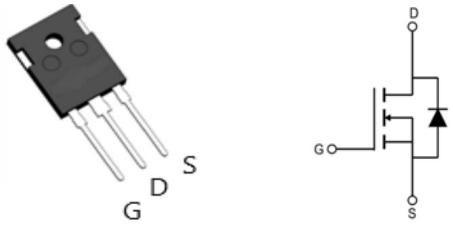
KSU80N650

650V N-Channel MOSFET

General Description

KSU80N650 is Multi-EPI Super-Junction power MOSFET,KSU80N650 power MOSFET is a Hight voltage N channel power MOSFET sample with advanced technology to have better characteristics, such as fast switching time, low Ciss and Crss, low on resistance and excellent avalanche characteristics, making it especially suitable for applications which require superior power density and outstanding efficiency.

TO-247 Pin Configuration



Product Summary

V_{DS} (V)	$R_{DS(on)}$ (mΩ)	I_D (A)
650	36 at V_{GS} = 10V	80

Features

- Extreme dv/dt rated
- Special process technology for high ESD capability
- Good stability and uniformity with high EAS

Applications

- Such as phase-shift-bridge(ZVS),Application-Server Power,Telecom Power,EV Charging.
- PFC stages for server & telecom

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Drain Current – Continuous (T_C=25℃)	80	A
	Drain Current – Continuous (T_C=100℃)	56	A
I_{DM}	Drain Current – Pulsed[1]	240	A
P_D	Power Dissipation (T_C=25℃)	420	W
	Power Dissipation (T_C=100℃)	0.8	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	---	66	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.4	℃/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	650	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=650V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=650V , V_{GS}=0V , T_J=125℃	---	---	20	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V , V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}= 10V， ID=35A	---	36	45	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	VGS = VDS, IDS= 250μA	2.5	3.5	4.5	V
gfs	Forward Transconductance	VDS= 4V, ID= 35A	---	33	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge	VDS=520V , VGS=10V , ID=35A	---	310	---	nC
Q_{gs}	Gate-Source Charge		---	60	---	
Q_{gd}	Gate-Drain Charge		---	195	---	
$T_{d(on)}$	Turn-On Delay Time	VDS = 520V, RG = 20Ω	---	40	---	ns
T_r	Rise Time		---	20	---	
$T_{d(off)}$	Turn-Off Delay Time		---	105	---	
T_f	Fall Time		---	110	---	
C_{iss}	Input Capacitance	VDS=25V, VGS=0V, f=1.0MHz	---	6210	---	pF
C_{oss}	Output Capacitance		---	305	---	
C_{rss}	Reverse Transfer Capacitance		---	80	---	

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	---	---	80	A
I_{SM}	Pulsed Source Current		---	---	250	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.4	V
trr	Body Diode Reverse Recovery Time	IF=20A, di/dt=500A/μs	---	280	---	ns
Qrr	Body Diode Reverse Recovery Charge		---	11	---	nC

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℃, VDD=50V, VG=10V, RG=25Ω, L=0.5mH, IAS=19A

Typical Electrical and Thermal Characteristics (Curves)

