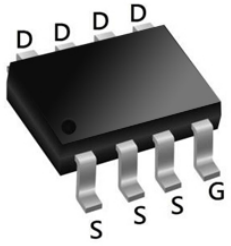
N-Ch 100V Fast Switching MOSFETs

Features:

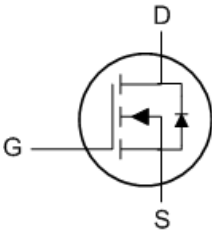
★ 100% EAS Guaranteed
★ Low $R_{DS(ON)}$
★ Low Gate Charge
★ RoHs and Halogen-Free Compliant



SOP8 Pin Configuration

Description:

The KWS0094 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the Synchronous Rectification for AC/DC Quick Charger.



Product Summary

BVDSS	RDSON	ID
100V	12mΩ	11.5A

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25°C	Continuous Drain Current[1]	11.5	A
I_D@T_A=70°C	Continuous Drain Current[1]	9	A
I_{DM}	Pulsed Drain Current[2]	46	A
EAS	Single Pulse Avalanche Energy[3]	12	mJ
I_{AS}	Avalanche Current	9	A
P_D@T_A=25°C	Total Power Dissipation[4]	3.1	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1](t≦10s)	---	40	°C/W
	Thermal Resistance Junction-Ambient [1]	---	75	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	24	°C/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	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=11.5A	---	9	12	mΩ
	Static Drain-Source On-Resistance[2]	V_{GS}=4.5V , I_D=9.5A	---	12	15.	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	---	2.3	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=11.5A	---	45	---	S
Qg	Total Gate Charge (10V)	V_{DS}=50V , V_{GS}=10V , I_D=11.5A	---	35	---	nC
Qg	Total Gate Charge (4.5V)		---	16	---	
Qgs	Gate-Source Charge		---	8	---	
Qgd	Gate-Drain Charge		---	4	---	
Td(on)	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , R_G=3Ω, I_D=11.5A	---	9	---	ns
Tr	Rise Time		---	4.5	---	
Td(off)	Turn-Off Delay Time		---	35	---	
Tf	Fall Time		---	5.5	---	
Ciss	Input Capacitance	V_{DS}=50V , V_{GS}=0V , f=1MHz	---	255	---	pF
Coss	Output Capacitance		---	305	---	
Crss	Reverse Transfer Capacitance		---	12	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	4	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.1	V
t_{rr}	Reverse Recovery Time	I_F=11.5A , di/dt=100A/μs , T_J=25℃	---	28	---	nS
Q_{rr}	Reverse Recovery Charge		---	120	---	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}=25V,V_{GS}=10V,L=0.3mH,I_{AS}=9A
4.The power dissipation is limited by 150℃ 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

