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

Green

BVDSS	RDSON	ID
-25V	15mΩ	-9.0A

Description

The UD25P09L is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications

The UD25P09L meet the RoHS and Green Product requirement with full function reliability approved.

SOT23-3L PinConfiguration

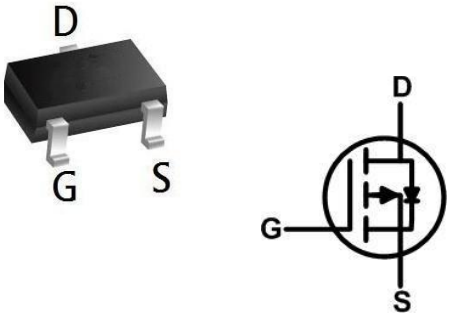


Table 1. Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

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℃)	-9	A
	Drain Current-Continuous(T_C=100℃)	-4.9	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	-31.2	A
P_D	Maximum Power Dissipation(T_C=25℃)	2.4	W
	Maximum Power Dissipation(T_C=100℃)	0.96	W
E_{AS}	Avalanche energy (Note 2)	95	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 2. Thermal Characteristic

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

Table 3. Electrical Characteristics (T_J=25℃ 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.E_{AS} condition: T_J=25℃,V_{DD}=30V,V_G=-10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

