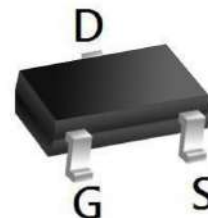


P-Ch 30V Fast Switching MOSFETs

Features:

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

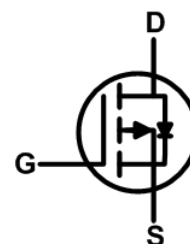


Description:

The KN3601S is the high cell density trench P-ch MOSFETs, which provides excellent $R_{DS(on)}$ and efficiency for most of the small power switching and load switch applications.

The KN3601S meet the RoHS and Green Product requirement with full function reliability approved.

SOT23S Pin Configurations



Product Summary

BVDSS	$R_{DS(on)}$	I_D
-30V	53m Ω	-4.3A

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current	-4.3	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current	-3.6	A
I_{DM}	Pulsed Drain Current ²	-20	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	1.4	W
$P_D@T_A=70^\circ\text{C}$	Total Power Dissipation ³	0.9	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	---	125	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹ (t ≤ 10 s)	---	85	$^\circ\text{C/W}$

Symbol	Parameter	Conditions	Min	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
$\Delta BV_{DSS}/\Delta$	BV_{DSS} Temperature Coefficient	Reference to $25^\circ C, I_D=-1mA$	---	-	---	$V/^\circ C$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V, I_D=-3A$	---	---	53	$m\Omega$
		$V_{GS}=-4.5V, I_D=-3A$	---	---	60	
		$V_{GS}=-2.5V, I_D=-2A$	---	---	80	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-	---	-1.2	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2.6	---	$mV/^\circ C$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-24V, V_{GS}=0V, T_J=25^\circ C$	---	---	-1	μA
		$V_{DS}=-24V, V_{GS}=0V, T_J=55^\circ C$	---	---	-5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=-5V, I_D=-3A$	---	5.6	---	S
Q_g	Total Gate Charge (-4.5V)	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-3A$	---	11.9	---	nC
Q_{gs}	Gate-Source Charge		---	1.8	---	
Q_{gd}	Gate-Drain Charge		---	3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V, V_{GS}=-4.5V, R_G=3.3\Omega, I_D=-3A$	---	6.6	---	ns
T_r	Rise Time		---	27.8	---	
$T_{d(off)}$	Turn-Off Delay Time		---	46.2	---	
T_f	Fall Time		---	20.6	---	
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$	---	920	---	pF
C_{oss}	Output Capacitance		---	73	---	
C_{rss}	Reverse Transfer Capacitance		---	71	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max.	Uni
I_S	Continuous Source Current ^{1,4}	$V_G=V_D=0V$, Force Current	---	---	-4.3	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	---	---	-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 $150^\circ C$ 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

