General Description

The WSR30N65C series of devices use advanced trench gate super junction technology and design to provide excellent RDS(ON) with low gate charge. This super junction MOSFET fits the industry's AC-DC SMPS requirements for PFC, AC/DC power conversion, and industrial power applications.

The WSR30N65C 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

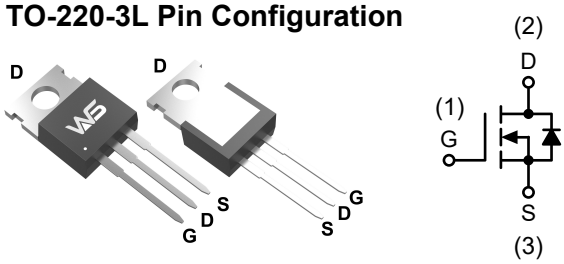
Product Summery

BV_{DSS}	R_{DSON}	I_D
650V	110mΩ	28A

Applications

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

TO-220-3L 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]	28	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	18	A
I_{DM}	Pulsed Drain Current[2]	112	A
EAS	Single Pulse Avalanche Energy[3]	676	mJ
P_D	Total Power Dissipation[3]	260	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]	---	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.48	℃/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	650	---	---	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=14A	---	110	140	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.0	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.57	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=650V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=650V , V_{GS}=0V , T_J=125℃	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±200V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=9A	---	32	---	S
Q_g	Total Gate Charge (10V)	V_{DS}=100V , V_{GS}=10V , I_D=18A	---	38	---	nC
Q_{gs}	Gate-Source Charge		---	13	---	
Q_{gd}	Gate-Drain Charge		---	11.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=30V , V_{GS}=10V , R_G=6Ω, I_D=18A, R_L=30Ω	---	12	---	ns
T_r	Rise Time		---	14	---	
$T_{d(off)}$	Turn-Off Delay Time		---	11	---	
T_f	Fall Time		---	65	---	
C_{iss}	Input Capacitance	V_{DS}=30V , V_{GS}=0V , f=1MHz	---	2070	---	pF
C_{oss}	Output Capacitance		---	120	---	
C_{rss}	Reverse Transfer Capacitance		---	0.5	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	---	---	28	A
I_{SM}	Pulsed Source Current[2,6]		---	---	112	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=28A , T_J=25℃	---	---	1.2	V
t_{rr}	Reverse Recovery Time	I_F=14A , dI/dt=100A/μs , T_J=25℃	---	190	---	nS
Q_{rr}	Reverse Recovery Charge		---	2000	---	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition: Tj=25℃,V_{DD}=50V,V_G=10V,L=0.5mH,Rg=25Ω

