Product Specification

QNN80N10

100V N-Channel MOSFET

FEATURES

- 100V,93A

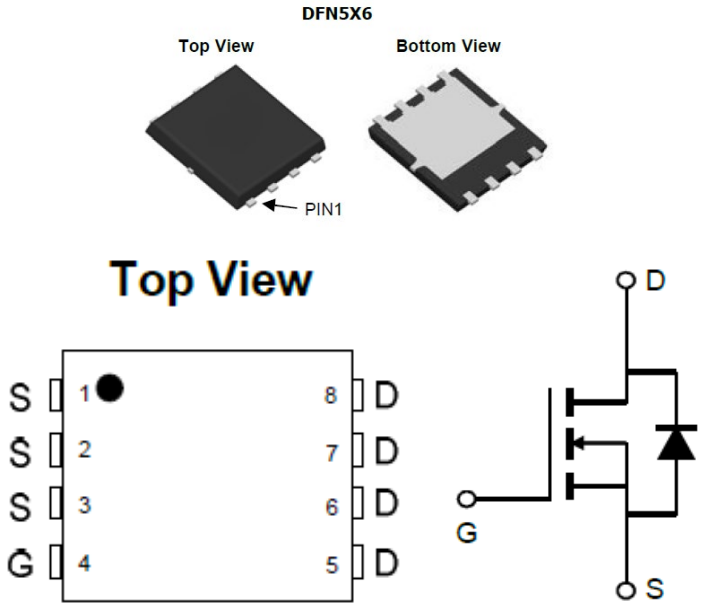
  $R_{DS(ON)}$ (@ V_{GS} = 10V)TYP= 5.6 mΩ

  $R_{DS(ON)}$ (@ V_{GS} = 4.5V) TYP= 7.3 mΩ
- Ultra-low $R_{DS(ON)}$
- Low Gate Charge
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

Applications

- Power Managerment in Telecom., Industrial Automation, CE
- Current Switching in DC/DC & AC/DC Sub-systems
- Motor Driving in Power Tool, E-vehicle, Robotics

Pin Description



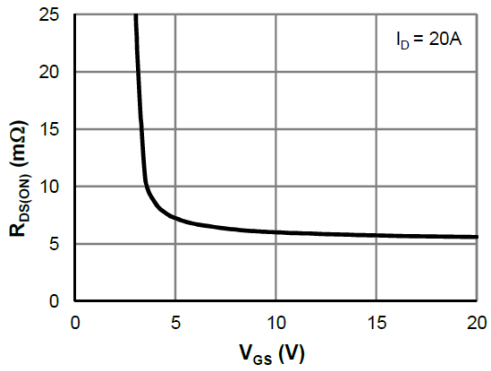
NO.	Symbol	Description
1	S	SOURCE
2	S	SOURCE
3	S	SOURCE
4	G	GATE
5	D	DRAIN
6	D	DRAIN
7	D	DRAIN
8	D	DRAIN

Absolute Maximum Ratings

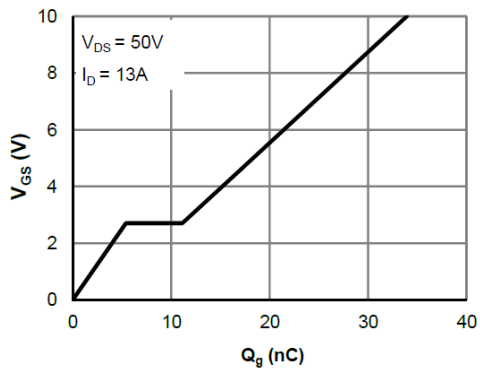
(@ T_C = 25℃ unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-to-Source Voltage		100	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current (1)	T_C = 25℃	93	A
		T_C = 100℃	54	
I_{DM}	Pulsed Drain Current (2)		210	A
I_{AS}	Avalanche Current (3)		45	A
E_{AS}	Avalanche Energy (3)		101	mJ
P_D	Power Dissipation (4)	T_C = 25℃	104	W
		T_C = 100℃	42	
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	℃

$R_{DS(ON)}$ vs. V_{GS}



Gate Charge



Electrical Characteristics

(T_J = 25℃ unless otherwise specified)

