

General Description

The WSF22N06 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 synchronous buck converter applications.

The WSF22N06 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

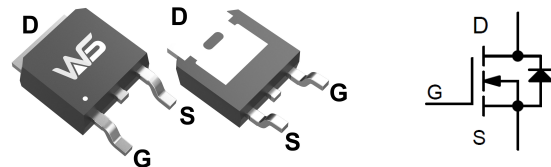
Product Summary

BVDSS	R _{DS(on)}	ID
60V	65mΩ	18A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- LCD/LED back light

TO-252 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _{D@T_C=25°C}	Continuous Drain Current, V _{GS} @ 10V ¹	18	A
I _{D@T_C=70°C}	Continuous Drain Current, V _{GS} @ 10V ¹	12	A
I _{DP}	Pulsed Drain Current ²	50	A
EAS	Single Pulse Avalanche Energy ³	11	mJ
I _{AS}	Avalanche Current	10	A
P _{D@T_C=25°C}	Total Power Dissipation ⁴	42	W
P _{D@T_C=100°C}	Total Power Dissipation ⁴	30	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	---	3.0	°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	60	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.057	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =10A	---	65	76	mΩ
		V _{GS} =4.5V, I _D =5A	---	75	97	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.8	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-5.68	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =48V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =48V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =5A	---	30	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.7	---	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =30V, V _{GS} =10V, I _D =5A	---	5.5	---	nC
Q _{gs}	Gate-Source Charge		---	1.8	---	
Q _{gd}	Gate-Drain Charge		---	2.1	---	
T _{d(on)}	Turn-On Delay Time	VDD=30V, RL=30Ω, IDS=1A, VGEN=10V, RG=6Ω	---	10	---	ns
T _r	Rise Time		---	8	---	
T _{d(off)}	Turn-Off Delay Time		---	25	---	
T _f	Fall Time		---	18	---	
C _{iss}	Input Capacitance	VGS=0V, VDS=30V, Frequency=1.0MHz	---	450	---	pF
C _{oss}	Output Capacitance		---	55	---	
C _{rss}	Reverse Transfer Capacitance		---	38	---	

Diode Characteristics

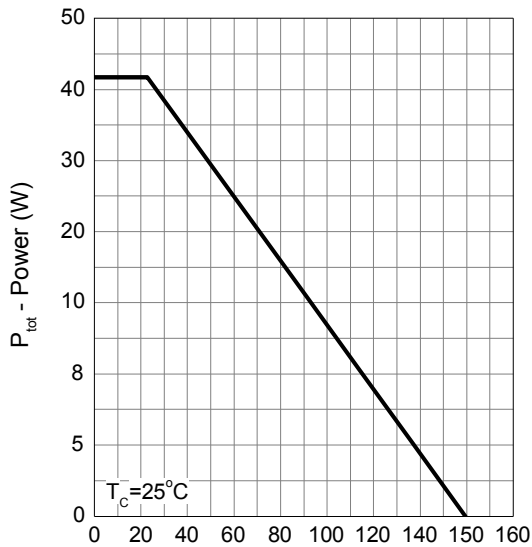
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,6}	V _G =V _D =0V, Force Current	---	---	10	A
I _{SM}	Pulsed Source Current ^{2,6}		---	---	35	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.3	V
t _{rr}	Reverse Recovery Time	IF=10A, dI/dt=100A/μs, T _J =25°C	---	30	---	nS
Q _{rr}	Reverse Recovery Charge		---	35	---	nC

Note a : Pulse test ; pulse width≤300μs, duty cycle≤2%.

Note b : Guaranteed by design, not subject to production testing.

