KSI6024

60V N-Channel MOSFET

General Description

The KSI6024 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance 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)
60	23 at V_{GS} = 10 V	20
	28 at V_{GS} = 4.5 V	18

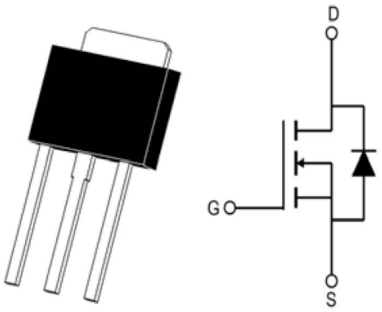
Features

- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

TO-251 Pin Configuration



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℃)	20	A
	Drain Current – Continuous (T_C=100℃)	14.5	A
I_{DM}	Drain Current – Pulsed[1]	60	A
P_D	Power Dissipation (T_C=25℃)	34	W
	Power Dissipation (T_C=100℃)	1.12	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	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	1.4	℃/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}=55V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=55V , V_{GS}=0V , T_J=125℃	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=10A	---	23	28	mΩ
		V_{GS}=4.5V , I_D=5A	---	28	35	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	1.7	2.4	V
gfs	Forward Transconductance	V_{DS}=10V , I_S=10A	---	15	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=30V , V_{GS}=10V , I_D=10A	---	28	---	nC
Q_{gs}	Gate-Source Charge[2,3]		---	4.9	---	
Q_{gd}	Gate-Drain Charge[2,3]		---	7.6	---	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DS}=30V, R_L=3Ω V_{GS}=10V, R_G=3Ω	---	16	---	ns
T_r	Rise Time[2,3]		---	27	---	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	13	---	
T_f	Fall Time[2,3]		---	28	---	
C_{iss}	Input Capacitance	V_{DS}=30V , V_{GS}=0V , F=1MHz	---	1420	---	pF
C_{oss}	Output Capacitance		---	218	---	
C_{rss}	Reverse Transfer Capacitance		---	65	---	

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	---	---	20	A
I_{SM}	Pulsed Source Current		---	---	50	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	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
5. EAS condition:Tj=25℃,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25Ω

Typical Electrical and Thermal Characteristics (Curves)

