General Description

The WSK180N04 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 WSK180N04 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
- 100% EAS Guaranteed
- Green Device Available

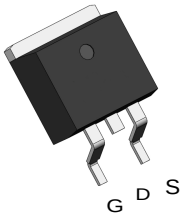
Product Summery

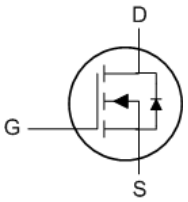
BVDSS	RDSON	ID
40V	3.0mΩ	180A

Applications

- Switching application
- Power Management for Inverter Systems.

TO-263 Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		40	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		175	℃
T_{STG}	Storage Temperature Range		-55 to 175	℃
I_S	Diode Continuous Forward Current	T_C=25℃	176	A
Mounted on Large Heat Sink				
I_{DM}	Pulsed Drain Current *	T_C=25℃	648[1,2]	A
I_D	Continuous Drain Current	T_C=25℃	180	A
		T_C=100℃	120	
P_D	Maximum Power Dissipation	T_C=25℃	192	W
		T_C=100℃	96	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.78	℃/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62.5	
Avalanche Ratings				
E_{AS}	Avalanche Energy, Single Pulsed	L=0.5mH	1.09[1,2]	J

NOTE: 1,Repetitive rating ; pulse width limiited by junction temperatur

2,Drain current is limited by junction temperature

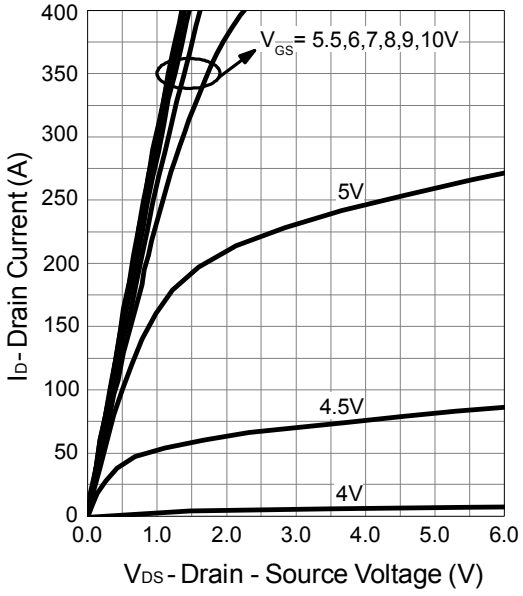
Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V, V_{GS}=0V	-	-	1	μA
		T_J=85℃	-	-	10	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	2.0	3.0	4.0	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ *	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=88A	-	3.0	3.6	mΩ
Diode Characteristics						
V_{SD} *	Diode Forward Voltage	I_{SD}=88A, V_{GS}=0V	-	0.8	1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=88A, dI_{SD}/ dt=100A/μs	-	27	-	ns
Q_{rr}	Reverse Recovery Charge		-	50	-	nC
Dynamic Characteristics						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	1.1	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, Frequency=1.0MHz	-	4426	-	pF
C_{oss}	Output Capacitance		-	1027	-	
C_{rss}	Reverse Transfer Capacitance		-	537	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V, R_G=6 Ω, I_{DS} =88A, V_{GS}=10V ,	-	27	-	ns
T_r	Turn-on Rise Time		-	18	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	41	-	
T_f	Turn-off Fall Time		-	53	-	
Gate Charge Characteristics						
Q_g	Total Gate Charge	V_{DS}=32V, V_{GS}=10V, I_{DS}=88A	-	121	-	nC
Q_{gs}	Gate-Source Charge		-	28	-	
Q_{gd}	Gate-Drain Charge		-	34	-	

