General Description

The WSF80P04 is the highest performance trench P-Channel MOSFET with extreme high cell density,which provide excellent RDSON and gate chargefor most of the synchronous buck converterapplications.

The WSF80P04 meet the RoHS and GreenProduct requirement 100% EAS guaranteed withfull function reliability approved.

Product Summery

BV_{DSS}	R_{DSON}	I_D
-40V	7mΩ	-80A

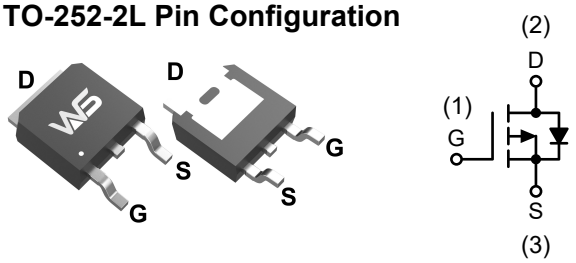
Applications

- Motor Drivers.
- Primary Switch for 12V Systems.
- Load Switch.

Features

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

TO-252-2L Pin Configuration



Absolute Maximum Ratings (T_A = 25ÁC Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-80	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -10V[1]	-38	A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-13	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ -10V[1]	-10	A
I_{DM}	Pulsed Drain Current[2],T_C=25°C	-210	A
EAS	Avalanche Energy, Single pulse,L=0.1mH	1008	mJ
I_{AS}	Avalanche Current, Single pulse,L=0.1mH	-142	A
P_D@T_C=25℃	Total Power Dissipation[4]	78	W
P_D@T_C=100℃	Total Power Dissipation[4]	37	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]	---	1.8	℃/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	-40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V, I_{DS}=-27	---	7	10	mΩ
		V_{GS}=-4.5V, I_{DS}=-17A	---	9	14	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.3	-1.8	-2.3	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-32V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-32V , V_{GS}=0V , T_J=85℃	---	---	-30	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±25V , V_{DS}=0V	---	---	±100	nA
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.5	---	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=-20V , V_{GS}=-4.5V , I_D=-27A	---	51	71	nC
Q_{gs}	Gate-Source Charge		---	9	---	
Q_{gd}	Gate-Drain Charge		---	11	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-20V, R_L=20Ω, I_{DS}=-1A, V_{GEN}=-10V, R_G=6Ω	---	11	20	ns
T_r	Rise Time		---	14	25	
$T_{d(off)}$	Turn-Off Delay Time		---	41	74	
T_f	Fall Time		---	77	139	
C_{iss}	Input Capacitance	V_{DS}=-20V , V_{GS}=0V , f=1MHz	---	5500	5857	pF
C_{oss}	Output Capacitance		---	560	---	
C_{rss}	Reverse Transfer Capacitance		---	500	---	

Diode Characteristics

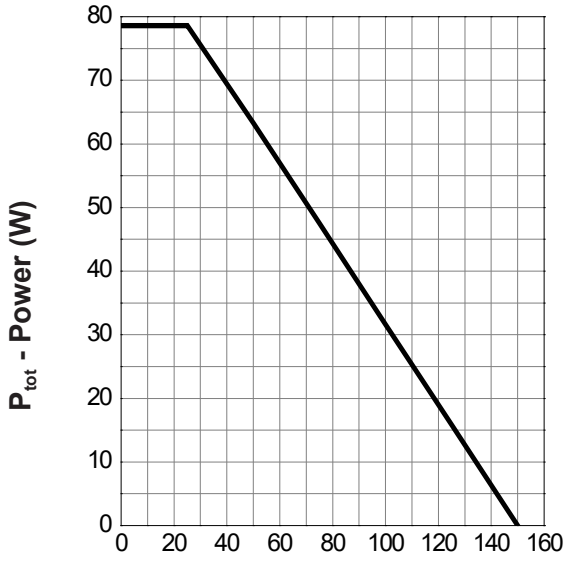
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	---	---	-80	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-13A , T_J=25℃	---	-0.8	-1.1	V
t_{rr}	Reverse Recovery Time	I_F=20A,dI/dt=100A/μs,T_J=25℃	---	28	---	nS
Q_{rr}	Reverse Recovery Charge		---	20	---	nC

