KSL190N12S

120V N-Channel MOSFET

GeneralDescription

The KSL190N12S use advanced MOSFET technology to provide low R_{DS}(ON), low gate charge, fast switching and excellent avalanche characteristics. This device is specially designed to get better ruggedness and suitable to use in Synchronous-rectification applications

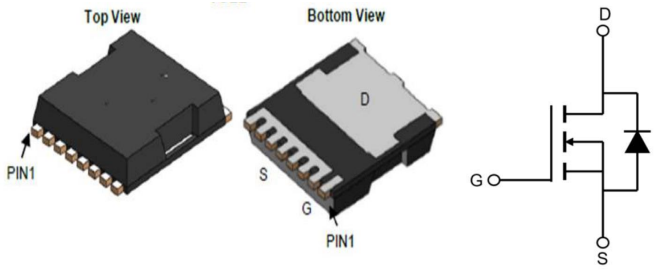
Product Summary

V_{DS} (V)	R_{DS}(on) (mΩ)	I_D (A)
120	5.8 at V_{GS} = 10 V	190

Features

- High density cell design for low R_{DS}(ON)
- Excellent package for heat dissipation
- Split Gate Trench MOSFET technology

TOLL Pin Configuration



Applications

- DC-DC Converters
- Motor control
- Power management functions

100% UIS TESTED!
100% ΔVds TESTED!

Absolute Maximum Ratings T_C=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	120	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25℃)	190	A
	Drain Current – Continuous (T_C=100℃)	100	A
I_{DM}	Drain Current – Pulsed[1]	480	A
P_D	Power Dissipation (T_C=25℃)	420	W
	Power Dissipation – Derate above 25℃	2.3	W/℃
T_{STG}	Storage Temperature Range	-50 to 150	℃
T_J	Operating Junction Temperature Range	-50 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	56	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.75	℃/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	120	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.01	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=120V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=100V , 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=30A	---	5.8	6.2	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.0	V
gfs	Forward Transconductance	V_{DS}=10V , I_S=30A	---	40	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=60V , V_{GS}=10V , I_D=30A	---	107	---	nC
Q_{gs}	Gate-Source Charge[2,3]		---	25	---	
Q_{gd}	Gate-Drain Charge[2,3]		---	21	---	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DS}=60V , V_{GS}=10V , R_G=3.9 Ω I_D=30A	---	27	---	ns
T_r	Rise Time[2,3]		---	58	---	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	63	---	
T_f	Fall Time[2,3]		---	49	---	
C_{iss}	Input Capacitance	V_{DS}=60V , V_{GS}=0V , F=1MHz	---	5870	---	pF
C_{oss}	Output Capacitance		---	573	---	
C_{rss}	Reverse Transfer Capacitance		---	60	---	

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	---	---	190	A
I_{SM}	Pulsed Source Current		---	---	430	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.20	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.

