

### General Description

The 3306 is a N-channel Power MOSFET. It has specifically been designed to minimize input capacitance and gate charge. The device is therefore suitable in advanced high-efficiency switching applications.

### Features

- Advanced Process Technology
- Ultra Low On-Resistance
- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated
- Lead-Free

### Absolute Maximum Ratings

| Symbol                | Parameter                                  | Rating     | Units |
|-----------------------|--|------------|-------|
| $V_{DS}$              | Drain-Source Voltage                       | 60         | V     |
| $V_{GS}$              | Gate-Source Voltage                        | $\pm 25$   | V     |
| $I_D@T_C=25^\circ C$  | Continuous Drain Current, VGS @ 10V        | 150        | A     |
| $I_D@T_C=100^\circ C$ | Continuous Drain Current, VGS @ 10V        | 100        | A     |
| $I_{DM}$              | Pulsed Drain Current                       | 450        | A     |
| EAS                   | Single Pulse Avalanche Energy <sup>1</sup> | 550        | mJ    |
| $P_D@T_C=25^\circ C$  | Power Dissipation                          | 230        | W     |
| $T_{STG}$             | Storage Temperature Range                  | -55 to 175 | °C    |
| $T_J$                 | Operating Junction Temperature Range       | -55 to 175 | °C    |

### Thermal Data

| Symbol          | Parameter                       | Typ. | Max. | Unit |
|-----------------|---------------------------------|------|------|------|
| $R_{\theta JA}$ | Junction-to-Ambient (PCB mount) | ---  | 40   | °C/W |
| $R_{\theta JC}$ | Junction-to-Case                | ---  | 0.65 | °C/W |

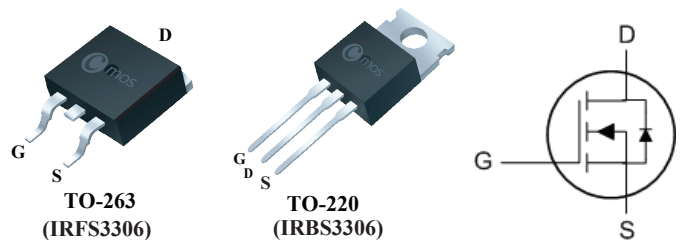
### Product Summary

| BVDSS | RDSON | ID   |
|-------|-------|------|
| 60V   | 4.2mΩ | 150A |

### Applications

- LED power controller
- DC-DC & DC-AC converters
- High current, High speed switching
- Solenoid and relay drivers
- Motor control, Audio amplifiers

### TO-263/220 Pin Configuration



## N-Channel Enhancement Mode Field Effect Transistor

Electrical Characteristics ( $T_J=25^\circ\text{C}$ , unless otherwise noted)

| Symbol                       | Parameter                         | Conditions   | Min. | Typ. | Max.      | Unit               |
|------------------------------|-----------------------------------|--|------|------|-----------|--------------------|
| $BV_{DSS}$                   | Drain-Source Breakdown Voltage    | $V_{GS}=0V, I_D=250\mu A$                                | 60   | ---  | ---       | V                  |
| $\Delta BV_{DSS}/\Delta T_J$ | BVDSS Temperature Coefficient     | Reference to $25^\circ\text{C}, I_D=1\text{mA}$          | ---  | 0.07 | ---       | $V/^\circ\text{C}$ |
| $R_{DS(ON)}$                 | Static Drain-Source On-Resistance | $V_{GS}=10V, I_D=30A$                                    | ---  | ---  | 4.2       | m $\Omega$         |
|                              |                                   | $V_{GS}=5V, I_D=15A$                                     | ---  | ---  | 8         |                    |
| $V_{GS(th)}$                 | Gate Threshold Voltage            | $V_{GS}=V_{DS}, I_D=250\mu A$                            | 2    | ---  | 4         | V                  |
| $I_{DSS}$                    | Drain-Source Leakage Current      | $V_{DS}=60V, V_{GS}=0V$                                  | ---  | ---  | 20        | $\mu A$            |
|                              |                                   | $V_{DS}=48V, V_{GS}=0V@125^\circ\text{C}$                | ---  | ---  | 250       |                    |
| $I_{GSS}$                    | Gate-Source Leakage Current       | $V_{GS}=\pm 25V$   | ---  | ---  | $\pm 100$ | nA                 |
| $Q_g$                        | Total Gate Charge                 | $I_D=75A$  | ---  | 85   | ---       | nC                 |
| $Q_{gs}$                     | Gate-Source Charge                | $V_{DS}=30V$   | ---  | 20   | ---       |                    |
| $Q_{gd}$                     | Gate-Drain Charge                 | $V_{GS}=10V$   | ---  | 28   | ---       |                    |
| $T_{d(on)}$                  | Turn-On Delay Time                | $V_{DD}=30V$<br>$I_D=75A$<br>$R_G=2.7\Omega, V_{GS}=10V$ | ---  | 15   | ---       | ns                 |
| $T_r$                        | Rise Time                         |  | ---  | 77   | ---       |                    |
| $T_{d(off)}$                 | Turn-Off Delay Time               |  | ---  | 40   | ---       |                    |
| $T_f$                        | Fall Time                         |  | ---  | 80   | ---       |                    |
| $C_{iss}$                    | Input Capacitance                 | $V_{DS}=50V, V_{GS}=0V, f=1\text{MHz}$                   | ---  | 4700 | ---       | pF                 |
| $C_{oss}$                    | Output Capacitance                |  | ---  | 500  | ---       |                    |
| $C_{rss}$                    | Reverse Transfer Capacitance      |  | ---  | 250  | ---       |                    |

## Diode Characteristics

| Symbol   | Parameter                          | Conditions                                 | Min. | Typ. | Max. | Unit |
|----------|------------------------------------|--|------|------|------|------|
| $I_S$    | Continuous Source Current          | $V_G=V_D=0V$ , Force Current               | ---  | ---  | 150  | A    |
| $I_{SM}$ | Pulsed Source Current <sup>1</sup> |  | ---  | ---  | 450  | A    |
| $V_{SD}$ | Diode Forward Voltage              | $V_{GS}=0V, I_S=30A, T_J=25^\circ\text{C}$ | ---  | ---  | 1.3  | V    |

Note :

1.Starting  $T_J = 25^\circ\text{C}$ ,  $L = 1\text{mH}$ ,  $R_G = 25\Omega$ ,  $I_{AS} = 27A$ .

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