KSD15N10

100V N-Channel MOSFET

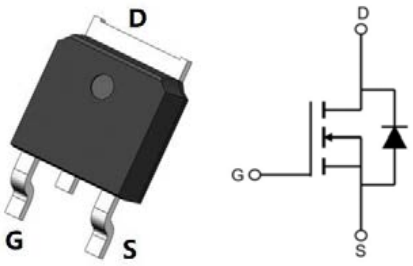
General Description

The KSD15N10 combines advanced trench MOSFET technology with a low resistance package to provide extremely low R_{DS}(ON). This device is ideal for boost converters and synchronous rectifiers for consumer, telecom, industrial power supplies and LED backlighting.

Product Summary

V_{DS} (V)	$R_{DS(on)}$ (mΩ)	I_D (A)
100	85 at V_{GS} = 10 V	15
	107 at V_{GS} = 4.5 V	13

TO-252 Pin Configuration



Features

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

Applications

- Power switching application
- Hard switched and high frequency circuits

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℃)	15	A
	Drain Current – Continuous (T_C=100℃)	10.5	A
I_{DM}	Drain Current – Pulsed[1]	56	A
P_D	Power Dissipation (T_C=25℃)	50	W
	Power Dissipation (T_C=100℃)	2	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	---	60	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	3	℃/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}=80V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=80V , 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=15A	---	85	102	mΩ
		V_{GS}=4.5V , I_D=10A	---	107	128	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	2.0	3	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	mV/℃
gfs	Forward Transconductance	V_{DS}=10V , I_S=5A	---	17	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=50V , V_{GS}=10V , I_D=10A	---	22.5	28	nC
Q_{gs}	Gate-Source Charge[2,3]		---	2.9	3.6	
Q_{gd}	Gate-Drain Charge[2,3]		---	8	9.6	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DS}=50V, R_L=6.4Ω V_{GS}=10V,R_G=3Ω	---	15	18	ns
T_r	Rise Time[2,3]		---	5	7	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	25	32	
T_f	Fall Time[2,3]		---	7	9	
C_{iss}	Input Capacitance	V_{DS}=50V , V_{GS}=0V , F=1MHz	---	830	1000	pF
C_{oss}	Output Capacitance		---	105		
C_{rss}	Reverse Transfer Capacitance		---	72		

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	---	---	15	A
I_{SM}	Pulsed Source Current		---	---	40	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , 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)

