

P-Ch 25V Fast Switching MOSFETs

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

Product Summary

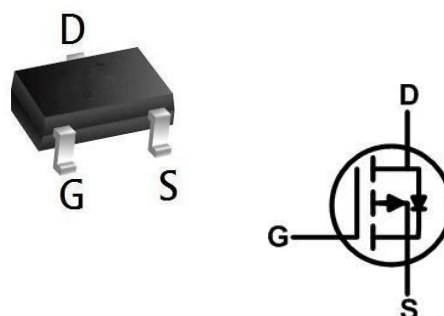


BVDSS	RDSON	ID
-25V	15mΩ	-9.0A

Description

The XR25P09L is the high cell density trench P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications. The XR25P09L meet the RoHS and Green Product requirement with full function reliability approved.

SOT23-3L PinConfiguration

Table 1. Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	-25	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	V
I_D	Drain Current-Continuous($T_C=25^\circ\text{C}$)	-9	A
	Drain Current-Continuous($T_C=100^\circ\text{C}$)	-4.9	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	-31.2	A
P_D	Maximum Power Dissipation($T_C=25^\circ\text{C}$)	2.4	W
	Maximum Power Dissipation($T_C=100^\circ\text{C}$)	0.96	W
E_{AS}	Avalanche energy (Note 2)	95	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ\text{C}$

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		52	$^\circ\text{C/W}$

Table 3. Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =-250μA	-25			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-25V, V _{GS} =0V			-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.2	-2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-7.5A		15	20	mΩ
		V _{GS} =-4.5V, I _D =-5A		20	26	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1.0MHz		1135		pF
C _{oss}	Output Capacitance			184		pF
C _{rss}	Reverse Transfer Capacitance			117		pF
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =-10V, V _{DS} =-15V, R _L =15Ω, R _{GEN} =6Ω		12		nS
t _r	Turn-on Rise Time			14		nS
t _{d(off)}	Turn-Off Delay Time			195		nS
t _f	Turn-Off Fall Time			95		nS
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-7.5A		21.7		nC
Q _{gs}	Gate-Source Charge			1.4		nC
Q _{gd}	Gate-Drain Charge			4.1		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				-9	A
V _{SD}	Forward on Voltage (Note 3)	V _{GS} =0V, I _S =-7.5A			-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-2A, dI/dt=100A/μs		36		ns
Q _{rr}	Reverse Recovery Charge	I _F =-2A, dI/dt=100A/μs		34		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.EAS condition: $T_J=25^\circ\text{C}$, $V_{DD}=30V$, $V_G=-10V$, $R_g=25\Omega$, $L=0.5mH$.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Electrical And Thermal Characteristics (Curves)

