P-Ch 17V Fast Switching MOSFETs

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

Product Summary

Green

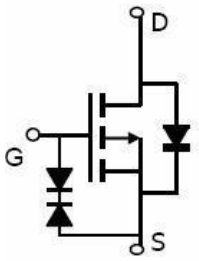
BVDSS	RDSON	ID
-17V	30mΩ	-5.0A

Description

The XR3415E 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 XR3415E meet the RoHS and Green Product requirement with full function reliability approved. ESD Rating: 2500V HBM

SOT23 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		10s	Steady State	
V_{DS}	Drain-Source Voltage	-17		V
V_{GS}	Gate-Source Voltage	±10		V
I_D@T_A=25 ŏ	Continuous Drain Current, V_{GS} @ -4.5V[1]	-5.	-4.	A
I_D@T_A=70 ŏ	Continuous Drain Current, V_{GS} @ -4.5V[1]	-4.	-3.7	A
I_{DM}	Pulsed Drain Current[2]	-18		A
P_D@T_A=25 ŏ	Total Power Dissipation[3]	1.32	1	W
T_{STG}	Storage Temperature Range	-55 to 150		ŏ
T_J	Operating Junction Temperature Range	-55 to 150		ŏ

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	125	ŏ /W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1] (t ≤10s)	---	95	ŏ /W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	80	ŏ /W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-17	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25 ǒ , I_D=-1mA	---	---	---	V/ ǒ
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-4.5V , I_D=-1A	---	30	40	mΩ
		V_{GS}=-2.5V , I_D=-1A	---	38	50	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	-0.4	-0.7	-1	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	mV/ ǒ
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-17V , V_{GS}=0V , T_J=25 ǒ	---	---	1	uA
		V_{DS}=-17V, V_{GS}=0V , T_J=100 ǒ	---	---	---	
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±12V , V_{DS}=0V	---	---	±100	nA
Q_g	Total Gate Charge	V_{DS}=-10V , V_{GS}=-4.5V , I_D=-3A	---	13	---	nC
Q_{gs}	Gate-Source Charge		---	1.5	---	
Q_{gd}	Gate-Drain Charge		---	3.9	---	
$T_{d(on)}$	Turn-On Delay Time	V_{GS}=-4.5V,V_{DD}=-10V, R_L=0.75Ω， R_{GEN}=3Ω I_D=-3.3A	---	18	---	ns
T_r	Rise Time		---	48	---	
$T_{d(off)}$	Turn-Off Delay Time		---	43	---	
T_f	Fall Time		---	15	---	
C_{iss}	Input Capacitance	V_{DS}=-10V , V_{GS}=0V , f=1MHz	---	833	---	pF
C_{oss}	Output Capacitance		---	147	---	
C_{rss}	Reverse Transfer Capacitance		---	33	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	-5	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25˚C	---	---	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˚C 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 Performance Characteristics