Note :

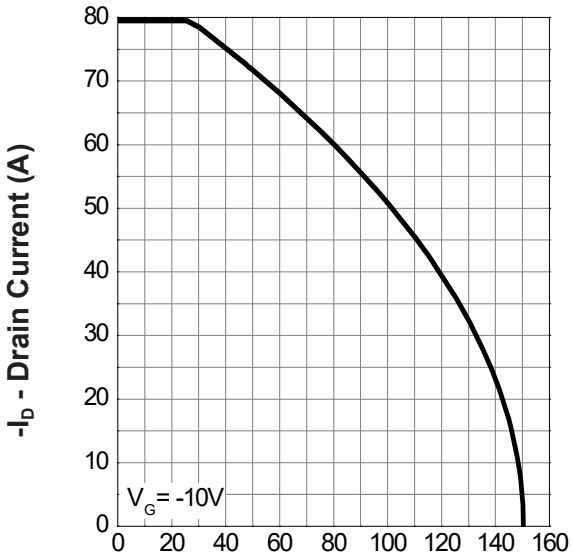
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper,t<10sec.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DS}=-20V,V_{GS}=-10V,L=0.1mH,I_{AS}=-142A
4.The power dissipation is limited by 150℃ junction 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

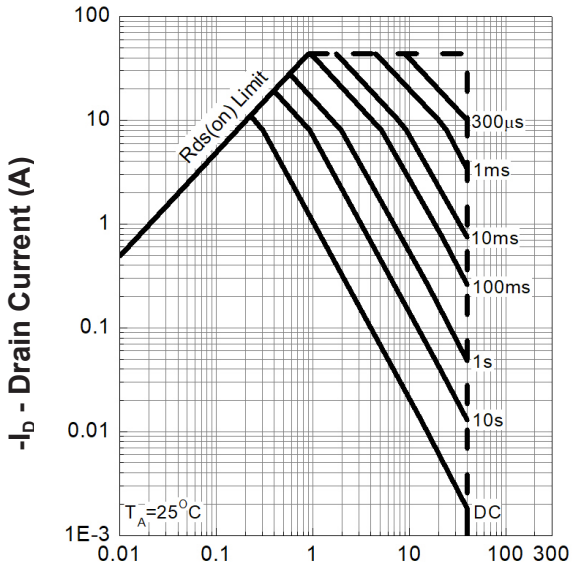
Power Dissipation



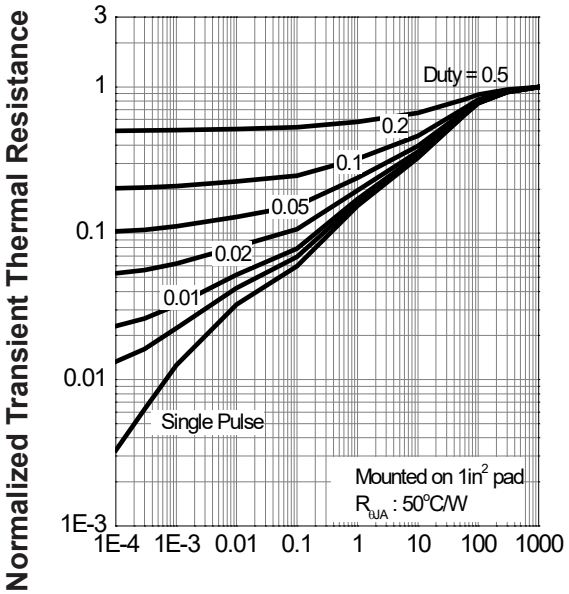
Drain Current



Safe Operation Area

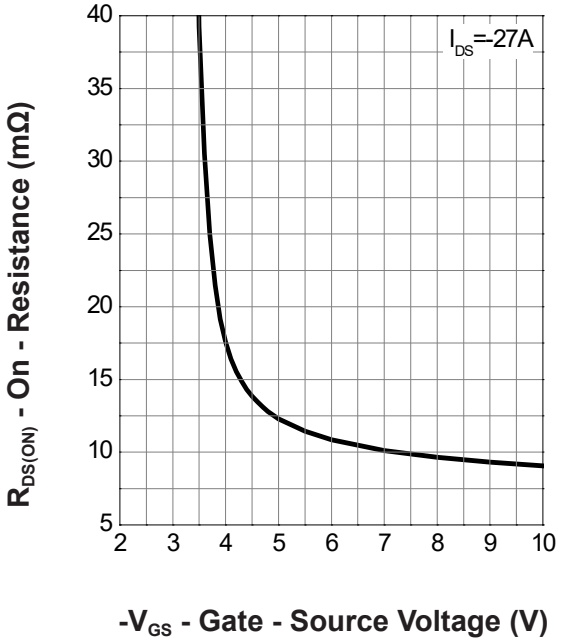


Thermal Transient Impedance

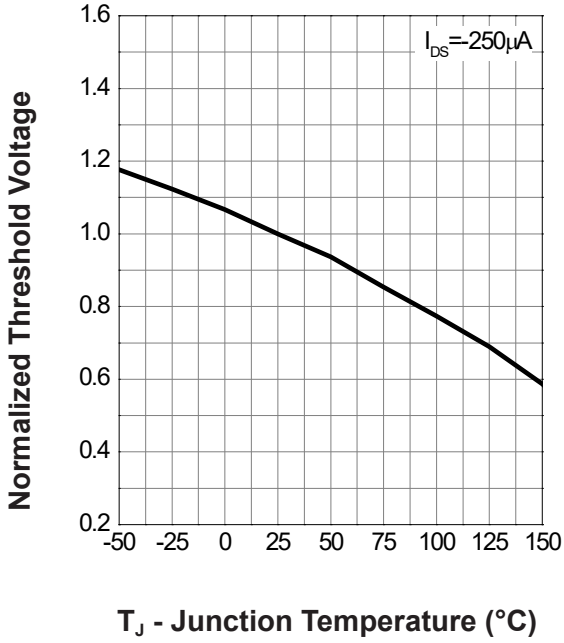


Typical Characteristics (Cont.)

