-20V P-Channe Enhancement Mode MOSFET

Description

The XPX20L85RX uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

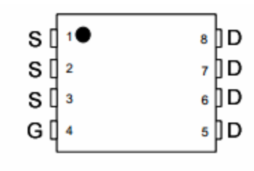
V_{DS} =-20V, I_D =-85A

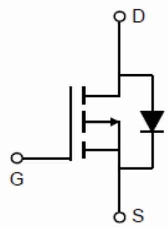
$R_{DS(ON)}$=4.5mΩ (typ) @ V_{GS}=-4.5V

$R_{DS(ON)}$=6.0mΩ (typ) @ V_{GS}=-2.5V

General Features

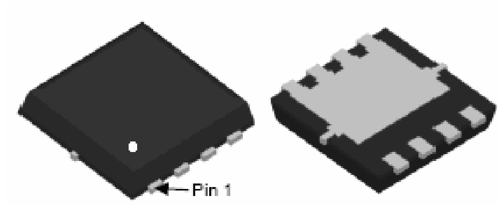
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation





Application

- Load switch
- Battery protection



DFN 3.3x3.3-8L

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
XPX20L85RX	XPX20L85RX	DFN 3.3x3.3-8L	-	-	5000

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	-85	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	-65	A
Pulsed Drain Current	I_{DM}	-230	A
Maximum Power Dissipation	P_D	85	W
Single pulse avalanche energy (Note 5)	E_{AS}	180	mJ
Derating factor		0.66	W/℃
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃
Thermal Resistance,Junction-to-Case(Note 2)	$R_{\theta JC}$	1.9	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-20	-22	---	V
△BVDSS/△TJ	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.012	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=-4.5V , I_D=-20A	---	4.5	6.0	mΩ
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=-2.5V , I_D=-10A	---	6.0	7.8	
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-0.45	0.65	-1.0	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2.94	---	mV/℃
IDSS	Drain-Source Leakage Current	V_{DS}=-20V , V_{GS}=0V , T_J=25℃	---	---	1	uA
IGSS	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-5V , I_D=-10A	20	---	---	S
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-10V , V_{GS}=-4.5V , I_D=-10A	---	55	---	nC
Qgs	Gate-Source Charge		---	10	---	
Qgd	Gate-Drain Charge		---	15	---	
Td(on)	Turn-On Delay Time	V_{DD}=-10V , V_{GS}=-4.5V , R_G=6Ω, I_D=-1A	---	15.8	---	ns
T_r	Rise Time		---	76.8	---	
Td(off)	Turn-Off Delay Time		---	193	---	
T_f	Fall Time		---	186.4	---	
Ciss	Input Capacitance	V_{DS}=-10V , V_{GS}=0V , f=1MHz	---	3000	---	pF
Coss	Output Capacitance		---	650	---	
Crss	Reverse Transfer Capacitance		---	500	---	
IS	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	-35	A
ISM	Pulsed Source Current[2,4]		---	---	-70	A
VSD	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1.2	V

Note :

1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、The power dissipation is limited by 150℃ junction temperature

4、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.

