KSF22N60

600V N-Channel MOSFET

General Description

The KSF22N60 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)
600	165 at V_{GS} = 10 V	22

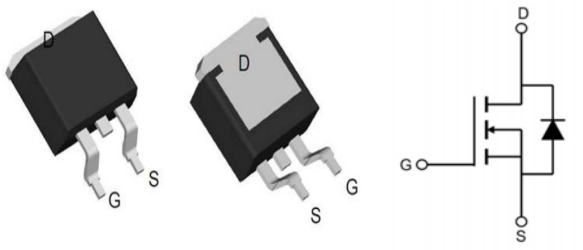
Features

- Enhanced Body diode for robusstness and fast reverse recovery
- Optimized switching parameters for better EMI Performance
- Low Rds(on)

Applications

- SMPS with PFC Flyback and LLC topologies
- Hard Switching and Hing Speed Circuit
- Power Factor Correction (PFC)

TO-263 Pin Configuration



Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	600	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25℃)	22	A
	Drain Current – Continuous (T_C=100℃)	10	A
I_{DM}	Drain Current – Pulsed[1]	80	A
P_D	Power Dissipation (T_C=25℃)	300	W
	Power Dissipation (T_C=100℃)	1.8	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	---	61	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.65	℃/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	600	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=600V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=400V , 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=10A	---	165	185	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	3.0	---	mV/℃
gfs	Forward Transconductance	V_{DS}=10V , I_S=10A	---	37	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=400V , V_{GS}=10V , I_D=10A	---	32	---	nC
Q_{gs}	Gate-Source Charge[2,3]		---	14	---	
Q_{gd}	Gate-Drain Charge[2,3]		---	9	---	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DS}=400V, I_D=10A V_{GS}=10V,R_G=5Ω	---	38	---	ns
T_r	Rise Time[2,3]		---	22	---	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	65	---	
T_f	Fall Time[2,3]		---	13	---	
C_{iss}	Input Capacitance	V_{DS}=100V , V_{GS}=0V , F=1MHz	---	3597	---	pF
C_{oss}	Output Capacitance		---	112	---	
C_{rss}	Reverse Transfer Capacitance		---	7	---	

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	---	---	16	A
I_{SM}	Pulsed Source Current		---	---	38	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=10A , T_J=25℃	---	---	1.0	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)

