Product Specification

QN4812

30V Dual N-Channel MOSFET

FEATURES

- 30V, 8A

  $R_{DS(ON)}$ < 23mΩ @ V_{GS} = 10V

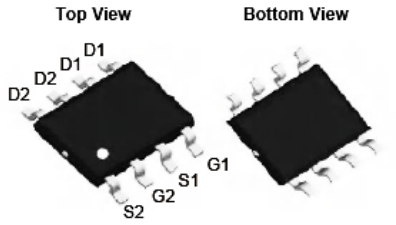
  $R_{DS(ON)}$ < 26mΩ @ V_{GS} = 4.5V

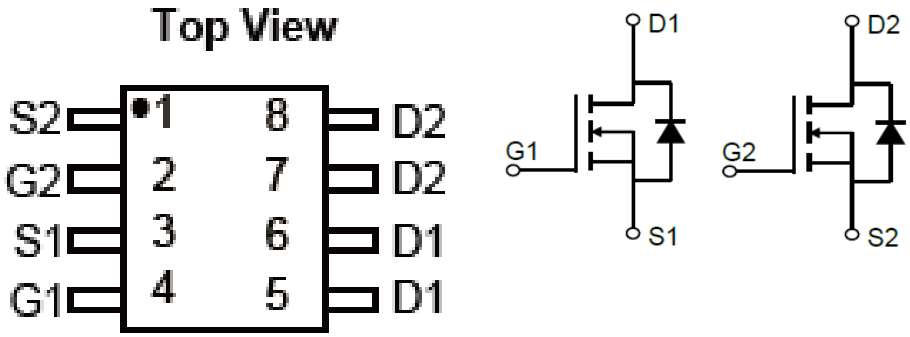
  $R_{DS(ON)}$ < 36mΩ @ V_{GS} = 2.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

Applications

- Load Switch
- PWM Application
- Power Management

Pin Description





Schematic Diagram

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

Absolute Maximum Ratings

(@ T_A = 25℃ unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		30	V
V_{GS}	Gate-to-Source Voltage		±12	V
I_D	Continuous Drain Current	T_A=25℃	8	A
		T_A=100℃	5	
I_{DM}	Pulsed Drain Current (1)		32	A
E_{AS}	Single Pulsed Avalanche Energy (2)		16	mJ
P_D	Power Dissipation	T_A = 25℃	1.8	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient(3)		70	℃/W
T_J,T_{STG}	Junction & Storage Temperature Range		-55 to 150	℃

Electrical Characteristics

(T_J = 25℃ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D=250uA,V_{GS}=0V	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V,V_{GS}=0V	-	-	1.0	uA
I_{GSS}	Gate-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	0.6	1.0	1.3	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS}=10V,I_D=4.2A	-	21	23	mΩ
		V_{GS}=4.5V,I_D=4A	-	24	26	mΩ
		V_{GS}=2.5V,I_D=1A	-	34	36	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=15V, f=1MHz	-	462	-	pF
C_{oss}	Output Capacitance		-	65	-	pF
C_{rss}	Reverse Transfer Capacitance		-	44	-	pF
Q_g	Total Gate Charge	V_{GS}=0~4.5V V_{DS}=15V,I_D=3A	-	9	-	nC
Q_{gs}	Gate Source Charge		-	2	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	2.1	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS}=10V,V_{DD}=15V I_D=3A, R_{GEN}=3Ω	-	4	-	ns
t_r	Turn-On Rise Time		-	11	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	24	-	ns
t_f	Turn-Off Fall Time		-	2	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	8	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	32	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=8A	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	I_F=3A,di/dt=100A/us	-	8.4	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	3.3	-	nC

Notes:

- Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
- E_{AS} condition: Starting T_J=25℃, V_{DD}=15V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=8A
- $R_{\theta JA}$ is measured with the device mounted on a 1 $inch^2$ pad of 2oz copper FR4 PCB
- Pulse Test: Pulse Width≤300us, Duty Cycle≤0.5%

