General Description

The WSF7P20 uses advanced proprietary, planar stripe, DMOS technology to provide excellent $R_{DS(on)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications. They are also well suited for high efficiency switching DC/DC converters.

Features

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

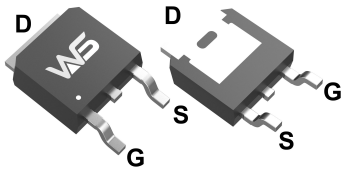
Product Summery

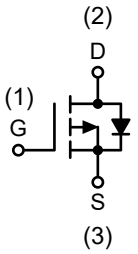
BV_{DSS}	R_{DSON}	I_D
-200V	540mΩ	-5.7A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

TO-252-2L Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-200	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Continuous Drain Current	-5.7	A
I_{DM}	Pulsed Drain Current (Note 2)	-22.8	A
I_{AR}	Avalanche Current (Note 2)	-5.7	A
E_{AS}	Single Pulsed Avalanche Energy (Note 3)	570	mJ
E_{AR}	Repetitive Avalanche Energy (Note 2)	5.5	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 4)	-5.5	V/ns
P_D	Total Power Dissipation T_a = 25°C	2.5	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Note: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Pulse width limited by $T_{J(MAX)}$
3. L=26.3mH, I_{AS}=-5.7A, V_{DD}=-50V, R_G=25Ω
4. I_{SD}≦-7.3A, di/dt≦300A/μs, V_{DD}≦BV_{DSS}

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	---	100	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	2.27	℃/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
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.1	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V , I_D=-2.85A	---	540	690	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-2	---	-4	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4.08	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-200V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=-200V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-40V , I_D=-2.85A	---	3.7	---	S
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-160V,V_{GS}=-10V,I_D=-7.3A	---	19	25	nC
Q_{gs}	Gate-Source Charge		---	4.6	---	
Q_{gd}	Gate-Drain Charge		---	9.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-100V , V_{GS}=-10V . I_D=-7.3A ,RG=25Ω.	---	15	---	ns
T_r	Rise Time		---	110	---	
$T_{d(off)}$	Turn-Off Delay Time		---	30	---	
T_f	Fall Time		---	42	---	
C_{iss}	Input Capacitance	V_{DS}=-25V , V_{GS}=0V , f=1MHz	---	590	---	pF
C_{oss}	Output Capacitance		---	140	---	
C_{rss}	Reverse Transfer Capacitance		---	25	---	

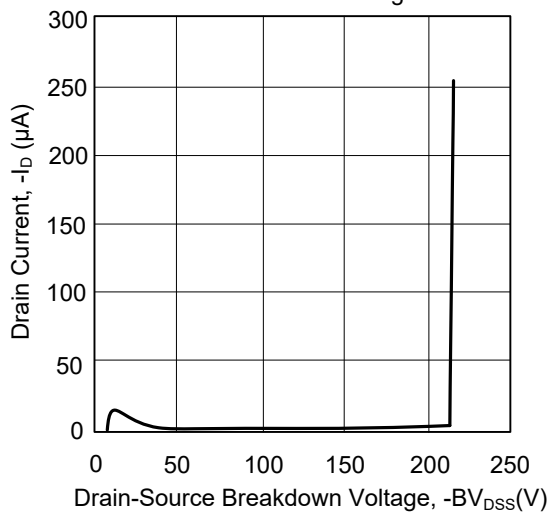
Note: 1. Pulse Test : Pulse width≦300μs, Duty cycle≦2%
2. Essentially independent of operating temperature

Diode Characteristics

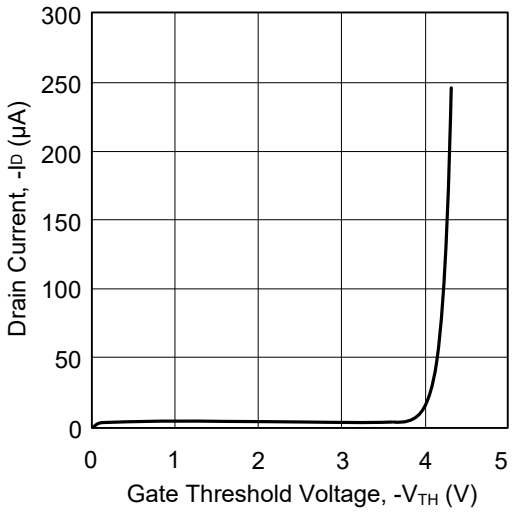
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	-5.7	A
I_{SM}	Pulsed Source Current		---	---	-22.8	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-5.7A , T_J=25℃	---	---	-5.0	V

