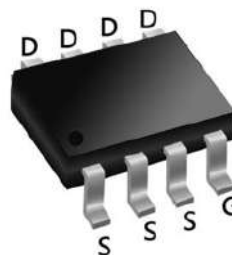


N-Ch 150V Fast Switching MOSFETs

Features:

- ★ Super Low Gate Charge
- ★ Green Device Available
- ★ Excellent Cdv/dt effect decline
- ★ Advanced high cell density Trench technology

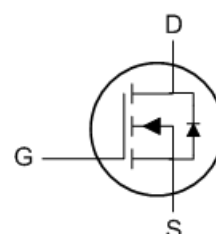


SOP8 Pin Configuration

Description:

The KSC20N15 is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The KSC20N15 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.



Product Summary

BVDSS	RDSON	ID
150V	88mΩ	3.5A

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current ¹	3.5	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current ¹	3	A
I_{DM}	Pulsed Drain Current ²	18	A
EAS	Single Pulse Avalanche Energy ³	53	mJ
I_{AS}	Avalanche Current	18	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	3.1	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	80	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹ ($t \leq 10\text{s}$)	---	40	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	150	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=3.5A$	---	---	88	$m\Omega$
	Static Drain-Source On-Resistance ²	$V_{GS}=4.5V$, $I_D=3.5A$	---	---	100	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.2	---	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=120V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=120V$, $V_{GS}=0V$, $T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=3.5A$	---	33	---	S
Q_g	Total Gate Charge	$V_{DS}=75V$, $V_{GS}=4.5V$, $I_D=3.5A$	---	25.1	---	nC
Q_{gs}	Gate-Source Charge		---	6.8	---	
Q_{gd}	Gate-Drain Charge		---	12.6	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=75V$, $V_{GS}=10V$, $R_G=3.3\Omega$ $I_D=3.5A$	---	13	---	ns
T_r	Rise Time		---	8.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	25	---	
T_f	Fall Time		---	11	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	2285	---	pF
C_{oss}	Output Capacitance		---	110	---	
C_{rss}	Reverse Transfer Capacitance		---	83	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	3	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ\text{C}$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=3.5A$, $dI/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	35	---	nS
Q_{rr}	Reverse Recovery Charge		---	242	---	nC

Note :

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating. The test condition is $V_{DD}=25V$, $V_{GS}=10V$, $L=0.3mH$, $I_{AS}=18A$
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

