



# JCS80N10I

## 主要参数 MAIN CHARACTERISTICS

$I_D$	80A
$V_{DSS}$	100V
$R_{dson-typ}$ (@ $V_{gs}=10V$ )	9.5m $\Omega$
$Q_g-typ$	70nC

### 用途

- 高功率 DC/DC 转换与功率开关
- 直流电机控制
- 汽车应用
- 不间断电源

### 产品特性

- 低栅极电荷
- 低  $R_{dson}$
- 开关速度快
- 产品全部经过雪崩测试
- 高抗  $dv/dt$  能力
- RoHS 产品

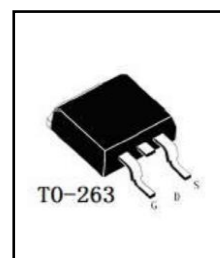
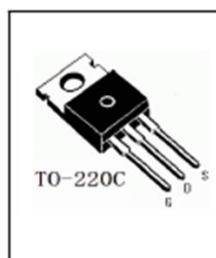
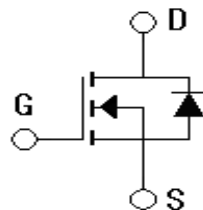
### APPLICATIONS

- High power DC/DC converters and switch mode power supplies
- DC motor control
- Automotive applications
- Uninterruptible power supply

### FEATURES

- Low gate charge
- Low  $R_{dson}$
- Fast switching
- 100% avalanche tested
- Improved  $dv/dt$  capability
- RoHS product

## 封装 Package



## 订货信息 ORDER MESSAGE

订货型号 Order codes				印 记 Marking	封 装 Package
有卤-条管 Halogen-Tube	无卤-条管 Halogen-Free-Tube	有卤-编带 Halogen-Reel	无卤-编带 Halogen-Free-Reel		
JCS80N10I-C-B	JCS80N10I-C-BR	N/A	N/A	JCS80N10	TO-220C
JCS80N10I-S-B	JCS80N10I-S-BR	JCS80N10I-S-A	JCS80N10I-S-AR	JCS80N10	TO-263



绝对最大额定值 ABSOLUTE RATINGS ( $T_c=25^\circ\text{C}$ )

项 目 Parameter	符 号 Symbol	数 值 Value	单 位 Unit
		JCS80N10I	
最高漏极-源极直流电压 Drain-Source Voltage	$V_{DSS}$	100	V
连续漏极电流 Drain Current -continuous	$I_D$ $T=25^\circ\text{C}$	80*	A
	$I_D$ $T=100^\circ\text{C}$	64*	A
最大脉冲漏极电流 (注1) Drain Current - pulse (note 1)	$I_{DM}$	320*	A
最高栅源电压 Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
单脉冲雪崩能量 (注2) Single Pulsed Avalanche Energy (note 2)	$E_{AS}$	506	mJ
雪崩电流 (注1) Avalanche Current (note 1)	$I_{AS}$	45	A
重复雪崩能量 (注1) Repetitive Avalanche Current (note 1)	$E_{AR}$	300	mJ
二极管反向恢复最大电压变化 速率 (注3) Peak Diode Recovery dv/dt (note 3)	dv/dt	13	V/ns
耗散功率 Power Dissipation	$P_D$ $T_c=25^\circ\text{C}$ -Derate above $25^\circ\text{C}$	208	W
		1.67	W/ $^\circ\text{C}$
最高结温及存储温度 Operating and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	$T_L$	300	$^\circ\text{C}$

\*漏极电流由最高结温限制

\*Drain current limited by maximum junction temperature





## 电特性 ELECTRICAL CHARACTERISTICS

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单 位 Units
<b>关态特性 Off –Characteristics</b>						
漏—源击穿电压 Drain-Source Voltage	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	100	-	-	V
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V,$ $T_C=25^\circ C$	-	-	1	$\mu A$
		$V_{DS}=100V, V_{GS}=0V,$ $T_C=100^\circ C$	-	-	20	$\mu A$
正向栅极体漏电流 Gate-body leakage current, forward	$I_{GSSF}$	$V_{DS}=0V, V_{GS}=20V$	-	-	100	nA
反向栅极体漏电流 Gate-body leakage current, reverse	$I_{GSSR}$	$V_{DS}=0V, V_{GS}=-20V$	-	-	-100	nA
<b>通态特性 On-Characteristics</b>						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=40A$	-	9.5	13.0	m $\Omega$
正向跨导 Forward Transconductance	$g_{fs}$	$V_{DS} = 35V, I_D=20A$ (note 4)	-	30	-	S
<b>动态特性 Dynamic Characteristics</b>						
输入电容 Input capacitance	$C_{iss}$	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	4000	-	pF
输出电容 Output capacitance	$C_{oss}$		-	440	-	pF
反向传输电容 Reverse transfer capacitance	$C_{rss}$		-	200	-	pF





