



QNHCHIP

QNM30ND50AY

Product Specification

QNM30ND50AY

30V Dual N-Channel MOSFET



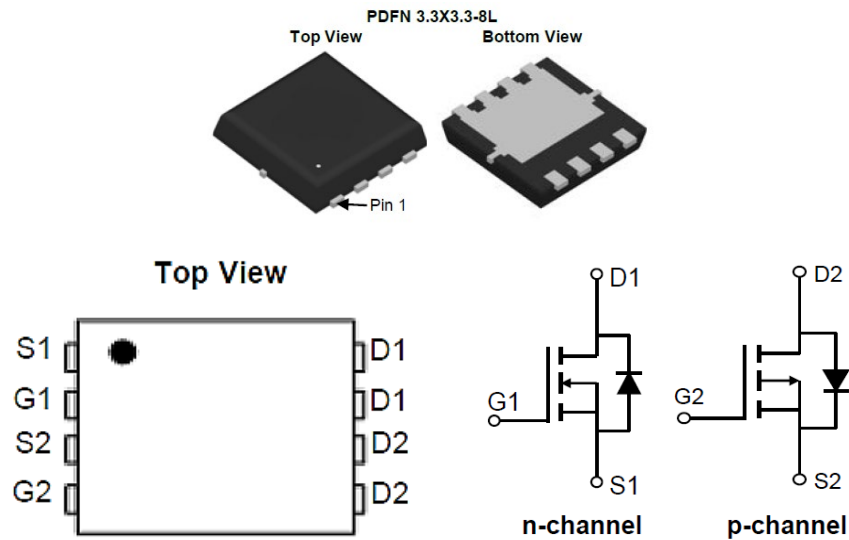
FEATURES

- 30V, 30A
 $R_{DS(ON)}$ TYP. = 6.2m Ω @ $V_{GS} = 10V$
 $R_{DS(ON)}$ TYP. = 11m Ω @ $V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

Applications

- Load Switch
- PWM Application
- Power Management

Pin Description



NO.	Symbol	Description
1	S1	SOURCE
2	G1	GATE
3	S2	SOURCE
4	G2	GATE
5	D1	DRAIN
6	D1	DRAIN
7	D2	DRAIN
8	D2	DRAIN



Absolute Maximum Ratings

(@ T_A = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	I _D = 250mA, V _{GS} = 0V	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 30V, V _{GS} = 0V	-	-	1.0	μA
I _{GSS}	Gate-Body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250mA	1.0	1.6	2.5	V
R _{DS(on)}	Static Drain-Source ON-Resistance ⁽⁴⁾	V _{GS} = 10V, I _D = 25A	-	6.2	8.1	mW
		V _{GS} = 4.5V, I _D = 15A	-	11	14.3	mW
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 15V, f = 1MHz	-	1310	-	pF
C _{oss}	Output Capacitance		-	180	-	pF
C _{rss}	Reverse Transfer Capacitance		-	136	-	pF
Q _g	Total Gate Charge	V _{GS} = 0 to 10V V _{DD} = 15V, I _D = 20A	-	23	-	nC
Q _{gs}	Gate Source Charge		-	4.5	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	5.5	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 15V I _D = 15A, R _{GEN} = 3Ω	-	7	-	ns
t _r	Turn-On Rise Time		-	15	-	ns
t _{d(off)}	Turn-Off DelayTime		-	25	-	ns
t _f	Turn-Off Fall Time		-	6	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	30	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	120	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = 15A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F = 20A, di/dt = 100A/μs	-	10	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	3	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J = 25°C, V_{DD} = 15V, V_G = 10V, R_G = 25ohm, L = 0.5mH, I_{AS} = 11A
3. R_{θJA} is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
4. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 0.5%.



Electrical Characteristics

($T_A = 25^\circ\text{C}$ unless otherwise specified)

