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

JCB190N650S

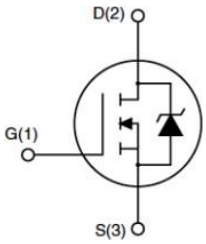
Features

V_{DSS}	$R_{DS(ON)}$ MAX	I_D MAX
650 V	190 mQ @ 10 V	20.0A

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

Description

The JCB190N650S is the high cell density trenched N-ch MOSFETs, which provide excellent R_{DSON} and gate charge for most of the synchronous buck converter applications. The JCB190N650S meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Equivalent Circuit	Outline
	**TO-263** 

Package Marking and Ordering Information

Part Number	Top Marking	Device Package	Quantity
JCB190N650S	JCB190N650S	TO-263	800 / Reel

Table 1. Thermal Characteristic

Symbol	Parameter	Max	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	TO-263	
		62	℃/W

Table 2. Absolute Maximum Ratings (TA=25℃)

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℃)	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℃)	151	W
T_J,T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 3. Electrical Characteristics (TA=25℃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℃)	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

t_f	Turn-Off Fall Time	R_G =25Ω		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℃			1.2	V
trr	Reverse Recovery Time	VGS=0V,IS=8A, diF/dt=100A/μs		423		Ns
Qrr	Reverse Recovery Charge			5.3		μC

Notes:

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width≦300us , duty cycle≦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℃ 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.

