

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

Product Summary

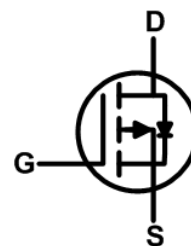
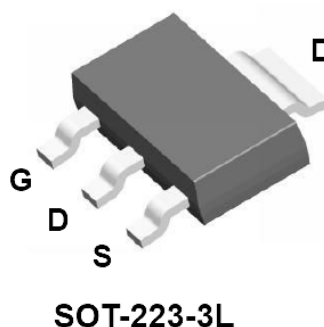


BVDSS	RDSON	ID
-100V	194mΩ	-10A

Description

The UD10P10K is the high cell density trenched N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications. The UD10P10K meet the RoHS and Green Product requirement with full function reliability approved.

SOT223 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ -10V ¹	-10	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ -10V ¹	-4	A
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ -10V ¹	-2.5	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, V_{GS} @ -10V ¹	-2.0	A
I_{DM}	Pulsed Drain Current ²	-20	A
EAS	Single Pulse Avalanche Energy ³	---	mJ
I_{AS}	Avalanche Current	---	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	2.4	W
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ⁴	1	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	69.4	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	8	$^\circ\text{C/W}$

P-Channel Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V$, $I_D=-3A$	---	194	242	$m\Omega$
		$V_{GS}=-4.5V$, $I_D=-2A$	---	217	271	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-1.2	-2	-2.3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-100V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-100V$, $V_{GS}=0V$, $T_J=85^\circ\text{C}$	---	---	-30	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	---	---	Ω
Q_g	Total Gate Charge (-10V)	$V_{DS}=-50V$, $V_{GS}=-10V$, $I_D=-2A$	---	29	---	nC
Q_{gs}	Gate-Source Charge		---	2.9	---	
Q_{gd}	Gate-Drain Charge		---	5.2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-50V$, $V_{GS}=-10V$, $R_G=3.3\Omega$, $I_D=-2A$	---	9.6	---	ns
T_r	Rise Time		---	17	---	
$T_{d(off)}$	Turn-Off Delay Time		---	60	---	
T_f	Fall Time		---	36	---	
C_{iss}	Input Capacitance	$V_{DS}=-50V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1290	---	pF
C_{oss}	Output Capacitance		---	34	---	
C_{rss}	Reverse Transfer Capacitance		---	28	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	10.0	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^\circ\text{C}$	---	---	-1.2	V

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2.The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

