100V N+N-Channel Enhancement Mode MOSFET

Description

The XPX40NN10RD uses advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

Marking and pin assignment

DFN5X6双基

General Features

V_{DS} = 100V I_D =40A

$R_{DS(ON)}$ < 14mΩ @ V_{GS}=10V

Application

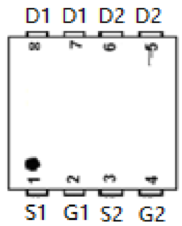
Consumer electronic power supply

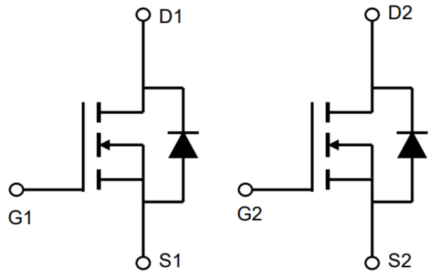
Motor control

Synchronous-rectification

Isolated DC

Schematic Diagram





Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
XPX40NN10RD	PDFN5*6-8L	XPX40NN10RD XXX YYYY	5000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain source voltage	100	V
VGS	Gate source voltage	±20	V
ID	Continuous drain current1), T_C=25 ℃	40	A
ID, pulse	Pulsed drain current2), T_C=25 ℃	120	A
P_D	Power dissipation3), T_C=25 ℃	71	W
EAS	Single pulsed avalanche energy5)	57	mJ
Tstg，Tj	Operation and storage temperature	-55 to 150	℃
RθJC	Thermal resistance, junction-case	1.76	℃/W
RθJA	Thermal resistance, junction-ambient4)	25	°C/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BVDSS	Drain-source breakdown voltage	V_{GS}=0 V, I_D=250 μA	100	107		V
VGS(th)	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250 μA	1.2	1.5	2.5	V
RDS(ON)	Drain-source on-state resistance	V_{GS}=10 V, I_D=10 A		14	20	mΩ
RDS(ON)	Drain-source on-state resistance	V_{GS}=4.5 V, I_D=7 A		18	25	mΩ
IGSS	Gate-source leakage current	V_{GS}=±20 V			±100	nA
IDSS	Drain-source leakage current	V_{DS}=100 V, V_{GS}=0 V			1	uA
Ciss	Input capacitance	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz		1013.9		pF
Coss	Output capacitance			185.4		pF
Crss	Reverse transfer capacitance			9.8		pF
td(on)	Turn-on delay time	V_{GS}=10 V, V_{DS}=50 V, R_G=10 Ω, I_D=5 A		16.6		ns
t_r	Rise time			3.8		ns
td(off)	Turn-off delay time			75.5		ns
t_f	Fall time			46		ns
Q_g	Total gate charge	I_D=5 A, V_{DS}=50V, V_{GS}=10V		16.2		nc
Q_{gs}	Gate-source charge			2.8		nc
Qgd	Gate-drain charge			4.1		nc
Vplateau	Gate plateau voltage			3		V
I_S	Diode forward current	VGS<Vth		30		A
ISP	Pulsed source current			90		A
trr	Reverse recovery time	I_S=1A, di/dt=100 A/μs	49			ns
Q_{rr}	Reverse recovery charge		61.8			nc
Irrm	Peak reverse recovery current		2.4			A

Note :

1、Calculated continuous current based on maximum allowable junction temperature.

2、Repetitive rating; pulse width limited by max. junction temperature.

3、Pd is based on max. junction temperature, using junction-case thermal resistance.

4、The value of $R_{\Theta ja}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.

5、V_{DD}=50 V, R_G=25 Ω, L=0.3 ㎜H, starting T_j=25 °C.