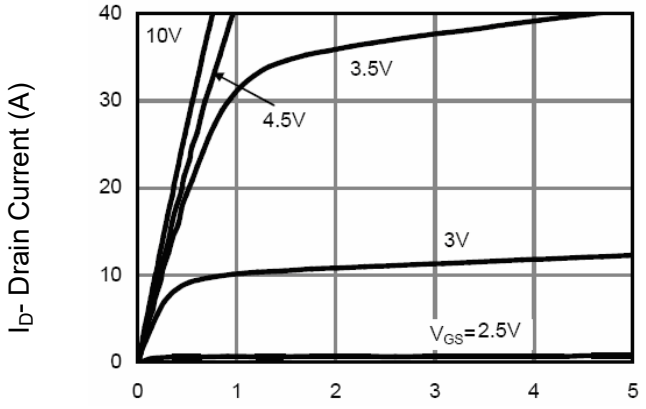


Fig.1 Output Characteristics

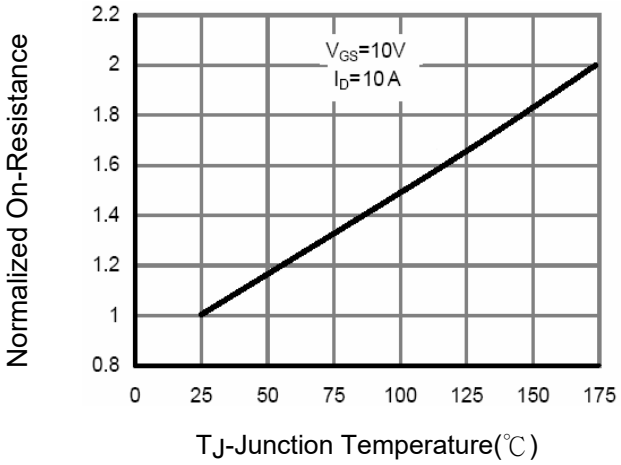


Fig. 4 Rdson-JunctionTemperature

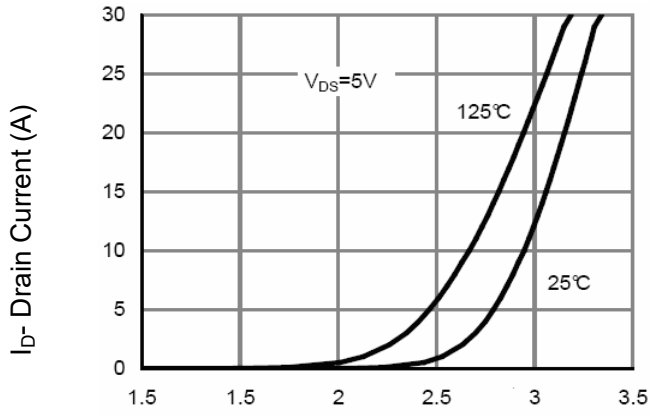


Fig. 2 Transfer Characteristics

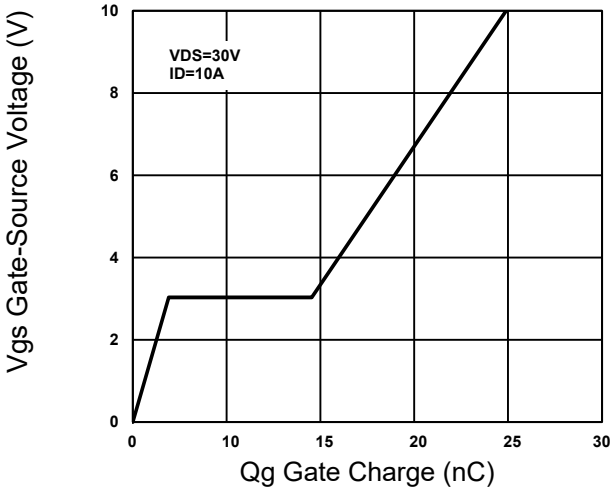


Fig. 5 Gate Charge

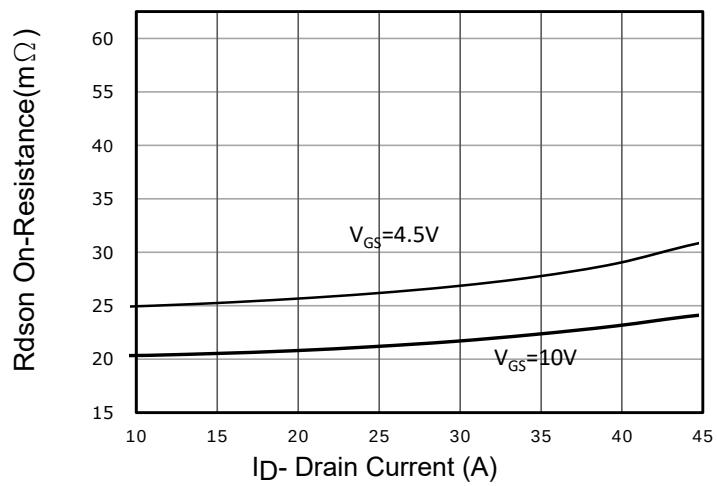


Fig. 3 Rdson- Drain Current

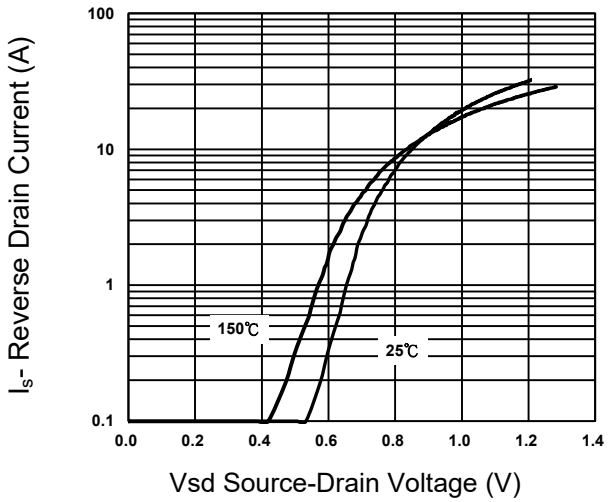
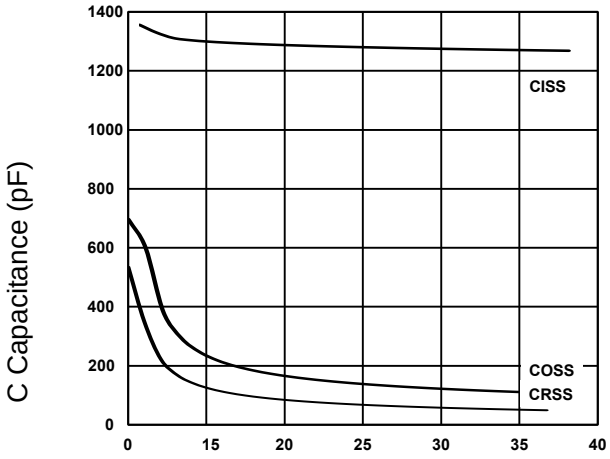


