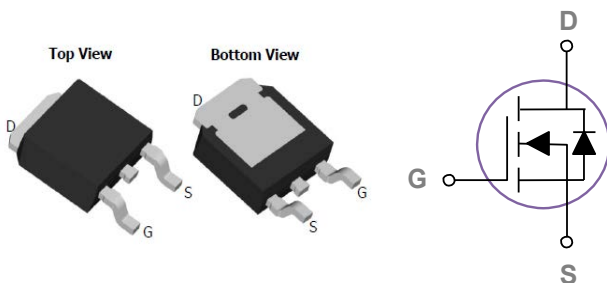


General Description

The KSD18N20 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

TO-252 Pin Configuration



Product Summary

V _{DS} (V)	R _{DS(on)} (mΩ)	I _D (A)
200	153 at V _{GS} = 10 V	18
	162 at V _{GS} = 4.5 V	13

Features

- Trench Power MV MOSFET technology
- Low R_{DS(ON)}
- Low Gate Charge
- Optimized for fast-switching applications

Applications

- Synchronous Rectification in DC/DC and AC/DC Converters
- Industrial and Motor Drive applications

Absolute Maximum Ratings T_c=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	200	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current – Continuous (T _c =25°C)	18	A
	Drain Current – Continuous (T _c =100°C)	10.5	A
I _{DM}	Drain Current – Pulsed ¹	46	A
P _D	Power Dissipation (T _c =25°C)	60	W
	Power Dissipation (T _c =100°C)	1	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	60	°C/W
R _{θJC}	Thermal Resistance Junction to Case	---	2	°C/W

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted) Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	200	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=8A$	---	153	180	$m\Omega$
		$V_{GS}=4.5V, I_D=5A$	---	162	200	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	2.0	3	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	$mV/^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_S=5A$	---	18	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=50V, V_{GS}=10V, I_D=8A$	---	32	---	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	5	---	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	8	---	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DS}=50V, I_D=8A$	---	9	---	ns
T_r	Rise Time ^{2, 3}		---	37	---	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		$V_{GS}=10V, R_G=10\Omega$	---	58	
T_f	Fall Time ^{2, 3}		---	84	---	
C_{iss}	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, F=1\text{MHz}$	---	1860	---	pF
C_{oss}	Output Capacitance		---	186	---	
C_{riss}	Reverse Transfer Capacitance		---	38	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	18	A
I_{SM}	Pulsed Source Current		---	---	35	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.2	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristics (Curves)