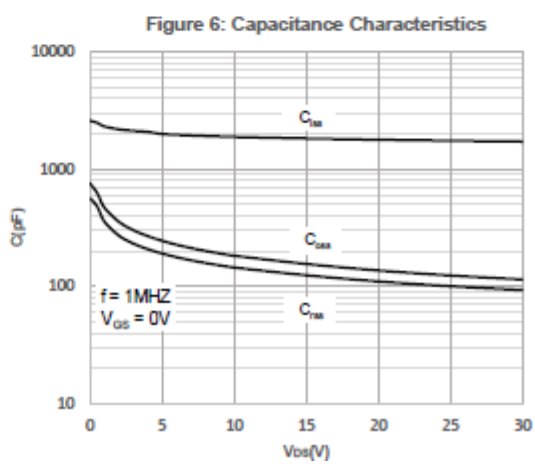
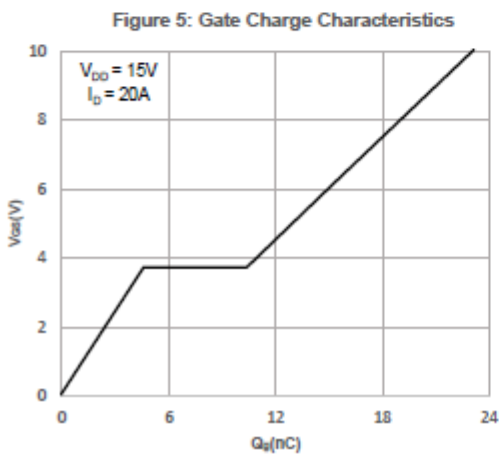
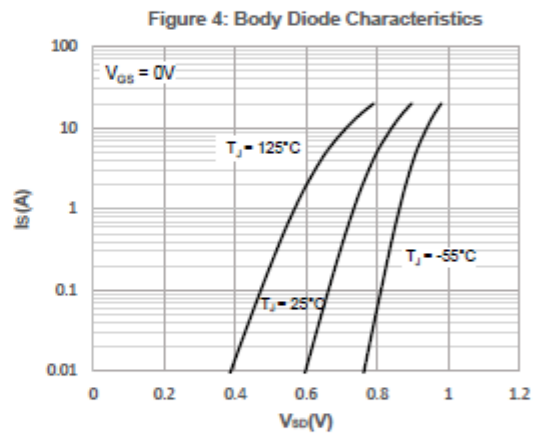
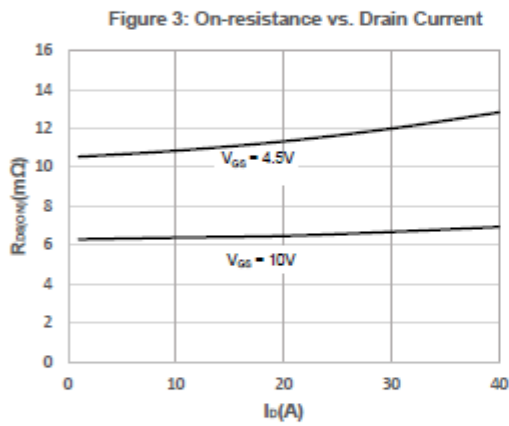
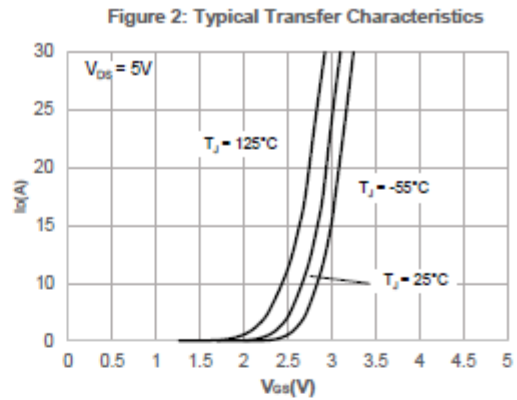
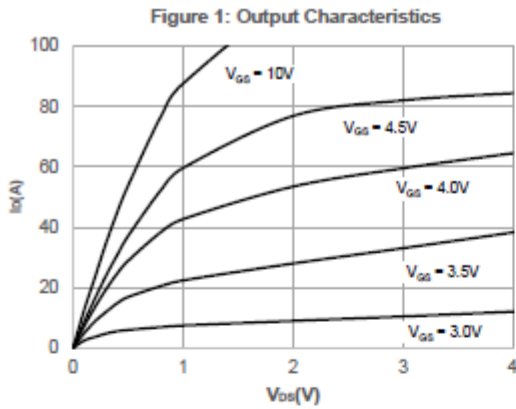




