

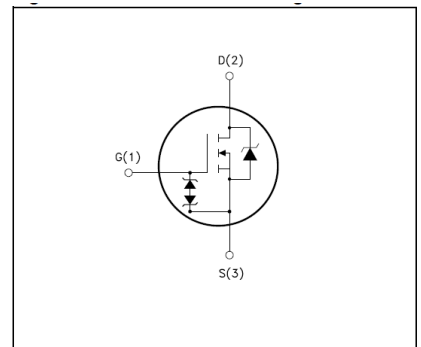
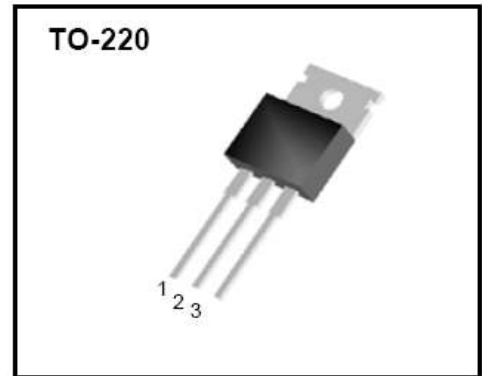
N-Channel MOSFET

Features

- ◆ $R_{DS(ON)}$ Max 1.0 ohm at $V_{GS} = 10V$
- ◆ Gate Charge (Typical 18nC)
- ◆ Improve dv/dt capability, Fast switching
- ◆ 100% avalanche Tested

General Description

This MOSFET is produced using advanced planar strip DMOS technology. This latest technology has been especially designed to minimize on-state resistance have a high rugged avalanche characteristics. These device are well suited for high efficiency switch mode power supply active power factor correction. Electronic lamp based on half bridge topology



Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Ratings | Units |
|----------------|---|------------|------------------|
| V_{DSS} | Drain-Source Voltage | 400 | V |
| I_D | Drain Current $T_C=25^\circ\text{C}$ $T_C=100^\circ\text{C}$ | 6.5 2.9 | A |
| V_{GSS} | Gate-Source Voltage | ± 30 | V |
| I_{DM} | Drain Current pulse (Note 1) | 24 | A |
| E_{AS} | Single Pulse Avalanche Energy (Note 2) | 335 | mJ |
| E_{AR} | Repetitive Avalanche Energy (Note 1) | 8.5 | mJ |
| dv/dt | Peak diode Recovery dv/dt (Note 3) | 4.5 | V/ns |
| P_D | Power Dissipation $T_C=25^\circ\text{C}$ | 76 | W |
| T_J, T_{STG} | Operation and Storage Temperature range | -45 ~ 150 | $^\circ\text{C}$ |

SFP730D

Thermal Characteristics

| Symbol | Parameter | Ratings | Unit |
|-----------------|--|---------|---------------|
| $R_{\theta JC}$ | Thermal Resistance Junction to Case | 1.65 | $^{\circ}C/W$ |
| $R_{\theta CS}$ | Thermal Resistance Case to Sink Typ. | 0.5 | $^{\circ}C/W$ |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 62.5 | $^{\circ}C/W$ |

Electrical Characteristics (TC = 25 $^{\circ}C$ Unless otherwise noted)

| Symbol | Items | Conditions | Ratings | | | Unit |
|--------------------------------|---|---|---------|------|---------|----------------|
| | | | Min | Typ. | Max | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS} = 0V, I_D = 250\mu A$ | 400 | | | V |
| $\Delta BV_{DSS} / \Delta T_J$ | Breakdown Voltage Temperature coefficient | $I_D = 250\mu A$, Reference to 25 $^{\circ}C$ | | 0.6 | | V/ $^{\circ}C$ |
| I_{DSS} | Zero gate voltage Drain Current | $V_{DS} = 400V, V_{GS} = 0V$ $V_{DS} = 320V, T_S = 125^{\circ}C$ | | | 1 10 | μA |
| I_{GSSF} | Gate body leakage current Forward | $V_{GS} = 30V, V_{DS} = 0V$ | | | 100 | nA |
| I_{GSSR} | Gate body leakage current Reverse | $V_{GS} = -30V, V_{DS} = 0V$ | | | -100 | nA |