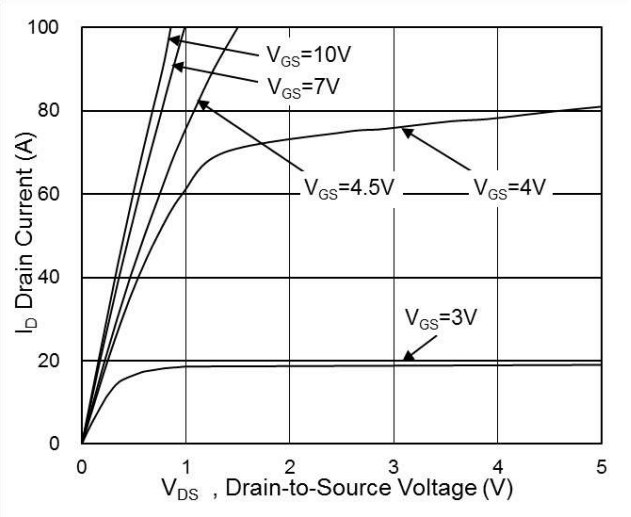


Fig.1 Typical Output Characteristics

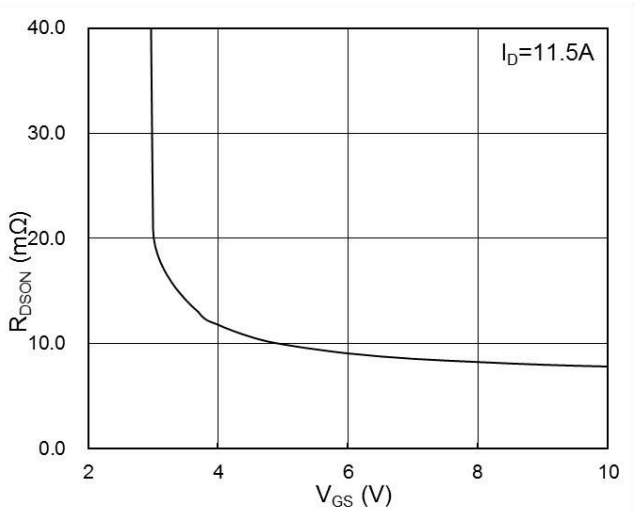


Fig.2 On-Resistance vs. G-S Voltage

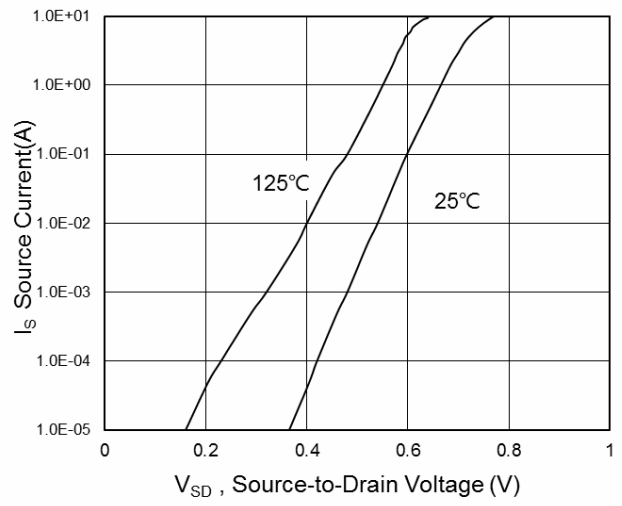


Fig.3 Source-Drain Forward Characteristics

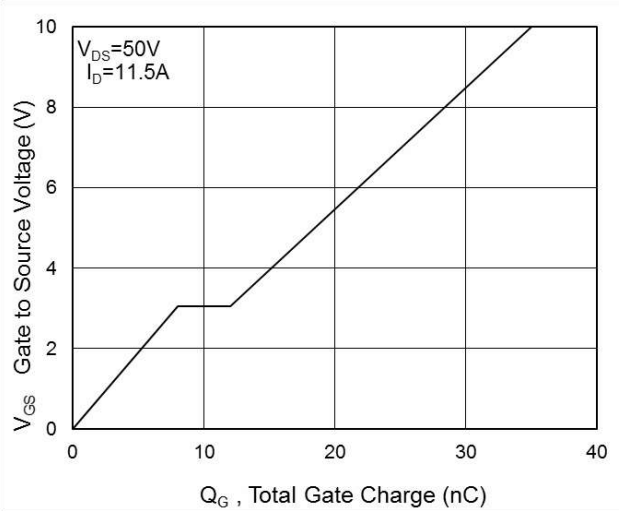


