

P-Ch 20V Fast Switching MOSFETs

- ★ Super Low Gate Charge
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

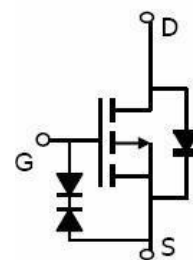
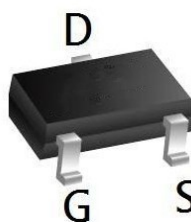
Product Summary


BVDSS	RDSON	ID
-20V	32mΩ	-5.0A

Description

The XR3415L is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The XR3415L meet the RoHS and Green Product requirement with full function reliability approved. ESD Rating: 2500V HBM

SOT23-3L Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-20	V
V _{GS}	Gate-Source Voltage	± 10	V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V ^{1,6}	-5	A
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ 10V ^{1,6}	-3	A
I _{DM}	Pulsed Drain Current ²	-16	A
EAS	Single Pulse Avalanche Energy ³	---	mJ
I _{AS}	Avalanche Current	---	A
P _D @T _C =25°C	Total Power Dissipation ⁴	1.08	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-Ambient ¹	---	115	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	---	°C/W

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Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-20	-	-	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±10V	-	-	±10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -20V, V _{GS} = 0V	-	-	-1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.35	-0.65	-0.9	V
Drain-Source on-Resistance ³	R _{DS(on)}	V _{GS} = -4.5V,I _D = -4A	-	30	38	mΩ
		V _{GS} = -2.5V,I _D = -3A	-	42	54	
		V _{GS} = -1.8V,I _D = -2A	-	-	-	
Dynamic Characteristics ⁴						
Input Capacitance	C _{iss}	V _{GS} = 0V ,V _{DS} = -10V, f=1MHz	-	1022	-	pF
Output Capacitance	C _{oss}		-	123	-	
Reverse Transfer Capacitance	C _{rss}		-	105	-	
Switching Characteristics ⁴						
Total Gate Charge	Q _g	V _{GS} = -4.5V ,V _{DS} = -10V, I _D = -4A	-	9.5	-	nC
Gate-Source Charge	Q _{gs}		-	1.2	-	
Gate-Drain Charge	Q _{gd}		-	2.3	-	
Turn-on Delay Time	t _{d(on)}	V _{GS} = -4.5V, V _{DD} = -10V, R _G = 3Ω, I _D = -4A	-	11	-	ns
Rise Time	t _r		-	9.5	-	
Turn-off Delay Time	t _{d(off)}		-	18	-	
Fall Time	t _f		-	24	-	
Drain-Source Body Diode Characteristics						
Body Diode voltage ³	V _{DS}	I _S = -1A,V _{GS} =0V	-	-	-1	V
Continuous Source Current	I _S	-	-	-	-5	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$.
2. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. This value is guaranteed by design hence it is not included in the production test.

