Product Specification

QNM7421AY

18V P-Channel MOSFET

Description

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

FEATURES

- V_{DS}=-18V, I_D=-55A

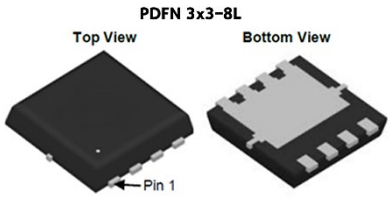
  $R_{DS(ON)}$ < 9.1mΩ @ V_{GS} = -4.5V

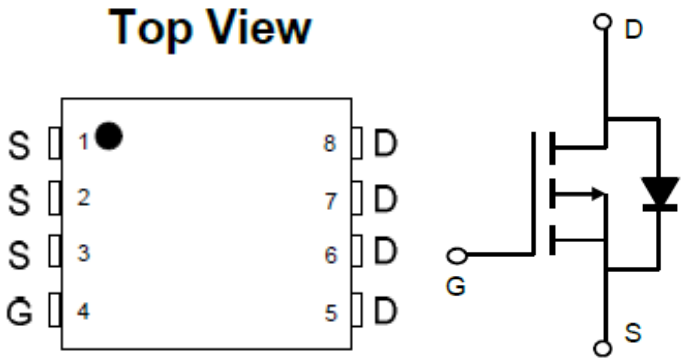
  $R_{DS(ON)}$ < 13.0mΩ @ V_{GS} = -2.5V

Applications

- PWM Applications
- Load Switch

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_C = 25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		-18	V
V_{GSS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current	T_C = 25℃	-55	A
		T_C = 100℃	-35	
I_{DM}	Pulsed Drain Current(1)		-220	A
E_{AS}	Single Pulsed Avalanche Energy(2)		90	mJ
P_D	Power Dissipation	T_C= 25℃	66	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.9	℃/ W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics

(T_J = 25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-18	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-18V, V_{GS}=0V,	-	-	-1	uA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±12V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-0.4	-0.55	-1.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance(3)	V_{GS}=-4.5V, I_D=-15A	-	6.4	9.1	mΩ
		V_{GS}=-2.5V, I_D=-12A	-	9.4	13.0	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-10V, V_{GS}=0V, f=1.0MHz	-	1935	-	pF
C_{oss}	Output Capacitance		-	407	-	pF
C_{rss}	Reverse Transfer Capacitance		-	368	-	pF
Q_g	Total Gate Charge	V_{DS}=-10V, I_D=-15A, V_{GS}=-4.5V	-	56	-	nC
Q_{gs}	Gate-Source Charge		-	8	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	16	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-10V, I_D=-13A, R_{GEN}=2.7Ω, V_{GS}=-10V	-	11	-	ns
t_r	Turn-on Rise Time		-	110	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	157	-	ns
t_f	Turn-off Fall Time		-	160	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-55	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-220	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=-30A	-	-	-0.7	V
trr	Reverse Recovery Time	T_J=25℃,I_S=-15A, di/dt=-100A/us	-	23	-	ns
Qrr	Reverse Recovery Charge		-	14	-	nC

Notes:

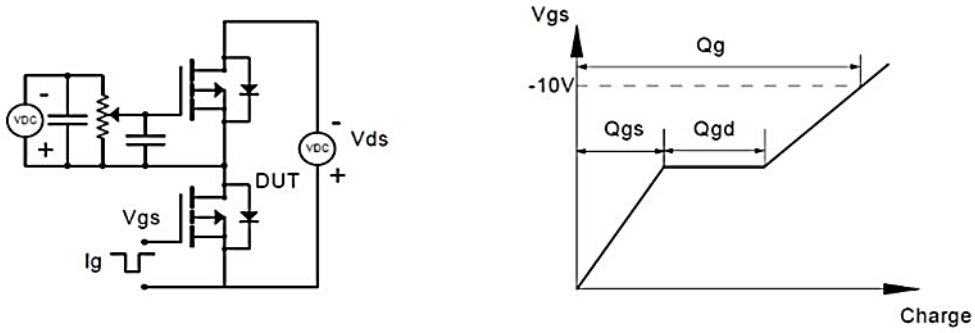
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. E_{AS} condition: T_J=25℃,V_{DD}=-10V,V_G=-10V, R_G=25Ω, L=0.5mH,I_{AS}=-19A

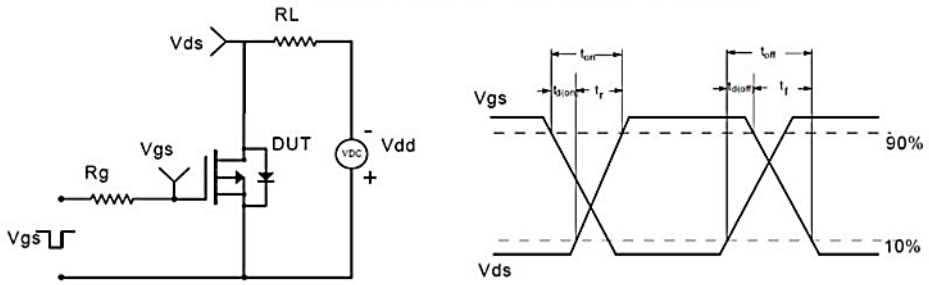
3. Pulse Test: Pulse Width≤300us, Duty Cycle≤0.5%

