



QNHCHIP

QN5P10

Product Specification

QN5P10

100 V P-Channel MOSFET



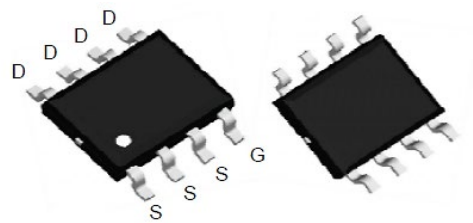
FEATURES

- -100 V, -5A
 $R_{DS(ON)} < 350m\Omega @ V_{GS} = -10V$
 $R_{DS(ON)} < 400m\Omega @ V_{GS} = -4.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

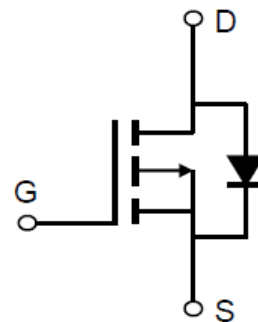
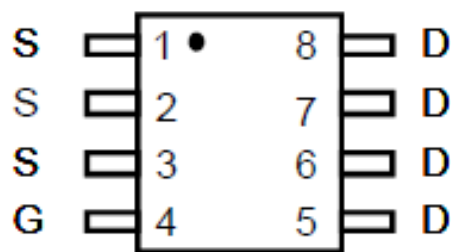
Applications

- Load Switch
- PWM Application
- Power Management

Pin Description



Top View



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

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

Symbol	Parameter	Value	Units	
V_{DS}	Drain-to-Source Voltage	-100	V	
V_{GS}	Gate-to-Source Voltage	± 20	V	
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	-5	A
		$T_A=100^\circ\text{C}$	-3	
I_{DM}	Pulsed Drain Current ⁽¹⁾	-12	A	
E_{AS}	Single Pulsed Avalanche Energy ⁽²⁾	20	mJ	
P_D	Power Dissipation	$T_A=25^\circ\text{C}$	1.9	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁽³⁾	66	$^\circ\text{C}/\text{W}$	
T_J, T_{STG}	Junction & Storage Temperature Range	-55 to 150	$^\circ\text{C}$	



Electrical Characteristics

(T_J = 25°C 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	-100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-100V, V _{GS} =0V	-	-	1.0	uA
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 =-250uA	-1	-1.8	-2.4	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽⁴⁾	V _{GS} =-10V, I _D =-3A	-	302	350	mΩ
		V _{GS} =-4.5V, I _D =-3A	-	333	400	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-50V f=1MHz	-	1007	-	pF
C _{oss}	Output Capacitance		-	32	-	pF
C _{rss}	Reverse Transfer Capacitance		-	20	-	pF
Q _g	Total Gate Charge	V _{GS} =0~-10V V _{DS} =-50V, I _D =-2A	-	88	-	nC
Q _{gs}	Gate Source Charge		-	9	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	16.5	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On DelayTime	V _{GS} =-10V, V _{DD} =-50V I _D =-2A, R _{GEN} =3Ω	-	20	-	ns
t _r	Turn-On Rise Time		-	30	-	ns
t _{d(off)}	Turn-Off DelayTime		-	55	-	ns
t _f	Turn-Off Fall Time		-	35	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-5	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-12	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =-5A	-	-	-1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =-5A, di/dt=100A/us	-	49	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	71	-	nC

Notes:

Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

E_{AS} condition: Starting T_J=25°C, V_{DD}=-100V, V_G=-10V, R_G=25Ω, L=0.5mH, I_{AS}=-12A

R_{θJA} is measured with the device mounted on a 1 inch² pad of 2oz copper FR4 PCB

