KSI60N1200

1200V N-Channel MOSFET

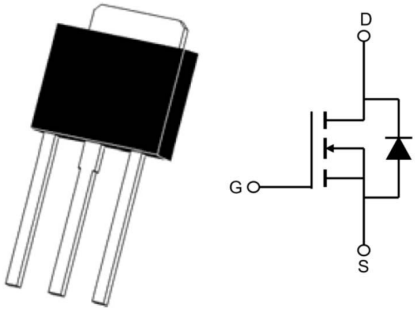
General Description

The KSI60N1200 is the silicon N-channel Enhanced MOSFET, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.

Product Summary

V_{DS} (V)	$R_{DS(on)}$ (mΩ)	I_D (A)
1200	38 at V_{GS} = 20 V	60

TO-251 Pin Configuration



Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness
- Halogen Free, RoHS Compliant

Applications

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters

Absolute Maximum Ratings T_C=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	1200	V
V_{GS}	Gate-Source Voltage	-10/+25	V
I_D	Drain Current – Continuous (T_C=25℃)	60	A
	Drain Current – Continuous (T_C=100℃)	40	A
I_{DM}	Drain Current – Pulsed[1]	300	A
P_D	Power Dissipation (T_C=25℃)	320	W
	Power Dissipation (T_C=100℃)	1.95	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	---	42	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.47	℃/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=100uA	655	700	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=1200V , V_{GS}=0V , T_J=25℃	---	---	5	uA
		V_{DS}=1200V , V_{GS}=0V , T_J=125℃	---	---	100	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=20V , V_{DS}=0V	---	---	±150	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=20V , I_D=20A	---	38	47	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	2.5	4.0	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	mV/℃
gfs	Forward Transconductance	V_{DS}=10V , I_S=30A	---	16	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=800V , V_{GS}=20V , I_D=20A	---	158	---	nC
Q_{gs}	Gate-Source Charge[2,3]		---	39	---	
Q_{gd}	Gate-Drain Charge[2,3]		---	62	---	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DS}=800V, I_D=40A V_{GS}=20V,R_G=5Ω	---	54	---	ns
T_r	Rise Time[2,3]		---	137	---	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	45	---	
T_f	Fall Time[2,3]		---	39	---	
C_{iss}	Input Capacitance	V_{DS}=1000V , V_{GS}=0V , F=1MHz	---	3640	---	pF
C_{oss}	Output Capacitance		---	189	---	
C_{rss}	Reverse Transfer Capacitance		---	32	---	

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	---	---	60	A
I_{SM}	Pulsed Source Current		---	---	190	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=15A , T_J=25℃	---	---	3.0	V

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristics (Curves)

