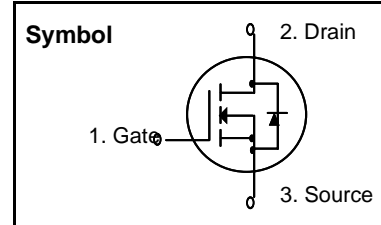


N-Channel MOSFET

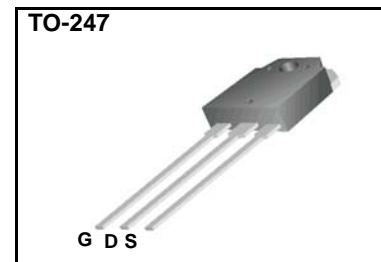
Features

- $R_{DS(on)}$ (Max 1.4 Ω)@ $V_{GS}=10V$
- Gate Charge (Typical 47nC)
- Improved dv/dt Capability, High Ruggedness
- 100% Avalanche Tested
- Maximum Junction Temperature Range (150°C)



General Description

This Power MOSFET is produced using Wisdom's advanced planar stripe, DMOS technology. This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. These devices are well suited for high efficiency switch mode power supplies.



Absolute Maximum Ratings

| Symbol | Parameter | Value | Units |
|----------------|--|------------|-------|
| V_{DSS} | Drain to Source Voltage | 900 | V |
| I_D | Continuous Drain Current(@ $T_C = 25^\circ C$) | 9 | A |
| | Continuous Drain Current(@ $T_C = 100^\circ C$) | 5.7 | A |
| I_{DM} | Drain Current Pulsed (Note 1) | 36 | A |
| V_{GS} | Gate to Source Voltage | ± 30 | V |
| E_{AS} | Single Pulsed Avalanche Energy (Note 2) | 900 | mJ |
| E_{AR} | Repetitive Avalanche Energy (Note 1) | 28 | mJ |
| dv/dt | Peak Diode Recovery dv/dt (Note 3) | 4.0 | V/ns |
| P_D | Total Power Dissipation(@ $T_C = 25^\circ C$) | 280 | W |
| | Derating Factor above 25 °C | 2.22 | W/°C |
| T_{STG}, T_J | Operating Junction Temperature & Storage Temperature | - 55 ~ 150 | °C |
| T_L | Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds. | 300 | °C |

Thermal Characteristics

| Symbol | Parameter | Value | | | Units |
|-----------------|---|-------|------|------|-------|
| | | Min. | Typ. | Max. | |
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case | - | - | 0.45 | °C/W |
| $R_{\theta CS}$ | Thermal Resistance, Case to Sink | - | 0.24 | - | °C/W |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | - | - | 40 | °C/W |

WFW9N90

Electrical Characteristics (T_C = 25 °C unless otherwise noted)

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
|--------------------------------------|---|---|-----|------|------|-------|
| Off Characteristics | | | | | | |
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} = 0V, I _D = 250uA | 900 | - | - | V |
| $\frac{\Delta BV_{DSS}}{\Delta T_J}$ | Breakdown Voltage Temperature coefficient | I _D = 250uA, referenced to 25 °C | - | 1.05 | - | V/°C |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} = 900V, V _{GS} = 0V | - | - | 10 | uA |
| | | V _{DS} = 720V, T _C = 125 °C | - | - | 100 | uA |
| I _{GSS} | Gate-Source Leakage, Forward | V _{GS} = 30V, V _{DS} = 0V | - | - | 100 | nA |
| | Gate-source Leakage, Reverse | V _{GS} = -30V, V _{DS} = 0V | - | - | -100 | nA |
| On Characteristics | | | | | | |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} = V _{GS} , I _D = 250uA | 3.0 | - | 5.0 | V |
| R _{DS(ON)} | Static Drain-Source On-state Resistance | V _{GS} = 10 V, I _D = 4.5A | - | 1.10 | 1.4 | Ω |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{GS} = 0 V, V _{DS} = 25V, f = 1MHz | - | 2200 | - | pF |
| C _{oss} | Output Capacitance | | - | 190 | - | |
| C _{rss} | Reverse Transfer Capacitance | | - | 16 | - | |
| Dynamic Characteristics | | | | | | |
| t _{d(on)} | Turn-on Delay Time | V _{DD} = 450V, I _D = 9.0A, R _G = 25Ω (Note 4, 5) | - | 55 | - | ns |
| t _r | Rise Time | | - | 130 | - | |
| t _{d(off)} | Turn-off Delay Time | | - | 110 | - | |
| t _f | Fall Time | | - | 82 | - | |
| Q _g | Total Gate Charge | V _{DS} = 720V, V _{GS} = 10V, I _D = 9.0A (Note 4, 5) | - | 47 | - | nC |
| Q _{gs} | Gate-Source Charge | | - | 15 | - | |
| Q _{gd} | Gate-Drain Charge(Miller Charge) | | - | 20 | - | |

Source-Drain Diode Ratings and Characteristics

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit. |
|-----------------|---------------------------|--|------|------|------|-------|
| I _S | Continuous Source Current | Integral Reverse p-n Junction Diode in the MOSFET | - | - | 9 | A |
| I _{SM} | Pulsed Source Current | | - | - | 36 | |
| V _{SD} | Diode Forward Voltage | I _S = 9.0A, V _{GS} = 0V | - | - | 1.4 | V |
| t _{rr} | Reverse Recovery Time | I _S = 9.0A, V _{GS} = 0V, di _F /dt = 100A/us | - | 550 | - | ns |
| Q _{rr} | Reverse Recovery Charge | | - | 6.5 | - | uC |

※ NOTES

1. Repeatability rating : pulse width limited by junction temperature
2. L = 21mH, I_{AS} = 9.0A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 9.0A, di/dt ≤ 200A/us, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C
4. Pulse Test : Pulse Width ≤ 300us, Duty Cycle ≤ 2%
5. Essentially independent of operating temperature.