Typical Characteristics

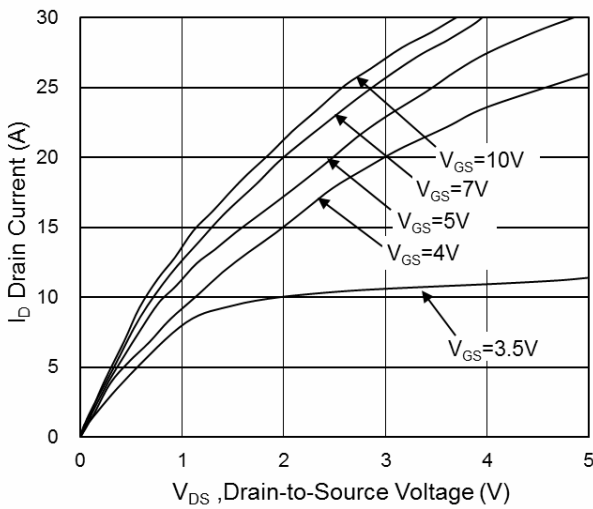


Fig.1 Typical Output Characteristics

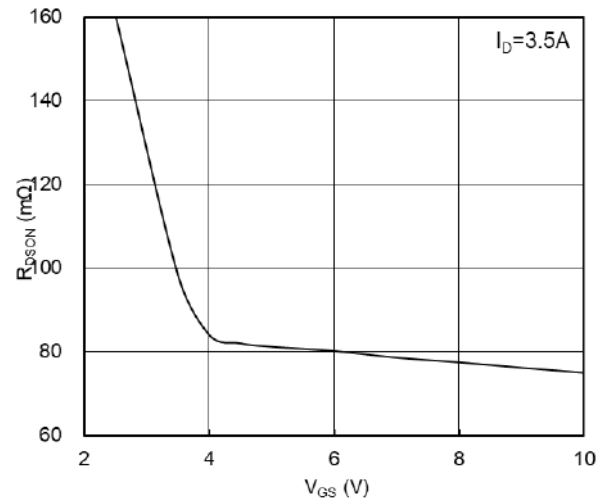


Fig.2 On-Resistance vs G-S Voltage

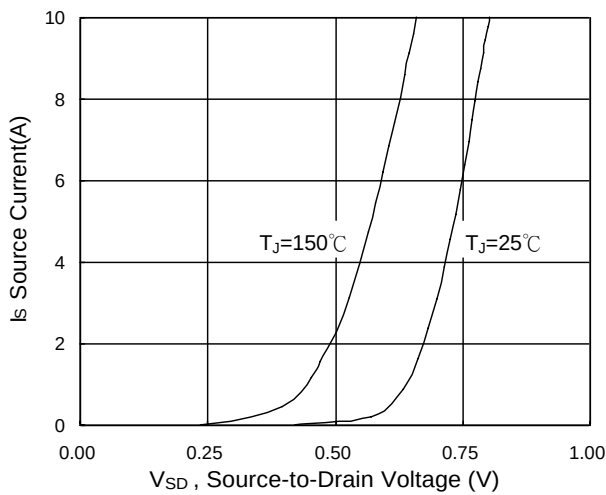


Fig.3 Source Drain Forward Characteristics

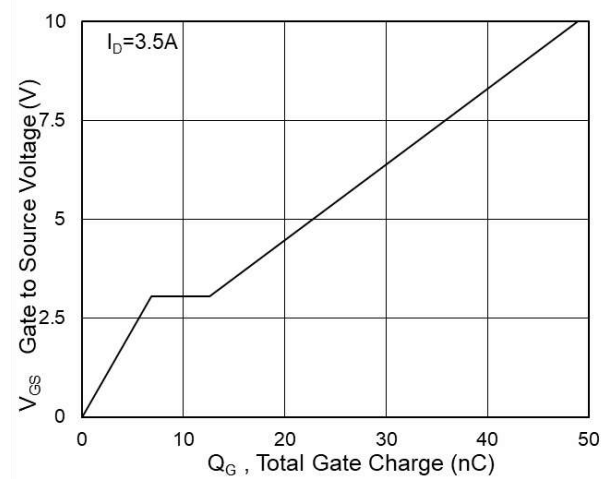


Fig.4 Gate-Charge Characteristics

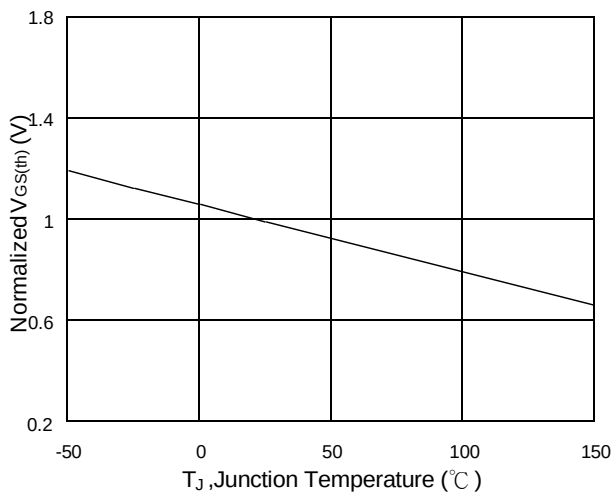


Fig.5 Normalized $V_{GS(th)}$ vs T_J