Test Circuit

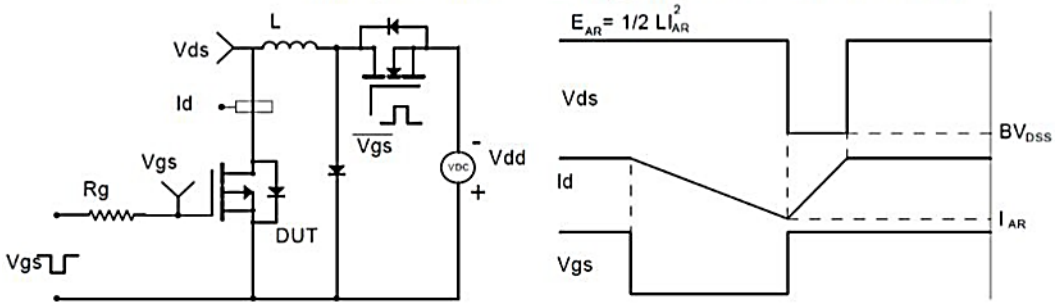
Gate Charge Test Circuit & Waveform



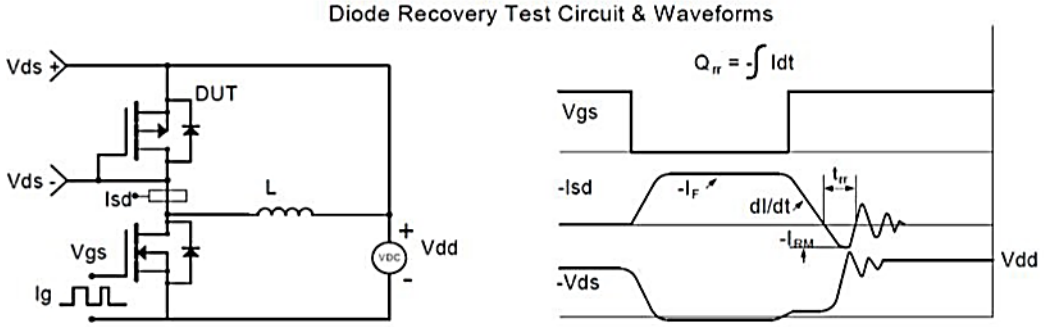
Resistive Switching Test Circuit & Waveforms



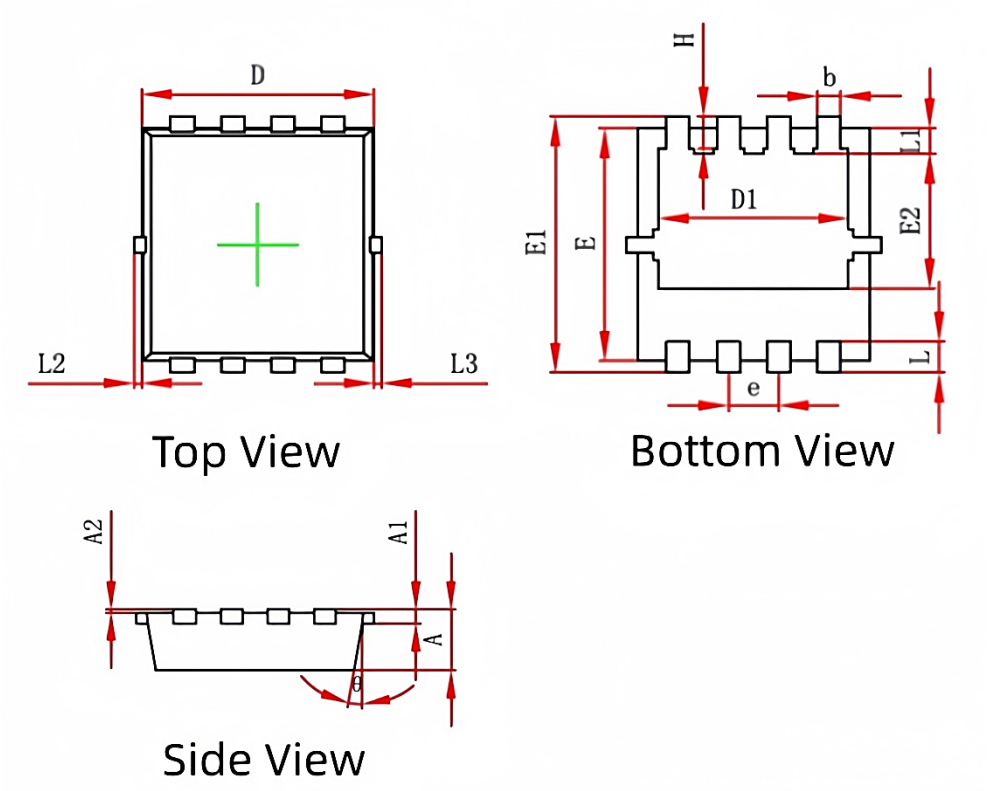
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



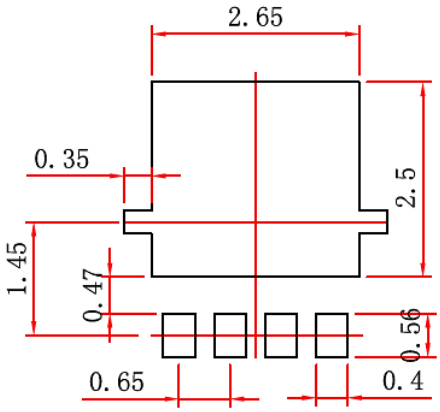
Diode Recovery Test Circuit & Waveforms



Package Mechanical Data(PDFN 3x3-8)



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)	
QNM7421AY	PDFN 3x3-8	-18	-55	V_{GS}=-4.5V	< 9.1
				V_{GS}=-2.5V	< 13.0