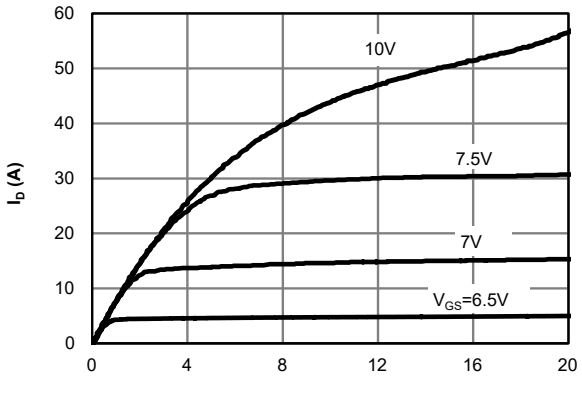


Figure 1: On-Region Characteristics

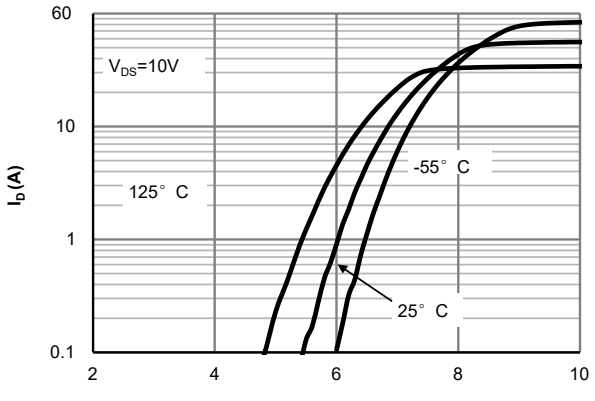


Figure 2: Transfer Characteristics

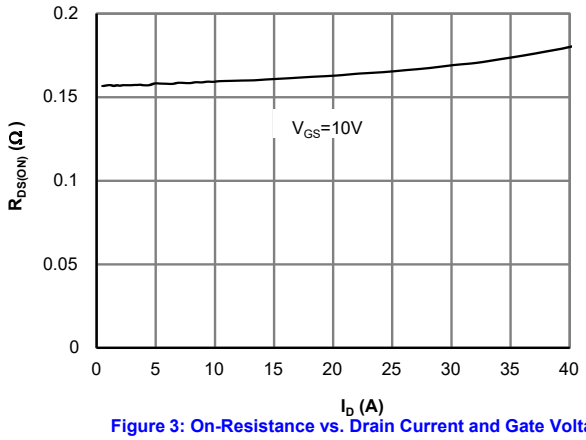


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

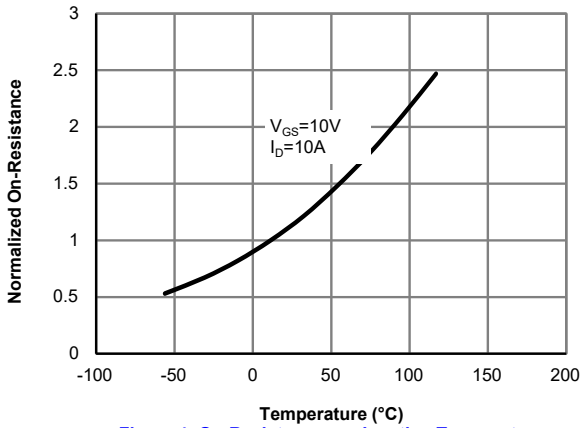


Figure 4: On-Resistance vs. Junction Temperature

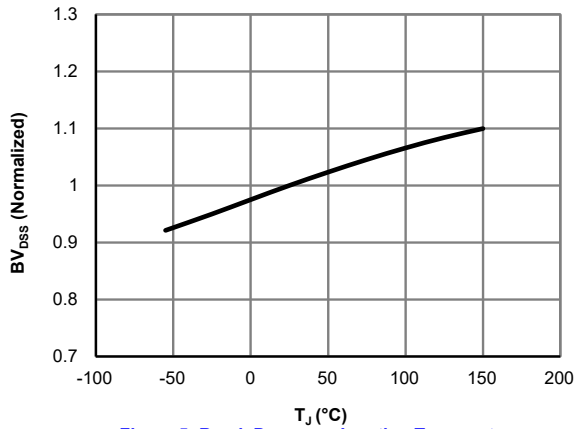


Figure 5: Break Down vs. Junction Temparature

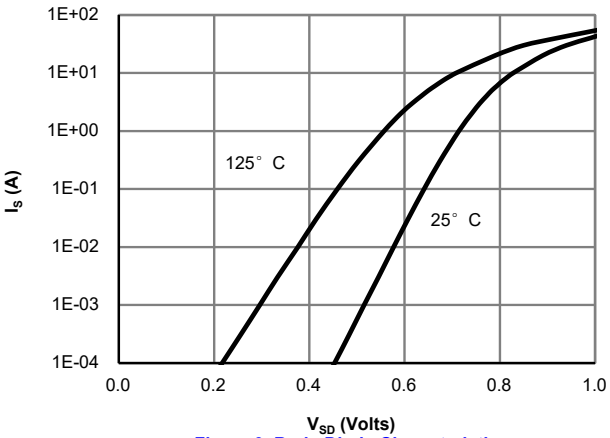