Typical Characteristics

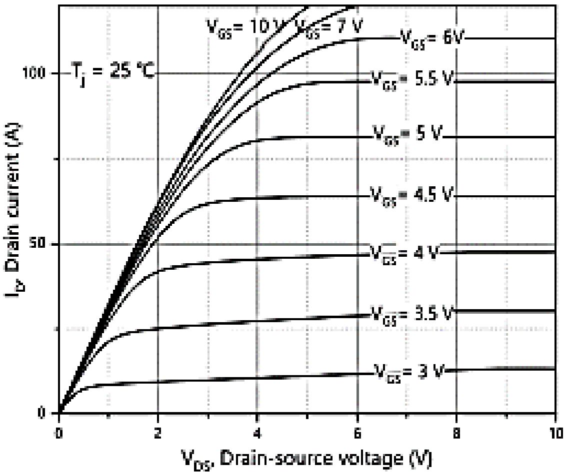


Figure 1, Typ. output characteristics

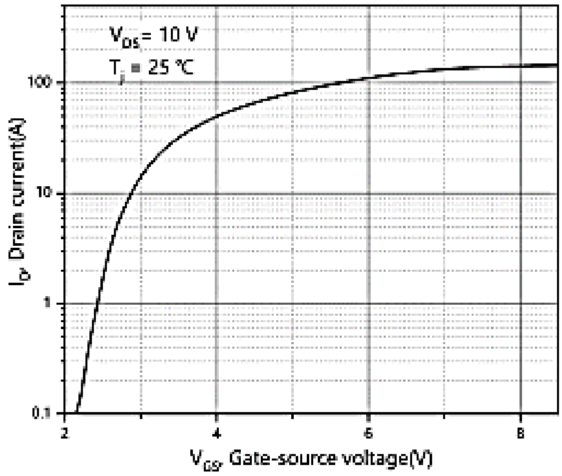


Figure 2, Typ. transfer characteristics

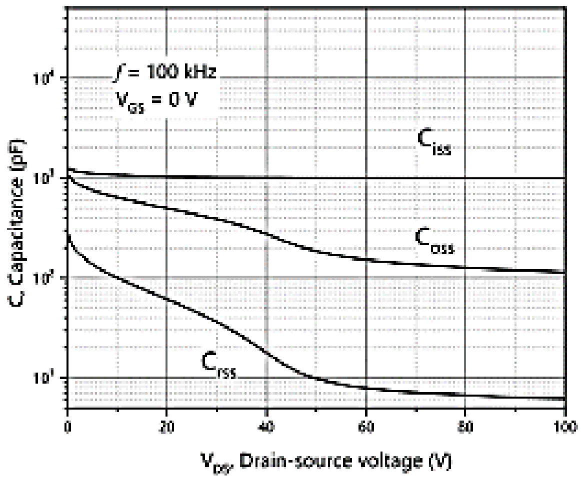


Figure 3, Typ. capacitances

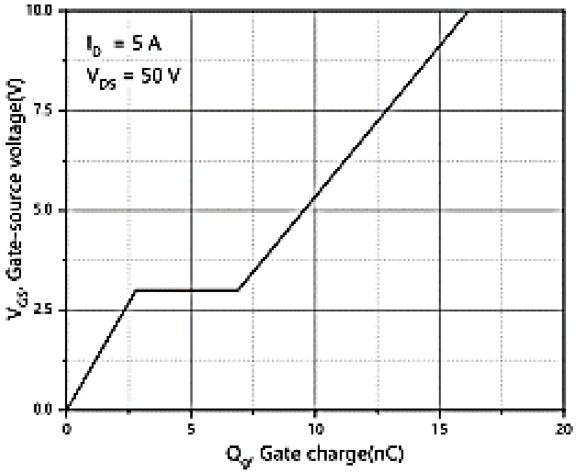


Figure 4, Typ. gate charge

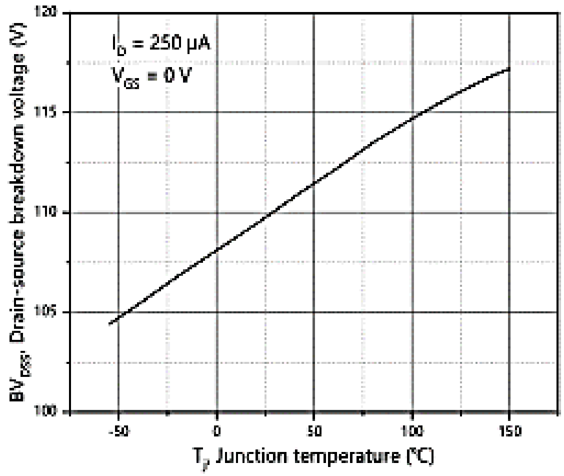


Figure 5, Drain-source breakdown voltage

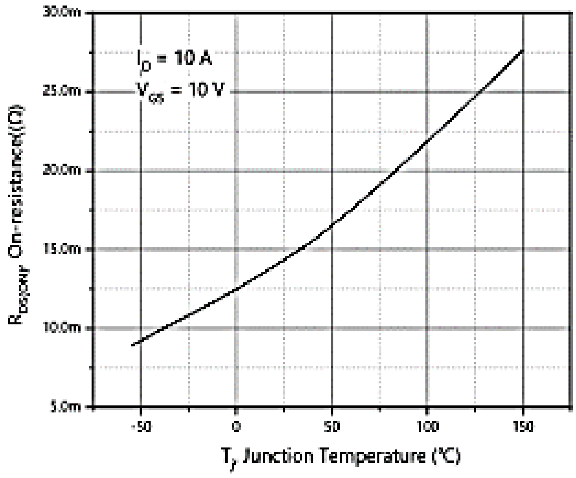


Figure 6, Drain-source on-state resistance

