General Description

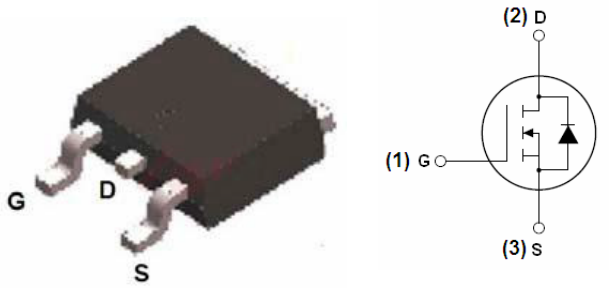
The WSK96N08 is the highest performance trench N-ch MOSFET with extreme high cell density , which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

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

Product Summery

BVDSS	RDSON	ID
80V	7mΩ	96A

TO-263-2L Pin Configuration



Applications

- Switching application
- Power management for inverter systems

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℃	Continuous Drain Current, V_{GS} @ 10V[1]	90	A
I_D@T_C=100℃	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℃	Total Power Dissipation[3]	185	W
P_D@T_C=100℃	Total Power Dissipation[3]	92	W
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Note: * Repetitive rating; pulse width limited by max.junction temperature.
** Surface mounted on 1in2 FR-4 board.
*** Limited by $T_J$max , starting T_J=25℃ , L = 0.5mH, R_G= 25Ω, V_{GS} =10V.

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	80	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.0	---	V/℃
$R_{DS(ON)}$	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
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-6.57	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	-	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=55℃	---	-	2	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	-	±100	nA
gfs	orward 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

