Product Specification

QNM3N50NA

500V N-Channel MOSFET

FEATURES

- 500V,3A

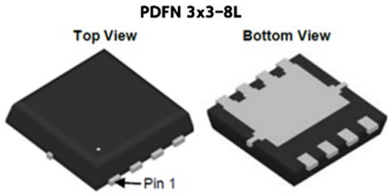
  $R_{DS(ON)} < 3.5\Omega$@ $V_{GS} = 10V$

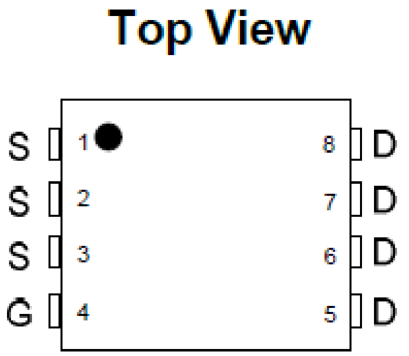
- Fast Switching
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge

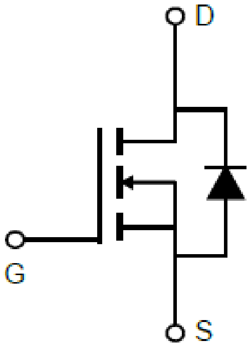
Applications

- PWM applications
- Load Switch
- Power management

Pin Description







NO.	Symbol	Description
1	S	SOURCE
2	S	SOURCE
3	S	SOURCE
4	G	GATE
5	D	DRAIN
6	D	DRAIN
7	D	DRAIN
8	D	DRAIN

Absolute Maximum Ratings

(@ T_A = 25℃ unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Sourc Voltagee	500	V
V_{GS}	Gate-Source Voltagep	±30	V
I_D	Continuous Drain Current(T_A=25℃)	3	A
I_D	Continuous Drain Current(T_A=100℃)	1.54	A
I_{DM}	Pulsed Drain Current(1).	8	A
E_{AS}	Single Pulsed Avalanche Energy(2)	35	mJ
P_D	Power Dissipatione	29	W
$R_{\theta JC}$	Thermal Resistance from Junction to Case	3.5	℃/W
T_J	Junction Temperaturee	150	℃
T_{STG}	Storage Temperaturee	-55~+150	℃

Electrical Characteristics

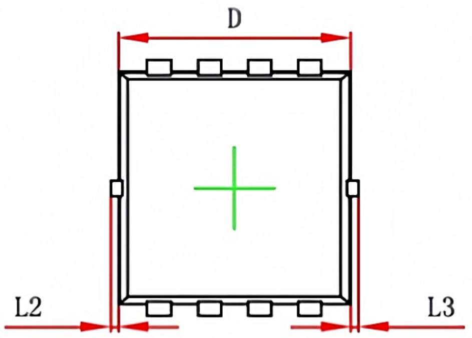
(T_A = 25℃ unless otherwise specified)

Symbol	Parameter	TestCondition	Min	Typ	Max	Unit
Static Characteristics						
$V_{(BR)DSS}$	Drain-source breakdown voltage	V_{GS}=0V,I_D=250uA	500	-	-	V
I_{DSS}	Zero gate voltage drain current	V_{DS}=500V,V_{GS}=0V	-	-	1	uA
I_{GSS}	Gate-body leakage current	V_{GS}=±30V,V_{DS}=0V	-	-	±100	nA
$V_{GS(th)}$	Gate threshold voltage(3)	V_{DS}=V_{GS},I_D=250uA	2	3.6	4	V
$R_{DS(on)}$	Drain-source on-resistance(3)	V_{GS}=10V,I_D=1.5A	-	2.6	3.5	Ω
g_{FS}	Forward tranconductance(3)	V_{DS}=10V,I_D=1.5A	0.5	-	-	S
Dynamic characteristics						
C_{iss}	InputCapacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	-	331	-	pF
C_{oss}	Output Capacitance		-	24	-	
C_{rss}	Reverse Transfer Capacitance		-	3	-	
Switching characteristics						
$t_{d(off)}$	Turn-off delay time	V_{DD}=300V,L_D=3A, V_{GS}=10V, R_G=25Ω	-	13	-	ns
Q_g	Total Gate Charge	V_{DS}=480V, I_D=1A, V_{GS}=10V	-	4.8	-	nC
Q_{gs}	Gate-Source Charge		-	0.7	-	
Q_{gd}	Gate-Drain Charge		-	2.7	-	
Source-Drain Diode characteristics						
V_{DS}	Diode Forward voltage(3)	V_{GS} =0V, I_S=3A	-	-	1.4	V
I_S	Diode Forward current(4)		-	-	3	A
t_{rr}	Body Diode Reverse Recovery Time	T_J=25℃,I_F=3A, di/dt=100A/us	-	190	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	T_J=25℃,I_F=3A, di/dt=100A/us	-	0.53	-	uc

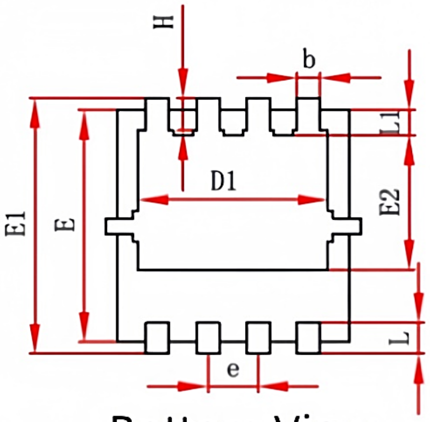
Notes:

1. Repetitive Rating:pulse width limited by maximum junction temperature
2. E_{AS} Condition:T_J=25℃,V_{DD}=50V,R_G=2.0Ω,L=10mH
3. Pulse Test:pulse width≤300us, duty cycle ≤2%
4. Surface Mounted on FR4 Board,t ≤10 sec

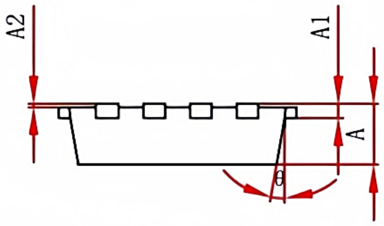
Package Mechanical Data(PDFN 3x3-8)



Top View

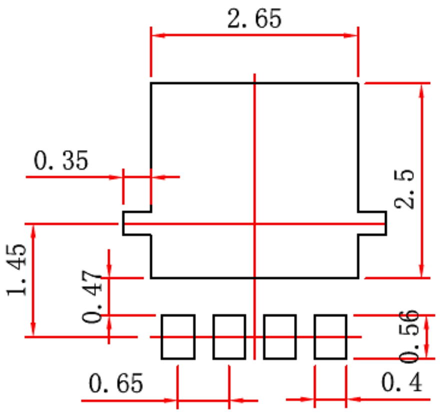


Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	**Max.**	**Min.**	**Max.**
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°



Note:

1.Controlling dimension: in millimeters.

2.General tolerance: ±0.05mm.

3.The pad layout is for reference purposes only.

Ordering information

Order Code	Package	V_{DS}(V)	I_D(A)	$R_{DS(ON)}$(mΩ)	
QNM3N50NA	PDFN 3x3-8	500	3	V_{GS}=10V	< 3.5