

General Description

The WSP9936 is the highest performance trench N-ch MOSFET with extreme high cell density, which provide excellent R_{DS(on)} and gate charge for most of the small power switching and load switch applications.

The WSP9936 meet the RoHS and Green Product requirement with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent C_{dv/dt} effect decline
- Green Device Available

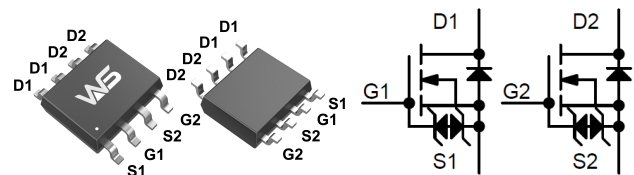
Product Summary

BVDSS	R _{DS(on)}	I _D
20V	14mΩ	8A

Applications

- High Frequency Point-of-Load Synchronous
Small power switching for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- ESD:2KV

SOP-8 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	20	V
V _{GS}	Gate-Source Voltage	± 12	V
I _{D@T_A=25°C}	Continuous Drain Current, V _{GS} @ 4.5V ¹	8	A
I _{D@T_A=70°C}	Continuous Drain Current, V _{GS} @ 4.5V ¹	6.1	A
I _{DM}	Pulsed Drain Current ²	40	A
P _{D@T_A=25°C}	Total Power Dissipation ³	2	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 _{θJA}	Thermal Resistance Junction-ambient ¹	---	62.5	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	10	°C/W

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.022	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =4.5V, I _D =8A	---	15	26	mΩ
		V _{GS} =2.5V, I _D =6.8A	---	19	34	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.5	0.75	1.1	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-2.33	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =16V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =16V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±12V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =5A	---	25	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	4.5	---	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =10V, V _{GS} =4.5V, I _D =8A	---	15.6	17	nC
Q _{gs}	Gate-Source Charge		---	1.3	---	
Q _{gd}	Gate-Drain Charge		---	2.5	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =10V, V _{GS} =4.5V, R _G =6Ω I _D =5A, R _L =10Ω.	---	4	9.5	ns
T _r	Rise Time		---	6	24	
T _{d(off)}	Turn-Off Delay Time		---	25	73	
T _f	Fall Time		---	4	39	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz	---	520	---	pF
C _{oss}	Output Capacitance		---	105	---	
C _{rss}	Reverse Transfer Capacitance		---	60	---	

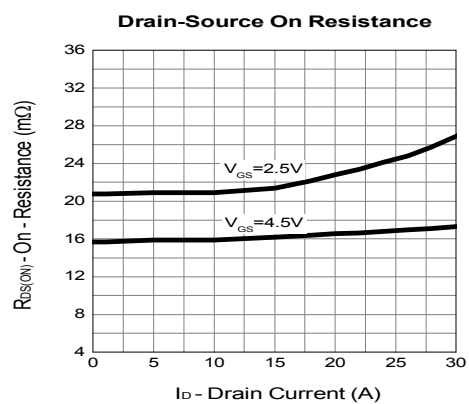
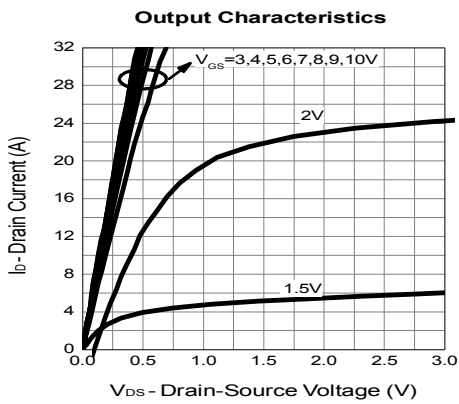
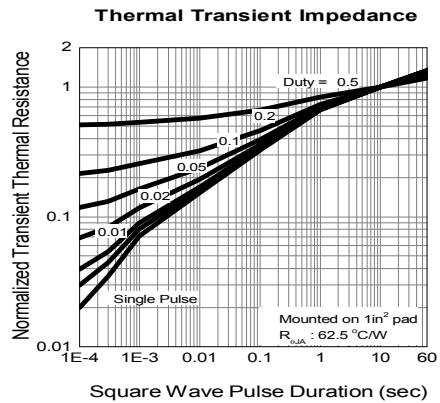
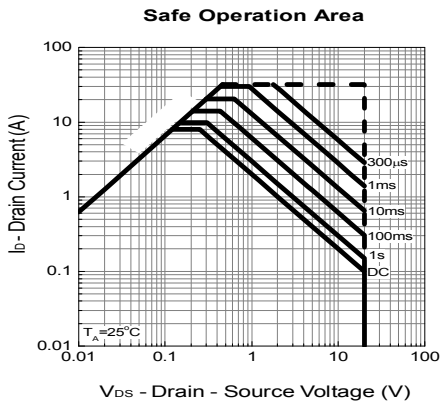
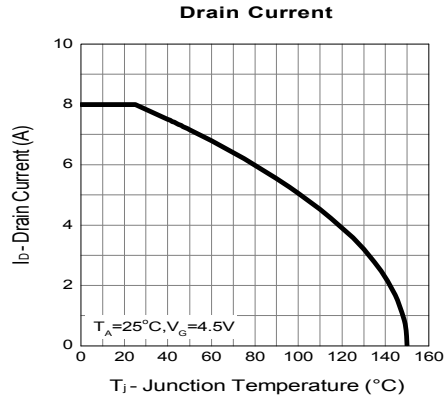
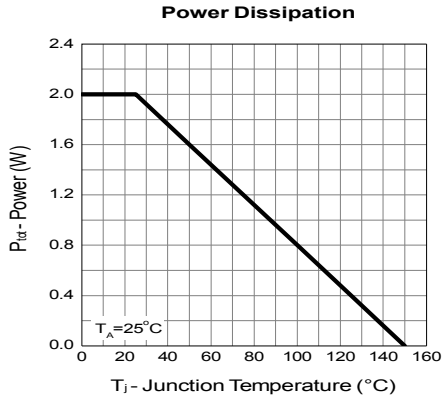
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	---	---	3.7	A
I _{SM}	Pulsed Source Current ^{2,4}		---	---	40	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.3	V
t _{rr}	Reverse Recovery Time	I _F =8A, di/dt=100A/μs, T _J =25°C	---	19.2	---	nS
Q _{rr}	Reverse Recovery Charge		---	4.6	---	nC

