

- ★ Super Low Gate Charge
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

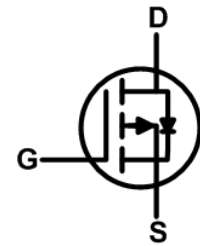
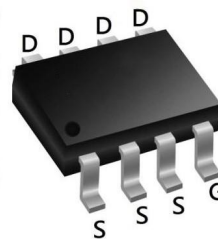

Product Summary

BVDSS	RDSON	ID
-100V	254mΩ	-5A

Description

The XXW5P10S 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 XXW5P10S 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	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	-5	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	-3.6	A
I_{DM}	Pulsed Drain Current ²	-26.8	A
EAS	Single Pulse Avalanche Energy ³	109	mJ
I_{AS}	Avalanche Current	---	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ⁴	40	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	---	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	3.7	$^\circ C/W$

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-100	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	---	---	V/ °C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-2A	---	254	330	mΩ
		V _{GS} =-4.5V, I _D =-1A	---	271	352	
		V _{GS} =-2.5V, I _D =-1A	---	---	---	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1	-1.7	-2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	---	---	mV/ °C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-100V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-100V, V _{GS} =0V, T _J =100°C	---	---	-100	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-4A	---	10	---	S
Q _g	Total Gate Charge	V _{DS} =-50V, V _{GS} =-10V, I _D =-3A	---	19.6	---	nC
Q _{gs}	Gate-Source Charge		---	6	---	
Q _{gd}	Gate-Drain Charge		---	4.2	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-50V, V _{GS} =-10V, R _G =3Ω	---	13.5	---	ns
T _r	Rise Time		---	3.8	---	
T _{d(off)}	Turn-Off Delay Time		---	42	---	
T _f	Fall Time		---	6.4	---	
C _{iss}	Input Capacitance	V _{DS} =-50V, V _{GS} =0V, f=1MHz	---	1199	---	pF
C _{oss}	Output Capacitance		---	33.8	---	
C _{rss}	Reverse Transfer Capacitance		---	28.2	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	---	---	-5	A
I _{SM}	Pulsed Source Current ^{2,4}		---	---	-20	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-3A, di/dt=100A/μs, T _J =25°C	---	42.9	---	nS
Q _{rr}	Reverse Recovery Charge		---	83.7	---	nC

Note :

1 The data is tested by surface mounted on a 4 inch² FR-4 board with 20Z copper.

2 The data is tested by pulsed pulse width < 300us duty cycle < 2%

3 The EAS data shows Max. rating. The test condition is V_{RM} > 0, V_{DD}=-50V, V_G=-10V, R_G=25Ω, L=0.5mH.

4 The power dissipation is limited by 150°C junction temperature

5 The data is theoretically the same as I_{SD} and I_{DM}. In real applications, it should be limited by total power A

dissipation.

Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

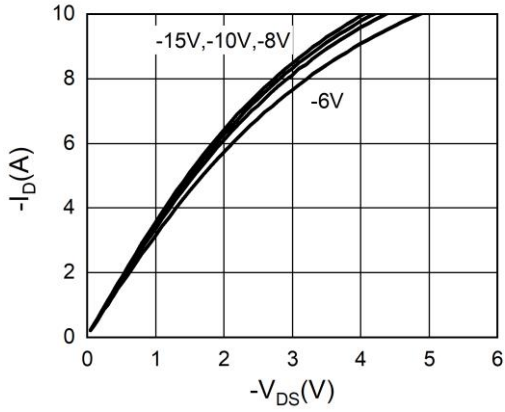


Figure 2. Transfer Characteristics

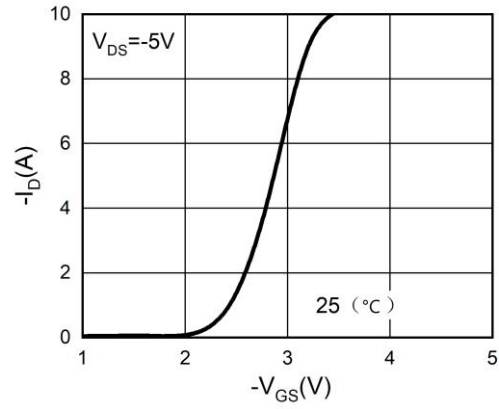


Figure 3. Power Dissipation

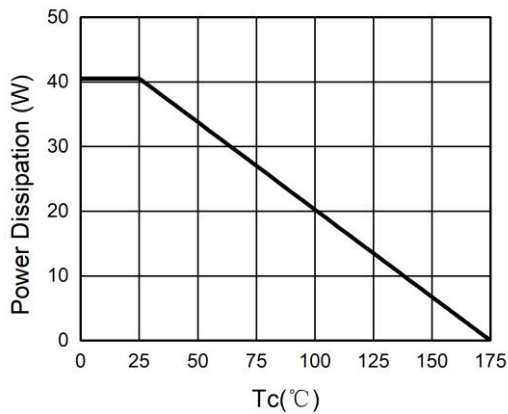


Figure 4. Drain Current

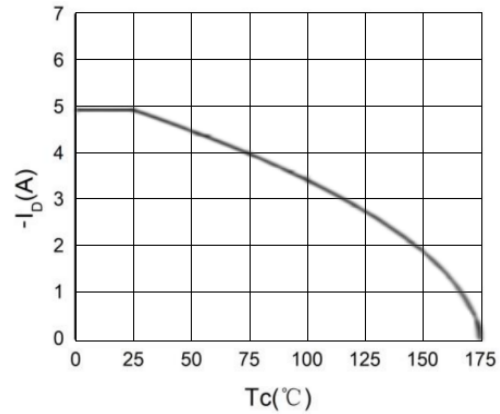


Figure 5. BV_{DSS} vs Junction Temperature

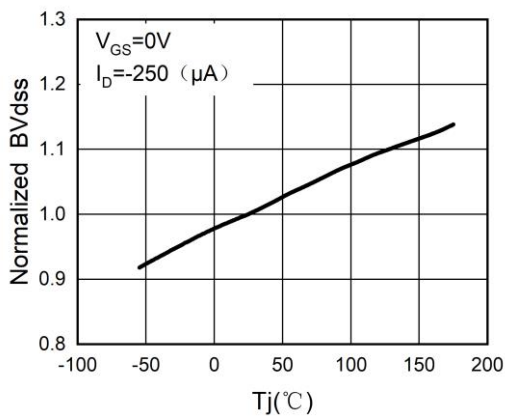


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

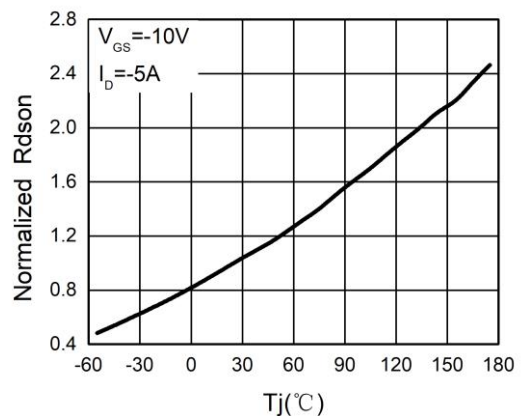


