

General Description

The WSK96N08 is the highest performance trench N-ch MOSFET with extreme high cell density, which provide excellent R_{DS(on)} and gate charge for most of the synchronous buck converter applications.

The WSK96N08 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

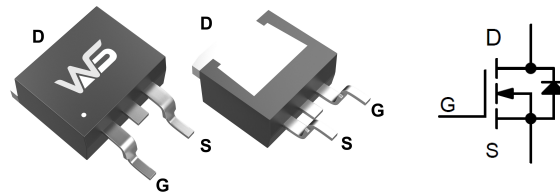
Applications

- Switching application
- Power management for inverter systems

Product Summary

BVDSS	R _{DS(on)}	I _D
80V	7mΩ	96A

TO-263-2L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	80	V
V _{GS}	Gate-Source Voltage	±25	V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V ¹	90	A
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ 10V ¹	64	A
I _{DM}	Pulsed Drain Current ²	360**	A
EAS	Single Pulse Avalanche Energy ³	416***	mJ
I _{AS}	Avalanche Current	200	A
P _D @T _C =25°C	Total Power Dissipation ³	185	W
P _D @T _C =100°C	Total Power Dissipation ³	92	W
T _{STG}	Storage Temperature Range	-55 to 175	°C
T _J	Operating Junction Temperature Range	-55 to 175	°C

Note: * Repetitive rating; pulse width limited by max.junction temperature.

** Surface mounted on 1in2 FR-4 board.

*** Limited by T_{Jmax}, starting T_J=25°C, L = 0.5mH, R_G= 25Ω, V_{GS} =10V.

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	80	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.0	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =45A	---	7	9	mΩ
		V _{GS} =6V, I _D =10A	---	10	12	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2	3	4	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-6.57	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =80V, V _{GS} =0V, T _J =25°C	---	-	1	uA
		V _{DS} =80V, V _{GS} =0V, T _J =55°C	---	-	2	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	-	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =20A	18	---	---	S
Q _g	Total Gate Charge (10V)	V _{DS} =50V, V _{GS} =10V, I _D =120A	---	86	---	nC
Q _{gs}	Gate-Source Charge		---	16	---	
Q _{gd}	Gate-Drain Charge		---	28	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =30V, V _{GS} =10V, R _G =6Ω, I _D =145A, R _L =30Ω	---	25	---	ns
T _r	Rise Time		---	42	---	
T _{d(off)}	Turn-Off Delay Time		---	62	---	
T _f	Fall Time		---	19	---	
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	---	3800	---	pF
C _{oss}	Output Capacitance		---	389	---	
C _{rss}	Reverse Transfer Capacitance		---	250	---	
V _{SD}	Diode Forward Voltage	I _{SD} =45A, V _{GS} =0V	---	0.8	---	V
t _{rr}	Reverse Recovery Time	I _{SD} =45A, dI _{SD} /dt=100A/μs	---	60	---	ns
Q _{rr}	Reverse Recovery Charge		---	125	---	nC