On Characteristics

| | | | | | | |
|--------------|-----------------------------------|-----------------------------------|-----|------|-----|----------|
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS} = V_{DS}, I_D = 250\mu A$ | 2.0 | | 4.0 | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS} = 10V, I_D = 3.0A$ | | 0.75 | 1.0 | Ω |

Dynamic Characteristics

| | | | | | | |
|-----------|------------------------------|---|--|-----|--|----|
| C_{iss} | Input Capacitance | $V_{DS} = 25V, V_{GS} = 0V$ $f = 1.0MHz$ | | 520 | | pF |
| C_{oss} | output Capacitance | | | 80 | | pF |
| C_{rss} | Reverse Transfer Capacitance | | | 15 | | pF |

Switching Characteristics

| Symbol | Items | Conditions | Min | Typ. | Max | Units |
|--------------|---------------------|--|-----|------|-----|-------|
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD} = 200V, I_D = 6.0A$ $R_G = 25 \Omega$ (note 4,5) | | 15 | | ns |
| t_r | Turn-on Rise Time | | | 65 | | ns |
| $t_{d(off)}$ | Turn-off Delay Time | | | 20 | | ns |
| t_f | Turn-off Fall Time | | | 40 | | ns |
| Q_g | Total Gate Charge | $V_{DS} = 320V, I_D = 6.0A$ $V_{GS} = 10V$ (note 4,5) | | 18 | | nC |
| Q_{gs} | Gate-Source Charge | | | 2.5 | | nC |
| Q_{gd} | Gate-Drain Charge | | | 8.5 | | nC |

Drain-Source Diode Characteristics

| | | | | | |
|----------|---|--|--|------|---------|
| I_S | Maximum Continuous Drain-Source diode Forward Current | | | 6.0 | A |
| I_{SM} | Maximum Pulse Drain-Source diode Forward Current | | | 24.0 | A |
| V_{SD} | Drain-Source diode Forward voltage | $V_{GS} = 0V, I_S = 6.0A$ | | 1.4 | V |
| t_{rr} | Reverse Recovery Time | $V_{GS} = 0V, I_S = 6.0A$ $di_F/dt = 100 A/us$ (note 4) | | 230 | nS |
| Q_{rr} | Reverse Recovery Charge | | | 1.8 | μC |

Notes

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $L = 17mH, I_{AS} = 6.0A, V_{DD} = 50V, R_G = 25 \Omega$, starting $T_J = 25^\circ C$
3. $I_{SD} \leq 6.0A, di/dt \leq 200A/us, V_{DD} \leq BV_{DSS}$, starting $T_J = 25^\circ C$
4. Pulse Test : Pulse width $\leq 300us$, Duty cycle $\leq 2\%$
5. Essentially independent of operation temperature

