

MSF14N60

N-Channel Enhancement Mode Power MOSFET

Description

The MS14N60 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The TO-220F package is universally preferred for all commercial-industrial applications

Features

- Low On Resistance
- Simple Drive Requirement
- Fast Switching Characteristic
- Insulating package, front/back side insulating

voltage=2500V(AC)

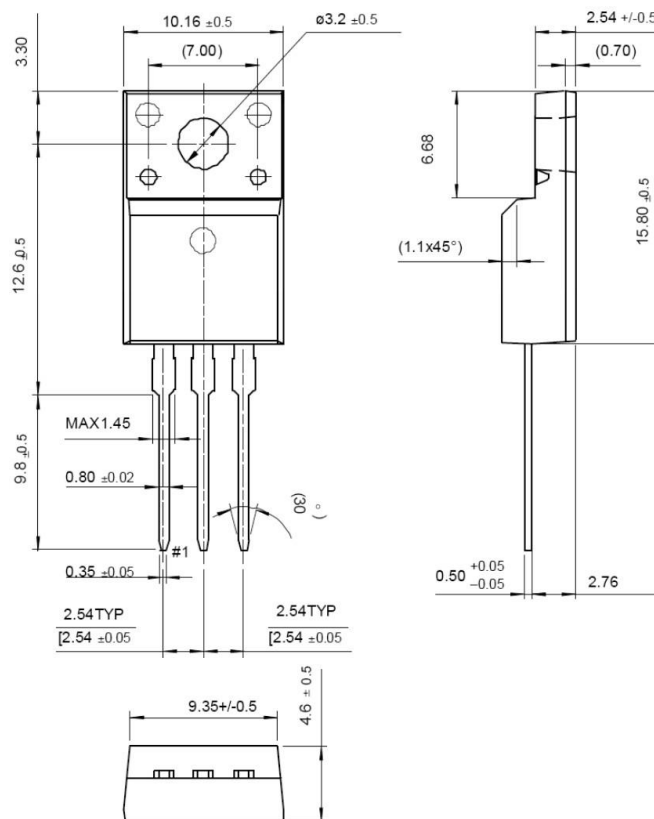
- RoHS compliant package

Application

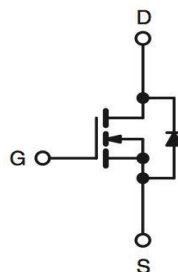
- Adapter
- Switching Mode Power Supply

Packing & Order Information

50/Tube ; 1,000/Box



Graphic symbol



RoHS
COMPLIANT

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

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)	14	A
	Drain Current -Continuous (TC=100°C)	8.4	A
I_{DM}	Drain Current Pulsed	56	A
E_{AS}	Single Pulsed Avalanche Energy	53	mJ
I_{AR}	Avalanche Current	14.0	A
E_{AR}	Repetitive Avalanche Energy	16	mJ
dV/dt	Peak Diode Recovery dV/dt	4.5	V/ns

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Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
P_D	Total Power Dissipation(@TC = 25 °C) 60 W	60	W
	Derating Factor above 25 °C	0.35	W/°C

- Drain current limited by maximum junction temperature

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

Symbol	Parameter	Value	Unit
T_L	Maximum Temperature for Soldering @ Lead at 0.125 in(0.318mm) from case for 10 seconds	300	°C
T_{STG}	Operating Junction Temperature	-55 ~ 150	W
T_J	Storage Temperature	150	°C

Note:

1. Repetitive rating; pulse width limited by maximum junction temperature.
2. IAS=14A, VDD=50V, L=0.5mH, RG=25Ω, starting TJ=+25°C.
3. ISD≤7.5A, dI/dt≤100A/μs, VDD≤BVDSS, starting TJ=+25°C.
4. Drain current limited by maximum junction temperature

Thermal characteristics

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Thermal Resistance,Junction-to-Case	2.58	°C/W
$R_{\theta JA}$	Thermal Resistance,Junction-to-Ambient	100	

Static Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	--	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=3A$	--	--	0.55	Ω
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$ $T_J=150^\circ C$	600	660	--	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D=250\mu A$, Referenced to 25°C	--	0.7	--	V/°C
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=600V, V_{GS}=0V$ $V_{DS}=480V, T_C=125^\circ C$	--	--	1 10	μA
I_{GSS}	Gate-Body Leakage , Forward	$V_{GS}=\pm 30$	--	--	±100	nA

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Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Time	$V_{DS}=250\text{ V}$, $I_D=14\text{ A}$, $V_{GS}=10\text{ V}$, $R_G=9.1\Omega$	--	40	--	ns
t_r	Turn-On Time		--	10	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	15	--	ns
t_f	Turn-Off Fall Time		--	16	--	ns
Q_g	Total Gate Charge	$V_{DS}=250\text{ V}$, $I_D=14\text{ A}$, $V_{GS}=10\text{ V}$	--	30	--	nC
Q_{gs}	Gate-Source Charge		--	48	--	nC
Q_{gd}	Gate-Drain Charge (Miller Charge)		--	34	--	nC

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
C_{ISS}	Input Capacitance	$V_{DS}=25\text{ V}$, $V_{GS}=0\text{ V}$, $f=1.0\text{ MHz}$	--	2222	--	pF
C_{OSS}	Output Capacitance		--	180	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	17	--	pF

Source-Drain Diode Maximum Ratings and Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
I_S		$V_D=V_G=0$, $V_S=1.3\text{ V}$	--	--	14	A
I_{SM}			--	--	56	
V_{SD}		$I_S=12\text{ A}$, $V_{GS}=0\text{ V}$	--	--	1.5	V
t_{rr}		$I_S=12\text{ A}$, $V_{GS}=0\text{ V}$ $diF/dt=100\text{ A}/\mu\text{s}$	--	392	--	ns
Q_{rr}			--	3529	--	uC

*Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycles $\leq 2\%$

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