

General Description

The WSR10N65F 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 WSR10N65F 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

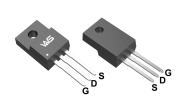
Product Summery

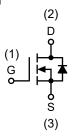
BV _{DSS}	R _{DSON}	I _D
650V	600mΩ	10A

Applications

- AC/DC Power Conversion in Switched Mode Power Supplies (SMPS).
- Uninterruptible Power Supply(UPS)
- Adapter.

TO-220F-3L Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	±30	V
I _D @T _C =25℃	Continuous Drain Current, V _{GS} @ 10V ^{1.5}	10	Α
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ 10V ^{1.5}	6	А
I _{DM}	Pulsed Drain Current ^{1.2.5}	40	Α
EAS	Single Pulse Avalanche Energy ¹	900	mJ
P _D	Total Power Dissipation ^{1,5}	39	W
T _{STG}	Storage Temperature Range	-55 to 150	$^{\circ}$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}$

Thermal Data

Symbol	Parameter	Тур.	Max.	Unit
$R_{ heta JA}$	Thermal Resistance Junction-ambient ¹		62.5	°C/W
$R_{ heta JC}$	Thermal Resistance Junction-Case ¹		3.2	°C/W



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

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit	
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	650			V	
$\triangle BV_{DSS}/\triangle T_{J}$	BVDSS Temperature Coefficient	Reference to 25℃ , I _D =250uA		0.6		V/℃	
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =3.5A		600	800	mΩ	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} . In =250uA	2.0	3.0	4.0	V	
$\triangle V_{GS(th)}$	V _{GS(th)} Temperature Coefficient	VGS-VDS, ID -250UA		-4.57		mV/℃	
	Drain Source Leakage Current	V_{DS} =650V , V_{GS} =0V , T_J =25 $^{\circ}$ C			1		
I _{DSS}	Drain-Source Leakage Current	V_{DS} =520V , V_{GS} =0V , T_{J} =55 $^{\circ}$ C			10	uA uA	
I _{GSS}	Gate-Source Leakage Current	V_{GS} = $\pm30V$, V_{DS} = $0V$			±100	nA	
gfs	Forward Transconductance	V _{DS} =40V , I _D =3.5A		5		S	
Qg	Total Gate Charge (10V)			21			
Q _{gs}	Gate-Source Charge	ource Charge VDD=520V , VGS=10V , ID=10A		7.5		nC	
Q _{gd}	Gate-Drain Charge			6		1	
T _{d(on)}	Turn-On Delay Time			28			
Tr	Rise Time	V _{DD} =300V , V _{GS} =10V ,		70			
T _{d(off)}	Turn-Off Delay Time	I_D =10A,RG=25 Ω .		35		ns	
T _f	Fall Time			53			
C _{iss}	Input Capacitance			1120			
Coss	Output Capacitance	V _{DS} =25V , V _{GS} =0V , f=1MHz		130	pF		
C _{rss}	Reverse Transfer Capacitance			4.9			

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
Is	Continuous Source Current ^{1,2,5}	V =V =0V Force Current			10	Α
I _{SM}	Pulsed Source Current ^{1,2}	$V_G=V_D=0V$, Force Current			40	Α
V _{SD}	Diode Forward Voltage ¹	V_{GS} =0V , I_{S} =10A , T_{J} =25 $^{\circ}$ C			1.4	V
t _{rr}	Reverse Recovery Time			491		nS
Q _{rr}	Reverse Recovery Charge	lF=10A , dl/dt=40A/μs , T _J =25℃		2296		nC

Notes:

Note 1 : limited by maximum junction temperature.

Note 2 : Bond wire current limit. Note 3 : V_{DS} =520V, I_{D} =10A.

Note 4 : I_D =0.5A, V_{DD} =50V, T_j =25°C.

Note 5: Repetitive Rating: Pulse width limited by maximum junction temperature.



