

General Description

The KST2312 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible onresistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

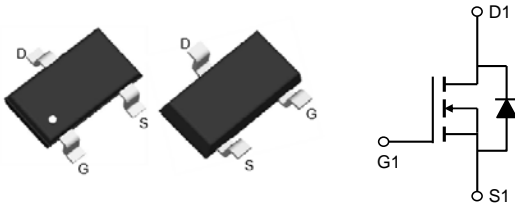
Product Summary

V _{DS} (V)	R _{DS(on)} (mΩ)	I _D (A)
20	24 at V _{GS} = 4.5 V	5.5
	30 at V _{GS} = 2.5 V	4.5

Features

- High power and current handing capability
- Lead free product is acquired
- Surface mount package

SOT-23-3L Pin Configuration



Applications

- Battery protection
- Load switch
- Power management

Absolute Maximum Ratings T_c=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	20	V
V _{GS}	Gate-Source Voltage	±12	V
I _D	Drain Current – Continuous (T _c =25°C)	5.5	A
	Drain Current – Continuous (T _c =100°C)	3.8	A
I _{DM}	Drain Current – Pulsed ¹	18	A
P _D	Power Dissipation (T _c =25°C)	1.0	W
	Power Dissipation (T _c =100°C)	0.01	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	65	°C/W
R _{θJC}	Thermal Resistance Junction to Case	---	17	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=20V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=5A$	---	24	32	$m\Omega$
		$V_{GS}=2.5V, I_D=3A$	---	30	43	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	0.8	1.5	V
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_S=5A$	---	15	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge	$V_{DS}=10V, V_{GS}=5V, I_D=3A$	---	9.5	---	nC
Q_{gs}	Gate-Source Charge		---	1.67	---	
Q_{gd}	Gate-Drain Charge		---	2.78	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=10V, I_D=3A$ $V_{GS}=5V, R_G=6\Omega$	---	8	---	ns
T_r	Rise Time		---	32	---	
$T_{d(off)}$	Turn-Off Delay Time		---	25	---	
T_f	Fall Time		---	9	---	
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, F=1\text{MHz}$	---	670	---	pF
C_{oss}	Output Capacitance		---	83	---	
C_{rss}	Reverse Transfer Capacitance		---	68	---	

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	---	---	6	A
I_{SM}	Pulsed Source Current		---	---	14	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.2	V

Note :

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

Typical Electrical and Thermal Characteristics (Curves)