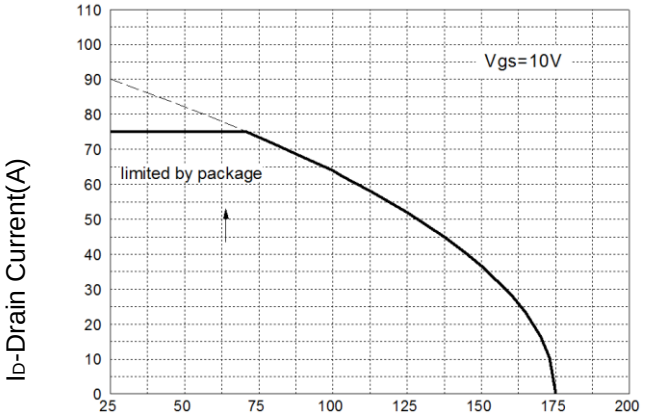


Figure 3: Safe Operation Area

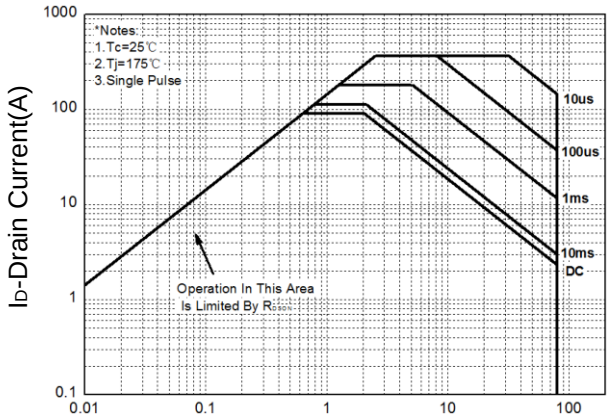


Figure 4: Thermal Transient Impedance

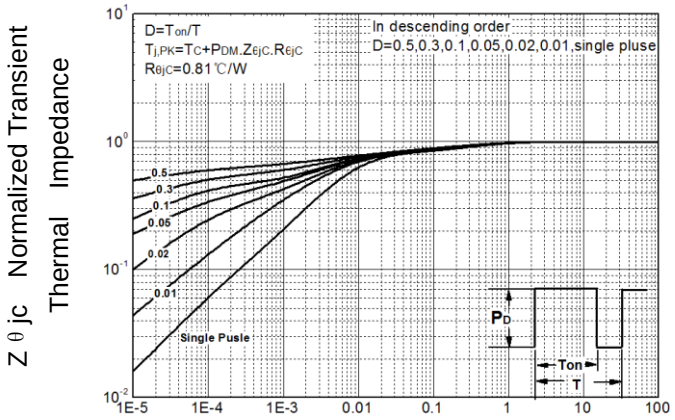


Figure 5: Output Characteristics

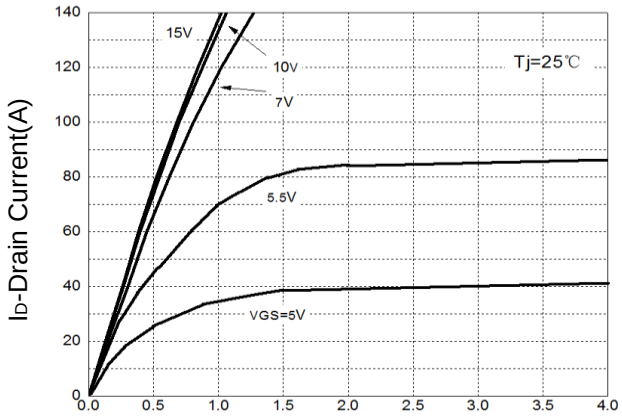
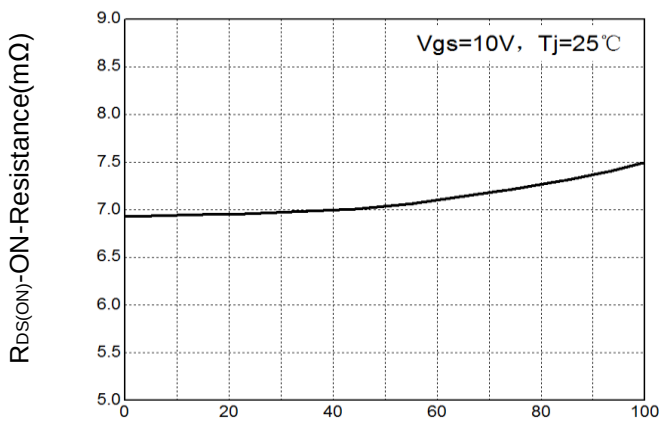
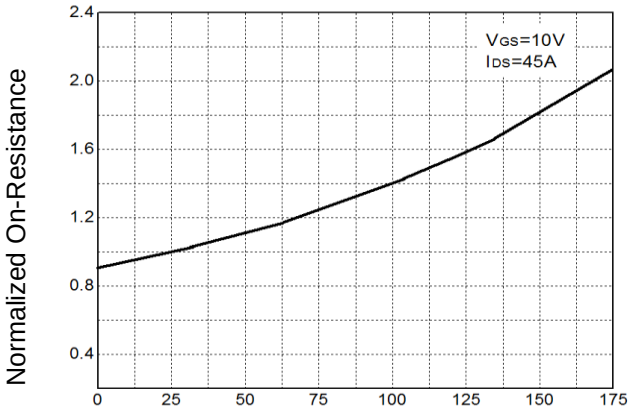


Figure 6: Drain-Source On Resistance



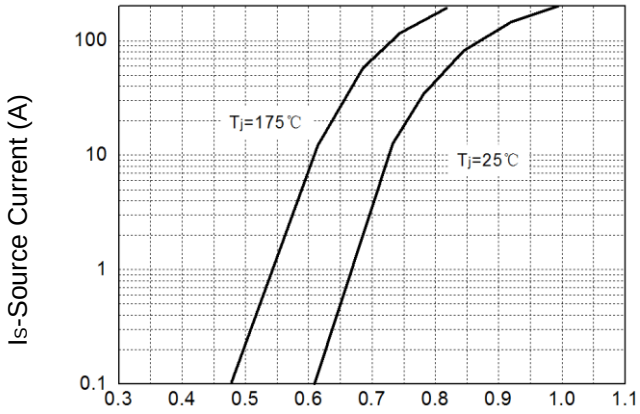
Typical Operating Characteristics

Figure 7: On-Resistance vs. Temperature



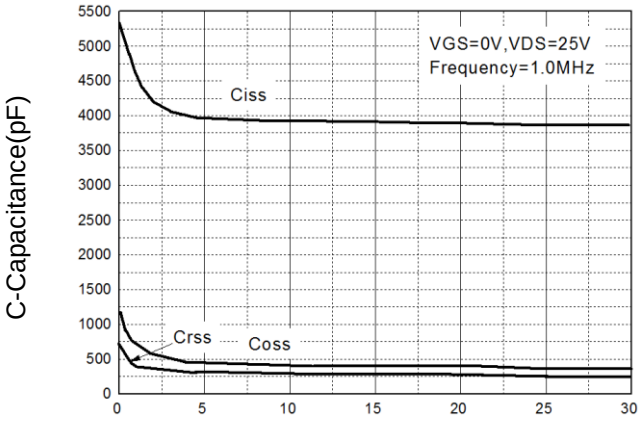
Tj-Junction Temperature (℃)

Figure 8: Source-Drain Diode Forward



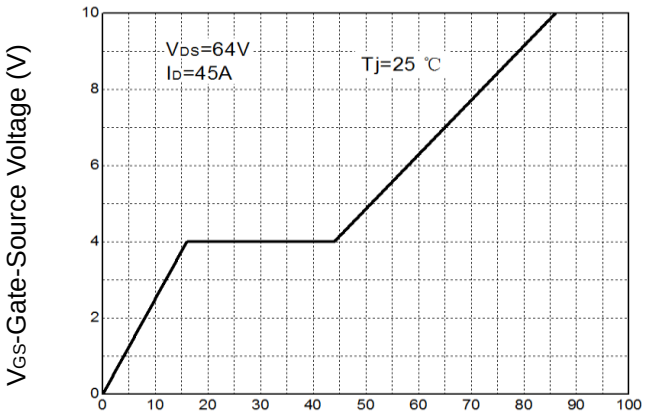
VSD-Source-Drain Voltage(V)