## 电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics					
延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{DD}=40V, I_D=50A, R_G=5\Omega$ (note 4, 5)	-	39	- ns
上升时间 Turn-On rise time	$t_r$		-	86	- ns
延迟时间 Turn-Off delay time	$t_{d(off)}$		-	141	- ns
下降时间 Turn-Off Fall time	$t_f$		-	82	- ns
栅极电荷总量 Total Gate Charge	$Q_g$	$V_{DS}=50V,$ $I_D=50A$ $V_{GS}=10V$ (note 4, 5)	-	70	- nC
栅-源电荷 Gate-Source charge	$Q_{gs}$		-	21	- nC
栅-漏电荷 Gate-Drain charge	$Q_{gd}$		-	26	- nC
漏-源二极管特性及最大额定值 Drain-Source Diode Characteristics and Maximum Ratings					
正向最大连续电流 Maximum Continuous Drain-Source Diode Forward Current		$I_S$	-	-	80 A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		$I_{SM}$	-	-	320 A
正向压降 Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V,$ $I_S=40A$	-	-	1.2 V
反向恢复时间 Reverse recovery time	$t_{rr}$	$V_{GS}=0V, I_S=40A$ $di_F/dt=100A/\mu s$ (note 4)	-	32	- ns
反向恢复电荷 Reverse recovery charge	$Q_{rr}$		-	42	- nC

## 热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大 Max	单 位 Unit
		JCS80N10I	
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.60	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	$^{\circ}C/W$

注释:

- 1: 脉冲宽度由最高结温限制
- 2:  $L=0.5mH, I_{AS}=45A, V_{DD}=64V, R_G=25\Omega$ , 起始结温  $T_J=25^{\circ}C$
- 3:  $I_{SD} \leq 80A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$ , 起始结温  $T_J=25^{\circ}C$
- 4: 脉冲测试: 脉冲宽度  $\leq 300\mu s$ , 占空比  $\leq 2\%$
- 5: 基本与工作温度无关

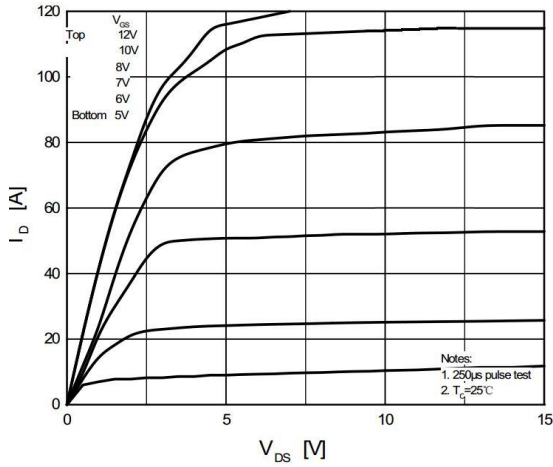
Notes:

- 1: Pulse width limited by maximum junction temperature
- 2:  $L=0.5mH, I_{AS}=45A, V_{DD}=64V, R_G=25\Omega$ , Starting  $T_J=25^{\circ}C$
- 3:  $I_{SD} \leq 80A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$ , Starting  $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$
- 5: Essentially independent of operating temperature