Typical Characteristics

Figure1. Safe operating area

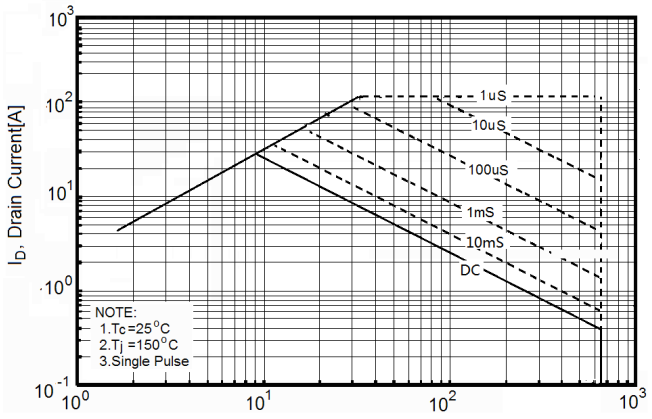


Figure2. Transient Thermal Impedance

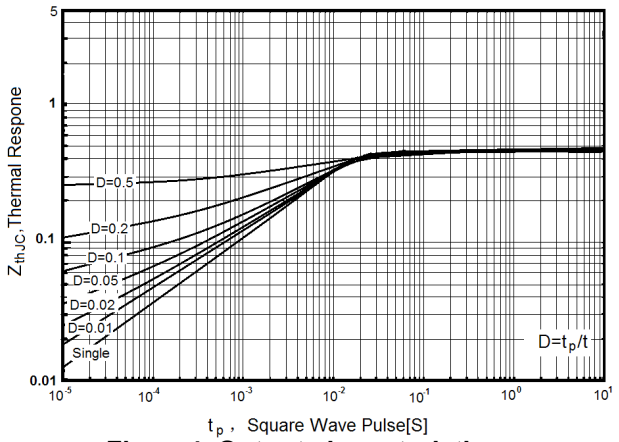


Figure3. Source-Drain Diode Forward Voltage

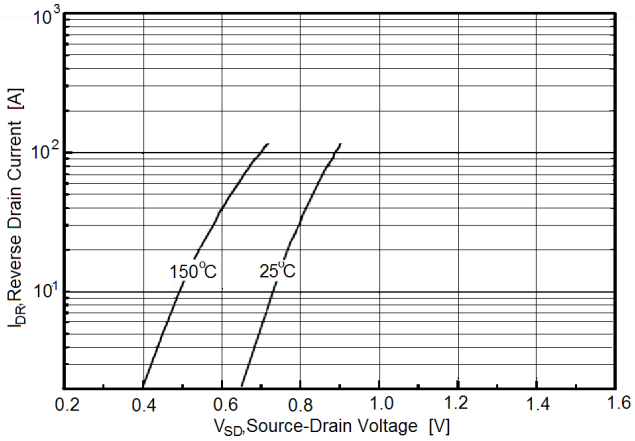


Figure4. Output characteristics

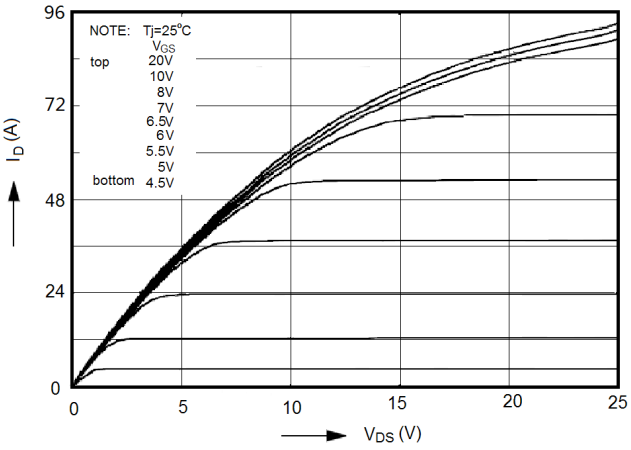


