

Preliminary 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)

Features

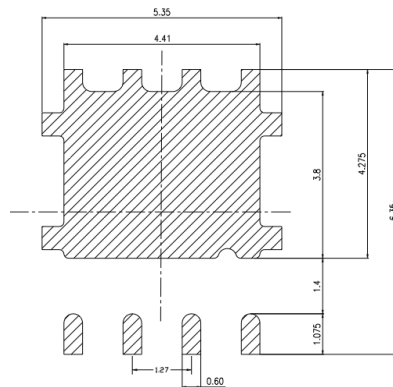
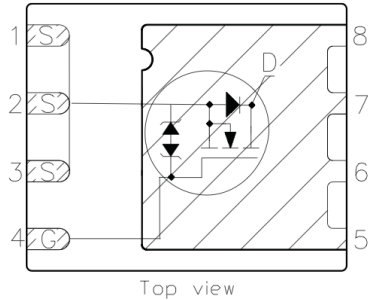
- $R_{DS(on)} = 1.50\Omega @V_{GS} = 10\text{ V}$
- Low gate charge (typical 11 nC)
- High ruggedness
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS compliant package

Application

- Ballast
- Inverter
- Switching applications

Packing & Order Information

50/Tube ; 1,000/Box



RoHS
COMPLIANT

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings ($T_c=25^\circ\text{C}$ 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 ($T_C=25^\circ\text{C}$)	5	A
	Drain Current -Continuous ($T_C=100^\circ\text{C}$)	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
R _{thic}	Typical thermal resistance	2	°C/W
R _{θJA}		32	

Static Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
BV _{DSS}	V _{GS} = 0 V , I _D = 250μA	500	--	--	V
ΔBV _{DSS} /ΔT _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 , T _j = 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
t _f		--	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}	$I_S = 18\text{ A}$, $V_{GS} = 0\text{ V}$		--	--	1.4	V
t_{rr}	$I_S = 18\text{ A}$, $V_{GS} = 0\text{ V}$		--	260	--	ns
Q_{rr}	$diF/dt = 100\text{ A}/\mu\text{s}$		--	2	--	nC

Notes;

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $L = 22\text{mH}$, $I_{AS}=5\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$
3. $I_{SD}\leq 5\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, 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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