Product Specification

QNN55P10AY

100V P-Channel MOSFET

FEATURES

- -100V, -18A

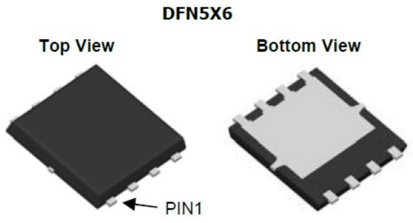
  $R_{DS(ON)}$ Typ = 82mΩ @ V_{GS} = -10V

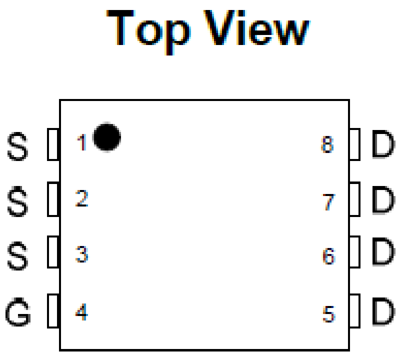
  $R_{DS(ON)}$ Typ = 87mΩ @ V_{GS} = -4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

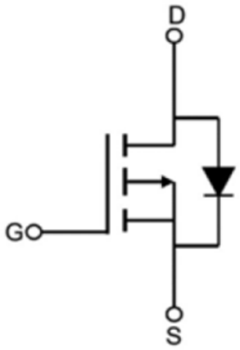
Applications

- Load Switch
- PWM Application
- 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	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℃	-18	A
		T_A = 100℃	-10.8	
I_{DM}	Pulsed Drain Current (1)		-72	A
E_{AS}	Single Pulsed Avalanche Energy (2)		72	mJ
P_D	Power Dissipation	T_A = 25℃	57	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		2.2	℃/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	-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	-1.6	-2.2	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS}=-10V, I_D=-5A	-	82	106	mΩ
		V_{GS}=-4.5V, I_D=-3A	-	87	113	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=-25V, f=1MHz	-	4292	-	pF
C_{oss}	Output Capacitance		-	87	-	pF
C_{rss}	Reverse Transfer Capacitance		-	70	-	pF
Q_g	Total Gate Charge	V_{GS}=0~-10V, V_{DS}=-5V, I_D=-3A	-	50	-	nC
Q_{gs}	Gate Source Charge		-	8	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	9	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS}=-10V,V_{DD}=-50V I_D=-3A,R_{GEN}=3 Ω	-	25	-	ns
t_r	Turn-On Rise Time		-	35	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	145	-	ns
t_f	Turn-Off Fall Time		-	90	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-18	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-72	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=-5A	-	-	-1.2	V
trr	Body Diode Reverse Recovery Time	I_F=-3A, di/dt=100A/us	-	60	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	145	-	nC

Notes:

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

2. EAS condition: Starting T_J=25℃, V_{DD}=-50V, V_G=-10V, R_G=25 Ω, L=0.5mH, I_{AS}=-17A

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

Typical Characteristics

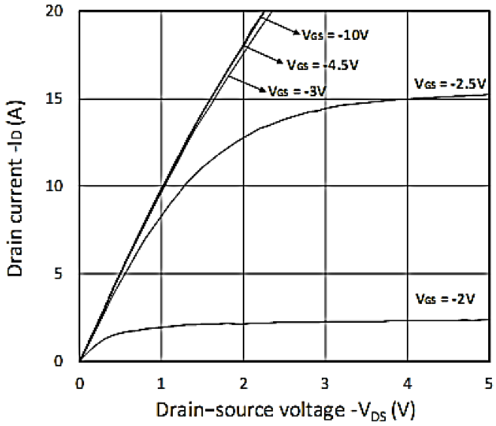


Figure 1. Output Characteristics

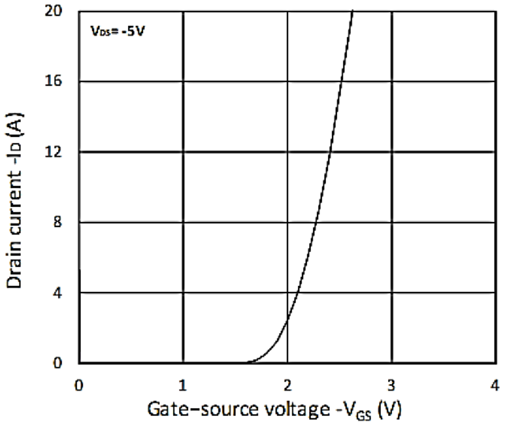


Figure 2. Transfer Characteristics

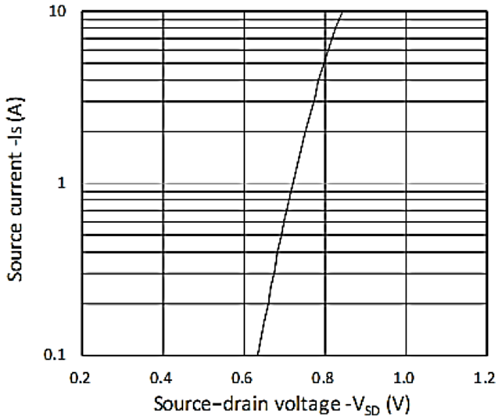


Figure 3. Forward Characteristics of Reverse

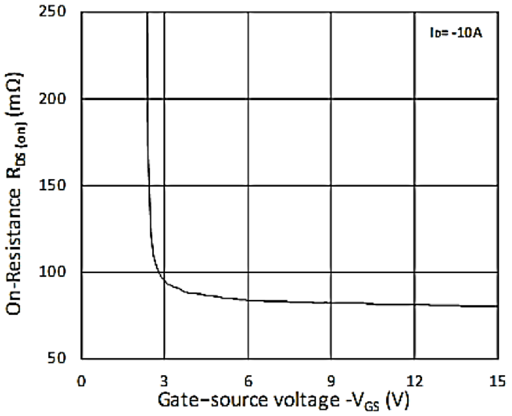


Figure 4. RDS(ON) vs. VGS

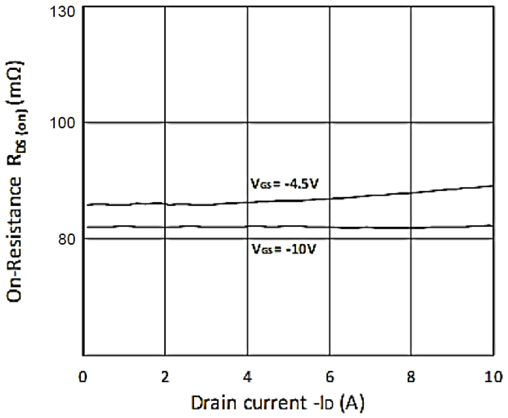


Figure 5. RDS(ON) vs. ID

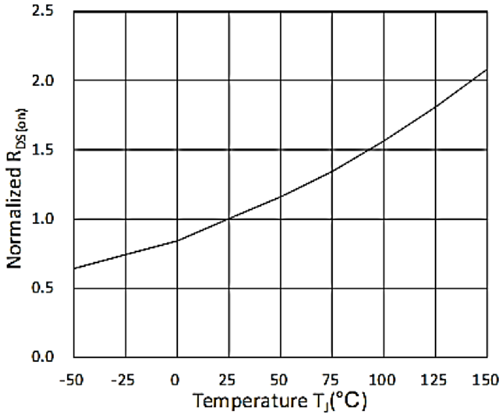
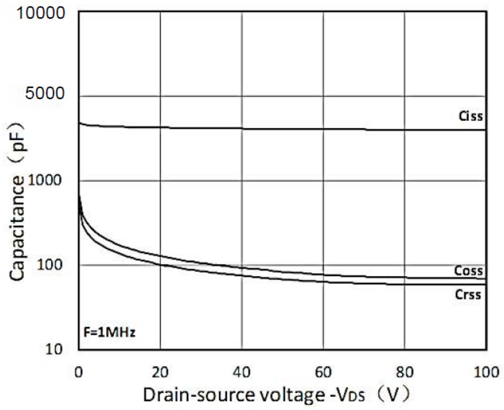