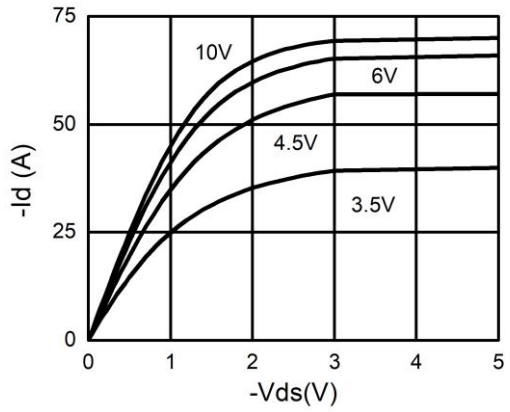


Figure 2. Transfer Characteristics

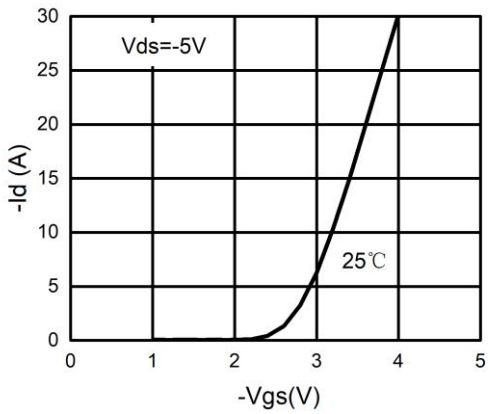


Figure 3. Power Dissipation

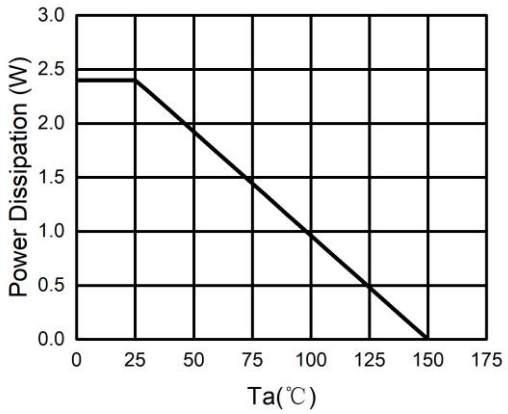


Figure 4. Drain Current

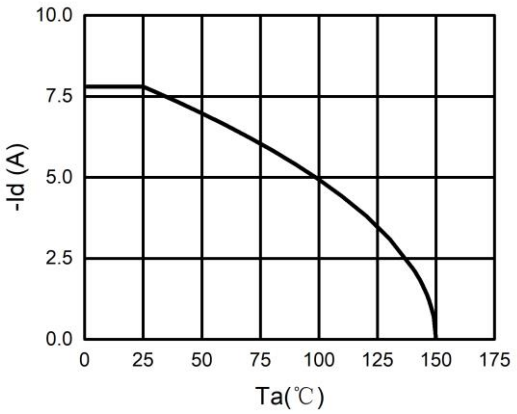


Figure 5. BV_{DSS} vs Junction Temperature

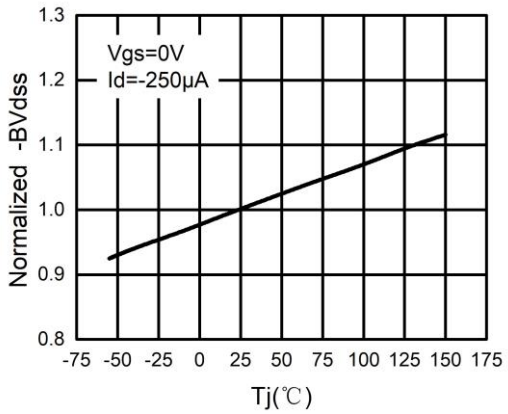


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

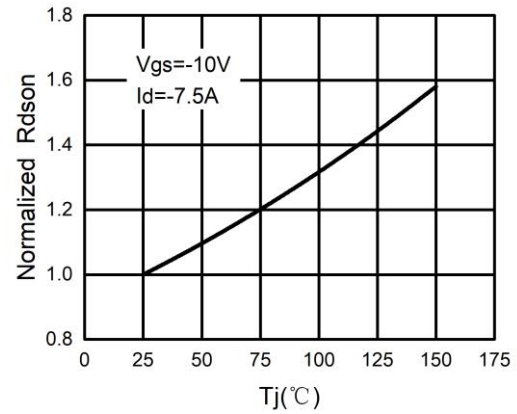


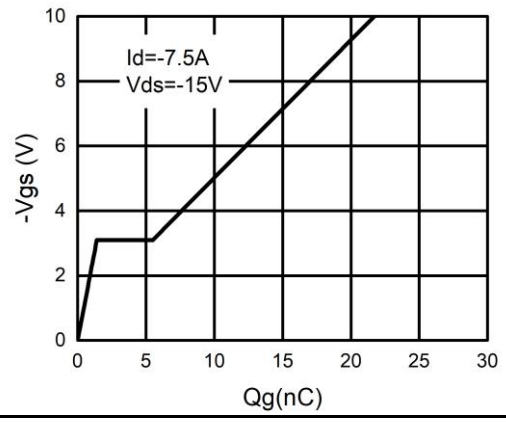
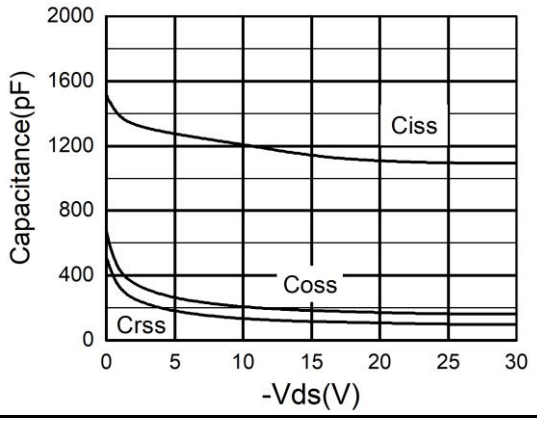
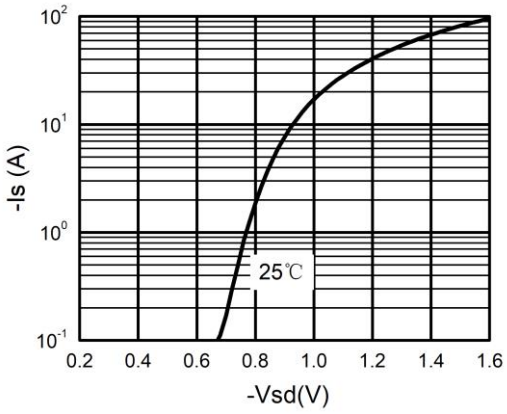
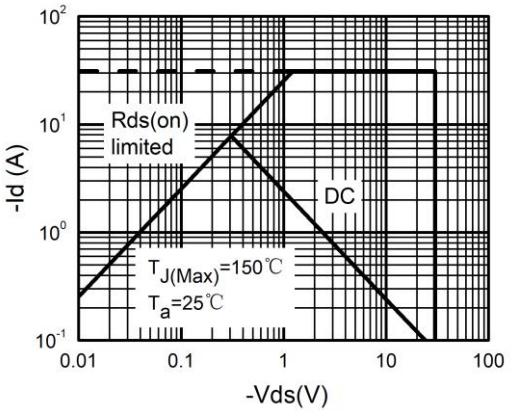
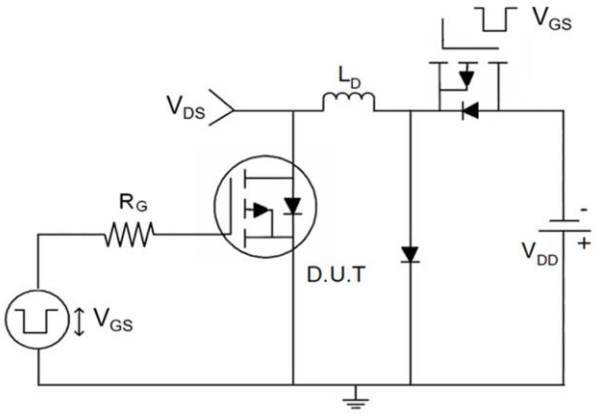
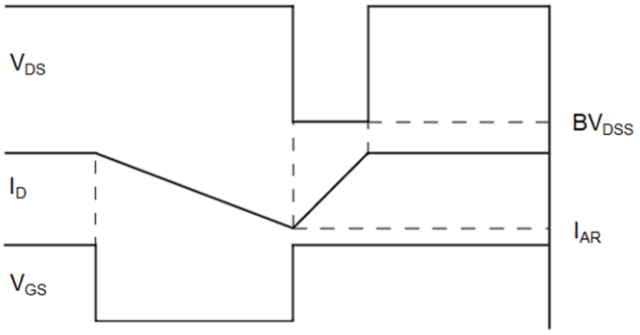
Figure 7. Gate Charge Waveforms	Figure 8. Capacitance
	