Typical Performance Characteristics

Figure 1: Output Characteristics

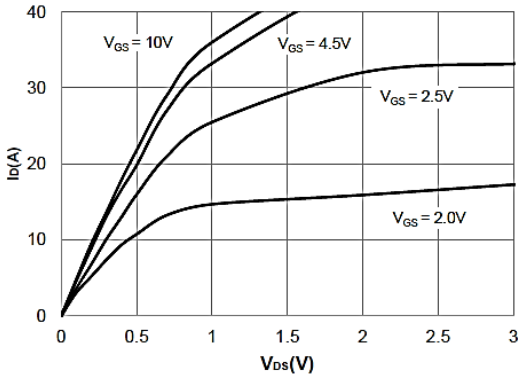


Figure 2: Typical Transfer Characteristics

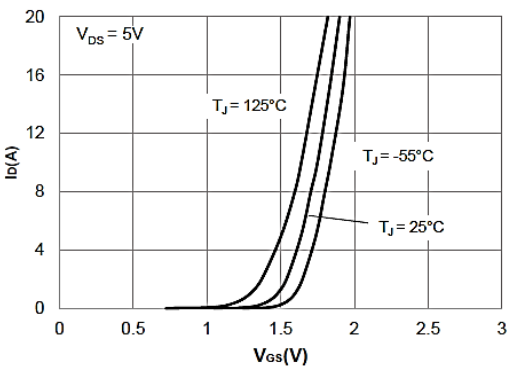


Figure 3: On-resistance vs. Drain Current

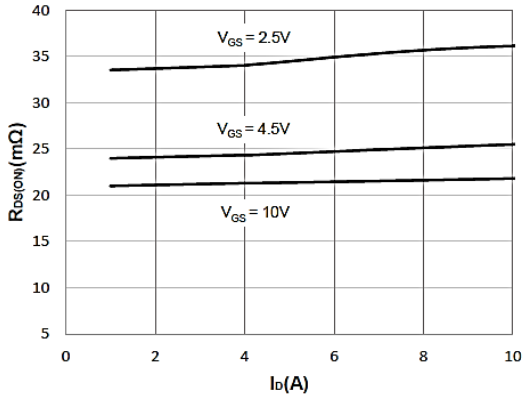


Figure 4: Body Diode Characteristics

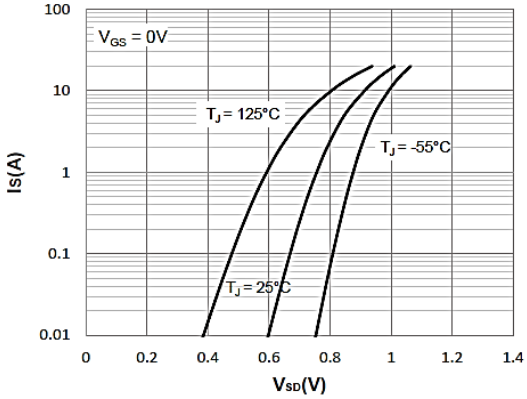


Figure 5: Gate Charge Characteristics

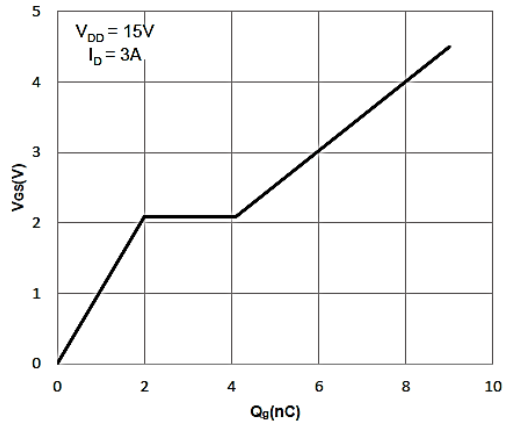


Figure 6: Capacitance Characteristics

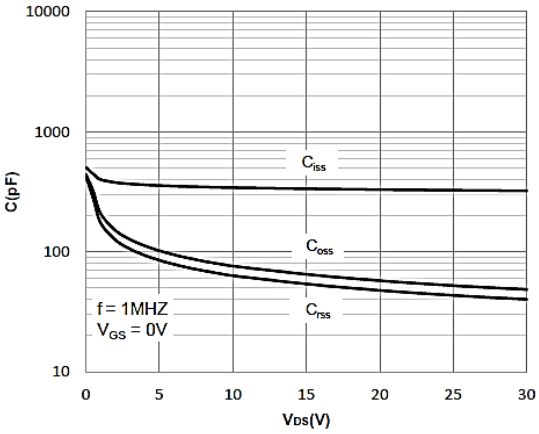


