

General Description

The WSR2N65 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 WSR2N65 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

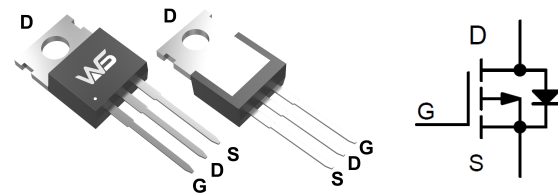
Product Summary

BV_{DSS}	R_{DSON}	I_D
650V	4.8Ω	2A

Applications

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

TO-220 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	±30	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1.5}$	2	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1.5}$	1	A
I_{DM}	Pulsed Drain Current ^{1,2,5}	6	A
EAS	Single Pulse Avalanche Energy ¹	57	mJ
P_D	Total Power Dissipation ^{1,5}	25	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	62.5	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	5	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	650	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =250uA	---	0.6	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =1A	---	4.0	4.8	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2.0	3.0	4.0	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-4.57	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =650V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =520V, V _{GS} =0V, T _J =55°C	---	---	10	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±30V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =300V, I _D =1A	---	5	---	S
Q _g	Total Gate Charge (10V)	V _{DS} =520V, V _{GS} =10V, I _D =1A	---	8.0	---	nC
Q _{gs}	Gate-Source Charge		---	1.2	---	
Q _{gd}	Gate-Drain Charge		---	5	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =300V, V _{GS} =10V, R _G =25Ω, I _D =1A.	---	7.8	---	ns
T _r	Rise Time		---	33	---	
T _{d(off)}	Turn-Off Delay Time		---	23	---	
T _f	Fall Time		---	59	---	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	310	---	pF
C _{oss}	Output Capacitance		---	39	---	
C _{rss}	Reverse Transfer Capacitance		---	6	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,2,5}	V _G =V _D =0V, Force Current	---	---	2	A
I _{SM}	Pulsed Source Current ^{1,2}		---	---	6	A
V _{SD}	Diode Forward Voltage ¹	V _{GS} =0V, I _S =2A, T _J =25°C	---	---	1.4	V
t _{rr}	Reverse Recovery Time	I _F =2A, di/dt=100A/μs	---	80	---	nS
Q _{rr}	Reverse Recovery Charge		---	1800	---	nC

Notes:

Note 1 : limited by maximum junction temperature.

Note 2 : Bond wire current limit.

Note 3 : V_{DS}=520V, I_D=2A.

Note 4 : I_D=1A, V_{DD}=50V, T_J=25°C.