Figure1: Output Characteristics

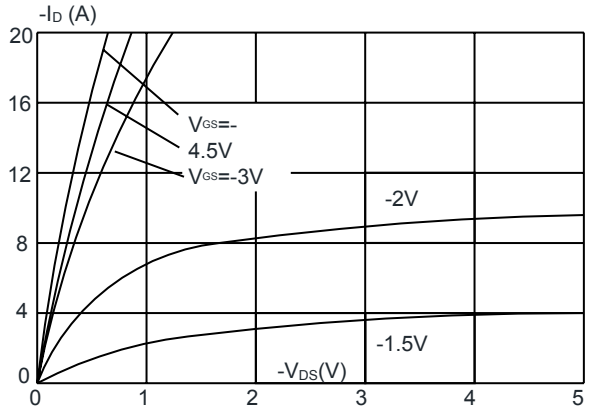


Figure 2: Typical Transfer Characteristics

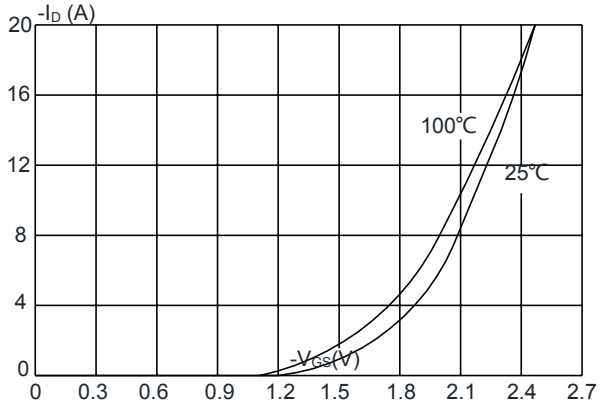


Figure 3: On-resistance vs. Drain Current

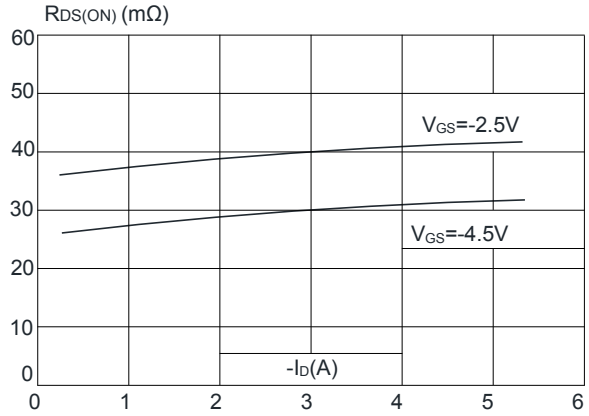


Figure 4: Body Diode Characteristics

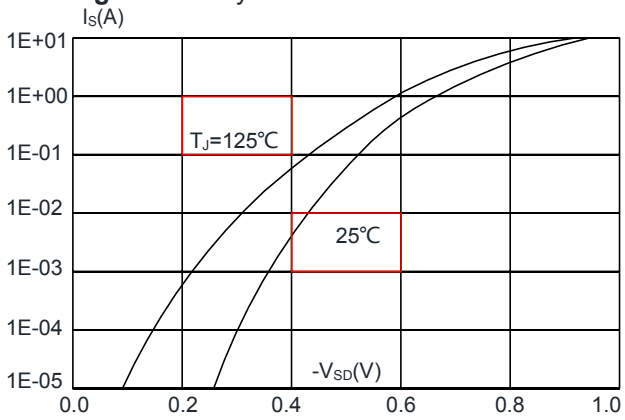


Figure 5: Gate Charge Characteristics

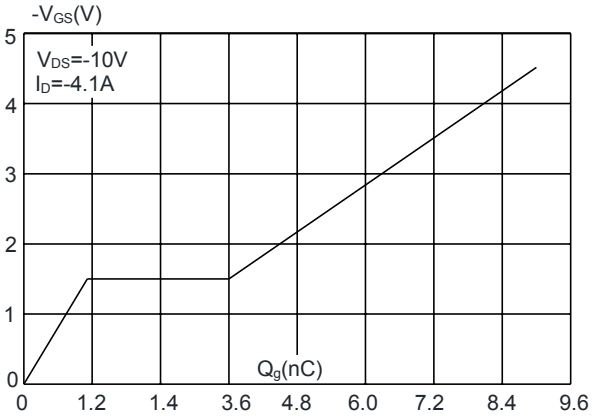


Figure 6: Capacitance Characteristics

