N-ch 200V Fast Switching MOSFETs

Features:

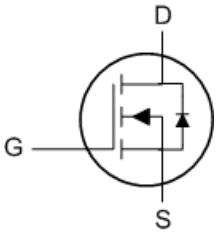
★ Super Low Gate Charge
★ Excellent CdV/dt effect decline
★ 100% EAS Guaranteed
★ Green Device Available

SOT223 Pin Configuration

Description:

The KWL03N20 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The KWL03N20 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.



Product Summary

BVDSS	RDSON	ID
200V	1.0Ω	1.5A

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	1.5	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	1.3	A
I_{DM}	Pulsed Drain Current[2]	8	A
EAS	Single Pulse Avalanche Energy[3]	8	mJ
I_{AS}	Avalanche Current	4	A
P_D@T_C=25℃	Total Power Dissipation[4]	42	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

*Drain current limited by maximum junction temperature

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State)[1]	---	85	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	30	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	200	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=1A	---	0.6	1.0	Ω
		V_{GS}=4.5V , I_D=1A	---	0.7	1.1	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	2	3	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=200V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10V , I_D=1A	---	10	---	S
Q_g	Total Gate Charge (10V)	V_{DS}=160V , V_{GS}=10V , I_D=1A	---	15		nC
Q_{gs}	Gate-Source Charge		---	3.0		
Q_{gd}	Gate-Drain Charge		---	5.2		
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=100V , V_{GS}=10V , R_G=3Ω, I_D=1A	---	22		ns
T_r	Rise Time		---	34		
$T_{d(off)}$	Turn-Off Delay Time		---	45		
T_f	Fall Time		---	11		
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	900		pF
C_{oss}	Output Capacitance		---	130		
C_{rss}	Reverse Transfer Capacitance		---	4.6		

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	---	---	1	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
t_{rr}	Reverse Recovery Time	I_F=1A , di/dt=100A/μs , T_J=25℃	---	85	---	nS
Q_{rr}	Reverse Recovery Charge		---	257	---	nC

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DD}=50V,V_{GS}=10V,L=1mH,I_{AS}=4A
4.The power dissipation is limited by 150℃ junction temperature
5.The Min. value is 100% EAS tested guarantee.
6.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