Note: *Pulse test, pulse width ≤ 300us, duty cycle ≤ 2%

Typical Operating Characteristics

Figure 1: Power Dissipation

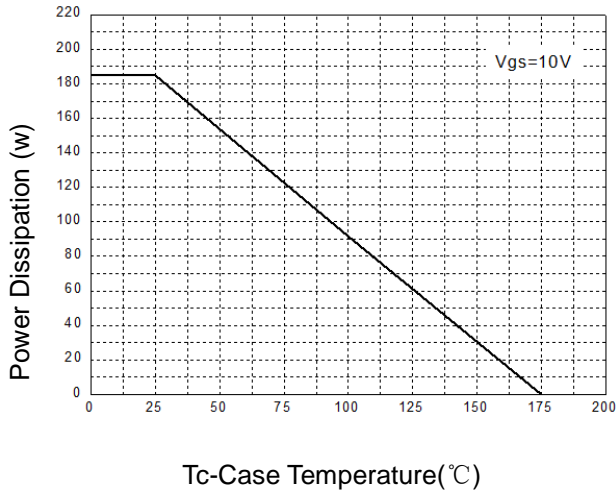


Figure 2: Drain Current

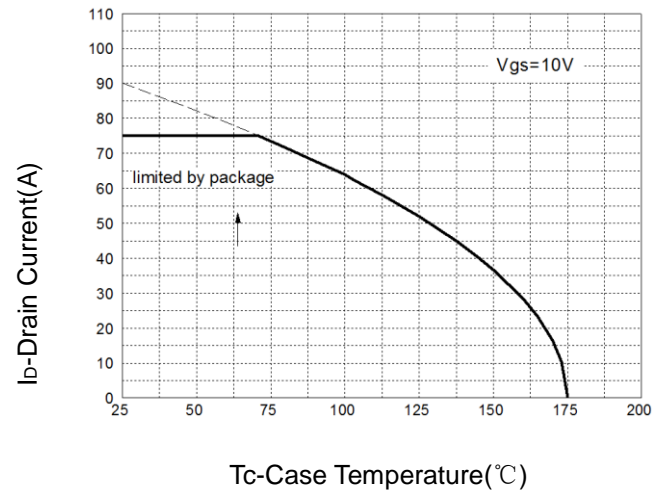


Figure 3: Safe Operation Area

