

Product Specification

PRELIMINARY

N-Channel Enhancement Mode Power MOSFET

MSQ4N60

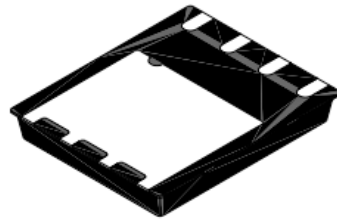
•Description

The MSQ4N60 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:

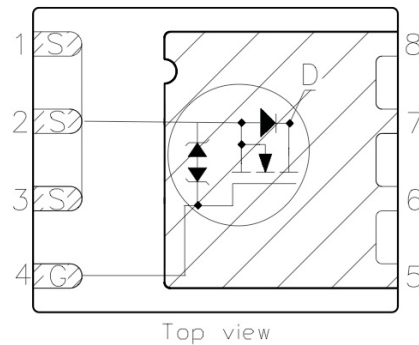
QFN 5X6 schematic diagram

- 4.5A, 600V, $R_{DS(on)} = 2.50\Omega$ @ $V_{GS} = 10V$
- Low gate charge (typical 16nC)
- High ruggedness
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



•APPLICATION:

- Ballast
- Inverter
- Switching applications



Absolute Maximum Ratings

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	VDS	600	V
Continuous Drain Current @ TC=25°C	ID	4.5	A
Continuous Drain Current @ TC=100°C	ID	2.8	A
Pulsed Drain Current	IDM	18	A
Gate-Source Voltage	VGS	±30	V
Single Pulsed Avalanche Energy	EAS	210	mJ
Repetitive Avalanche Energy	EAR	10	mJ
Peak Diode Recovery dV/dt	dV/dt	4.5	V/ns
Power Dissipation (TC=25°C)	PD	80	W
Power Dissipation (TC=100°C)		0.6	W
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150	°C

NOTE:

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

Thermal characteristics (Tc=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Typical thermal resistance	Rthjc	2	°C/W
	RθJA	32	

Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Test Conditions	Min.	Typ.	Max.	Unit
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Static Characteristics

BVDSS	VGS=0, ID=250μA	600	-	-	V
ΔBVDSS/ΔTj	Reference to 25°C, ID=250μA		0.60		
IDSS	VDS =600V, VGS =0V	-	-	1	uA
	VDS =480V, VGS =0, Tj=125°C	-	-	10	
IGSSF	VGS =30V, VDS =0V	-	-	100	nA
IGSSR	VGS =-30V, VDS =0V	-	-	-100	nA
VGS	VDS = VGS, ID=250μA	2.0	-	4.0	V
*RDS(ON)	VGS =10V, ID =2.5A	-	1.9	2.5	mΩ

Dynamic Characteristics

Ciss	VGS=0V, VDS=25V, f=1MHz	-	560	-	pF
Coss		-	55	-	
Crss		-	7	-	
td(ON)	VDS =300V, ID =4.5A, RG = 25 Ω	-	10	-	ns
tr		-	40	-	
td(OFF)		-	40	-	
tf		-	50	-	
Qg	VDS =480V, ID =4.5A, VGS =10V	-	16	-	nC
Qgs		-	2.5	-	
Qgd		-	6.5	-	

Source-Drain Diode Characteristics

IS		-	-	4.5	A
ISM		-	-	18	
VSD	VGS =0V, IS = 4.5A	-	-	1.4	V
trr	IS = 4.5 A, VGS = 0 V diF/dt = 100 A/μs	-	300	-	nS
Qrr		-	2	-	nC

NOTE:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L= 19mH, IAS= 4.5A, VDD=50V, RG=25Ω, Starting TJ=25°C
3. $ISD \leq 4.5\text{ A}$, $di/dt \leq 200\text{ A}/\mu\text{s}$, $VDD \leq BVDSS$, Starting TJ = 25°C
4. Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
5. Essentially Independent of Operating Temperature

Recommended footprint