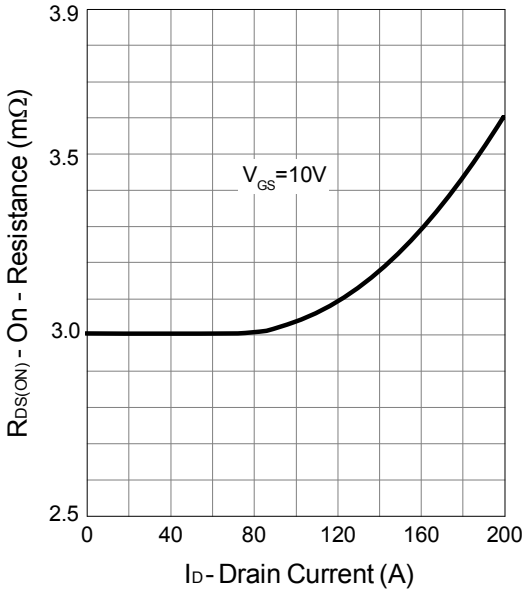
Note * : Pulse test ; pulse width≤300μs, duty cycle≤2%.

Typical Characteristics

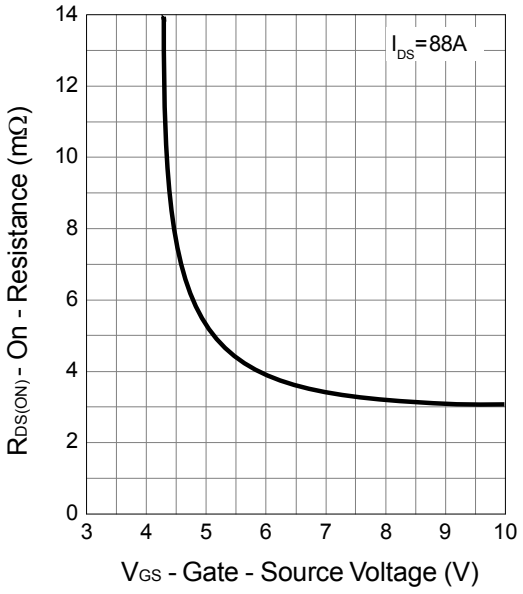
Output Characteristics



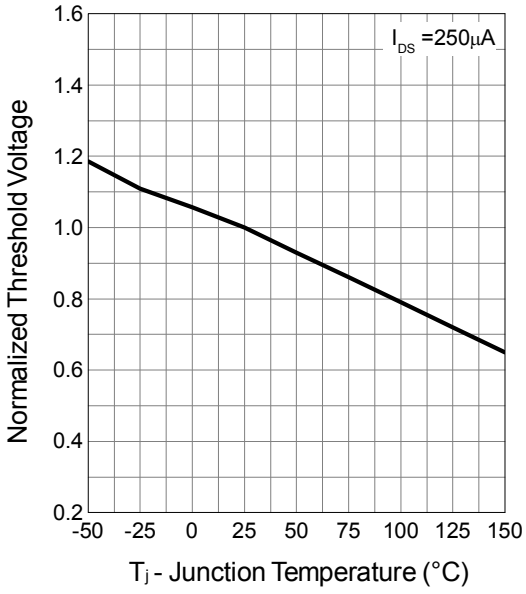
Drain-Source On Resistance



Gate-Source On Resistance

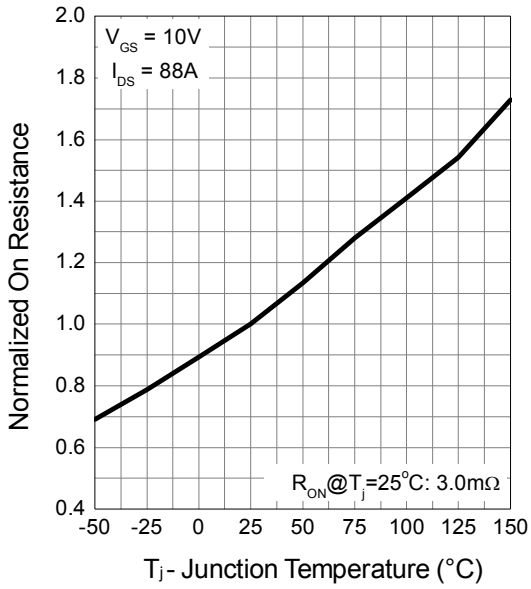


Gate Threshold Voltage

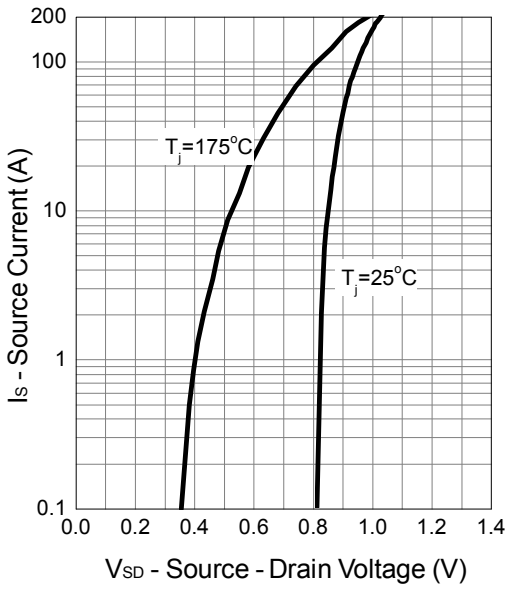


Typical Characteristics

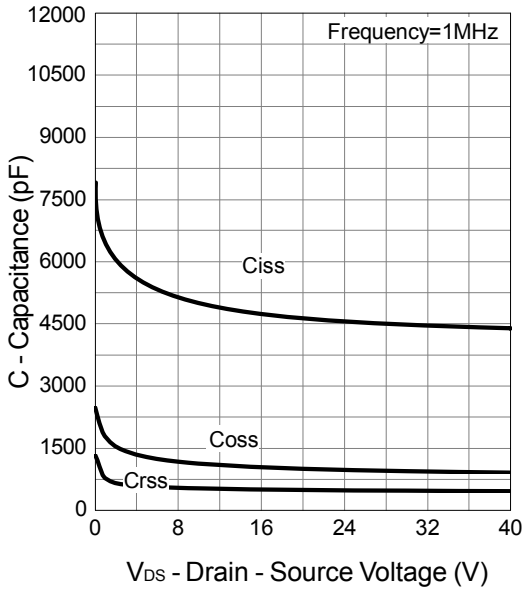
