General Description

The WSC4N65 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 WSC4N65 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

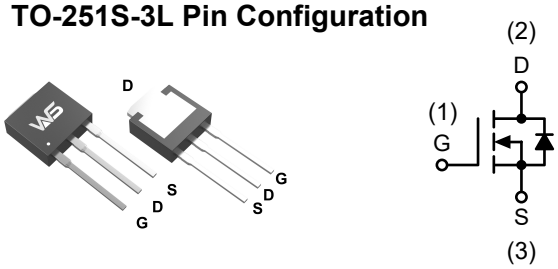
Product Summery

BV_{DSS}	R_{DSON}	I_D
650V	2600mΩ	4A

Applications

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

TO-251S-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]	4	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1.5]	2.5	A
I_{DM}	Pulsed Drain Current[1.2.5]	16	A
EAS	Single Pulse Avalanche Energy[1]	128	mJ
P_D	Total Power Dissipation[1,5]	77	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]	---	1.62	℃/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=250uA	---	0.6	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=3.5A	---	2600	3000	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}=520V , V_{GS}=0V , T_J=55℃	---	---	10	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=40V , I_D=3.5A	---	5	---	S
Q_g	Total Gate Charge (10V)	V_{DS}=520V , V_{GS}=10V , I_D=7A	---	10.2	---	nC
Q_{gs}	Gate-Source Charge		---	2.3	---	
Q_{gd}	Gate-Drain Charge		---	2.1	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=300V , V_{GS}=10V , R_G=25Ω, I_D=10A.	---	13	---	ns
T_r	Rise Time		---	15.5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	16	---	
T_f	Fall Time		---	40	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	550	---	pF
C_{oss}	Output Capacitance		---	46	---	
C_{rss}	Reverse Transfer Capacitance		---	2.3	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,2,5]	V_G=V_D=0V , Force Current	---	---	4	A
I_{SM}	Pulsed Source Current[1,2]		---	---	16	A
V_{SD}	Diode Forward Voltage[1]	V_{GS}=0V , I_S=7A , T_J=25℃	---	---	1.4	V
t_{rr}	Reverse Recovery Time	I_F=7A , dI/dt=40A/μs , T_J=25℃	---	454	---	nS
Q_{rr}	Reverse Recovery Charge		---	2076	---	nC

Notes:

Note 1：limited by maximum junction temperature.
Note 2：Bond wire current limit.
Note 3：V_{DS}=520V, I_D=4A.
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