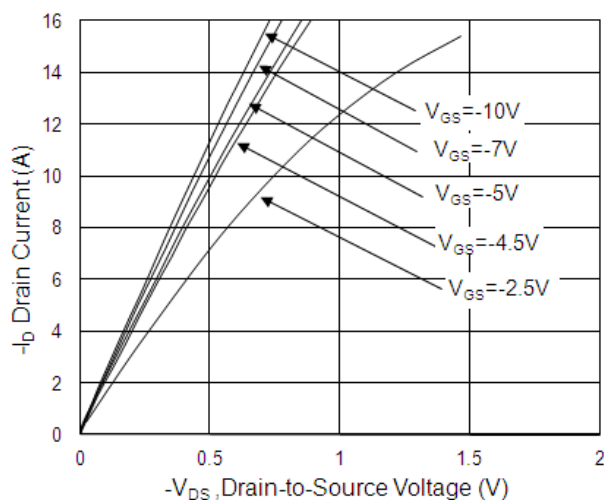


Fig.1 Typical Output Characteristics

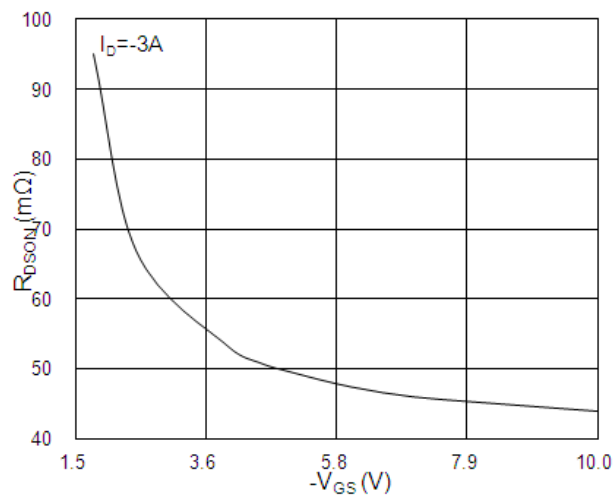


Fig.2 On-Resistance vs. G-S Voltage

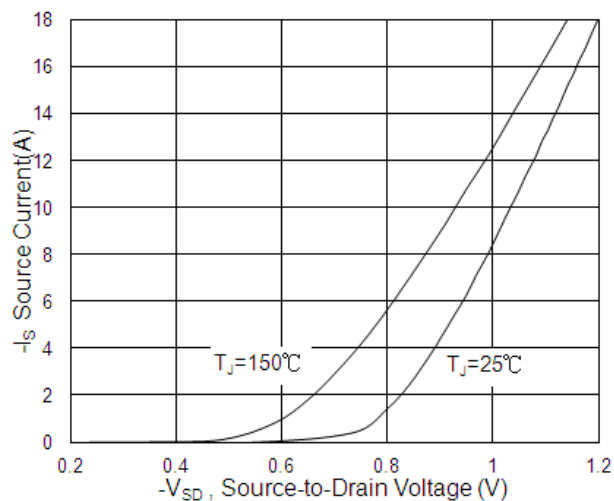


Fig.3 Forward Characteristics Of Reverse

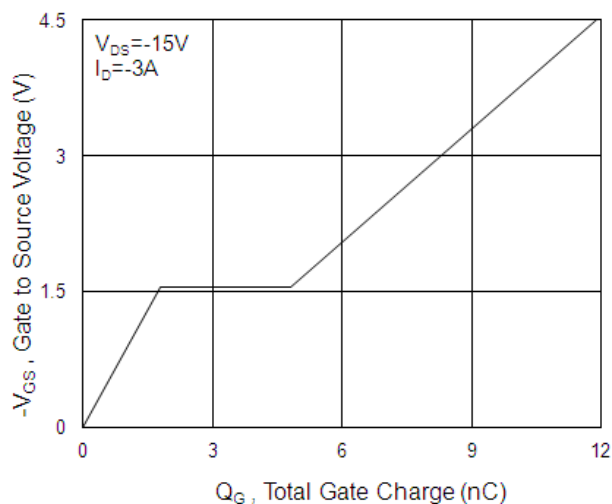


Fig.4 Gate-Charge Characteristics

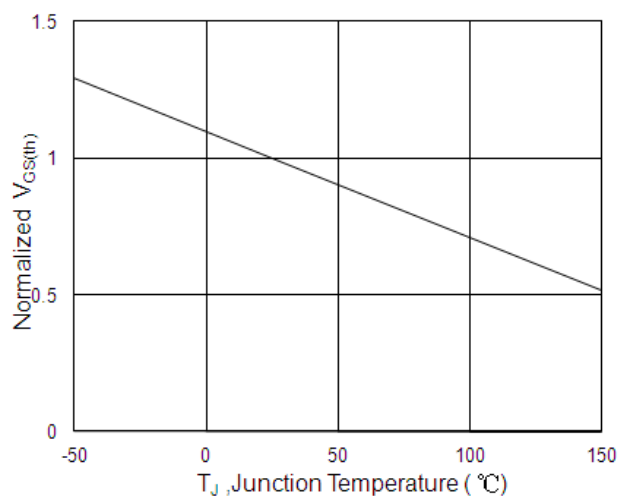


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

