MSU4N60_S

600V N-Channel MOSFET

Description

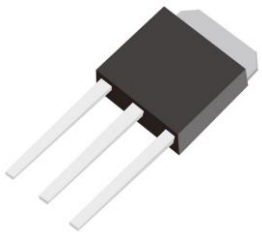
The MSU4N60_S is a N-channel enhancement-mode MOSFET , providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The TO-251 package is universally preferred for all commercial-industrial applications

Features

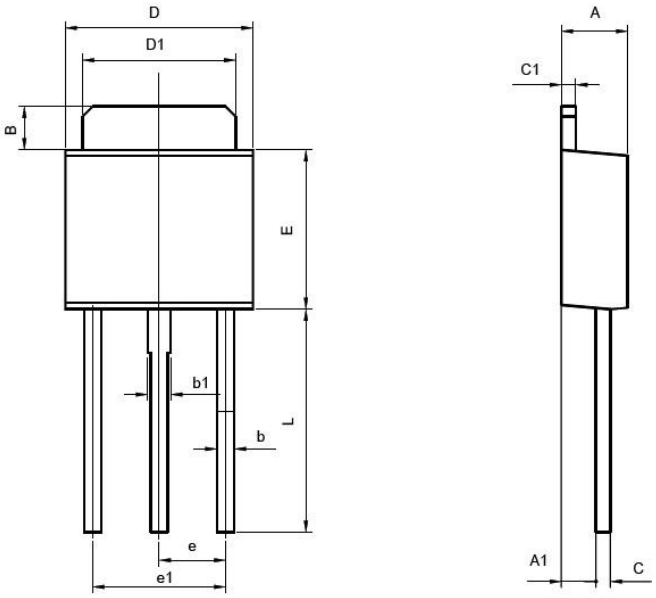
- Originative New Design
- Very Low Intrinsic Capacitances
- Excellent Switching Characteristics
- Unrivalled Gate Charge : 12.8 nC (Typ.)
- Extended Safe Operating Area
- Lower RDS(ON) : 2.0 Ω (Typ.) @VGS=10V
- 100% Avalanche Tested
- RoHS compliant package

Packing & Order Information

80/Tube ; 4,000/Box

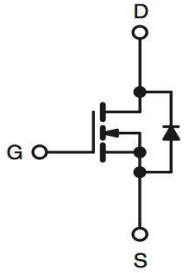


RoHS COMPLIANT



	Dimensions in Millimeters		Dimensions in Inches	
Symbol	min	max	min	max
A	2.15	2.45	0.85	0.96
A1	1.00	1.40	0.39	0.55
B	1.25	1.75	0.49	0.69
b	0.45	0.75	0.18	0.3
b1	0.65	0.95	0.26	0.37
C	0.38	0.64	0.15	0.25
C1	0.38	0.64	0.15	0.25
D	6.30	6.70	2.48	2.64
D1	5.10	5.50	2.01	2.17
E	5.30	5.70	2.09	2.24
e	2.3 (typ.)		0.91 (typ.)	
e1	4.4	4.8	1.73	1.89
L	7.4	8.0	2.91	3.15

Graphic symbol



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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)	4.5	A
	Drain Current -Continuous (TC=100°C)	2.6	A
I_{DM}	Drain Current Pulsed	18	A
E_{AS}	Single Pulsed Avalanche Energy	33.9	mJ
E_{AR}	Repetitive Avalanche Energy	5.0	mJ
dV/dt	Peak Diode Recovery dV/dt	4.5	V/ns
P_D	Power Dissipation (TC = 25 °C)	50	W
	- Derate above 25°C	0.4	W/°C
T_J , T_{STG}	Operating and Storage Temperature	-55 to +150	°C
T_L	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	2.3	°C/W
$R_{\theta JA}$	Junction-to-Ambient	85	

On Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
V_{GS}	Gate Threshold Voltage	V_{DS} = V_{GS} , I_D = 250μA	2.0	--	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V , I_D = 2.25 A	--	4.0	4.7	Ω

Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V , I_D=250μA	600	--	--	V
ΔBV_{DSS} /ΔT_J	Breakdown Voltage Temperature Coefficient	I_D = 250μA, Referenced to 25°C	--	0.65	--	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 600 V , V_{GS} = 0 V V_{DS} = 480 V , T_C = 125°C	--	--	1 10	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 30 V , V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -30 V , V_{DS} = 0 V	--	--	-100	nA

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Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Time	V_{DS} = 300 V, I_D = 4.5 A, R_G = 25 Ω	--	10	--	ns
t_r	Turn-On Time		--	40	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	40	--	ns
tf	Turn-Off Fall Time		--	50	--	ns
Q_g	Total Gate Charge	V_{DS} = 480 V, I_D = 4.5 A, V_{GS} = 10 V	--	12.8	--	nC
Q_{gs}	Gate-Source Charge		--	2.4	--	nC
Q_{gd}	Gate-Drain Charge		--	7.1	--	nC
C_{ISS}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, F = 1.0MHz	--	560	580	pF
C_{OSS}	Output Capacitance		--	55	58	pF
C_{RSS}	Reverse Transfer Capacitance		--	7	7.2	pF

Source-Drain Diode Maximum Ratings and Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
I_S	Continuous Source-Drain Diode Forward Current		--	--	4	A
I_{SM}	Pulsed Source-Drain Diode Forward Current		--	--	18	
V_{SD}	Source-Drain Diode Forward Voltage	I_S = 1 A , V_{GS} = 0 V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S = 1 A , V_{GS} = 0 V diF/dt = 100A/μs	--	300	--	ns
Q_{rr}	Reverse Recovery Charge		--	2.1	--	μC

Notes;

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L=55mH, I_{AS}=4.5A, V_{DD}=50V, R_G=50Ω, Starting T_J=25℃
3. I_{AS}=4.5A, V_{DD}=50V, L=4mH, V_G=10V, starting TJ=+25°C.
4. I_{SD}≦4A, di/dt≦100A/μs, V_{DD}≦BV_{DSS}, Starting T_J=25℃
5. Pulse Test: Pulse Width ≦ 300μs, Duty Cycle≦ 2%
6. Essentially Independent of Operating Temperature

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