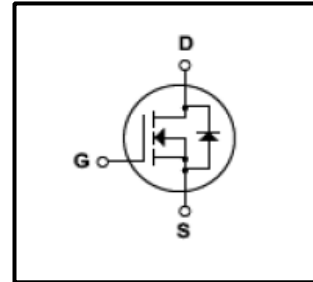


***Silicon N-Channel MOSFET***

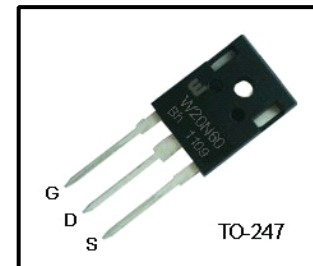
**Features**

- 20A,600V, $R_{DS(on)}$ (Max0.39 $\Omega$ )@ $V_{GS}=10V$
- Ultra-low Gate charge(Typical 150nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150℃)



**General Description**

This Power MOSFET is produced using Winsemi's advanced planar stripe, VDMOS technology. This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. This device is specially well suited for AC-DC switching power supplies, DC-DC power converters, high voltage H-bridge motor drive PWM.



**Absolute Maximum Ratings**

| Symbol         | Parameter                                       | Value    | Units      |
|----------------|-------------------------------------------------|----------|------------|
| $V_{DSS}$      | Drain Source Voltage                            | 600      | V          |
| $I_D$          | Continuous Drain Current (@ $T_c=25^\circ C$ )  | 20       | A          |
|                | Continuous Drain Current (@ $T_c=100^\circ C$ ) | 15       | A          |
| $I_{DM}$       | Drain Current Pulsed (Note1)                    | 80       | A          |
| $V_{GS}$       | Gate to Source Voltage                          | $\pm 30$ | V          |
| $E_{AR}$       | Repetitive Avalanche Energy (Note1)             | 30       | mJ         |
| $dv/dt$        | Peak Diode Recovery $dv/dt$ (Note3)             | 5.0      | V/ ns      |
| $P_D$          | Total Power Dissipation (@ $T_c=25^\circ C$ )   | 300      | W          |
| $T_J, T_{stg}$ | Junction and Storage Temperature                | -55~150  | $^\circ C$ |
| $T_L$          | Channel Temperature                             | 300      | $^\circ C$ |

**Thermal Characteristics**

| Symbol    | Parameter                               | Value |     |      | Units        |
|-----------|-----------------------------------------|-------|-----|------|--------------|
|           |                                         | Min   | Typ | Max  |              |
| $R_{QJC}$ | Thermal Resistance , Junction -to -Case | -     | -   | 0.25 | $^\circ C/W$ |

## Electrical Characteristics(Tc=25℃)

| Characteristics                                |               | Symbol                                  | Test Condition                                        | Min | Type | Max  | Unit |
|------------------------------------------------|---------------|-----------------------------------------|-------------------------------------------------------|-----|------|------|------|
| Gate leakage current                           |               | I <sub>GSS</sub>                        | V <sub>GS</sub> =±30V,V <sub>DS</sub> =0V             | -   | -    | ±100 | nA   |
| Gate-source breakdown voltage                  |               | V <sub>(BR)GSS</sub>                    | I <sub>G</sub> =±10 μA,V <sub>DS</sub> =0V            | ±30 | -    | -    | V    |
| Drain cut -off current                         |               | I <sub>DSS</sub>                        | V <sub>DS</sub> =600V,V <sub>GS</sub> =0V             | -   | -    | 200  | μA   |
|                                                |               |                                         | V <sub>GS</sub> =0V,T <sub>J</sub> =125℃              | -   | -    | 1000 | μA   |
| Drain -source breakdown voltage                |               | V <sub>(BR)DSS</sub>                    | I <sub>D</sub> =250μA,V <sub>GS</sub> =0V             | 600 | -    | -    | V    |
| Breakdown voltage Temperature coefficient      |               | ΔBV <sub>DSS</sub> /<br>ΔT <sub>J</sub> | I <sub>D</sub> =250μA,Referenced to 25℃               | -   | 0.5  | -    | V/℃  |
| Gate threshold voltage                         |               | V <sub>GS(th)</sub>                     | V <sub>DS</sub> =V <sub>GS</sub> ,I <sub>D</sub> =4mA | 3   | -    | 5    | V    |
| Drain -source ON resistance                    |               | R <sub>DS(ON)</sub>                     | V <sub>GS</sub> =10V,I <sub>D</sub> =10A              | -   | -    | 0.39 | Ω    |
| Forward Transconductance                       |               | g <sub>fs</sub>                         | V <sub>DS</sub> ≥10V,I <sub>D</sub> =10A              | 11  | 18   | -    | S    |
| Input capacitance                              |               | C <sub>iss</sub>                        | V <sub>DS</sub> =25V,                                 | -   | 4500 |      | pF   |
| Reverse transfer capacitance                   |               | C <sub>rss</sub>                        | V <sub>GS</sub> =0V,                                  | -   | 140  |      |      |
| Output capacitance                             |               | C <sub>oss</sub>                        | f=1MHz                                                | -   | 420  |      |      |
| Switching time                                 | Rise time     | t <sub>r</sub>                          | V <sub>GS</sub> =10V                                  | -   | 45   | 60   | ns   |
|                                                | Turn-on time  | t <sub>on</sub>                         | V <sub>DS</sub> =300V,                                | -   | 20   | 40   |      |
|                                                | Fall time     | t <sub>f</sub>                          | I <sub>D</sub> =10A                                   | -   | 40   | 60   |      |
|                                                | Turn-off time | T <sub>off</sub>                        | R <sub>G</sub> =2.00Ω                                 | -   | 70   | 90   |      |
| Total gate charge(gate-source plus gate-drain) |               | Q <sub>g</sub>                          | V <sub>DS</sub> =300V,<br>V <sub>GS</sub> =10V,       | -   | 150  | 170  | nC   |
| Gate-source charge                             |               | Q <sub>gs</sub>                         | I <sub>D</sub> =10A                                   | -   | 30   | 40   |      |
| Gate-drain("miller") Charge                    |               | Q <sub>gd</sub>                         |                                                       | -   | 60   | 85   |      |

## Source-Drain Ratings and Characteristics(Ta=25℃)

| Characteristics                  | Symbol           | Test Condition                                        | Min | Type | Max | Unit |
|----------------------------------|------------------|-------------------------------------------------------|-----|------|-----|------|
| Continuous drain reverse current | I <sub>DR</sub>  | -                                                     | -   | -    | 20  | A    |
| Forward voltage(diode)           | V <sub>DSF</sub> | I <sub>DR</sub> =I <sub>S</sub> , V <sub>GS</sub> =0V | -   | -    | 1.5 | V    |
| Reverse recovery time            | t <sub>rr</sub>  | I <sub>DR</sub> =10A, V <sub>GS</sub> =0V,            | -   |      | 250 | ns   |
| Reverse recovery charge          | Q <sub>rr</sub>  | dI <sub>DR</sub> / dt =100 A / μs                     | -   | 1    | -   | μC   |

Note 1.Pulse Test:Pulse Width≤300us,Duty Cycle≤2%

2. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

**TO-247 Package Dimension**

Unit:mm

