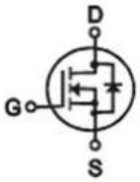
RoHS COMPLIANT

● General Description

The XR1110 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSO and gate charge for most of the Synchronou Rectification for AC/DC Quick Charger.



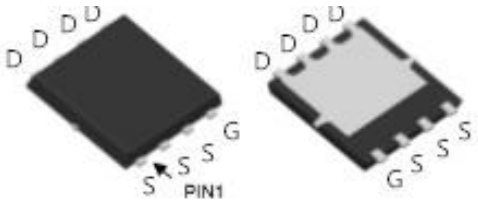
V_{DS} =110V

$R_{DS(ON)}$ =5mΩ

I D =100A

● Features

- ■ Advance high cell density Trench technology
- ■Low $R_{DS(ON)}$ to minimize conductive loss
- ■Low Gate Charge for fast switching
- ■Low Thermal resistance



DFN5 x 6

Absolute Maximum Ratings at T_J=25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	I_D	T_C=25℃	100	A
		T_C=100℃	80	
Continuous Drain Current (Package Limited)		T_C=25℃	75	
Drain to Source Voltage	V_{DS}	-	110	V
Gate to Source Voltage	V_{GS}	-	±20	V
Pulsed Drain Current	I_{DM}	-	300	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.3mH, T_C=25℃	120	mJ
Power Dissipation	P_D	T_C=25℃	125	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1](t≦10s)	---	25	℃/W
	Thermal Resistance Junction-Ambient [1]	---	55	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	1.15	℃/W

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
XR1110		PDFN5060	Tape&Reel	5000	13"	12mm

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	105	110	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=13.5A	---	5	6.5	mΩ
	Static Drain-Source On-Resistance[2]	V_{GS}=4.5V , I_D=11.5A	---	6.3	8.2	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	1.6	2.3	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A	---	85	---	S
Qg	Total Gate Charge (10V)	V_{DS}=50V , V_{GS}=10V , I_D=13.5A	---	45	---	nC
Qg	Total Gate Charge (4.5V)		---	19.3	---	
Qgs	Gate-Source Charge		---	9.5	---	
Qgd	Gate-Drain Charge		---	4.8	---	
Td(on)	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , R_G=3Ω, I_D=13.5A	---	10	---	ns
Tr	Rise Time		---	6.5	---	
Td(off)	Turn-Off Delay Time		---	45	---	
Tf	Fall Time		---	7.5	---	
Ciss	Input Capacitance	V_{DS}=50V , V_{GS}=0V , f=1MHz	---	3150	---	pF
Coss	Output Capacitance		---	608	---	
Crss	Reverse Transfer Capacitance		---	22	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5,6]	V_G=V_D=0V , Force Current	---	---	48	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.1	V
t_{rr}	Reverse Recovery Time	I_F=13.5A , di/dt=100A/μs , T_J=25℃	---	33	---	nS
Q_{rr}	Reverse Recovery Charge		---	150	---	nC

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 EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.3mH,I_{AS}=35A
4.The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
6.The maximum current rating is package limited.

