KSN1075X

-100V P-Channel MOSFET

General Description

The KSN1075X is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications

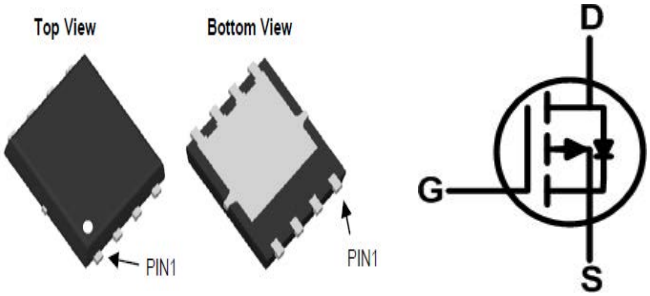
Product Summary

V_{DS} (V)	$R_{DS(on)}$ (mΩ)	I_D (A)
-100	20 at V_{GS} = 10 V	-75

Features

- Reliable and Rugged
- Lead Free and Green Devices Available

PDFN5*6 Pin Configuration



Applications

- Portable equipment and battery powered systems
- DC-DC Converters

Absolute Maximum Ratings T_C=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25℃)	-75	A
	Drain Current – Continuous (T_C=100℃)	-50	A
I_{DM}	Drain Current – Pulsed[1]	-210	A
P_D	Power Dissipation (T_C=25℃)	160	W
	Power Dissipation (T_C=100℃)	2.25	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	---	1.32	℃/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	-100	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-100V , V_{GS}=0V , T_J=25℃	---	---	5	uA
		V_{DS}=-100V , V_{GS}=0V , T_J=125℃	---	---	100	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=-15A	---	20	24	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-2.0	-3.0	-4..0	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.0	---	mV/℃
gfs	Forward Transconductance	V_{DS}=-10V , I_S=--20A	---	30	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=-50V , V_{GS}=-10V , I_D=-20A	---	168	---	nC
Q_{gs}	Gate-Source Charge[2,3]		---	53	---	
Q_{gd}	Gate-Drain Charge[2,3]		---	34	---	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DS}=-50V, I_D=--20A V_{GS}=--10V,R_G=3Ω	---	23	---	ns
T_r	Rise Time[2,3]		---	85	---	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	155	---	
T_f	Fall Time[2,3]		---	73	---	
C_{iss}	Input Capacitance	V_{DS}=-50V , V_{GS}=0V , F=1MHz	---	9974	---	pF
C_{oss}	Output Capacitance		---	294	---	
C_{rss}	Reverse Transfer Capacitance		---	67	---	

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	---	---	-70	A
I_{SM}	Pulsed Source Current		---	---	-150	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-2A , T_J=25℃	---	---	-1.2	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)

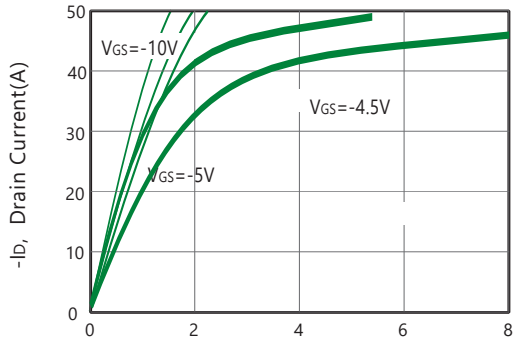


Figure 1. Output Characteristics
-VDS, Drain-to-Source Voltage(V)

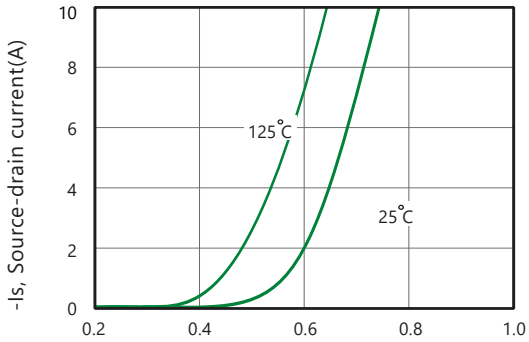


Figure 2. Body Diode Forward Voltage Variation with Source Current
-VSD, Body Diode Forward Voltage(V)

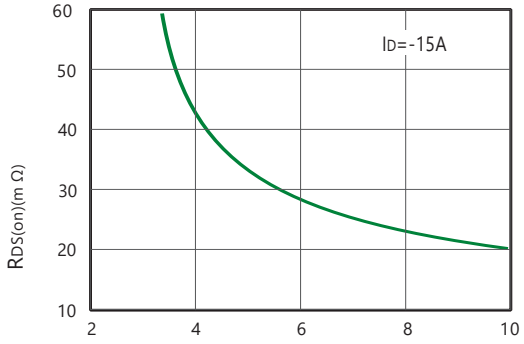


Figure 3. On-Resistance vs. Gate-Source Voltage
-VGS, Gate-to-Source Voltage(V)

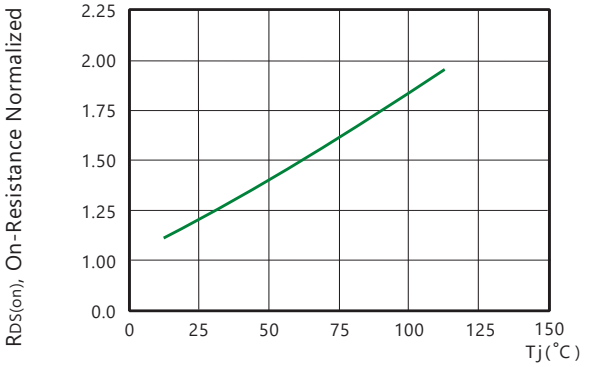


Figure 4. On-Resistance Variation with Drain Current and Temperature
Tj, Junction Temperature(°C)