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Typical Characteristics

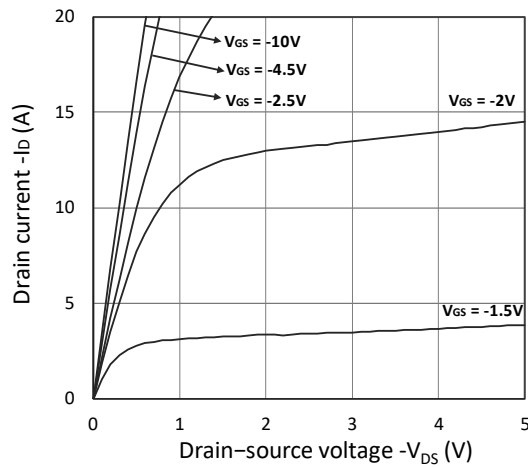


Figure 1. Output Characteristics

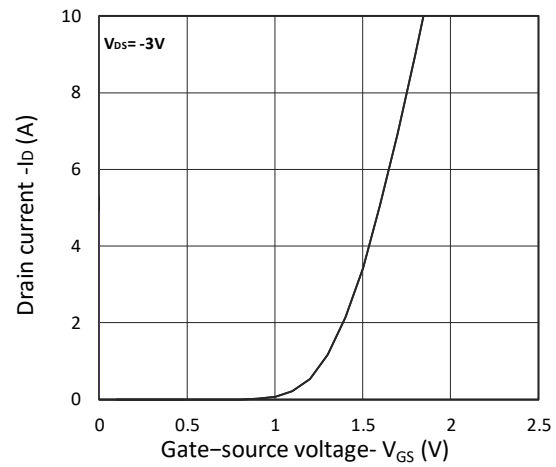


Figure 2. Transfer Characteristics

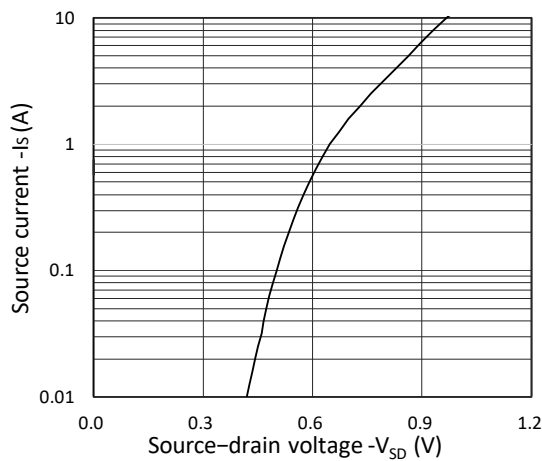


Figure 3. Forward Characteristics of Reverse

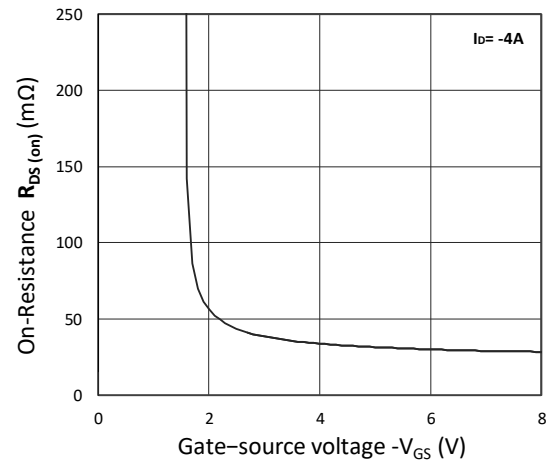


Figure 4. $R_{DS(on)}$ vs. V_{GS}

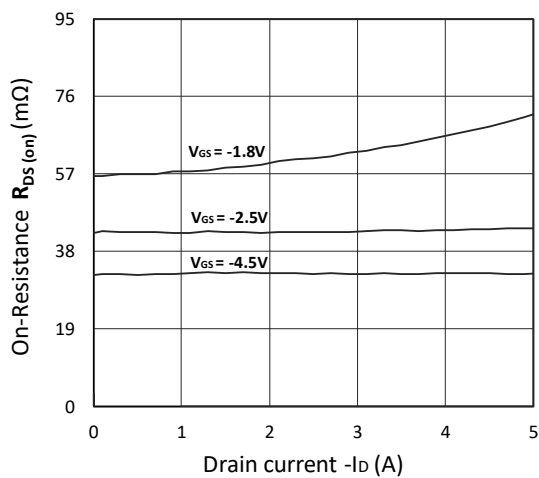


