

General Description

The WSF50P10 is the highest performance trench P-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 WSF50P10 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)}	I _D
-100V	40mΩ	-34A

Applications

- Power Management for Industrial DC / DC Converters.

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-100	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current, -V _{GS} @ -10V	-34	A
I _D @T _C =100°C	Continuous Drain Current, -V _{GS} @ -10V	-22	A
I _{DM}	Pulsed Drain Current	-136 ^a	A
E _{AS} ^c	Single Pulse Avalanche Energy	182	mJ
I _{AS} ^c	Avalanche Current	-27	A
P _D @T _C =25°C	Total Power Dissipation	96	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

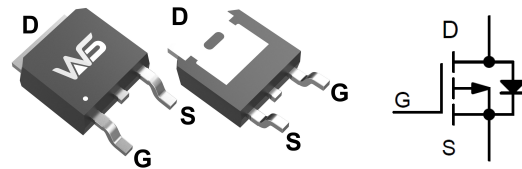
Symbol	Parameter	Typ.	Max.	Unit
R _{θJA} ^b	Thermal Resistance Junction-Ambient	---	60	°C/W
R _{θJC}	Thermal Resistance Junction-Case	---	1.3	°C/W

Note a : Pulse width is limited by max. junction temperature.

Note b : Surface Mounted on 1in² pad area.

Note c : UIS tested and pulse width are limited by maximum junction temperature 150°C(initial temperature T_J=25°C).

TO-252 Pin Configuration



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	-100	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.021	---	V/°C
R _{DS(ON)} ^d	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-18A	---	32	40	mΩ
		V _{GS} =-4.5V, I _D =-10A	---	38	51	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.0	-2.0	-3.0	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	4.08	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-80V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-80V, V _{GS} =0V, T _J =85°C	---	---	-30	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Q _g ^e	Total Gate Charge	V _{DS} =-30V, V _{GS} =-10V, I _D =-18A	---	56	---	nC
Q _{gs} ^e	Gate-Source Charge		---	9.5	---	
Q _{gd} ^e	Gate-Drain Charge		---	14.5	---	
T _{d(on)} ^e	Turn-On Delay Time	V _{DD} =-30V, V _{GS} =-10V, R _G =6Ω, I _D =-1A, RL=30Ω.	---	17	---	ns
T _r ^e	Rise Time		---	9	---	
T _{d(off)} ^e	Turn-Off Delay Time		---	83	---	
T _f ^e	Fall Time		---	34	---	
C _{iss} ^e	Input Capacitance	V _{DS} =-50V, V _{GS} =0V, f=1MHz	---	2480	3207	pF
C _{oss} ^e	Output Capacitance		---	268	---	
C _{riss} ^e	Reverse Transfer Capacitance		---	126	---	

Diode Characteristics

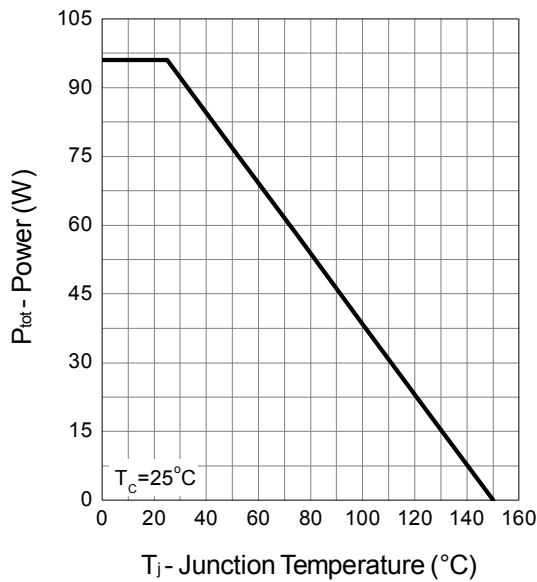
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	-18	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-18A, T _J =25°C	---	---	-1.2	V