Symbol	Parameter	Conditions		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D=250uA,V_{GS}=0V		100			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V,V_{GS}=0V				1.0	□ uA
			T_J=55℃			5.0	
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V, V_{GS}=±20V				±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA		1.2	1.7	2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance	V_{GS}=10V, I_D=20A			5.6	7.4	mΩ
		V_{GS}=4.5V, I_D=15A			7.3	10.0	mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=20A			82		S
V_{SD}	Diode Forward Voltage	I_S=1A, V_{GS}=0V			0.72	1.0	V
I_S	Diode Continuous Current	T_C=25℃				104	A
DYNAMIC PARAMETERS (5)							
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=50V, f=1MHz			2200		pF
C_{oss}	Output Capacitance				791		pF
C_{rss}	Reverse Transfer Capacitance				143		pF
R_g	Gate Resistance	V_{GS}=0V, V_{DS}= 0V, f=1MHz			1.8		□
SWITCHING PARAMETERS (5)							
Q_g	Total Gate Charge (@V_{GS}=10V)	V_{GS}=0~10V V_{DS}=50V, I_D=13A			34		nC
Q_g	Total Gate Charge (@V_{GS}=4.5V)				17.0		nC
Q_{gs}	Gate Source Charge				5.5		nC
Q_{gd}	Gate Drain Charge				5.7		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=50V, R_L=3.8Ω , R_{GEN}=6Ω			13.0		ns
t_r	Turn-On Rise Time				14.0		ns
$t_{D(off)}$	Turn-Off DelayTime				29		ns
t_f	Turn-Off Fall Time				17.0		ns
trr	Body Diode Reverse Recovery Time	I_F=13A, dI_F/dt=100A/us			51		ns
Qrr	Body Diode Reverse Recovery Charge	I_F=13A, dI_F/dt=100A/us			90		nC

Thermal Performance				
Symbol	**Parameter**	**Typ.**	**Max.**	**Unit**
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	65	℃/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.0	1.2	℃/W

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T_{J_Max}=150℃.
3. This single-pulse measurement was taken under the following condition [L=100uH, V_{GS}=10V, V_{DS}=50V] while its value is limited by T_{J_Max}=150℃
4. The power dissipation PD is based on T_{J_Max}=150℃.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