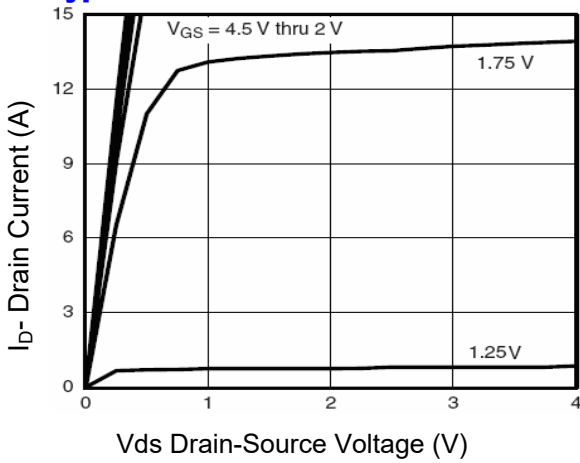


Fig. 1 Output Characteristics

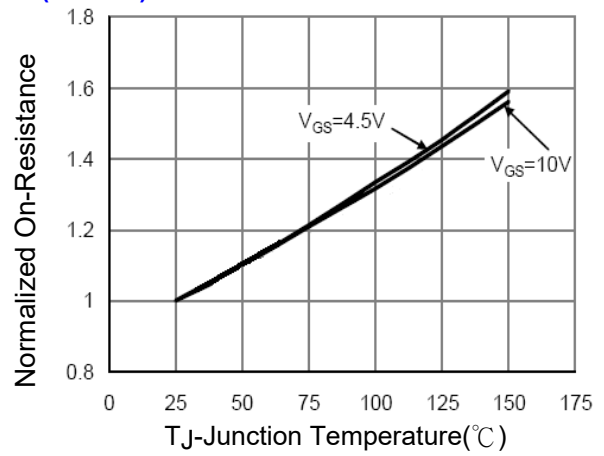


Fig. 4 Drain-Source On-Resistance

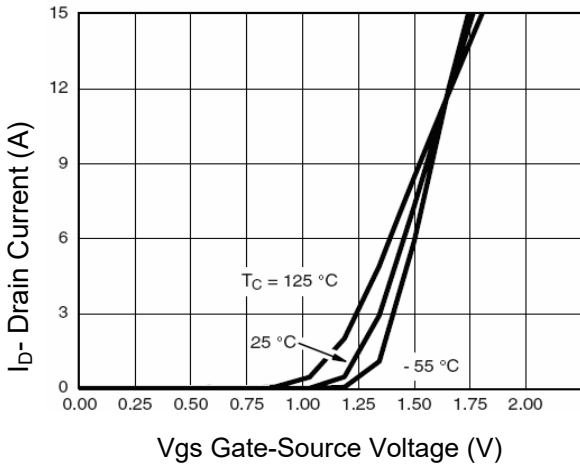


Fig. 2 Transfer Characteristics

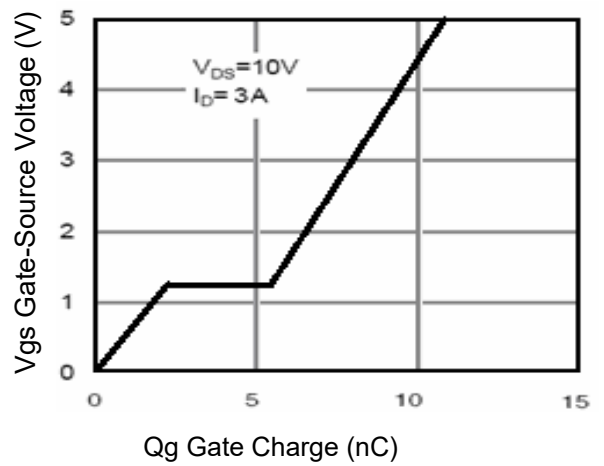


Fig. 5 Gate Charge

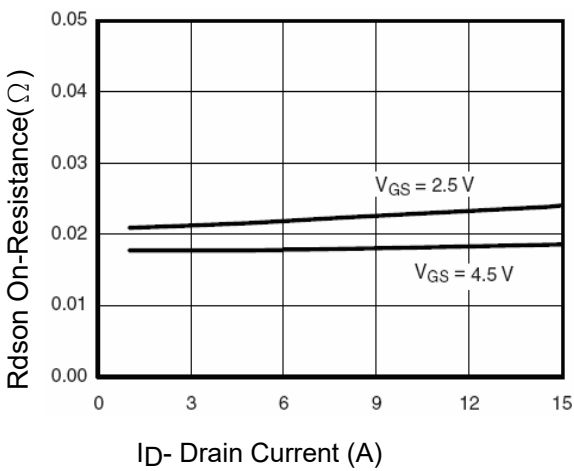


Fig. 3 Rdson- Drain Current

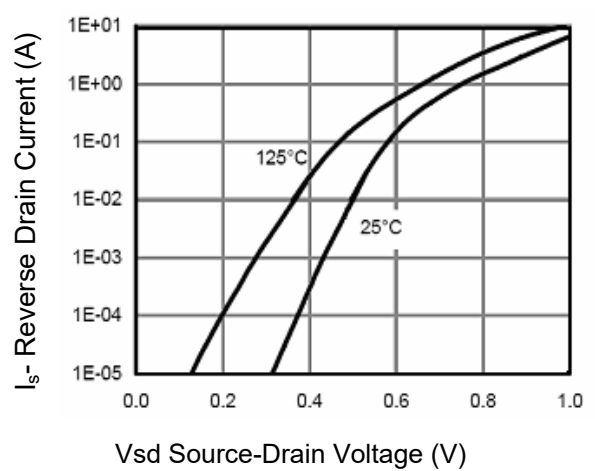


Fig. 6 Source- Drain Diode Forward

