WSK290N04G6

N-Ch MOSFET

General Description

The WSK290N04G6 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 WSK290N04G6 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

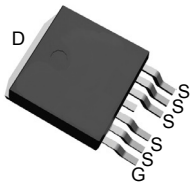
Product Summery

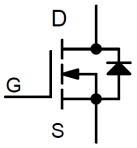
BVDSS	RDSON	ID
40V	1.2mΩ	290A

Applications

- Switching application
- Power Management for Inverter Systems.

TO-263-6L 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℃	190	A
Mounted on Large Heat Sink				
I_{DM}	Pulsed Drain Current [1]	T_C=25℃	1015	A
I_D	Continuous Drain Current	T_C=25℃	290	A
		T_C=100℃	207	
P_D	Maximum Power Dissipation	T_C=25℃	230	W
		T_C=100℃	115	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.65	℃/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		50	
Avalanche Ratings				
E_{AS}	Avalanche Energy, Single Pulsed	L=0.5mH	1400	mJ

NOTE:

1,Pulse width limited by maximum junction temperature.

2,UIS tested and pulse width limited by maximum junction temperature (initial temperature Tj=25°C.

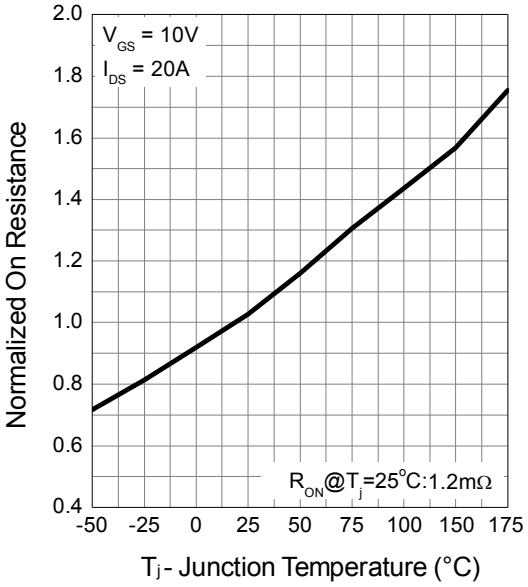
Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

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	1.0	1.8	2.5	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}=30A	-	1.2	1.6	mΩ
$R_{DS(ON)}$ *	Drain-Source On-state Resistance	V_{GS}=4.5V, I_{DS}=20A	-	1.5	2.5	mΩ
Diode Characteristics						
V_{SD} *	Diode Forward Voltage	I_{SD}=20A, V_{GS}=0V	-	0.8	1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=104A, dI_{SD}/ dt=100A/μs	-	45	-	ns
Q_{rr}	Reverse Recovery Charge		-	98	-	nC
Dynamic Characteristics						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	1.0	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=20V, Frequency=1.0MHz	-	8102	-	pF
C_{oss}	Output Capacitance		-	945	-	
C_{rss}	Reverse Transfer Capacitance		-	410	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V, R_G=6 Ω, I_{DS} =20A, V_{GS}=10V .,	-	29	-	ns
T_r	Turn-on Rise Time		-	17	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	150	-	
T_f	Turn-off Fall Time		-	65	-	
Gate Charge Characteristics						
Q_g	Total Gate Charge	V_{DS}=20V, V_{GS}=10V, I_{DS}=20A	-	142	-	nC
Q_{gs}	Gate-Source Charge		-	34	-	
Q_{gd}	Gate-Drain Charge		-	25	-	

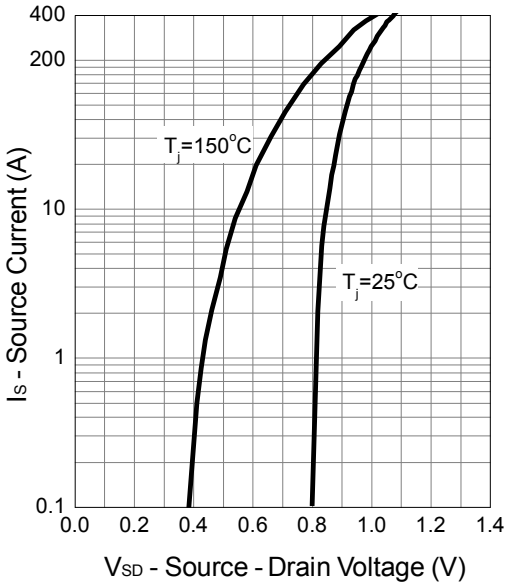
Note * : Pulse test ; pulse width ≤300μs, duty cycle≤2%.

