General Description

The WSR88P06 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.

Product Summery

BV_{DSS}	R_{DSON}	I_D
-60V	9.0mΩ	-88A

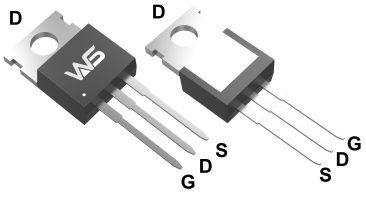
Application

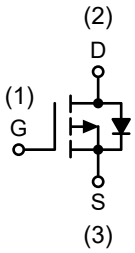
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Features

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

TO-220-3L Pin Configuration





Absolute Maximum Ratings (T_C=25 ℃,unless otherwise noted)

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, -VGS @ -10V1	-88	A
I_D@T_C=100˚C	Continuous Drain Current, -VGS @ -10V1	-50	A
I_{DM}	Pulsed Drain Current2	-320	A
E_{AS}	Single Pulse Avalanche Energy3	450	mJ
I_{AS}	Avalanche Current	41	A
P_D@T_C=25˚C	Total Power Dissipation4	110	W
T_{STG}	Storage Temperature Range	-55 to 150	˚C
T_J	Operating Junction Temperature Range	-55 to 150	˚C

Thermal Data

Symbol	Parameter	Rating	Units
$R_{\theta JA}$	Thermal Resistance Junction-Ambient 1	1.1	˚C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case1	60	˚C/W

Electrical Characteristics (T_C=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-60	---	---	V
△BVDSS/△TJ	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.035	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance2	V_{GS}=-10V , I_D=-20A	---	9.0	11	mΩ
		V_{GS}=-4.5V , I_D=-15A	---	12	16	
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.0	-1.8	-2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4.28	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-60V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=-60V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-5V , I_D=-20A	---	50	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.0	---	Ω
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-30V , V_{GS}=-10V , I_D=-20A	---	56	---	nC
Q_{gs}	Gate-Source Charge		---	11	---	
Q_{gd}	Gate-Drain Charge		---	9	---	
Td(on)	Turn-On Delay Time	V_{DD}=-30V , V_{GS}=-10V , R_G=3Ω, I_D=-20A	---	2.5	---	ns
T_r	Rise Time		---	4.5	---	
Td(off)	Turn-Off Delay Time		---	3.8	---	
T_f	Fall Time		---	14.5	---	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	3500	---	pF
C_{oss}	Output Capacitance		---	600	---	
C_{rss}	Reverse Transfer Capacitance		---	25	---	
I_S	Continuous Source Current1,5	V_G=V_D=0V , Force Current	---	---	-80	A
I_{SM}	Pulsed Source Current2,5		---	---	-240	A
V_{SD}	Diode Forward Voltage2	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1.2	V

Note :

1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、The E_{AS} data shows Max. rating . The test condition is V_{DD} =-48V,V_{GS} =-10V,L=0.1mH,I_{AS} =-41A

4、The power dissipation is limited by 150℃ junction temperature

5、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.

Typical Characteristics

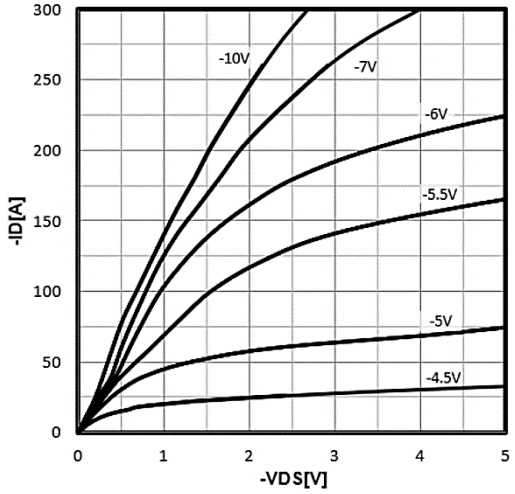


Figure 1. Type. Output Characteristics (Tj=25 ℃)