Fig.4 Gate-Charge Characteristics

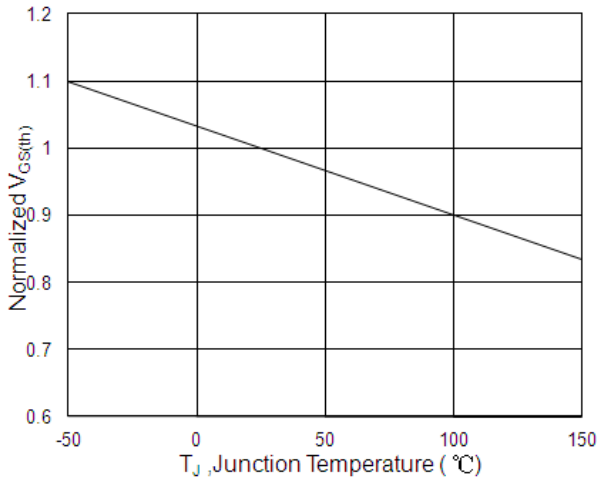


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

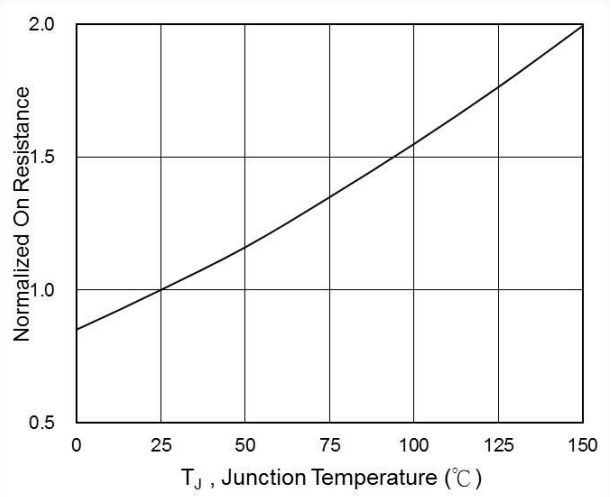


Fig.6 Normalized R_{DSON} vs. T_J

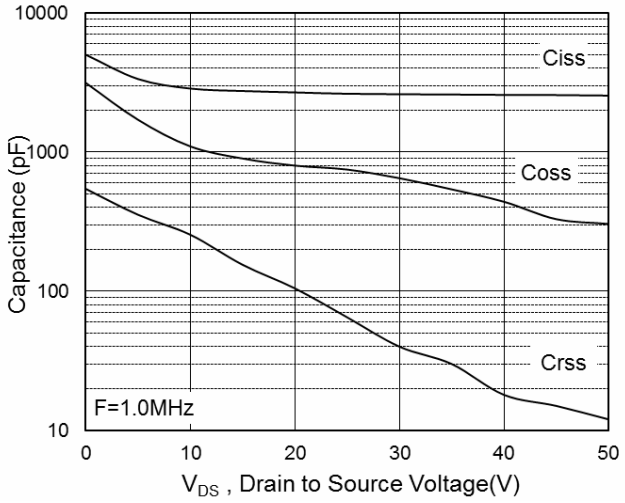


Fig.7 Capacitance

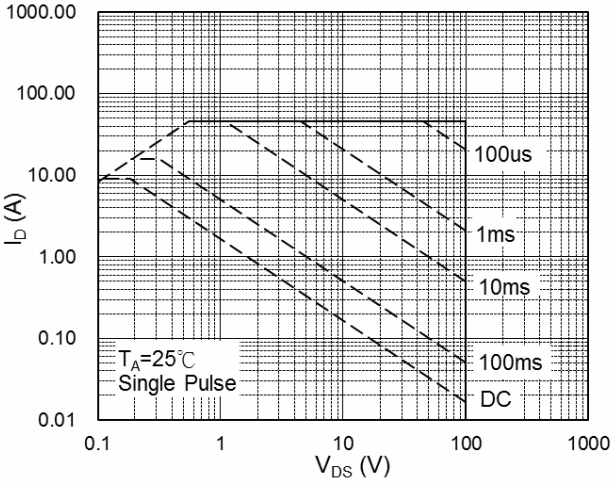