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 Characteristics

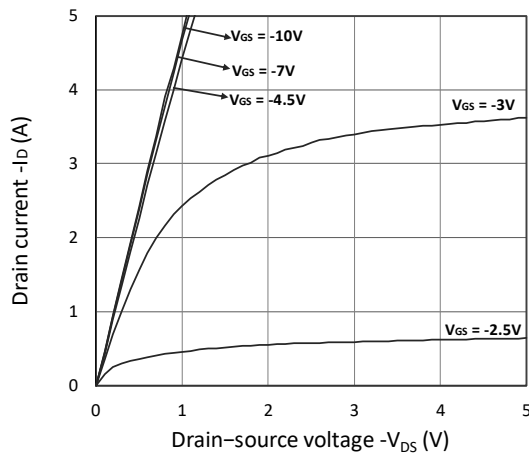


Figure 1. Output Characteristics

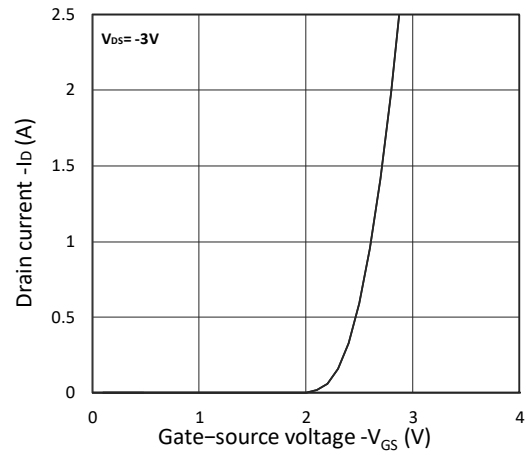


Figure 2. Transfer Characteristics

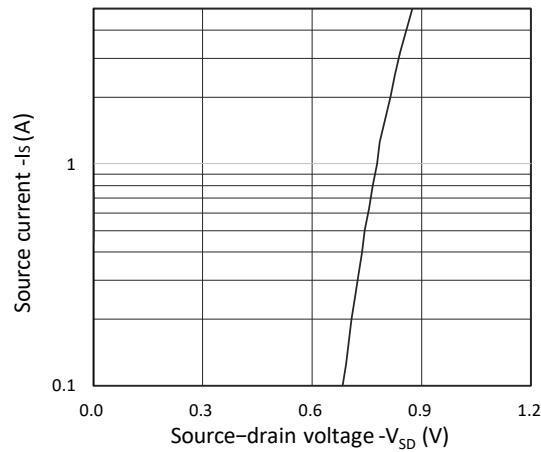


Figure 3. Forward Characteristics of Reverse

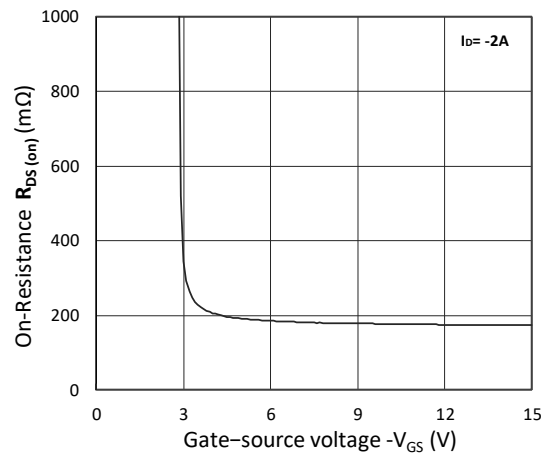


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

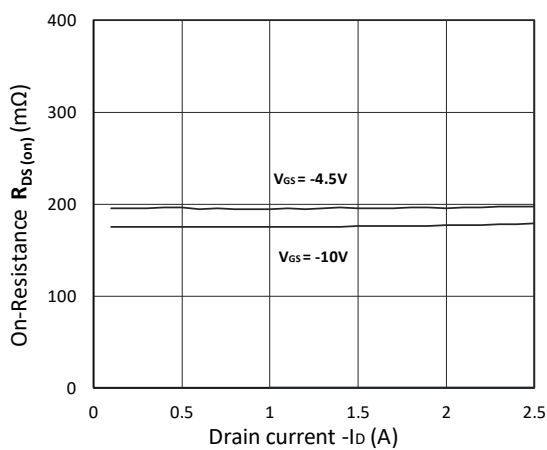


Figure 5. $R_{DS(ON)}$ vs. I_D

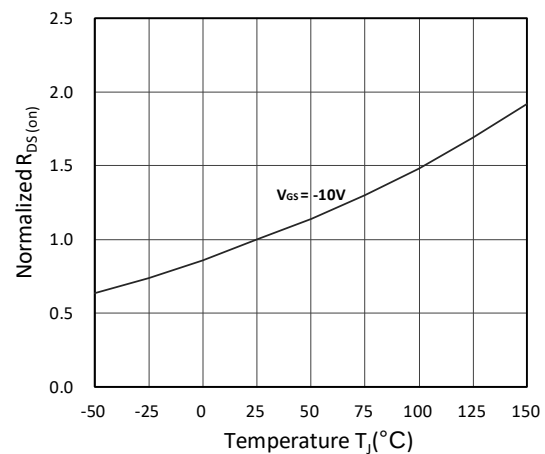


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

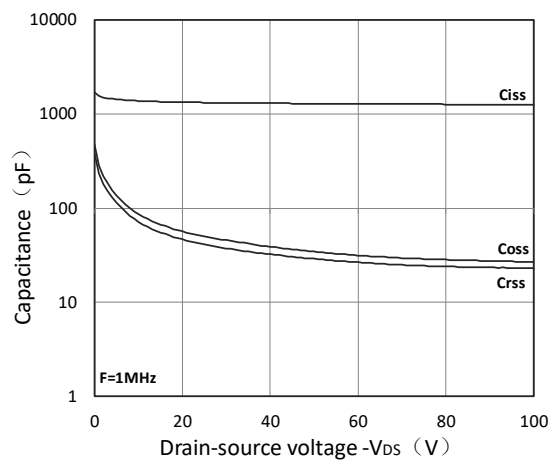


Figure 7. Capacitance Characteristics

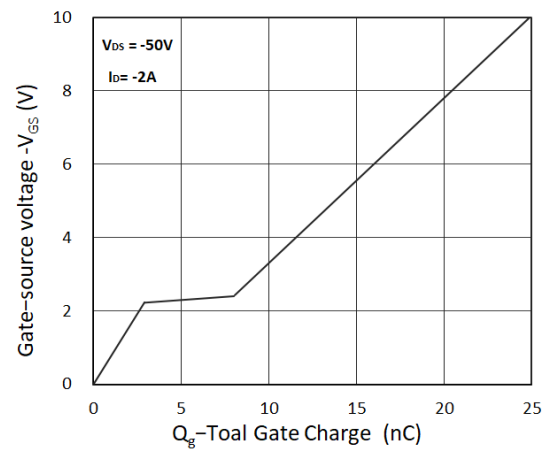
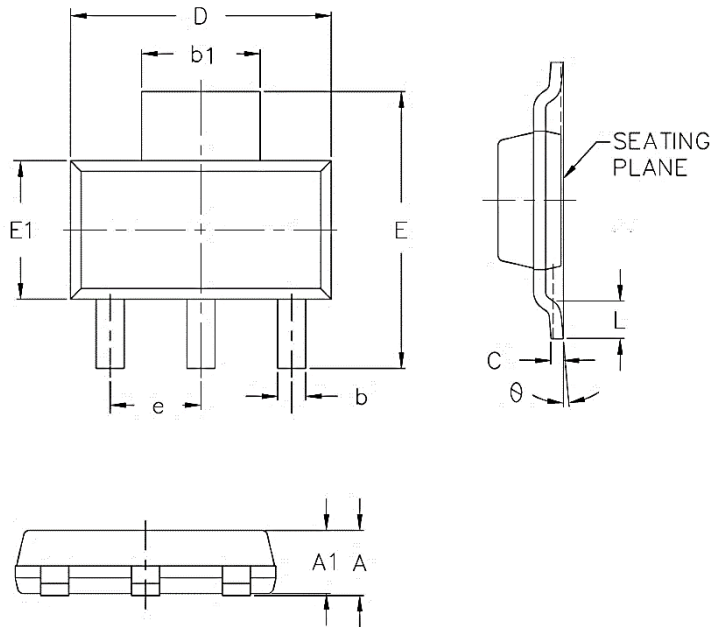


Figure 8. Gate Charge Characteristics

Mechanical Dimensions for SOT-223-3L



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	-	1.80
A1	1.45	1.75
b	0.60	0.84
b1	2.90	3.10
C	0.23	0.35
D	6.20	6.70
E	6.70	7.30
E1	3.30	3.70
e	2.30BSC	
L	0.80	-
θ	0°	10°