Typical Characteristics

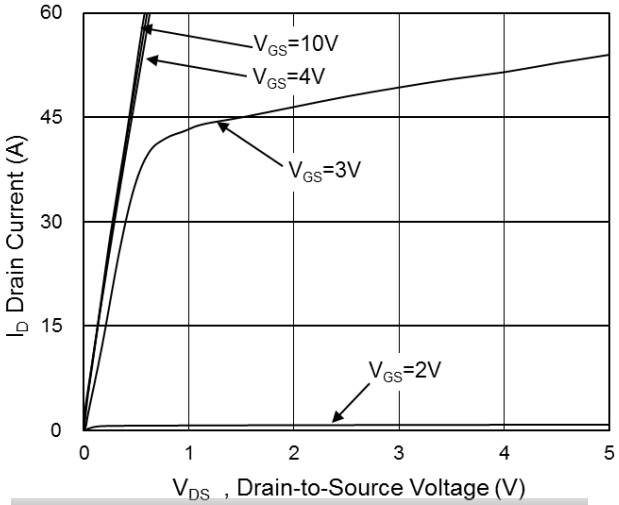


Fig.1 Typical Output Characteristics

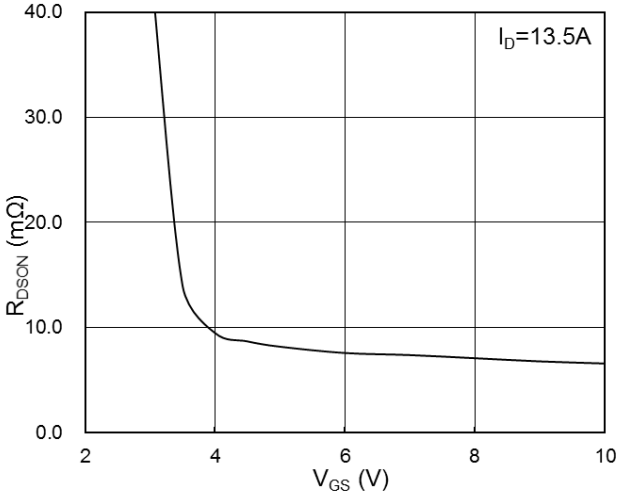


Fig.2 On-Resistance vs. G-S Voltage

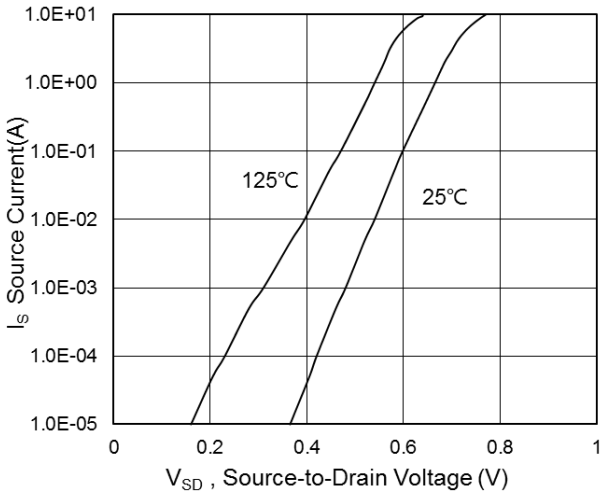


Fig.3 Source-Drain Forward Characteristics

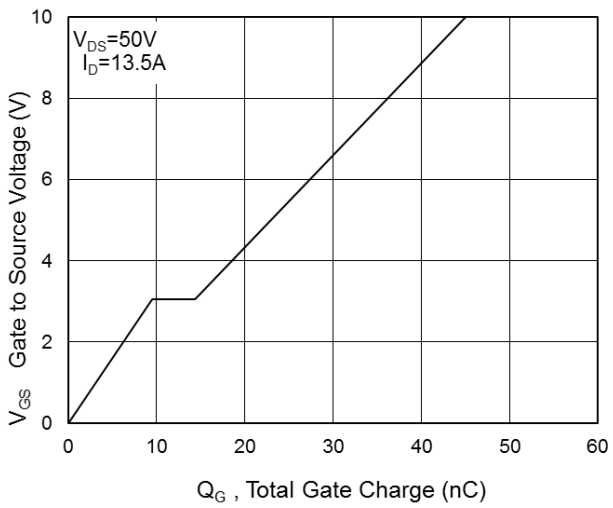


Fig.4 Gate-Charge Characteristics

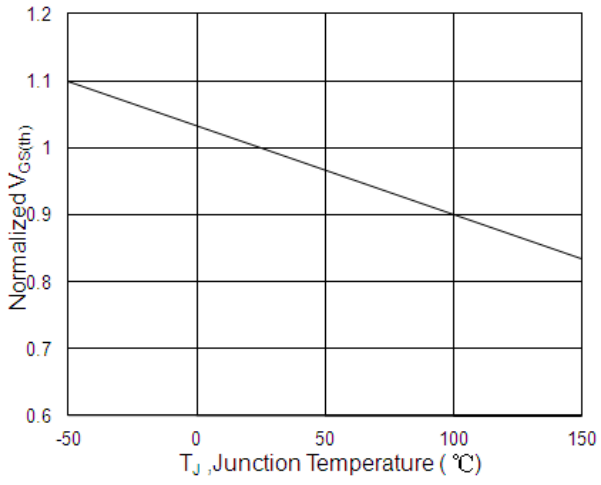


