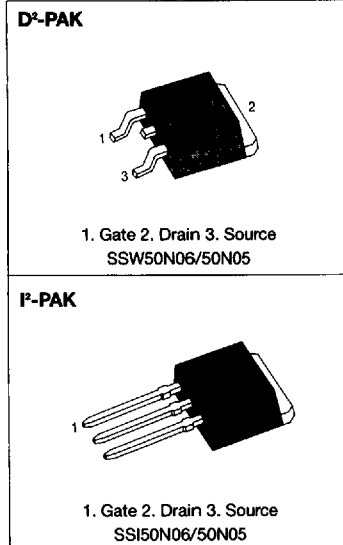


FEATURES

- Lower $R_{DS(on)}$
- Improved Inductive Ruggedness
- Fast switching times
- Rugged polysilicon gate cell structure
- Lower input capacitance
- Extended safe operating area
- Improved high temperature reliability

PRODUCT SUMMARY

| Part Number | V_{DSS} | $R_{DS(on)}$ | I_D |
|----------------|-----------|----------------|-------|
| SSW50N06/50N06 | 60 | 0.024 Ω | 50A |
| SSW50N05/50N05 | 50 | 0.024 Ω | 50A |



ABSOLUTE MAXIMUM RATINGS

| Characteristic | Symbol | SSW50N06 SSI50N06 | SSW50N05 SSI50N05 | Unit |
|--|----------------|----------------------|----------------------|---------------|
| Drain-Source Voltage (1) | V_{DSS} | 60 | 50 | Vdc |
| Drain-Gate Voltage ($R_{GS}=1M\Omega$)(1) | V_{DGR} | 60 | 50 | Vdc |
| Gate-Source Voltage | V_{GS} | ± 20 | | Adc |
| Continuous Drain Current $T_C=25^\circ C$ | I_D | 50 | | Adc |
| Continuous Drain Current $T_C=100^\circ C$ | I_D | 38 | | Adc |
| Drain Current - Pulsed (3) | I_{DM} | 220 | | Adc |
| Single Pulsed Avalanche Energy (4) | EAS | 110 | | mJ |
| Avalanche Current | I_{AS} | 50 | | A |
| Total Power Dissipation $T_C=25^\circ C$ | P_D | 150 | | Watts |
| Derate Above $25^\circ C$ | | 1.2 | | W/ $^\circ C$ |
| Operating and Storage Junction Temperature Range | T_J, T_{STG} | -55 to +175 | | $^\circ C$ |
| Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds | T_L | 300 | | $^\circ C$ |

Notes : (1) $T_J=25^\circ C$ to $175^\circ C$

(2) Pulse test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

(3) Repetitive rating : Pulse width limited by junction temperature

(4) $L=34\mu H$, $V_{dd}=25V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$

ELECTRICAL CHARACTERISTICS (Tc=25°C unless otherwise specified)

| Symbol | Characteristic | Min | Typ | Max | Units | Test Conditions |
|---------------------|---|-----|-----|-------|-------|---|
| BV _{DSS} | Drain-Source Breakdown Voltage | | | | | |
| | SSW50N06/I50N06 | 60 | - | - | V | V _{GS} =0V, I _D =250μA |
| | SSW50N05/I50N05 | 50 | - | - | V | |
| V _{GS(th)} | Gate Threshold Voltage | 2.0 | - | 4.0 | V | V _{DS} =V _{GS} , I _D =250μA |
| I _{GSS} | Gate-Source Leakage Forward | - | - | 100 | nA | V _{GS} =20V |
| I _{GSS} | Gate-Source Leakage Reverse | - | - | -100 | nA | V _{GS} =-20V |
| I _{DSS} | Zero Gate Voltage Drain Current | - | - | 250 | μA | V _{DS} =Max. Rating, V _{GS} =0V |
| | | - | - | 1000 | μA | V _{DS} =0.8 Max. Rating, V _{GS} =0V, T _C =150°C |
| R _{DS(on)} | Static Drain-Source On Resistance(2) | - | - | 0.024 | Ω | V _{GS} =10V, I _D =25A |
| g _{fs} | Forward Transconductance (2) | 24 | - | - | Ω | V _{GS} =50V, I _D =25A |
| C _{iss} | Input Capacitance | - | 358 | - | pF | V _{GS} =0V, V _{DS} =25V, f=1MHz |
| C _{OSS} | Output Capacitance | - | 134 | - | pF | |
| C _{rss} | Reverse Transfer Capacitance | - | 55 | - | pF | |
| t _{d(on)} | Turn-On Delay Time | - | - | 15 | ns | V _{DD} =0.5 BV _{DSS} , I _D =50A, Z _O =9.1Ω (MOSFET switching times are essentially independent of operating temperature) |
| t _r | Rise Time | - | - | 75 | ns | |
| t _{d(off)} | Turn-Off Delay Time | - | - | 20 | ns | |
| t _f | Fall Time | - | - | 29 | ns | |
| Q _g | Total Gate Charge (Gate-Source Plus Gate-Drain) | - | - | 66 | nC | |
| Q _{gs} | Gate-Source Charge | - | 15 | - | nC | V _{GS} =10V, V _{DS} =50A, V _{DS} =0.8 Max. Rating (Gate charge is essentially independent of operating temperature) |
| Q _{gd} | Gate-Drain ("Miller") Charge | - | 25 | - | nC | |

THERMAL RESISTANCE

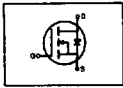
| Symbol | Characteristics | | All | Units | Remark |
|-------------------|---------------------|-----|------|-------|--------------------|
| R _{thJC} | Junction-to-Case | MAX | 1.0 | K/W | |
| R _{thJA} | Junction-to-Ambient | MAX | 62.5 | K/W | Free Air Operation |

Notes : (1) T_J=25°C to 150°C

(2) Pulse test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%

(3) Repetitive rating : Pulse width limited by max. junction temperature

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

| Symbol | Characteristic | Min | Typ | Max | Units | Test Conditions |
|-----------------|---|-----|-----|-----|-------|---|
| I _s | Continuous Source Current (Body Diode) | - | - | 50 | A | Modified MOSFET symbol showing the integral reverse P-N junction rectifier  |
| I _{SM} | Pulse Source Current (Body Diode) (3) | - | - | 220 | A | |
| V _{SD} | Diode Forward Voltage (2) | - | - | 2.5 | V | T _J =25°C, I _s =50A, V _{GS} =0V |
| t _r | Reverse Recovery Time | - | - | 99 | ns | T _J =25°C, I _F =50A, dI _F /dt=100A/μS |

- Notes : (1) T_J=25°C to 150°C
 (2) Pulse test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%
 (3) Repetitive rating : Pulse width limited by max. Junction temperature