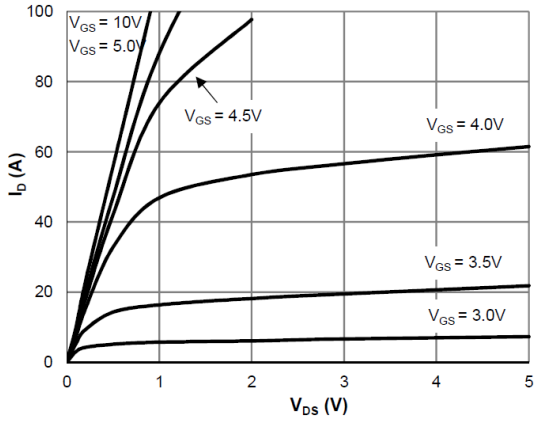


Figure 1: Saturation Characteristics

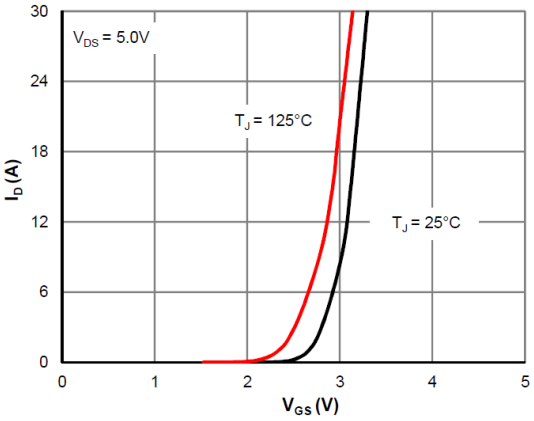


Figure 2: Transfer Characteristics

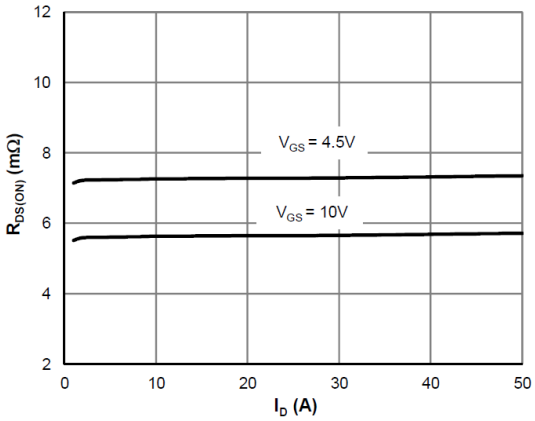


Figure 3: $R_{DS(ON)}$ vs. Drain Current

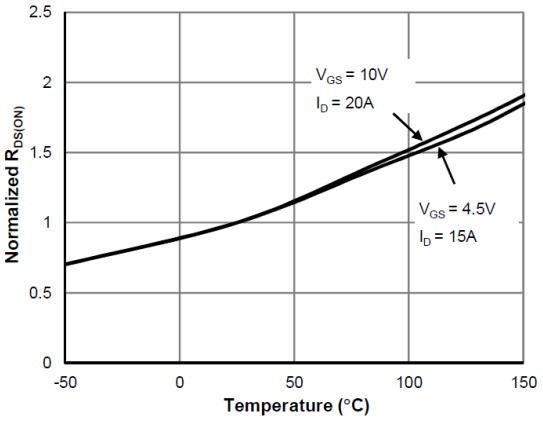


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

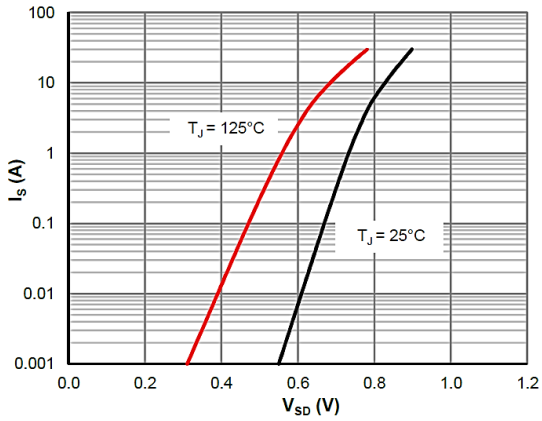


Figure 5: Body-Diode Characteristics

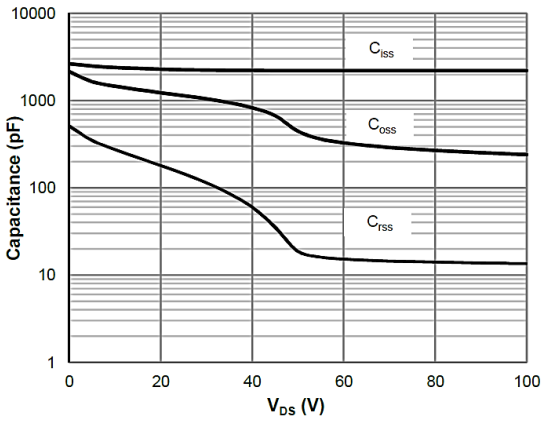


Figure 6: Capacitance Characteristics

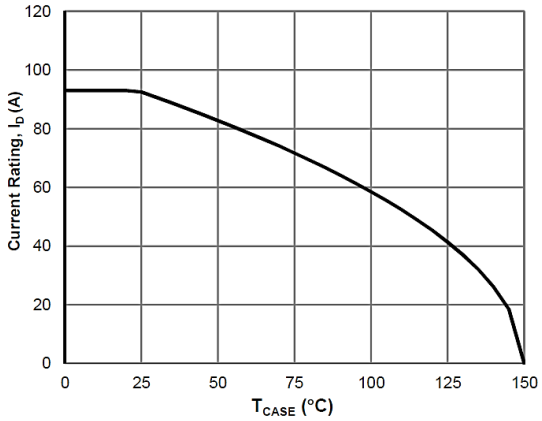