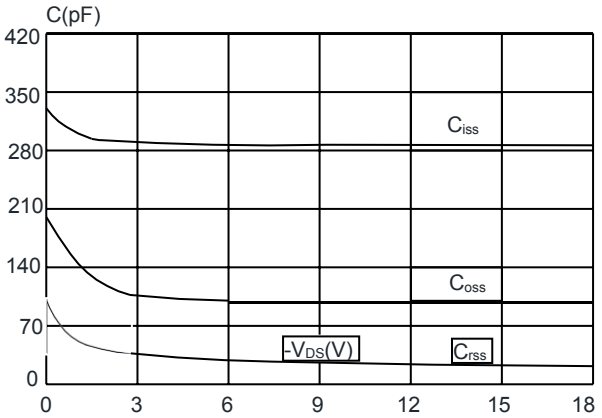


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

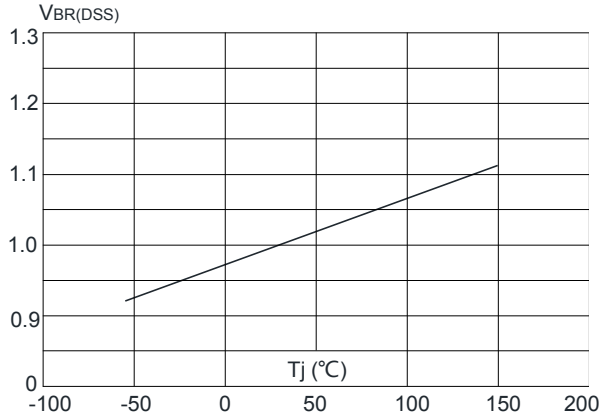


Figure 8: Normalized on Resistance vs. Junction Temperature

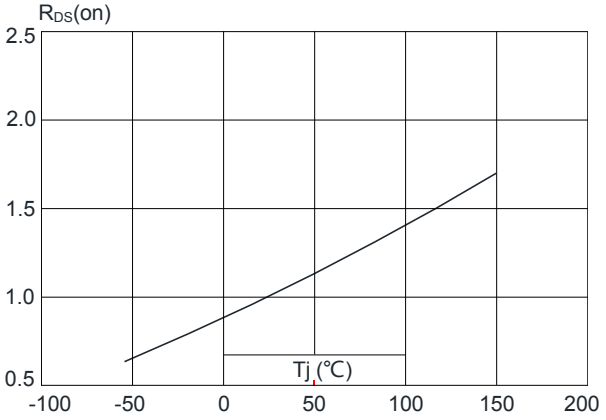


Figure 9: Maximum Safe Operating Area

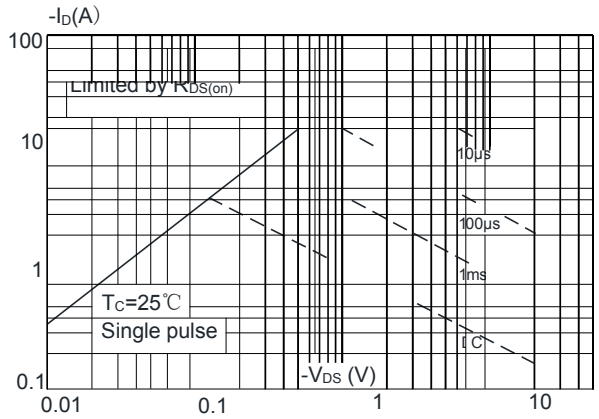


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

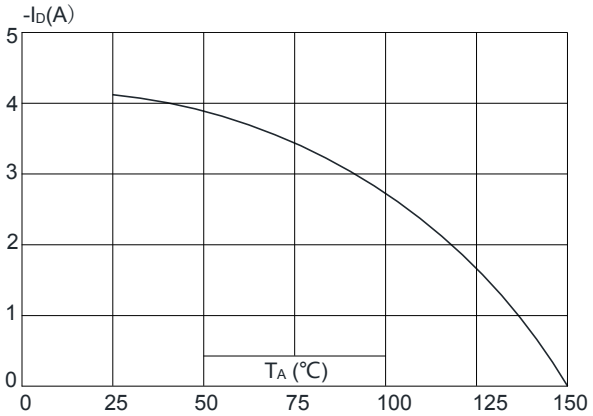