Figure 9. Body-Diode Characteristics	Figure 10. Maximum Safe Operating Area
	

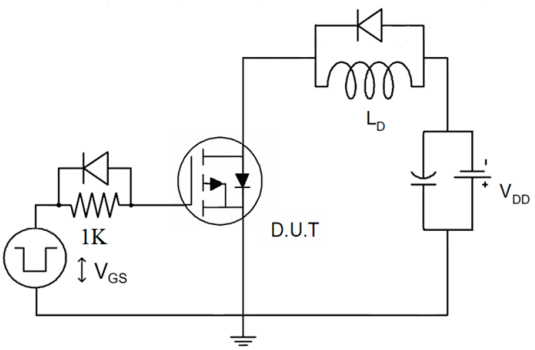
Test Circuit

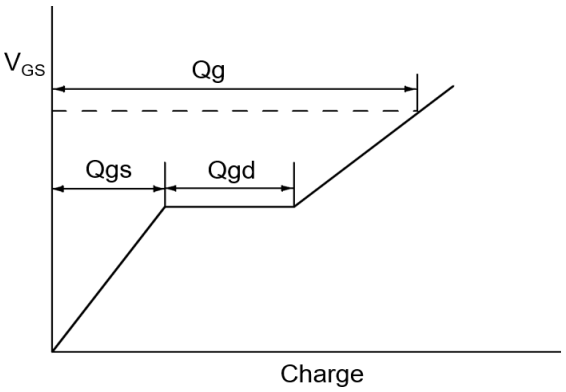
1) E_{AS} Test Circuits



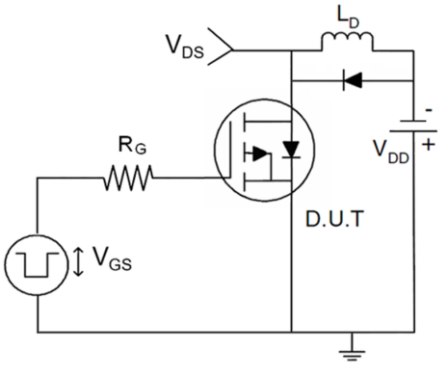


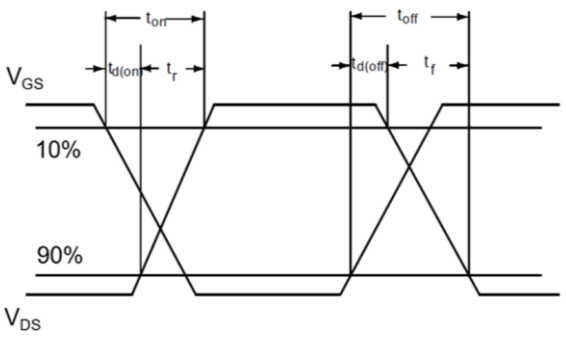
2) Gate Charge Test Circuit



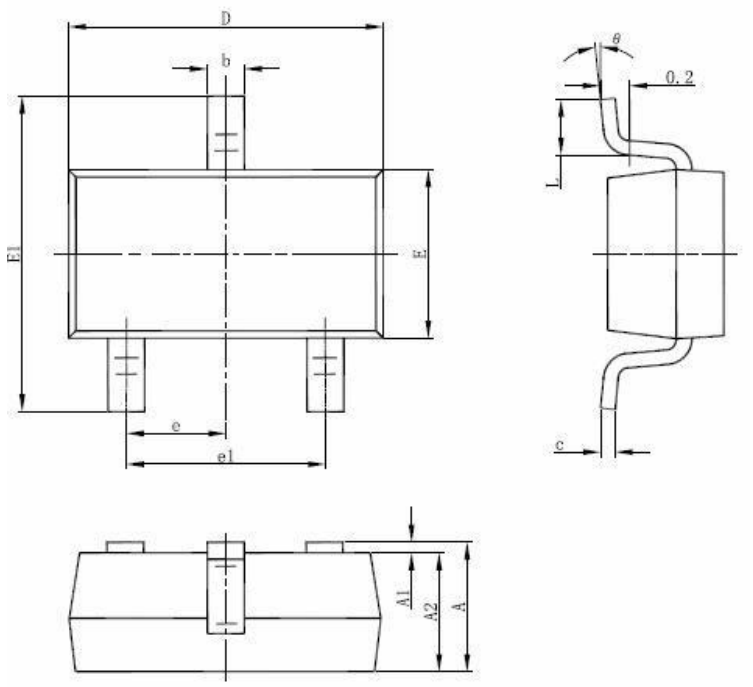


3) Switch Time Test Circuit





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°