Preliminary MSW20N60

500V N-Channel MOSFET

Description

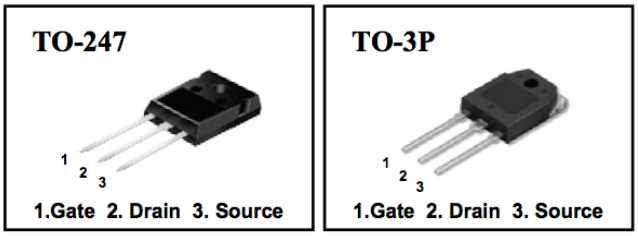
This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. These devices are well suited for high efficiency switch mode power supplies.

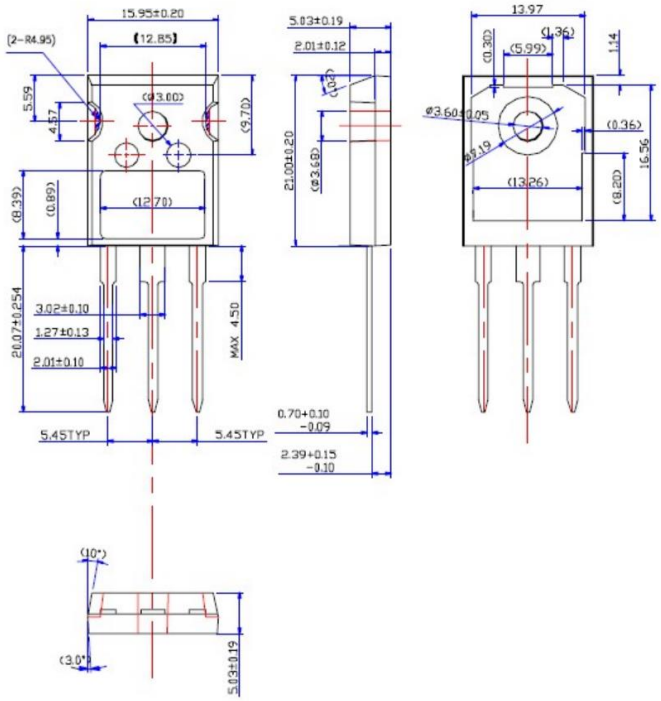
Features

- 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

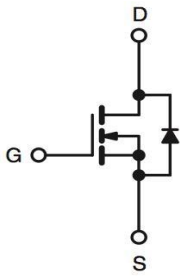
Packing & Order Information

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_{DSS}	Drain-Source Voltage	600	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Drain Current -Continuous (TC=25°C)	20	A
	Drain Current -Continuous (TC=100°C)	12	A
I_{DM}	Drain Current Pulsed	80	A
E_{AS}	Single Pulsed Avalanche Energy	1310	mJ
E_{AR}	Repetitive Avalanche Energy	32	mJ
dV/dt	Peak Diode Recovery dV/dt	4.5	V/ns
P_D	Power Dissipation (TC = 25 °C)	320	W
	- Derate above 25°C	2.56	W/°C
T_J,T_{STG}	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**
$R_{\theta JC}$	Junction-to-Case	0.39	°C/W
$R_{\theta JA}$	Junction-to-Ambient	40	

On Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
V_{GS}	V_{DS} = V_{GS} , I_D = 250μA	2.0	3.0	4.0	V
*$R_{DS(ON)}$	V_{GS} = 10 V , I_D = 10 A	--	0.26	0.32	Ω

Off Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
BV_{DSS}	V_{GS} = 0 V , I_D=250μA	600	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	I_D = 250μA, Referenced to 25°C	--	0.6	--	V/°C
I_{DSS}	V_{DS} = 500 V , V_{GS} = 0 V V_{DS} = 400 V , V_{GS} = 0 V , Tj = 125°C	--	--	10 100	μA
I_{GSSF}	V_{GS} = 30 V , V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	V_{GS} = -30 V , V_{DS} = 0 V	--	--	-100	nA

Switching Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
$t_{d(on)}$	V_{DS} = 300 V, I_D = 20 A, R_G = 25 Ω	--	60	--	ns
t_r		--	200	--	ns
$t_{d(off)}$		--	130	--	ns
tf		--	125	--	ns
Q_g	V_{DS} = 480 V,I_D = 20 A, V_{GS} = 10 V	--	80	--	nC
Q_{gs}		--	18	--	nC
Q_{gd}		--	36	--	nC
C_{ISS}	V_{DS} = 25 V, V_{GS} = 0 V, F = 1.0MHz	--	3200	--	pF
C_{OSS}		--	410	--	pF
C_{RSS}		--	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}	$I_S = I_F$, $V_{GS} = 0$ V		--	--	1.4	V
t_{rr}	I_S = 20 A , V_{GS} = 0 V		--	400	--	ns
Q_{rr}	diF/dt = 100A/μs		--	5.0	--	uC

Notes;

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L = 6.0mH, I_{AS}=20A, V_{DD}=50V, R_G=25Ω, Starting T_J=25℃
3. I_{SD}≦20A, di/dt≦200A/μs,V_{DD}≦BV_{DSS}, Starting T_J=25℃
4. Pulse Test: Pulse Width ≦ 300μs, Duty Cycle≦ 2%
5. Essentially Independent of Operating Temperature

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