N-Ch 40V Fast Switching MOSFETs

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

Product Summary

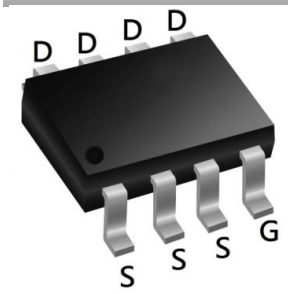
Green

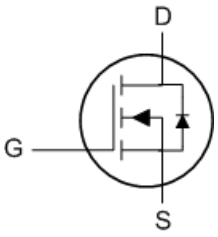
BVDSS	RDSON	ID
40V	9.5mΩ	10A

Description

The XR10N04S is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The XR10N04S meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

SOP8 Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	10	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	5	A
I_{DM}	Pulsed Drain Current[2]	25	A
EAS	Single Pulse Avalanche Energy[3]	19	mJ
I_{AS}	Avalanche Current	10	A
P_D@T_C=25℃	Total Power Dissipation[4]	20	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	55	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	4.32	℃/W

N-CH Electrical Characteristics (T_A=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1	1.5	2.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=8A	-	9.5	12	mΩ
		V_{GS}=4.5V, I_D=4A	-	16	20	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=8A	33	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=20V,V_{GS}=0V, F=1.0MHz	-	964	-	PF
Output Capacitance	C_{oss}		-	109	-	PF
Reverse Transfer Capacitance	C_{rss}		-	96	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=20V, R_L=2.5Ω V_{GS}=10V,R_{GEN}=3Ω	-	5.5	-	nS
Turn-on Rise Time	t_r		-	14	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	24	-	nS
Turn-Off Fall Time	t_f		-	12	-	nS
Total Gate Charge	Q_g	V_{DS}=20V,I_D=8A, V_{GS}=10V	-	22.9	-	nC
Gate-Source Charge	Q_{gs}		-	3.5	-	nC
Gate-Drain Charge	Q_{gd}		-	5.3	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=9A	-	0.8	1.2	V

N- Channel Typical Electrical and Thermal Characteristics (Curves)

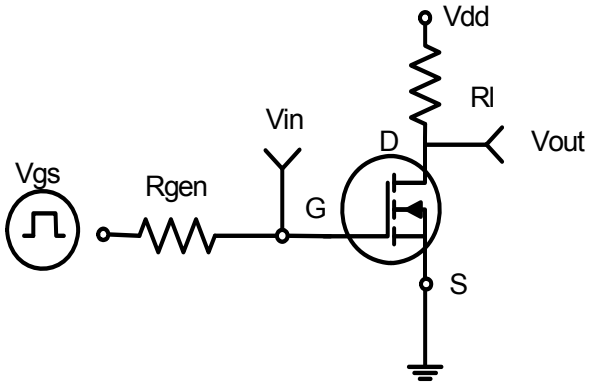


Figure 1:Switching Test Circuit

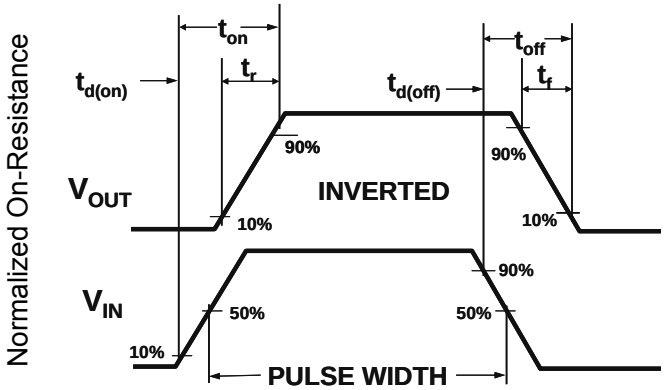
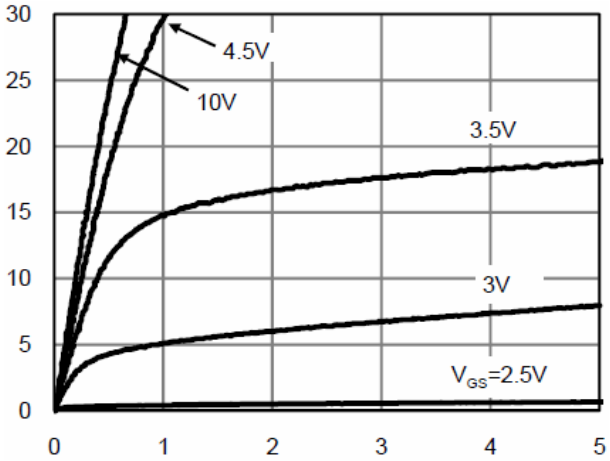
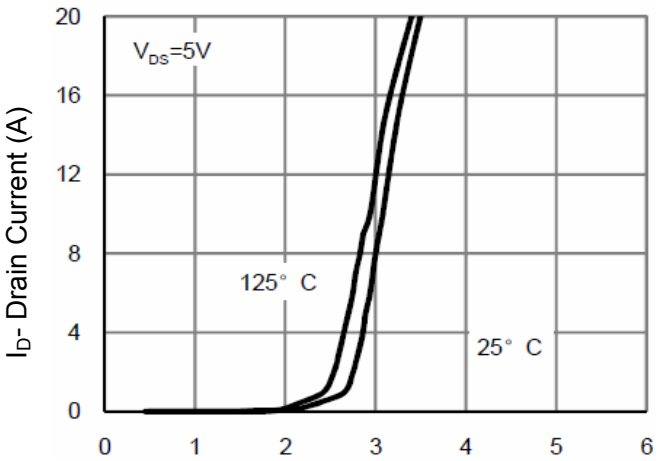