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

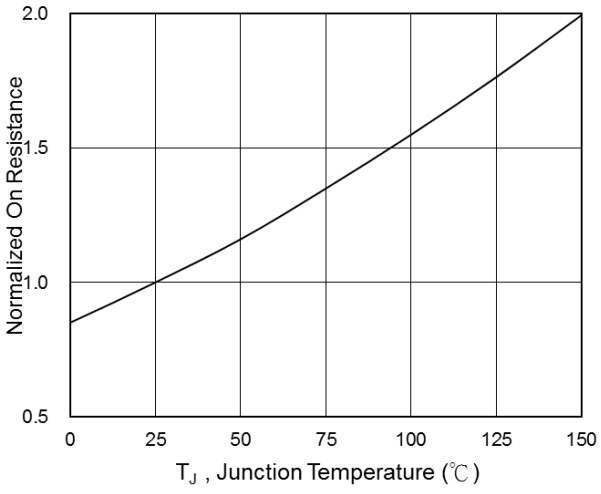


Fig.6 Normalized R_{DSON} vs. T_J

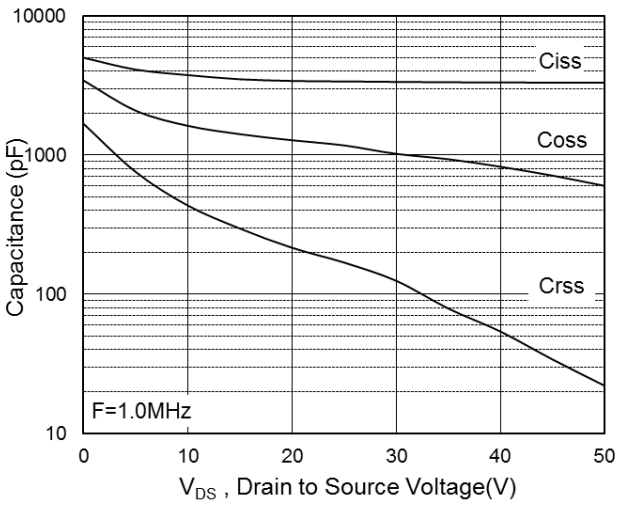


Fig.7 Capacitance

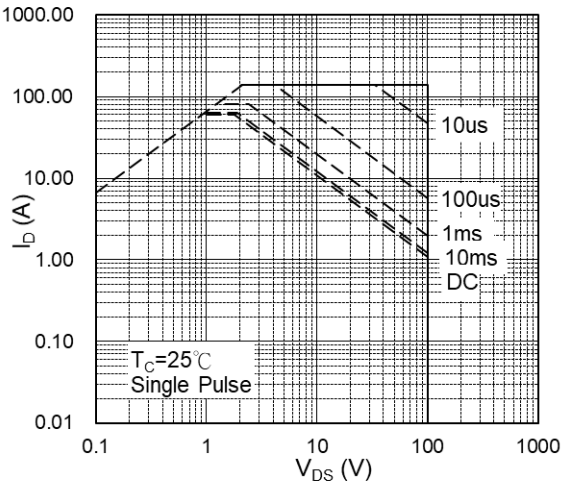


Fig.8 Safe Operating Area

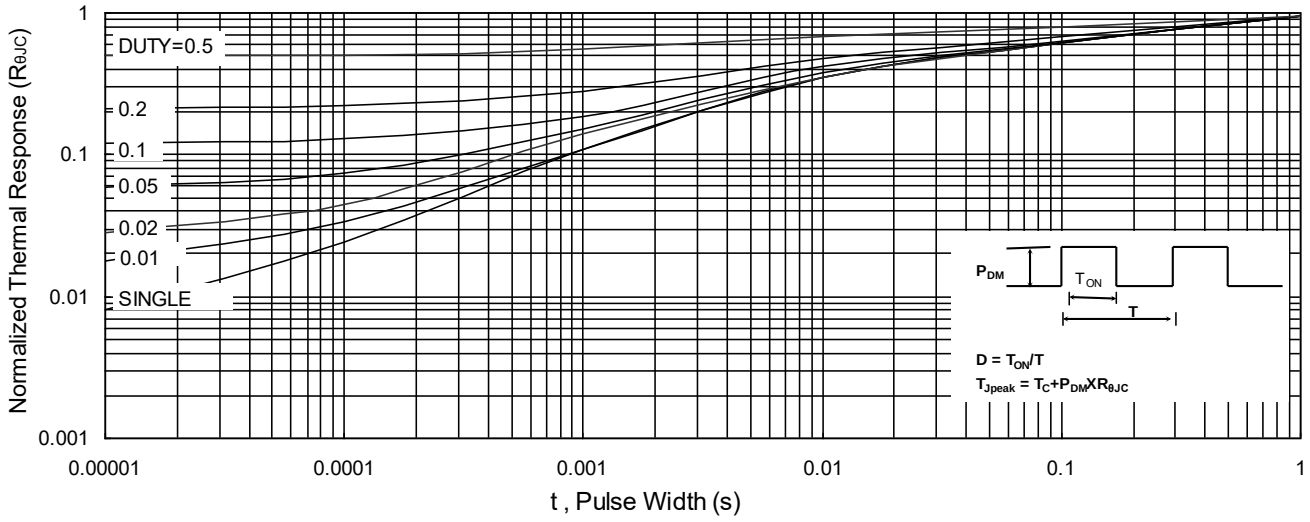


Fig.9 Normalized Maximum Transient Thermal Impedance