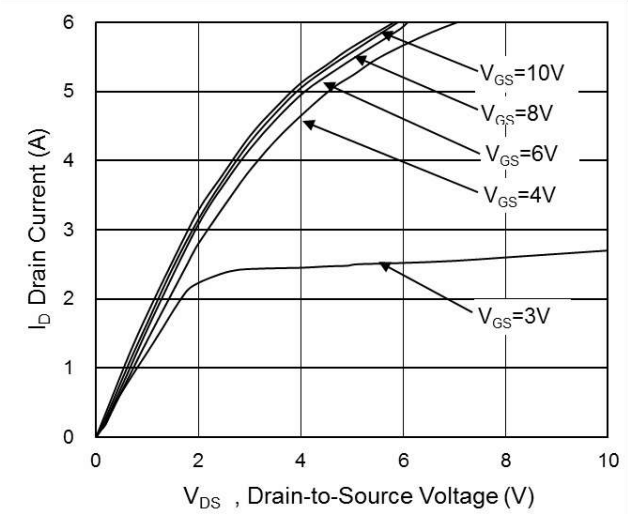


Fig.1 Typical Output Characteristics

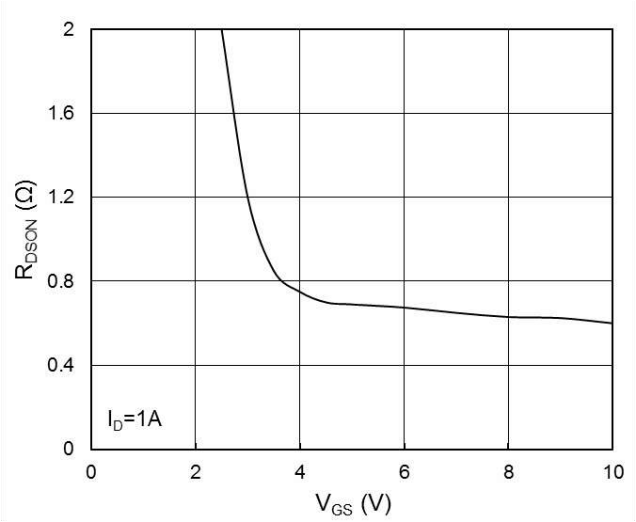


Fig.2 On-Resistance vs. G-S Voltage

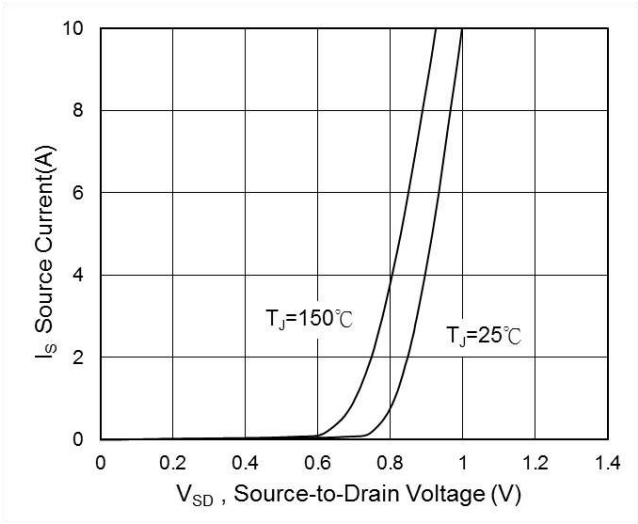


Fig.3 Forward Characteristics of Reverse

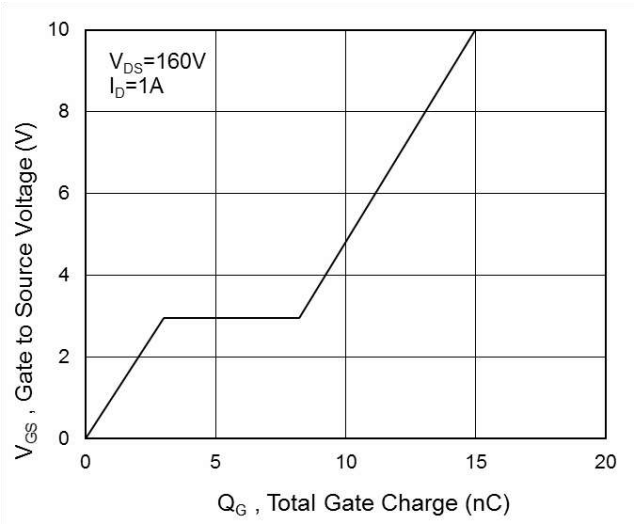


Fig.4 Gate-Charge Characteristics