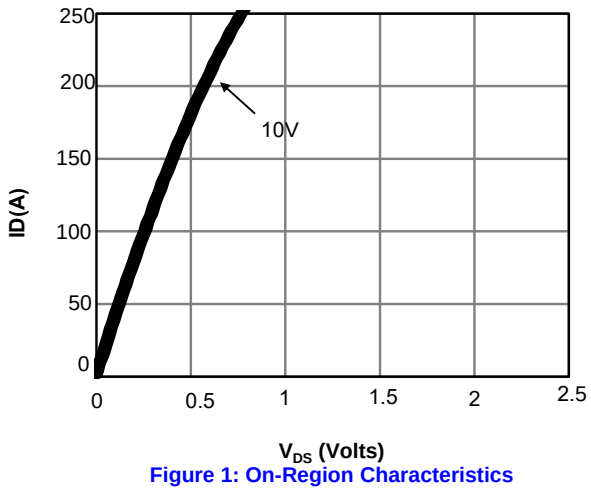


Figure 1: On-Region Characteristics

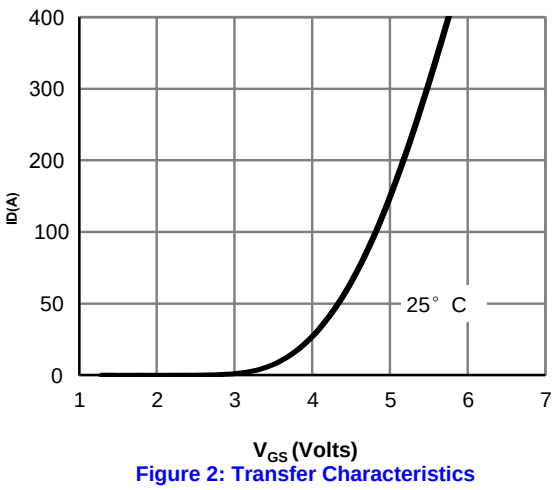


Figure 2: Transfer Characteristics

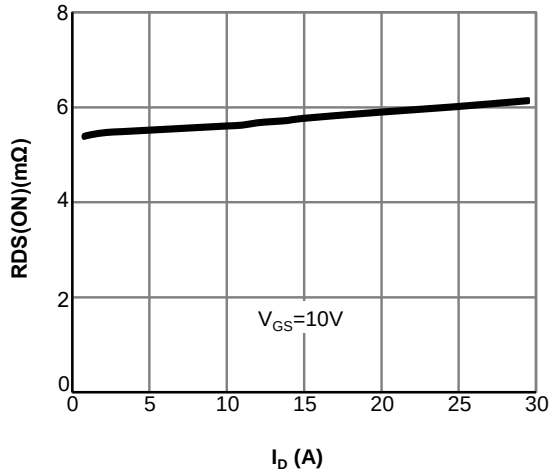


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

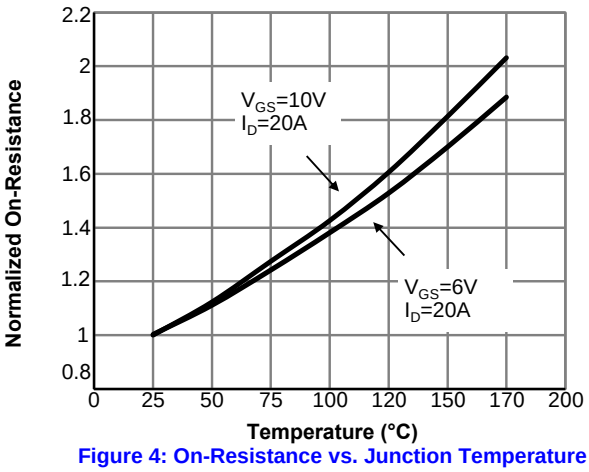


Figure 4: On-Resistance vs. Junction Temperature

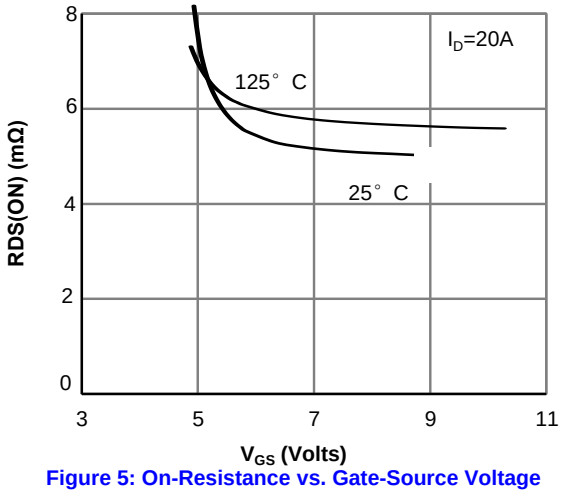


Figure 5: On-Resistance vs. Gate-Source Voltage

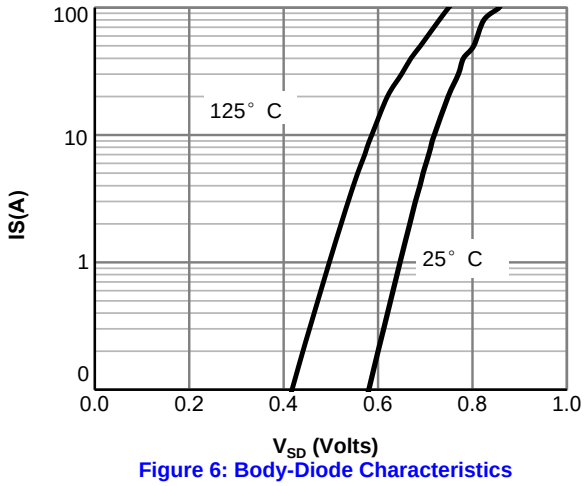


Figure 6: Body-Diode Characteristics