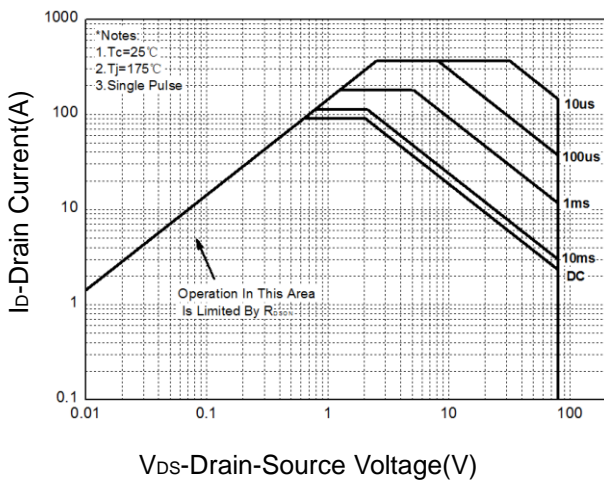


Figure 4: Thermal Transient Impedance

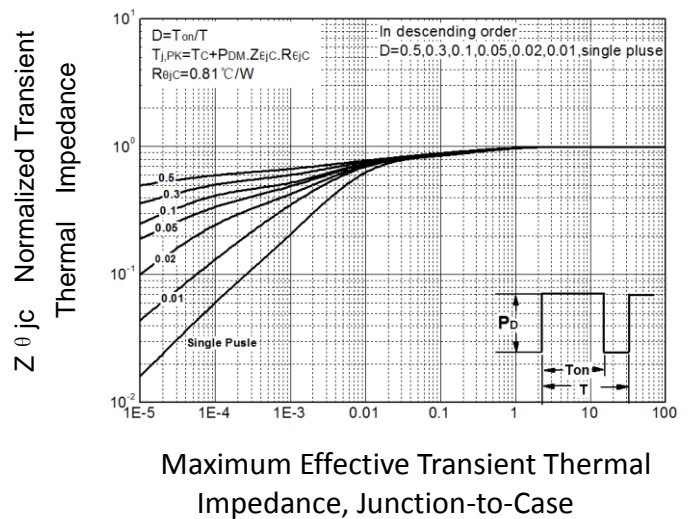


Figure 5: Output Characteristics

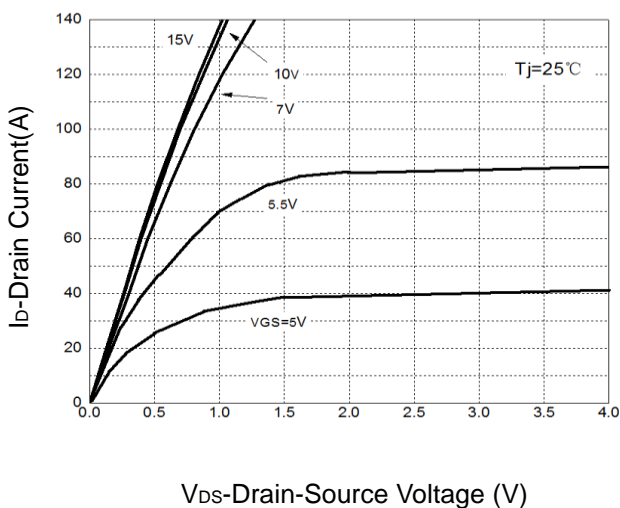
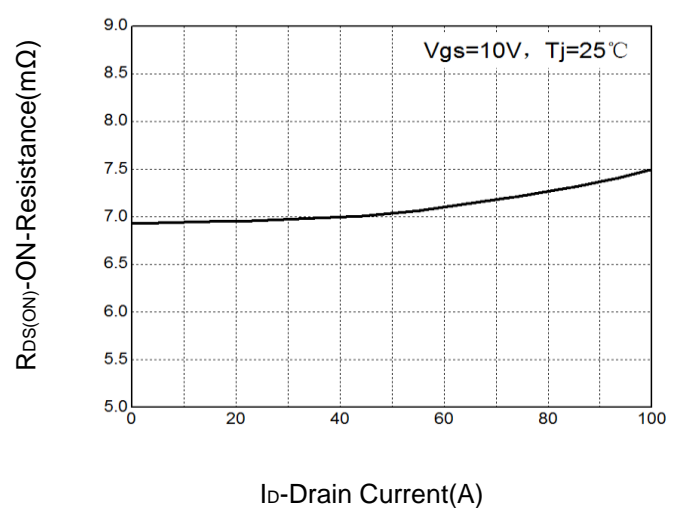


