General Description

The WSF25N20 is the highest performance trench N-Ch MOSFET with extreme high cell density,which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

The WSF25N20 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
- Green Device Available

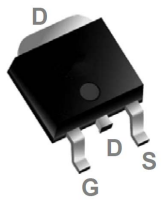
Product Summery

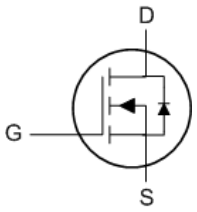
BV_{DSS}	R_{DSON}	I_D
200V	60mΩ	25A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch

TO-252 Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	25	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	16	A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	3.7	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	3.0	A
I_{DM}	Pulsed Drain Current[2]	75	A
EAS	Single Pulse Avalanche Energy[3]	35	mJ
I_{AS}	Avalanche Current	6.5	A
P_D@T_C=25℃	Total Power Dissipation[3]	113	W
P_D@T_C=100℃	Total Power Dissipation[3]	45	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	50	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	1.1	℃/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
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.098	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=12A	---	60	75	mΩ
		V_{GS}=6.0V , I_D=10A	---	85	150	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	1.5	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.57	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=160V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=160V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±25V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=8A	---	20	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2	4	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=100V , V_{GS}=10V , I_D=12A	---	40	---	nC
Q_{gs}	Gate-Source Charge		---	14	---	
Q_{gd}	Gate-Drain Charge		---	10	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=30V , V_{GS}=10V , R_G=6Ω, I_D=12A, R_L=30Ω	---	16	---	ns
T_r	Rise Time		---	7	---	
$T_{d(off)}$	Turn-Off Delay Time		---	37	---	
T_f	Fall Time		---	15	---	
C_{iss}	Input Capacitance	V_{DS}=30V , V_{GS}=0V , f=1MHz	---	2350	---	pF
C_{oss}	Output Capacitance		---	155	---	
C_{rss}	Reverse Transfer Capacitance		---	45	---	

Guaranteed Avalanche Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
EAS	Single Pulse Avalanche Energy[5]	V_{DD}=25V , L=0.5mH , I_{AS}=6.5A	10	---	---	mJ

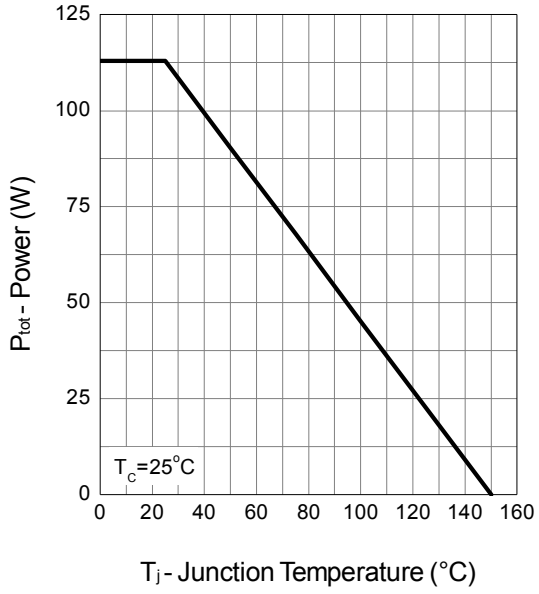
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	---	---	12	A
I_{SM}	Pulsed Source Current[2,6]		---	---	36	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=12A , T_J=25℃	---	---	1.3	V
t_{rr}	Reverse Recovery Time	IF=12A , dI/dt=100A/μs , T_J=25℃	---	75	---	nS
Q_{rr}	Reverse Recovery Charge		---	250	---	nC

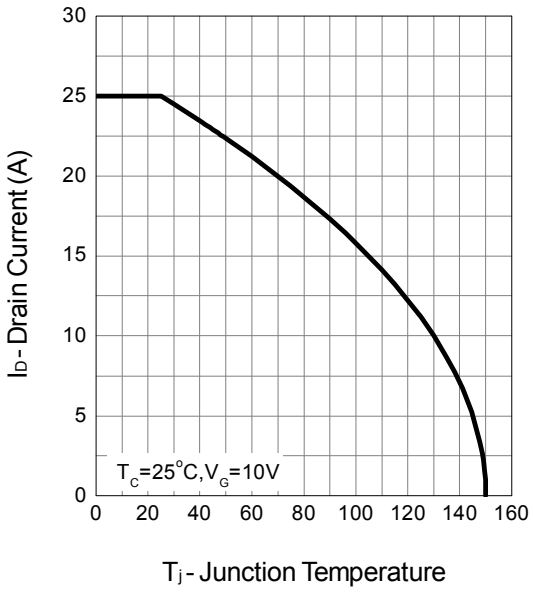
Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper,t<=10sec.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.5mH,I_{AS}=6.5A
4.The power dissipation is limited by 150℃ junction temperature
5.The Min. value is 100% EAS tested guarantee.
6.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