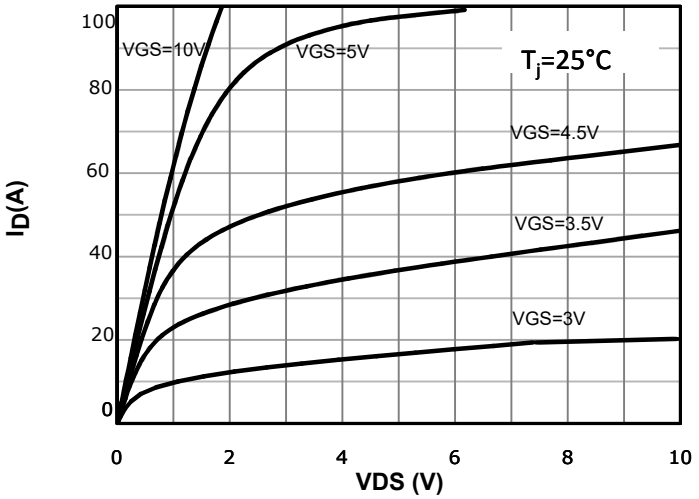
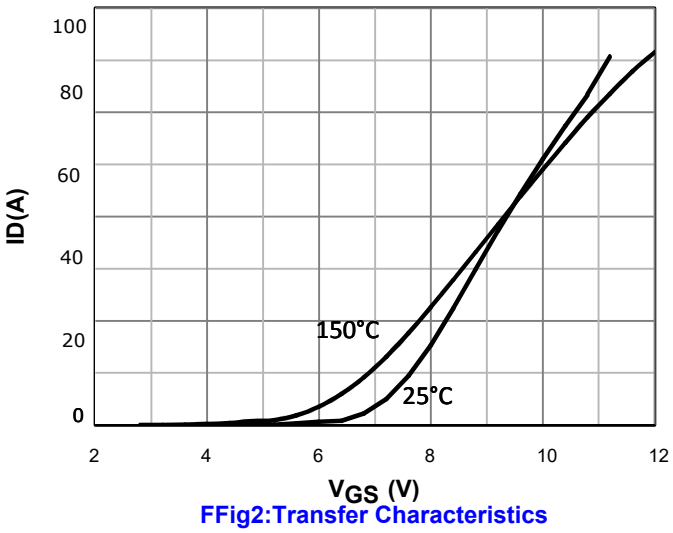
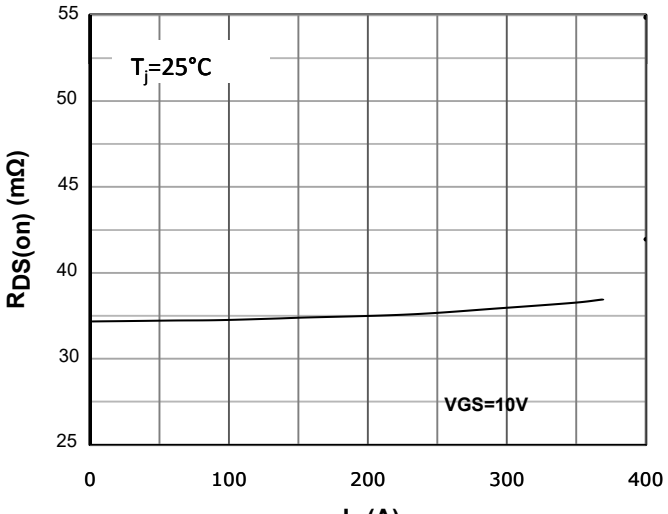


