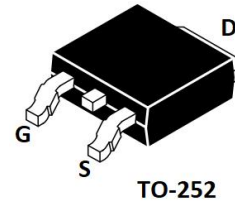


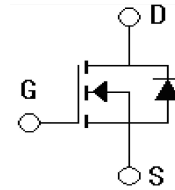
Features

- Low gate charge
- Low Crss (typical 25pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product



Applications

- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- UPS



Absolute Ratings (Tc=25°C)

| Parameter | Symbol | Value | Unit |
|---|-----------------------------------|----------|------|
| Drain-Source Voltage | V _{DSS} | 200 | V |
| Drain Current -continuous | I _D | 13 | A |
| Drain Current - pulse | I _{DM} | 52 | A |
| Gate-Source Voltage | V _{GSS} | ±30 | V |
| Single Pulsed Avalanche Energy | E _{AS} | 259 | mJ |
| Power Dissipation | PD | 140 | W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55~+175 | °C |
| Peak Diode Recovery dv/dt | dv/dt | 5.5 | V/ns |
| Maximum Lead Temperature for Soldering Purposes | T _L | 300 | °C |

*Drain current limited by maximum junction temperature

Electrical Characteristics (T_{CASE}=25°C unless otherwise specified)

| Parameter | Symbol | Tests conditions | Min | Type | Max | Units |
|------------------------------------|-------------------|--|-----|------|------|-------|
| Off-Characteristics | | | | | | |
| Drain-Source Voltage | BV _{DSS} | I _D =250μA, V _{GS} =0V | 200 | - | - | V |
| Drain cut-off current | I _{DSS} | V _{DS} =200V, V _{GS} =0V | - | - | 1 | μA |
| Gate-body leakage current, forward | I _{GSSF} | V _{DS} =0V, V _{GS} =30V | - | - | 100 | nA |
| Gate-body leakage current, reverse | I _{GSSR} | V _{DS} =0V, V _{GS} =-30V | - | - | -100 | nA |

| On-Characteristics | | | | | | |
|--|--------------|--|------|------|------|------------|
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2 | - | 4 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=6.5A$ | 80 | 120 | 150 | m Ω |
| Forward Transconductance | Gfs | $V_{DS}=40V, I_D=6.5A$ | - | 14.5 | - | S |
| Dynamic Characteristics | | | | | | |
| Input capacitance | Ciss | $V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$ | 350 | 1001 | 1650 | pF |
| Output capacitance | Coss | | 104 | 173 | 300 | pF |
| Reverse transfer capacitance | Crss | | 15 | 25 | 40 | pF |
| Gate Resistance | R_G | $f=1.0MHz$ | 0.5 | 1.5 | 2.5 | Ω |
| Switching Characteristics | | | | | | |
| Turn-On delay time | $t_{d(on)}$ | $V_{DD}=100V, I_D=13A.,$ $R_G=25\Omega$ | 9 | 15.2 | 21 | ns |
| Turn-On rise time | t_r | | 16.5 | 38.7 | 60 | ns |
| Turn-Off delay time | $T_{d(off)}$ | | 21.5 | 46.4 | 71.5 | ns |
| Turn-Off Fall time | t_f | | 6.8 | 12.8 | 18.8 | ns |
| Total Gate Charge | Qg | $V_{DS}=160V,$ $I_D=13A,$ $V_{GS}=10V$ | 12 | 27.5 | 42 | nC |
| Gate-Source charge | Qgs | | 2.5 | 5.7 | 8.9 | nC |
| Gate-Drain charge | Qgd | | 5.8 | 10.8 | 15.8 | nC |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| Drain-Source Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=13A$ | - | - | 1.4 | V |
| Maximum Continuous Drain-Source Diode Forward Current | | I_S | - | - | 13 | A |
| Reverse recovery time | trr | $V_{GS}=0V, I_F=13A$ $dI_F/dt=100A/\mu s$ | 124 | 224 | 324 | ns |
| Reverse recovery charge | Qrr | | 0.58 | 1.38 | 2.18 | μC |