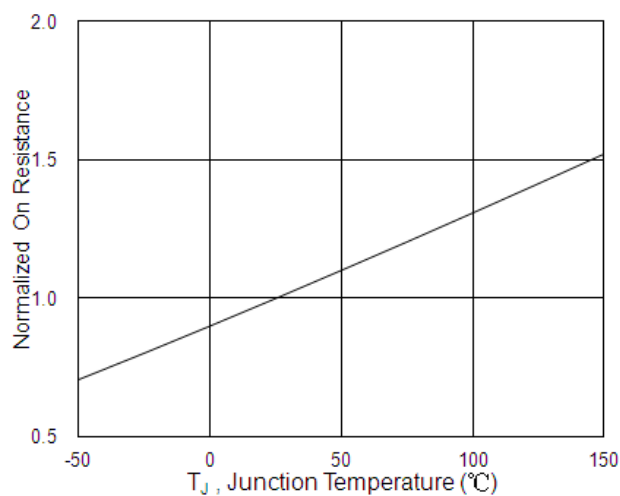


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

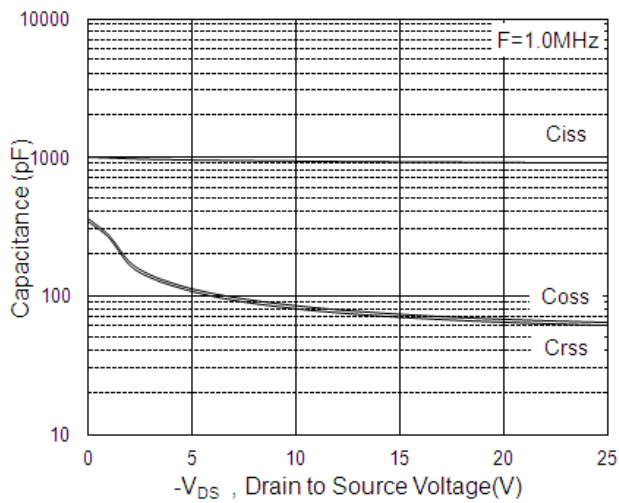


Fig.7 Capacitance

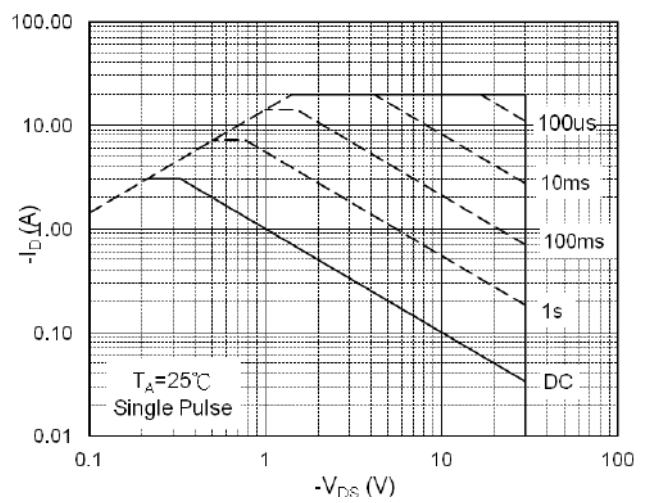


Fig.8 Safe Operating Area

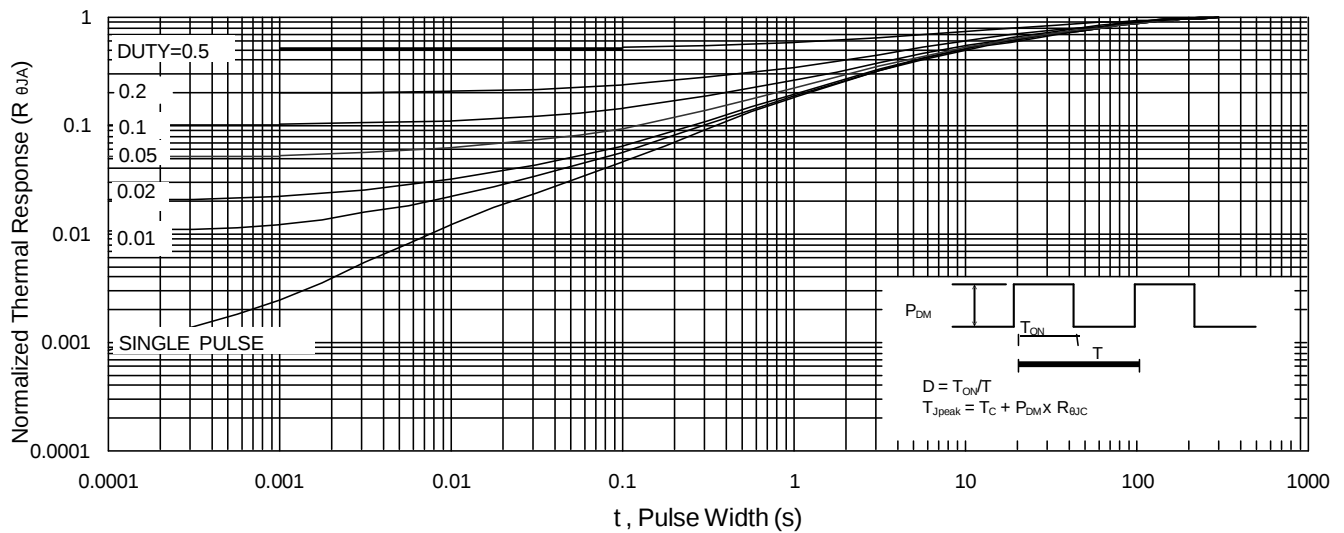


Fig.9 Normalized Maximum Transient Thermal Impedance

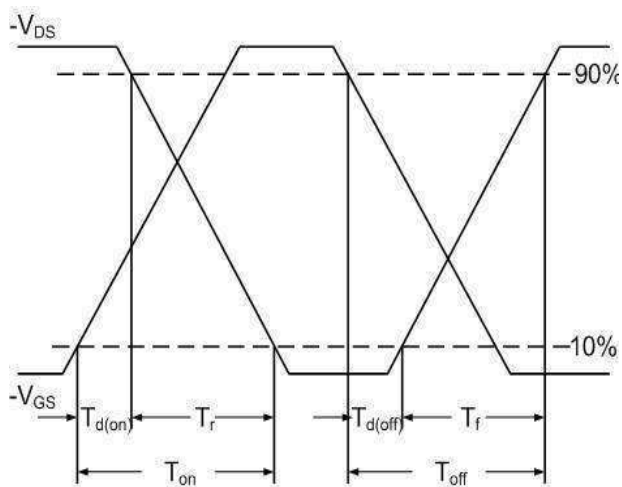


Fig.10 Switching Time Waveform