Figure 6. Normalized RDS(on) vs. Temperature



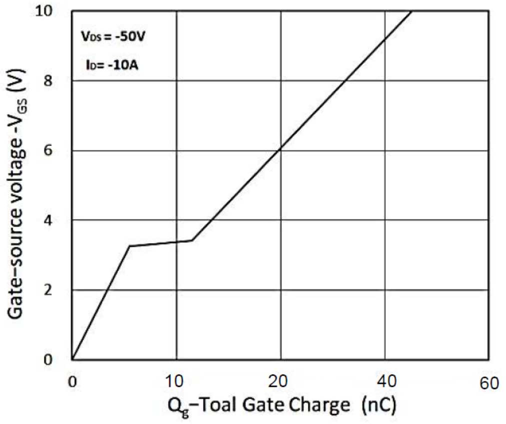
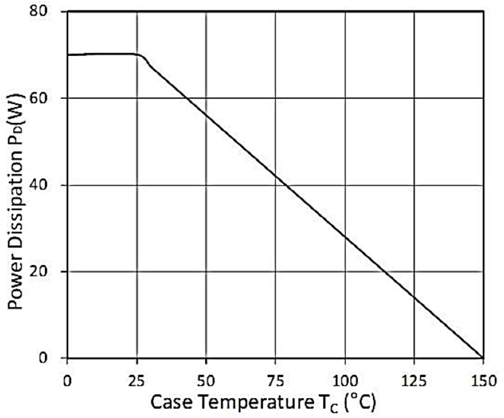