Figure 7: Current De-rating

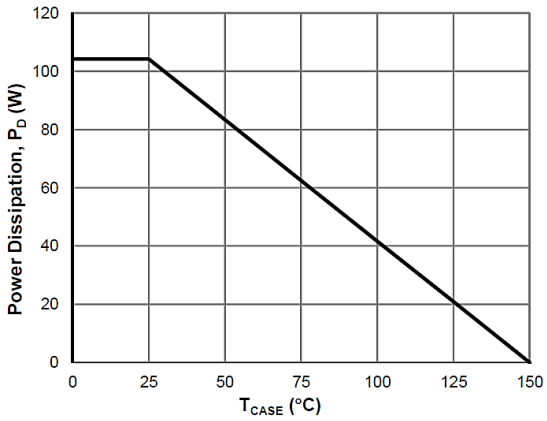


Figure 8: Power De-rating

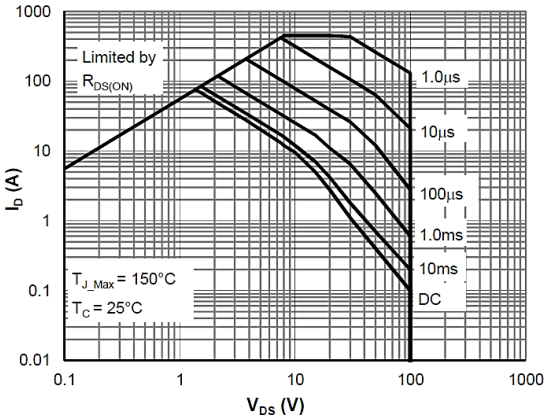


Figure 9: Maximum Safe Operating

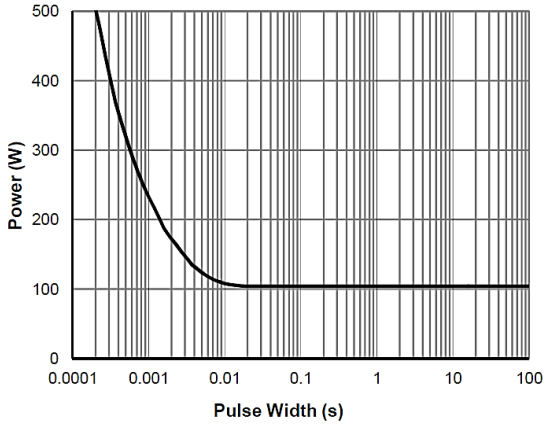


Figure 10: Single Pulse Power Rating, Junction-to-Case

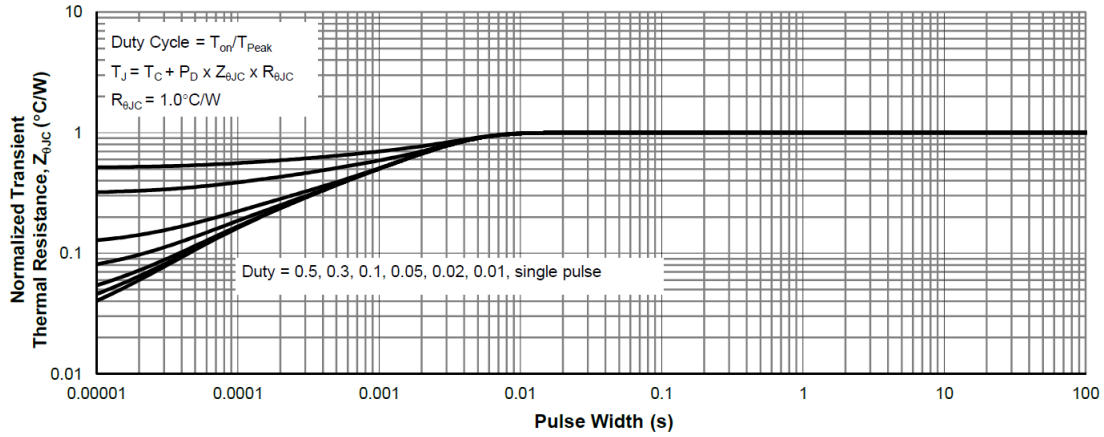
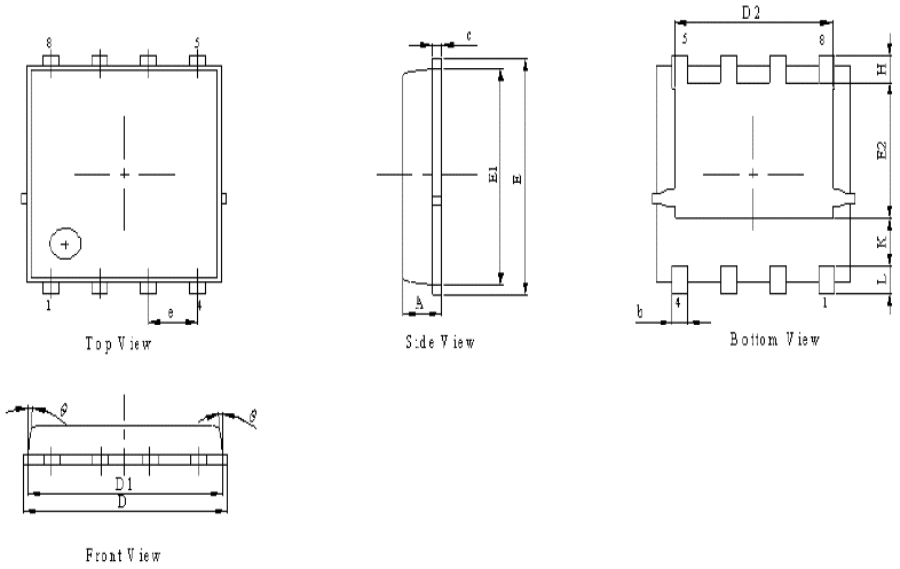
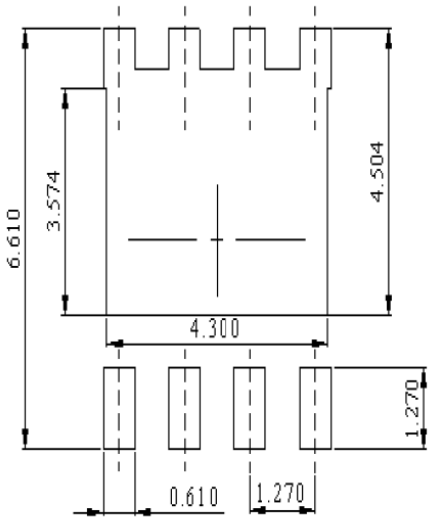


Figure 11: Normalized Maximum Transient Thermal Impedance

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)	
QNN80N10	PDFN 5x6-8	100	93	V_{GS}=10V	5.6
				V_{GS}=4.5V	7.3