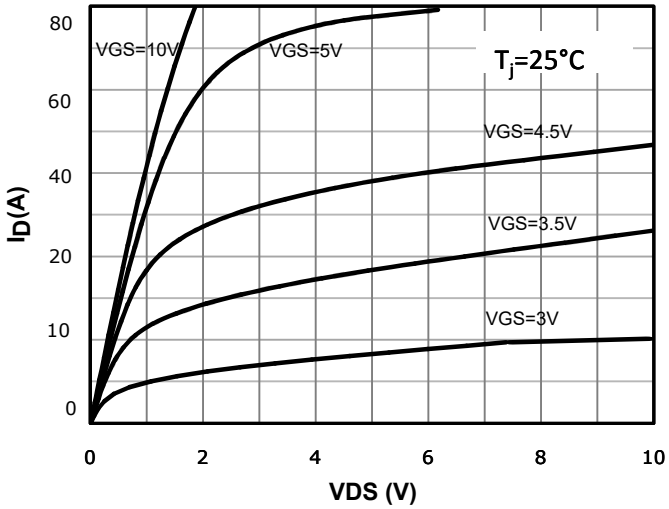


Fig1:Output Characteristics

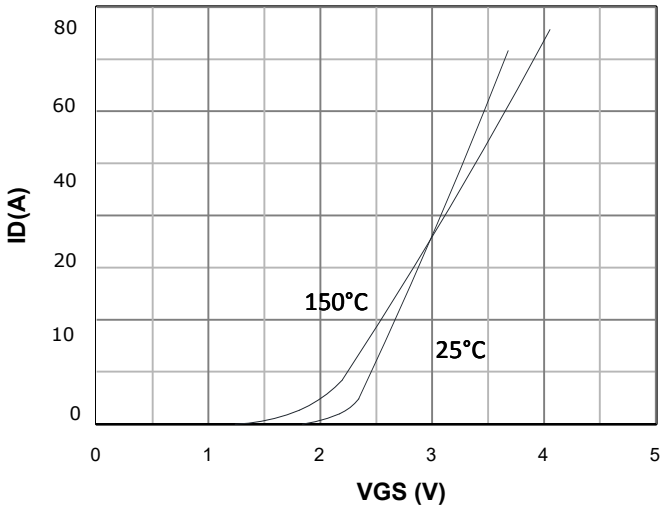


Fig2:Transfer Characteristics

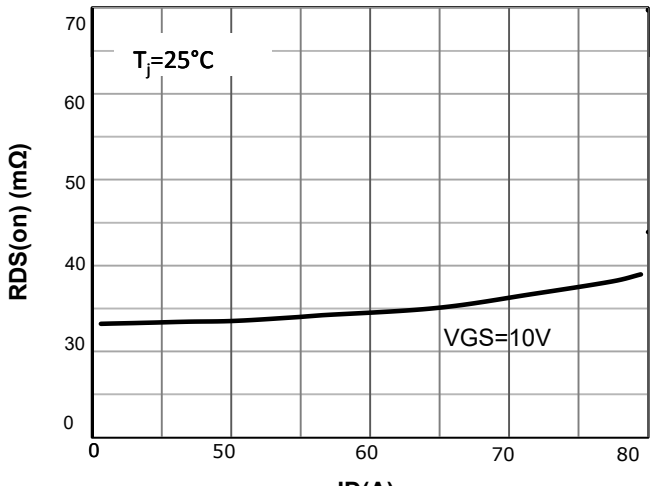


Fig3:Rdson- Drain Current

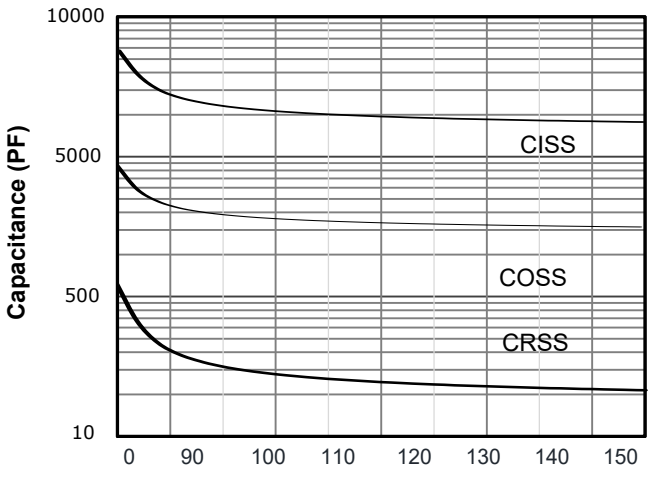


Fig4:Capacitance vs Vds