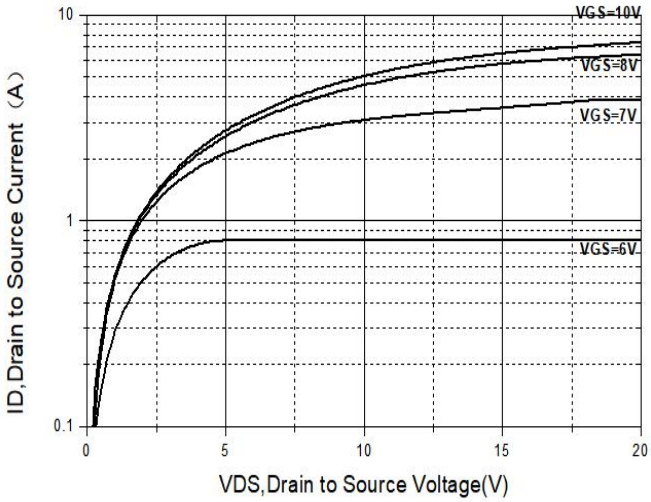


Figure 1 Output Characteristics

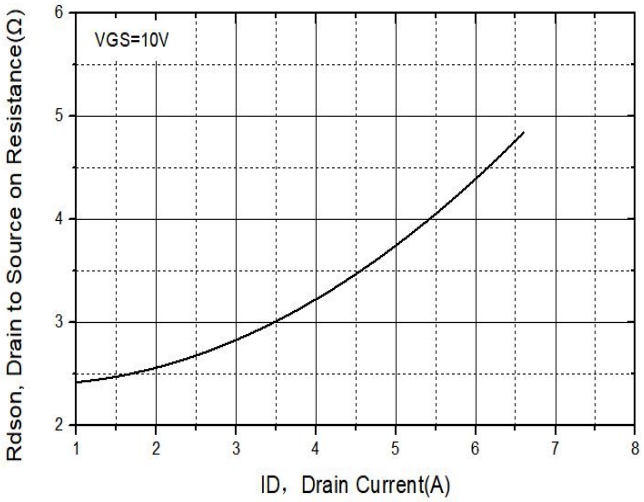


Figure 3 Rdson-ID Characteristics

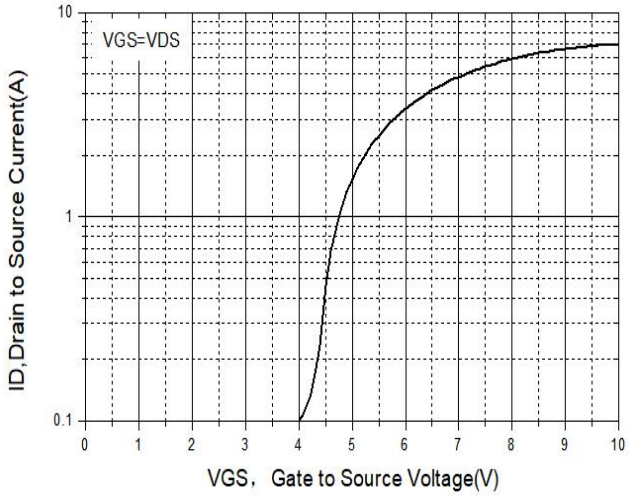


Figure 2 Transfer Characteristics

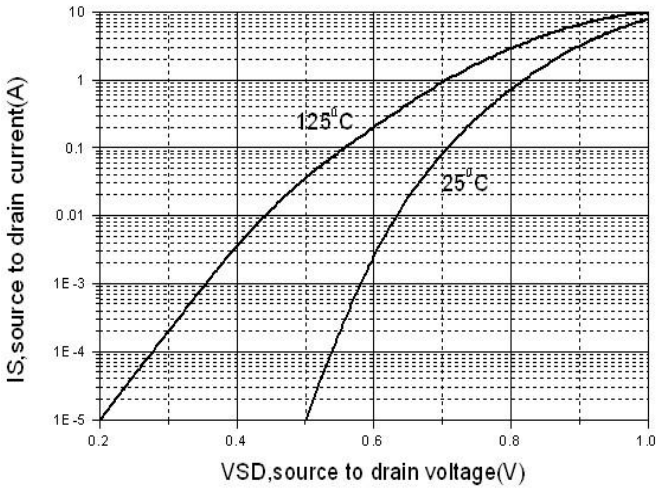


Figure 4 Body diode Characteristics

Typical Characteristics

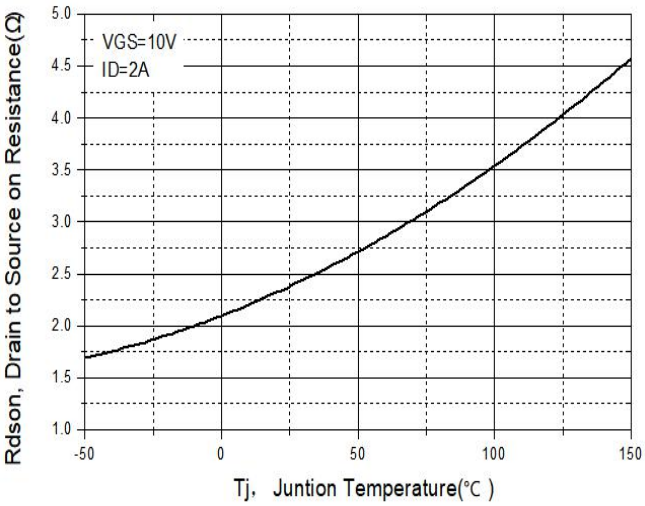


Figure 5 Rdson- T_J Relation

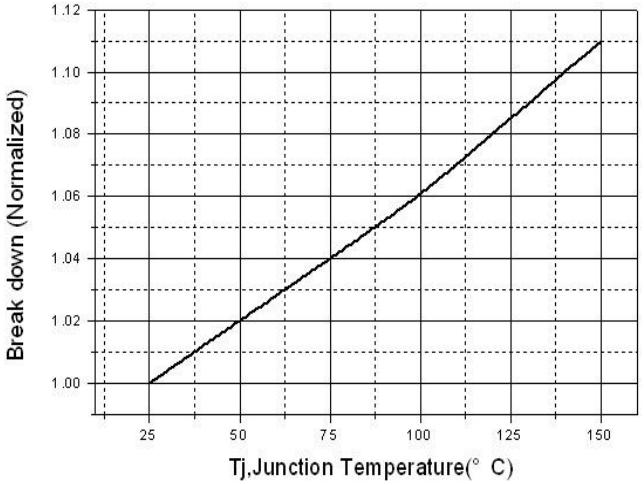