Typical Characteristics

Figure 1. Output Characteristics

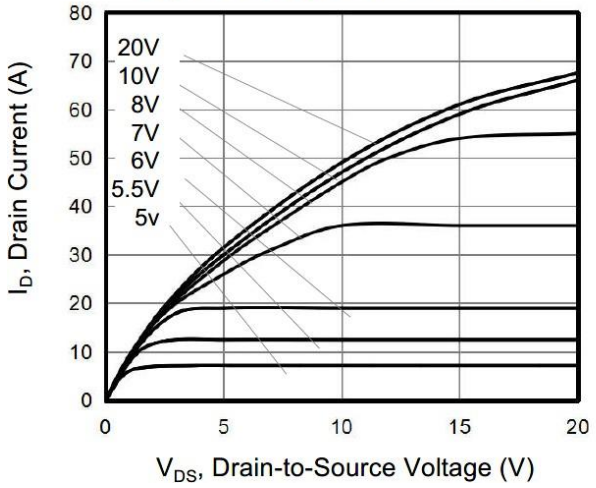


Figure 2. Transfer Characteristics

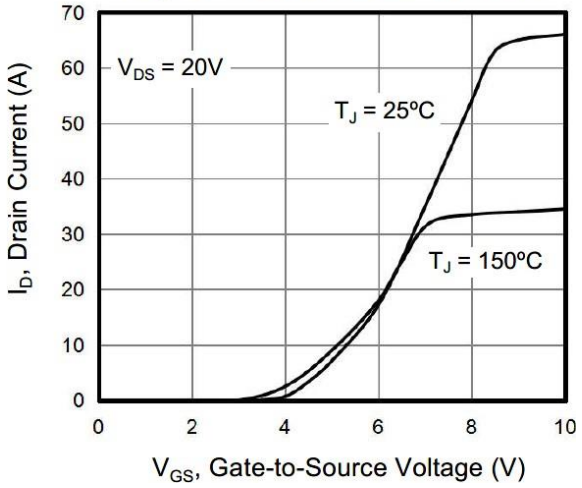


Figure 3. On-Resistance vs. Drain Current

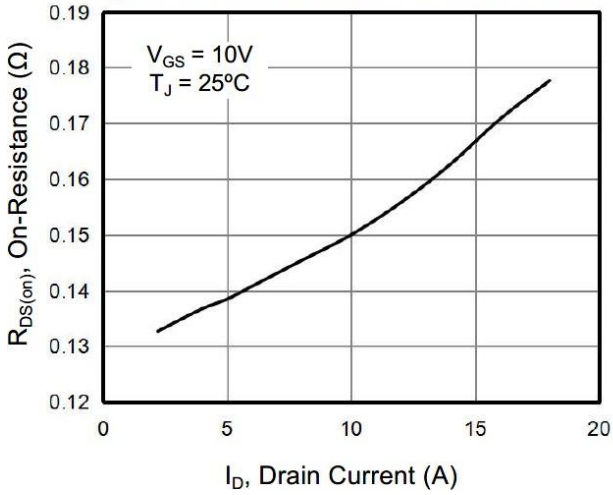


Figure 4. Capacitance

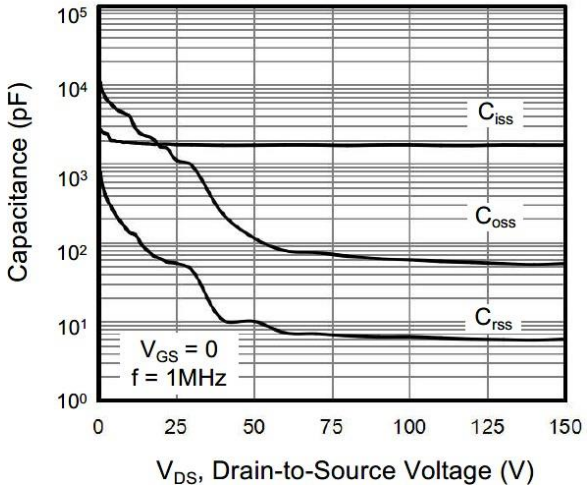


Figure 5. Gate Charge

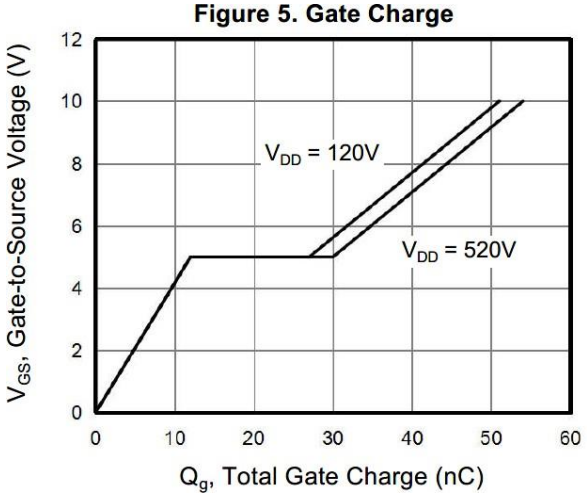


Figure 6. Body Diode Forward Voltage

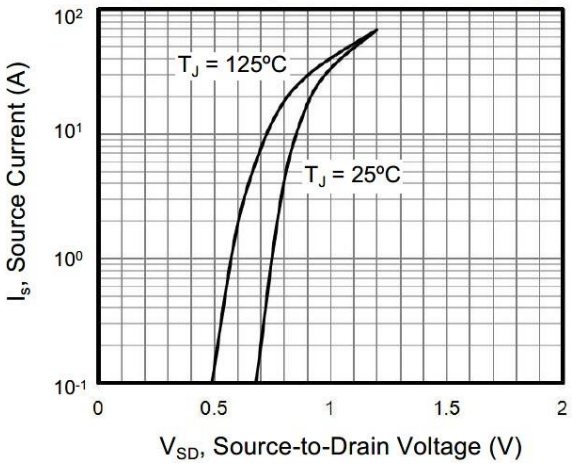


Figure 7. On-Resistance vs. Junction Temperature

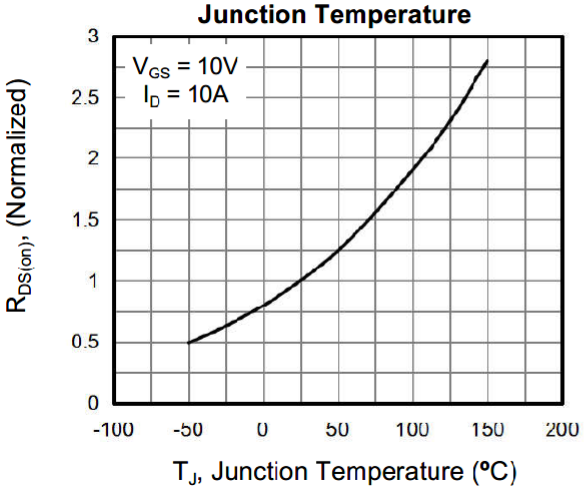


Figure 8. Threshold Voltage vs. Junction Temperature

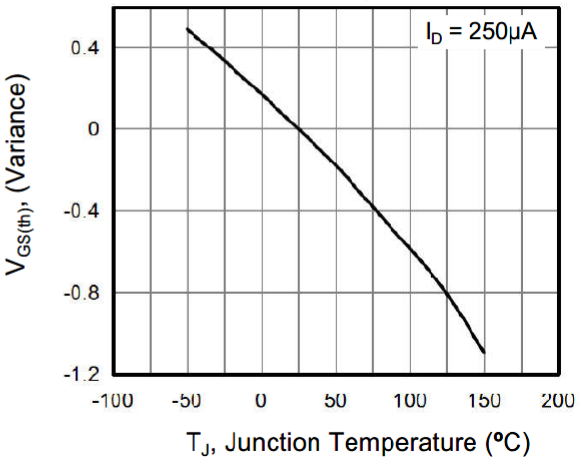


Figure 9. Transient Thermal Impedance TO-220/TO-3PN/TO-247

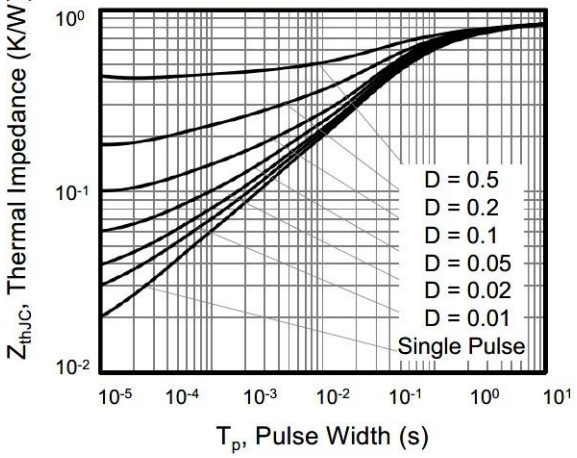