Figure 6: Drain-Source On Resistance



Typical Operating Characteristics

Figure 7: On-Resistance vs. Temperature

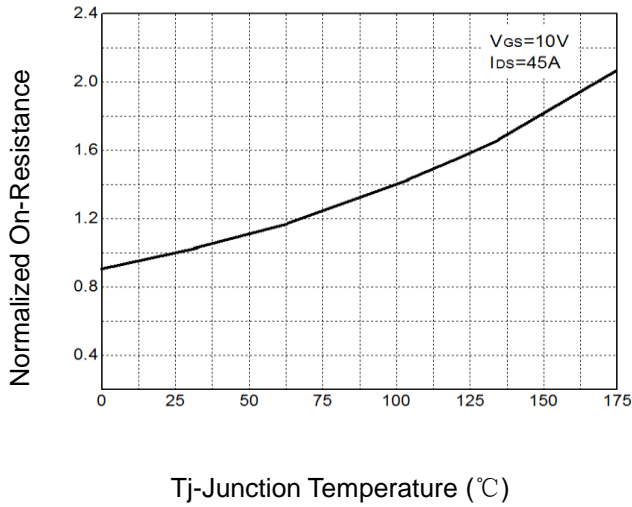


Figure 8: Source-Drain Diode Forward

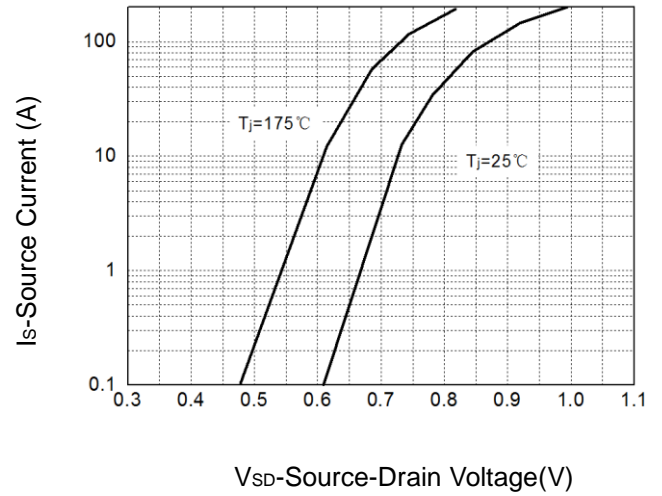


Figure 9: Capacitance Characteristics

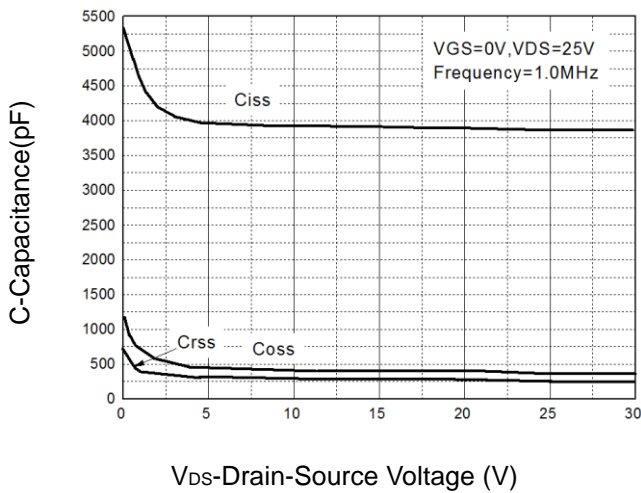
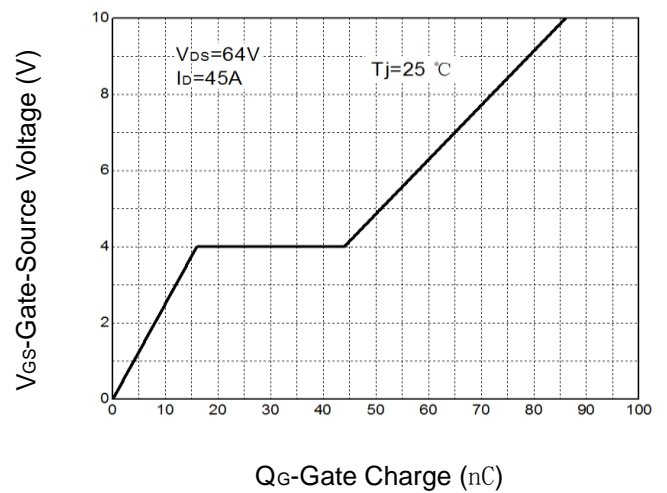
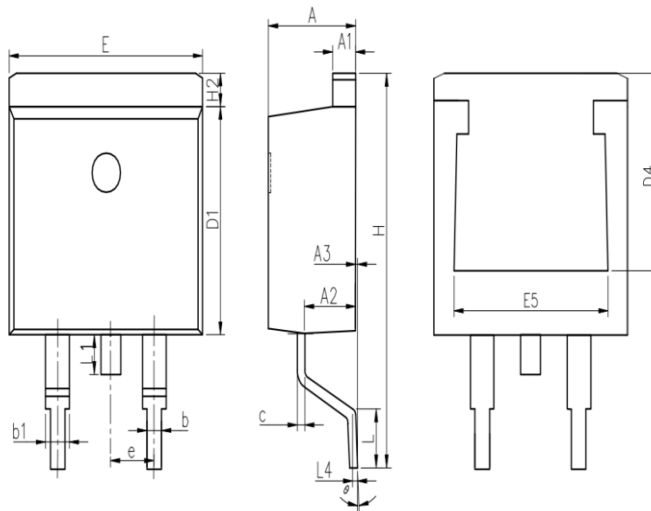