Thermal Characteristic

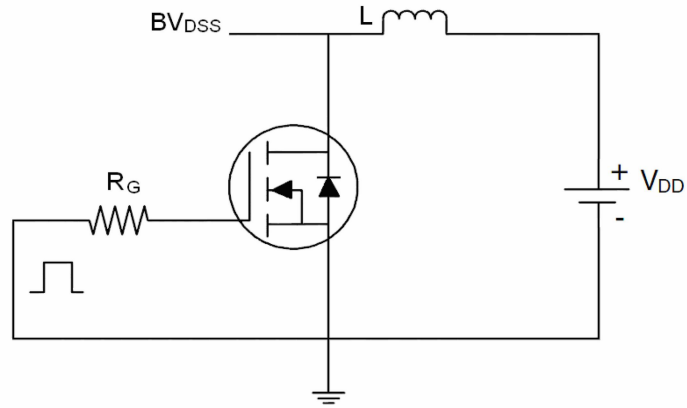
| Parameter | Symbol | Value | Unit |
|---|-----------------|-------|---------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 0.89 | $^{\circ}C/W$ |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 62.5 | |

Notes:

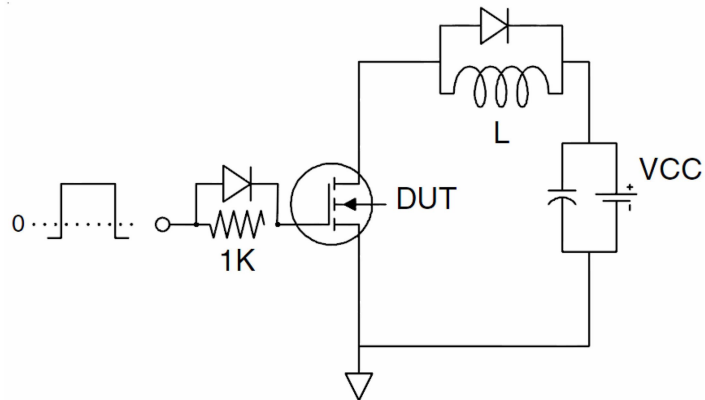
1. Pulse width limited by maximum junction temperature
2. $L=1.6mH, I_{AS}=13A, V_{DD}=50V, R_G=25\Omega, \text{Starting } T_J=25^{\circ}C$
3. $I_{SD} \leq 13A, di/dt \leq 200A/\mu s, V_{DD} \leq B_{VDSS}, \text{Starting } T_J=25^{\circ}C$
4. Pulse Test: Pulse Width $\leq 300\mu s, \text{Duty Cycle} \leq 2\%$
5. Essentially independent of operating temperature

