

General Description

The WSE3088 is the highest performance trench N-Ch MOSFET with extreme high cell density , which provide excellent R_{DSON} and gate charge for most of the synchronous buck converter applications .

The WSE3088 meet the RoHS and Green Product requirement with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Green Device Available

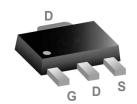
Product Summery

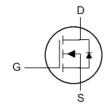
BVDSS	RDSON	ID
30V	23mΩ	7A

Applications

- High Frequency Point-of-Load Synchronous s Small power switching for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

SOT-89 Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25℃	Continuous Drain Current, V _{GS} @ 10V ¹	7.0	Α
I _D @T _C =70°C	Continuous Drain Current, V _{GS} @ 10V ¹	5.5	Α
I _{DM}	Pulsed Drain Current ²	28	Α
EAS	Single Pulse Avalanche Energy ³	9	mJ
I _{AS}	I _{AS} Avalanche Current		А
P _D @T _A =25℃	P _D @T _A =25℃ Total Power Dissipation ⁴ 1.8		W
T _{STG}	Storage Temperature Range -55 to 150		$^{\circ}$
TJ	Operating Junction Temperature Range -55 to 150		$^{\circ}$

Thermal Data

Symbol	Parameter	Тур.	Max.	Unit
$R_{ heta JA}$	Thermal Resistance Junction-ambient ¹		70	°C/W
$R_{ heta JC}$	Thermal Resistance Junction-Case ¹		30	°C/W



Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	30			V
$\triangle BV_{DSS}/\triangle T_{J}$	BVDSS Temperature Coefficient	Reference to 25℃, I _D =1mA		0.023		V/°C
В	Static Drain Source On Decistance ²	V _{GS} =4.5V , I _D =7A		23	28	0
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =2.5V , I _D =6A		31	38	mΩ
V _{GS(th)}	Gate Threshold Voltage	\/ -\/ -250\\A	0.5	1.0	1.5	V
$\triangle V_{GS(th)}$	V _{GS(th)} Temperature Coefficient	$V_{GS}=V_{DS}$, $I_D=250uA$		-4.2		mV/℃
	Drain Source Leakage Current	V_{DS} =24V , V_{GS} =0V , T_{J} =25 $^{\circ}$ C			1	
I _{DSS}	Drain-Source Leakage Current	V _{DS} =24V , V _{GS} =0V , T _J =55℃			5	uA
I _{GSS}	Gate-Source Leakage Current	V_{GS} = $\pm 20 V$, V_{DS} = $0 V$			±100	nA
gfs	Forward Transconductance	V _{DS} =5V , I _D =6A		7		S
Rg	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz		2.5	5.0	Ω
Q_g	Total Gate Charge (4.5V)			8.0	10.5	
Q_gs	Gate-Source Charge	V _{DS} =10V , V _{GS} =4.5V , I _D =7A		0.7		nC
Q_{gd}	Gate-Drain Charge			1.5		
$T_{d(on)}$	Turn-On Delay Time			4	7.5	
T _r	Rise Time	V _{DD} =10V ,V _{GS} =10V,		12.5	23	
$T_{d(off)}$	Turn-Off Delay Time	$R_G=6\Omega,I_D=1A$,RL= 10Ω ,		13.5	25	ns
T _f	Fall Time			2	3.5	
Ciss	Input Capacitance			360	730	
C _{oss}	Output Capacitance	V _{DS} =10V , V _{GS} =0V , f=1MHz		80	112	pF
C _{rss}	Reverse Transfer Capacitance			55	65	

Guaranteed Avalanche Characteristics

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
EAS	Single Pulse Avalanche Energy ⁵	V _{DD} =25V , L=0.5mH , I _{AS} =6A	7			mJ

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
I _S	Continuous Source Current ^{1,6}	V =V =0V Force Current			2	Α
I _{SM}	Pulsed Source Current ^{2,6}	V _G =V _D =0V , Force Current			28	Α
V_{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =3A , T _J =25°C			1.3	V
t _{rr}	Reverse Recovery Time			8.5		nS
Qrr	Reverse Recovery Charge	IF=7A , dI/dt=100A/μs , T _J =25℃		2.5		nC

Note:

- 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, t≤10sec.
- 2.The data tested by pulsed , pulse width $\,\leq\,300\text{us}$, duty cycle $\,\leq\,2\%$
- 3. The EAS data shows Max. rating . The test condition is V_{DD} =25V, V_{GS} =10V, L=0.5mH, I_{AS} =6A
- 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