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



Test Circuit

Figure 1: Gate Charge Test Circuit & Waveform

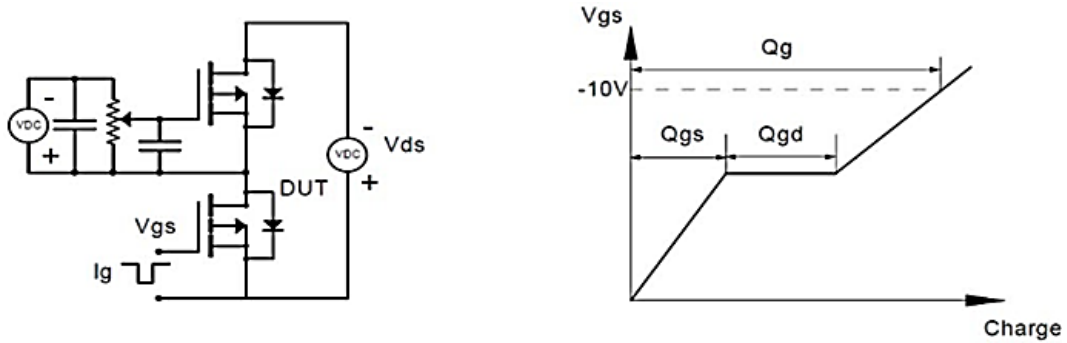


Figure 2: Resistive Switching Test Circuit & Waveform

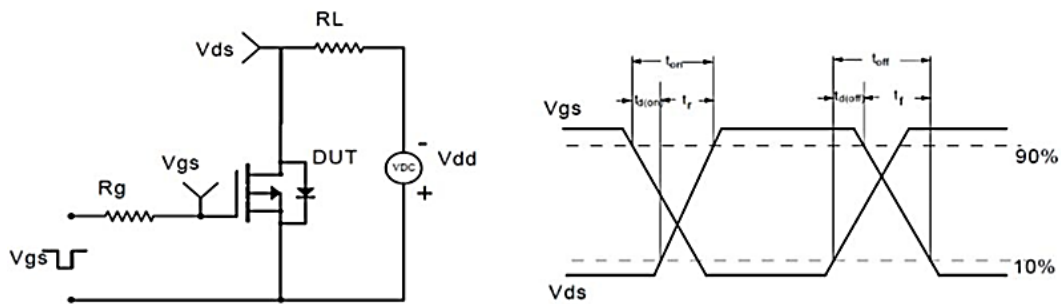


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

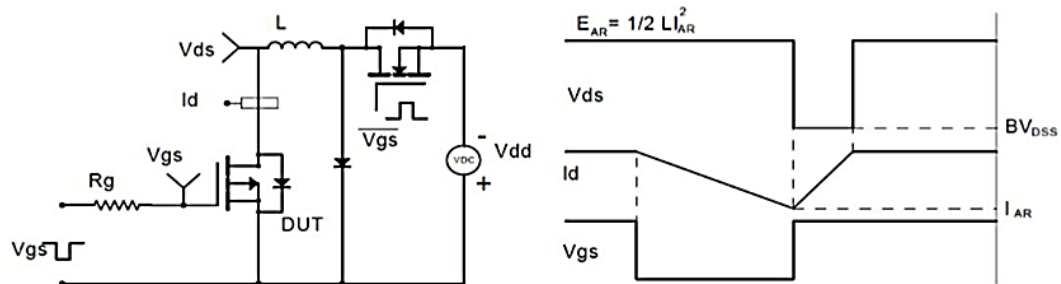
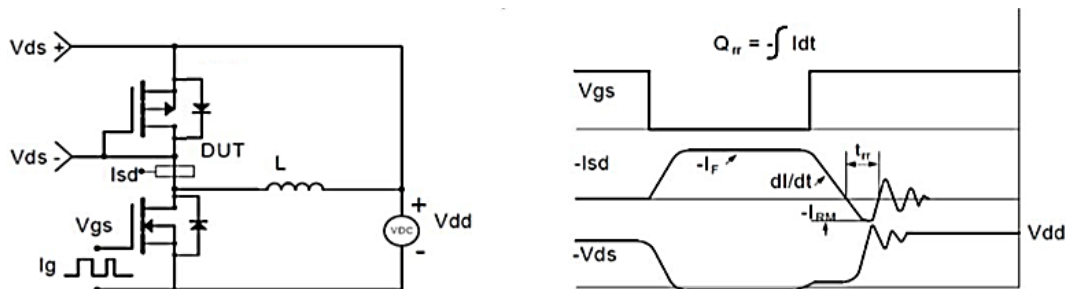


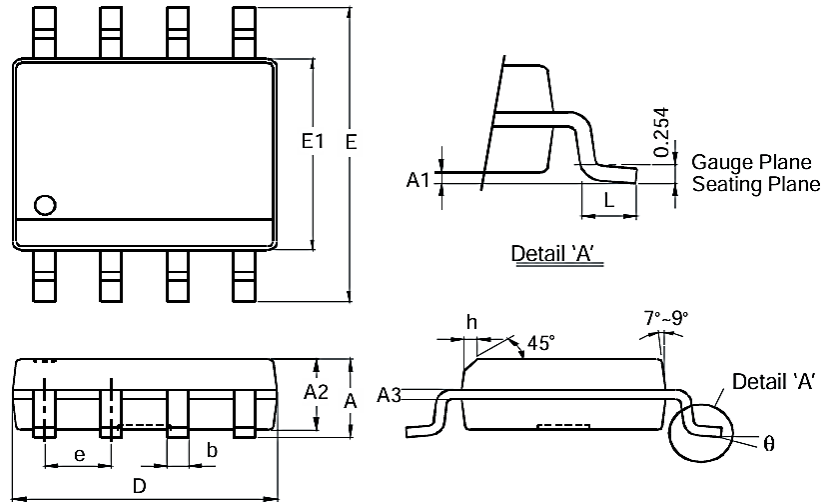
Figure 4: Diode Recovery Test Circuit & Waveform





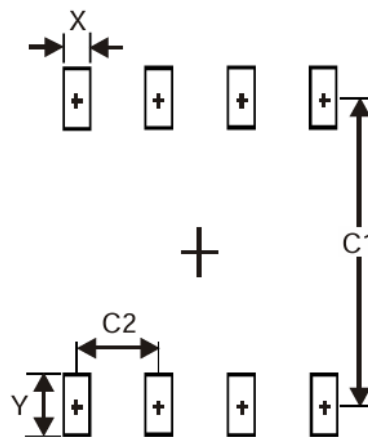
Package Mechanical Data

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)} (m Ω)	
QN5P10	SOP-8	-100	-5	V _{GS} = -10V	<350
				V _{GS} = -4.5V	<400