Typical Characteristics

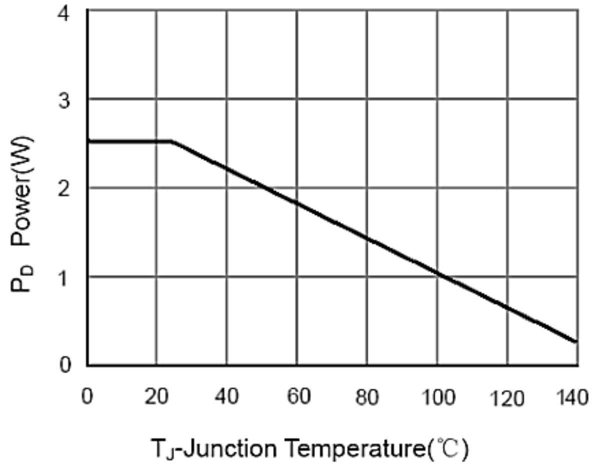


Figure 1：Power Dissipation

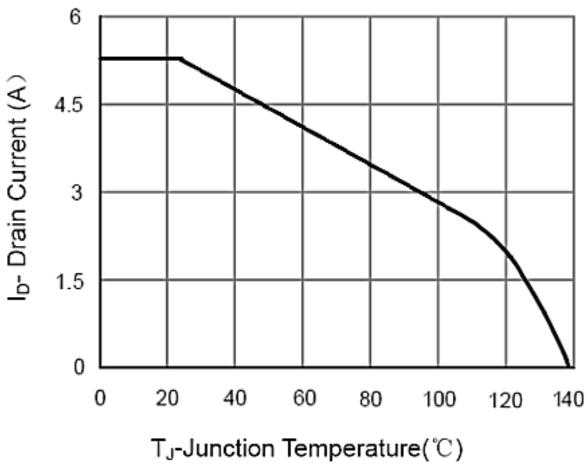


Figure 2：Drain Current

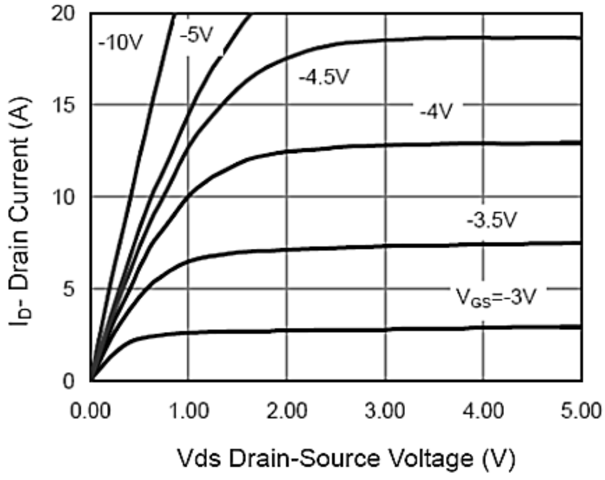


Figure 3：Output Characteristics

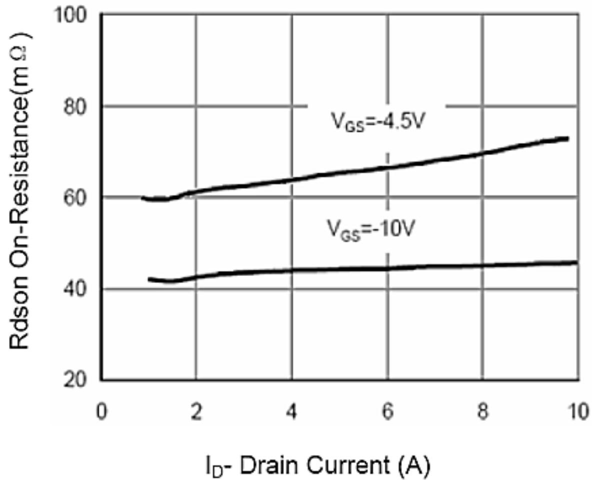


Figure 4：Drain-Source On-Resistance

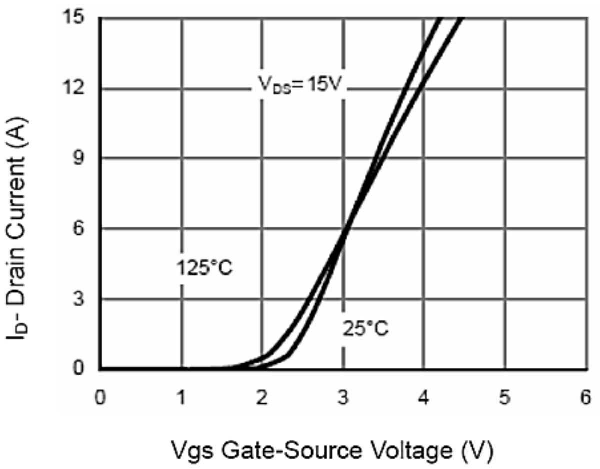