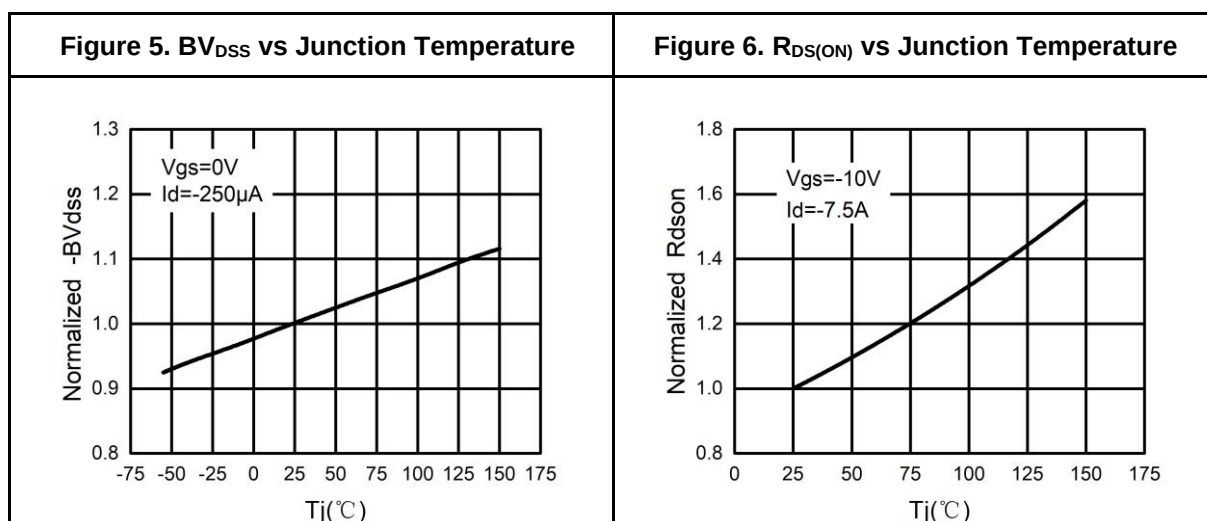
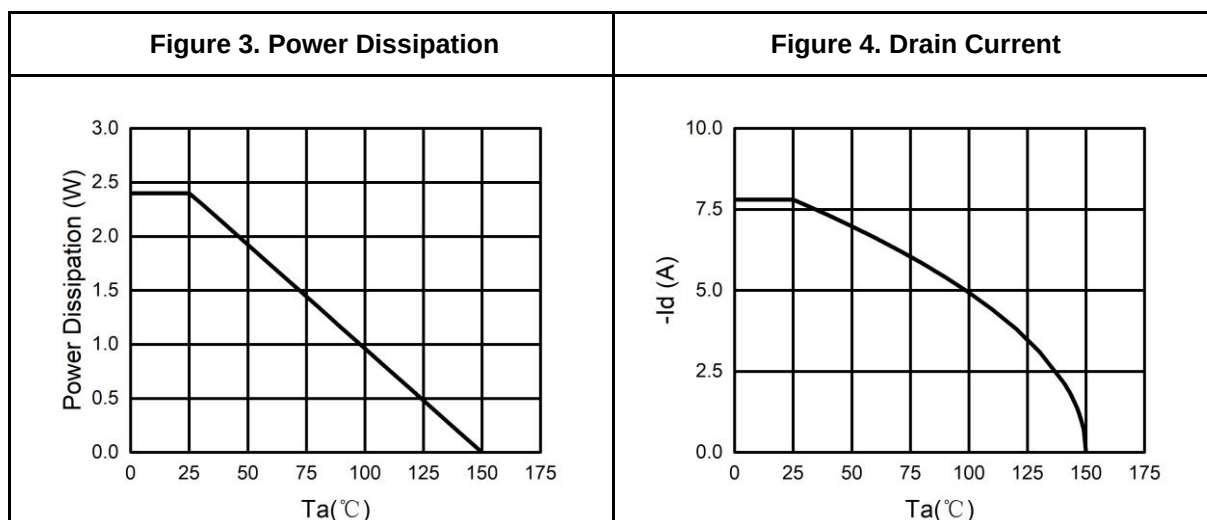
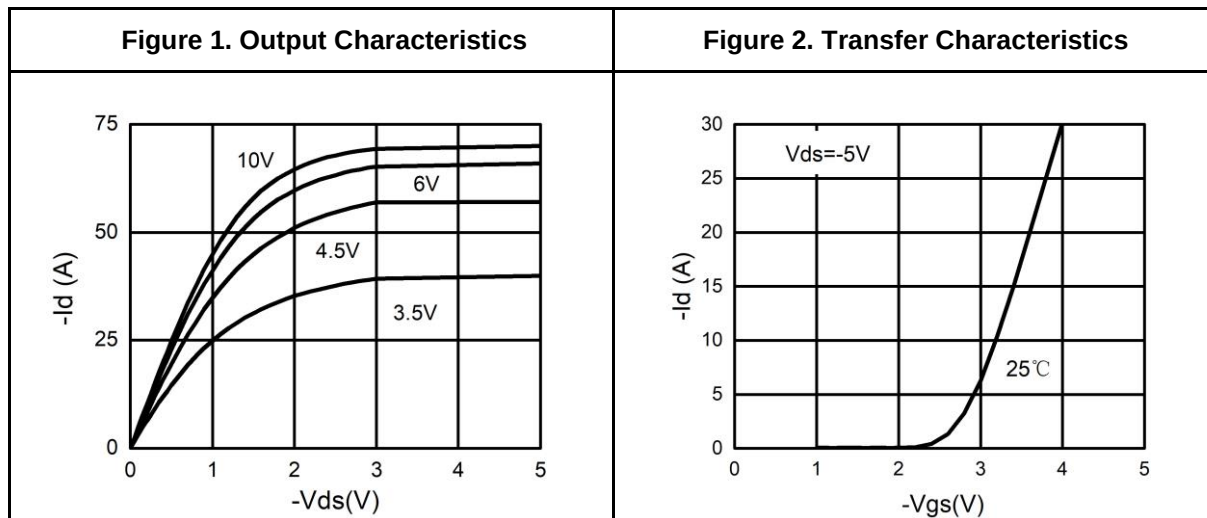


