



100V N-Channel Enhancement Mode MOSFET

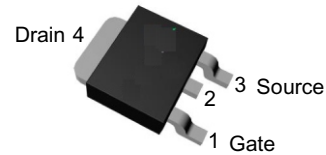
Features

- 100V/24A,
 $R_{DS(ON)} = 45m\Omega$ (Max.) @ $V_{GS} = 10V$
Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

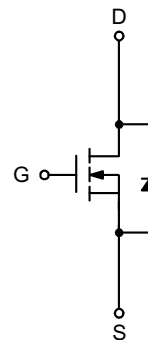
Applications

- High Speed Switching.
- High Voltage Synchronous Rectification for
Industrial Application.

Pin Description



Top View of TO-252-3



N-Channel MOSFET



Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

| Symbol | Parameter | Rating | Unit |
|-------------------------------|--|-----------------------------|------|
| Common Ratings | | | |
| V _{DSS} | Drain-Source Voltage | 100 | V |
| V _{GSS} | Gate-Source Voltage | ±25 | |
| T _J | Maximum Junction Temperature | 150 | °C |
| T _{STG} | Storage Temperature Range | -55 to 150 | |
| I _S | Diode Continuous Forward Current | T _C =25°C 12 | A |
| I _D | Continuous Drain Current | T _C =25°C 24 | A |
| | | T _C =100°C 15 | |
| I _{DM} ^a | Pulsed Drain Current | T _C =25°C 72 | |
| P _D | Maximum Power Dissipation | T _C =25°C 54 | W |
| | | T _C =100°C 21 | |
| R _{qJC} | Thermal Resistance-Junction to Case | 2.3 | °C/W |
| I _D | Continuous Drain Current | T _A =25°C 5 | A |
| | | T _A =70°C 3 | |
| P _D | Maximum Power Dissipation | T _A =25°C 2.5 | W |
| | | T _A =70°C 1.6 | |
| R _{qJA} ^c | Thermal Resistance-Junction to Ambient | 50 | °C/W |
| I _{AS} ^b | Avalanche Current, Single pulse | L=0.5mH 12 | A |
| E _{AS} ^b | Avalanche Energy, Single pulse | L=0.5mH 36 | mJ |

Note a : Pulse width limited by max. junction temperature.

Note b : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_J=25°C).

Note c : Surface Mounted on 1in² pad area.

Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|--|------------------------------------|---|------|------|------|------|
| Static Characteristics | | | | | | |
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _{DS} =250mA | 100 | - | - | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =80V, V _{GS} =0V T _J =85°C | - | - | 1 | mA |
| | | | - | - | 30 | |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _{DS} =250mA | 2 | 3 | 4 | V |
| I _{GSS} | Gate Leakage Current | V _{GS} =±25V, V _{DS} =0V | - | - | ±100 | nA |
| R _{DS(ON)} ^d | Drain-Source On-state Resistance V | V _{GS} =10V, I _{DS} =12A | - | 37 | 45 | mW |
| Diode Characteristics | | | | | | |
| V _{SD} ^d | Diode Forward Voltage | I _{SD} =12A, V _{GS} =0V | - | 0.8 | 1.3 | V |
| t _{rr} | Reverse Recovery Time | I _{SD} =12A, di _{SD} /dt=100A/ms | - | 31 | - | ns |
| Q _{rr} | Reverse Recovery Charge | | - | 40 | - | nC |
| Dynamic Characteristics^e | | | | | | |
| R _G | Gate Resistance | V _{GS} =0V, V _{DS} =0V, f=1MHz | - | 2.5 | - | W |
| C _{iss} | Input Capacitance | V _{GS} =0V, V _{DS} =30V, Frequency=1.0MHz | - | 1160 | 1500 | pF |
| C _{oss} | Output Capacitance | | - | 90 | - | |
| C _{rss} | Reverse Transfer Capacitance | | - | 45 | - | |
| t _{d(ON)} | Turn-on Delay Time | V _{DD} =30V, R _L =30Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω | - | 15 | 27 | ns |
| t _r | Turn-on Rise Time | | - | 8 | 15 | |
| t _{d(OFF)} | Turn-off Delay Time | | - | 29 | 53 | |
| t _f | Turn-off Fall Time | | - | 9 | 17 | |
| Gate Charge Characteristics^e | | | | | | |
| Q _g | Total Gate Charge | V _{DS} =50V, V _{GS} =10V, I _{DS} =12A | - | 23 | 33 | nC |
| Q _{gs} | Gate-Source Charge | | - | 6 | - | |
| Q _{gd} | Gate-Drain Charge | | - | 5.5 | - | |