Fig.8 Safe Operating Area

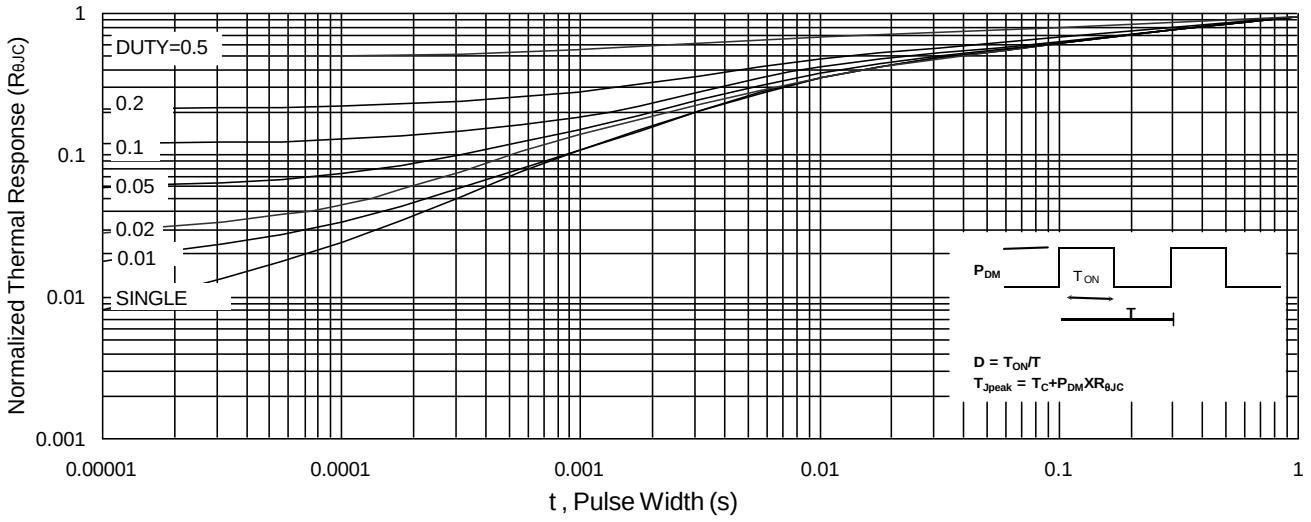


Fig.9 Normalized Maximum Transient Thermal Impedance

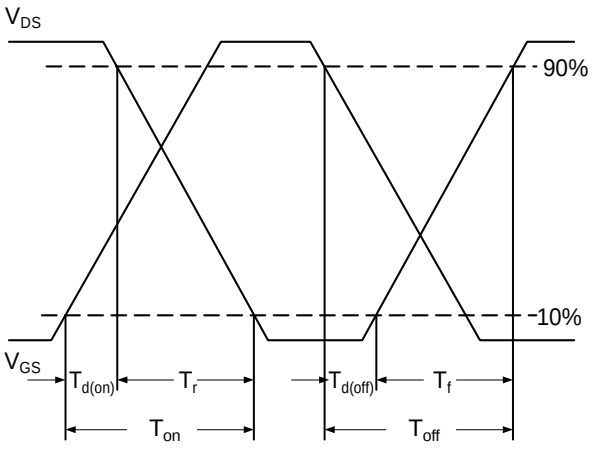


Fig.10 Switching Time Waveform

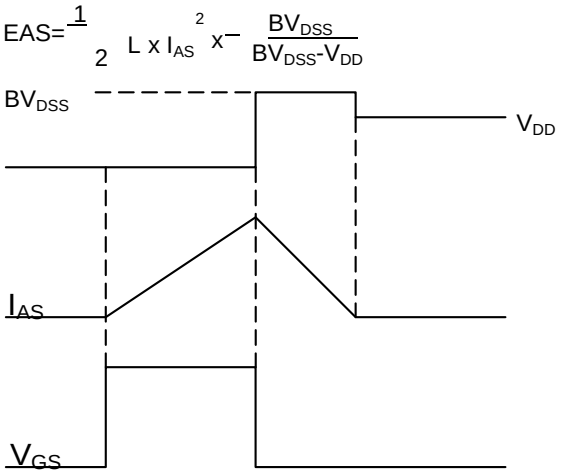


Fig.11 Unclamped Inductive Switching Waveform