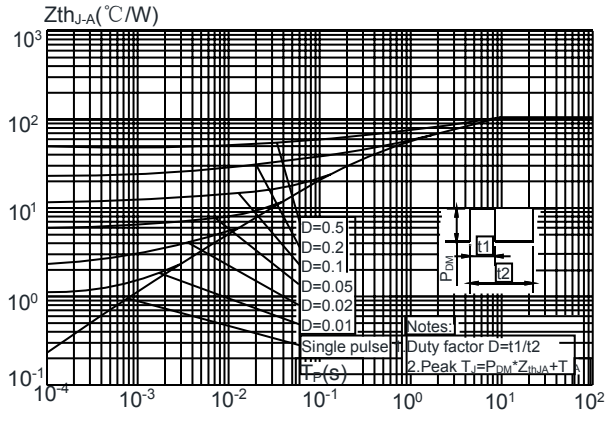
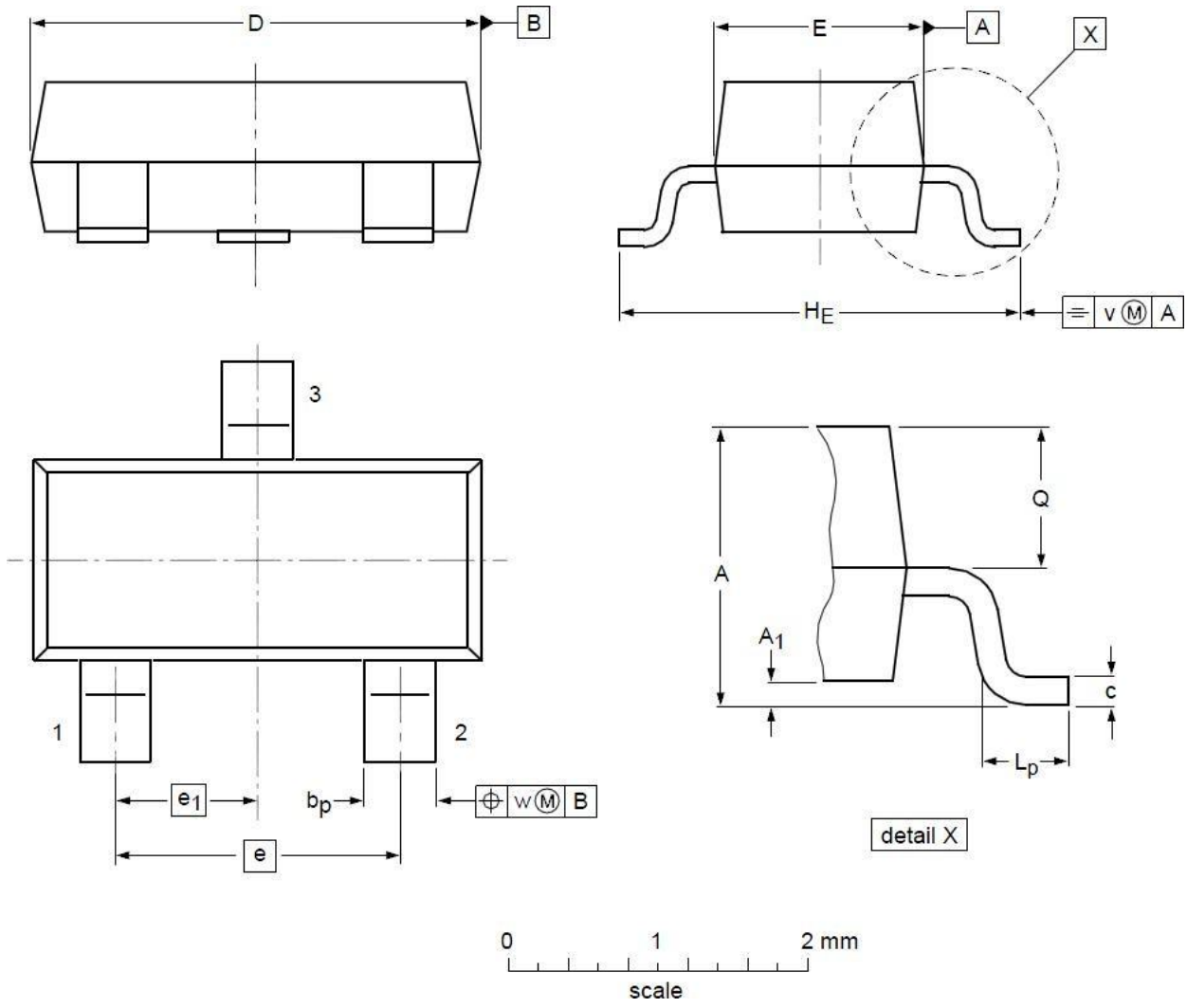


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



SOT23 Mechanical Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	**A_1**	0.01	0.05	0.10
b_p	0.30	0.42	0.50	**c**	0.08	0.13	0.15
D	2.80	2.92	3.00	**E**	1.20	1.33	1.40
e	--	1.90	--	**e_1**	--	0.95	--
H_E	2.25	2.40	2.55	**L_p**	0.30	0.42	0.50
Q	0.45	0.49	0.55	**v**	--	0.20	--
w	--	0.10	--				