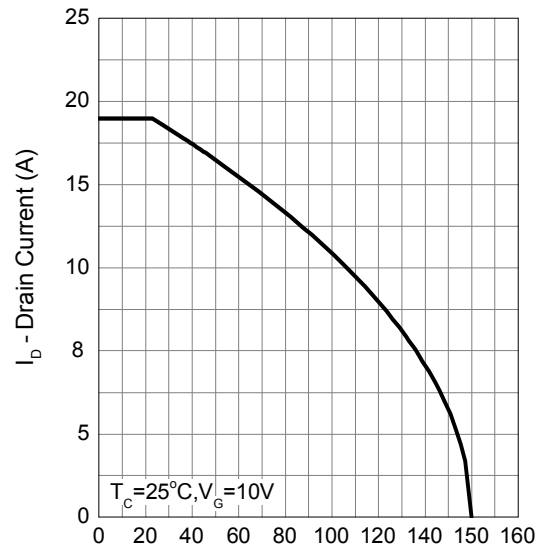
Typical Operating Characteristics

Power Dissipation



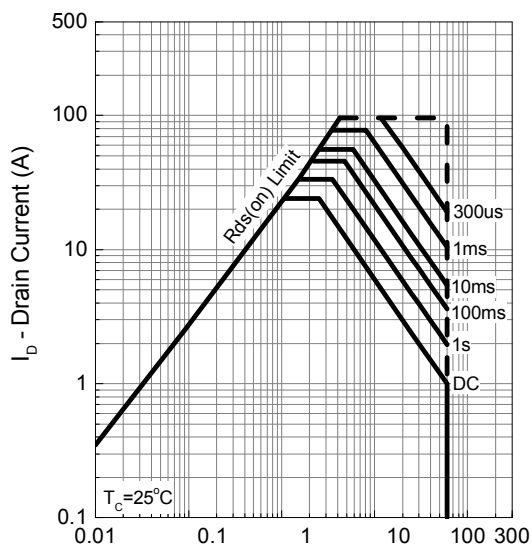
T_j - Junction Temperature ($^{\circ}$ C)

Drain Current



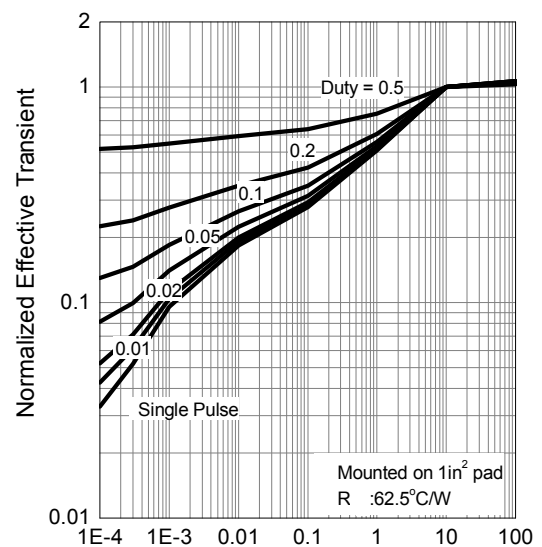
T_j - Junction Temperature ($^{\circ}$ C)

Safe Operation Area



V_{DS} - Drain-Source Voltage (V)