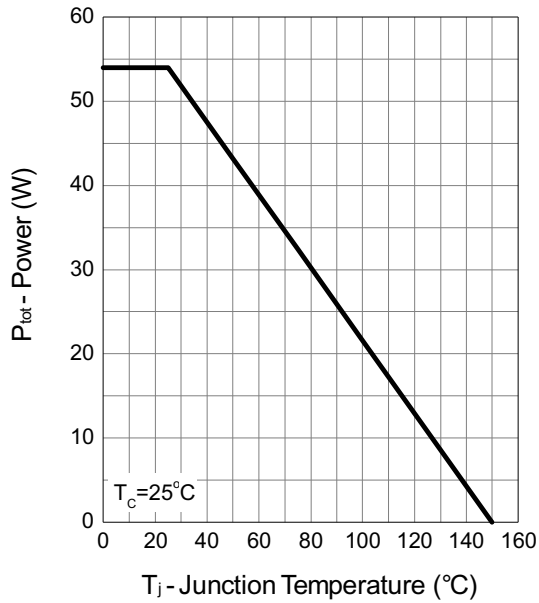
Note d : Pulse test ; pulse width<300ms, duty cycle+2%.

Note e : Guaranteed by design, not subject to production testing.

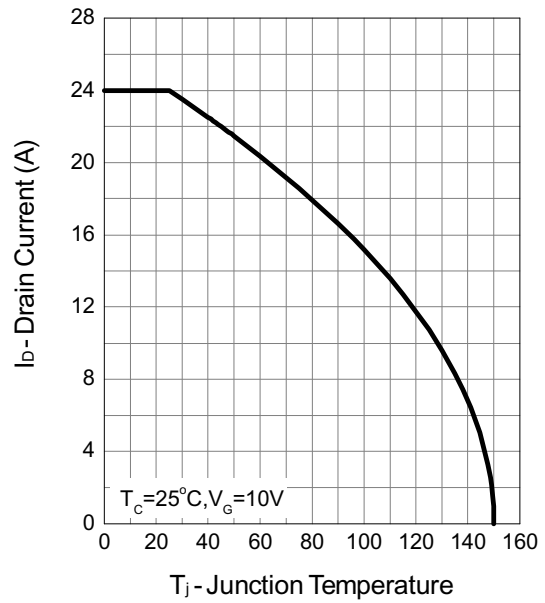


Typical Operating Characteristics

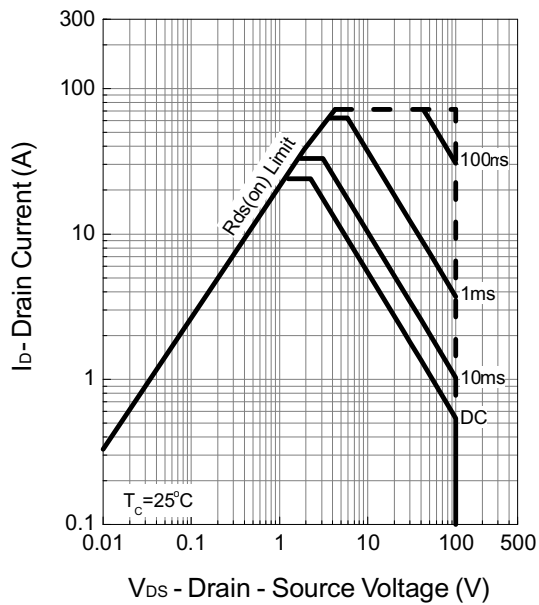