Figure 7: Normalized Breakdown voltage vs. Junction Temperature

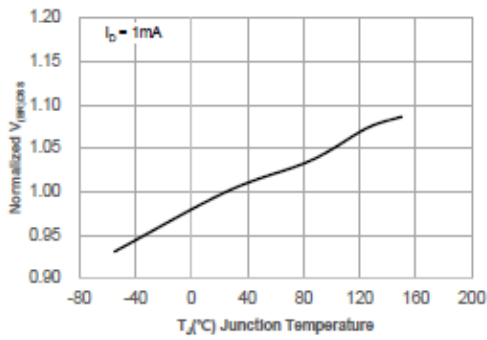


Figure 8: Normalized on Resistance vs. Junction Temperature

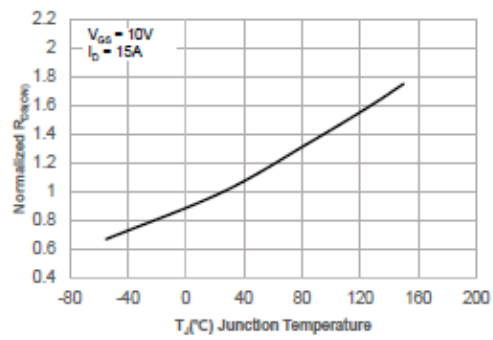


Figure 9: Maximum Safe Operating Area

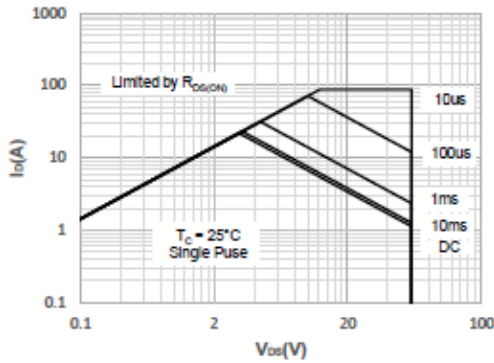


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

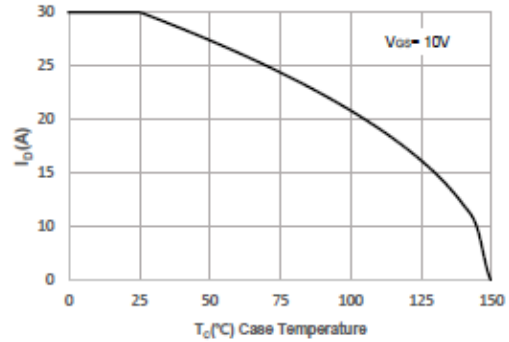


Figure 11: Normalized Maximum Transient Thermal Impedance

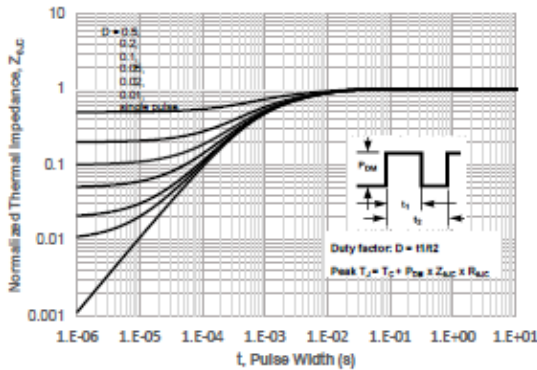
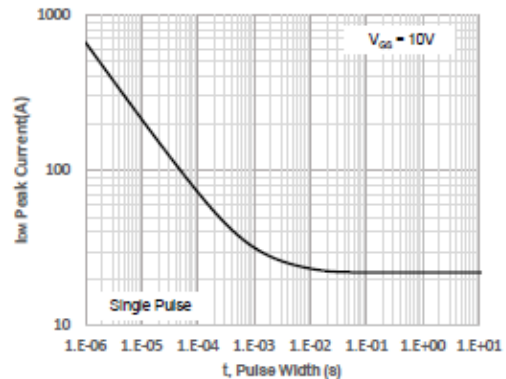