Figure 6: Body-Diode Characteristics

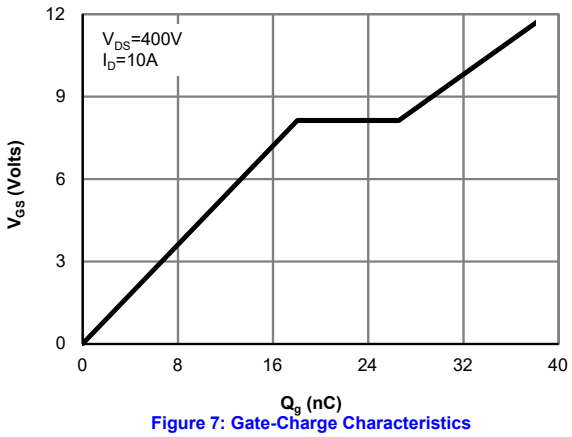


Figure 7: Gate-Charge Characteristics

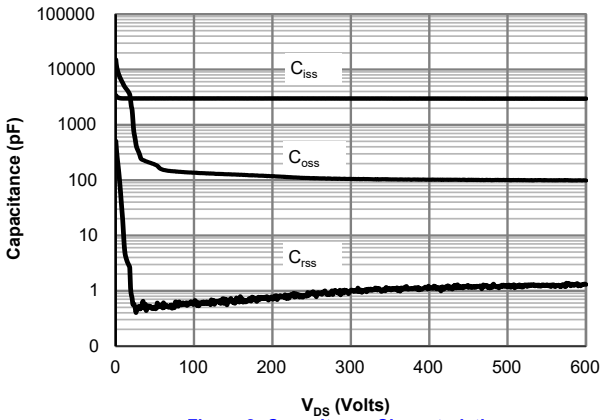


Figure 8: Capacitance Characteristics

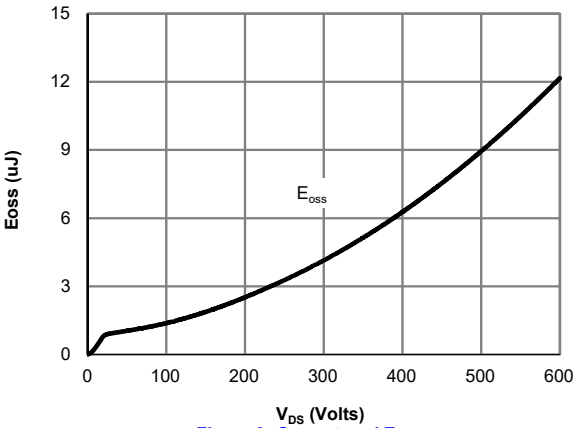


Figure 9: Coss stored Energy

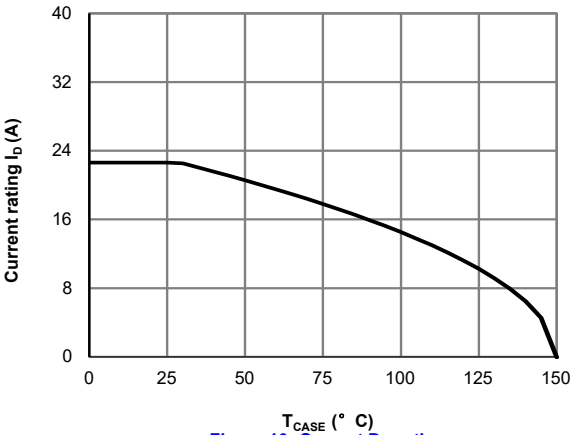


Figure 10: Current De-rating

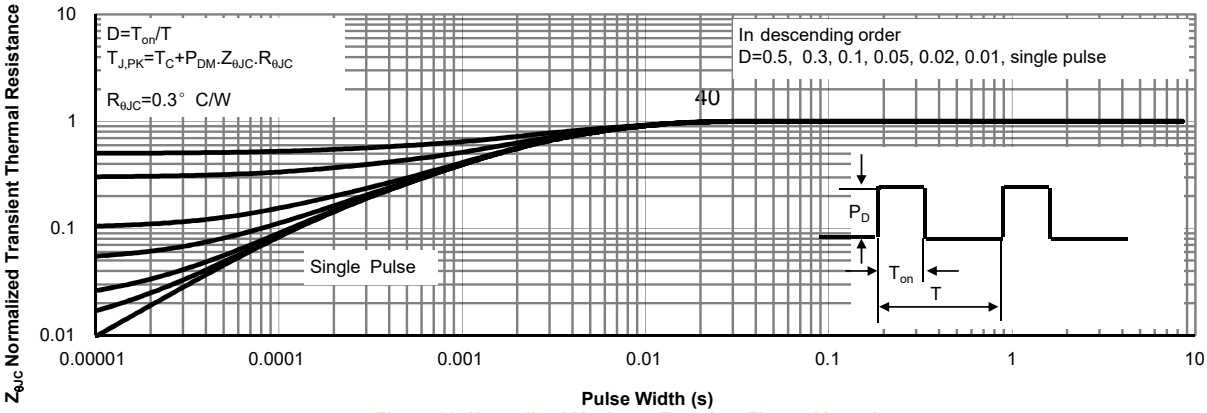


Figure 11: Normalized Maximum Transient Thermal Impedance

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