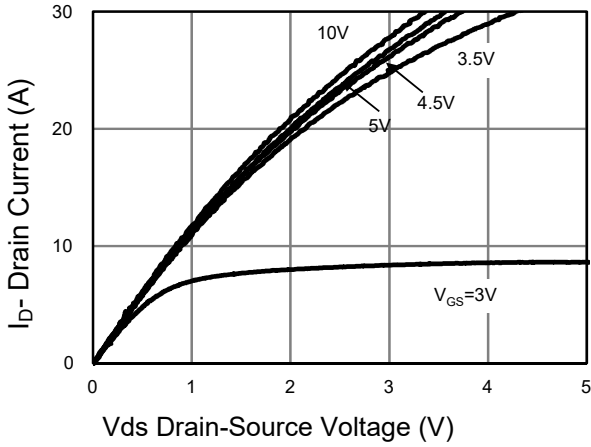


Fig.1 Output Characteristics

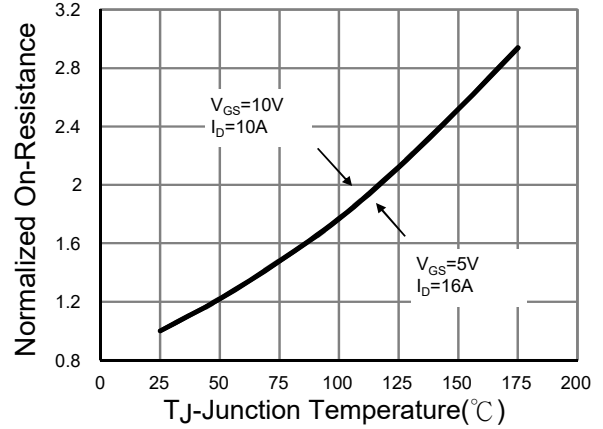


Fig. 4 Rds(on)-Junction Temperature

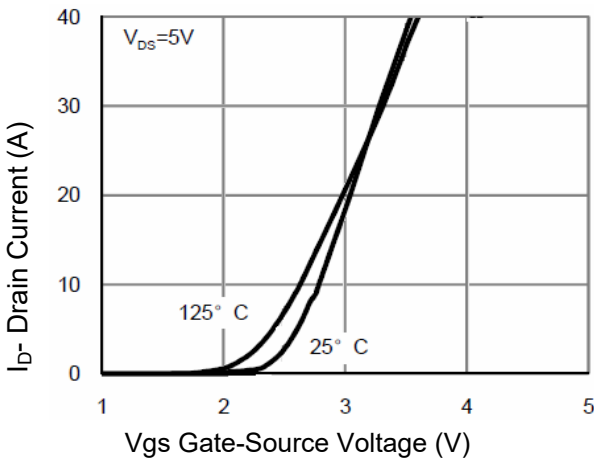


Fig. 2 Transfer Characteristics

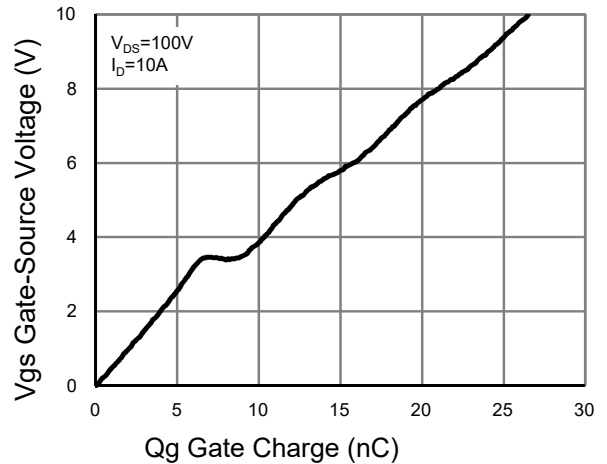


Fig. 5 Gate Charge

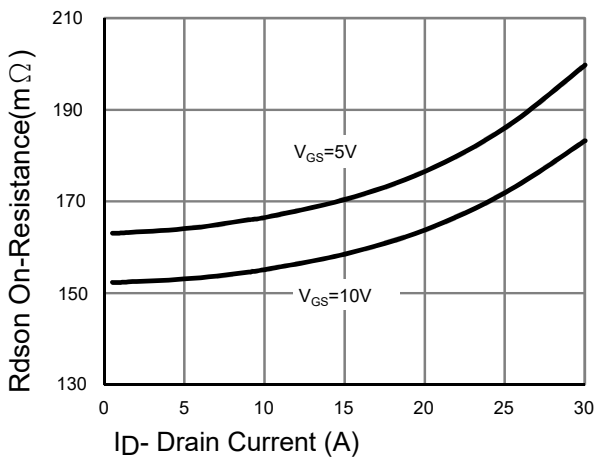


Fig. 3 Rdson- Drain Current

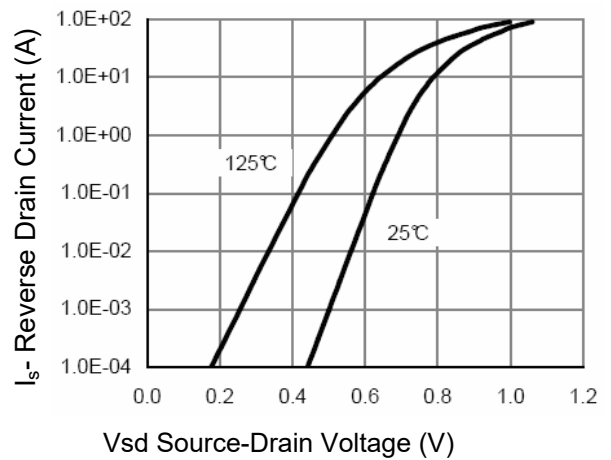


Fig. 6 Source- Drain Diode Forward

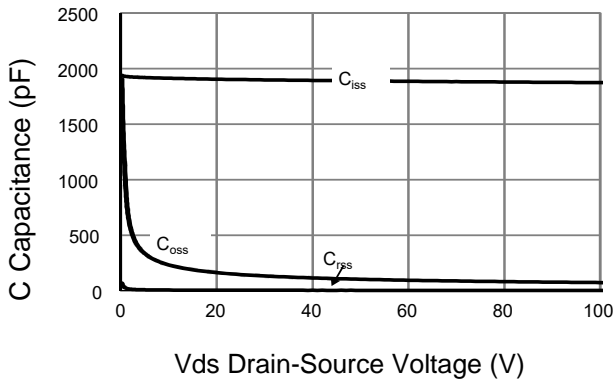


