

## MS6N95

### 950V N-Channel MOSFET

#### Description

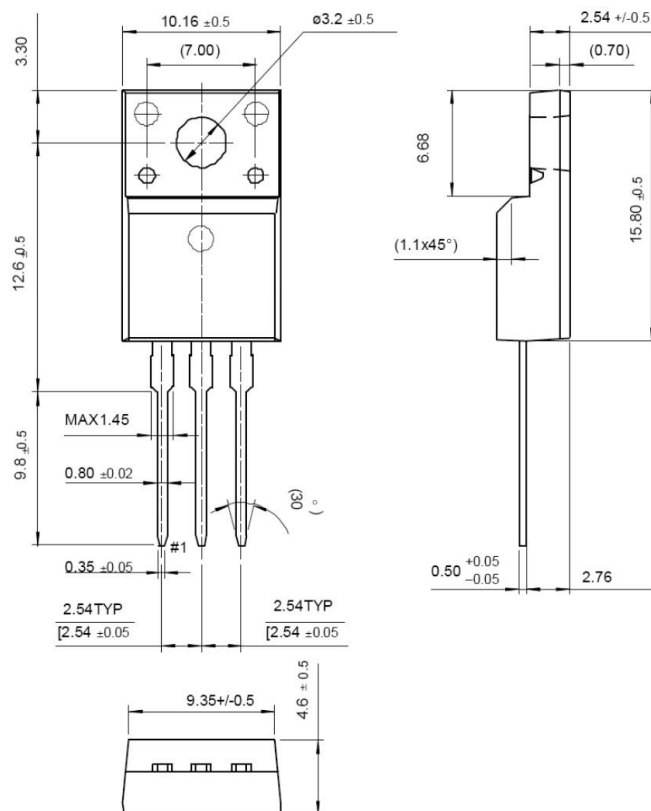
The MS6N95 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The TO-220 package is universally preferred for all commercial-industrial applications

#### Features

- RDS(on) (Max 2.4  $\Omega$ ) @VGS=10V
- Gate Charge (Typical 33nC)
- Improved dv/dt Capability, High Ruggedness
- 100% Avalanche Tested
- Maximum Junction Temperature Range (150°C)
- RoHS compliant package

#### Application

- Adapter
- Switching Mode Power Supply



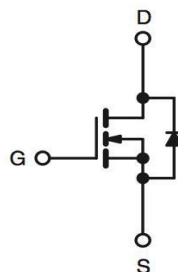
#### Packing & Order Information

50/Tube ; 1,000/Box



**RoHS**  
COMPLIANT

#### Graphic symbol



### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V <sub>DSS</sub>	Drain-Source Voltage	950	V
I <sub>D</sub>	Drain Current -Continuous (TC=25°C)	6	A
	Drain Current -Continuous (TC=100°C)	3.8	A
I <sub>DM</sub>	Drain Current –Pulsed	24	A
V <sub>GS</sub>	Gate-Source Voltage	±30	V
E <sub>AS</sub>	Single Pulsed Avalanche Energy	650	mJ
E <sub>AR</sub>	Repetitive Avalanche Energy	16.7	mJ
dv/dt	Peak Diode Recovery dv/dt	4.5	V/ns

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

Symbol	Parameter	Value	Unit
P <sub>D</sub>	Power Dissipation (TC=25°C)	56	W
	- Derate above 25°C	0.48	W/°C
T <sub>J</sub> /T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C
T <sub>L</sub>	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	Typ.	Max.	Units
R <sub>θJC</sub>	Junction-to-Case	--	2.25	°C/W
R <sub>θJA</sub>	Junction-to-Ambient	--	62.5	

#### On Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
V <sub>GS</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	3.0	--	5.0	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 3 A	--	1.95	2.40	Ω

#### Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250μA	900	--	--	V
ΔBV <sub>DSS</sub> / ΔT <sub>J</sub>	Breakdown Voltage Temperature Coefficient	I <sub>D</sub> = 250μA, Referenced to 25°C	--	0.6	--	V/°C
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 950 V, V <sub>GS</sub> = 0 V V <sub>DS</sub> = 720 V, V <sub>C</sub> = 125 °C	--	--	10 100	μA
I <sub>GSSF</sub>	Gate-Body Leakage Current, Forward	V <sub>GS</sub> = 30 V, V <sub>DS</sub> = 0 V	--	--	100	μA
I <sub>GSSR</sub>	Gate-Body Leakage Current, Reverse	V <sub>GS</sub> = -30V, V <sub>DS</sub> = 0 V	--	--	-100	nA

#### Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0 V, f = 1.0MHz	--	1500	--	pF
C <sub>OSS</sub>	Coss Output Capacitance		--	120	--	pF
C <sub>RSS</sub>	Crss Reverse Transfer Capacitance		--	12	--	pF

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#### Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Time	$V_{DS} = 450\text{ V}$ , $I_D = 6\text{ A}$ , $R_G = 25\ \Omega$	--	50	--	ns
$t_r$	Turn-On Rise Time		--	100	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	50	--	ns
$t_f$	Turn-Off Fall Time		--	60	--	ns
$Q_g$	Total Gate Charge	$V_{DS} = 720\text{ V}$ , $I_D = 6\text{ A}$ , $V_{GS} = 10\text{ V}$	--	33	--	nC
$Q_{gs}$	Gate-Source Charge		--	10	--	nC
$Q_{gd}$	Gate-Drain Charge		--	13	--	nC

#### Source-Drain Diode Maximum Ratings and Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$I_S$	Continuous Source-Drain Diode Forward Current		--	--	6.0	A
$I_{SM}$	ISM Pulsed Source-Drain Diode Forward Current		--	--	24.0	
$V_{SD}$	Source-Drain Diode Forward Voltage	$I_S = 6\text{ A}$ , $V_{GS} = 0\text{ V}$	--	--	1.4	V
$T_{rr}$	Reverse Recovery Time	$I_S = 6\text{ A}$ , $V_{GS} = 0\text{ V}$ $diF/dt=100\text{A}/\mu\text{s}$	--	0.65	--	ns
$Q_{rr}$	Reverse Recovery Charge		--	7.0	--	$\mu\text{C}$

#### Notes:

1. Repeativity rating : pulse width limited by junction temperature
2.  $L = 34.0\text{mH}$ ,  $I_{AS} = 6.0\text{A}$ ,  $V_{DD} = 50\text{V}$ ,  $R_G = 25\ \Omega$ , Starting  $T_J = 25^\circ\text{C}$
3.  $I_{SD} \leq 6.0\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq \text{BVDSS}$ , 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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