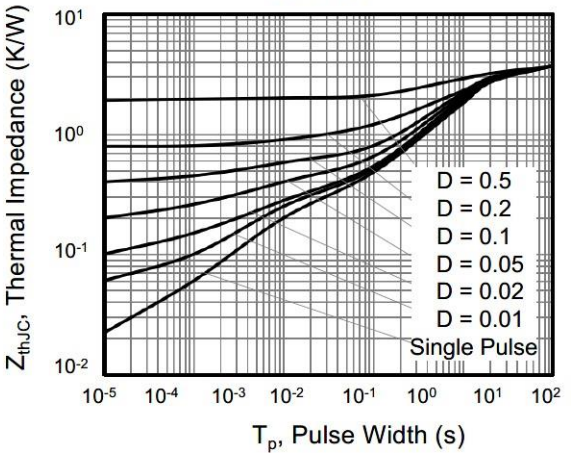
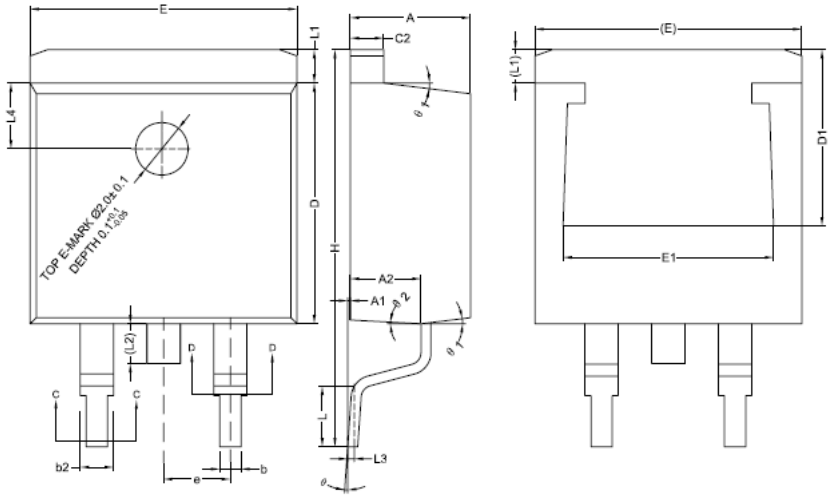


Figure 10. Transient Thermal Impedance TO-220F



PACKAGE DIMENSIONS

TO−263 3−LEAD



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	4.40	4.57	4.70
A1	0	0.10	0.25
A2	2.59	2.69	2.79
b	0.77	-	0.90
b1	0.76	0.81	0.86
b2	1.23	-	1.36
b3	1.22	1.27	1.32
c	0.34	-	0.47
c1	0.33	0.38	0.43
c2	1.22	-	1.32
D	9.05	9.15	9.25
D1	6.60	-	-
E	10.06	10.16	10.26
E1	7.80	-	8.20
e	2.54BSC		
H	14.70	15.10	15.50
L	2.00	2.30	2.60
L1	1.17	1.27	1.40
L2	-	-	1.75
L3	0.25BSC		
L4	2.00REF		
θ	0°	-	8°
θ1	5°	7°	9°
θ2	1°	3°	5°

Note：
Dimension and tolerance per ASME 14.5M,1994.
Controlling dimension: Millimeters

Disclaimer

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

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