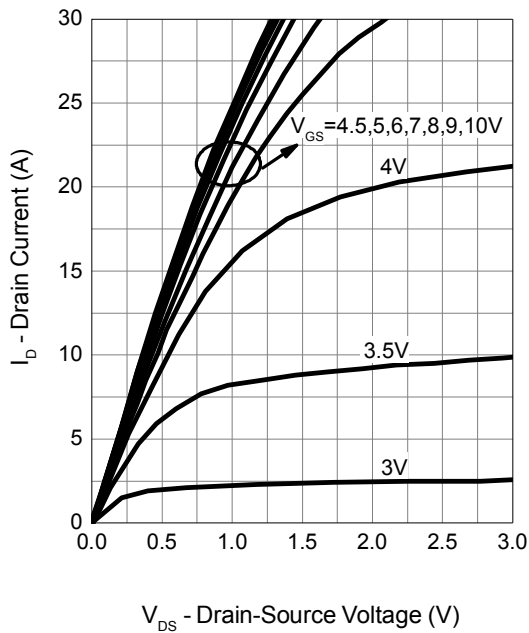
Thermal Transient Impedance



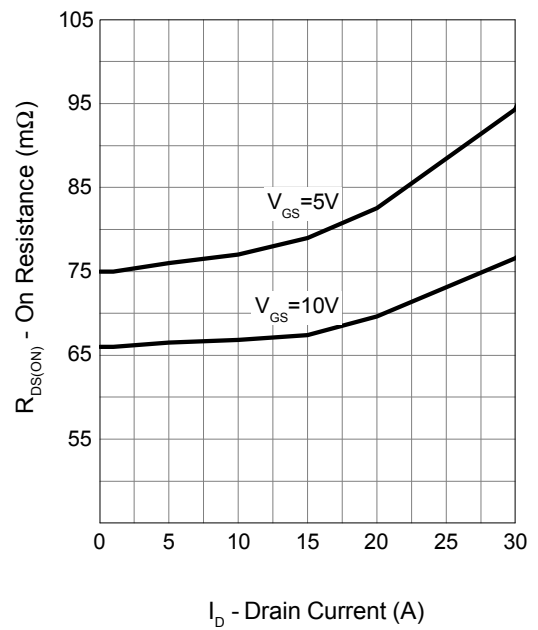
Square Wave Pulse Duration (sec)

Typical Operating Characteristics (Cont.)