Figure 5. $R_{DS(on)}$ vs. I_D

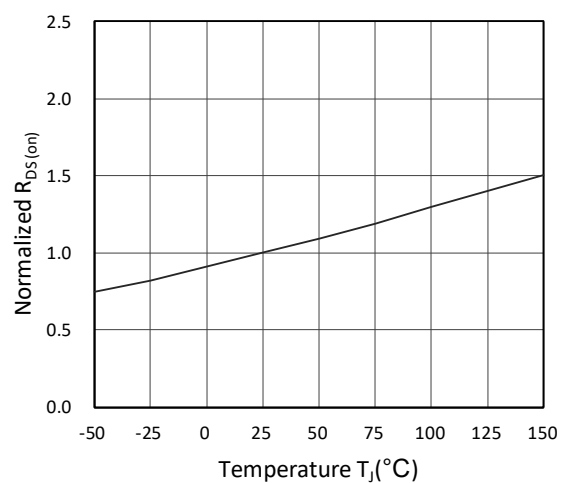


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

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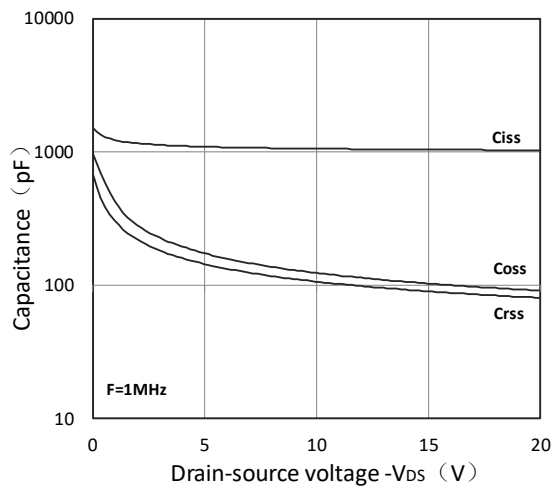


Figure 7. Capacitance Characteristics

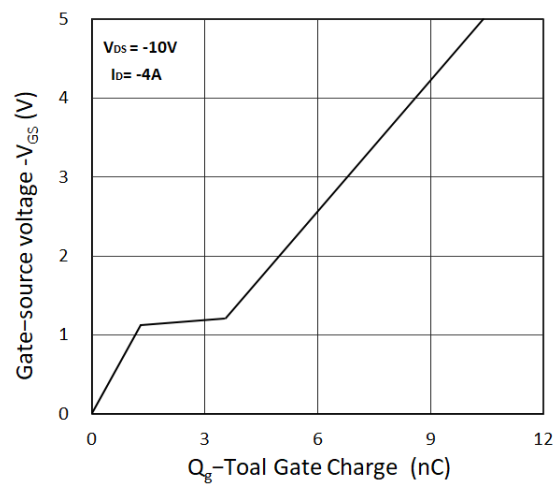
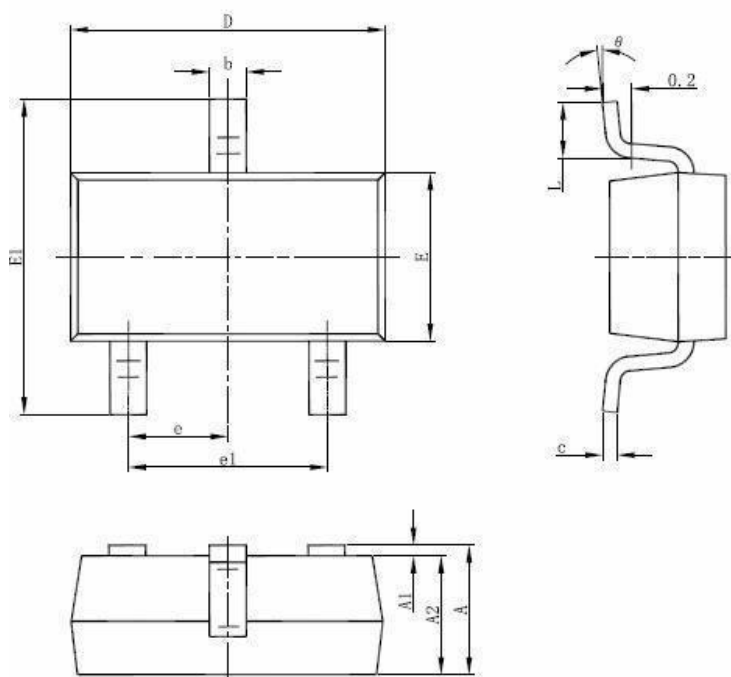


Figure 8. Gate Charge Characteristics

SOT-23-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°