Power Dissipation



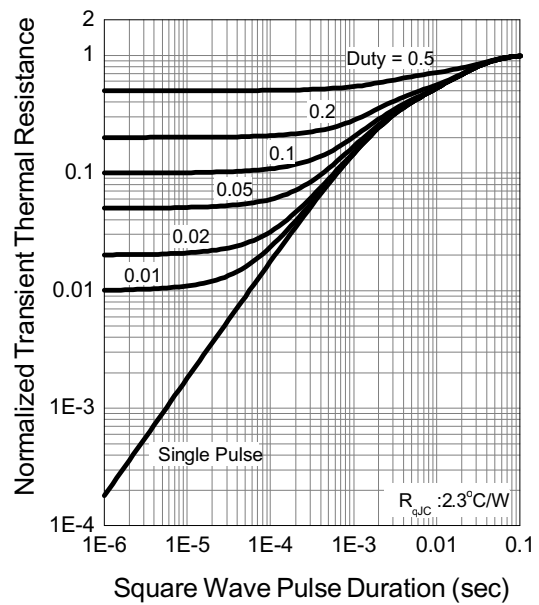
Drain Current



Safe Operation Area



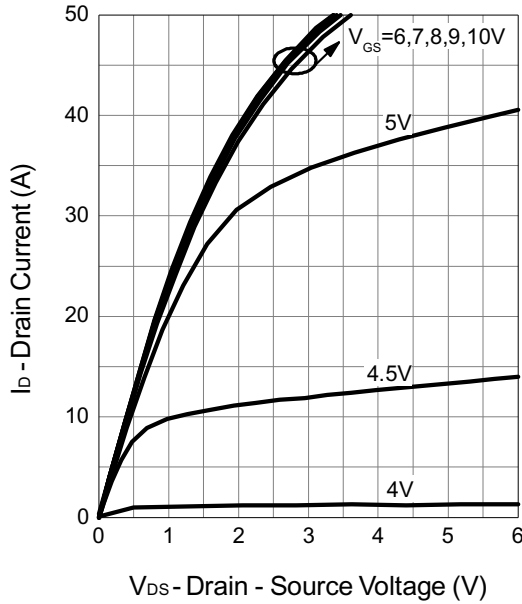
Thermal Transient Impedance



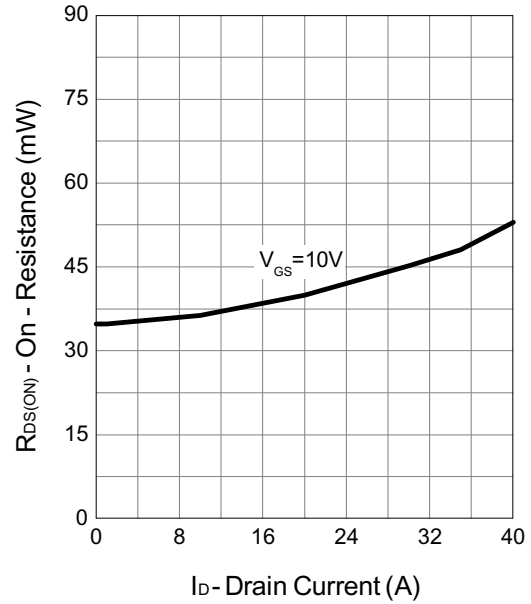


Typical Operating Characteristics (Cont.)