Fig. 6 Source- Drain Diode Forward



Figu.7 Capacitance vs Vds

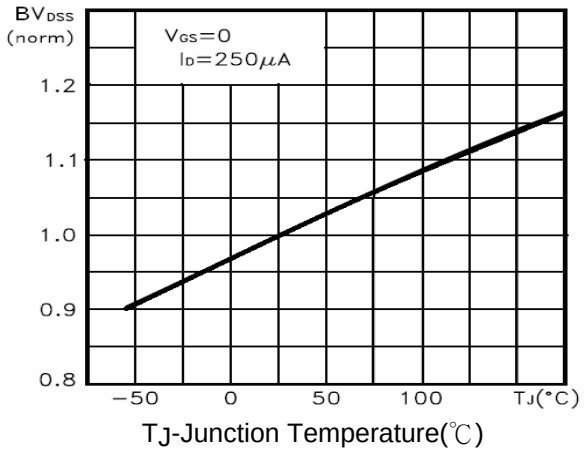


Fig. 8 BVDSS vs Junction Temperature

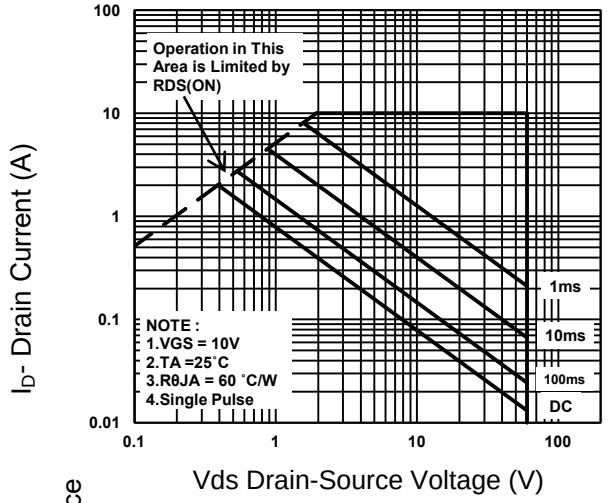


Fig.9 Safe Operation Area

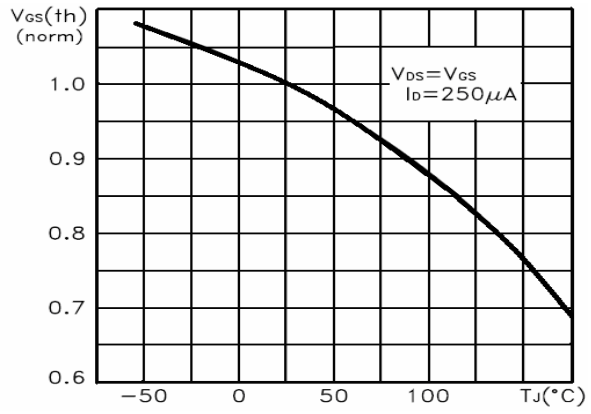


Fig. 10 VGS(th) vs Junction Temperature

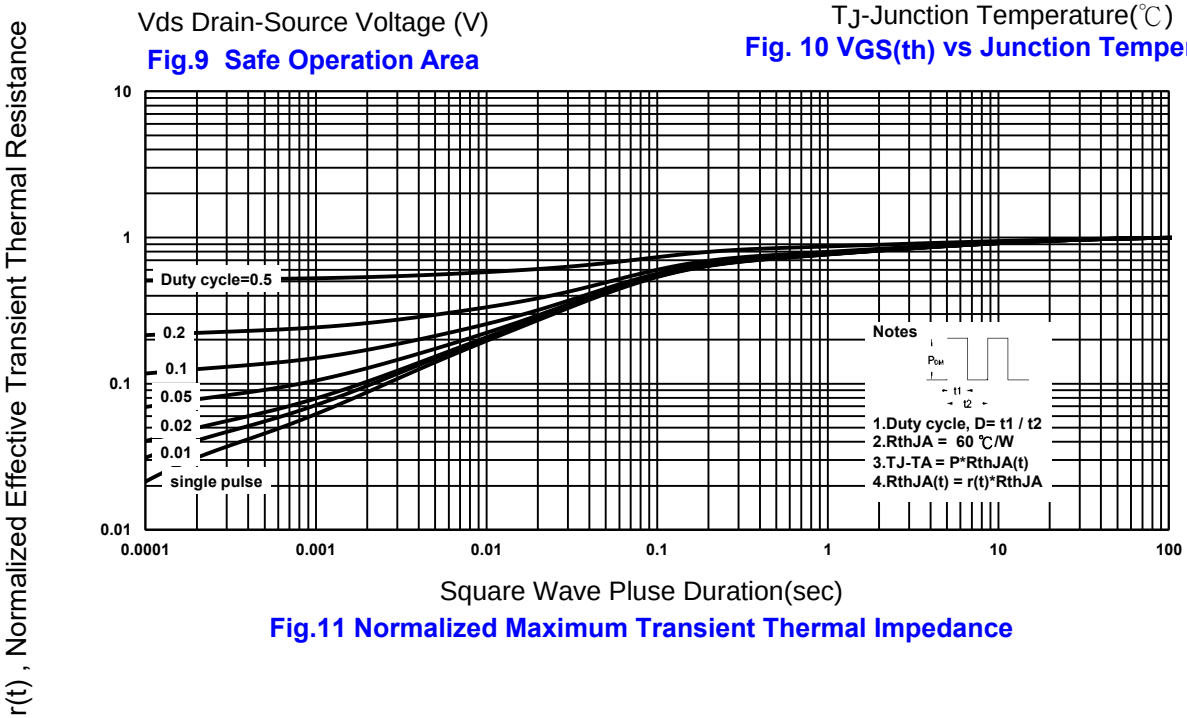


Fig.11 Normalized Maximum Transient Thermal Impedance

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