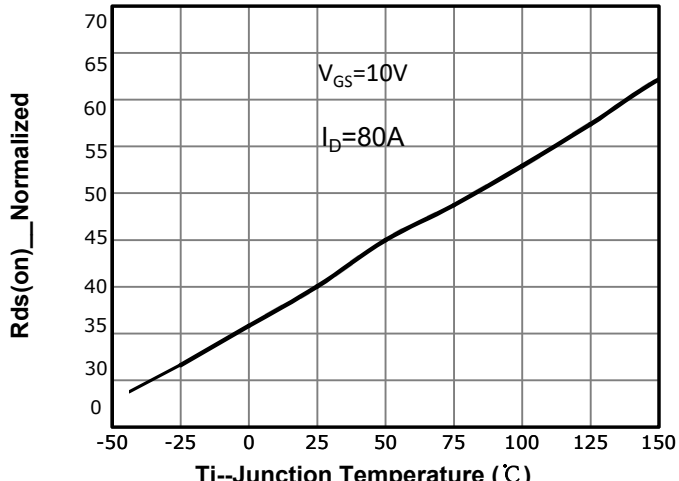


Fig5:Rds(on) vs. Temperature

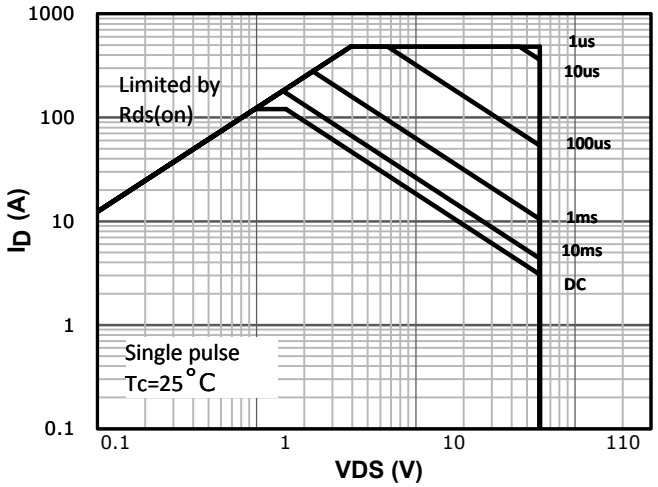


Fig6:Safe Operating Area

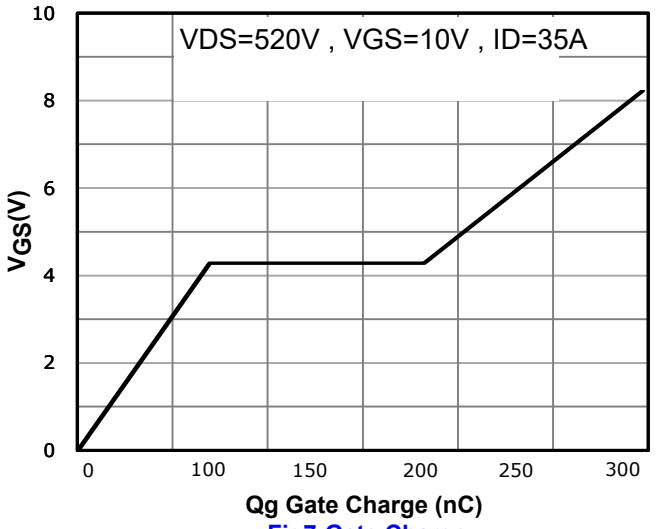


Fig7:Gate Charge

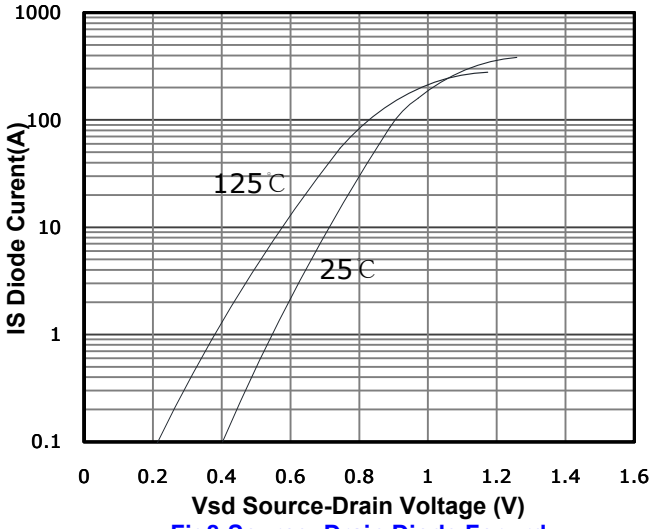


Fig8:Source- Drain Diode Forwrd