Figure 2:Switching Waveforms



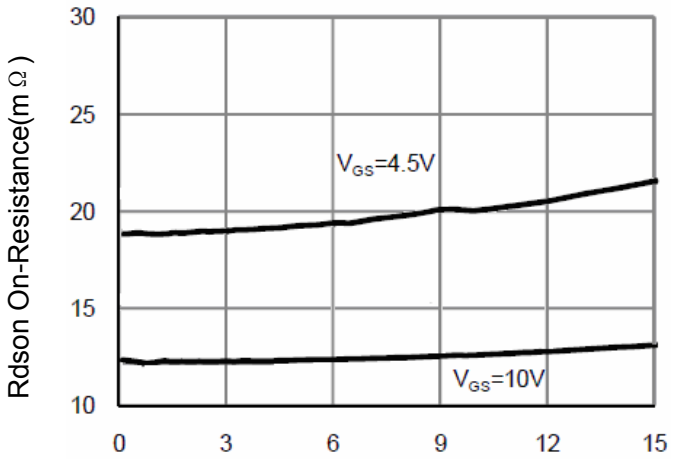
Vds Drain-Source Voltage (V)

Figure 3 Output Characteristics



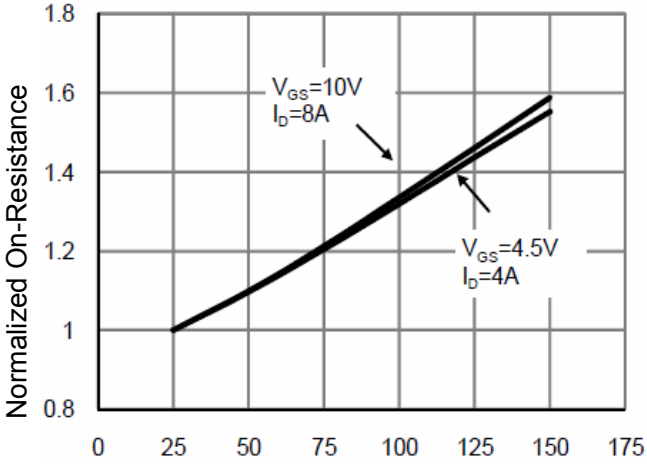
Vgs Gate-Source Voltage (V)

Figure 4 Transfer Characteristics



I_D- Drain Current (A)

Figure 5 Drain-Source On-Resistance



T_J-Junction Temperature(℃)