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

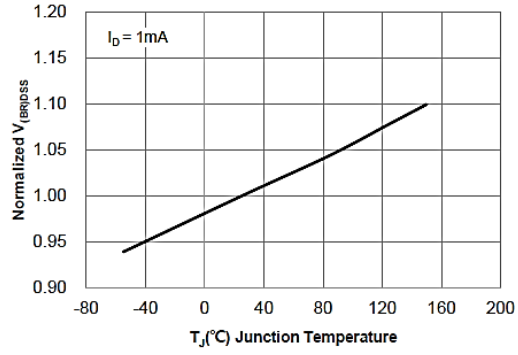


Figure 8: Normalized on Resistance vs. Junction Temperature

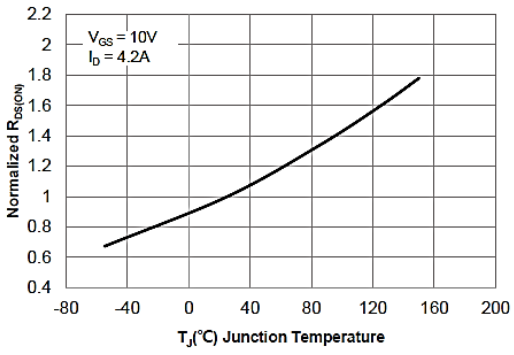


Figure 9: Maximum Safe Operating Area

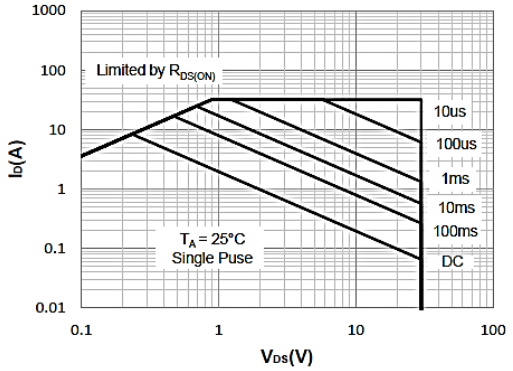


Figure 10: Maximum Continuous Drian Current vs. Ambient Temperature

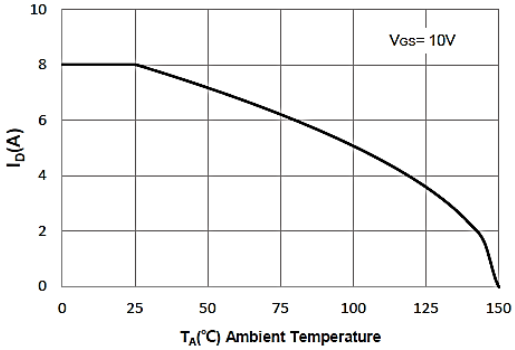


Figure 11: Normalized Maximum Transient Thermal Impedance

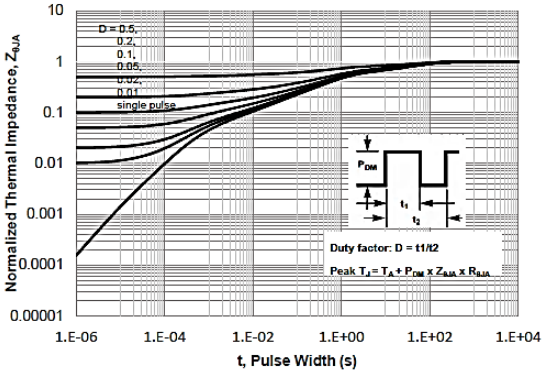
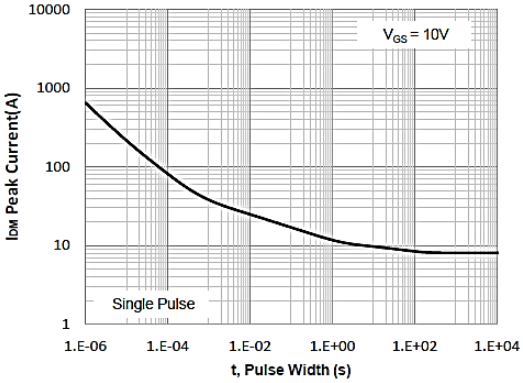