Fig.7 Capacitance vs Vds

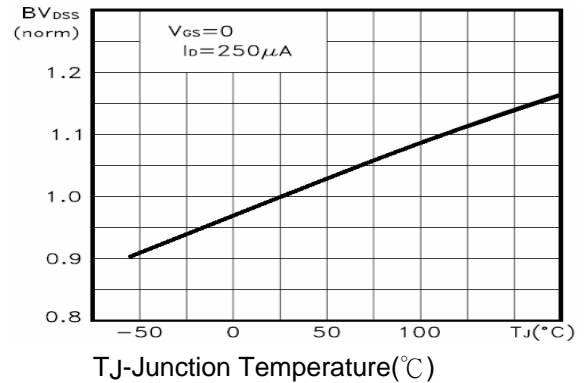


Fig. 8 BVdss vs Junction Temperature

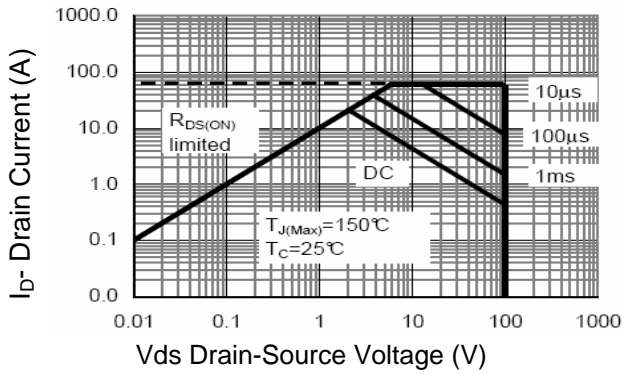


Fig.9 Safe Operation Area

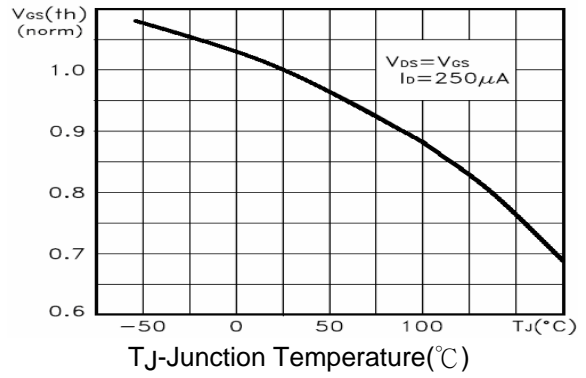
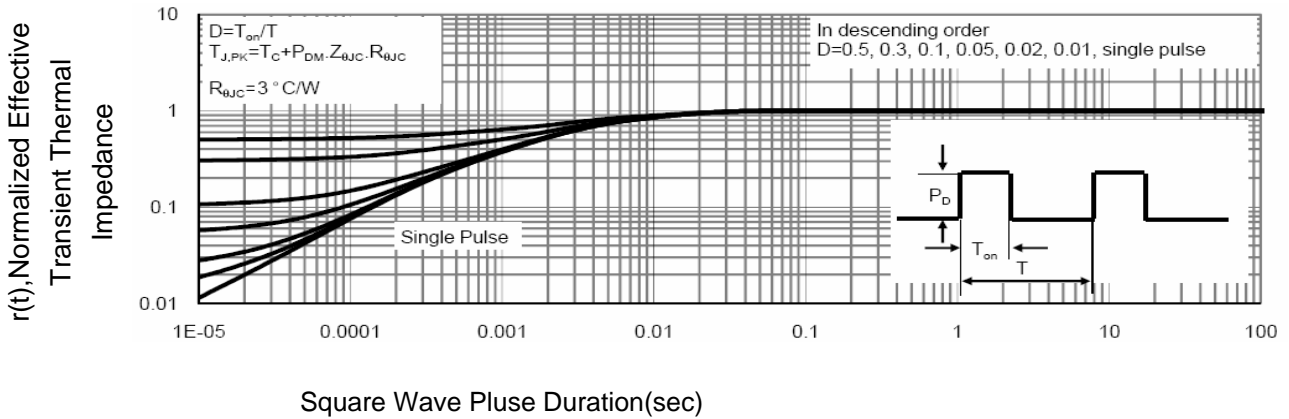


Fig. 10 VGS(th) vs Junction Temperature



Square Wave Pulse Duration(sec)

Fig.11 Normalized Maximum Transient Thermal Impedance

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