Figure 6 Drain-Source On-Resistance

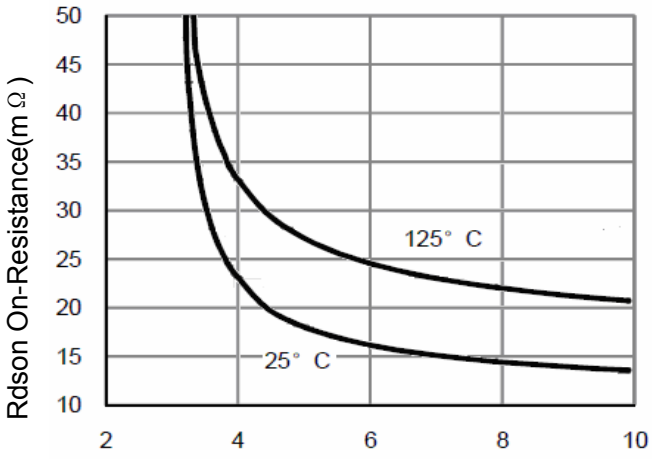


Figure7 Rdson vs Vgs

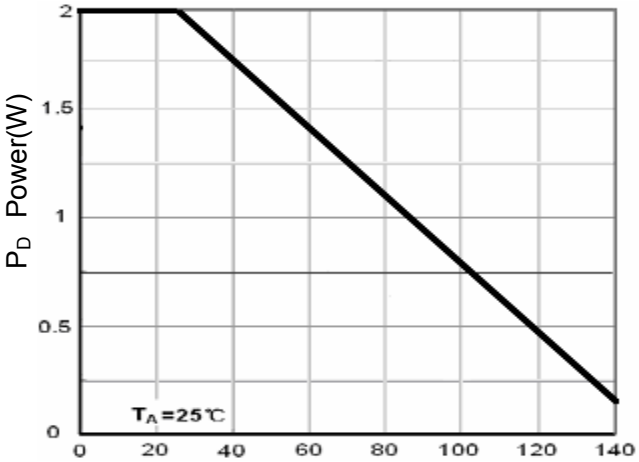


Figure 8 Power Dissipation

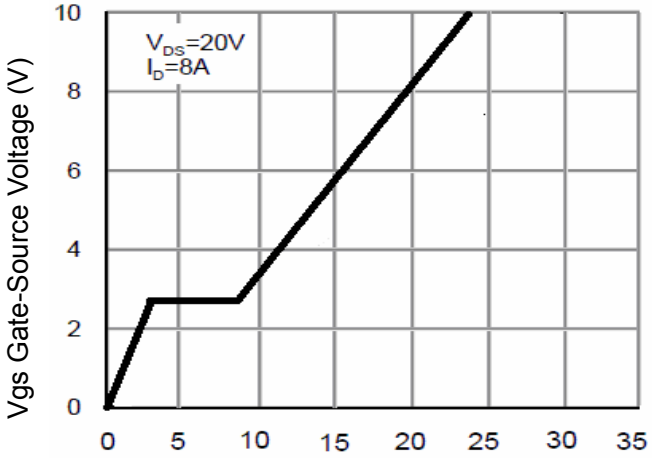


Figure 9 Gate Charge

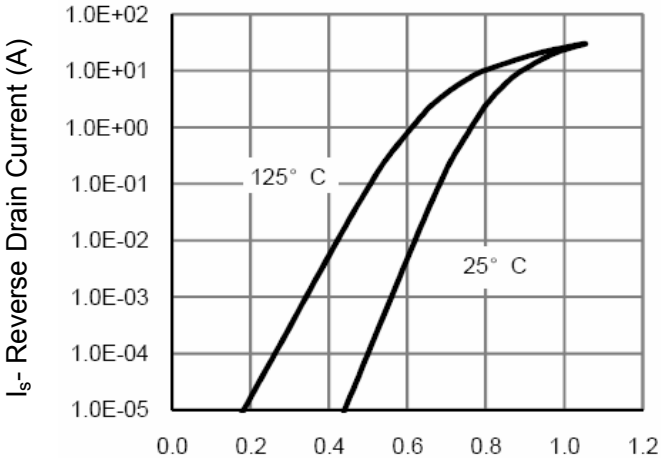