Test Circuit

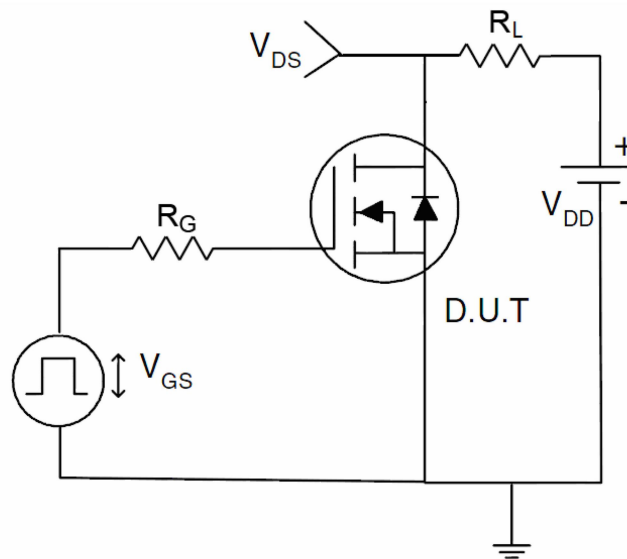
1) E_{AS} test Circuit



2) Gate charge test Circuit

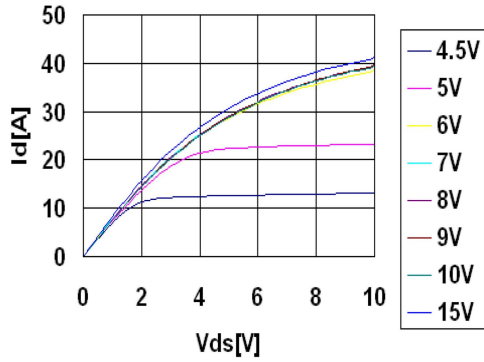


3) Switch Time Test Circuit

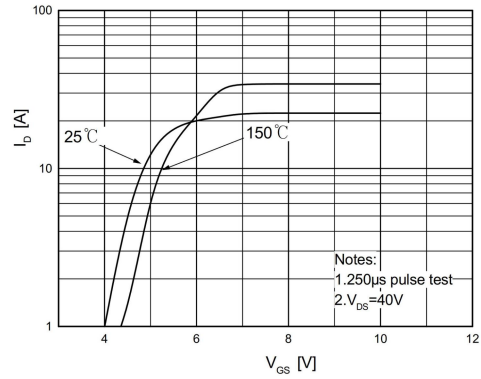


Typical Electrical and Thermal Characteristics (Curves)

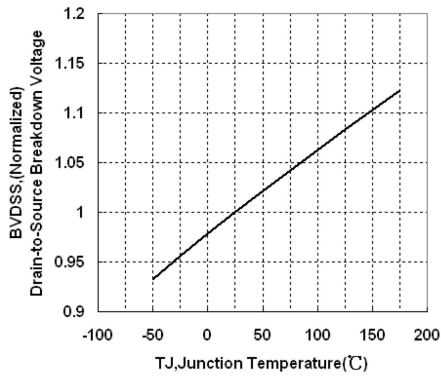
Typical Output Characteristics, $T_c=25^\circ\text{C}$



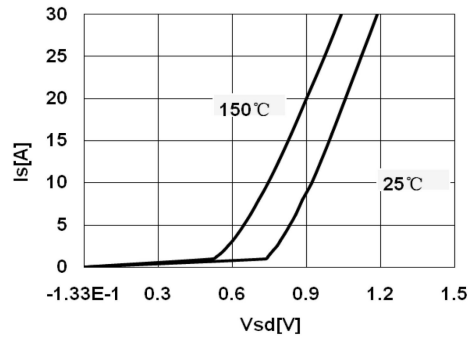
Transfer Characteristics



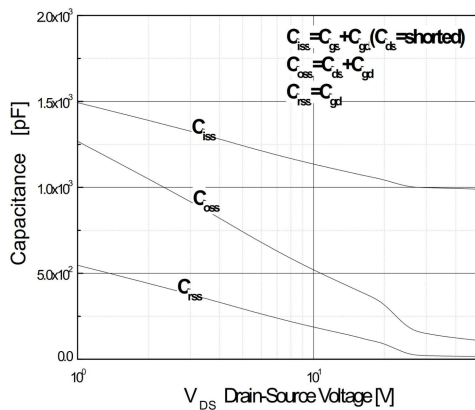
Breakdown Voltage Variation vs. Temperature



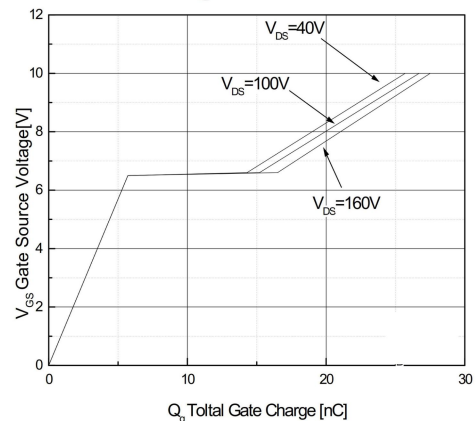
Body Diode Forward Voltage Variation vs. Source Current and Temperature