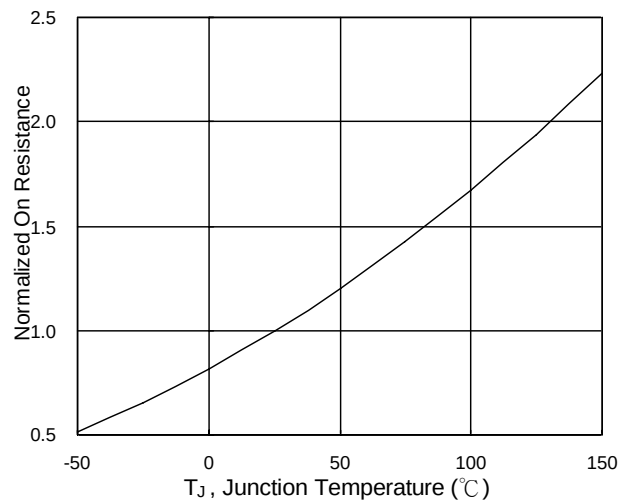


Fig.6 Normalized $R_{DS(on)}$ vs T_J

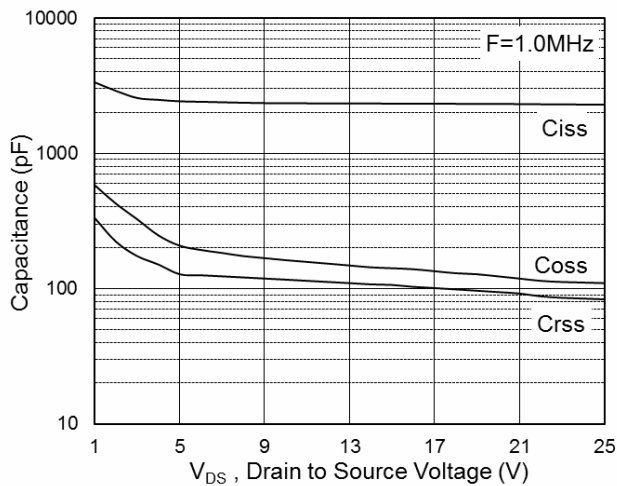


Fig.7 Capacitance

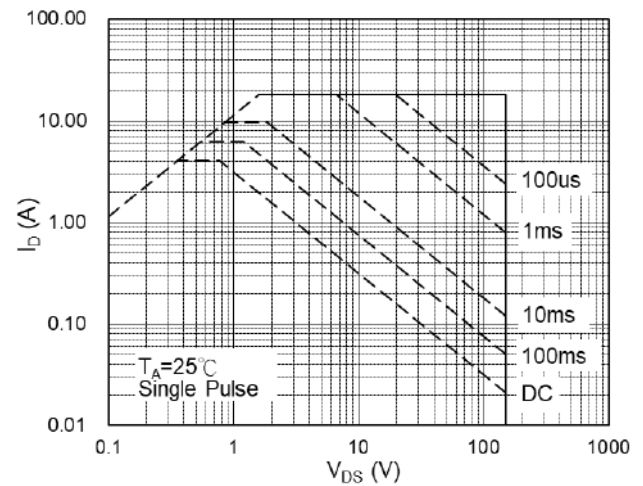


Fig.8 Safe Operating Area

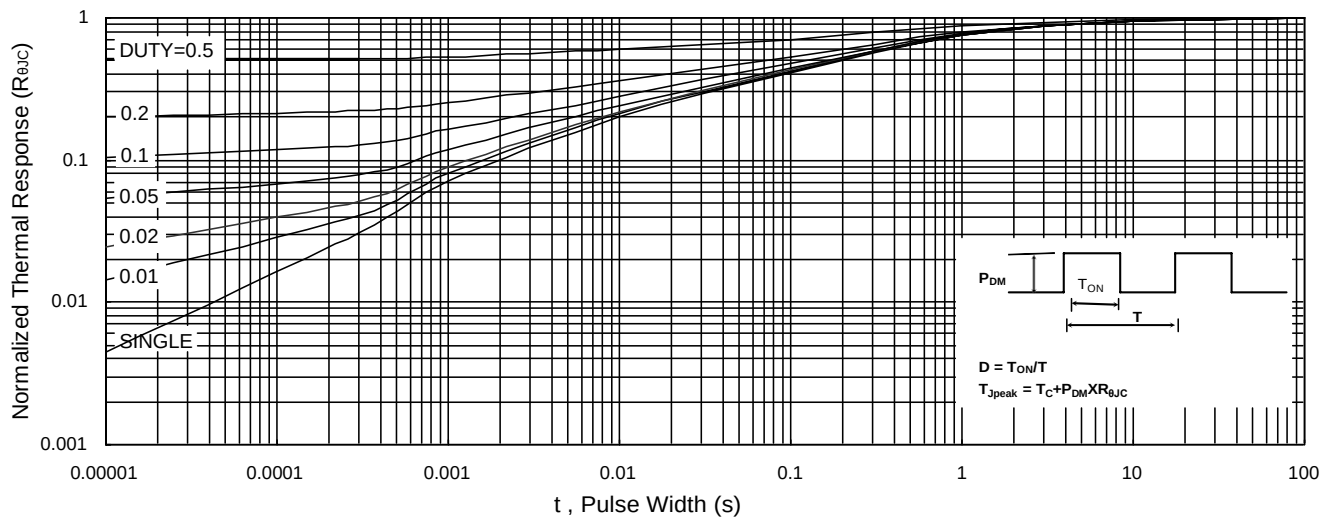


Fig.9 Normalized Maximum Transient Thermal Impedance

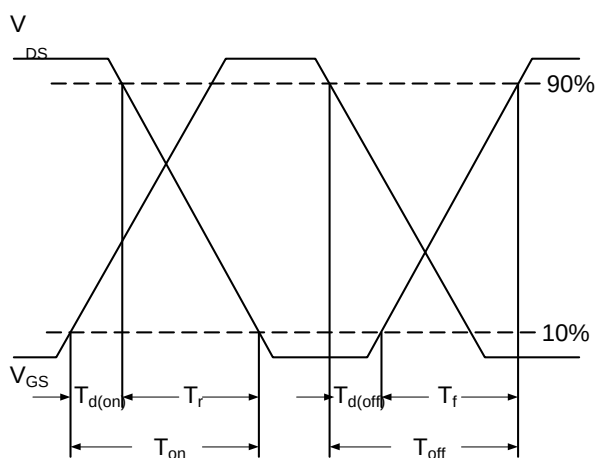


Fig.10 Switching Time Waveform

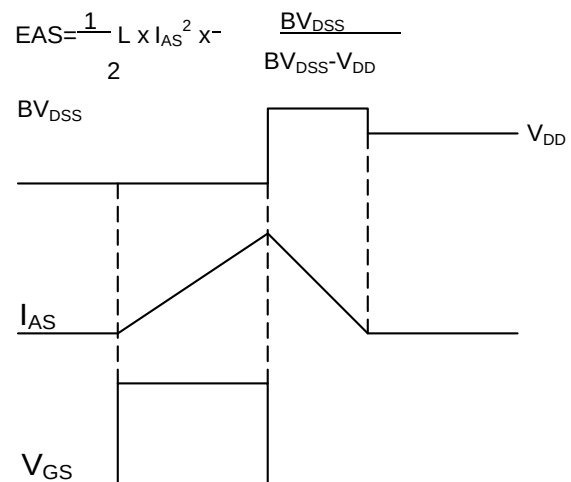


Fig.11 Unclamped Inductive Switching Waveform