Figure5. Transfer characteristics

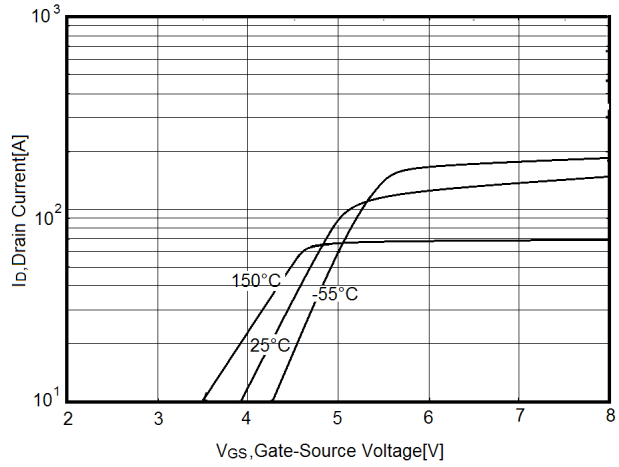


Figure6. Static drain-source on resistance

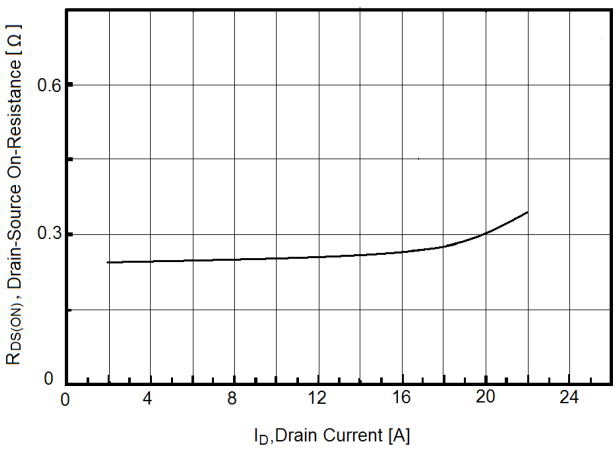


Figure7. $R_{DS(ON)}$ vs Junction Temperature

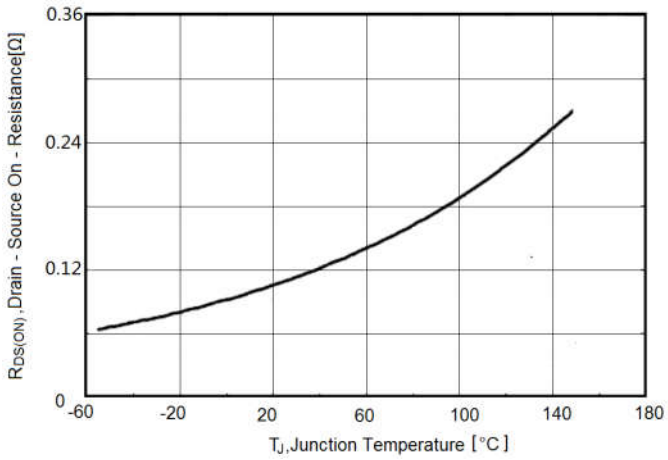


Figure8. BV_{DSS} vs Junction Temperature

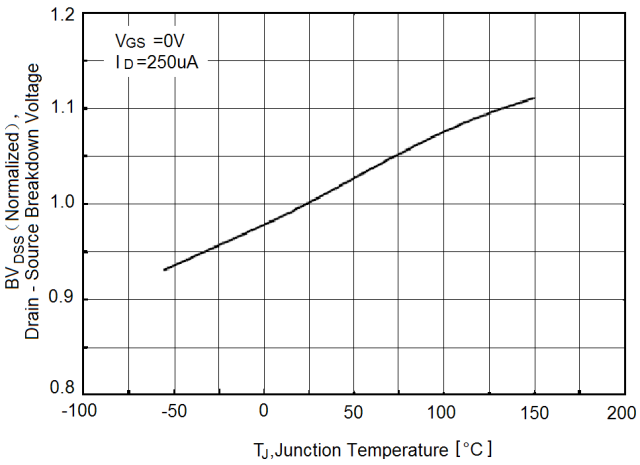


Figure9. Maximum I_D vs Junction Temperature