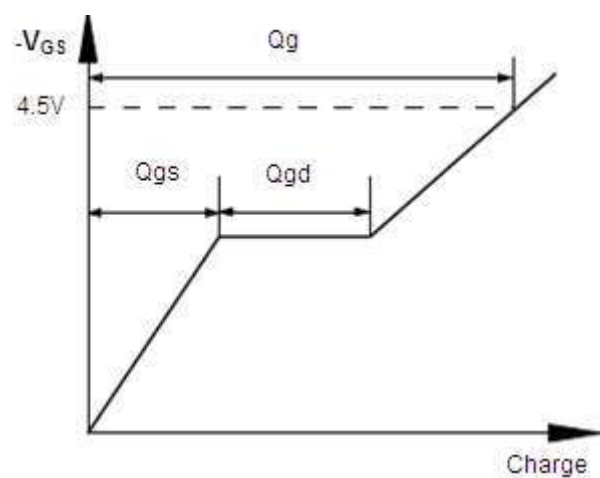
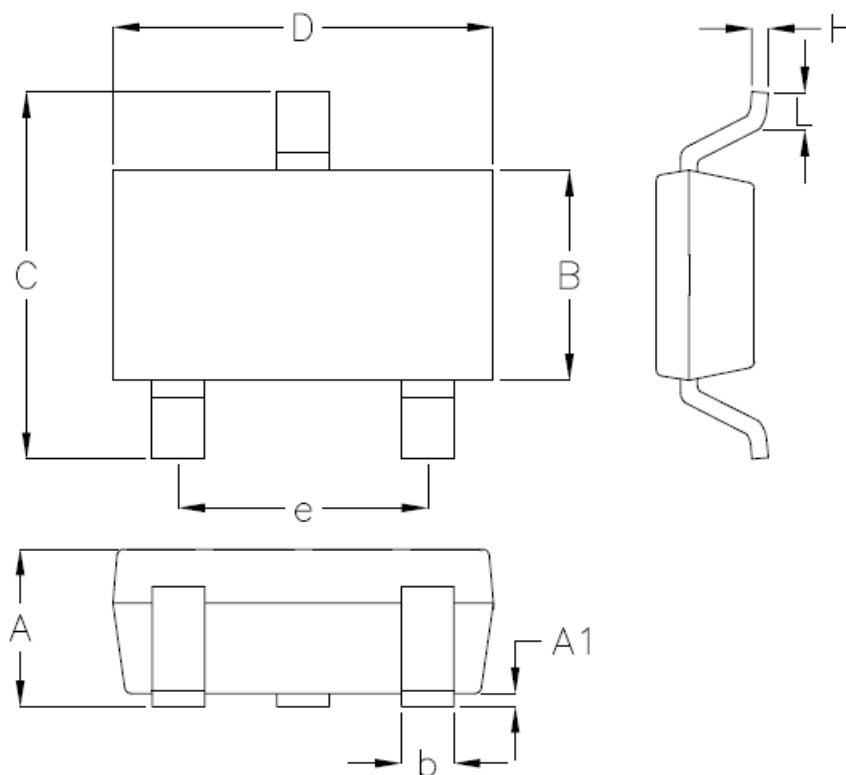


Fig.11 Gate Charge Waveform

SOT-23S Package Outline



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.890	1.295	0.035	0.051
A1	0.000	0.152	0.000	0.006
B	1.200	1.400	0.047	0.055
b	0.300	0.508	0.012	0.020
C	2.100	2.640	0.083	0.104
D	2.692	3.099	0.106	0.122
e	1.793	2.007	0.070	0.079
H	0.080	0.254	0.003	0.010
L	0.300	0.610	0.012	0.024