Figure 5：Transfer Characteristics

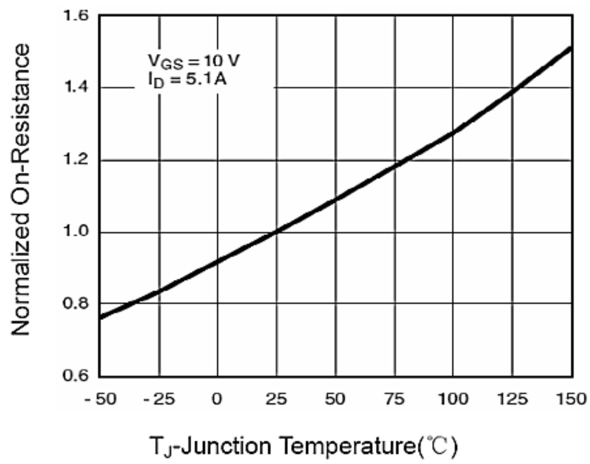


Figure 6：Drain-Source On-Resistance

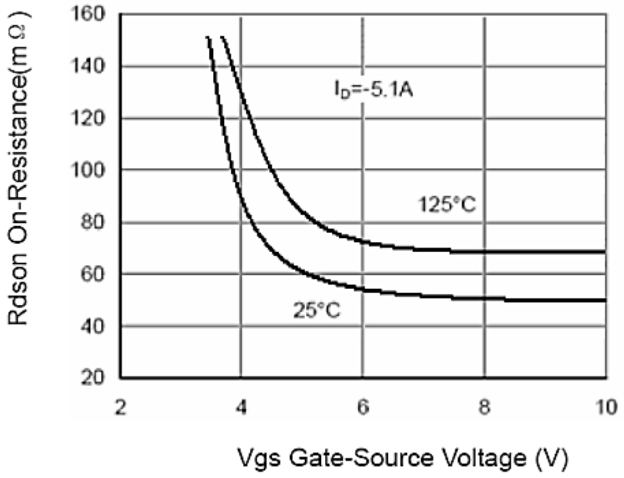


Figure 7: Rdson vs Vgs

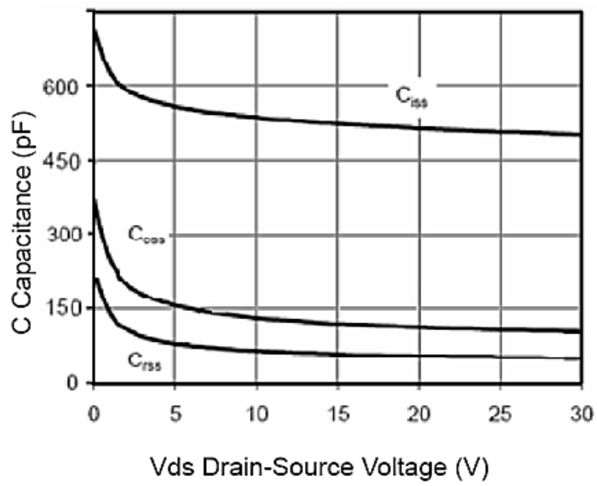


Figure 8: Capacitance vs Vds

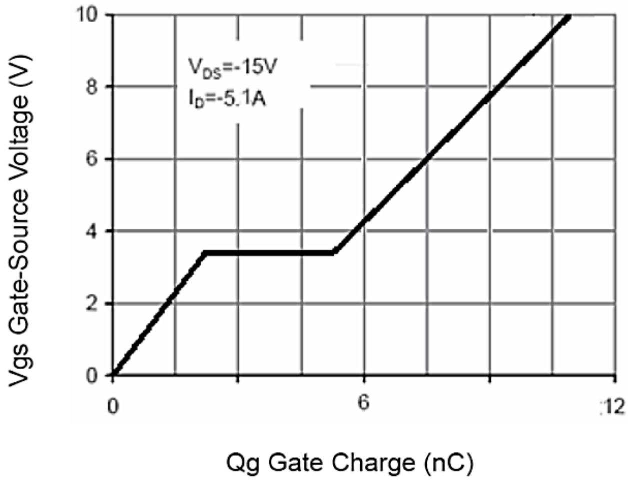


Figure 9: Gate Charge

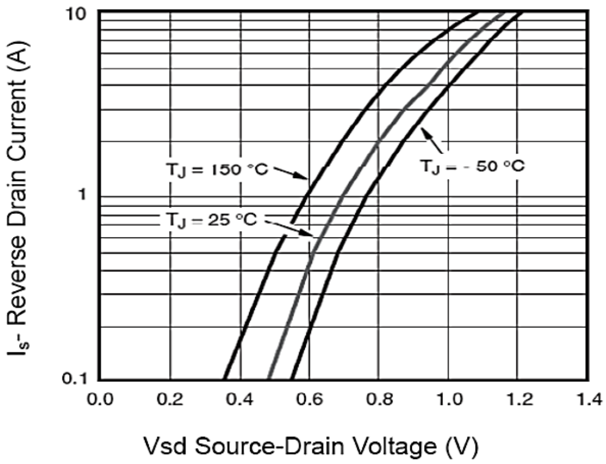