Typical Characteristics

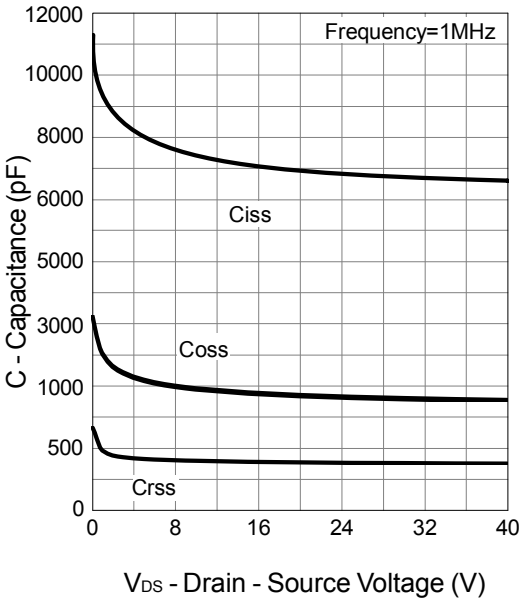
Drain-Source On Resistance



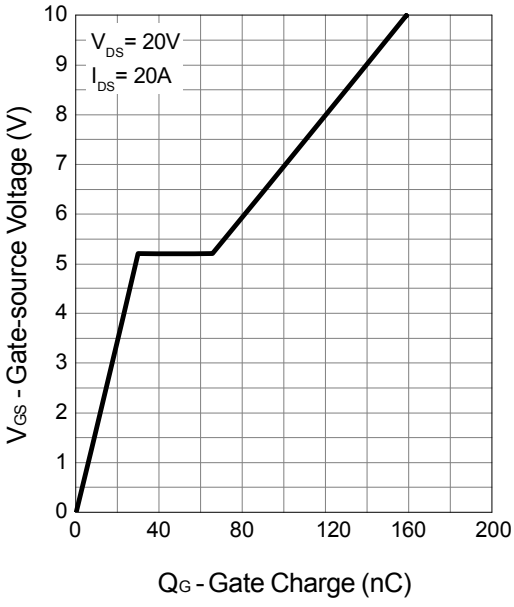
Source-Drain Diode Forward



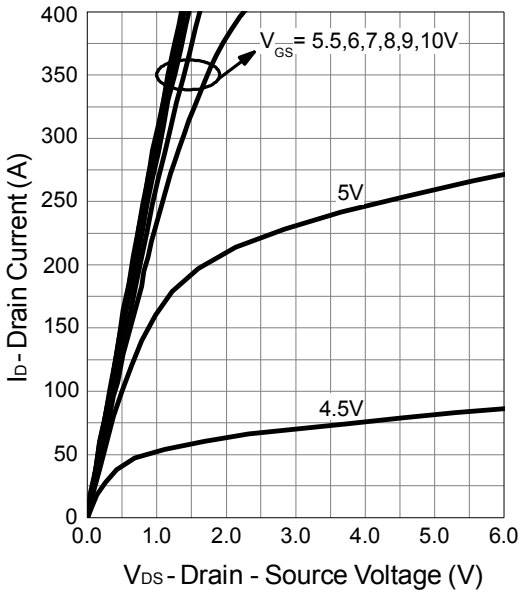
Capacitance



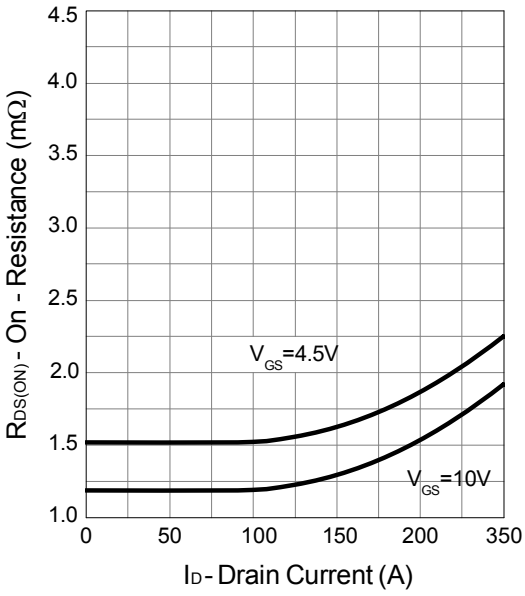
