

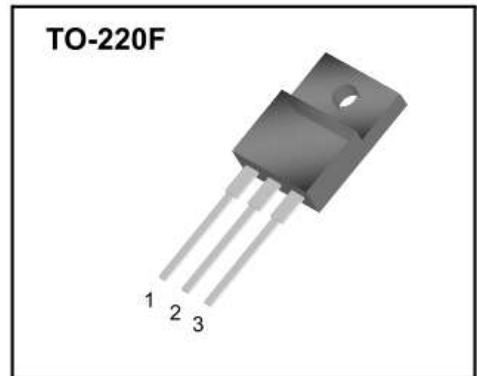
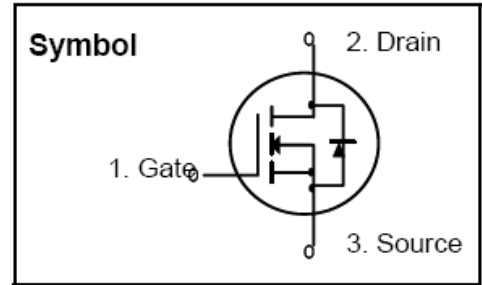
**N-Channel MOSFET**

**Features**

- ◆  $R_{DS(ON)}$  Max 0.65 ohm at  $V_{GS} = 10V$
- ◆ Gate Charge ( Typical 52 nC)
- ◆ 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 ( $T_J = 25^\circ C$  unless otherwise specified)

Symbol	Parameter	Ratings	Units
$V_{DSS}$	Drain-Source Voltage	600	V
$I_D$	Drain Current $T_C=25^\circ C$ $T_C=100^\circ C$	12 7.4	A
$V_{GSS}$	Gate-Source Voltage	$\pm 30$	V
$I_{DM}$	Drain Current pulse (Note 1)	88	A
$E_{AS}$	Single Pulse Avalanche Energy (Note 2)	865	mJ
$E_{AR}$	Repetitive Avalanche Energy (Note 1)	23.1	mJ
dv/dt	Peak diode Recovery dv/dt (Note 3)	4.5	V/ns
$P_D$	Power Dissipation $T_C=25^\circ C$	54	W
$T_J, T_{STG}$	Operation and Storage Temperature range	-45 ~ 150	$^\circ C$

# SFF12N60

## Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{\theta JC}$	Thermal Resistance Junction to Case	2.33	$^{\circ}C/W$
$R_{\theta CS}$	Thermal Resistance Case to Sink Typ.	-	$^{\circ}C/W$
$R_{\theta JA}$	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	$V_{GS} = 0V, I_D = 250\mu A$	600			V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature coefficient	$I_D = 250\mu A$ , Reference to 25 $^{\circ}C$		0.7		V/ $^{\circ}C$
$I_{DSS}$	Zero gate voltage Drain Current	$V_{DS} = 600V, V_{GS} = 0V$ $V_{DS} = 480V, T_S = 125^{\circ}C$			1 10	$\mu A$
$I_{GSSF}$	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	$V_{GS} = V_{DS}, I_D = 250\mu A$	2.5		4.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = 10V, I_D = 6A$		0.5	0.65	$\Omega$

## Dynamic Characteristics

$C_{iss}$	Input Capacitance	$V_{DS} = 25V, V_{GS} = 0V$ $f = 1.0MHz$		1850		pF
$C_{oss}$	output Capacitance			180		pF
$C_{rss}$	Reverse Transfer Capacitance			20		pF

## Switching Characteristics

Symbol	Items	Conditions	Min	Typ.	Max	Units
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 300V, I_D = 12.0A$ $R_G = 25 \Omega$ (note 4,5)		30		ns
$t_r$	Turn-on Rise Time			90		ns
$t_{d(off)}$	Turn-off Delay Time			140		ns
$t_f$	Turn-off Fall Time			90		ns
$Q_g$	Total Gate Charge	$V_{DS} = 480V, I_D = 12.0A$ $V_{GS} = 10V$ (note 4,5)		52		nC
$Q_{gs}$	Gate-Source Charge			8.5		nC
$Q_{gd}$	Gate-Drain Charge			20.0		nC

## Drain-Source Diode Characteristics

$I_S$	Maximum Continuous Drain-Source diode Forward Current			12	A
$I_{SM}$	Maximum Pulse Drain-Source diode Forward Current			48	A
$V_{SD}$	Drain-Source diode Forward voltage	$V_{GS} = 0V, I_S = 12.0A$		1.4	V
$t_{rr}$	Reverse Recovery Time	$V_{GS} = 0V, I_S = 12.0A$ $di_F/dt = 100 A/us$ (note 4)		430	nS
$Q_{rr}$	Reverse Recovery Charge			5.3	$\mu C$

## Notes

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2.  $L = 11mH, I_{AS} = 12.0A, V_{DD} = 50V, R_G = 25 \Omega$ , starting  $T_J = 25^\circ C$
3.  $I_{SD} \leq 12.0A, di/dt \leq 200A/us, V_{DD} \leq BV_{DSS}$ , starting  $T_J = 25^\circ C$
4. Pulse Test : Pulse width  $\leq 300us$ , Duty cycle  $\leq 2\%$
5. Essentially independent of operation temperature