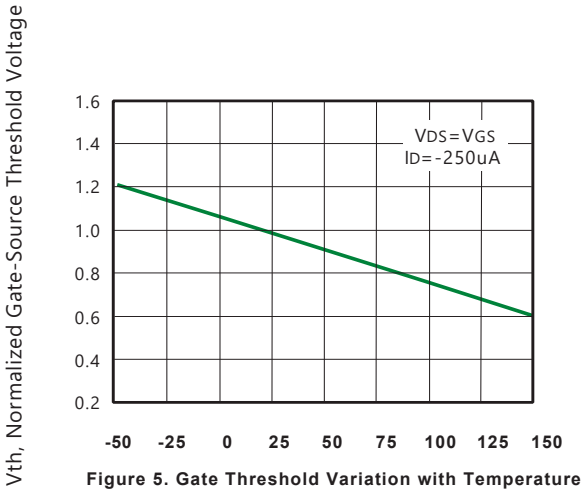


Figure 5. Gate Threshold Variation with Temperature

Tj, Junction Temperature(°C)

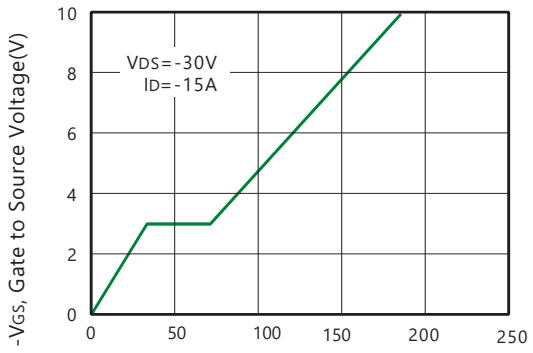


Figure 6. Gate Charge
Qg, Total Gate Charge(nC)

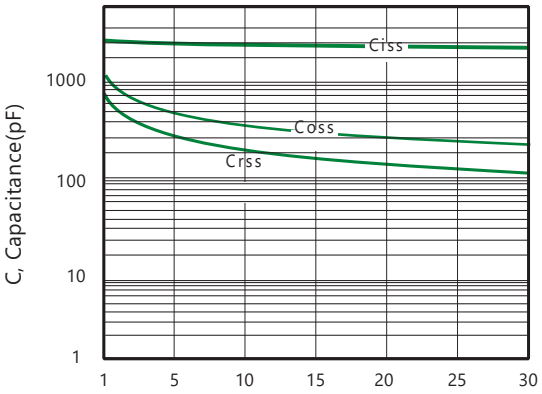


Figure 7. Capacitance
-VDS, Drain-to-Source Voltage(V)

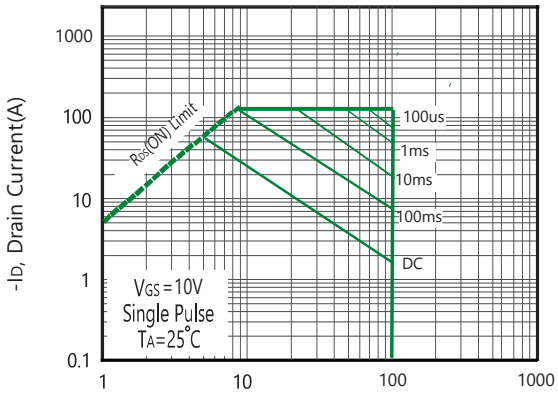


Figure 8. Maximum Safe Operating Area-VDS
Drain-Source Voltage(V)

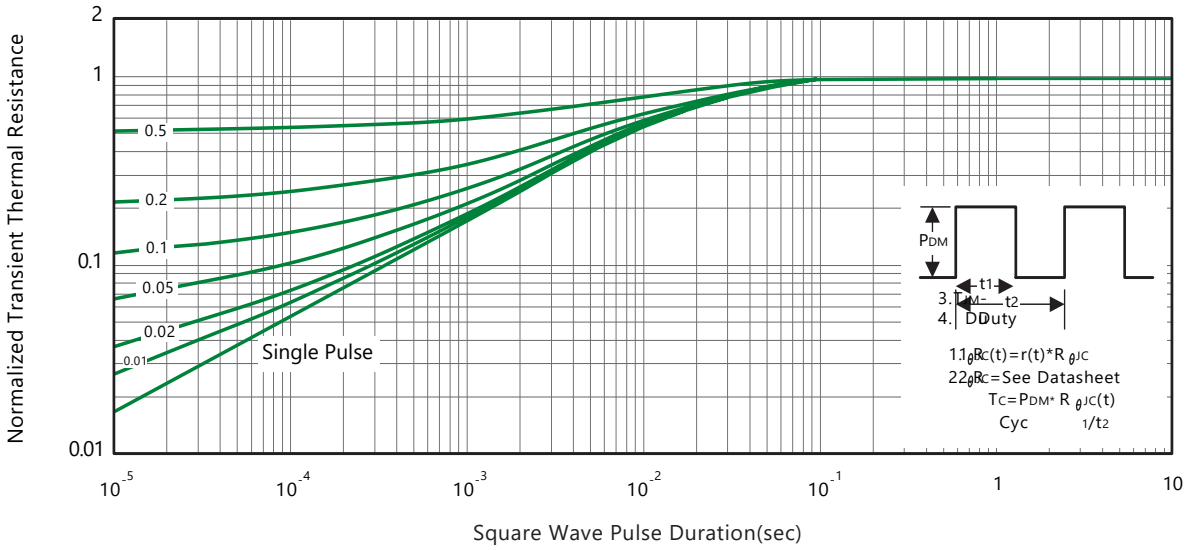


Figure 9. Normalized Thermal Transient Impedance Curve

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