Figure 12: Peak Current Capacity





Test Circuit

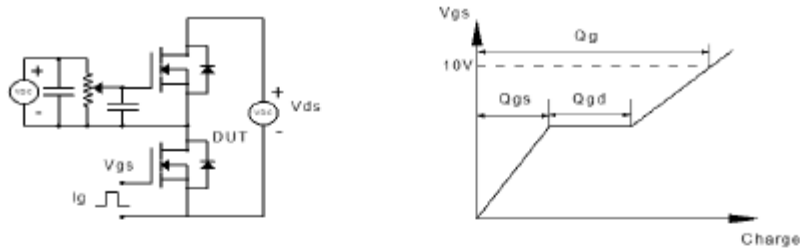


Figure 1: Gate Charge Test Circuit & Waveform

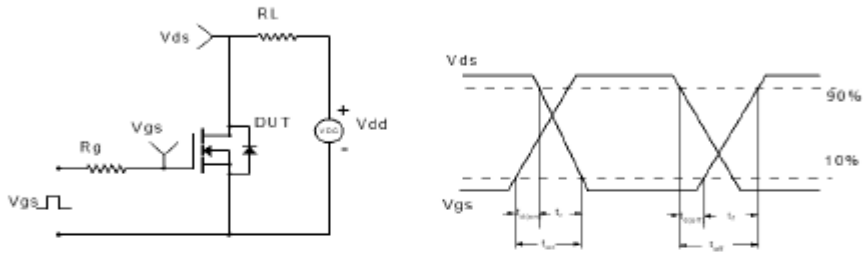


Figure 2: Resistive Switching Test Circuit & Waveform

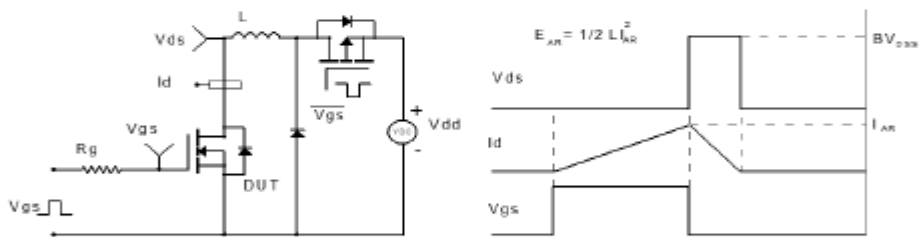


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

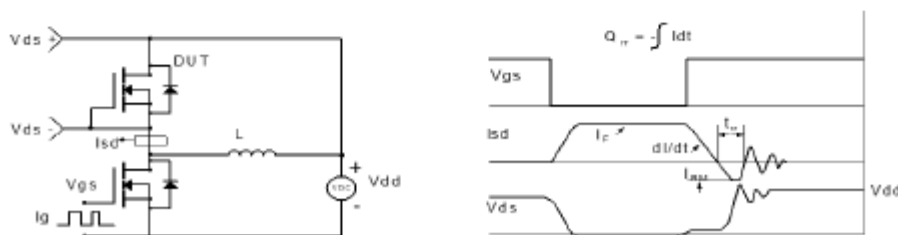
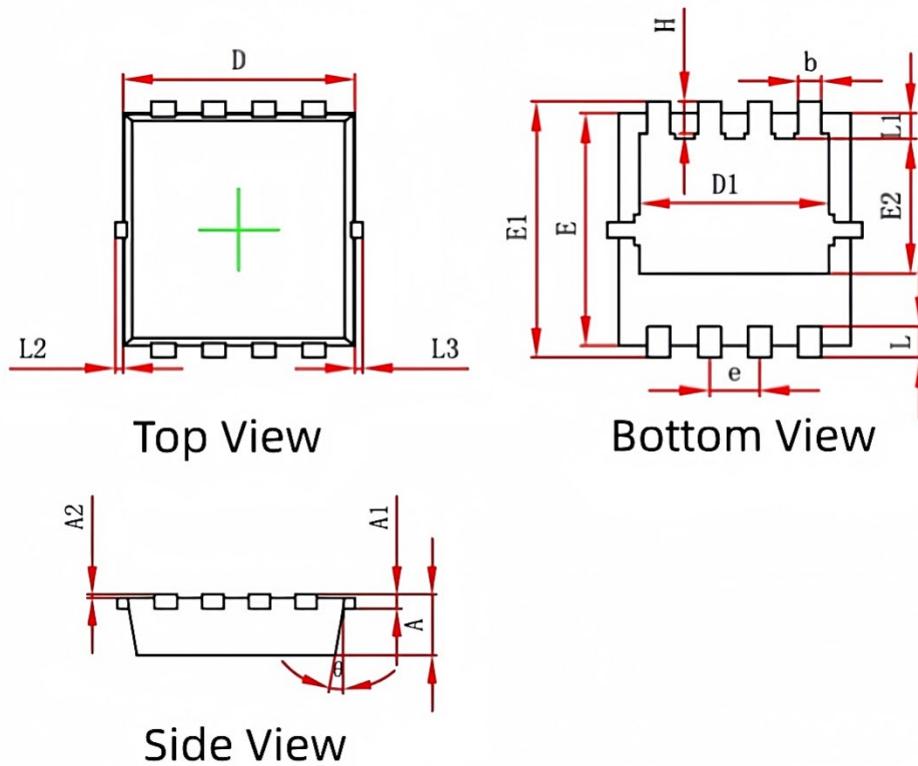


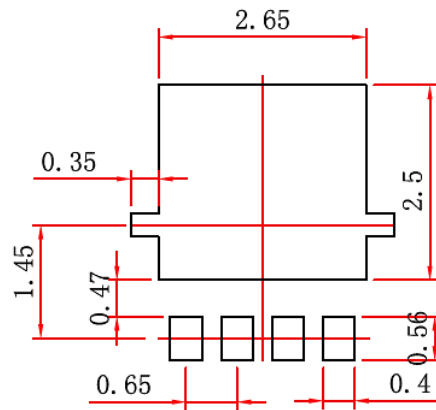
Figure 4: Diode Recovery Test Circuit & Waveform



Package Mechanical Data(PDFN 3.3x3.3-8)



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: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

Ordering information

Order Code	Package	V _{DS} (V)	I _D (A)	R _{DS(ON)} (mΩ)	
				V _{GS} =10V	V _{GS} =4.5V
QNM30ND50AY	PDFN 3.3x3.3-8	30	30	V _{GS} =10V	6.2
				V _{GS} =4.5V	11