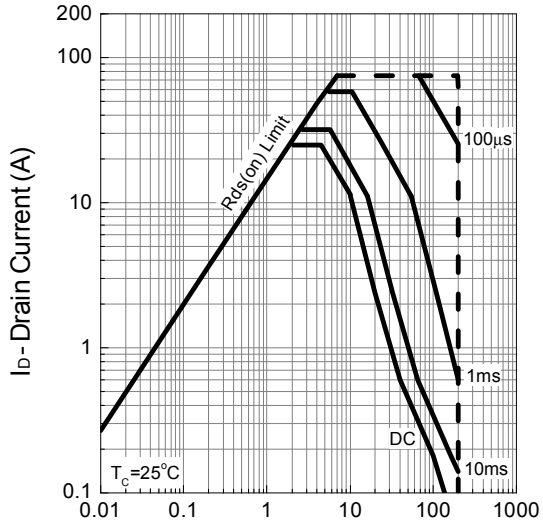
Power Dissipation



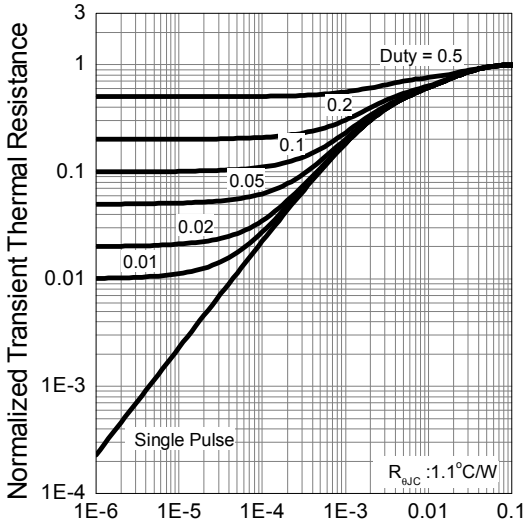
Drain Current



Safe Operation Area

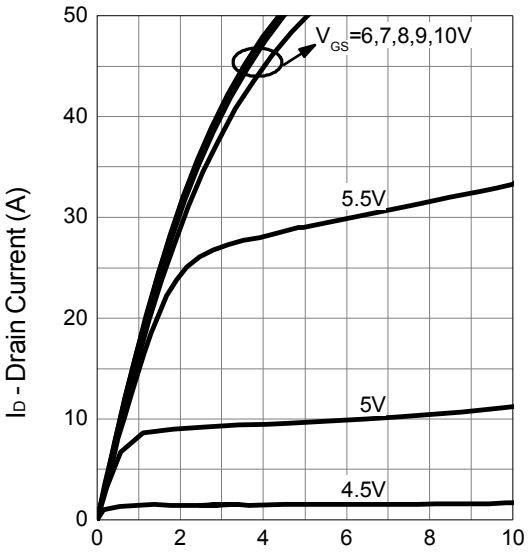


Thermal Transient Impedance

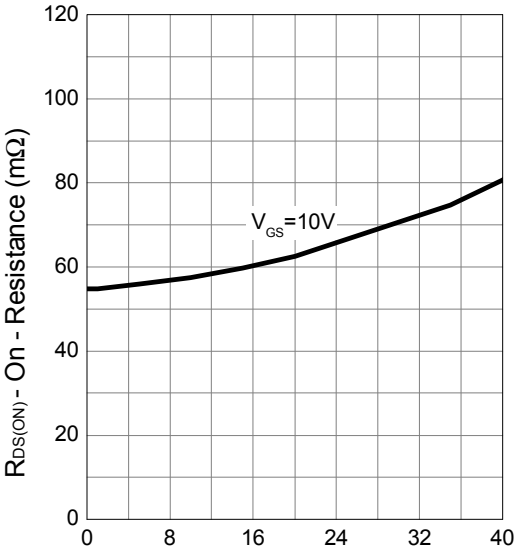


Typical Characteristics

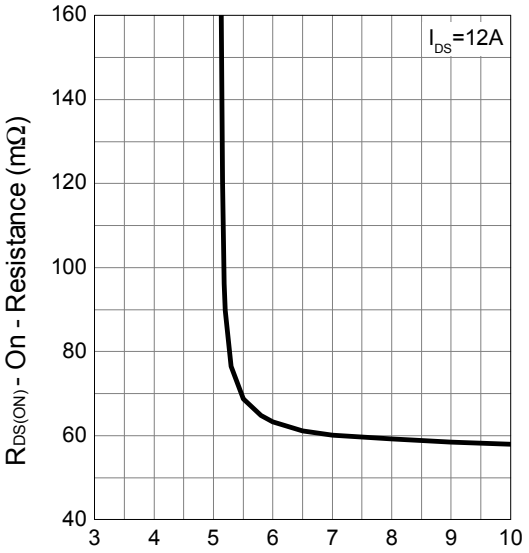
Output Characteristics



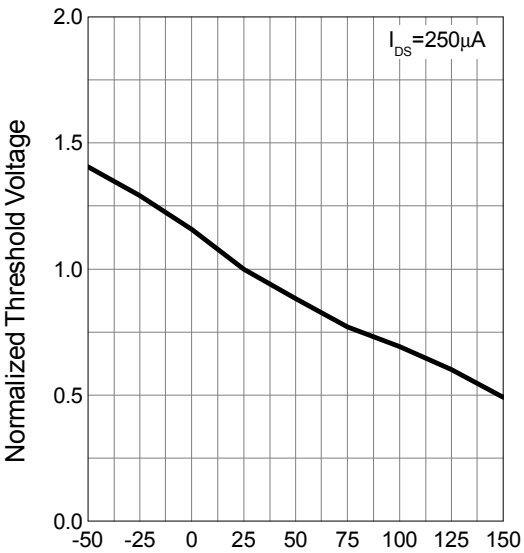