Figure 7. Gate Charge Waveforms

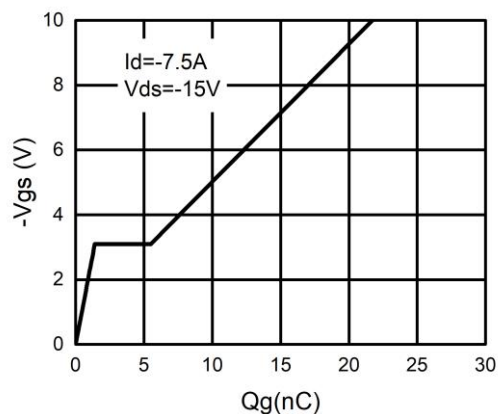


Figure 8. Capacitance

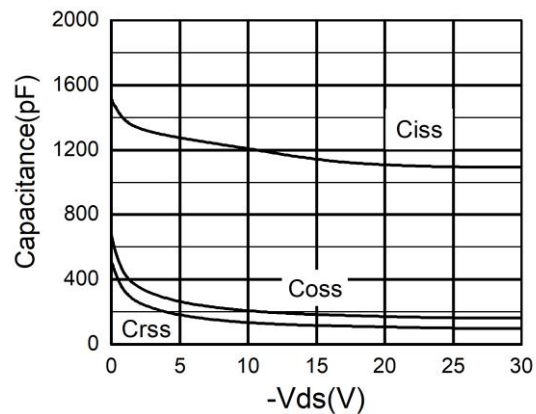


Figure 9. Body-Diode Characteristics

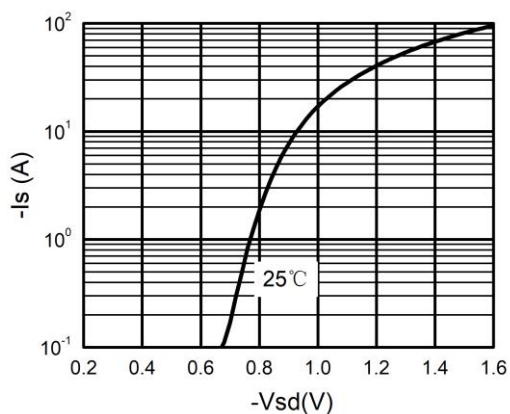
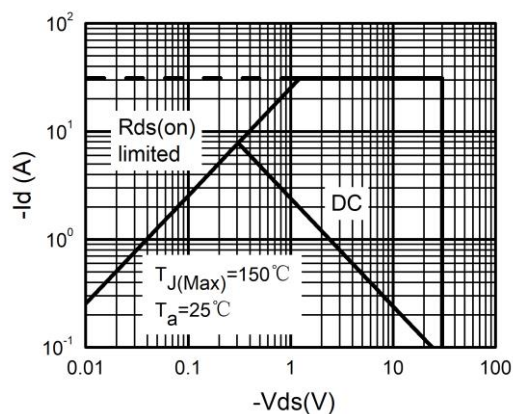
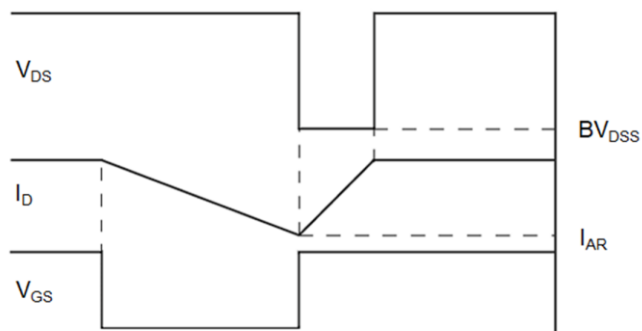
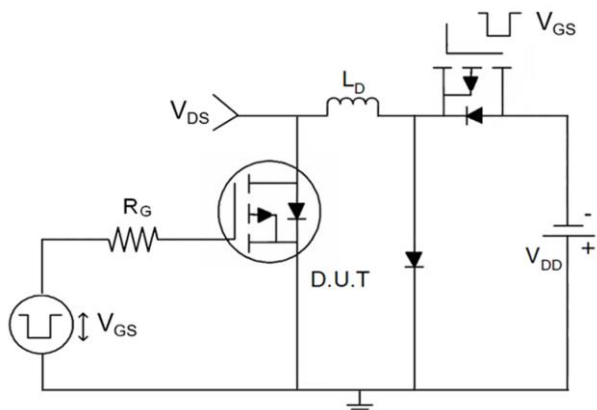