Figure 7. Capacitance Characteristics

Figure 8. Gate Charge Characteristics



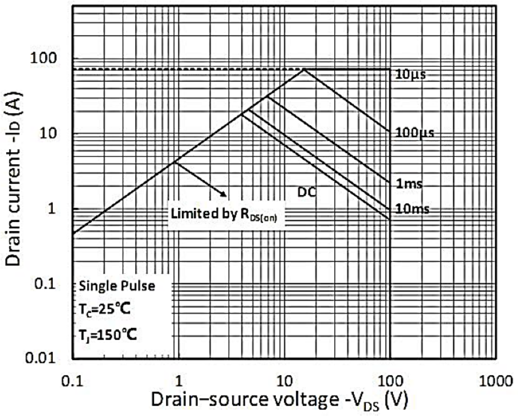


Figure 9. Power Dissipation

Figure10. Safe Operating Area

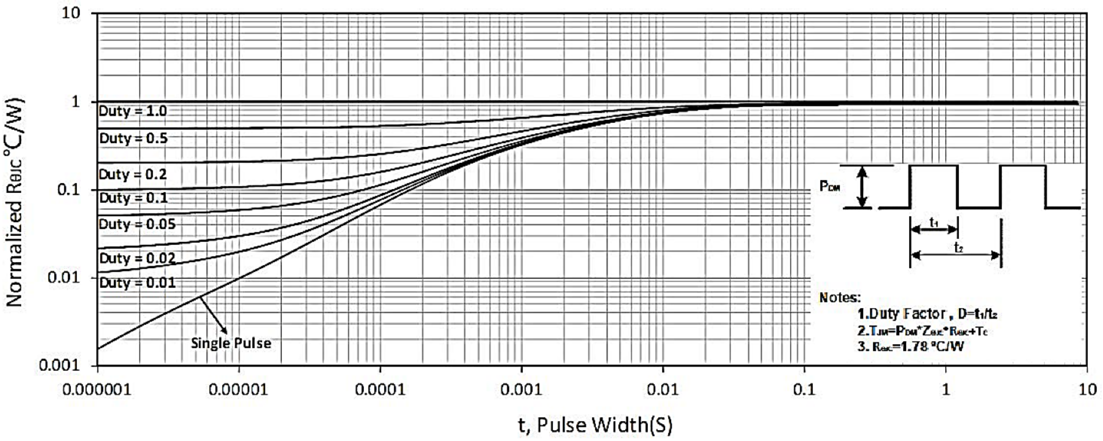


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

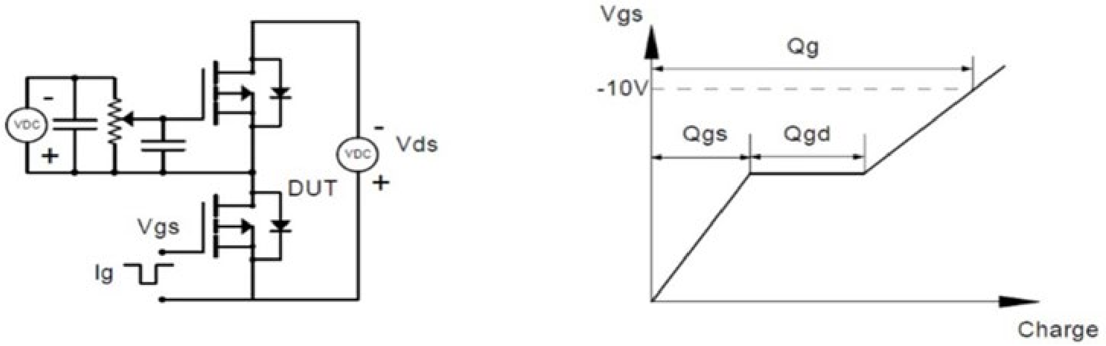


Figure 1: Gate Charge Test Circuit & Waveform

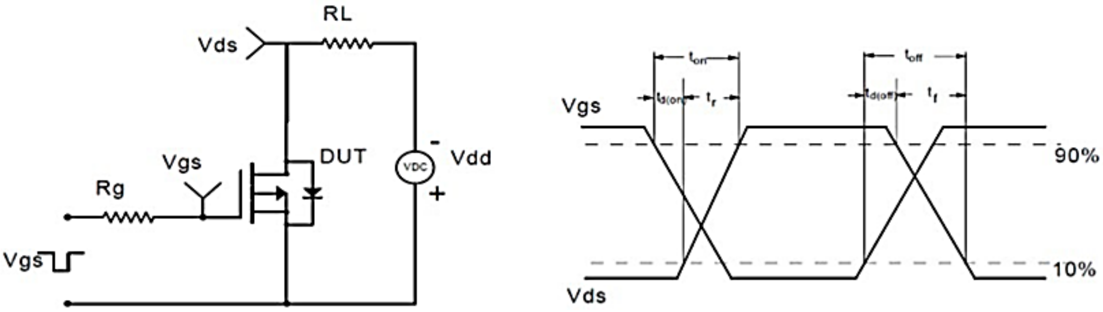


Figure 2: Resistive Switching Test Circuit & Waveform

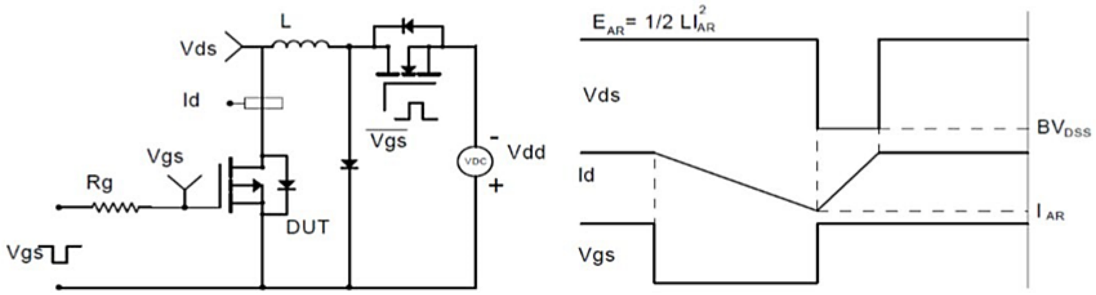


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

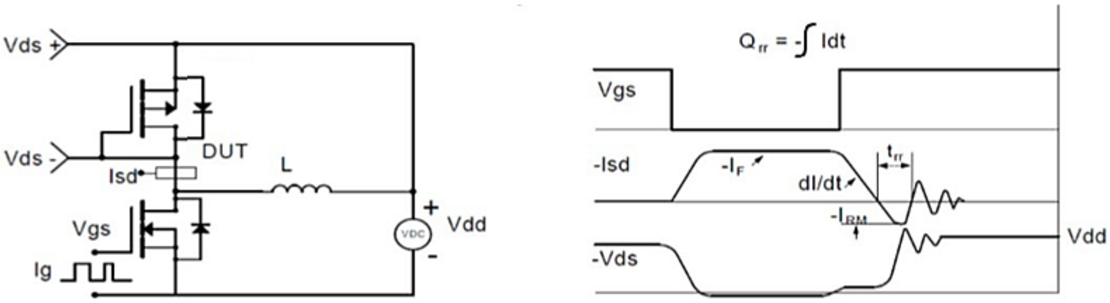
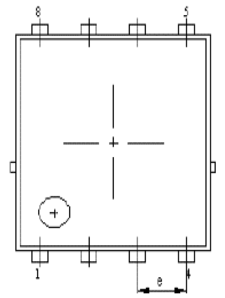
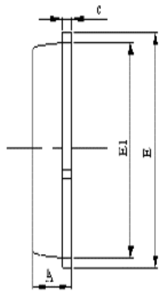