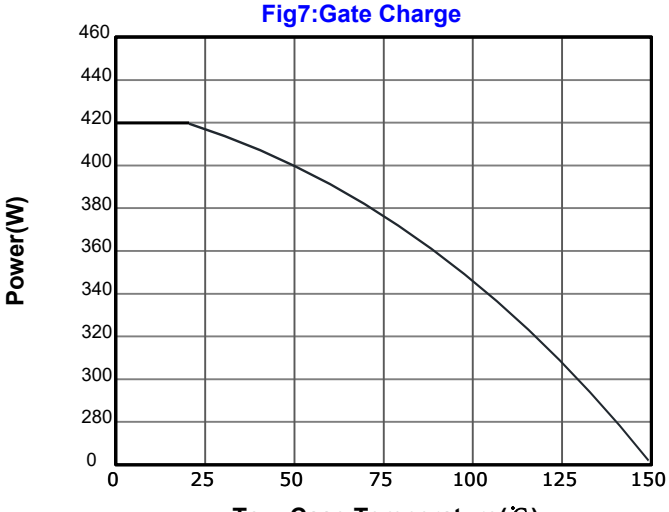


Fig9:Power Disipation

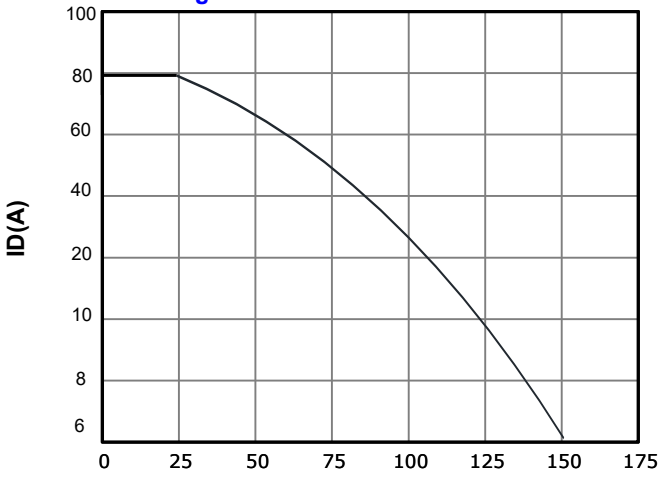


Fig10：IDCurrent- Junction Temperature

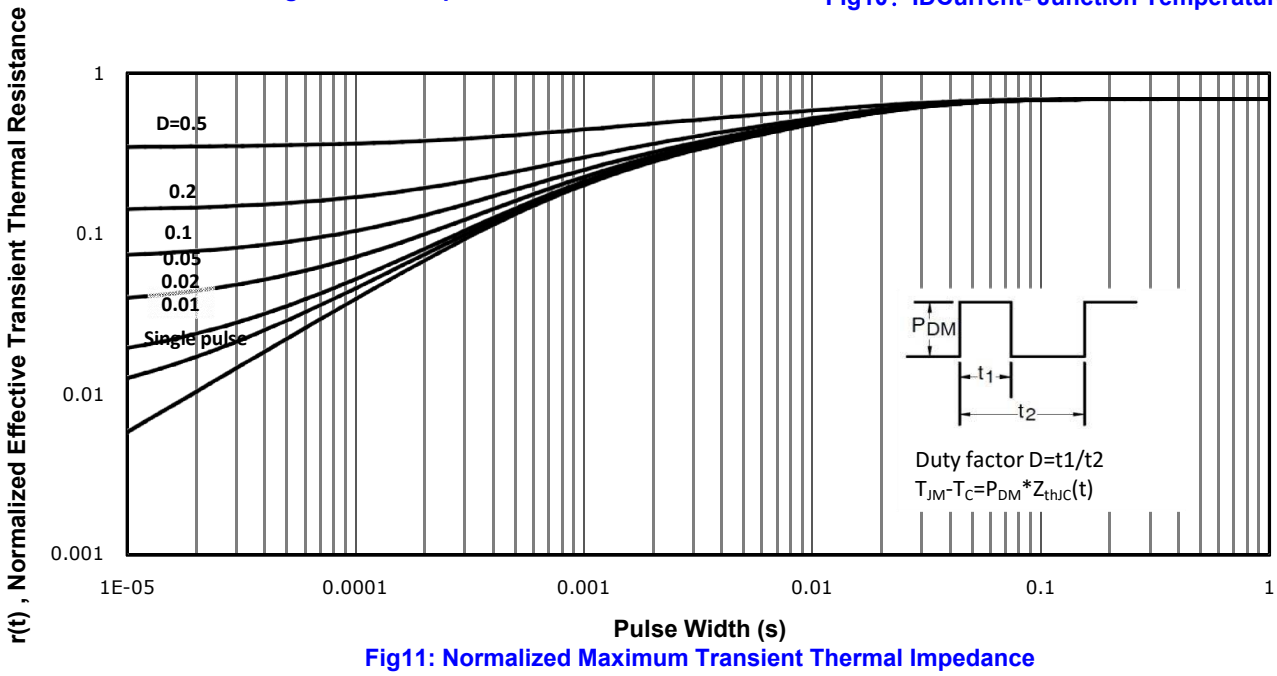


Fig11: Normalized Maximum Transient Thermal Impedance

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