

MOSFET – N-Channel, Super Junction
650 V, 20.0 A, 190 mQ



JCP190N650S

Features

- Super Low Gate Charge
- 100% EAS Guaranteed
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

V _{DSS}	R _{DS(ON)} MAX	I _D MAX
650 V	190 mQ @ 10 V	20.0A

Description

The JCP190N650S is the high cell density trenched N-ch MOSFETs, which provide excellent R_{DS(ON)} and gate charge for most of the synchronous buck converter applications. The JCP190N650S meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.



Equivalent Circuit	Outline
	<p>TO-220</p>

Package Marking and Ordering Information

Part Number	Top Marking	Device Package	Quantity
JCP190N650S	JCP190N650S	TO-220	50 Units / Tube

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Table 1. Thermal Characteristic

Symbol	Parameter	Max	Unit
R _{θJA}	Thermal Resistance Junction to Ambient	TO-220	°C/W
		62	

Table 2. Absolute Maximum Ratings (TA=25°C)

Symbol	Parameter	Value	Unit
V _{DS}	Drain-Source Voltage	650	V
V _{GS}	Gate-Source Voltage	±30	V
I _{D(DC)}	Drain Current-Continuous(Tc =25°C)	20	A
I _{DM(pluse)}	Drain Current-Continuous@ Current-Pulsed	60	A
EAS	Single Pulsed Avalanche Energy	480	mJ
P _D	Power Dissipation(Tc=25°C)	151	W
T _J ,T _{STG}	Operating Junction and Storage Temperature Range	-55 To 150	°C

Table 3. Electrical Characteristics (TA=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	650			V
I _{DSS}	Zero Gate Voltage Drain Current(Tc=25°C)	V _{DS} =650V, V _{GS} =0V			1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±30V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	3		4	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =10A		0.16	0.19	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =100V, V _{GS} =0V f=1.0MHz		1724		PF
C _{oss}	Output Capacitance			61		PF
C _{rss}	Reverse Transfer Capacitance			6		PF
Switching Times						
Q _g	Total Gate Charge	V _{DD} =520V V _{GS} =10V I _D =8A		38.5		nC
Q _{gs}	Gate-Source Charge			8		nC
Q _{gd}	Gate-Drain Charge			15		nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =400V V _{GS} =10V I _D =7A		15		nS
t _r	Turn-on Rise Time			59		nS
t _{d(off)}	Turn-Off Delay Time			121		nS

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t_f	Turn-Off Fall Time	$R_G = 25\Omega$		44		nS
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current(Body Diode)				20	A
I_{SDM}	Pulsed Source-Drain Current(Body Diode)				60	A
V_{SD}	Forward On Voltage	$I_{SD}=8A, V_{GS}=0V$ $T_J=25^\circ C$			1.2	V
t_{rr}	Reverse Recovery Time	$V_{GS}=0V, I_S=8A,$ $diF/dt=100A/\mu s$		423		Ns
Q_{rr}	Reverse Recovery Charge			5.3		μC

Notes:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating . The test condition is $V_{GS} = 10V, L=10mH$
4. The power dissipation is limited by 175^oC junction temperature
5. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