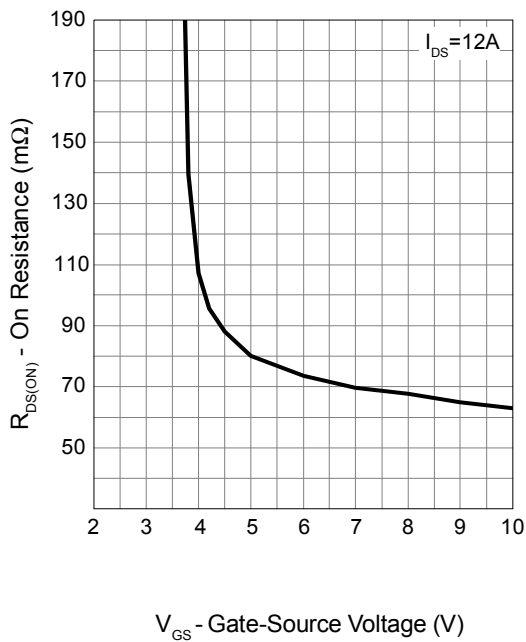
Output Characteristics



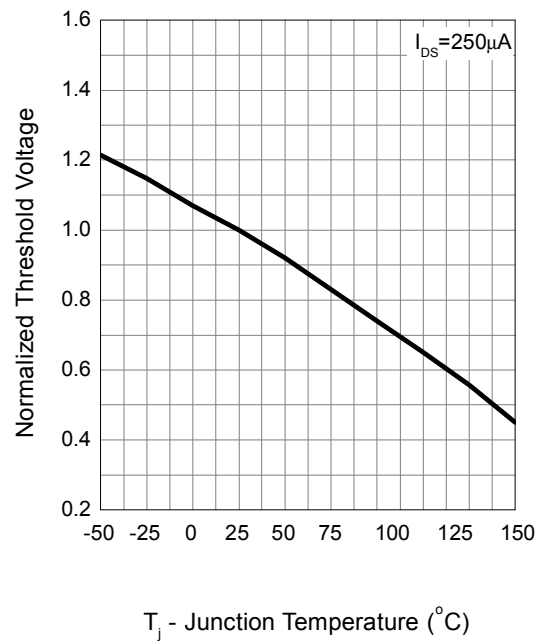
Drain-Source On Resistance



Gate-Source On Resistance

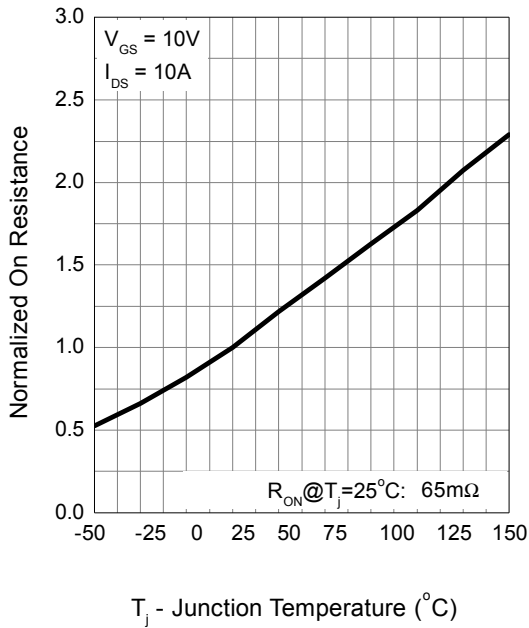


Gate Threshold Voltage

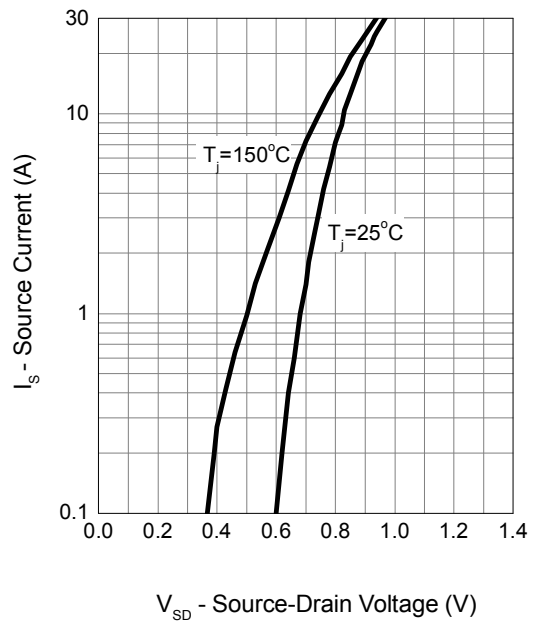


Typical Operating Characteristics (Cont.)

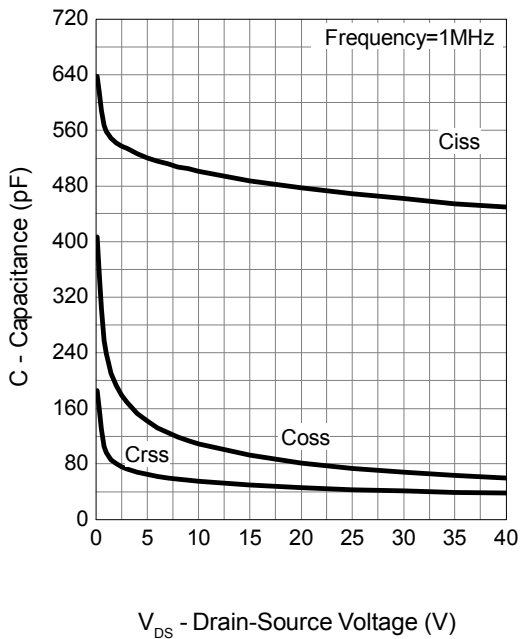
Drain-Source On Resistance



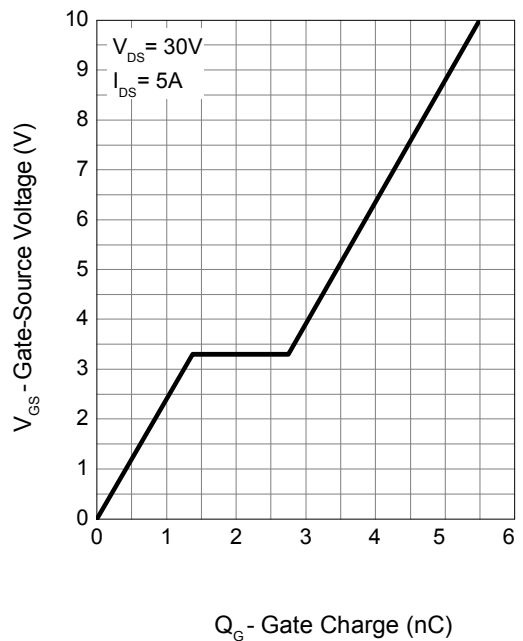
Source-Drain Diode Forward



Capacitance



Gate Charge





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