Typical Characteristics

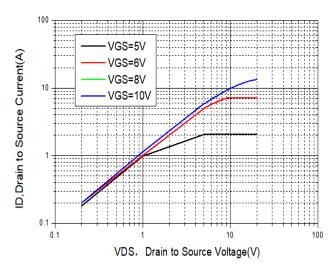


Figure 1 Output Characteristics

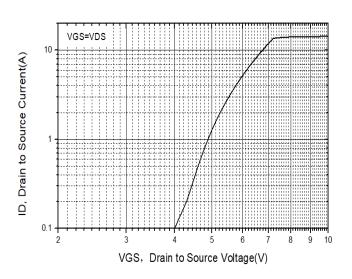


Figure 3 Rdson-ID Characteristics

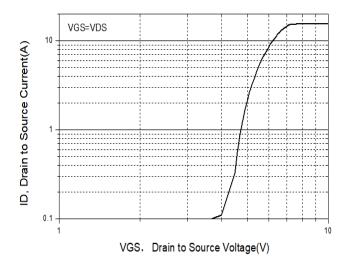


Figure 2 Transfer Characteristics

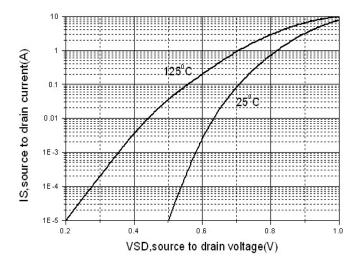


Figure 4 Body diode Characteristics



Typical Characteristics

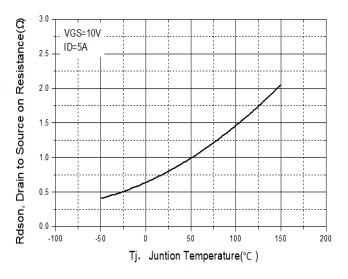


Figure 5 Rdson- Tj Relation

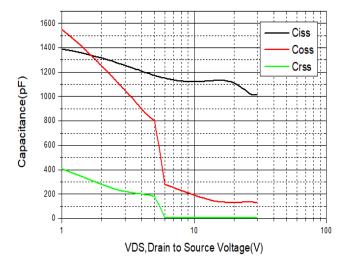


Figure 7 Capacitance vs Vds

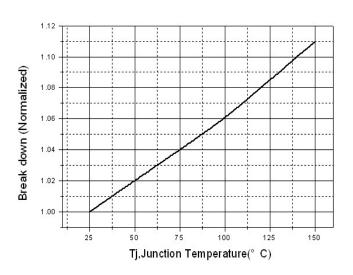


Figure 6 BVDSS vs Junction Temperature

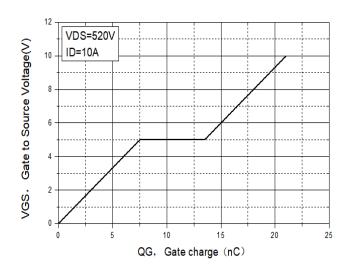
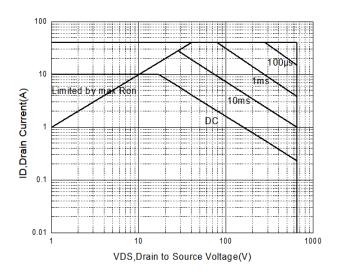


Figure 8 VGS vs QG Characteristics



Typical Characteristics



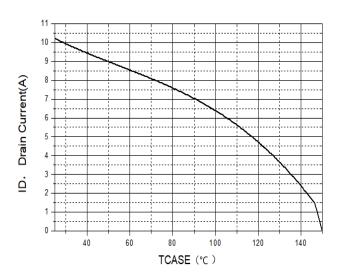


Figure 9 Safe Operation Area

Figure 10 Maximum current attenuation

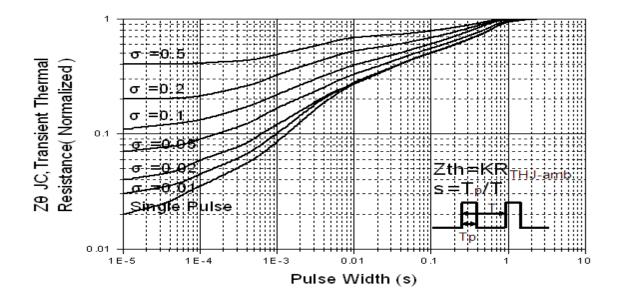
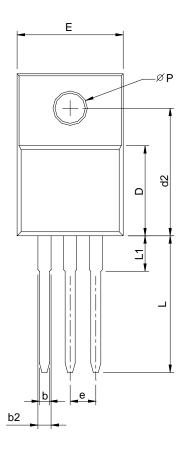
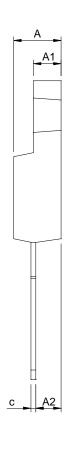


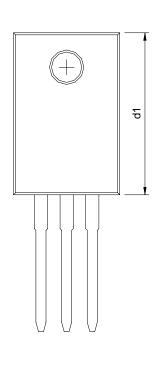
Figure 11 Normalized Maximum Transient Thermal Impedance



Packaging information

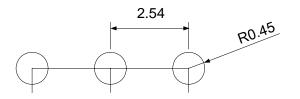






S Y	TO-220F-3L					
SYMBOL	MILLIM	ETERS	INC	HES		
P	MIN.	MAX.	MIN.	MAX.		
Α	4.20	4.80	0.165	0.189		
A1	2.34	3.20	0.092	0.126		
A2	2.10	2.90	0.083	0.114		
b	0.50	0.90	0.020	0.035		
b2	0.91	1.90	0.035	0.075		
С	0.30	0.80	0.012	0.031		
D	8.10	9.40	0.319	0.370		
d1	14.50	16.50	0.571	0.650		
d2	12.10	12.90	0.476	0.508		
Е	9.70	10.70	0.382	0.421		
е	2.54 BSC		0.10	0 BSC		
L	13.00	14.50	0.512	0.570		
L1	1.60	4.00	0.063	0.157		
Р	3.00	3.60	0.118	0.142		

RECOMMENDED LAND PATTERN



UNIT: mm



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