Figure 7. Gate Charge Waveforms

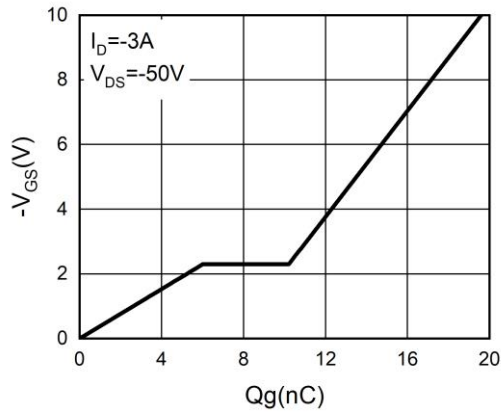


Figure 8. Capacitance

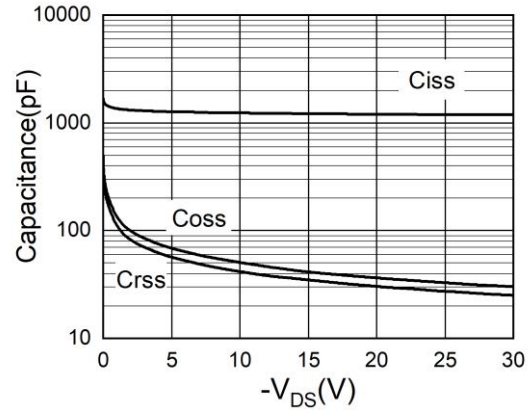


Figure 9. Body-Diode Characteristics

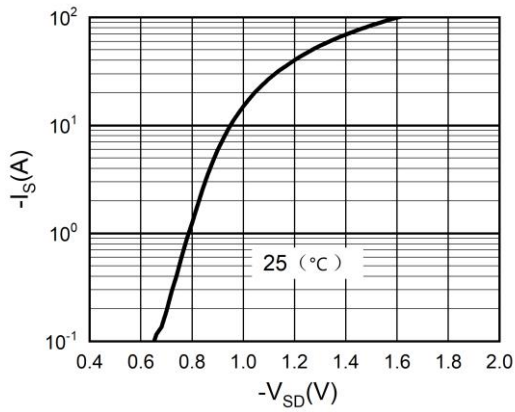
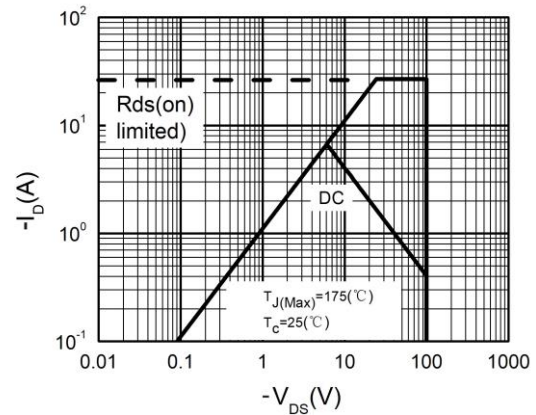
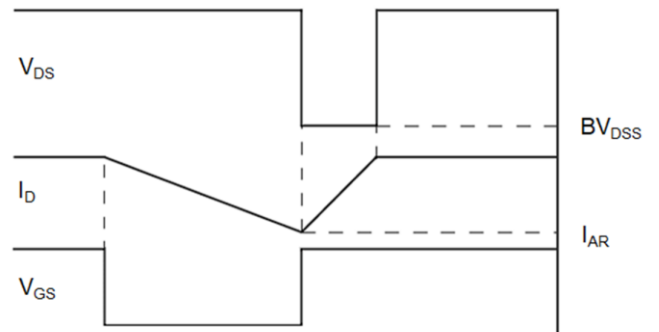
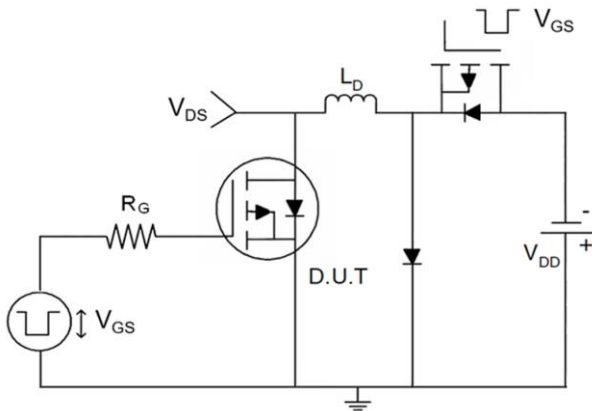


Figure 10. Maximum Safe Operating Area

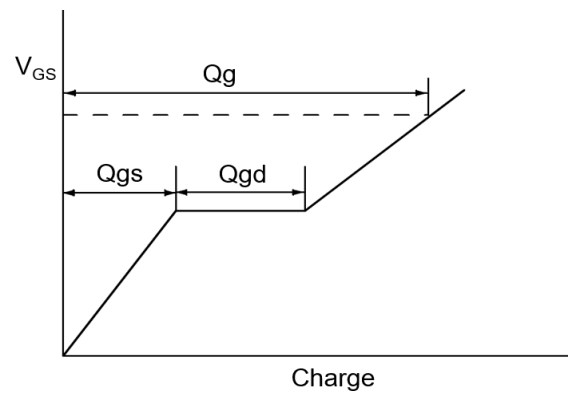
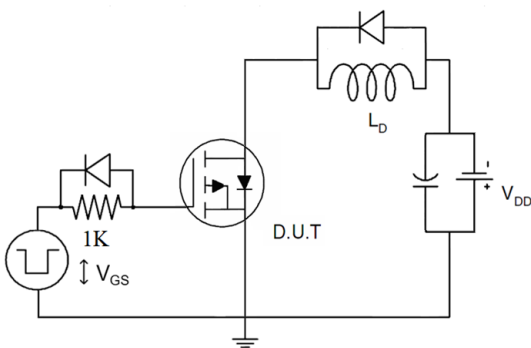