TYPICAL CHARACERISTICS

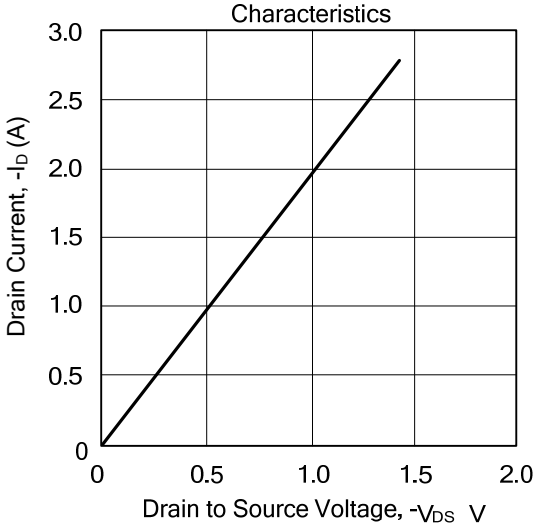
Drain Current vs. Drain-Source Breakdown Voltage



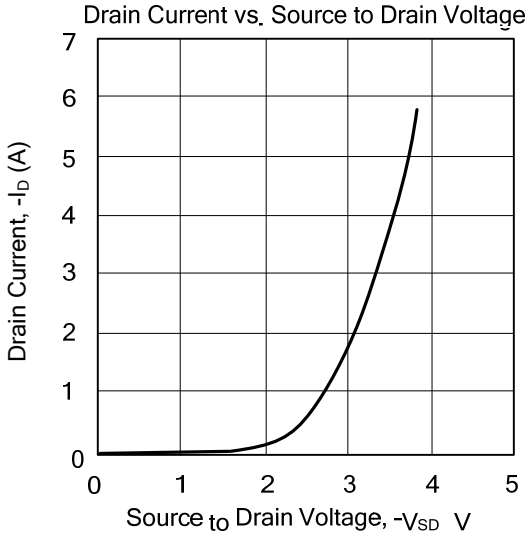
Drain Current vs. Gate Threshold Voltage



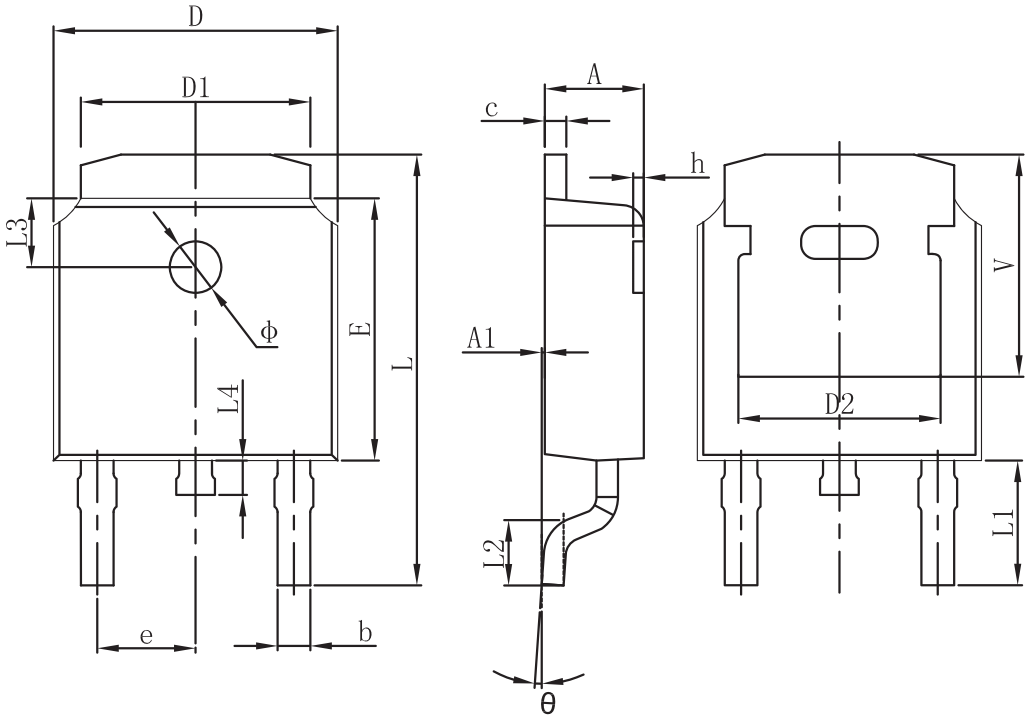
Drain-Source On-State Resistance Characteristics



Drain Current vs. Source to Drain Voltage



Packaging information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

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