Figure 4: Diode Recovery Test Circuit & Waveform

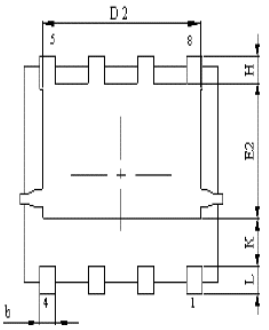
Package Mechanical Data(PDFN 5x6-8L)



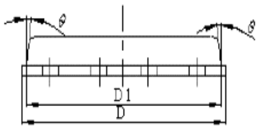
Top View



Side View

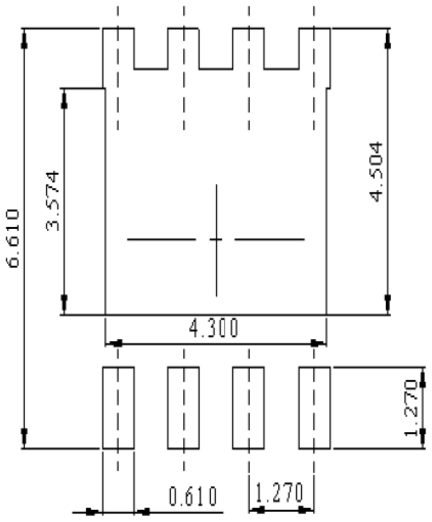


Bottom View



Front View

Symbol	Dimensions In Millimeters		
	Min.	NOM.	Max.
A	0.9	1	1.15
b	0.31	0.41	0.51
C	0.24	0.32	0.4
D	5	5.2	5.4
D1	4.95	5.05	5.15
D2	4	4.1	4.2
E	6.05	6.15	6.25
E1	5.5	5.6	5.7
E2	3.42	3.53	3.63
e		1.27 BSC	
H	0.6	0.7	0.8
L	0.5	0.7	0.8
K		1.23 BEF	
O			10



DIMENSIONS:MILLIMETERS

Ordering information

Order Code	Package	V_{DS}(V)	I_D(A)	$R_{DS(ON)}$(mΩ)	
QNN55P10AY	PDFN 5x6-8	-100	-18	V_{GS}=-10V	82
				V_{GS}=-4.5V	87