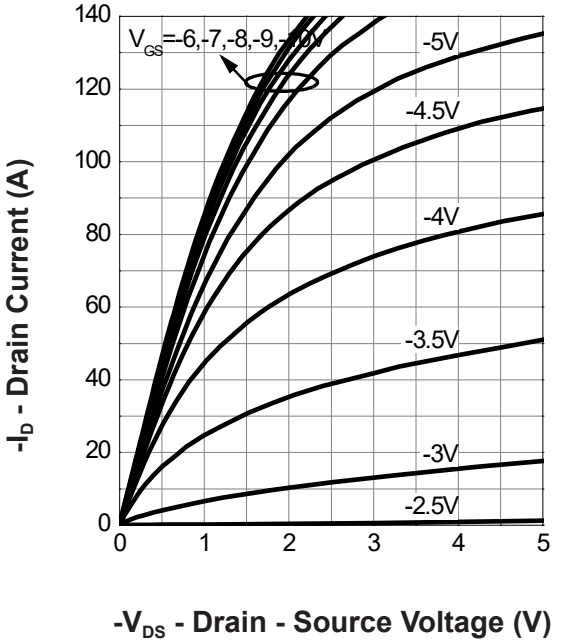
Gate-Source On Resistance



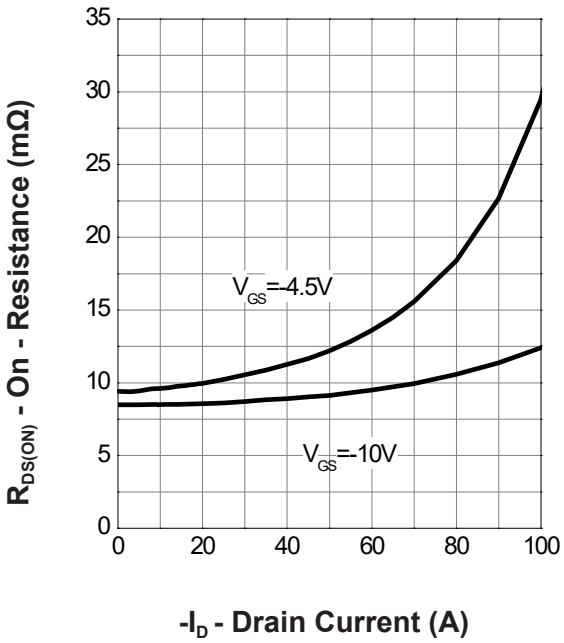
Gate Threshold Voltage



Output Characteristics

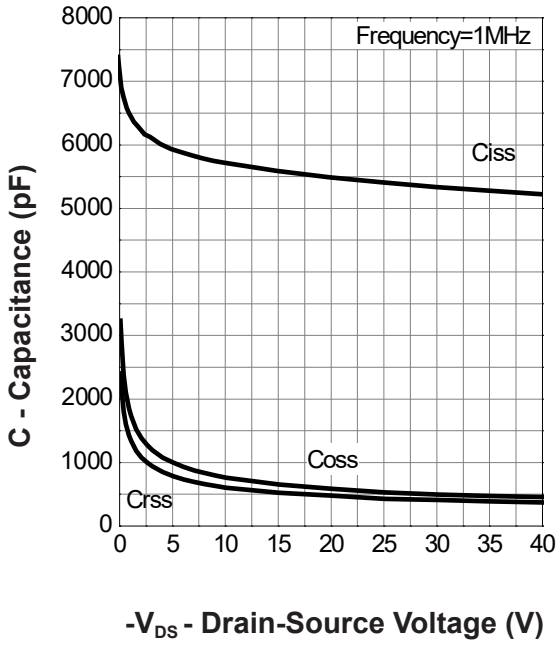


Drain-Source On Resistance

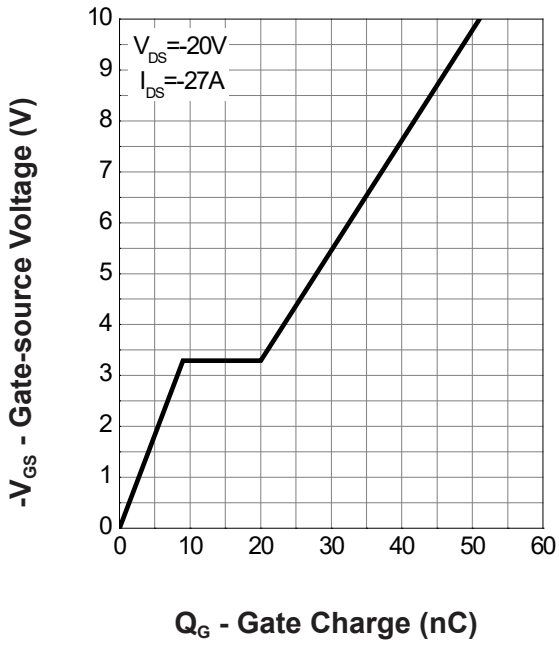


Typical Characteristics (Cont.)