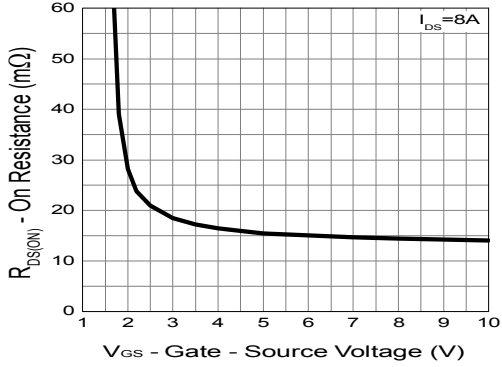
Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper,t<10sec.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

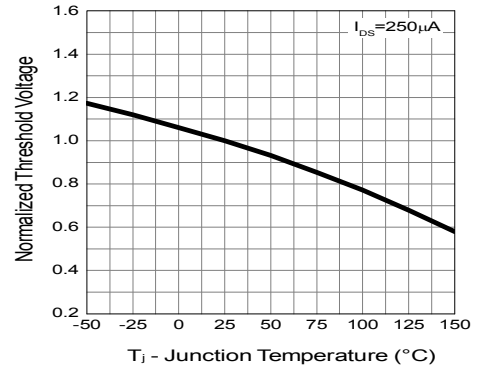
Typical Characteristics



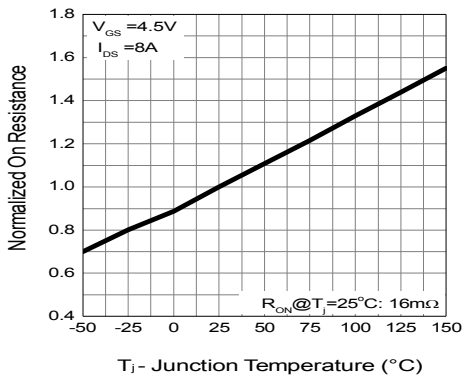
Transfer Characteristics



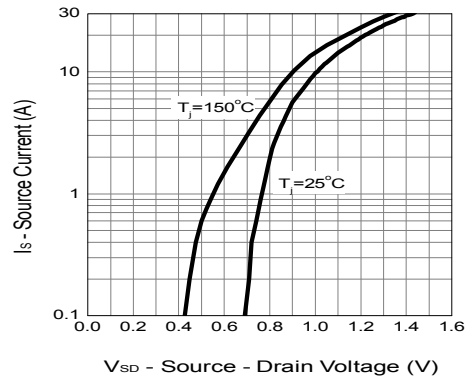
Gate Threshold Voltage



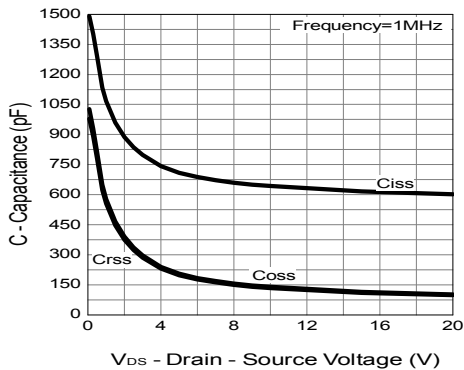
Drain-Source On Resistance



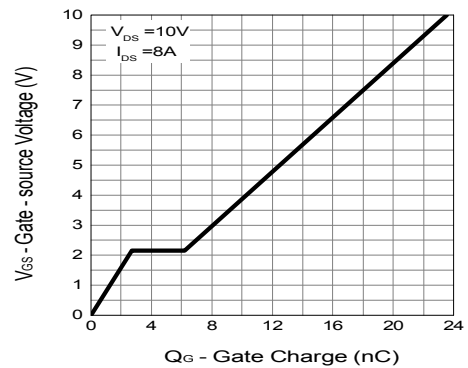
Source-Drain Diode Forward



Capacitance



Gate Charge





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