Product Specification

QNN100P03BJ

30V P-Channel MOSFET

FEATURES

- V_{DS} = -30V, I_D = -80A

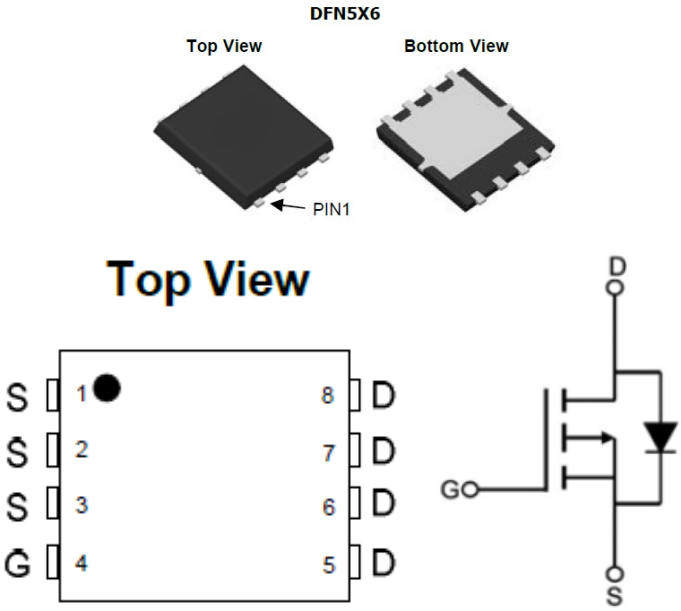
  $R_{DS(ON)}$ TYP. = 3.9mΩ @ V_{GS} = -10V

  $R_{DS(ON)}$ TYP.= 5.4mΩ @ V_{GS} = -4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Applications

- PWM Applications
- Load Switch
- 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_C = 25℃ unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-to-Source Voltage		-30	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	-80	A
		T_C=100℃	-57	
I_{DM}	Pulsed Drain Current (1)		320	A
E_{AS}	Single Pulsed Avalanche Energy (2)		363	mJ
P_D	Power Dissipation	T_C=25℃	52	W
		T_C=100℃	21	
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient(3)	43	℃/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.4	

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}=±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	-1.2	-1.7	-2.2	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS}=-10V, I_D=-20A	-	3.9	5.9	mΩ
		V_{GS}=-4.5V,I_D=-10A	-	5.4	8.0	mΩ
Dynamic Characteristics						
R_g	Gate Resistance	f=1MHz	-	3.9	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=-15V, f=1MHz	-	7747	-	pF
C_{oss}	Output Capacitance		-	871	-	pF
C_{rss}	Reverse Transfer Capacitance		-	559	-	pF
Q_g	Total Gate Charge	V_{GS}=0~-10V, V_{DS}=-15V, I_D=-20A	-	121	-	nC
Q_{gs}	Gate Source Charge		-	23	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	18	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS}=-10V,V_{DD}=-15V I_D=-20A,R_{GEN}=3Ω	-	28	-	ns
t_r	Turn-On Rise Time		-	83	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	77	-	ns
t_f	Turn-Off Fall Time		-	66	-	ns
Body Diode Characteristics						
I_S	Maximum Continuous Body Diode Forward Current		-	-	-80	A
I_{SM}	Maximum Pulsed Body Diode Forward Current		-	-	-320	A
V_{SD}	Body Diode Forward Voltage	V_{GS}=0V, I_S=-30A	-		1.2	V
t_{rr}	Body Diode Reverse Recovery Time	I_F=-20A, di/dt=100A/us	-	30	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	19.5	-	nC

Notes:

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

2. E_{AS} condition: Starting T_J=25℃, V_{DD}=-15V, V_G=-10V, R_G=25Ω, L=0.5mH, I_{AS}=-38.08A, V_{DD}=0V during time in avalanche.

3. $R_{\theta JA}$ is measured with the device mounted on a 1 inch^2 pad of 2oz copper FR4 PCB.

