KST2N7002

60V N-Channel MOSFET

General Description

The KST2N7002 is the highest performance trench N-ch MOSFET with extreme high cell density , which provide excellent RDSON and gate charge for most of the small power switching and load switch applications.

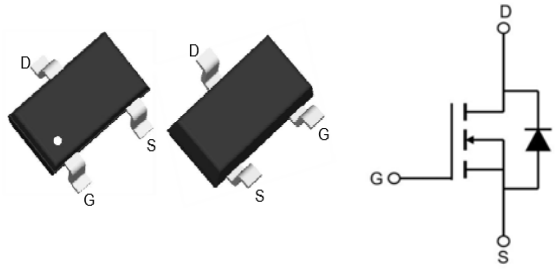
Product Summary

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (mA)
60	1.4 at V_{GS} = 10V	300
	1.7at V_{GS} = 4.5 V	260

Features

- Voltage controlled small signal switch
- Low input Capacitance
- Fast Switching Speed

SOT-23 Pin Configuration



Applications

- Direct logic-level interface: TTL/CMOS
- Battery operated systems
- Solid-state relays

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25℃)	300	mA
	Drain Current – Continuous (T_C=100℃)	265	mA
I_{DM}	Drain Current – Pulsed[1]	1.0	A
P_D	Power Dissipation (T_C=25℃)	0.034	W
	Power Dissipation (T_C=100℃)	0.021	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	29	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	1.5	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	60	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=20V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=20V , V_{GS}=0V , T_J=125℃	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±10V , V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=300mA	---	1.3	2.3	Ω
		V_{GS}=4.5V , I_D=260mA	---	1.7	3.0	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	1.3	2.5	V
gfs	Forward Transconductance	V_{DS}=10V , I_S=300mA	---	30	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge	V_{DS}=30V , V_{GS}=10V , I_D=0.03A	---	1.3	---	nC
Q_{gs}	Gate-Source Charge		---	0.5	---	
Q_{gd}	Gate-Drain Charge		---	0.6	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=30V,R_L=3.3Ω V_{GS}=10V,R_G=6Ω	---	3.5	---	ns
T_r	Rise Time		---	11	---	
$T_{d(off)}$	Turn-Off Delay Time		---	6.2	---	
T_f	Fall Time		---	2.0	---	
C_{iss}	Input Capacitance	V_{DS}=30V , V_{GS}=0V , F=1MHz	---	50	---	pF
C_{oss}	Output Capacitance		---	18	---	
C_{rss}	Reverse Transfer Capacitance		---	12	---	

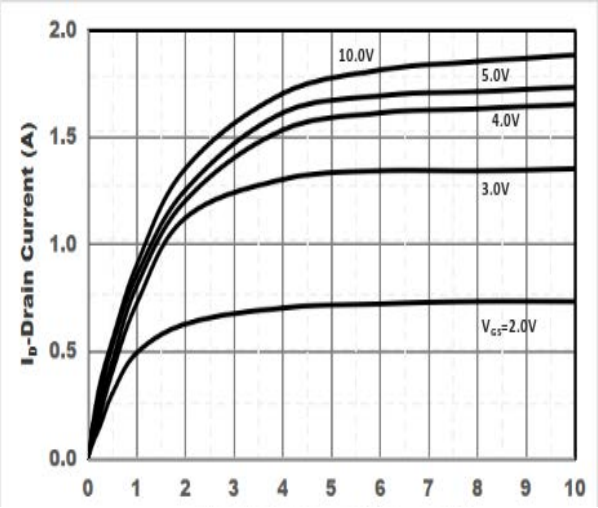
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	300	mA
I_{SM}	Pulsed Source Current		---	---	800	mA
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.0	V