Figure 12: Peak Current Capacity



Test Circuit

Figure 1: Gate Charge Test Circuit & Waveform

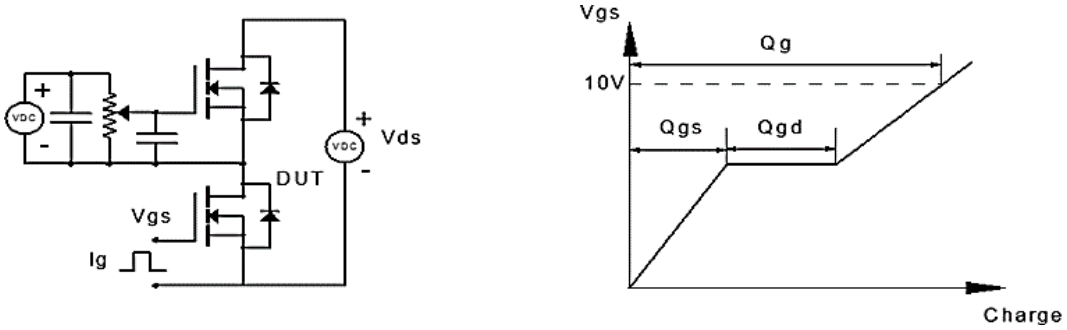


Figure 2: Resistive Switching Test Circuit & Waveform

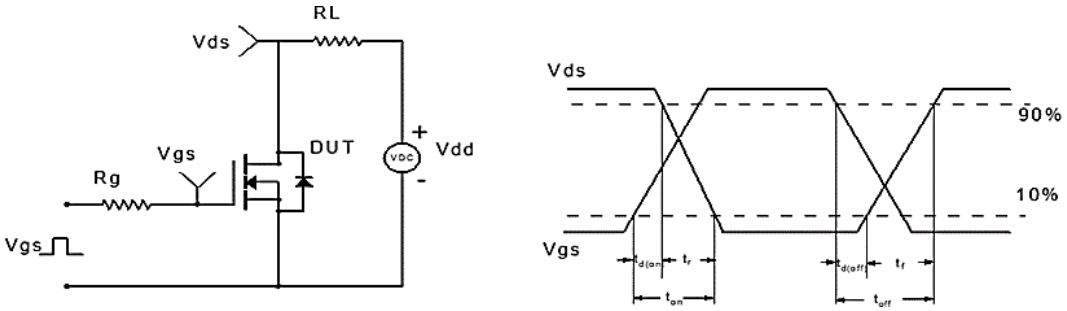


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

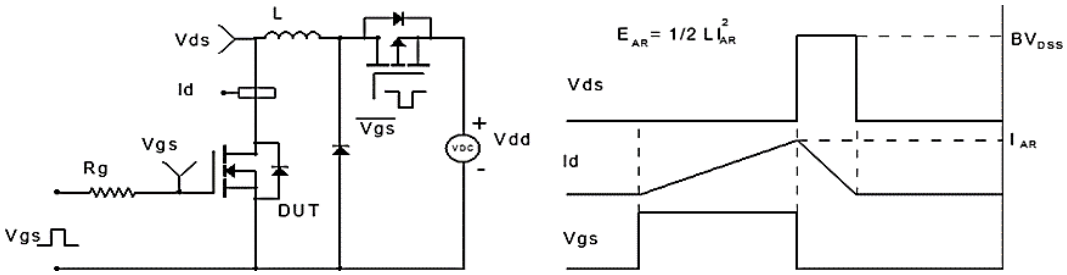
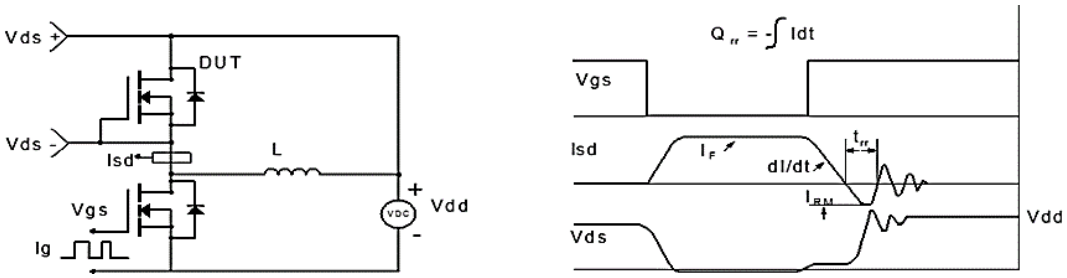
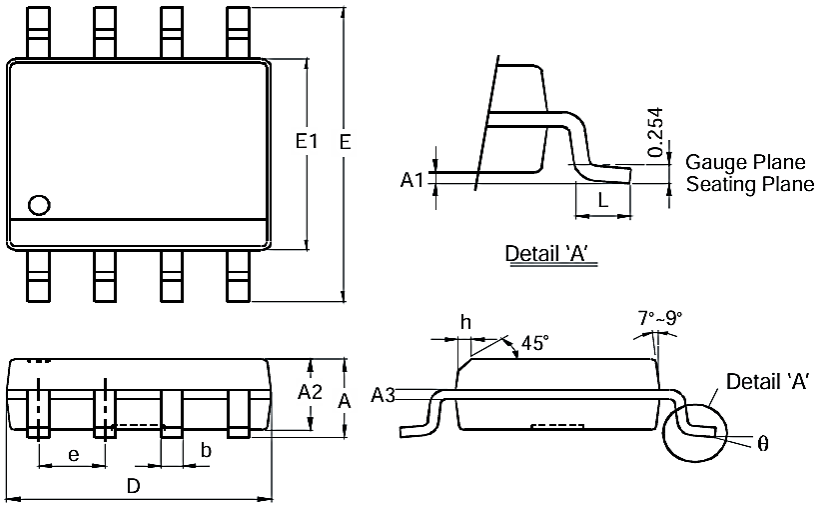


Figure 4: Diode Recovery Test Circuit & Waveform



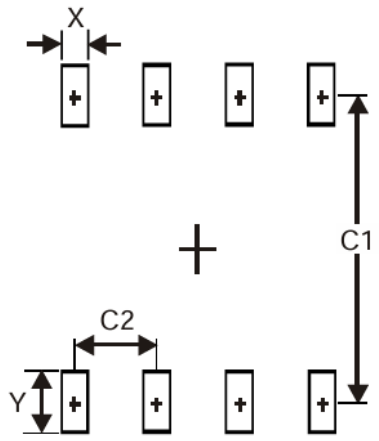
Package Mechanical Data

SOP-8



Dim	Min(mm)	Max(mm)
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°

suggested Pad Layout



Dimensions	Value(mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27

Ordering information

Order Code	Package	V_{DS}(V)	I_D(A)	$R_{DS(ON)}$(mΩ)	
QN4812	SOP-8	30	8	V_{GS}=10V	< 23
				V_{GS}=4.5V	< 26
				V_{GS}=2.5V	< 36