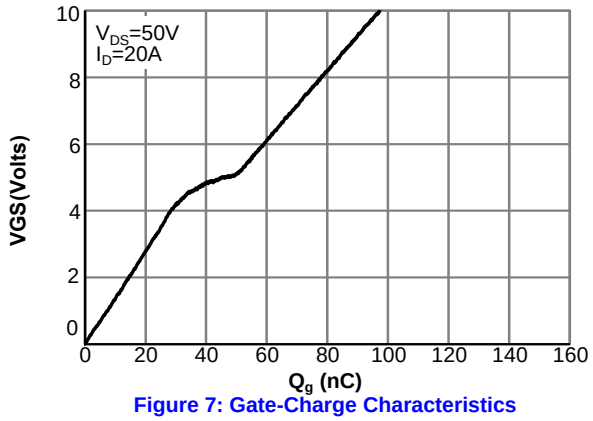


Figure 7: Gate-Charge Characteristics

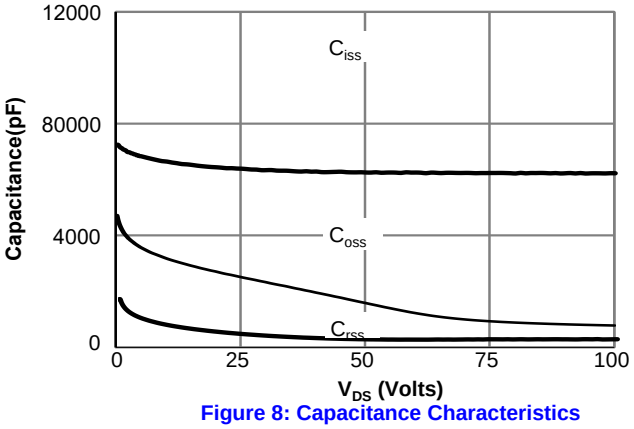


Figure 8: Capacitance Characteristics

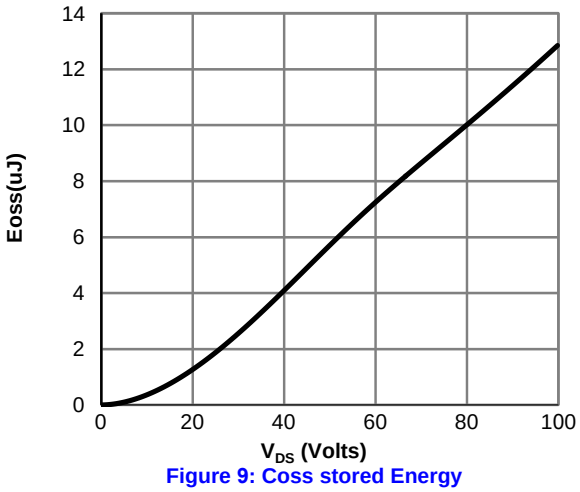


Figure 9: Coss stored Energy

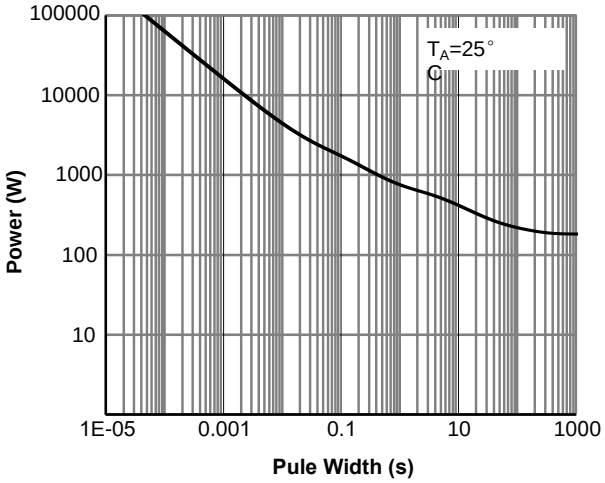


Figure 10: Single Pulse Power Rating Junction-to-Ambient

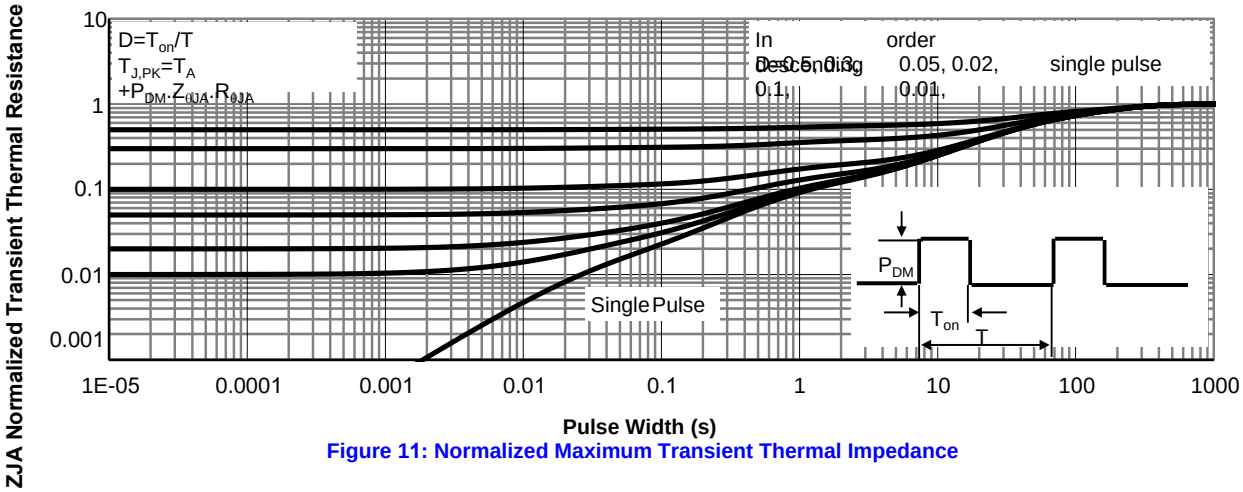


Figure 11: Normalized Maximum Transient Thermal Impedance

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