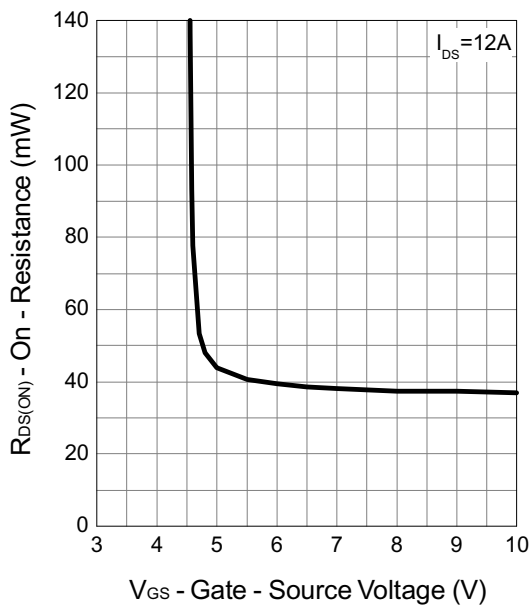
Output Characteristics



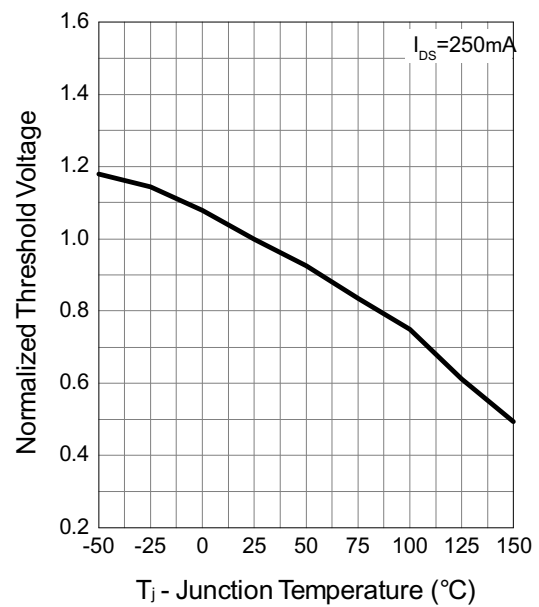
Drain-Source On Resistance



Gate-Source On Resistance



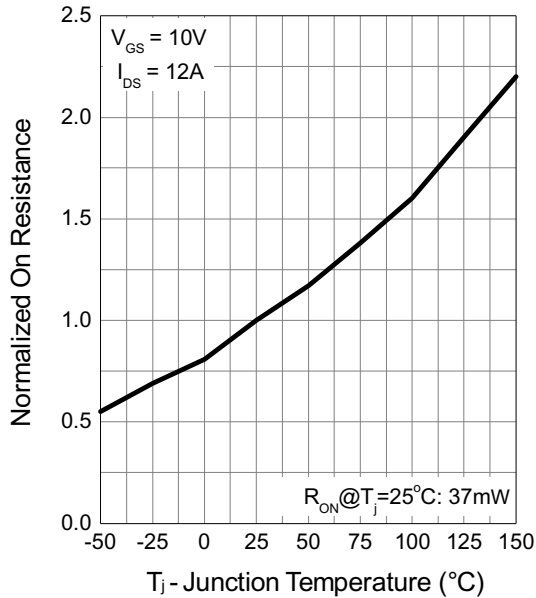
Gate Threshold Voltage



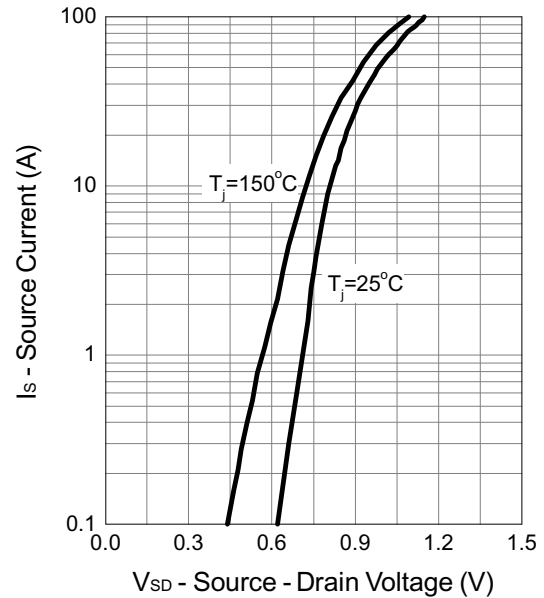


Typical Operating Characteristics (Cont.)