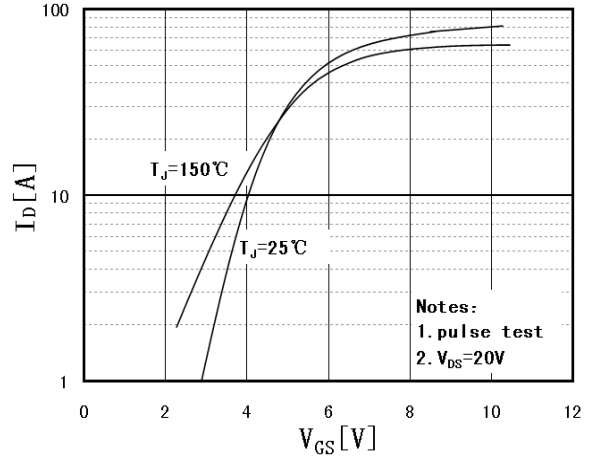


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

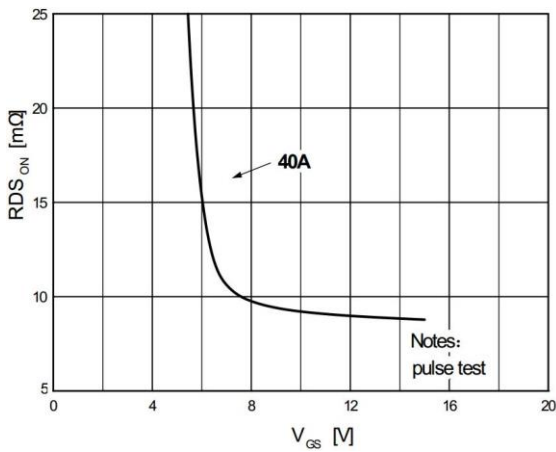
**On-Region Characteristics**



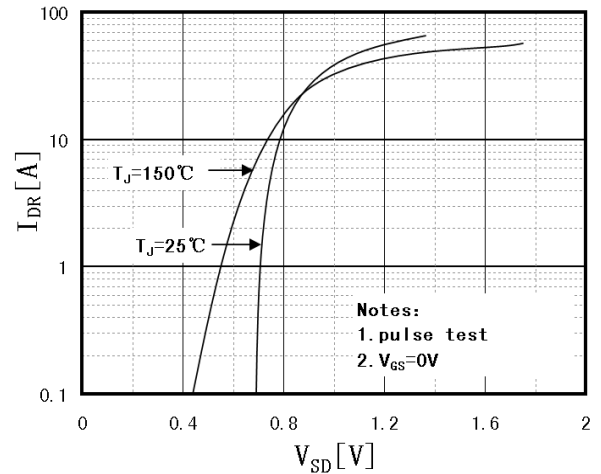
**Transfer Characteristics**



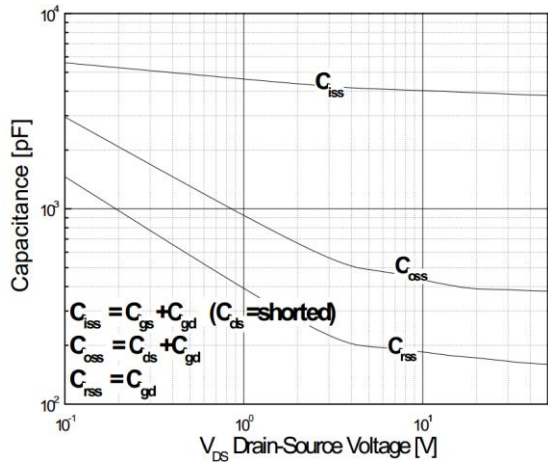
**On-Resistance Variation vs. Drain Current and Gate Voltage**



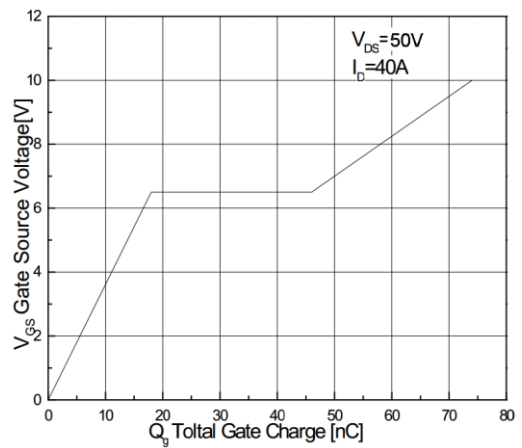
**Body Diode Forward Voltage Variation vs. Source Current and Temperature**