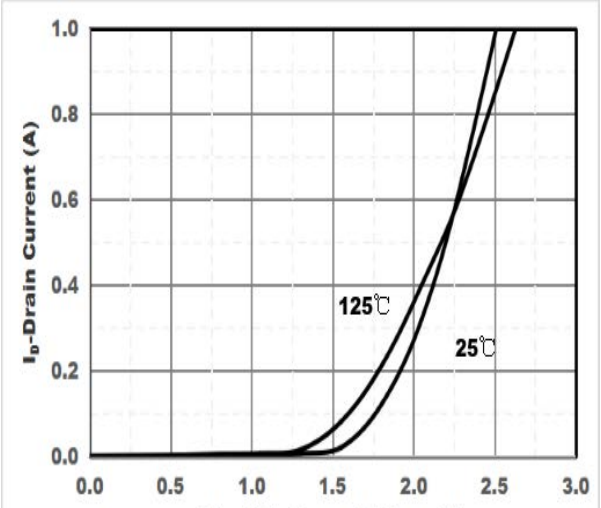
Note :

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

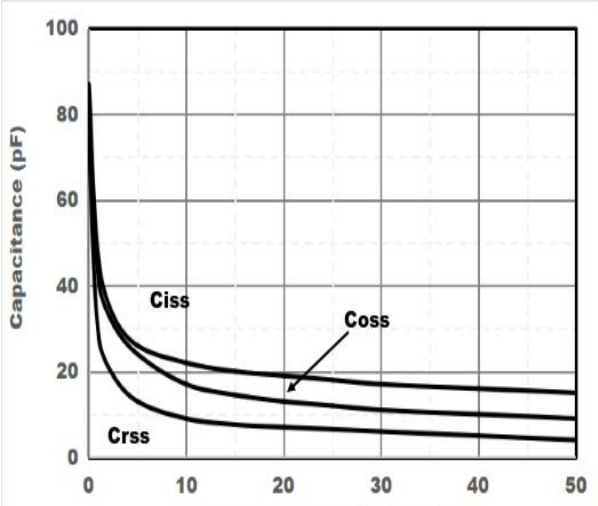
Typical Electrical and Thermal Characteristics (Curves)



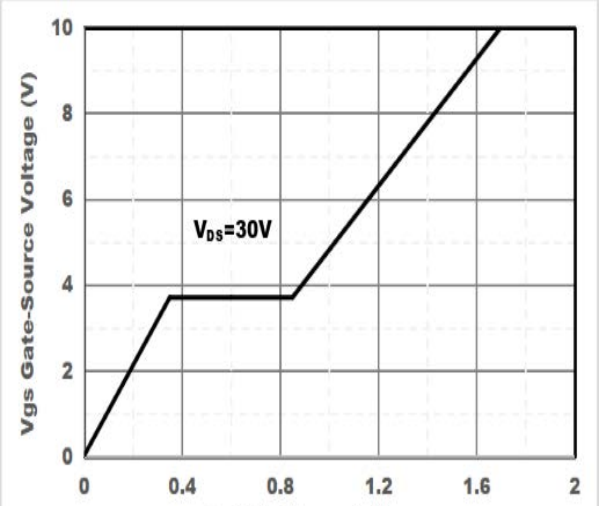
Vds Drain-Source Voltage (V)
Fig.1 Output Characteristics



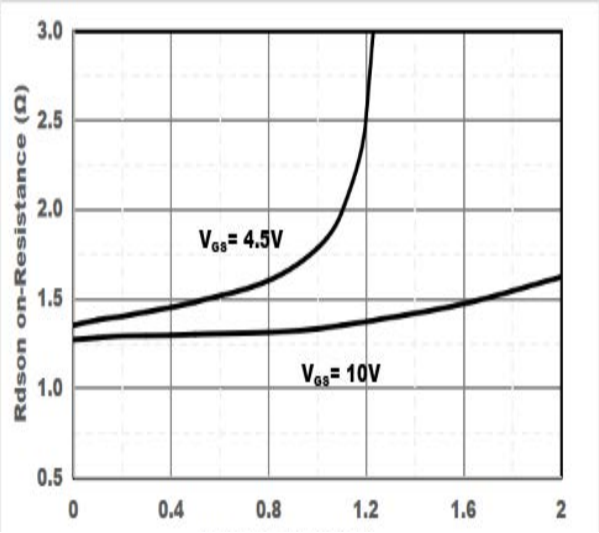
Vgs Gate-Source Voltage (V)
Fig. 2 Transfer Characteristics