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Typical Characteristics

Figure 1. Output Characteristics

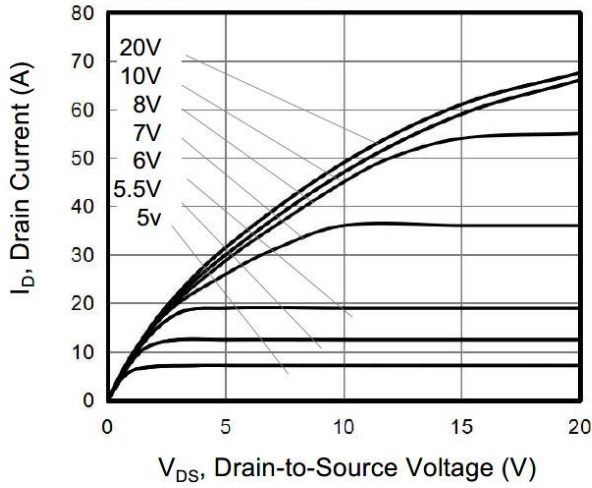


Figure 2. Transfer Characteristics

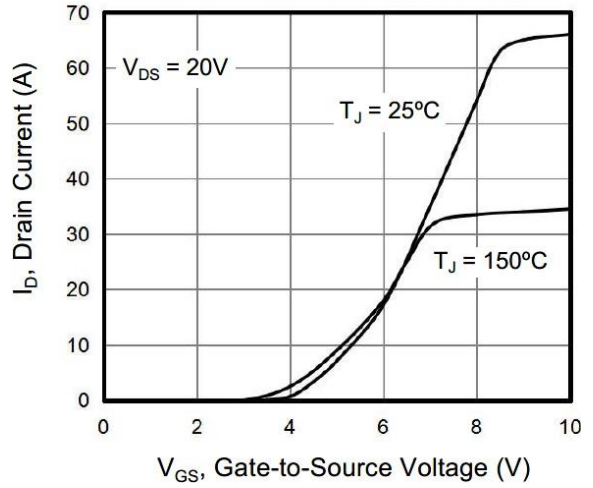


Figure 3. On-Resistance vs. Drain Current

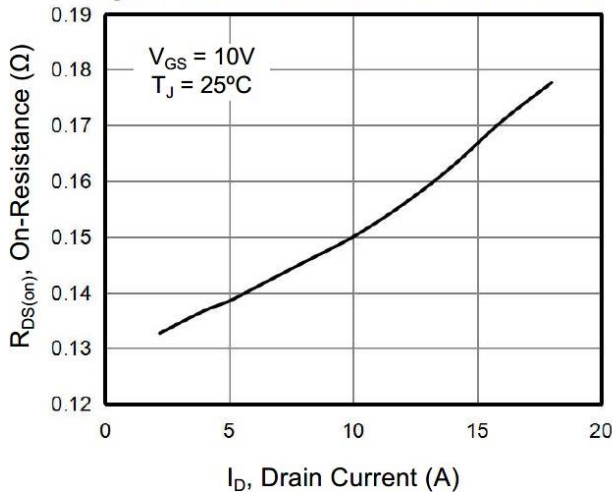


Figure 4. Capacitance

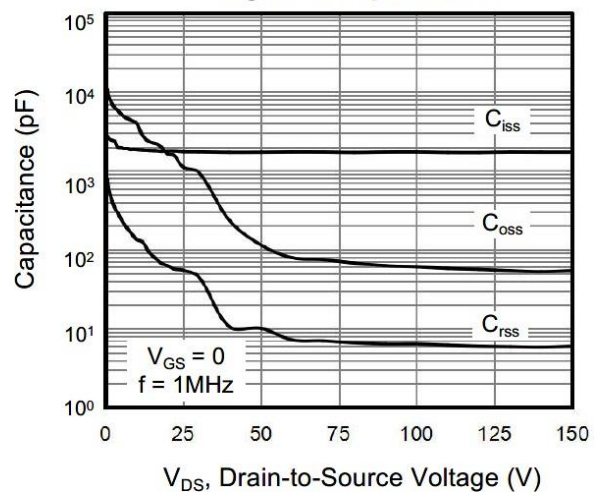


Figure 5. Gate Charge

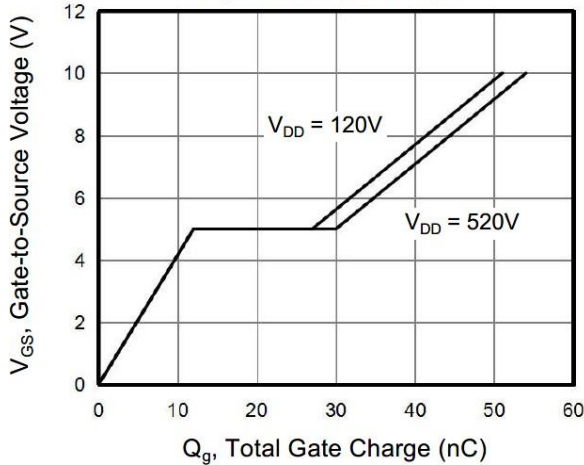
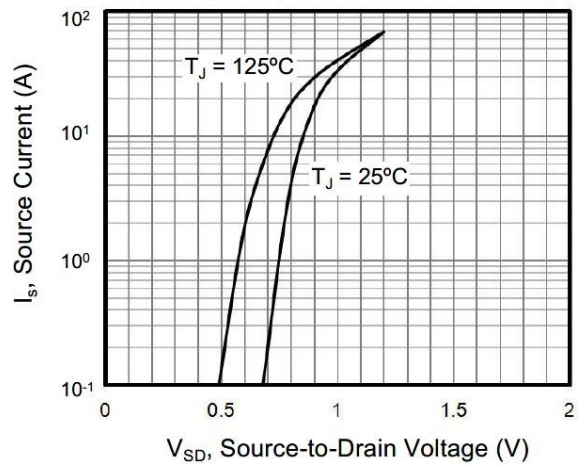


Figure 6. Body Diode Forward Voltage



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Figure 7. On-Resistance vs. Junction Temperature