Drain-Source On Resistance



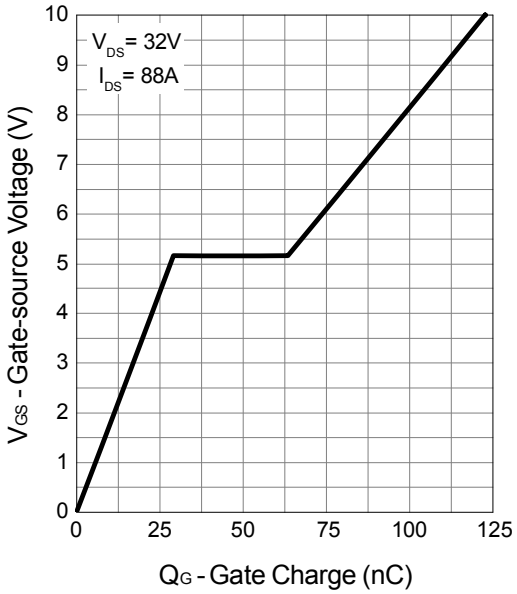
Source-Drain Diode Forward



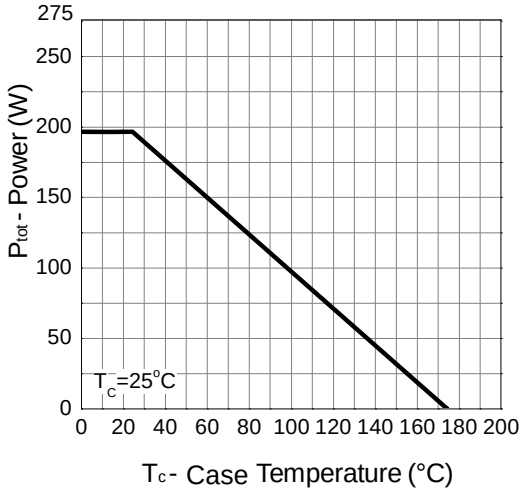
Capacitance



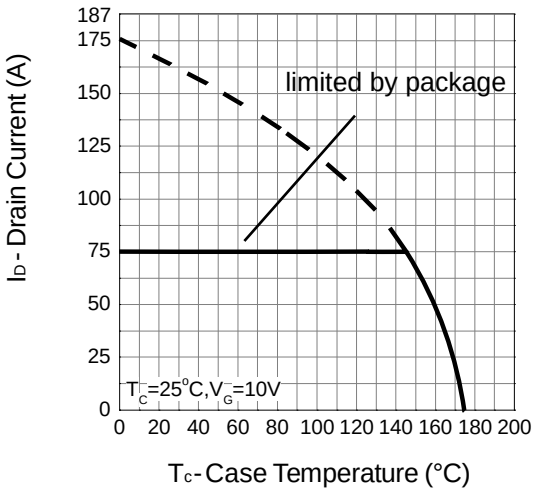
Gate Charge



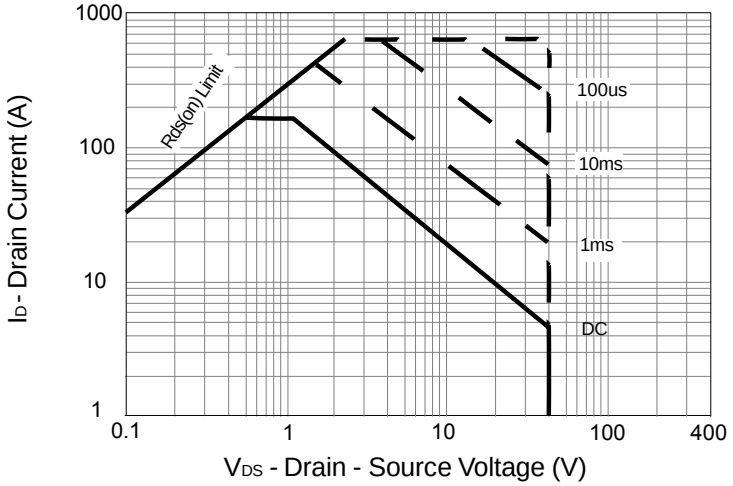
Power Dissipation



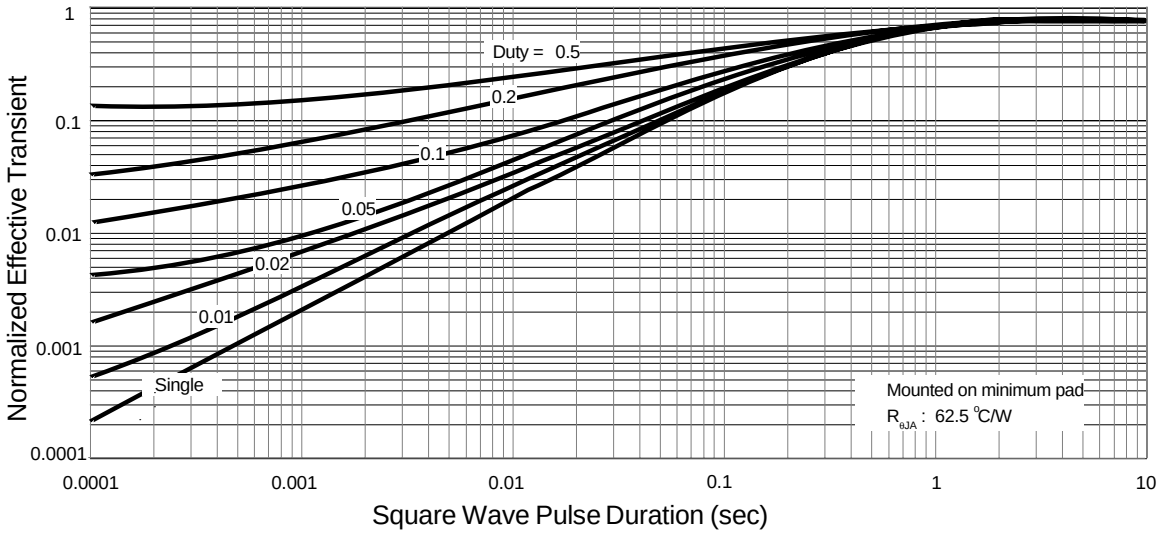
Drain Current



Safe Operation Area



Thermal Transient Impedance



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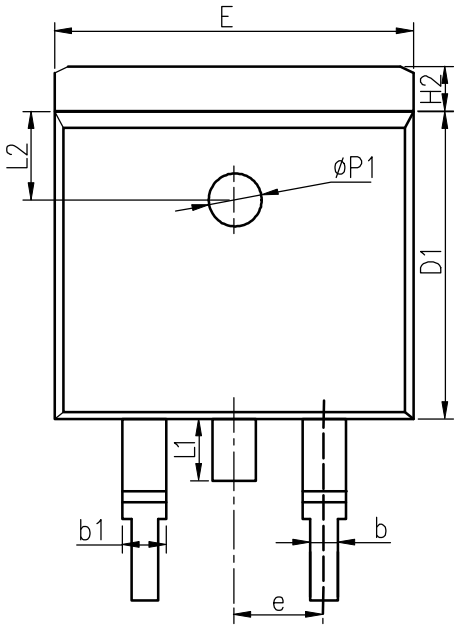