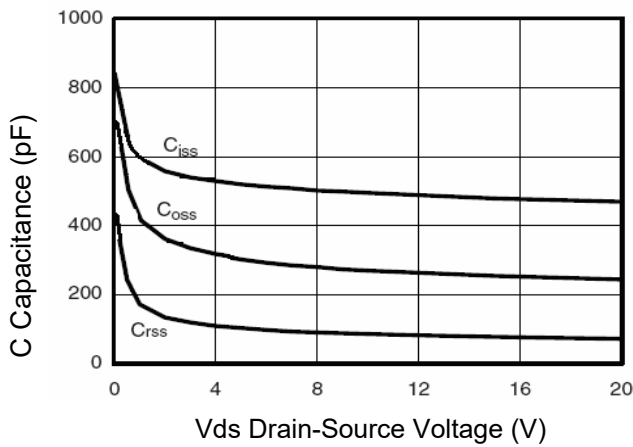


Fig.7 Capacitance vs Vds

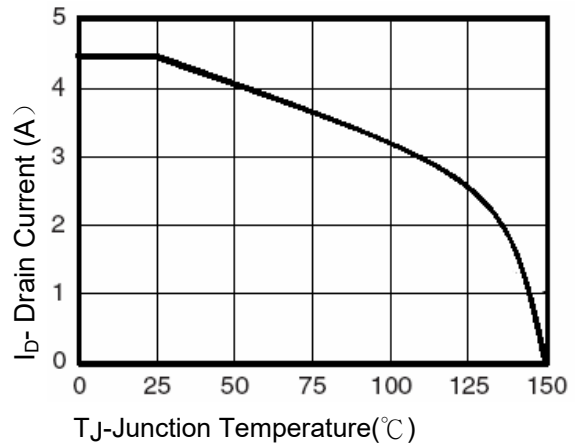


Fig. 8 Drain Current

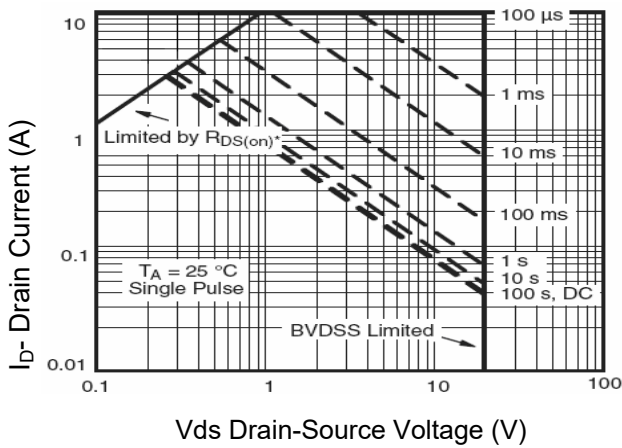


Fig.9 Safe Operation Area

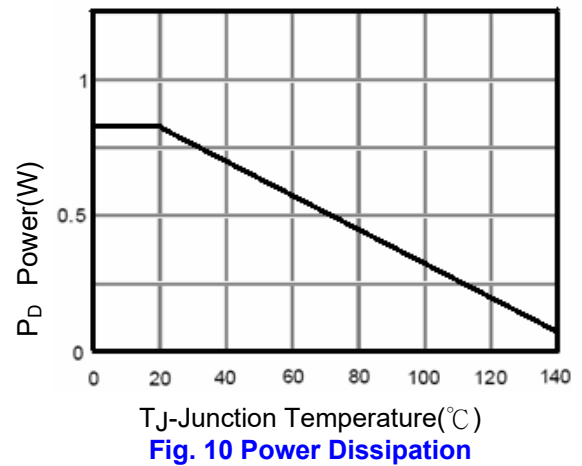


Fig. 10 Power Dissipation

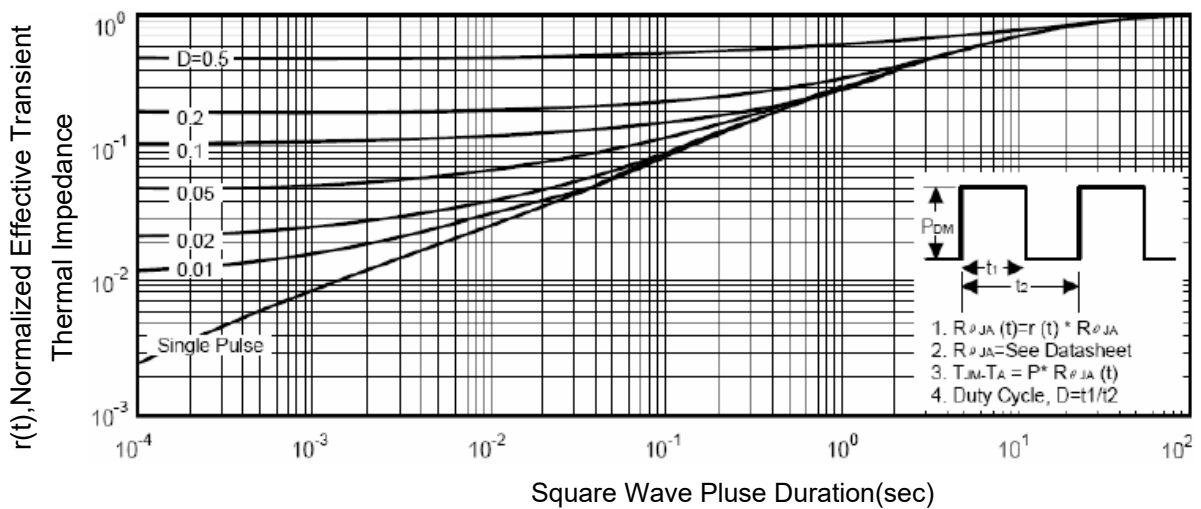


Fig.11 Normalized Maximum Transient Thermal Impedance

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