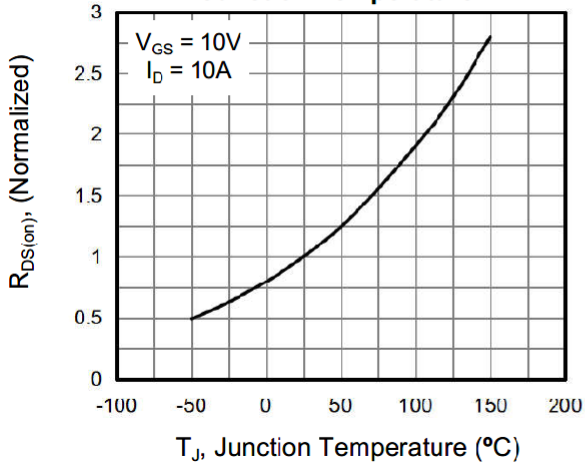


Figure 8. Threshold Voltage vs. Junction Temperature

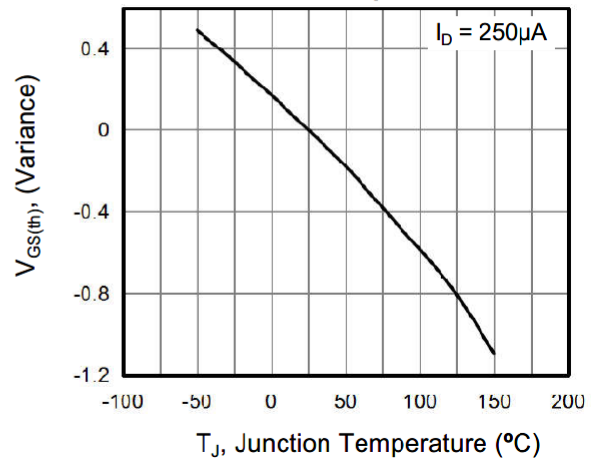


Figure 9. Transient Thermal Impedance TO-220/TO-3PN/TO-247

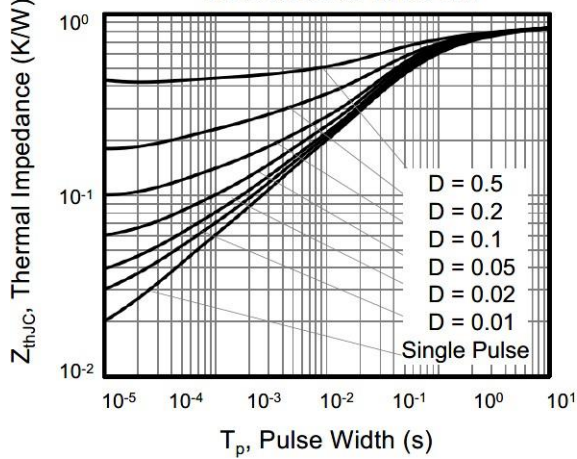
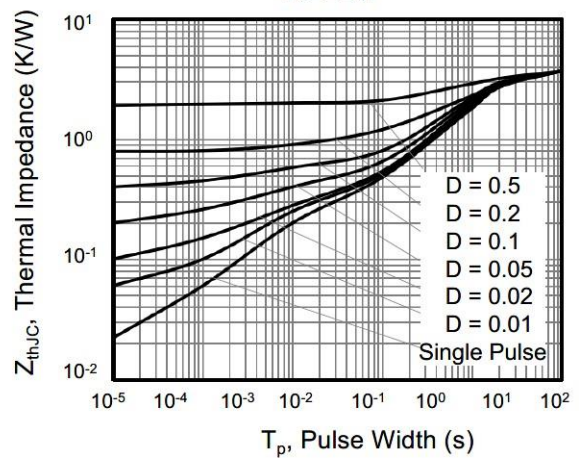


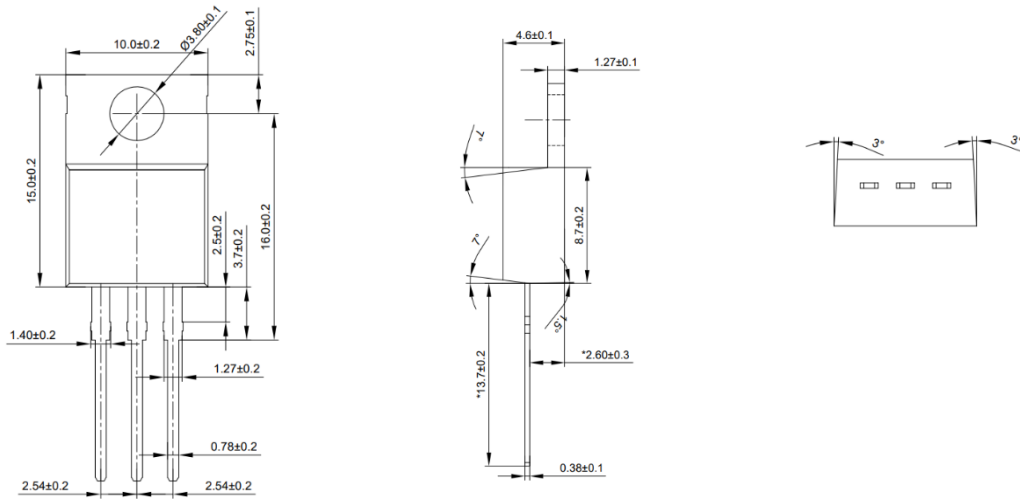
Figure 10. Transient Thermal Impedance TO-220F



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PACKAGE DIMENSIONS

TO-220 3-LEAD



Note:

Dimension and tolerance per ASME 14.5M,1994.

Controlling dimension: Millimeters

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Disclaimer

All product specifications and data are subject to change without notice.

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