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

Typical Characteristics

Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

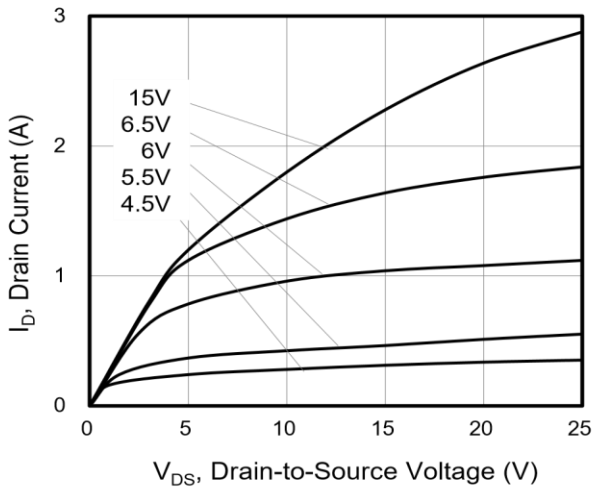


Figure 2. Body Diode Forward Voltage

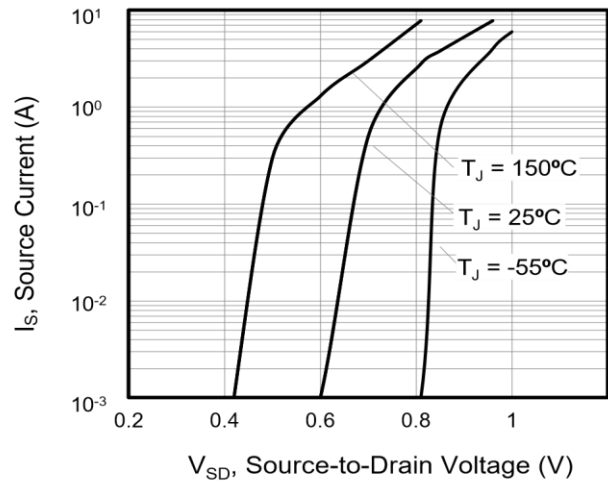


Figure 3. Drain Current vs. Temperature

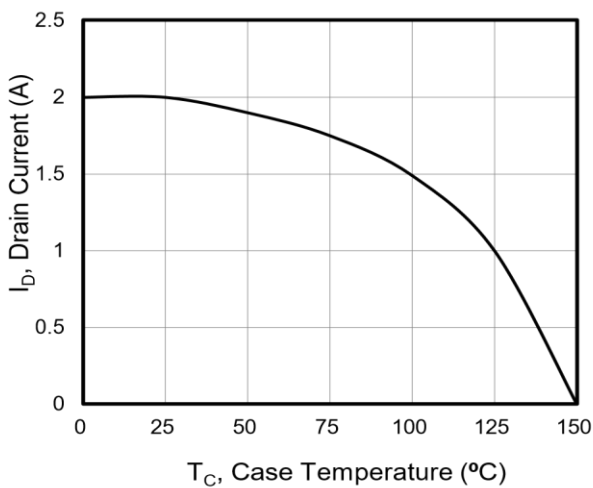


Figure 4. Power Dissipation vs. Temperature TO-251, TO-252

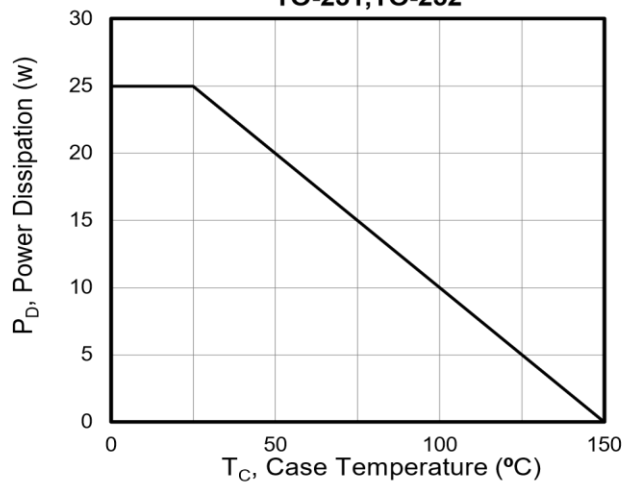


Figure 5. Transfer Characteristics