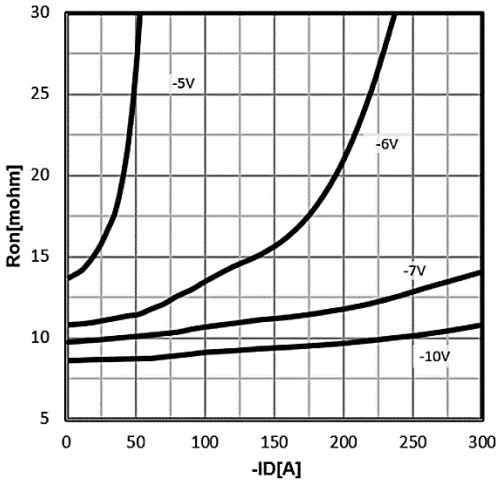


Figure 2. Type. drain-source on resistance

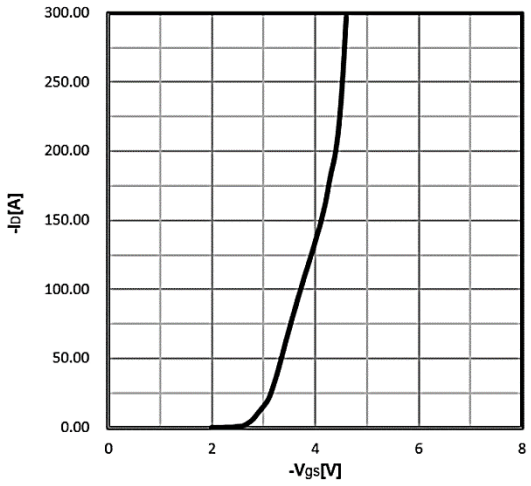


Figure 3. Type. transfer characteristics

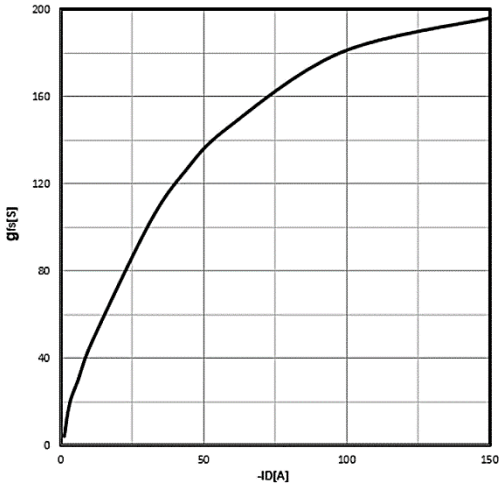


Figure 4. Type. forward transconductance

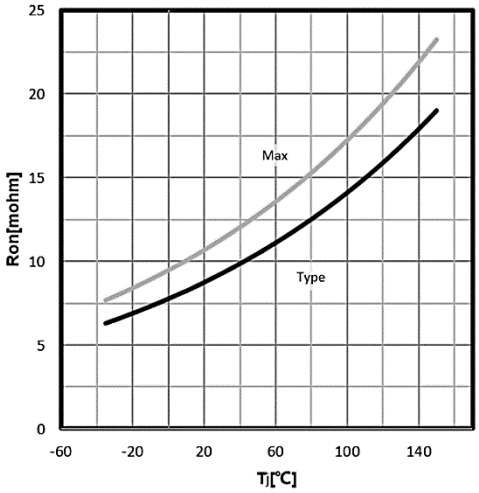


Figure 5. Drain-source on-state resistance
$R_{DS}(on) = f(T_J)$; I_D =80A; V_{GS} =10V