Figure 6 B_{VDSS} vs Junction Temperature

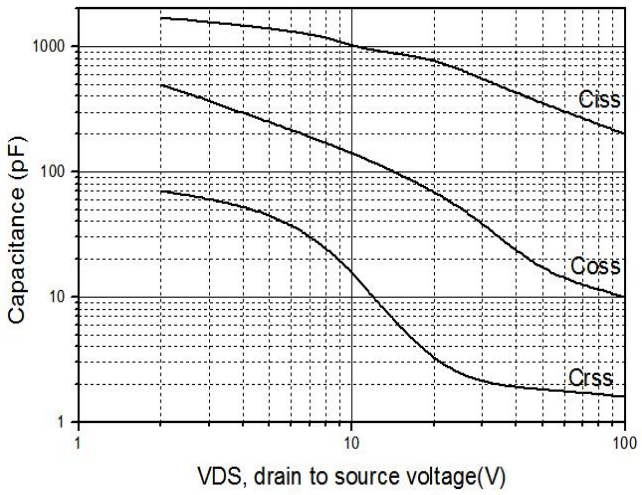


Figure 7 Capacitance vs V_{ds}

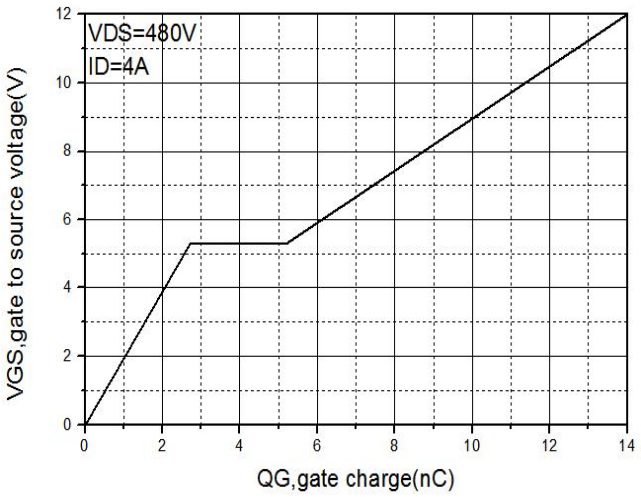


Figure 8 V_{GS} vs QG Characteristics

Typical Characteristics

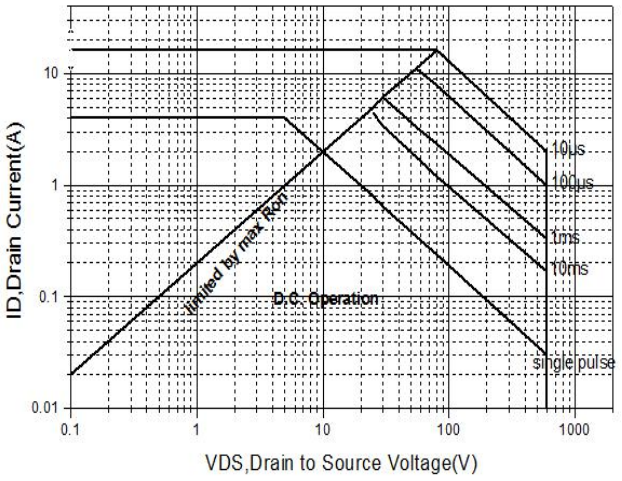


Figure 9 Safe Operation Area

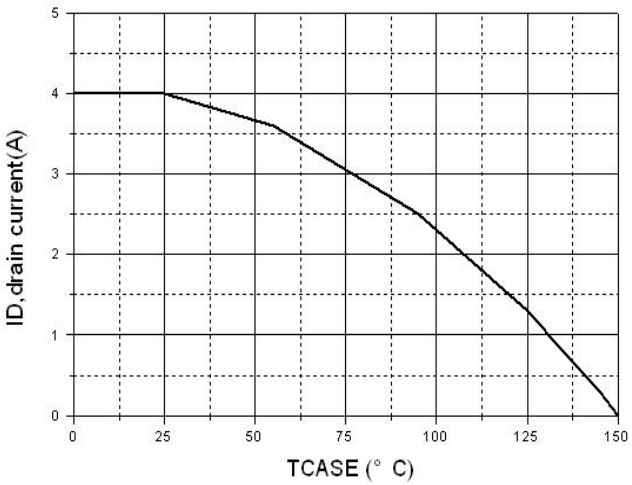


Figure 10 Maximum current attenuation

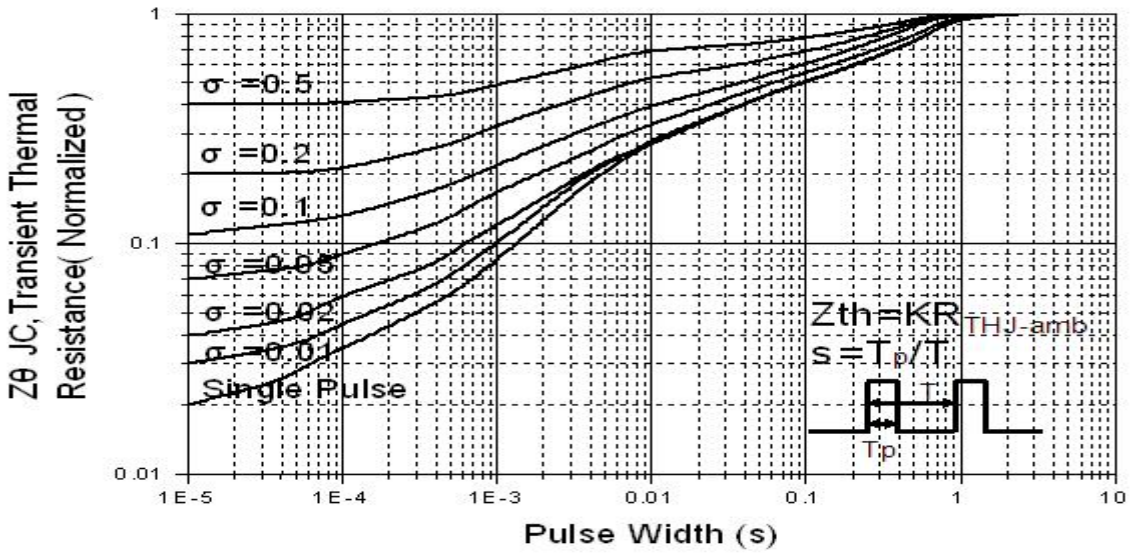