SFP730D

Fig. 1 On-State Characteristics

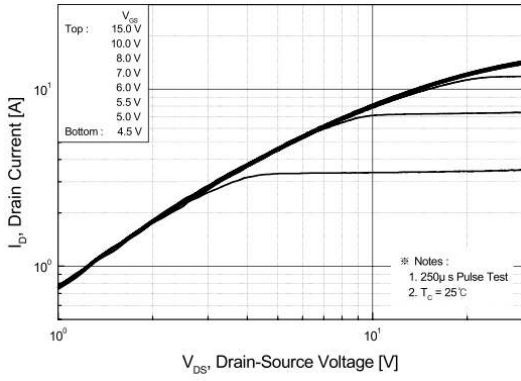


Fig. 2 On-Resistance variation vs Drain Current And gate Voltage

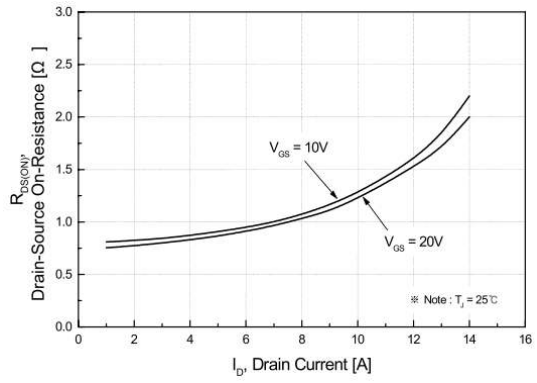


Fig. 3 Breakdown Voltage Variation vs Temperature

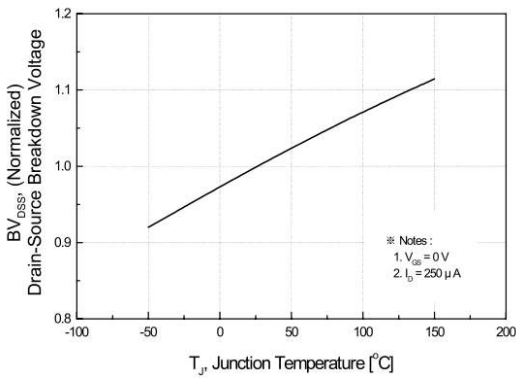


Fig. 4. On-Resistance Variation vs Temperature

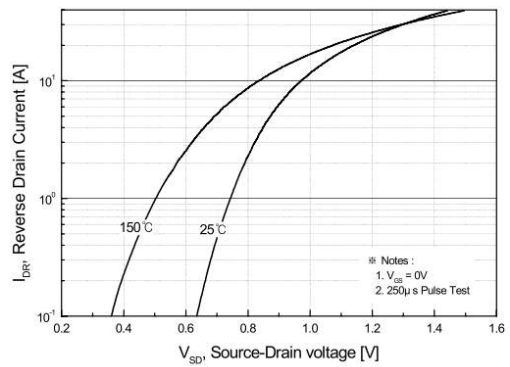
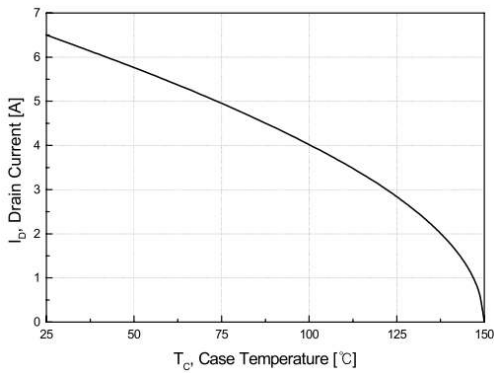


Fig. 5 Maximum Drain Current vs Case Temp.



SFP730D

TO-220 Package Dimension

| Dim. | mm | | | Inch | | |
|--------|------|------|------|-------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 9.7 | | 10.1 | 0.382 | | 0.398 |
| B | 6.3 | | 6.7 | 0.248 | | 0.264 |
| C | 9.0 | | 9.47 | 0.354 | | 0.373 |
| D | 12.8 | | 13.3 | 0.504 | | 0.524 |
| E | 1.2 | | 1.4 | 0.047 | | 0.055 |
| F | | 1.7 | | | 0.067 | |
| G | | 2.5 | | | 0.098 | |
| H | 3.0 | | 3.4 | 0.118 | | 0.134 |
| I | 1.25 | | 1.4 | 0.049 | | 0.055 |
| J | 2.4 | | 2.7 | 0.094 | | 0.106 |
| K | 5.0 | | 5.15 | 0.197 | | 0.203 |
| L | 2.2 | | 2.6 | 0.087 | | 0.102 |
| M | 1.25 | | 1.55 | 0.049 | | 0.061 |
| N | 0.45 | | 0.6 | 0.018 | | 0.024 |
| O | 0.6 | | 1.0 | 0.024 | | 0.039 |
| ϕ | | 3.6 | | | 0.142 | |

