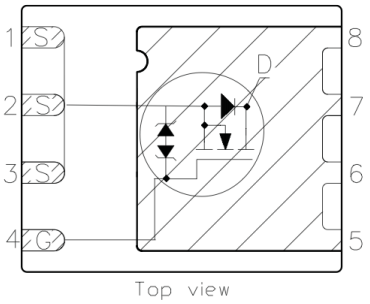
MSQ5N50

N-Channel Enhancement Mode Power MOSFET

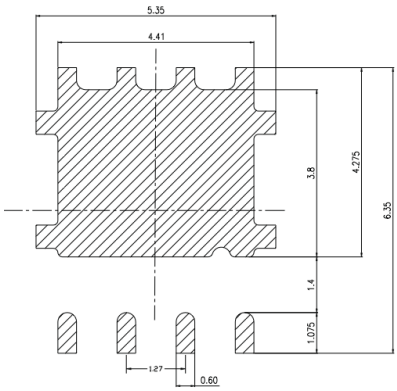
Description

The MSQ5N50 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 QFN-5X6 package which has been designed to achieve very low on-state resistance providing also one of the best-in-class figure of merit (FOM)

RoHS COMPLIANT



Top view



Features

- RDS(on) = 1.50Ω @VGS = 10 V
- Low gate charge (typical 11 nC)
- High ruggedness
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS compliant package

Application

- Ballast
- Inverter
- Switching applications

Package type：QFN5X6

Packing & Order Information

3,000/Reel

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Drain Current -Continuous (TC=25°C)	5	A
	Drain Current -Continuous (TC=100°C)	3.0	A
I_{DM}	Drain Current Pulsed	20	A
E_{AS}	Single Pulsed Avalanche Energy	305	mJ
E_{AR}	Repetitive Avalanche Energy	4.6	mJ

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Absolute Maximum Ratings (Tc=25°C unless otherwise noted)			
Symbol	Parameter	Value	Unit
dv/dt	Peak Diode Recovery dv/dt	4.5	V/ns
P_D	Power Dissipation (TC = 25 °C)	60	W
	- Derate above 25°C	0.4	W/°C
T_J,T_{STG}	Operating and Storage Temperature Range	-55 to +150	°C

NOTE:

1. Repetitive rating; pulse width limited by maximum junction temperature.

Thermal Resistance Characteristics			
Symbol	Parameter	Value	Units
Rthic	Typical thermal resistance	2	°C/W
$R_{\theta JA}$		32	

Static Characteristics					
Symbol	Test Conditions	Min	Typ.	Max.	Units
BV_{DSS}	V_{GS} = 0 V , I_D=250μA	500	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	I_D = 250μA, Referenced to 25°C	--	0.6	--	
I_{DSS}	V_{DS} = 500 V , V_{GS} = 0 V V_{DS} = 400 V , V_{GS} = 0 V , Tj= 125°C	--	--	1 10	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
V_{GS}	V_{DS} = V_{GS} , I_D = 250μA	2.0	--	4.0	V
*$R_{DS(ON)}$	V_{GS} = 10 V , I_D = 2.5 A	--	1	1.4	Ω

Dynamic Characteristics					
Symbol	Test Conditions	Min	Typ.	Max.	Units
C_{ISS}	V_{DS} = 25 V, V_{GS} = 0 V, F = 1.0MHz	--	480	--	pF
C_{OSS}		--	66	--	pF
C_{RSS}		--	5	--	pF
$t_{d(on)}$	V_{DS} = 250 V, I_D = 5 A, R_G = 25 Ω	--	13	--	ns
t_r		--	22	--	ns
$t_{d(off)}$		--	28	--	ns
tf		--	20	--	ns
Q_g	V_{DS} = 400 V,I_D = 5 A, V_{GS} = 10 V	--	11	--	nC
Q_{gs}		--	2.5	--	nC
Q_{gd}		--	5	--	nC

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Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
I_S			--	--	5	A
I_{SM}			--	--	20	
V_{SD}	I_S = 18 A , V_{GS} = 0 V		--	--	1.4	V
t_{rr}	I_S = 18 A , V_{GS} = 0 V		--	260	--	ns
Q_{rr}	diF/dt = 100A/μs		--	2	--	nC

Notes;

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L = 22mH, I_{AS}=5A, V_{DD}=50V, R_G=25Ω, Starting T_J=25℃
3. I_{SD}≦5A, 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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