Fig1:Output Characteristics



FFig2:Transfer Characteristics



FFig3:Rdson- Drain Current

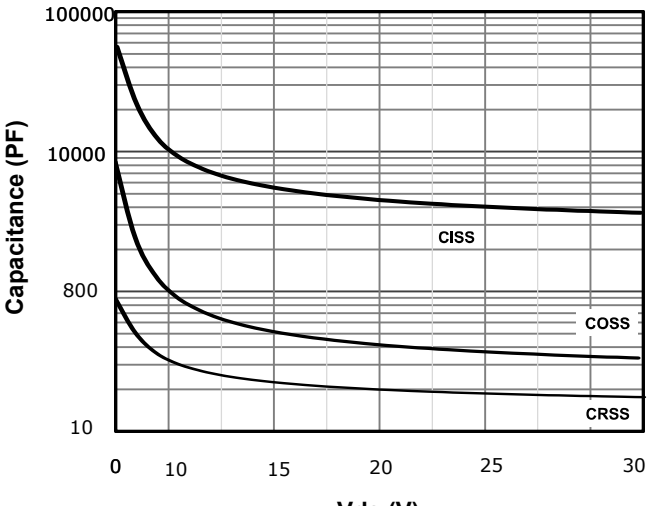


Fig4:Capacitance vs Vds

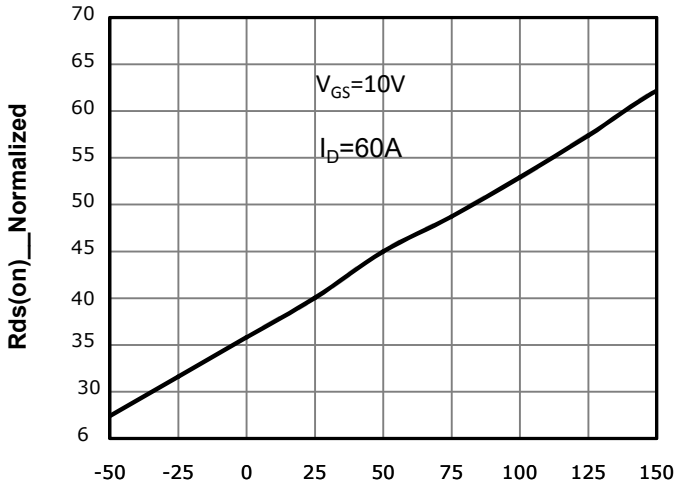


Fig5:Rds(on) vs. Temperature

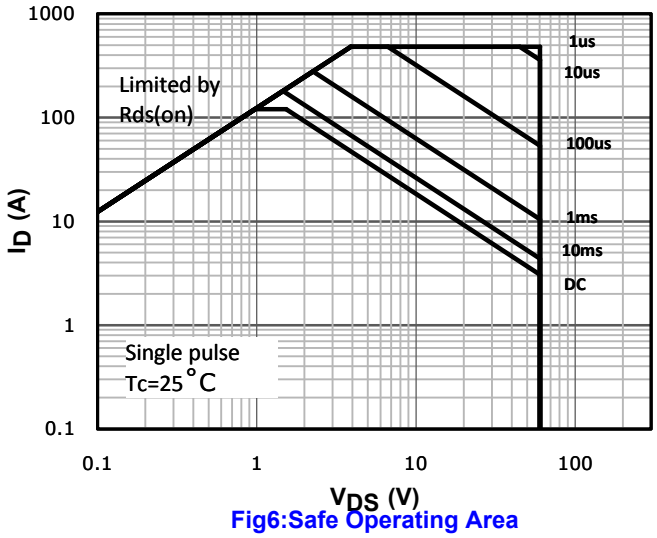


Fig6:Safe Operating Area

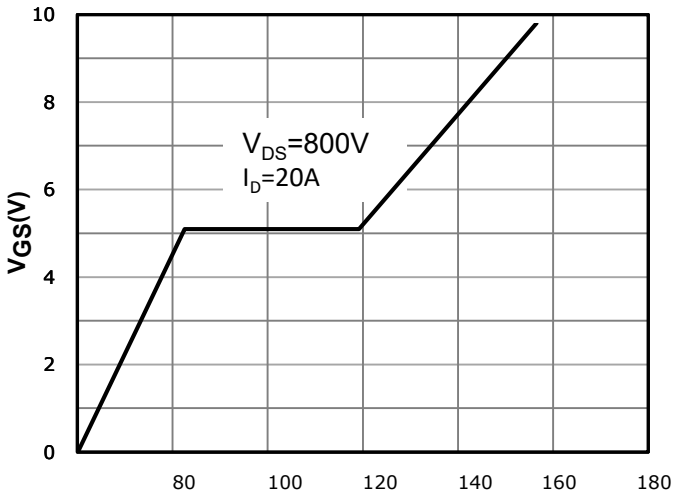


Fig7:Gate Charge