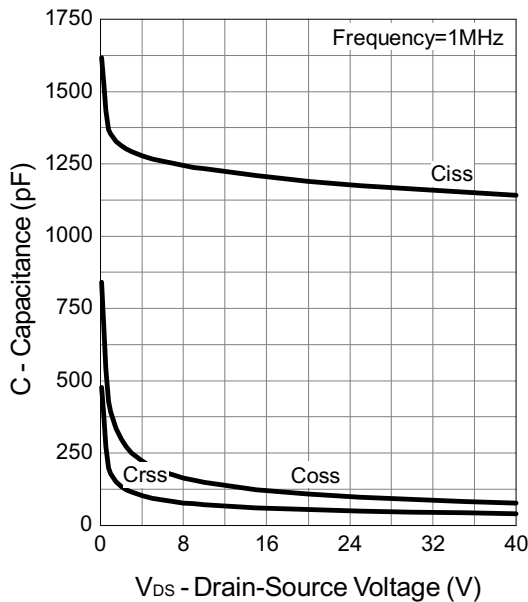
Drain-Source On Resistance



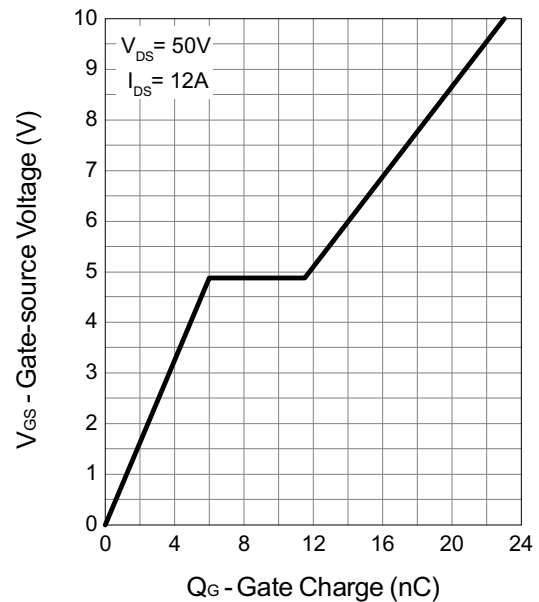
Source-Drain Diode Forward



Capacitance

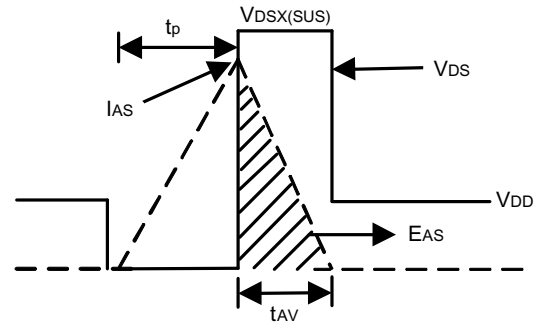
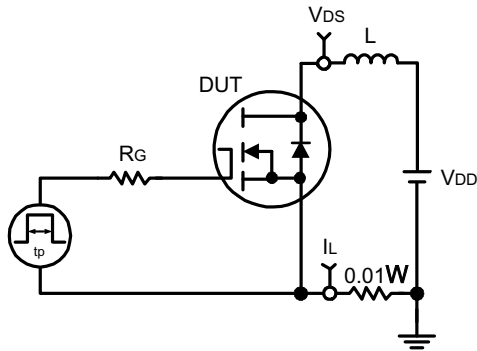


Gate Charge

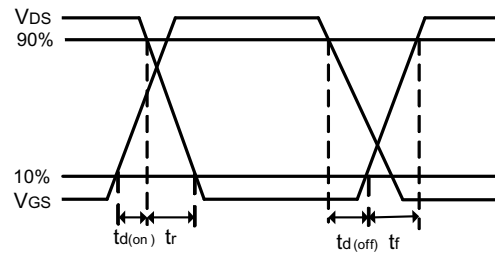
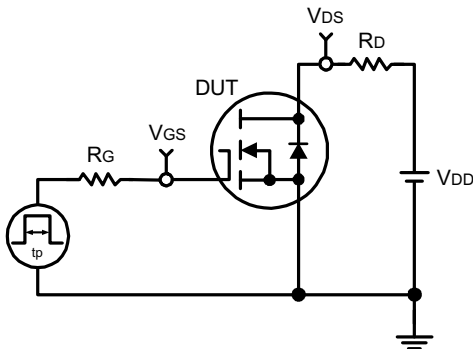