Figure 10 Source- Drain Diode Forward

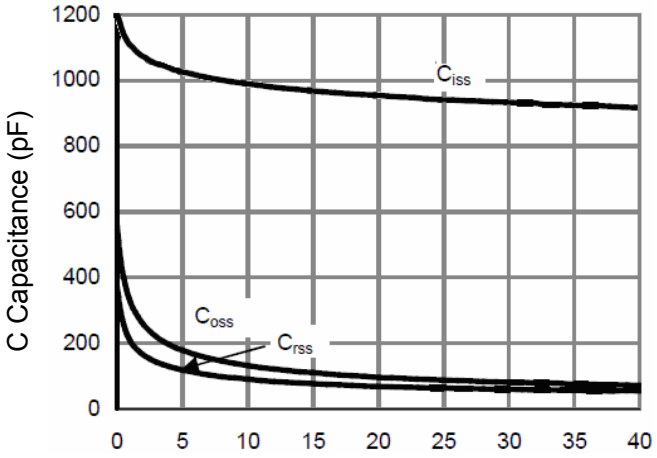


Figure 11 Capacitance vs Vds

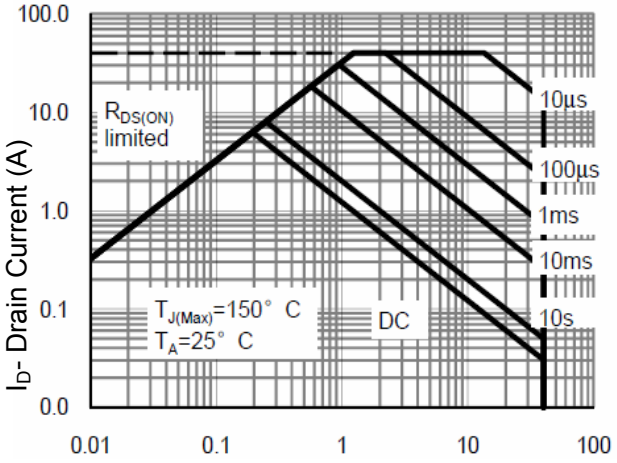
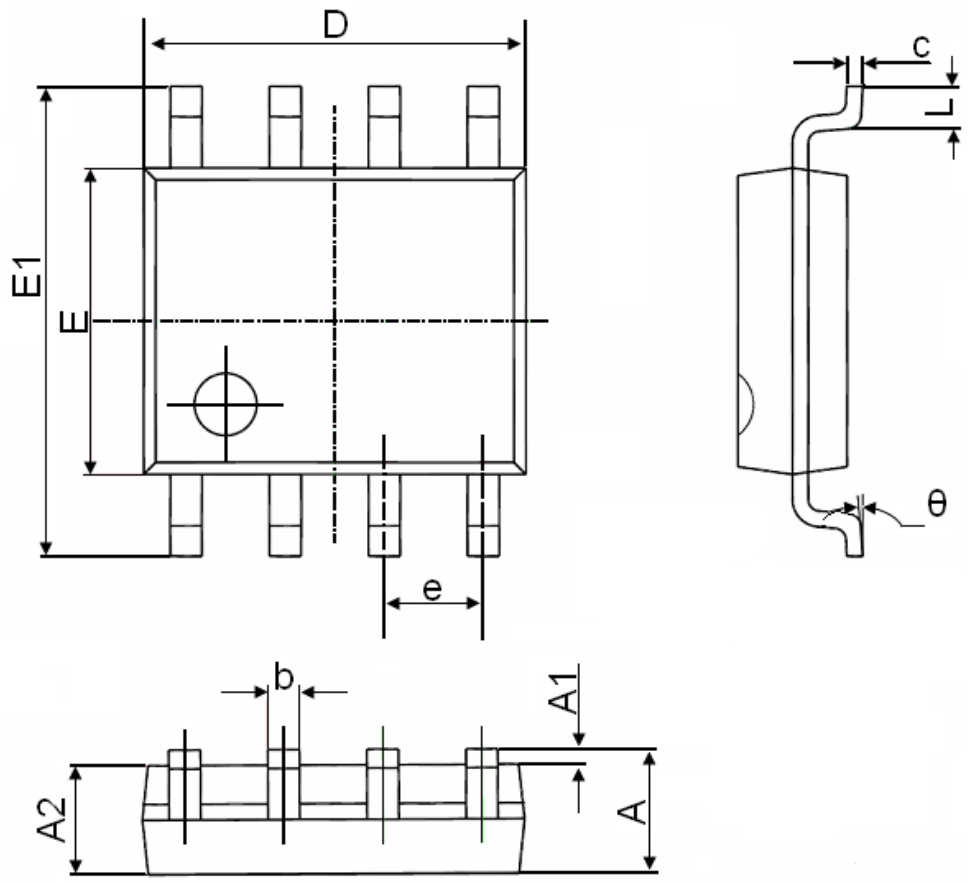


Figure 12 Safe Operation Area

SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°