Figure 10. Maximum Safe Operating Area

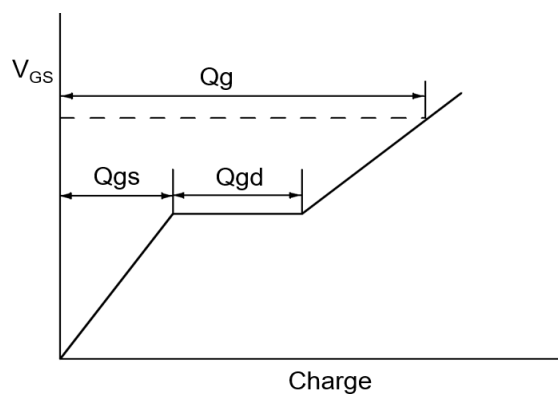
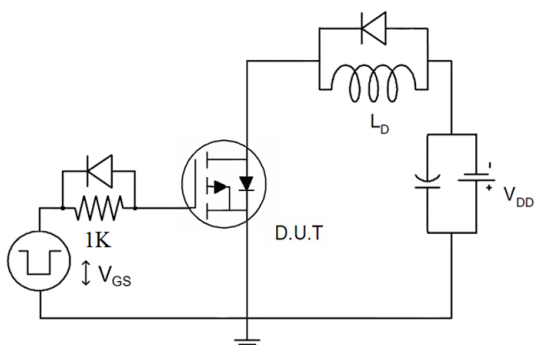


Test Circuit

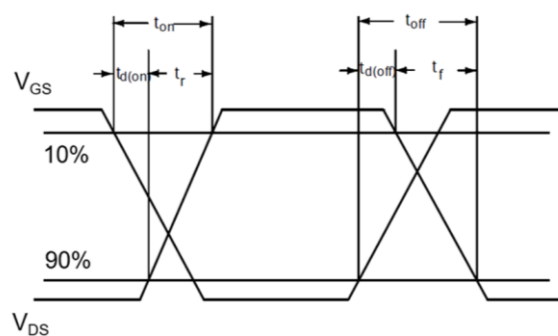
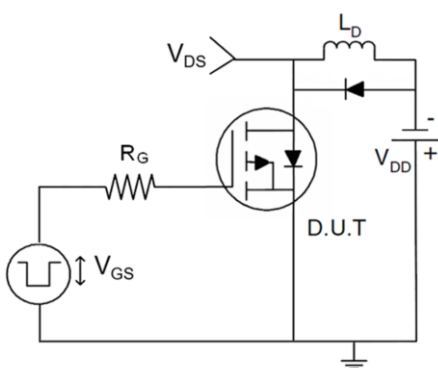
1) E_{AS} Test Circuits



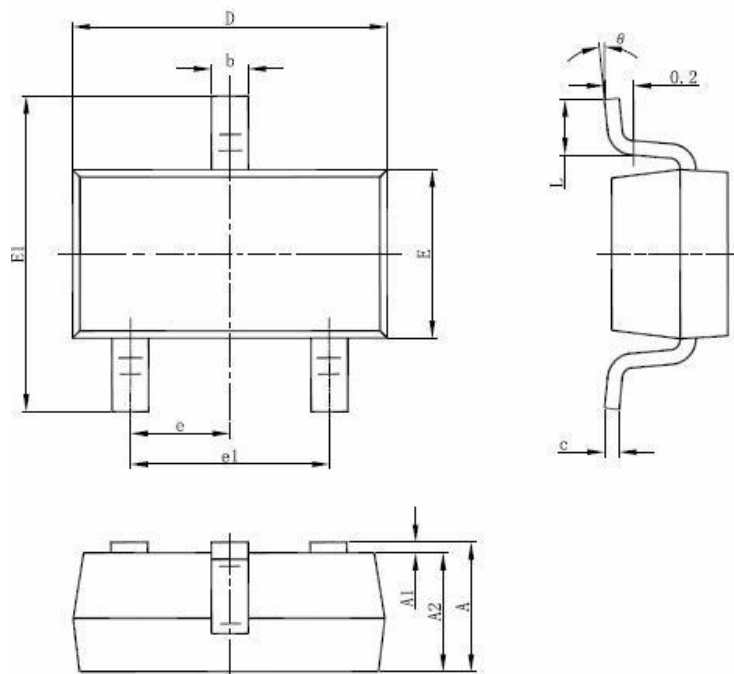
2) Gate Charge Test Circuit



3) Switch Time Test Circuit



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°