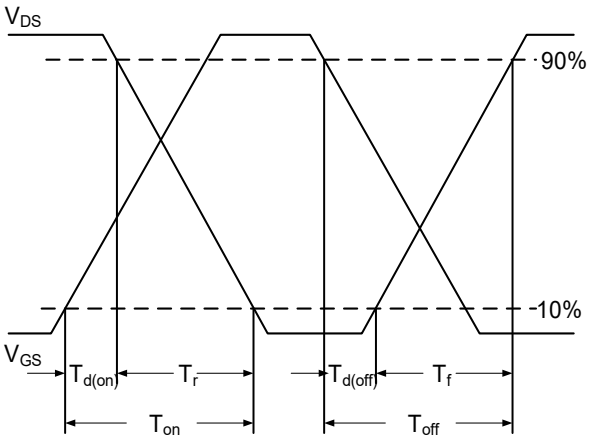


Fig.10 Switching Time Waveform

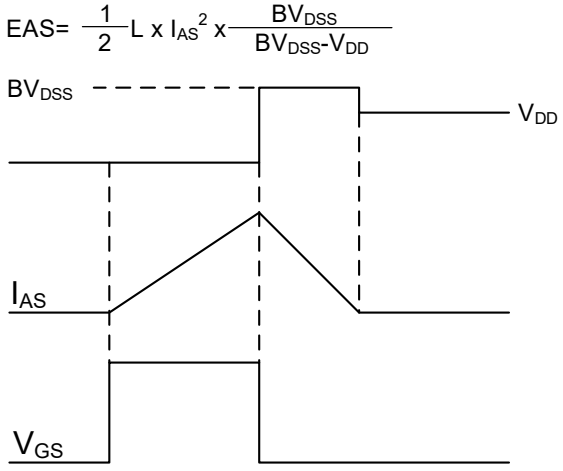
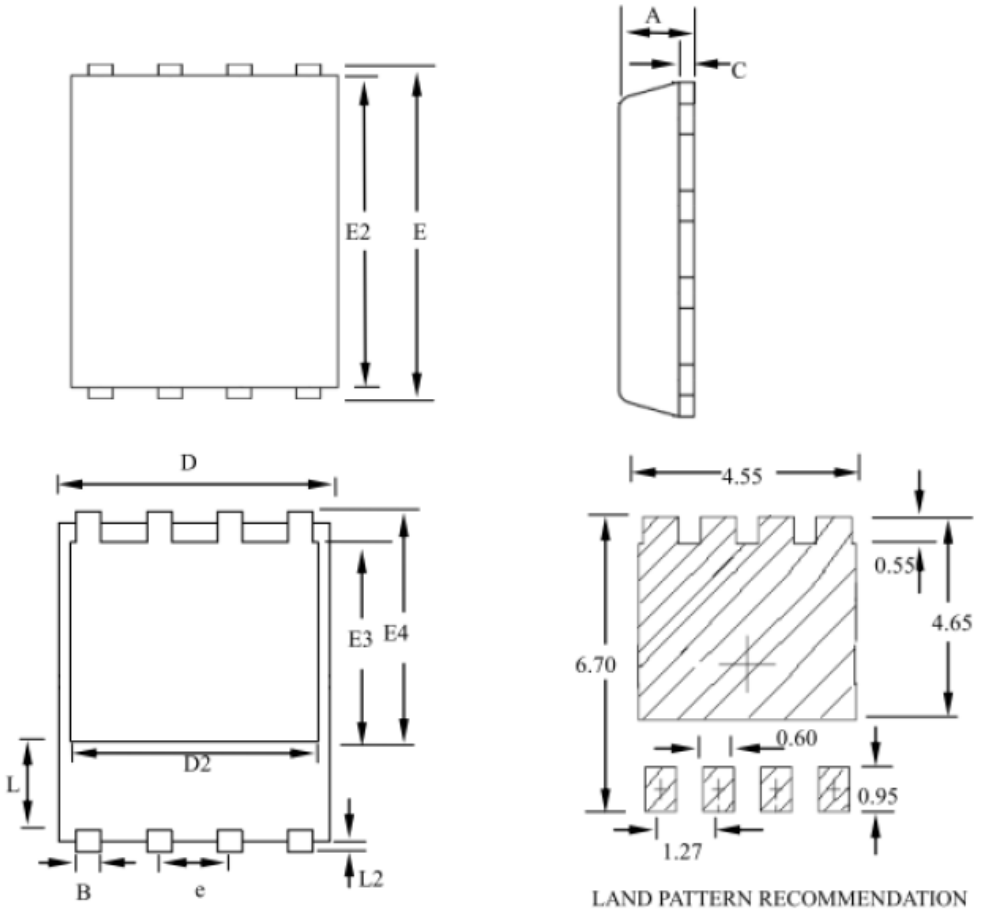


Fig.11 Unclamped Inductive Switching Waveform

PRPAK5X6 Package Outline Dimensions



LAND PATTERN RECOMMENDATION

SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.30	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.30	0.189	--	0.209
D2	3.61	--	4.35	0.142	--	0.171
E	5.90	--	6.35	0.232	--	0.250
E2	5.42	--	5.90	0.213	--	0.232
E3	3.23	--	3.90	0.127	--	0.154
E4	3.69	--	4.55	0.145		0.179
L	0.61	--	1.80	0.024	--	0.071
L2	0.05	--	0.36	0.002	--	0.014
e	--	1.27	--	--	0.050	--

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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