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

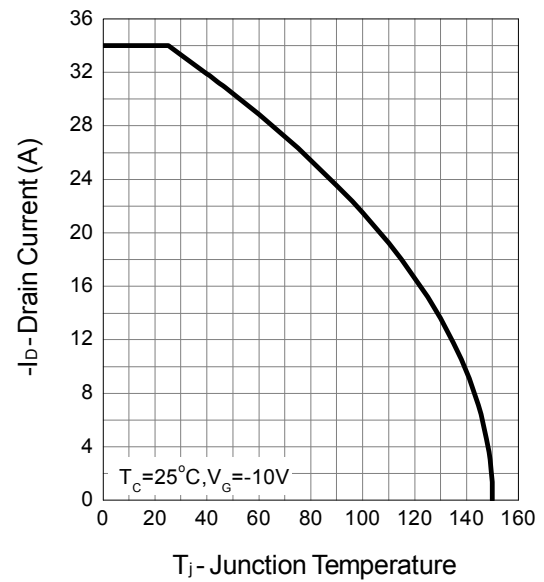
Note e : Guaranteed by design, not subject to production testing.

Typical Characteristics

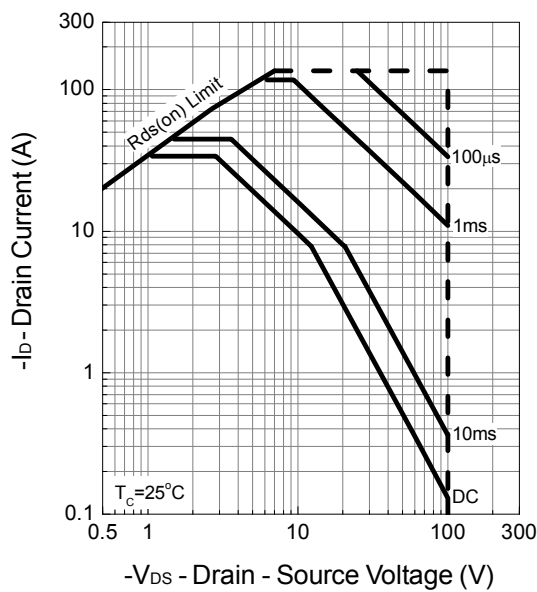
Power Dissipation



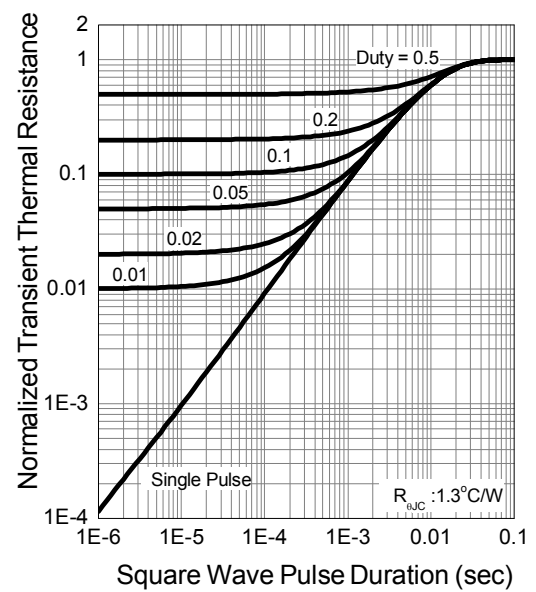
Drain Current



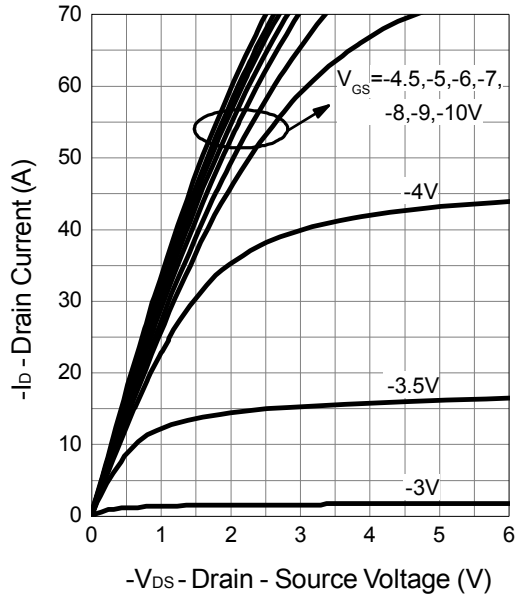