Figure 10: Sourece-Drain Diode Forward

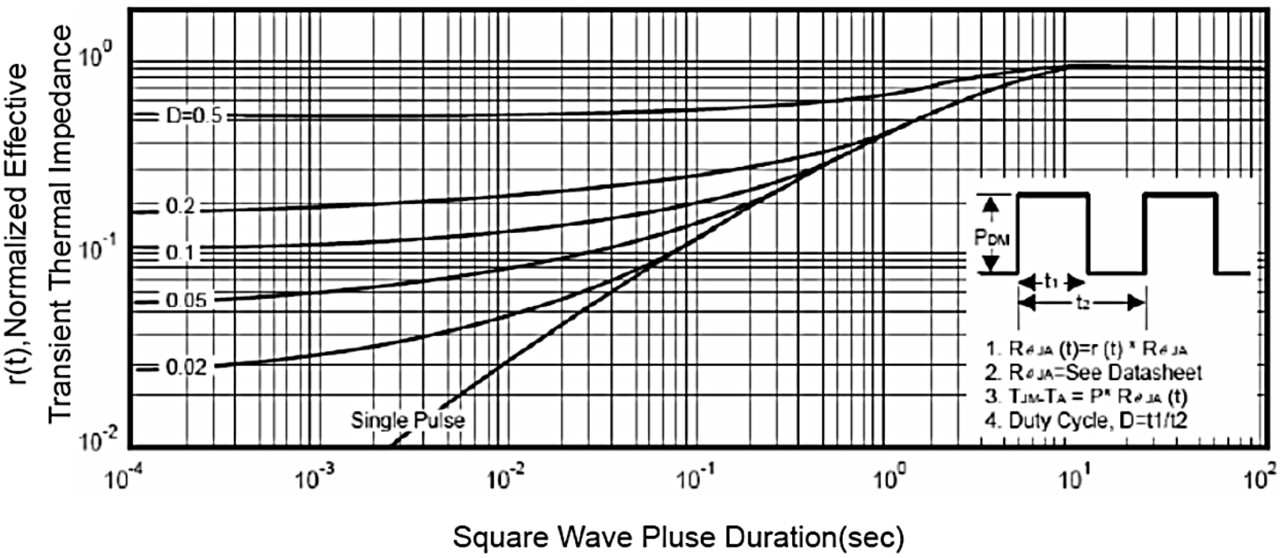
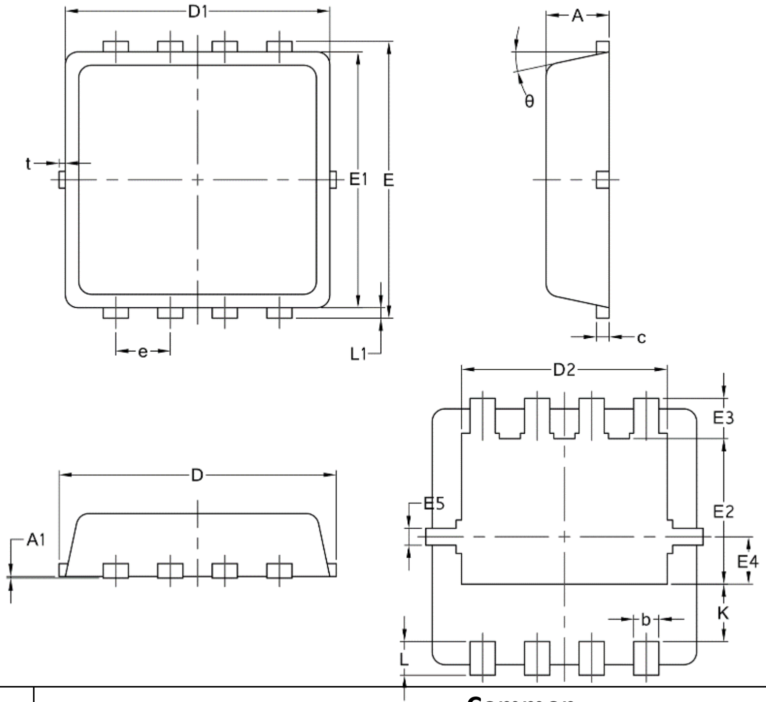


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Mechanical Data-DFN3*3-8L-JQ Single



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14

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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