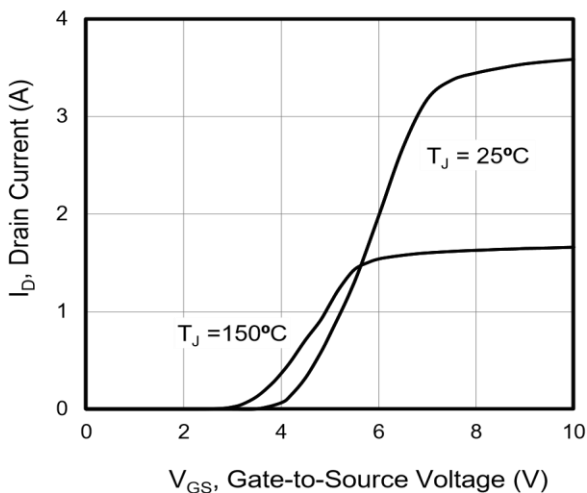
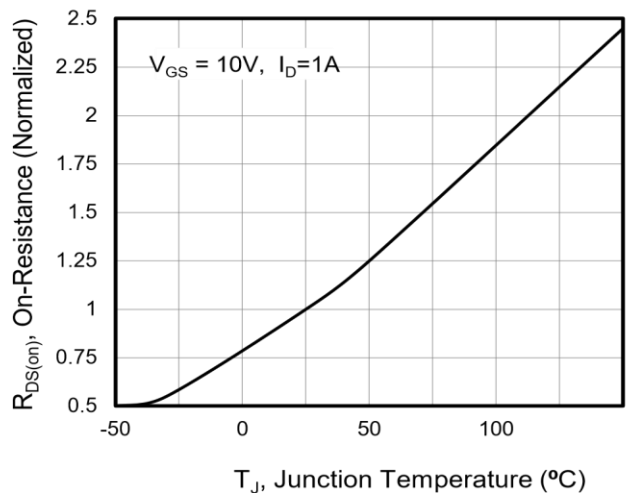
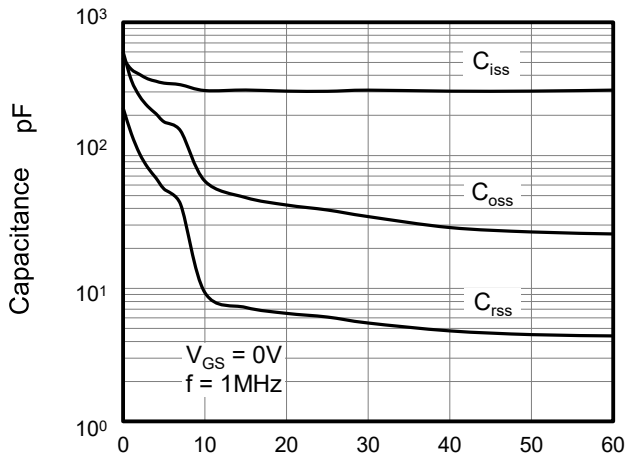


Figure 6. On-Resistance vs. Temperature



Typical Characteristics

Figure 7. Capacitance



V_{DS}, Drain-to-Source Voltage (V)

Figure 9. Transient Thermal Impedance

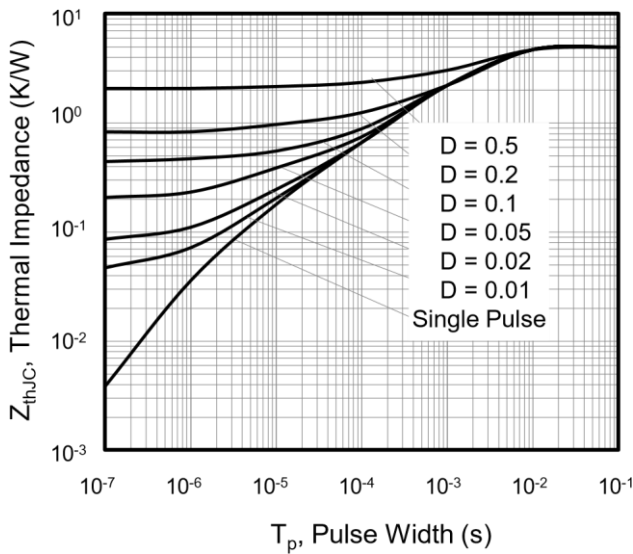
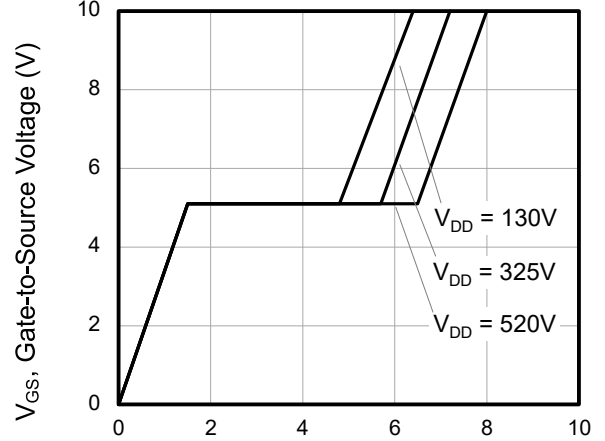


Figure 8. Gate Charge



Q_g, Total Gate Charge (nC)



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