Figure 10: Gate Charge Characteristics

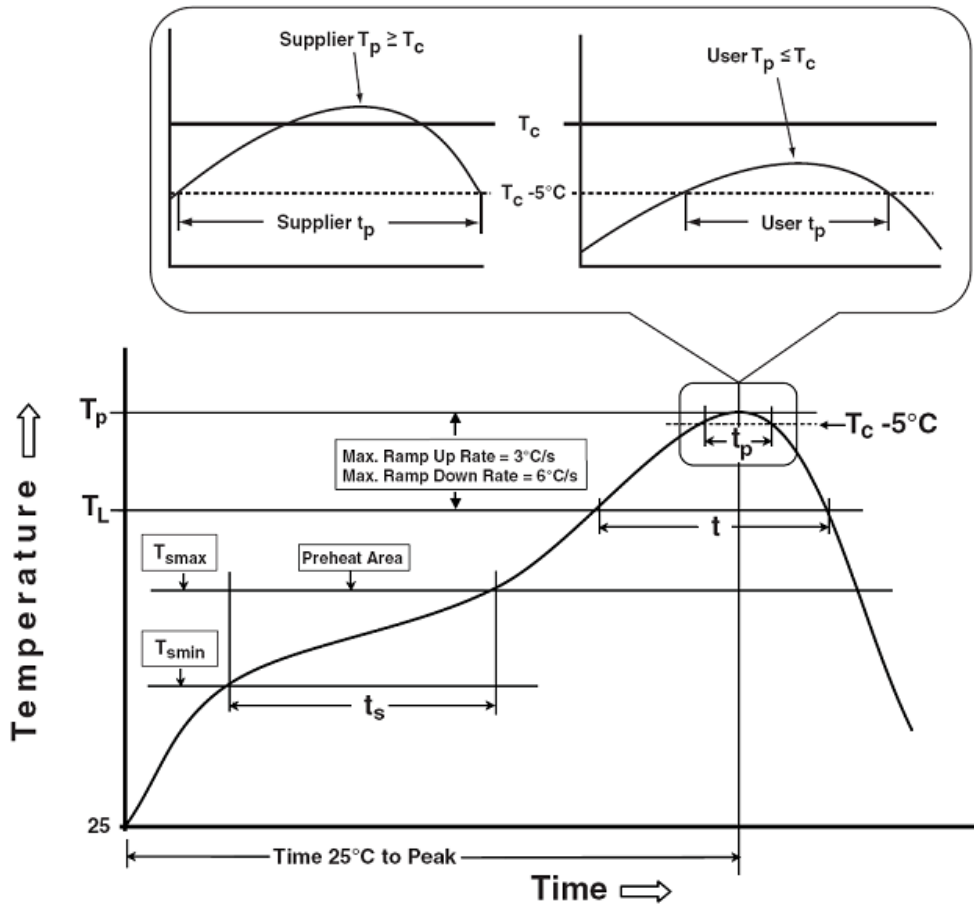


Device Per Unit

Package Type	Unit	Quantity
TO-263-2L	Reel	50

Package Information
TO-263-2L

COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.22	1.27	1.42
A2	2.49	2.69	2.89
A3	0	0.13	0.25
b	0.7	0.81	0.96
b1	1.17	1.27	1.47
c	0.3	0.38	0.53
D1	8.5	8.7	8.9
D4	6.6	-	-
E	9.86	10.16	10.36
E5	7.06	-	-
e	2.54 BSC		
H	14.7	15.1	15.5
H2	1.07	1.27	1.47
L	2	2.3	2.6
L1	1.4	1.55	1.7
L4	0.25 BSC		
θ	0°	5°	9°

Classification Profile

Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat & Soak		
Temperature min (T_{smin})	100 °C	150 °C
Temperature max (T_{smax})	150 °C	200 °C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max.	3°C/second max.
Liquidous temperature (T_L)	183 °C	217 °C
Time at liquidous (t)	60-150 seconds	60-150 seconds
Peak package body Temperature (T_p)*	See Classification Temp in table 1	See Classification Temp in table 2
Time (t_p)** within 5°C of the specified classification temperature (T_c)	20** seconds	30** seconds
Average ramp-down rate (T_p to T_{smax})	6 °C/second max.	6 °C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.
*Tolerance for peak profile Temperature (T_p) is defined as a supplier minimum and a user maximum.		
** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.		



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