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

Test Circuit

Figure 1: Gate Charge Test Circuit & Waveform

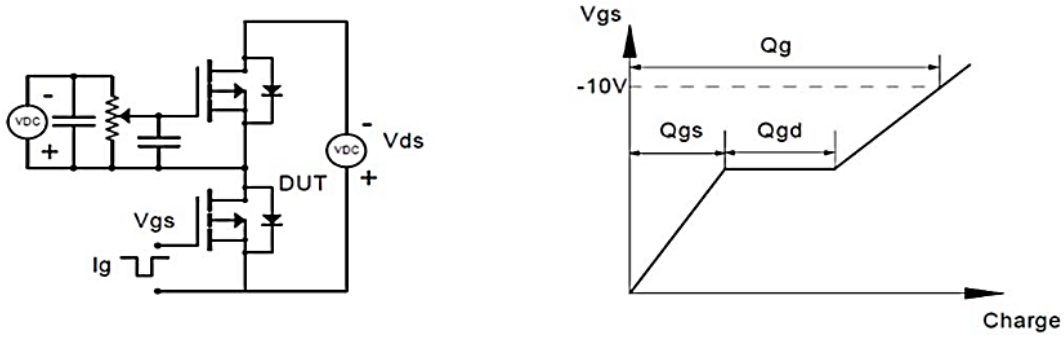


Figure 2: Resistive Switching Test Circuit & Waveform

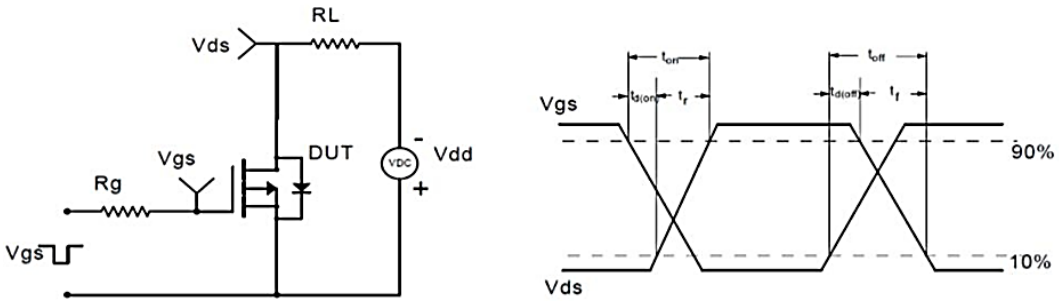


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

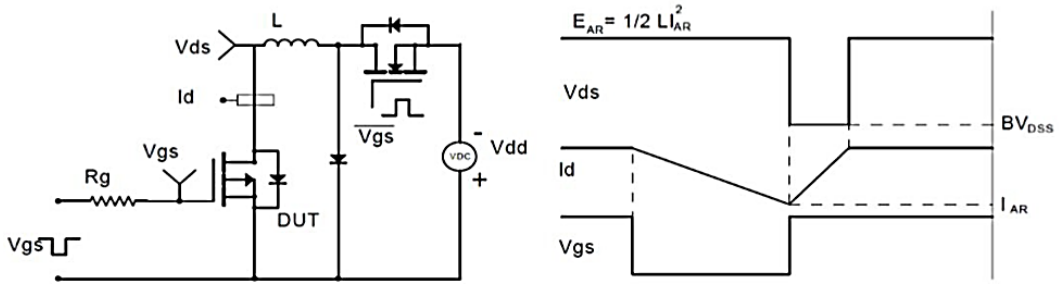
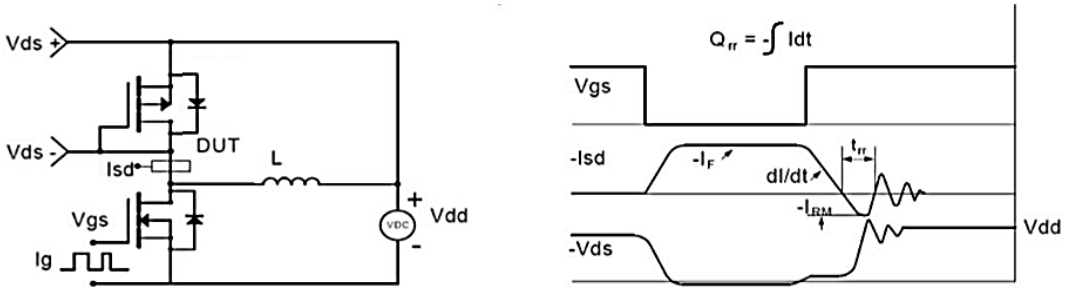
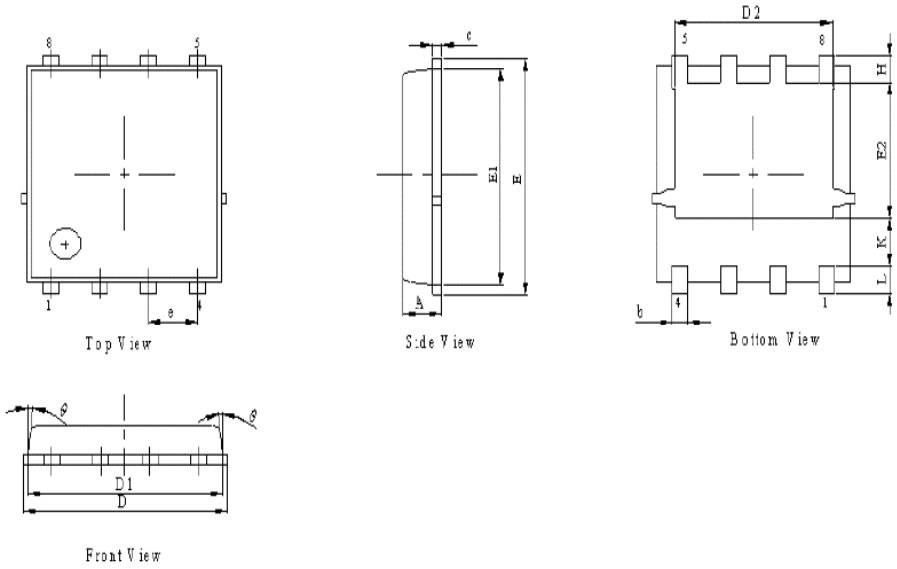


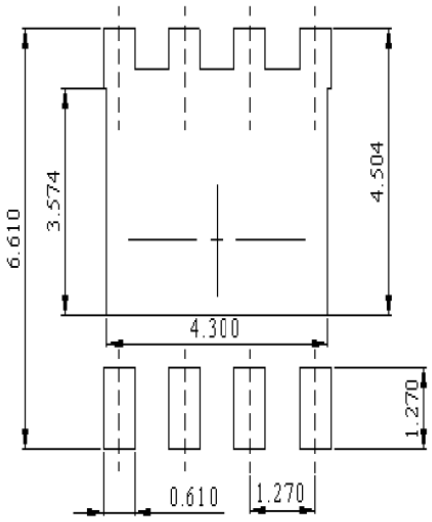
Figure 4: Diode Recovery Test Circuit & Waveform



Package Mechanical Data(PDFN 5x6-8L)



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)	$R_{DS(ON)}$(m Ω)	
QNN100P03BJ	PDFN 5x6-8L	-30	-80	V_{GS}=-10V	3.9
				V_{GS}=-4.5V	5.4