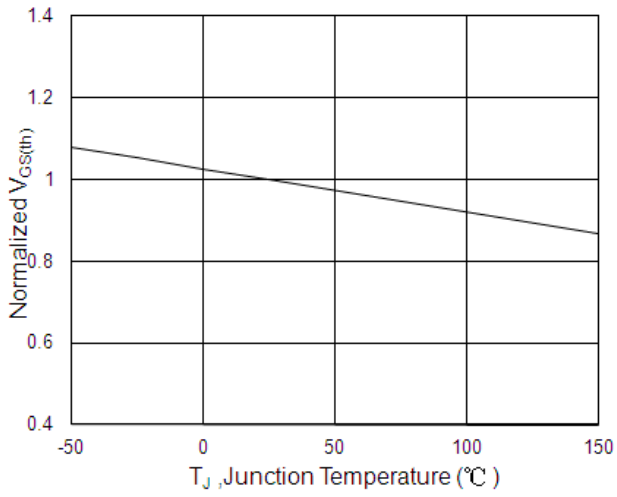


Fig.5 $V_{GS(th)}$ vs. T_J

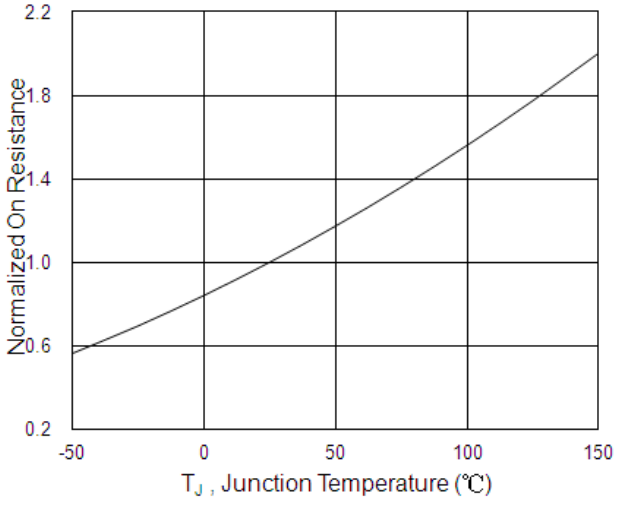


Fig.6 Normalized R_{DSON} vs. T_J

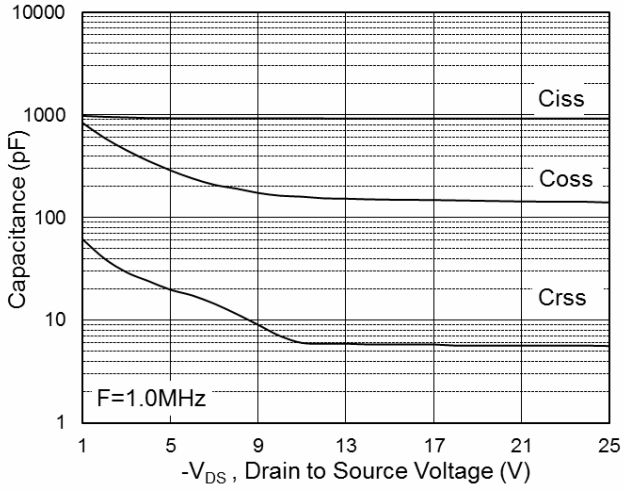


Fig.7 Capacitance

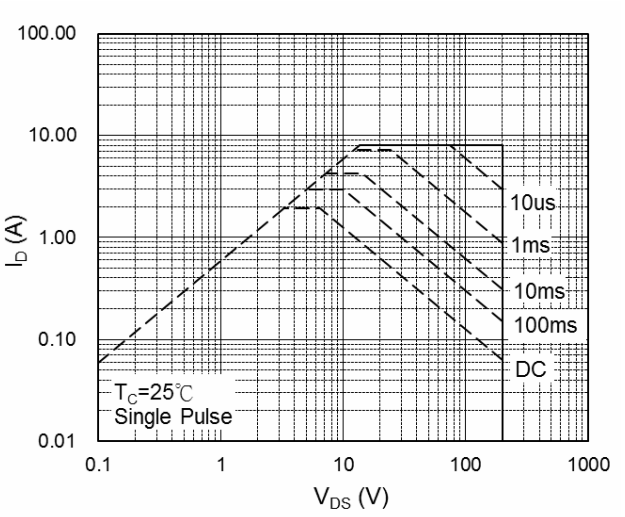


Fig.8 Safe Operating Area

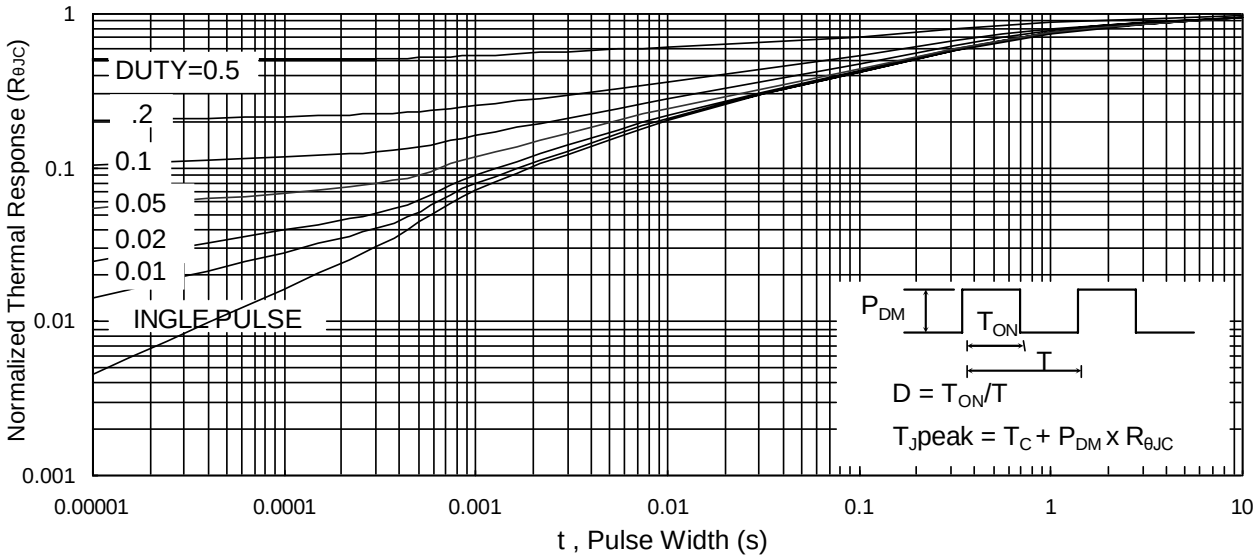