Figure 9: Capacitance Characteristics



VDS-Drain-Source Voltage (V)

Figure 10: Gate Charge Characteristics



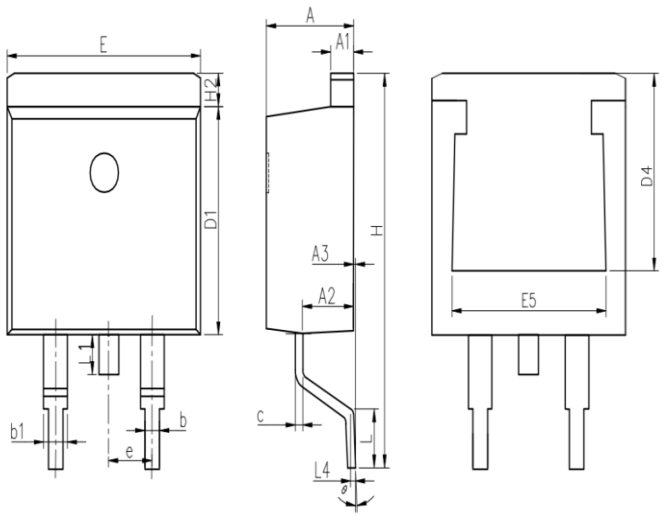
QG-Gate Charge (nC)

Device Per Unit

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

Package Information

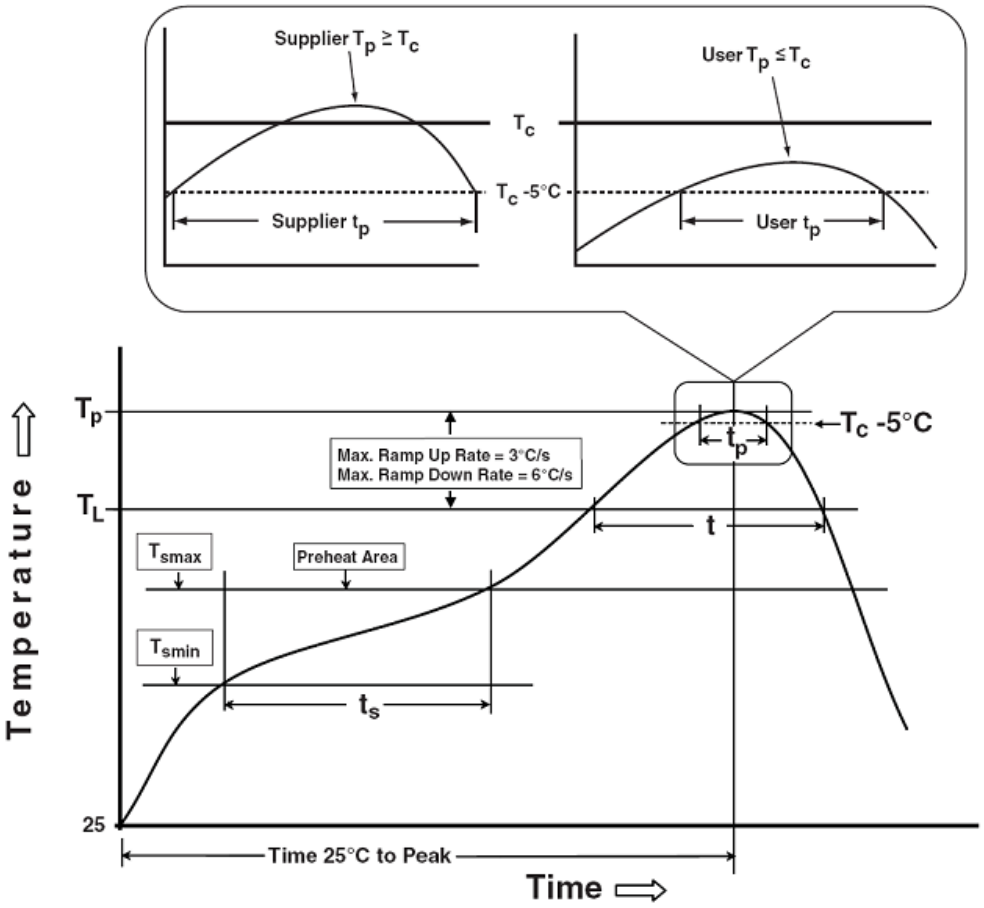
TO-263-2L



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}) Temperature max (T_{smax}) Time (Tsmin to Tsmax) (t_s)	 100 °C 150 °C 60-120 seconds	 150 °C 200 °C 60-120 seconds
Average ramp-up rate ($T_{smax}$to T_P)	3 °C/second max.	3°C/second max.
Liquidous temperature (T_L) Time at liquidous (t_L)	183 °C 60-150 seconds	217 °C 60-150 seconds
Peak package body Temperature (T_p)*	See Classification Temp in table 1	SeeClassification Tempin 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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