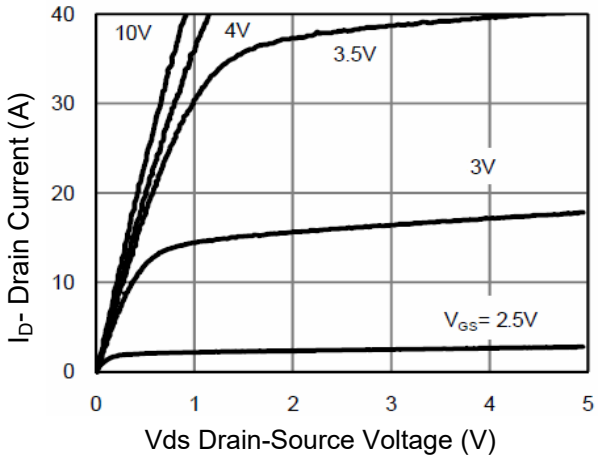


Fig.1 Output Characteristics

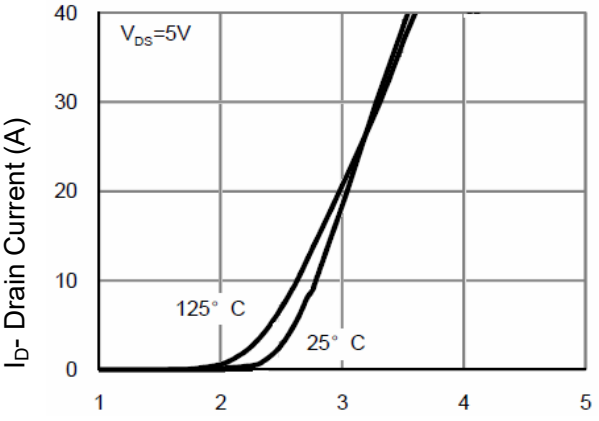


Fig. 2 Transfer Characteristics

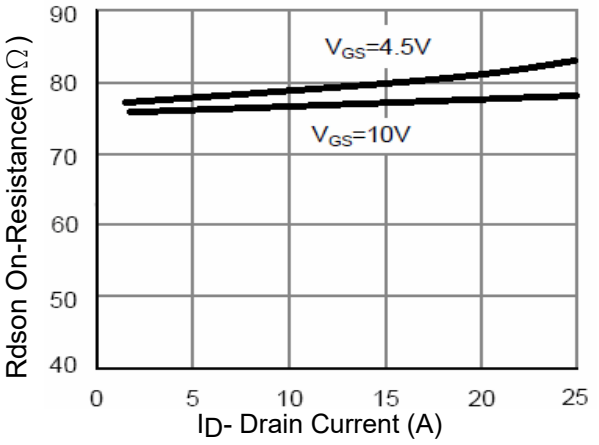


Fig. 3 Rdson- Drain Current

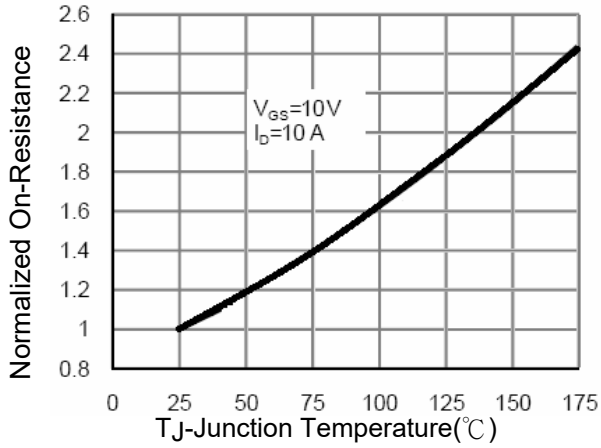


Fig. 4 Rdson-JunctionTemperature

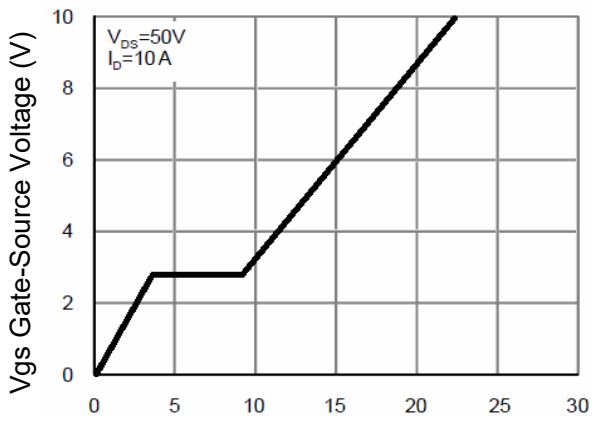


Fig. 5 Gate Charge

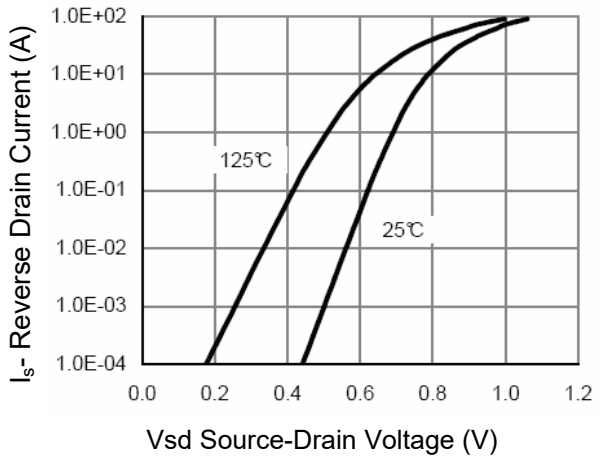
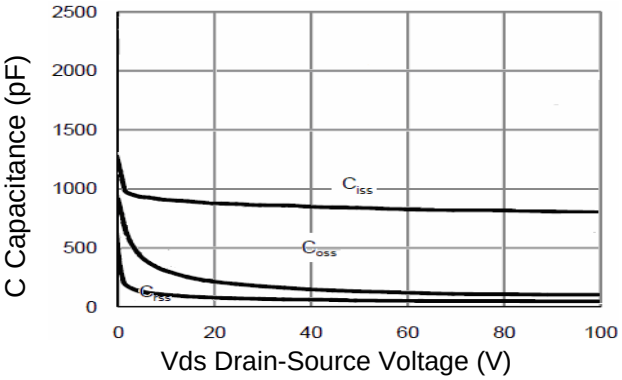