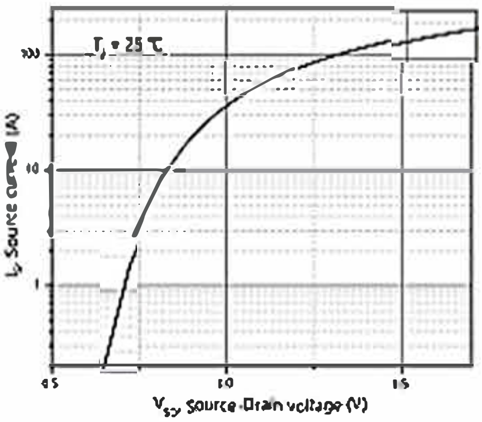


Figure 7. Forward characteristic of body diode

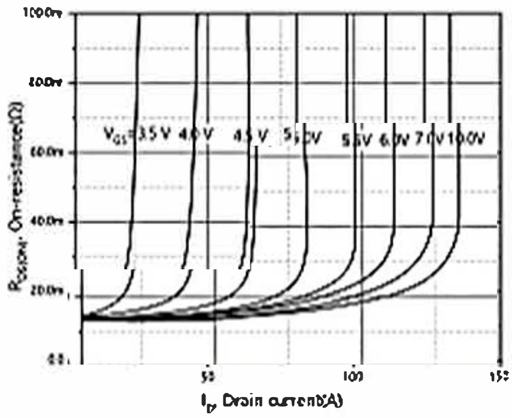


Figure 8. Drain-source on-state resistance

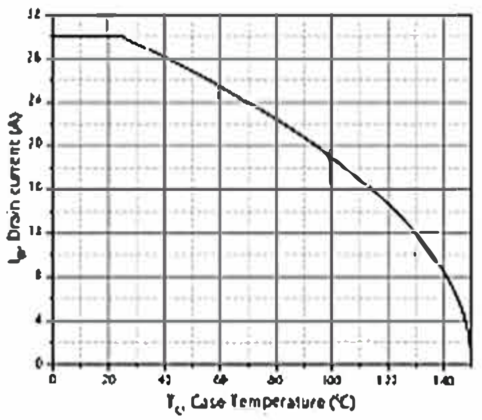


Figure 9. Drain current

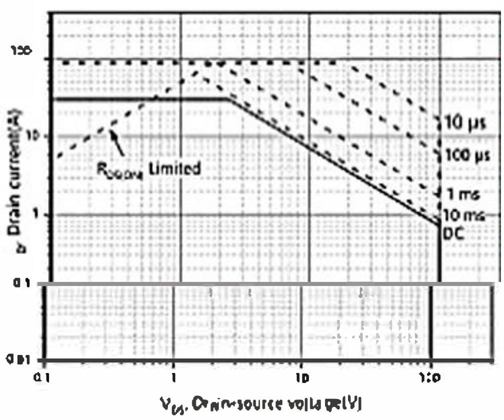
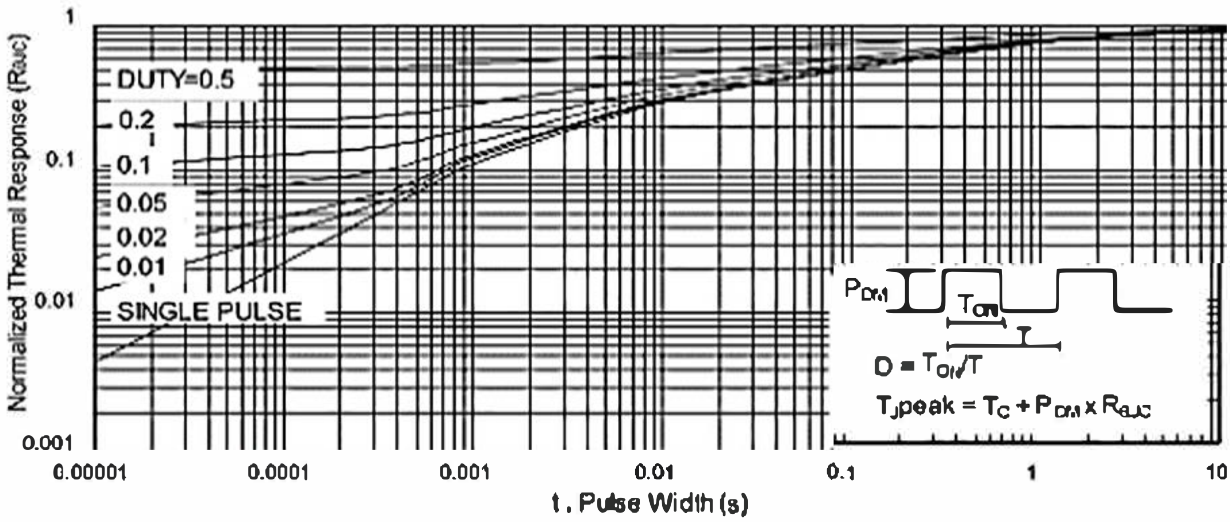
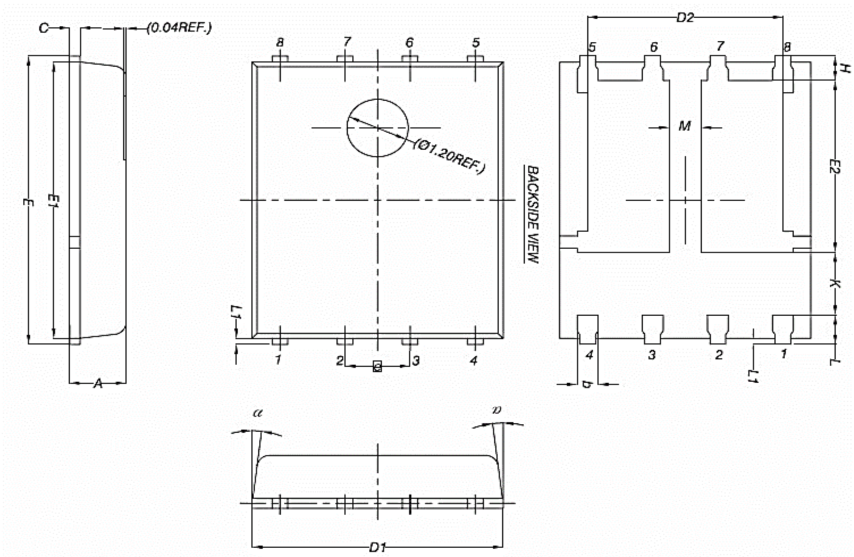


Figure 10. Safe operation area Tc=25 ℃



Figu11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-DFN5*6-8L-JQ Double



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	3.30	3.45
E2	3.38	3.05	3.20
e		1.27BSC	
H	0.41	0.51	0.61
K	1.10	--	--
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	--	--
a	0°	--	12°

Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb device	245℃±5℃	5sec±1sec
Pb-Free device	260℃+0/-5℃	5sec±1sec

This integrated circuit can be damaged by ESD UniverChip Corporation recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedure can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

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