Gate Charge



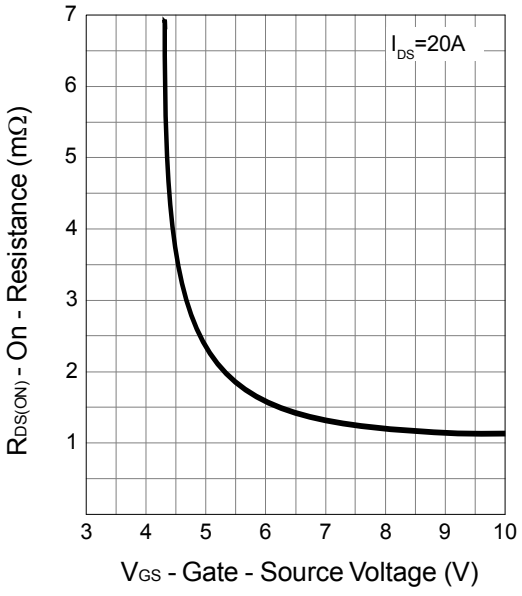
Output Characteristics



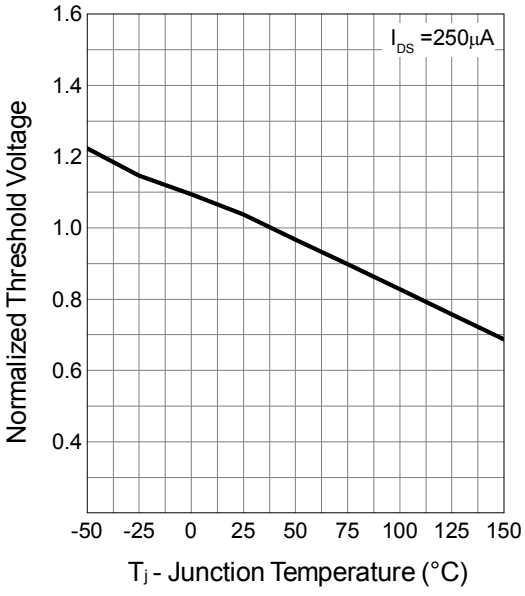
Drain-Source On Resistance

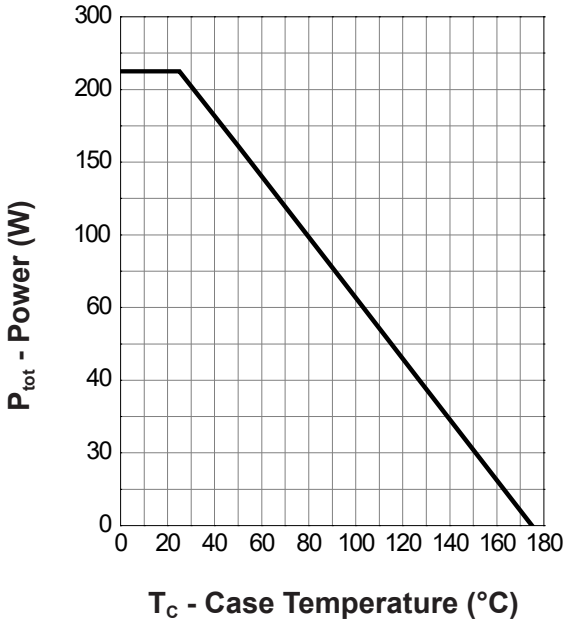


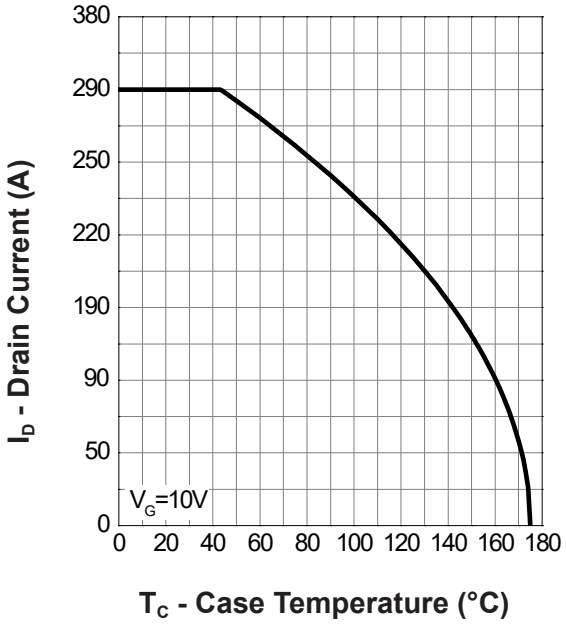