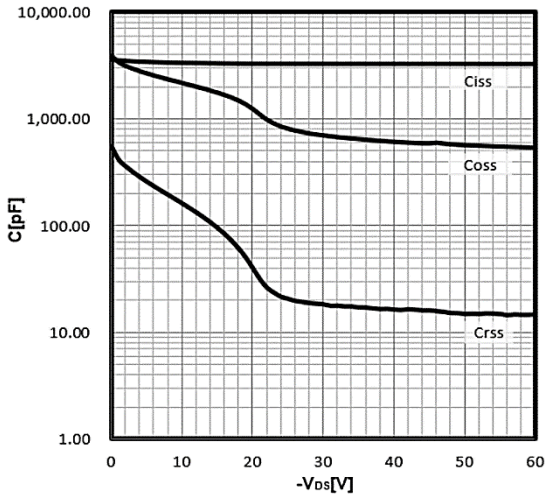


Figure 6 . Body-Diode Characteristics
$C = f(V_{DS})$; V_{GS} =0V; f=1MHz

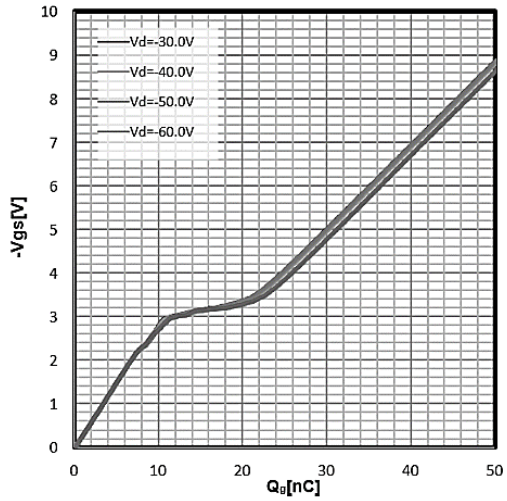


Figure 7. Typ. gate charge
VGS =f(Q gate) ; ID =20A

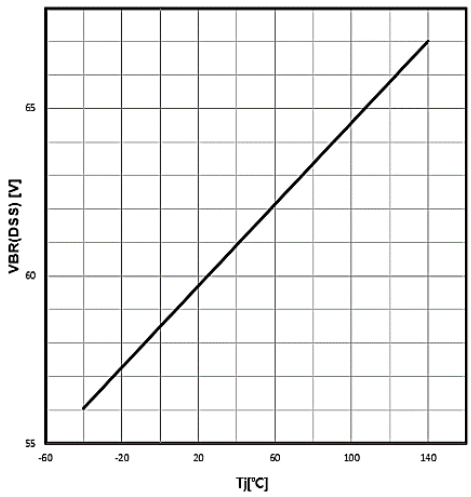


Figure 8. Drain Current Derating
VBR(DSS) =f(T j); I D =250uA

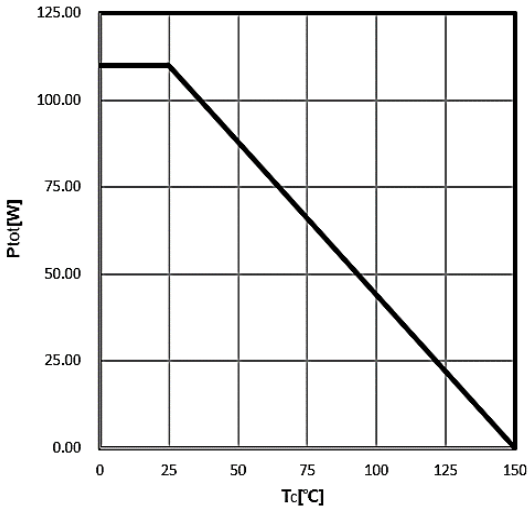