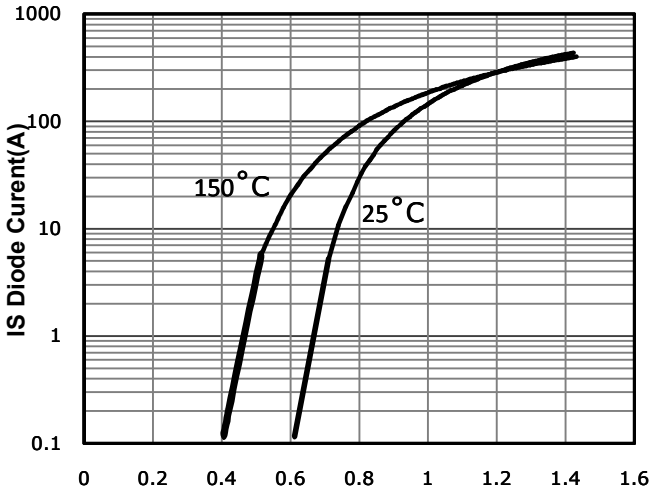


Fig8:Source- Drain Diode Forwrd

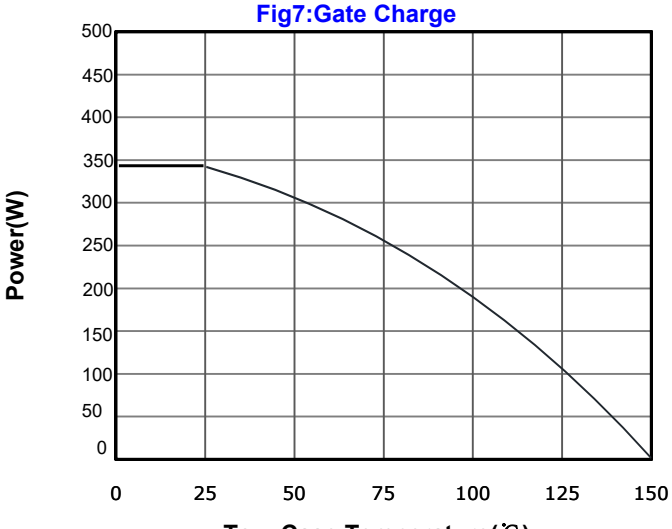


Fig9:Power Disipation

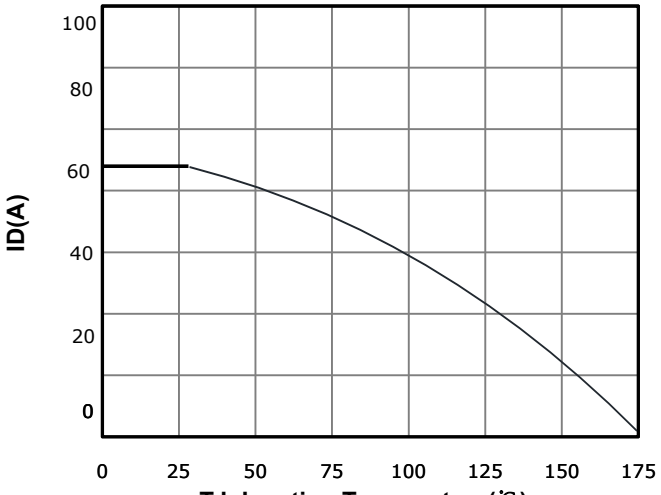


Fig10：IDCurrent- Junction Temperature

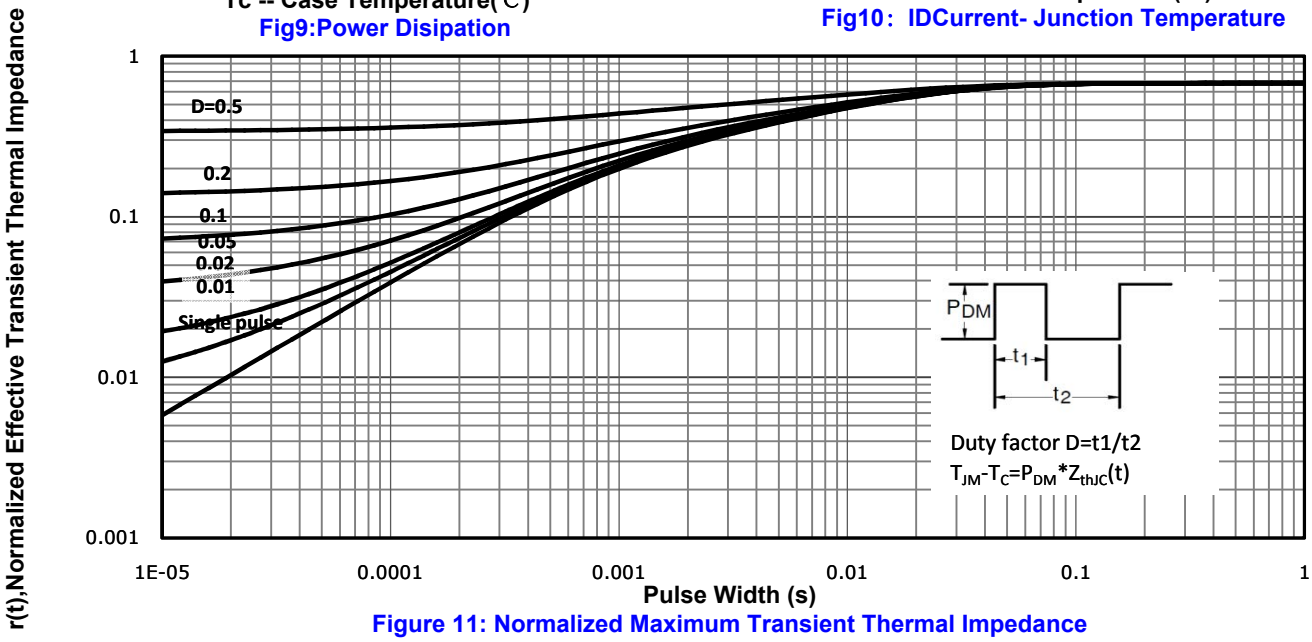


Figure 11: Normalized Maximum Transient Thermal Impedance

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