Gate-Source On Resistance



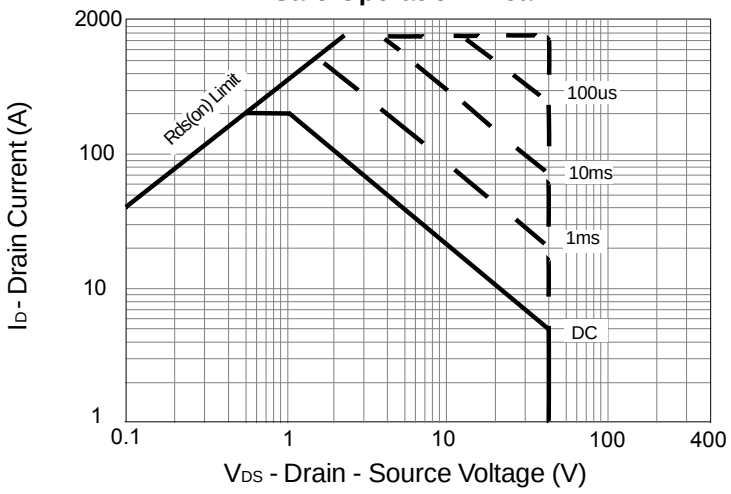
Gate Threshold Voltage



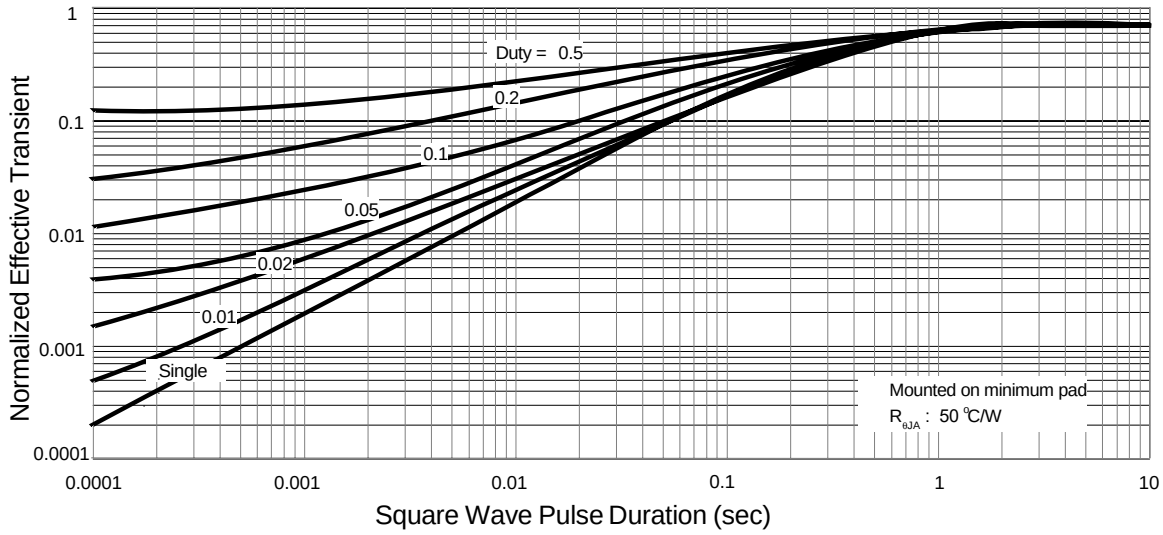




Safe Operation Area



Thermal Transient Impedance



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