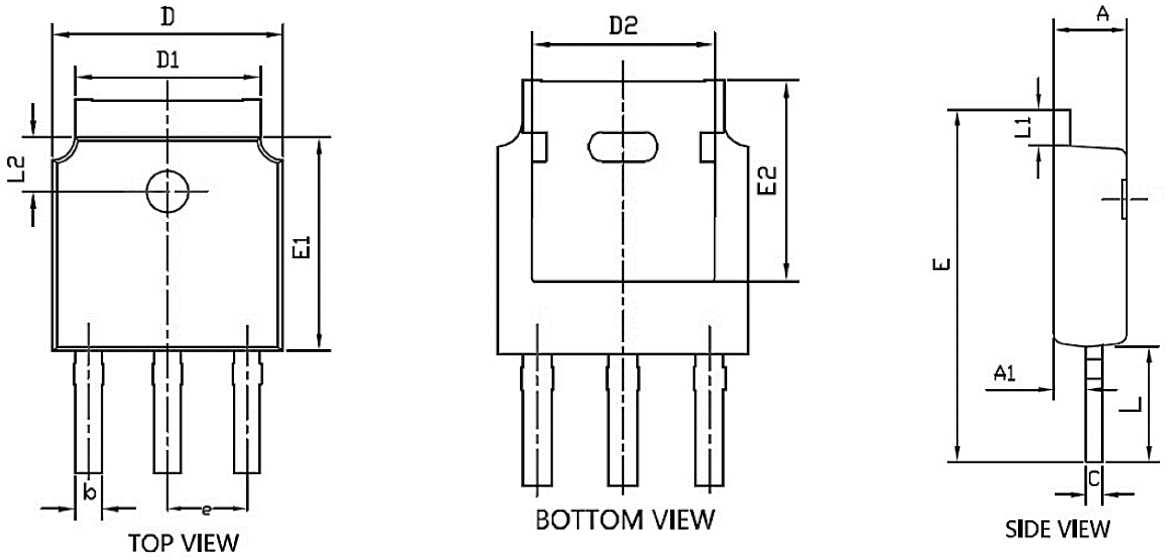


Figure 11 Normalized Maximum Transient Thermal Impedance

Packaging information



Symbol	Common		
	mm		
	Min	Typ	Max
A	2.2	2.3	2.4
A1	0.9	1.0	1.1
b	0.66	0.76	0.86
C	0.46	0.52	0.58
D	6.50	6.6	6.7
D1	5.15	5.3	5.45
D2	4.6	4.8	4.95
E	10.4	----	11.5
E1	6.0	6.1	6.2
E2	5.400REF		
e	2.286BSC		
L	3.5	4.0	4.3
L1	0.9	---	1.27
L2	1.4	---	1.9

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