

# MSW20N60

## 600V N-Channel MOSFET

### Description

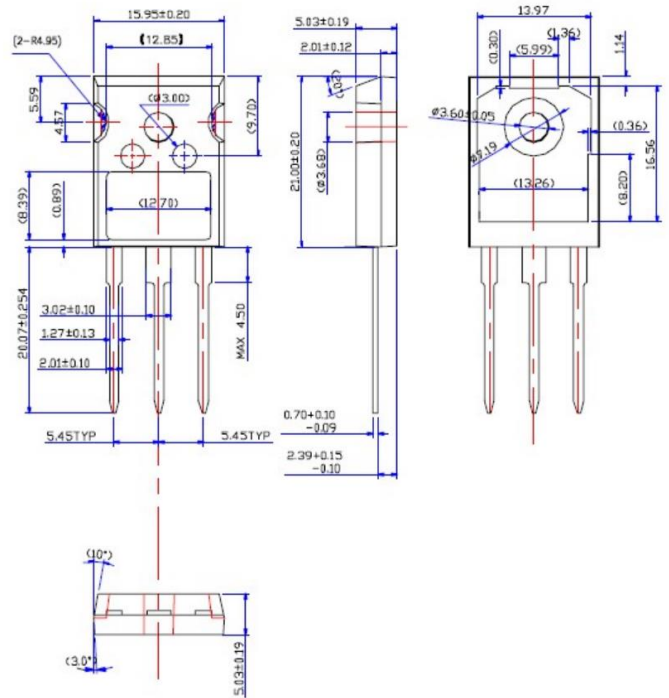
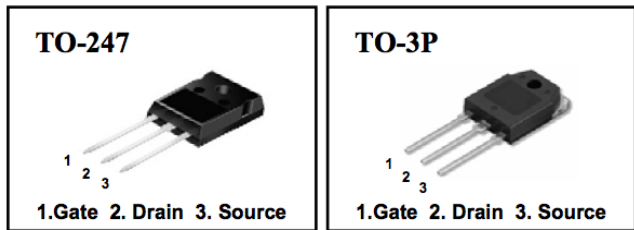
This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. These devices are well suited for high efficiency switch mode power supplies.

### Features

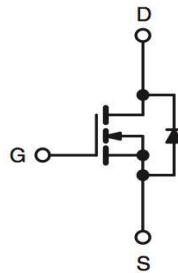
- RDS(on) (Typical 0.26Ω) @VGS=10V
- Gate Charge (Typical 80nC)
- Improved dv/dt Capability, High Ruggedness
- 100% Avalanche Tested
- Maximum Junction Temperature Range (150°C)
- RoHS compliant package

### Packing & Order Information

30/Tube ; 540/Box



### Graphic symbol



## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

### Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V <sub>DSS</sub>	Drain-Source Voltage	600	V
V <sub>GS</sub>	Gate-Source Voltage	±30	V
I <sub>D</sub>	Drain Current -Continuous (TC=25°C)	20	A
	Drain Current -Continuous (TC=100°C)	12	A
I <sub>DM</sub>	Drain Current Pulsed	80	A
E <sub>AS</sub>	Single Pulsed Avalanche Energy	1310	mJ
E <sub>AR</sub>	Repetitive Avalanche Energy	32	mJ
dV/dt	Peak Diode Recovery dV/dt	4.5	V/ns
P <sub>D</sub>	Power Dissipation (TC = 25 °C)	320	W
	- Derate above 25°C	2.56	W/°C
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C

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### Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
TL	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	°C

- Drain current limited by maximum junction temperature

### Thermal Resistance Characteristics

Symbol	Parameter	Max.	Units
R <sub>θJC</sub>	Junction-to-Case	0.39	°C/W
R <sub>θJA</sub>	Junction-to-Ambient	40	

### On Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
V <sub>GS</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2.0	3.0	4.0	V
*R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 A	--	0.26	0.32	Ω

### Off Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
BV <sub>DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250μA	600	--	--	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	I <sub>D</sub> = 250μA, Referenced to 25°C	--	0.6	--	V/°C
I <sub>DSS</sub>	V <sub>DS</sub> = 500 V, V <sub>GS</sub> = 0 V V <sub>DS</sub> = 400 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125°C	--	--	10 100	μA
I <sub>GSSF</sub>	V <sub>GS</sub> = 30 V, V <sub>DS</sub> = 0 V	--	--	100	nA
I <sub>GSSR</sub>	V <sub>GS</sub> = -30 V, V <sub>DS</sub> = 0 V	--	--	-100	nA

### Switching Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
t <sub>d(on)</sub>	V <sub>DS</sub> = 300 V, I <sub>D</sub> = 20 A, R <sub>G</sub> = 25 Ω	--	60	--	ns
t <sub>r</sub>		--	200	--	ns
t <sub>d(off)</sub>		--	130	--	ns
t <sub>f</sub>		--	125	--	ns
Q <sub>g</sub>	V <sub>DS</sub> = 480 V, I <sub>D</sub> = 20 A, V <sub>GS</sub> = 10 V	--	80	--	nC
Q <sub>gs</sub>		--	18	--	nC
Q <sub>gd</sub>		--	36	--	nC
C <sub>ISS</sub>	V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0 V, F = 1.0MHz	--	3200	--	pF
C <sub>OSS</sub>		--	410	--	pF
C <sub>RSS</sub>		--	41	--	pF

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Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$I_S$			--	--	20	A
$I_{SM}$			--	--	80	
$V_{SD}$	$I_S = I_F, V_{GS} = 0\text{ V}$		--	--	1.4	V
$t_{rr}$	$I_S = 20\text{ A}, V_{GS} = 0\text{ V}$ $diF/dt = 100\text{ A}/\mu\text{s}$		--	400	--	ns
$Q_{rr}$			--	5.0	--	uC

### Notes;

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2.  $L = 6.0\text{mH}, I_{AS}=20\text{A}, V_{DD}=50\text{V}, R_G=25\Omega$ , Starting  $T_J=25^\circ\text{C}$
3.  $I_{SD}\leq 20\text{A}, di/dt\leq 200\text{A}/\mu\text{s}, V_{DD}\leq BV_{DSS}$ , Starting  $T_J=25^\circ\text{C}$
4. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$
5. Essentially Independent of Operating Temperature

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### Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE

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