Drain-Source On Resistance



Gate-Source On Resistance

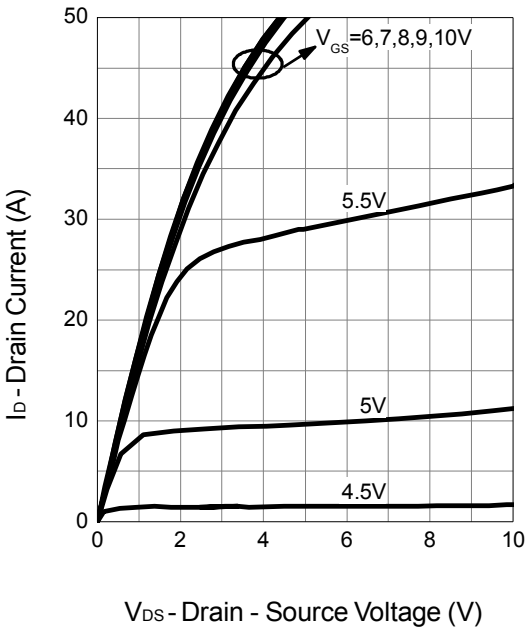


Gate Threshold Voltage

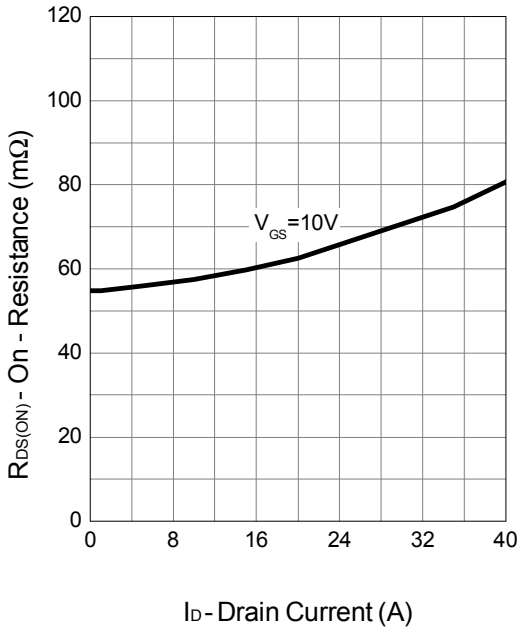


Typical Characteristics

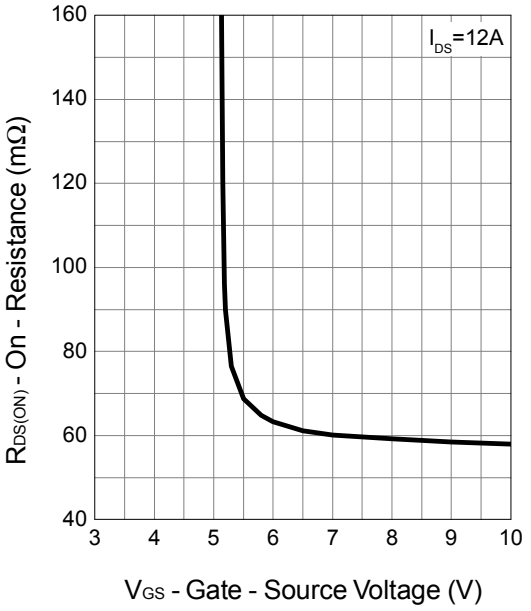
Output Characteristics



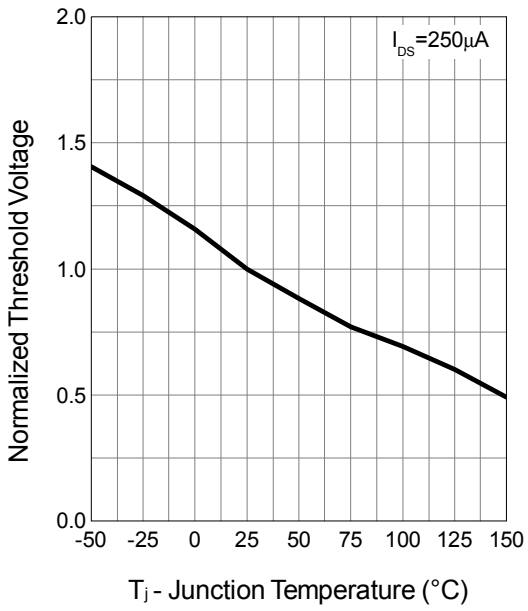
Drain-Source On Resistance



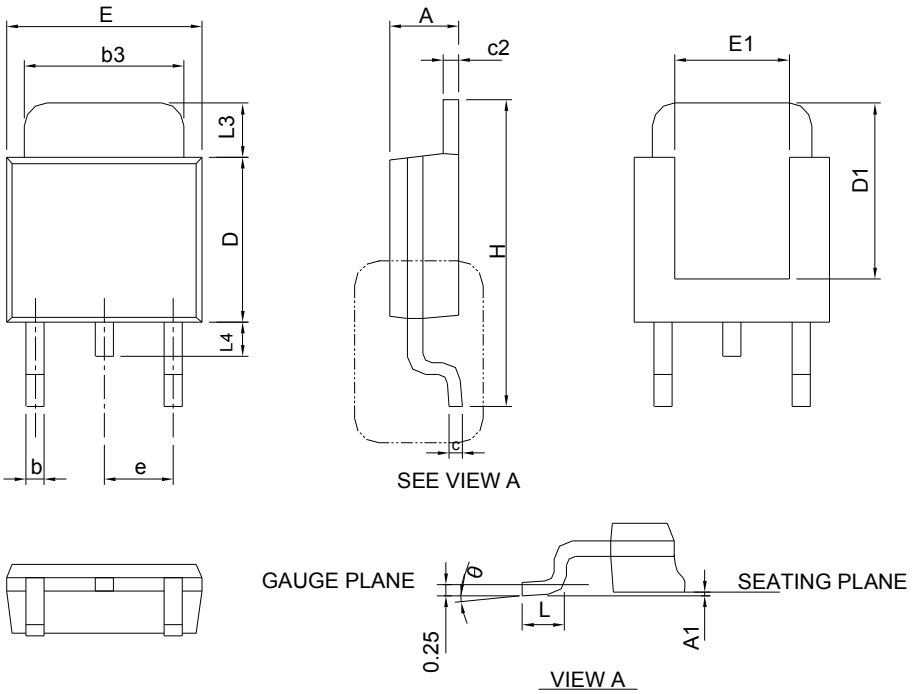
Gate-Source On Resistance



Gate Threshold Voltage

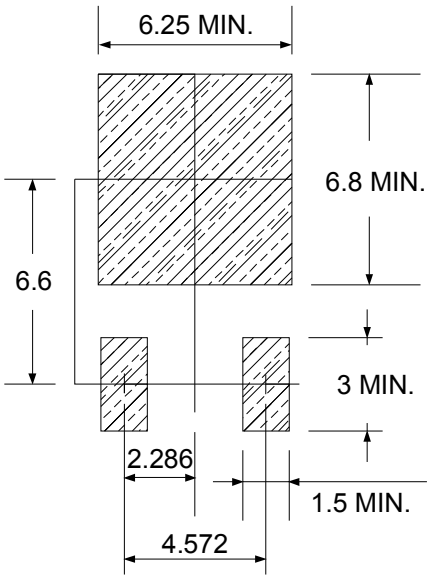


TO-252 Package Information



SYMBOL	TO-252			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	0.086	0.094
A1	-	0.13	-	0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4	-	1.02	-	0.040
θ	0°	8°	0°	8°

RECOMMENDED LAND PATTERN



UNIT: mm

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