Fig. 6 Source- Drain Diode Forward



Figu.7 Capacitance vs Vds

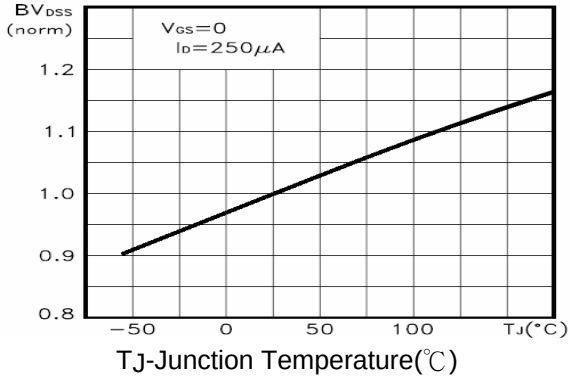


Fig. 8 BV_{DSS} vs Junction Temperature

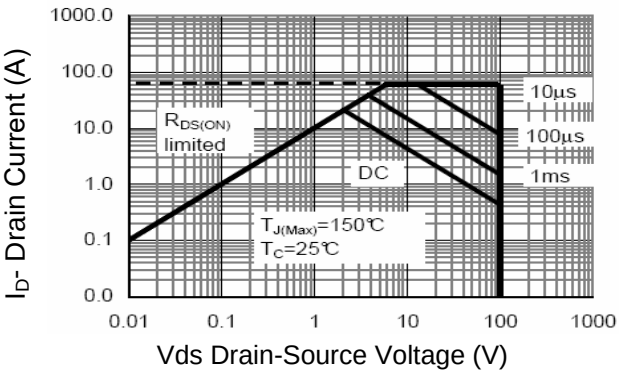


Fig.9 Safe Operation Area

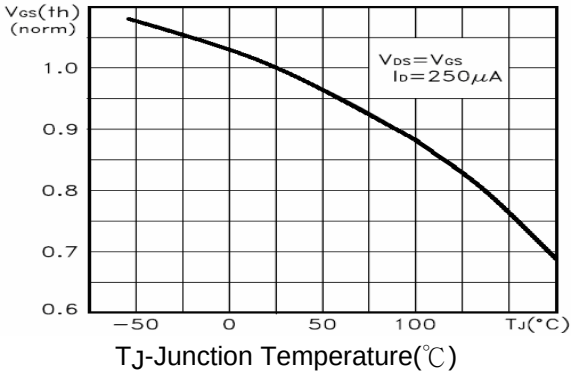


Fig. 10 $V_{GS(th)}$ vs Junction Temperature

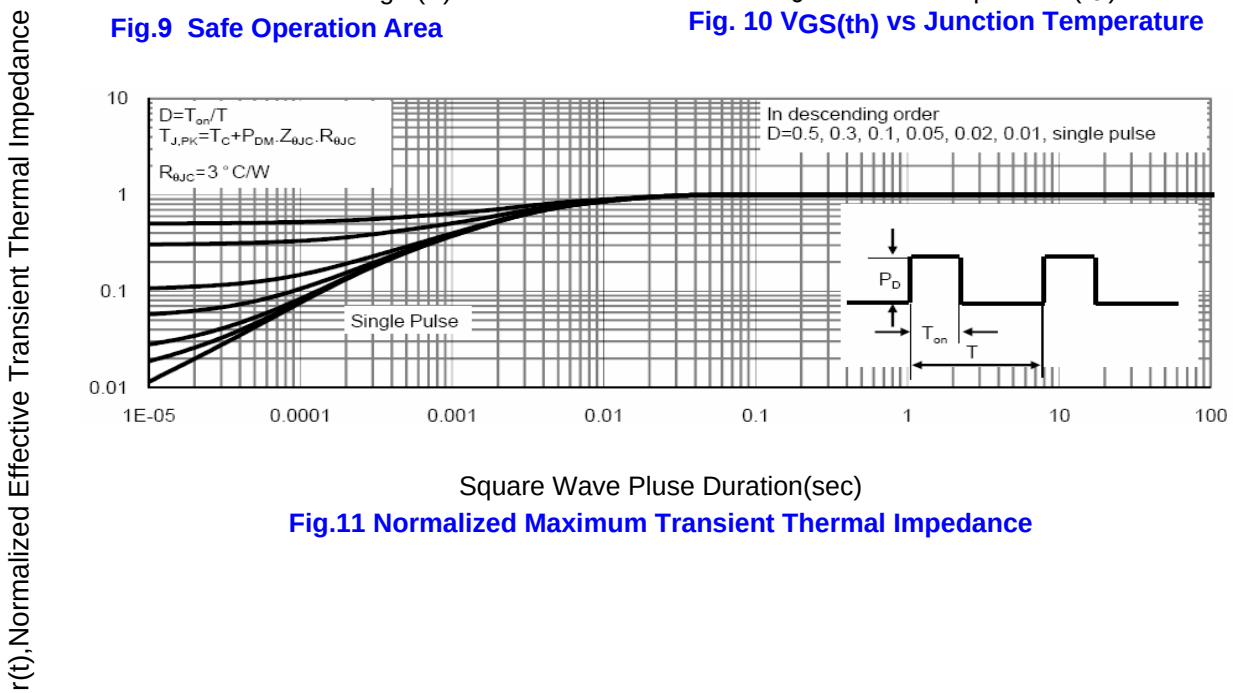


Fig.11 Normalized Maximum Transient Thermal Impedance

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