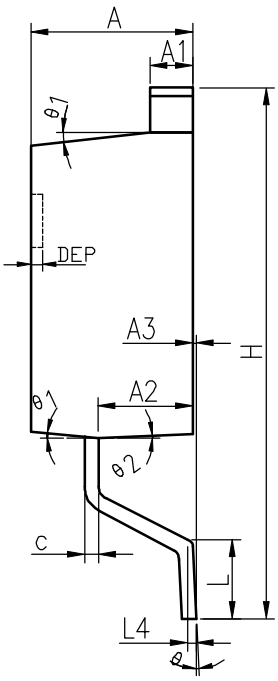

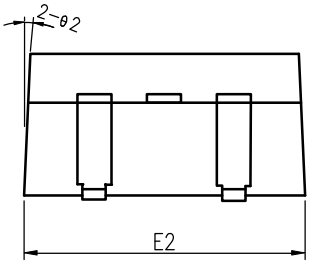

COMMON DIMENSIONS

SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.22	1.27	1.32	0.048	0.050	0.052
A2	2.59	2.69	2.79	0.102	0.106	0.110
A3	0.00	0.10	0.20	0.000	0.004	0.008
b	0.77	0.813	0.90	0.030	0.032	0.035
b1	1.20	1.270	1.36	0.047	0.050	0.054
c	0.34	0.381	0.47	0.013	0.015	0.019
D1	8.60	8.70	8.80	0.339	0.343	0.346
E	10.00	10.16	10.26	0.394	0.400	0.404
E2	10.00	10.10	10.20	0.394	0.398	0.402
e		2.54 BSC			0.100 BSC	
H	14.70	15.10	15.50	0.579	0.594	0.610
H2	1.17	1.27	1.40	0.046	0.050	0.055
L	2.00	2.30	2.60	0.079	0.091	0.102
L1	1.45	1.55	1.70	0.057	0.061	0.067
L2		2.50 REF			0.098 REF	
L4		0.25 BSC			0.010 BSC	
	0°	5°	8°	0°	5°	8°
1	5°	7°	9°	5°	7°	9°
2	1°	3°	5°	1°	3°	5°
ΦP1	1.40	1.50	1.60	0.055	0.059	0.063
DEP	0.05	0.10	0.20	0.002	0.004	0.008

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