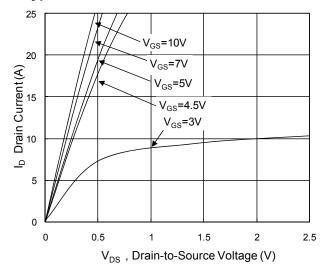


Fig.1 Typical Output Characteristics

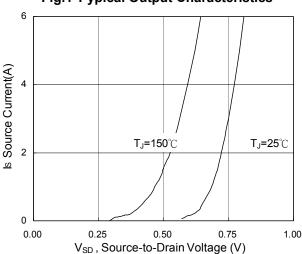


Fig.3 Forward Characteristics Of Reverse

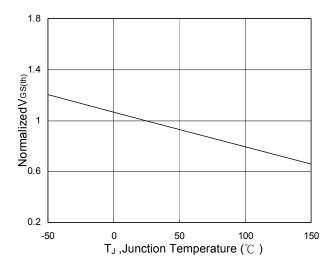


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

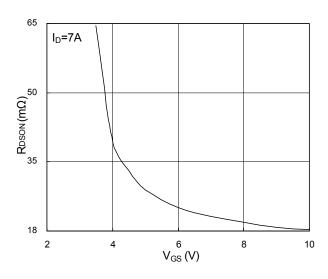


Fig.2 On-Resistance vs. Gate-Source

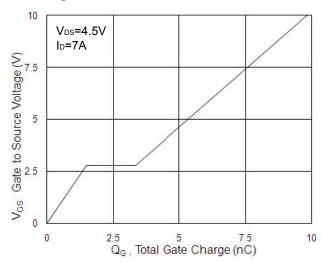


Fig.4 Gate-Charge Characteristics

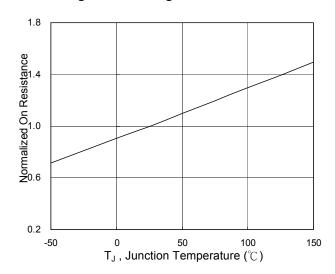
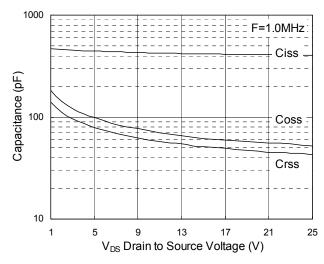


Fig.6 Normalized R_{DSON} vs





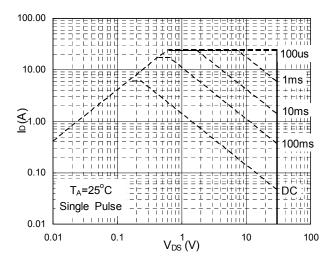


Fig.7 Capacitance

Fig.8 Safe Operating Area

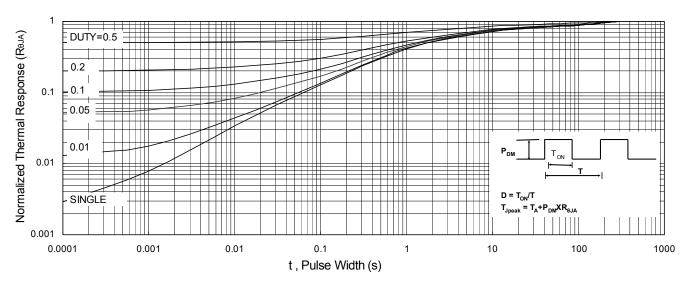


Fig.9 Normalized Maximum Transient Thermal Impedance

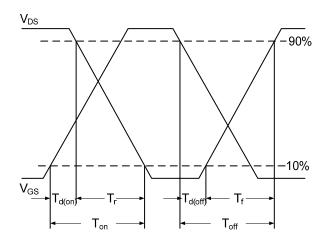


Fig.10 Switching Time Waveform

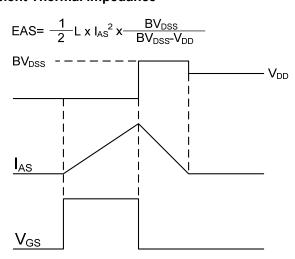


Fig.11 Unclamped Inductive Switching Waveform



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