Vds Drain-Source Voltage (V)
Figure3. Capacitance Characteristics

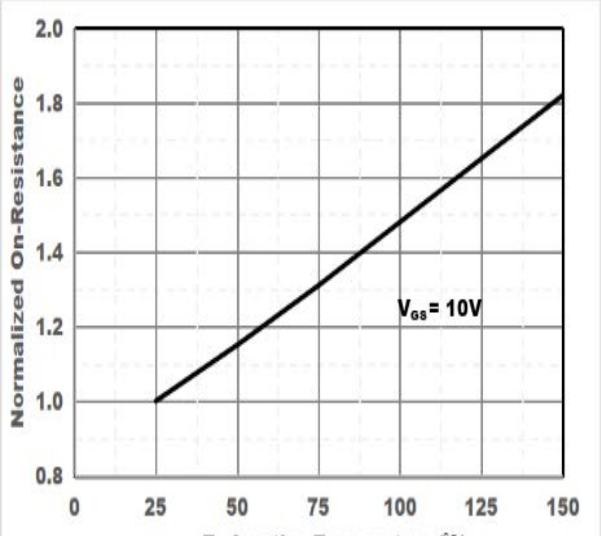


Qg Gate Charge (nC)
Figure4. Gate Charge



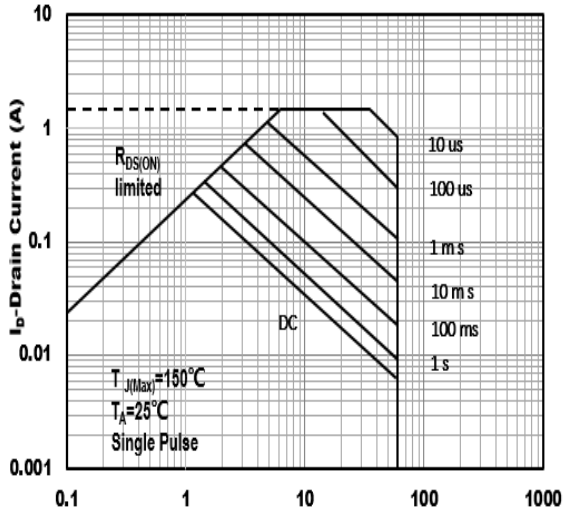
ID- Drain Current (A)

Figure5. Drain-Source on Resistance



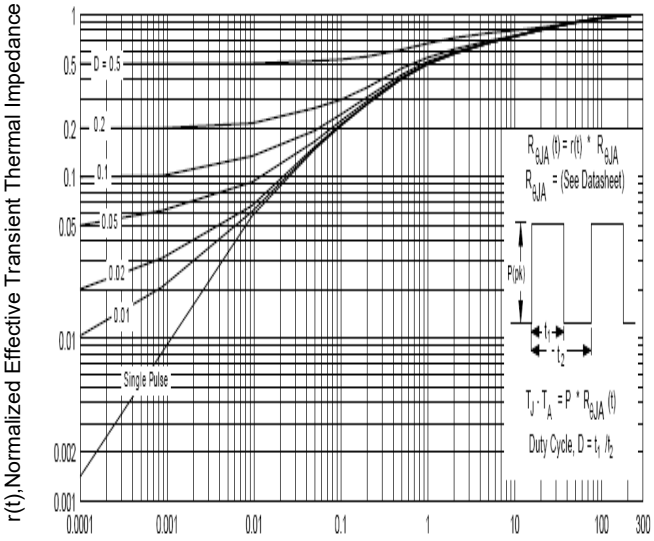
TJ-Junction Temperature(℃)

Figure6. Drain-Source on Resistance



Vds Drain-Source Voltage (V)

Figure7. Safe Operation Area



Square Wave Pluse Duration(sec)

Figure 8 Normalized Maximum Transient Thermal Impedance

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