Test Circuit

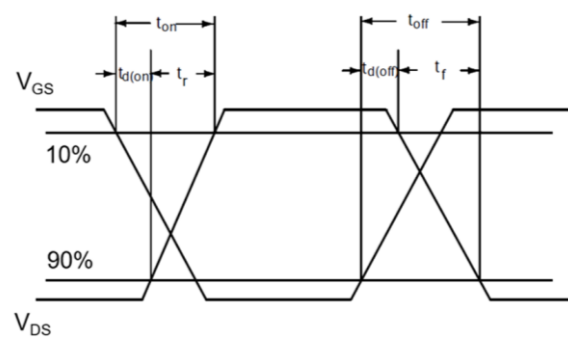
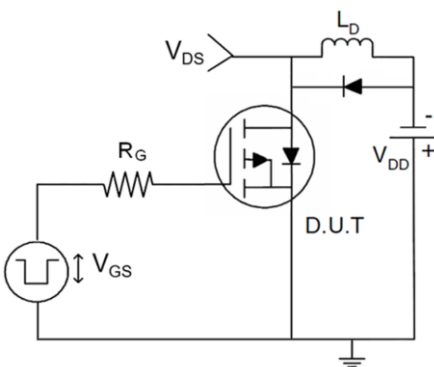
1) E_{AS} Test Circuits

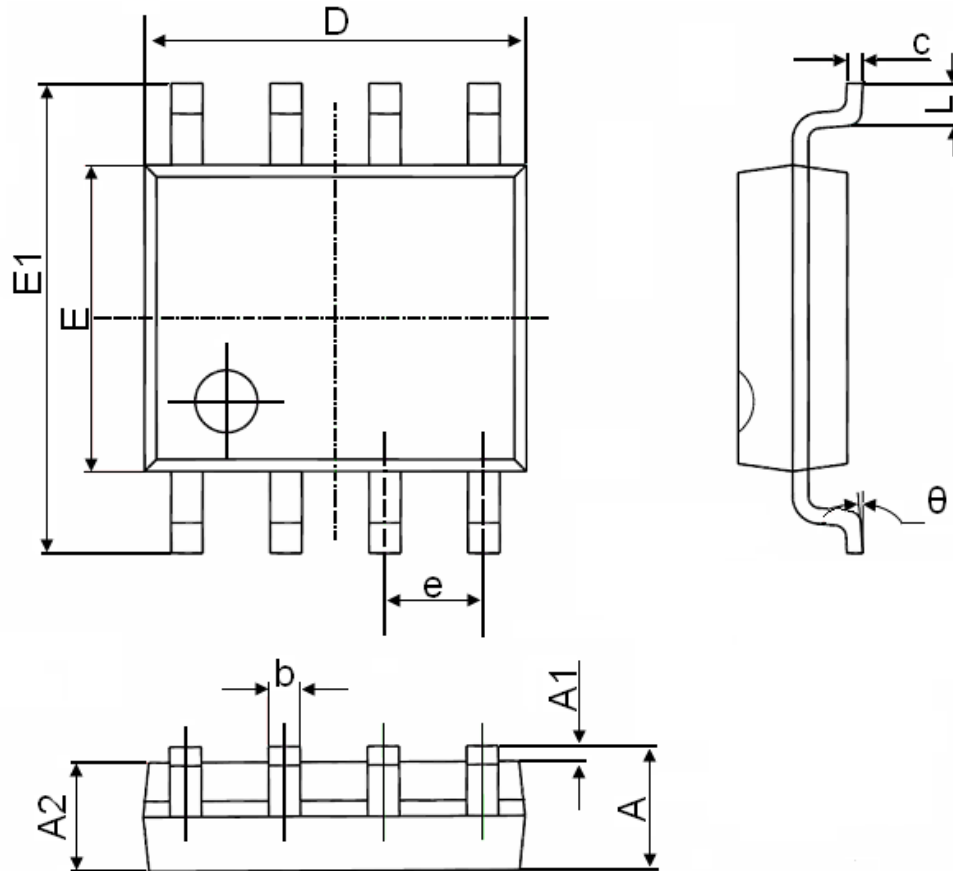


2) Gate Charge Test Circuit



3) Switch Time Test Circuit



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
theta	0°	8°	0°	8°