Figure 7. Power Dissipation

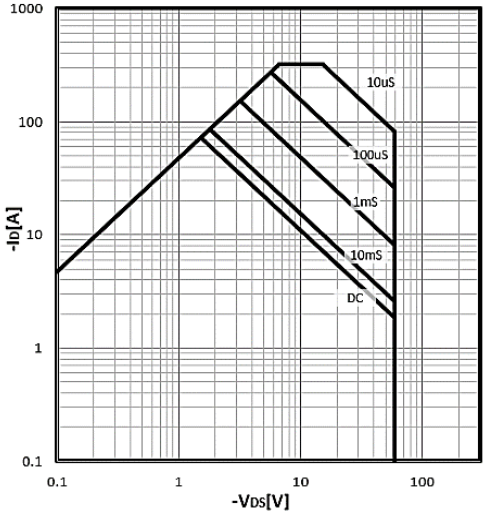


Figure 8. Safe operating area

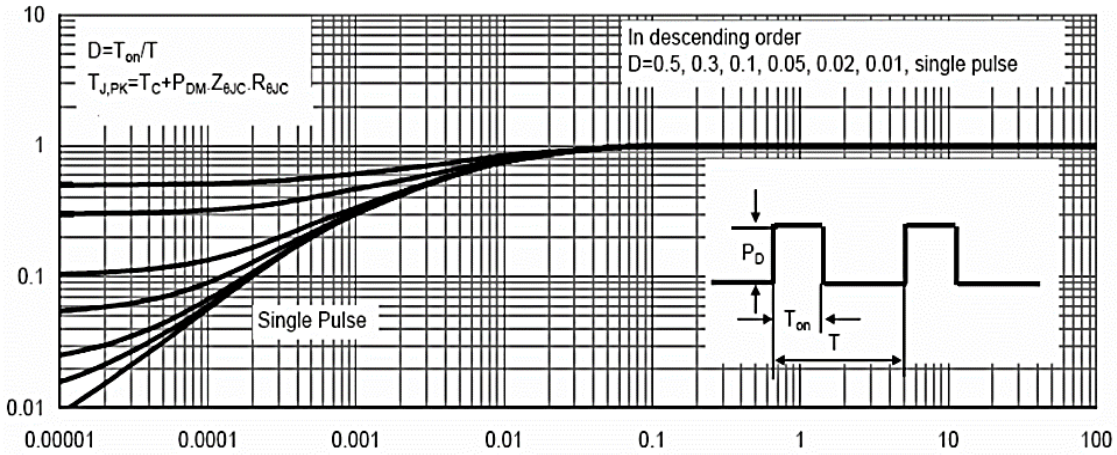
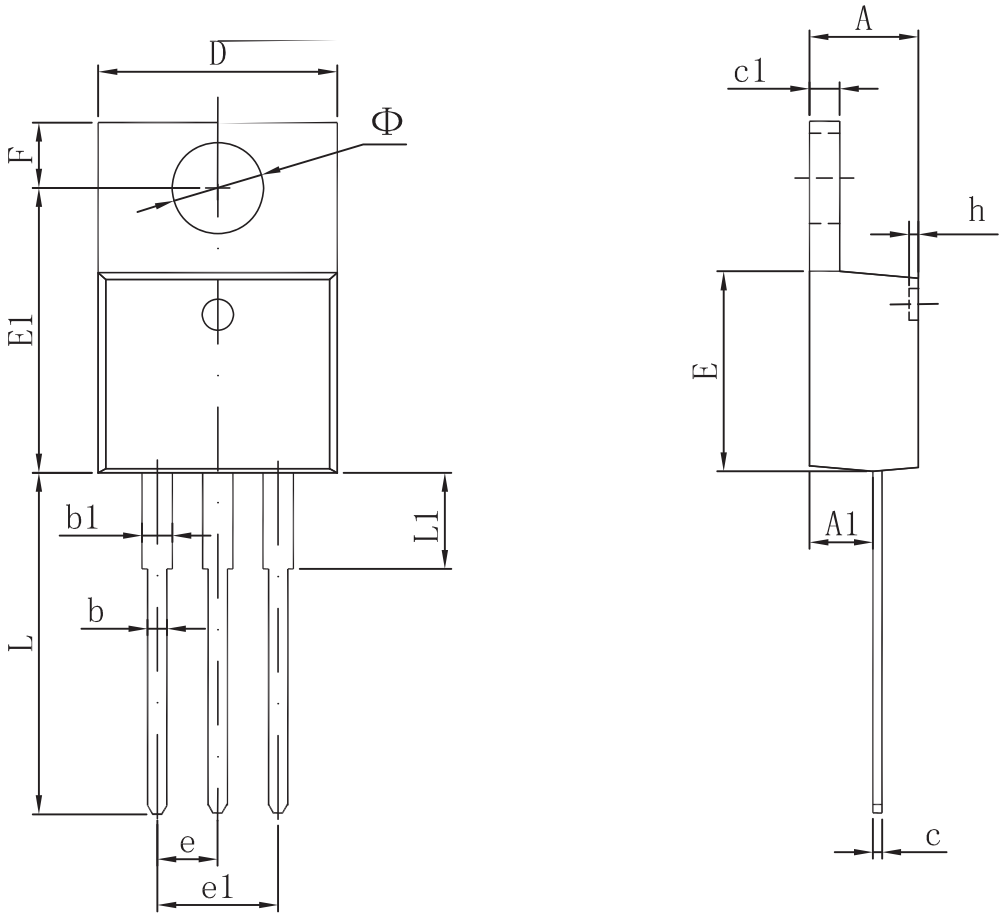


Figure 10. Max. transient thermal impedance

ZthJC =f(tp)

Packaging information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155

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