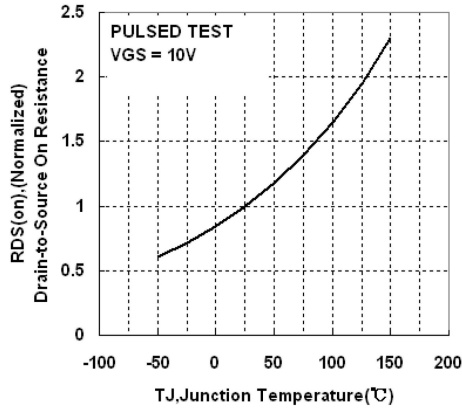
Capacitance Characteristics



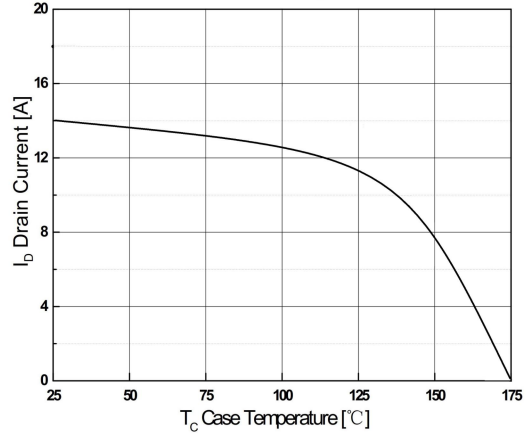
Gate Charge Characteristics



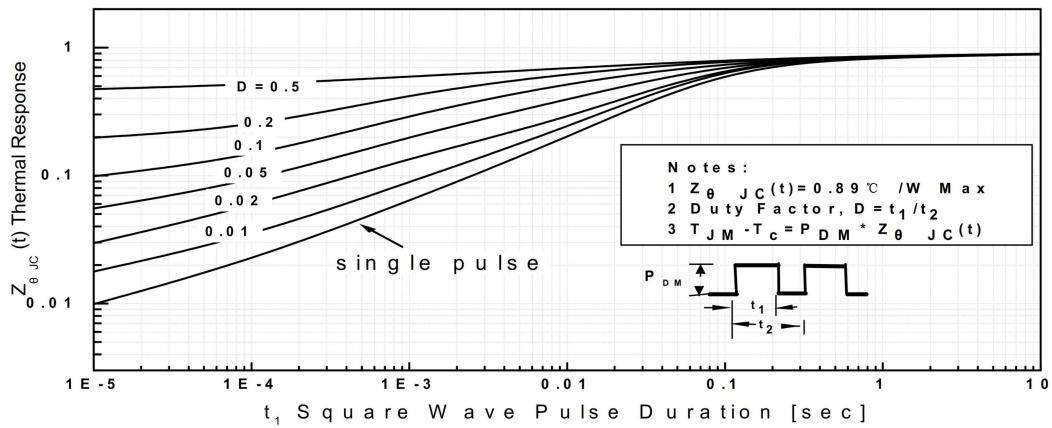
On-Resistance Variation vs. Temperature



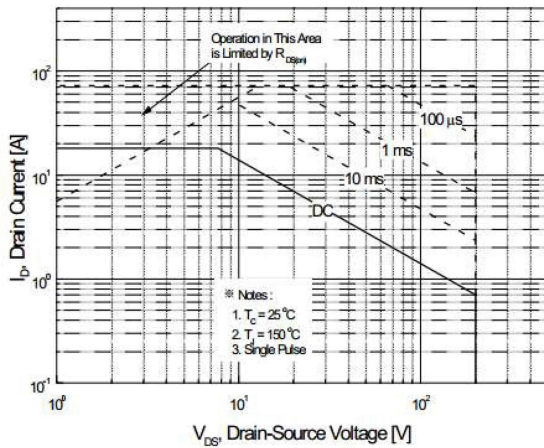
Maximum Drain Current vs. Case Temperature



Transient Thermal Response Curve



Maximum Safe Operating Area



Package Mechanical DATA