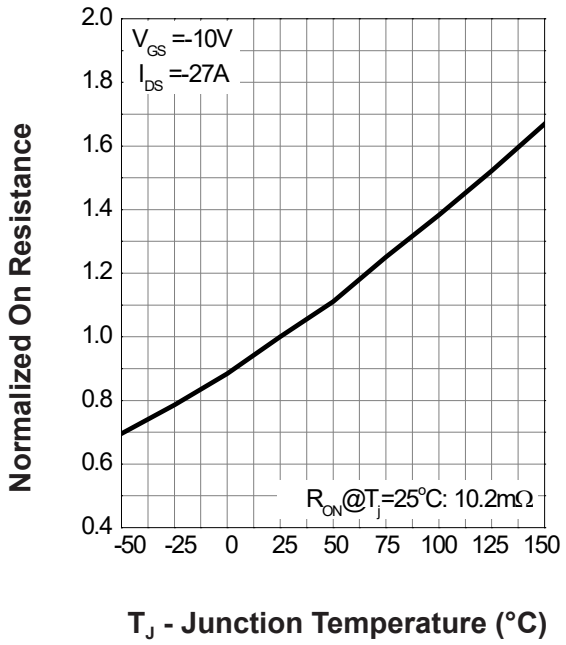
Capacitance



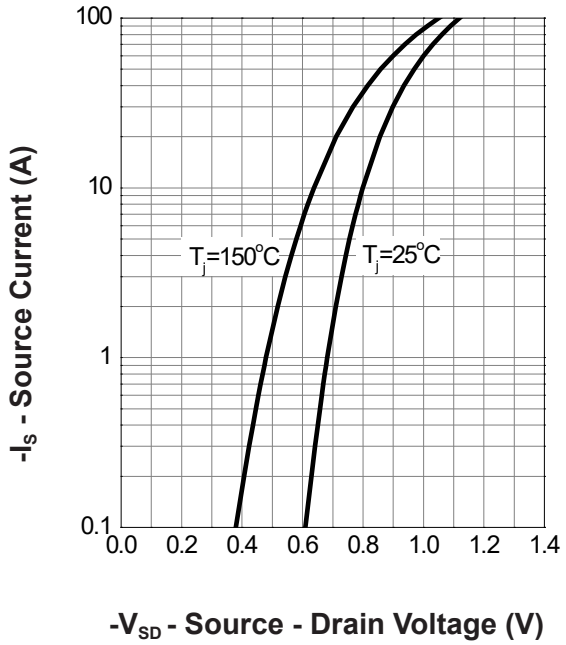
Gate Charge



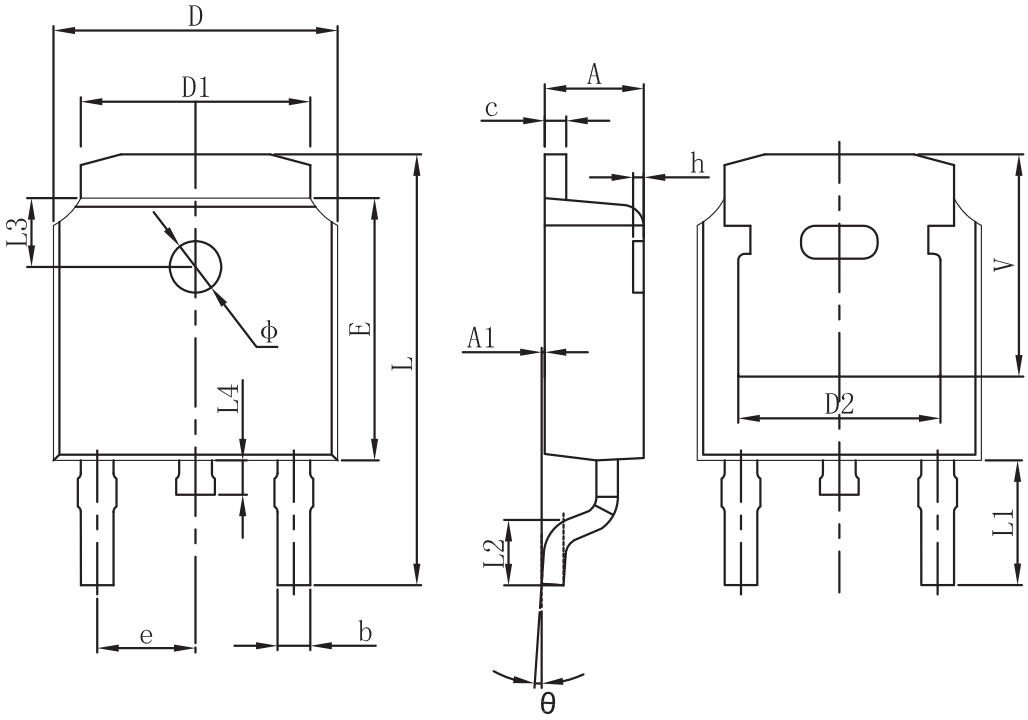
Drain-Source On Resistance



Source-Drain Diode Forward



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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