Switching Energy vs Gate Resistance

- \( V_{DS} = 133 \text{V} \)
- \( L = 100 \mu\text{H} \)

Operating Frequency vs Drain Current

- \( V_{DS} = 133 \text{V} \)
- \( D = 50\% \)
- \( R_{G} = 1.2 \Omega \)
- \( T_J = 125^\circ \text{C} \)

Source to Drain Diode Forward Voltage

- \( V_{SD} \) vs Reverse Drain Current
- \( V_{SD} \) vs Source to Drain Voltage

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