Safe Operation Area



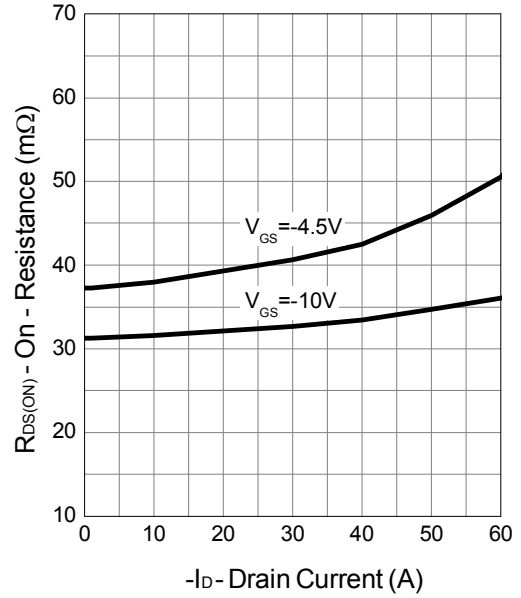
Thermal Transient Impedance



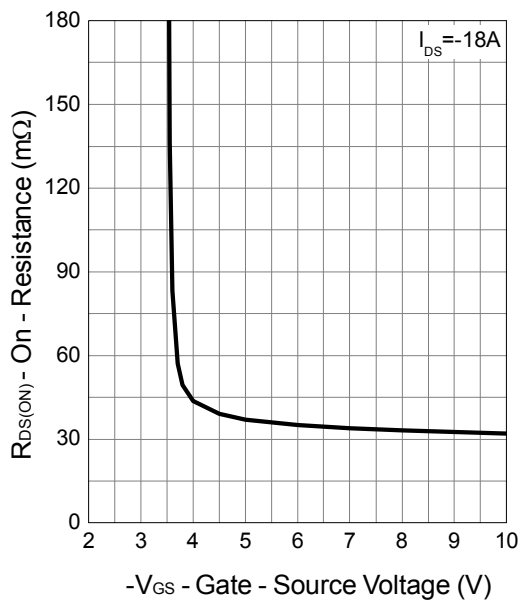
Output Characteristics



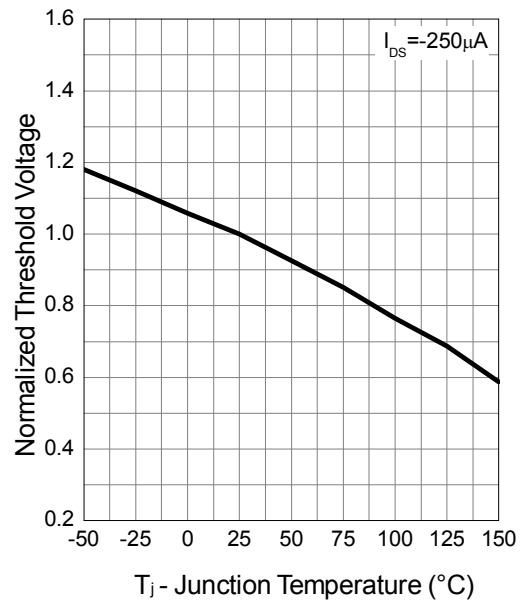
Drain-Source On Resistance



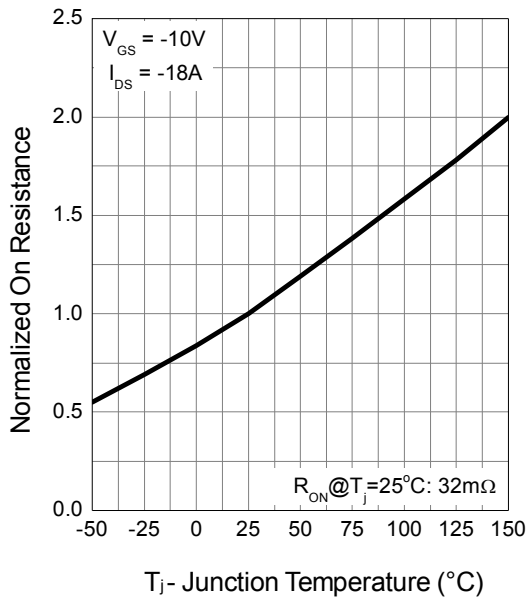
Gate-Source On Resistance



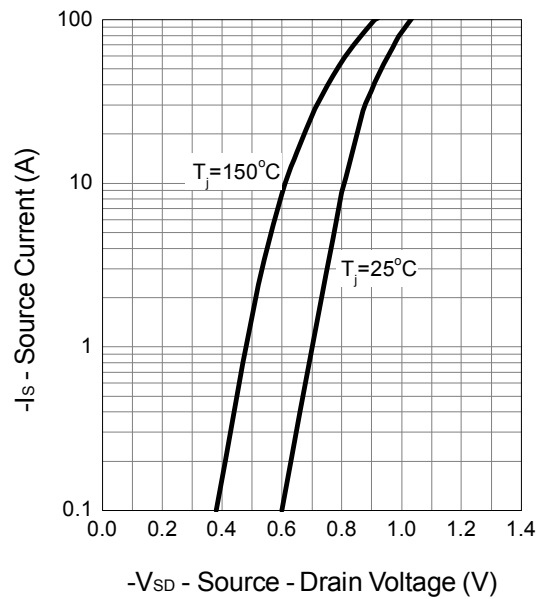