Fig.9 Normalized Maximum Transient Thermal Impedance

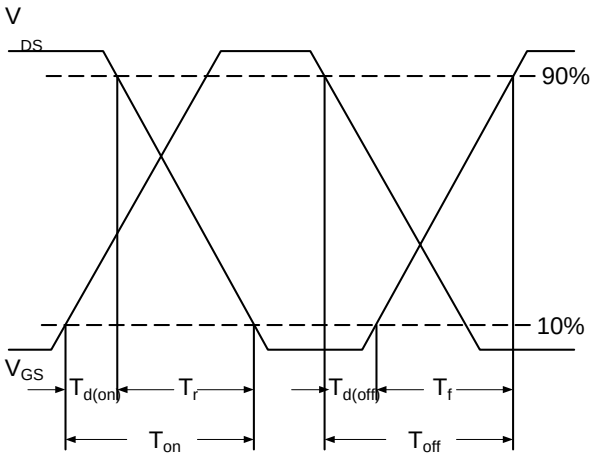


Fig.10 Switching Time Waveform

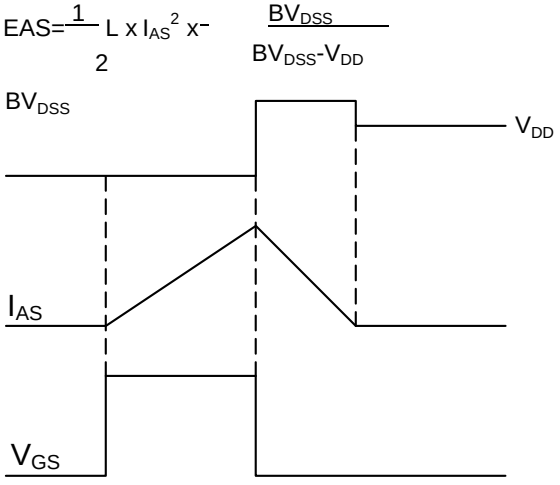


Fig.11 Unclamped Inductive Switching Waveform

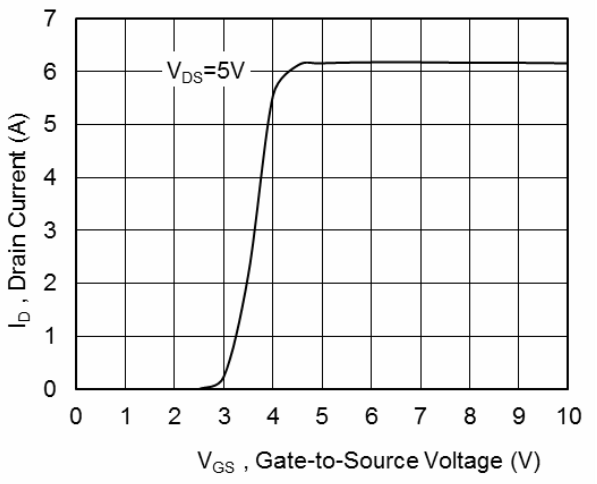


Fig.11 Transfer Characteristics