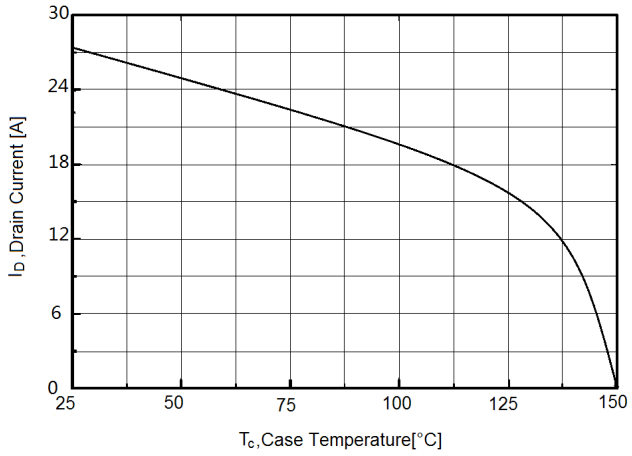


Figure10. Gate charge waveforms

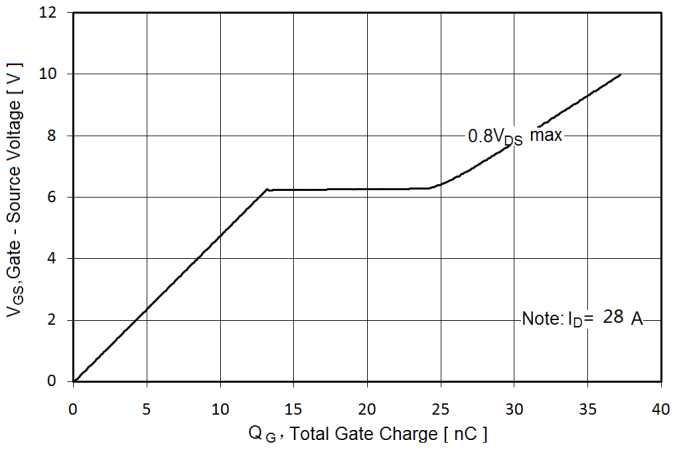
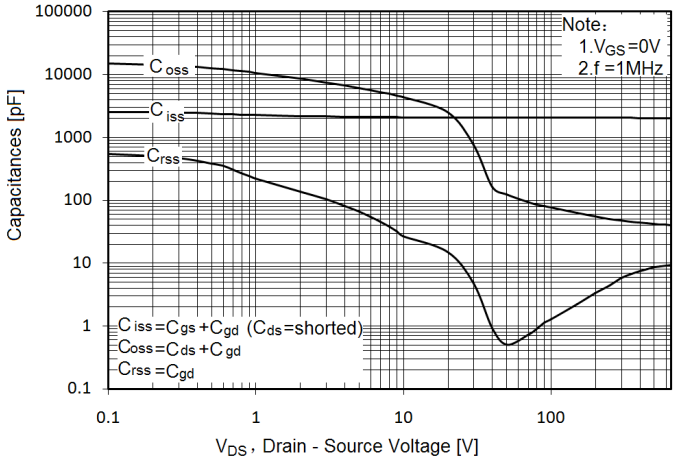
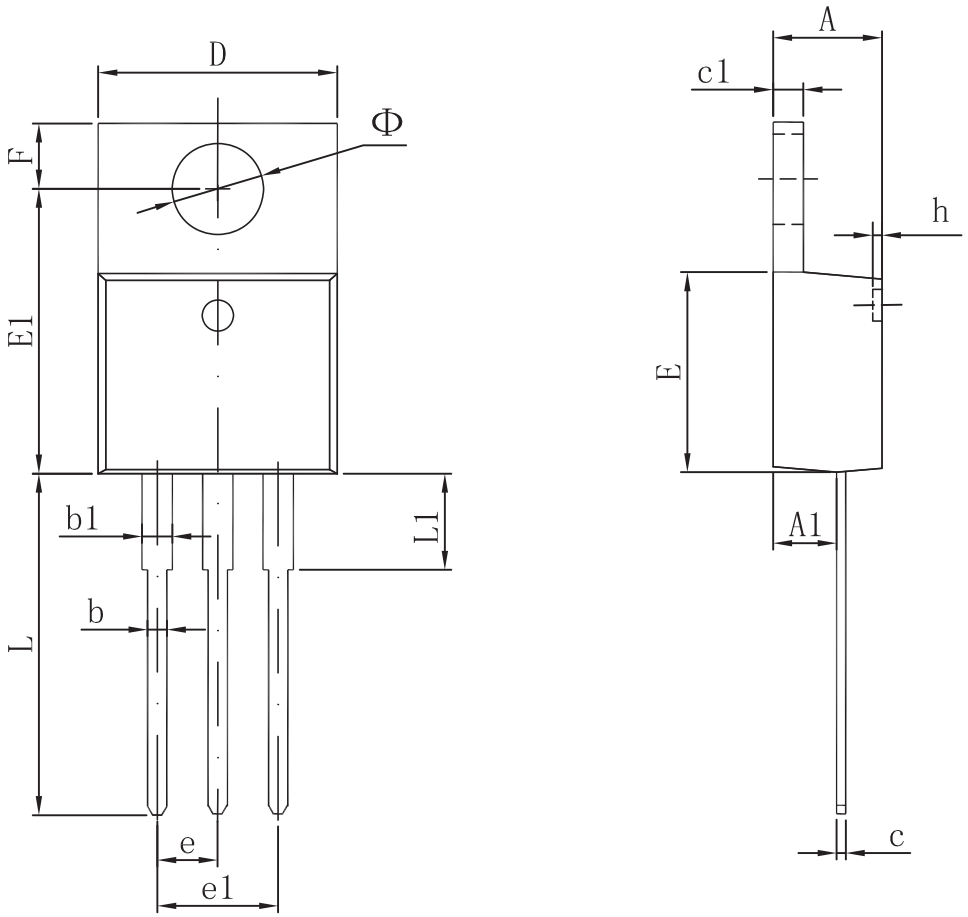


Figure11. Capacitance



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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