Avalanche Test Circuit and Waveforms



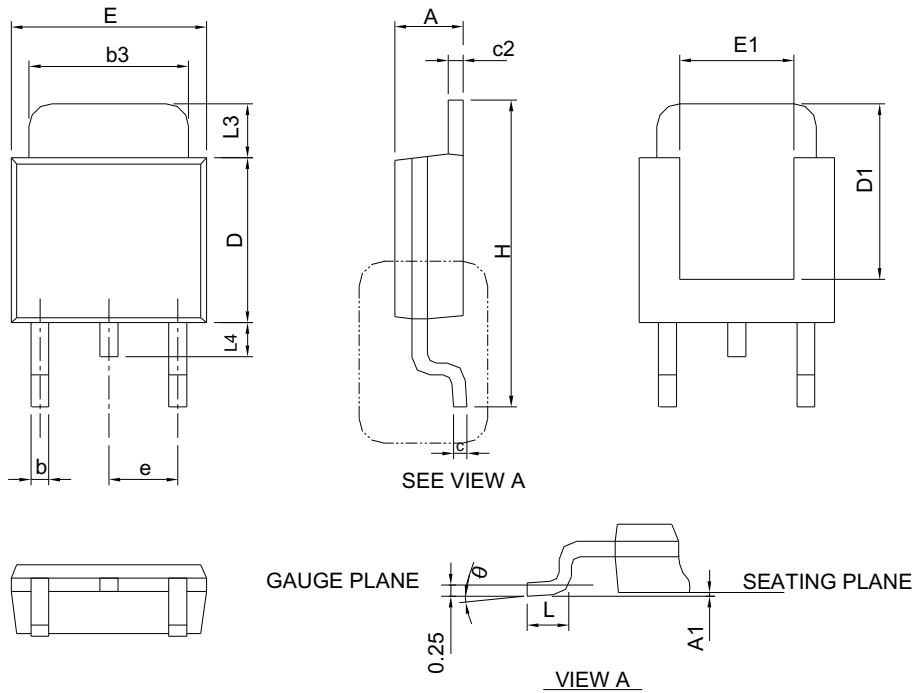
Switching Time Test Circuit and Waveforms





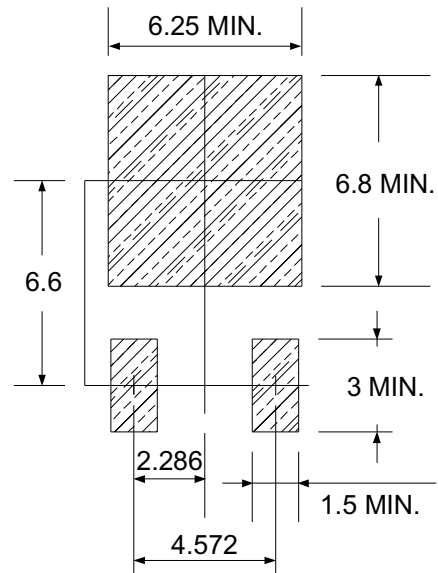
Package Information

TO-252-3



| DIMENSIONS | TO-252-3 | | | |
|------------|-------------|-------|-----------|-------|
| | MILLIMETERS | | INCHES | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 2.18 | 2.39 | 0.086 | 0.094 |
| A1 | | 0.13 | | 0.005 |
| b | 0.50 | 0.89 | 0.020 | 0.035 |
| b3 | 4.95 | 5.46 | 0.195 | 0.215 |
| c | 0.46 | 0.61 | 0.018 | 0.024 |
| c2 | 0.46 | 0.89 | 0.018 | 0.035 |
| D | 5.33 | 6.22 | 0.210 | 0.245 |
| D1 | 4.57 | 6.00 | 0.180 | 0.236 |
| E | 6.35 | 6.73 | 0.250 | 0.265 |
| E1 | 3.81 | 6.00 | 0.150 | 0.236 |
| e | 2.29 BSC | | 0.090 BSC | |
| H | 9.40 | 10.41 | 0.370 | 0.410 |
| L | 0.90 | 1.78 | 0.035 | 0.070 |
| L3 | 0.89 | 2.03 | 0.035 | 0.080 |
| L4 | | 1.02 | | 0.040 |
| θ | 0° | 8° | 0° | 8° |

RECOMMENDED LAND PATTERN



UNIT: mm

Note : Follow JEDEC TO-252 .