Gate Threshold Voltage



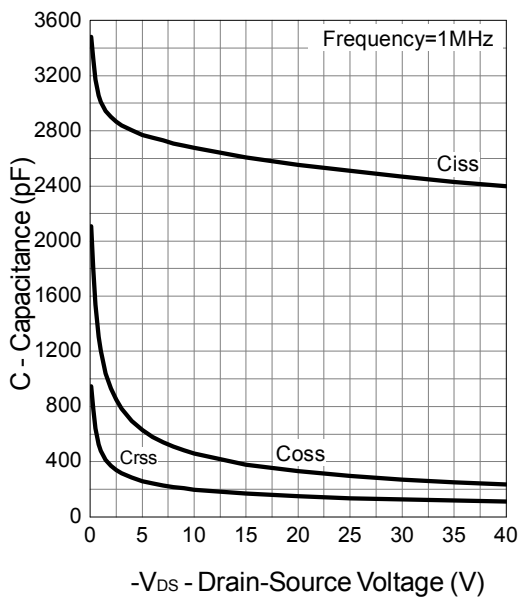
Drain-Source On Resistance



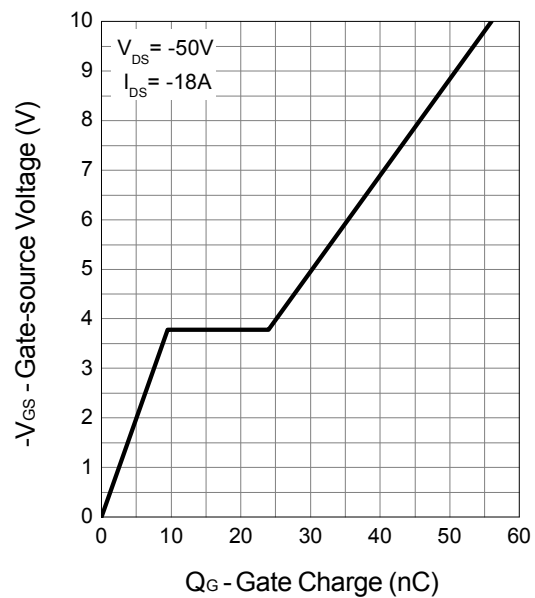
Source-Drain Diode Forward



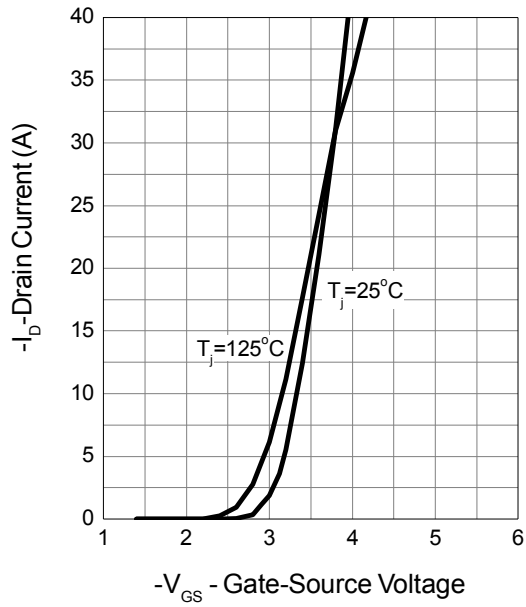
Capacitance



Gate Charge



Transfer Characteristics





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