**Capacitance Characteristics**



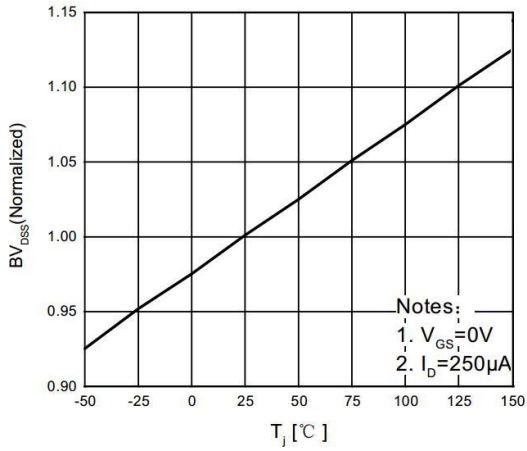
**Gate Charge Characteristics**



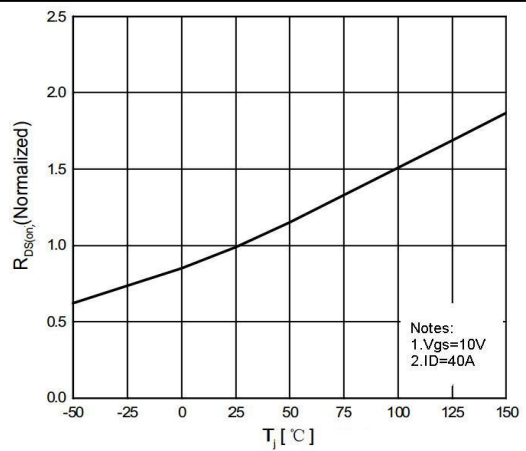


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

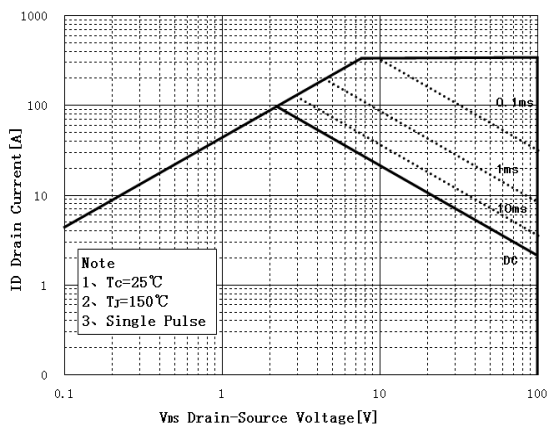
Breakdown Voltage Variation vs. Tj



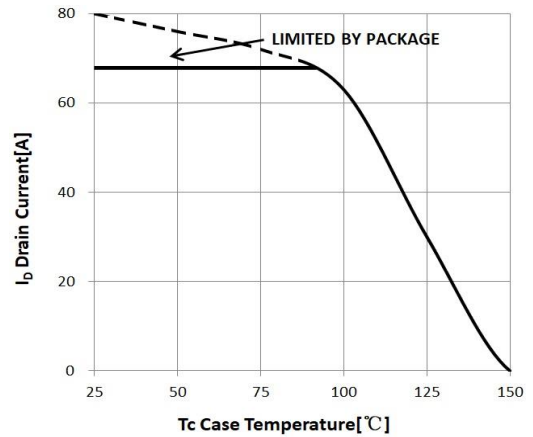
On-Resistance Variation vs. Tj



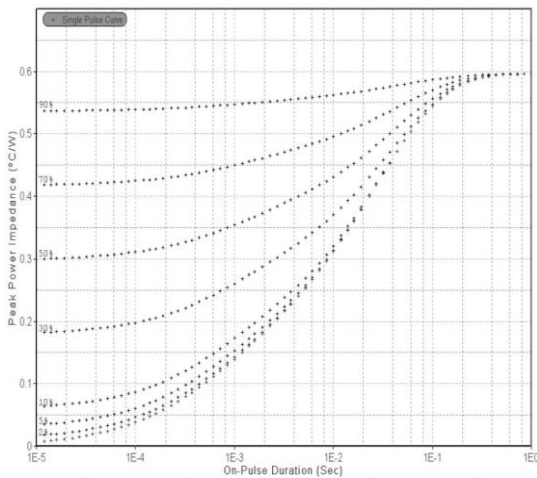
Maximum Safe Operating Area



Maximum Drain Current vs. Case Temperature



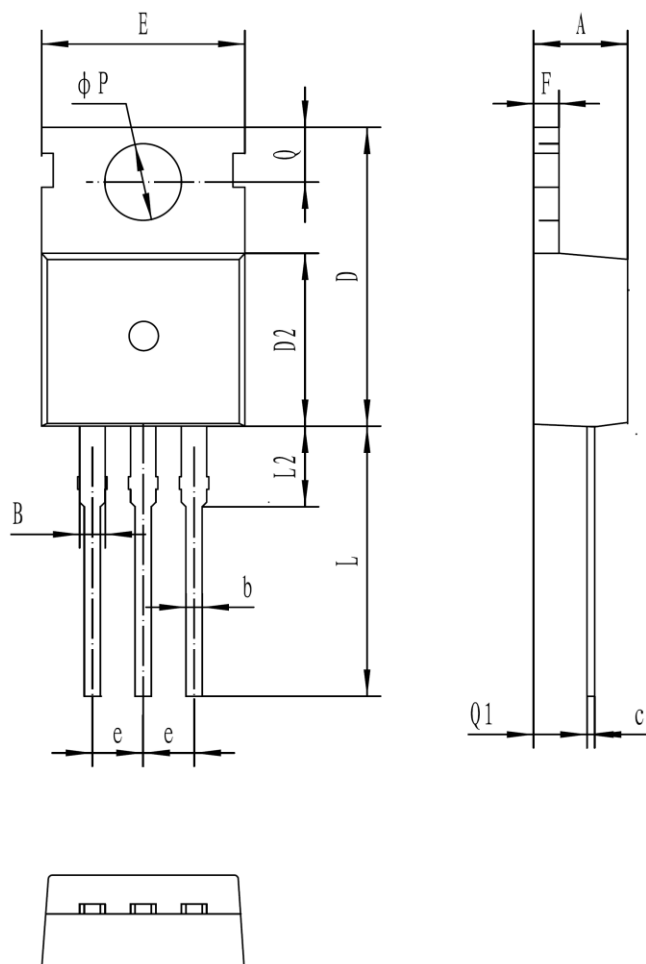
Transient Thermal Response Curve





TO-220C

单位 Unit: mm

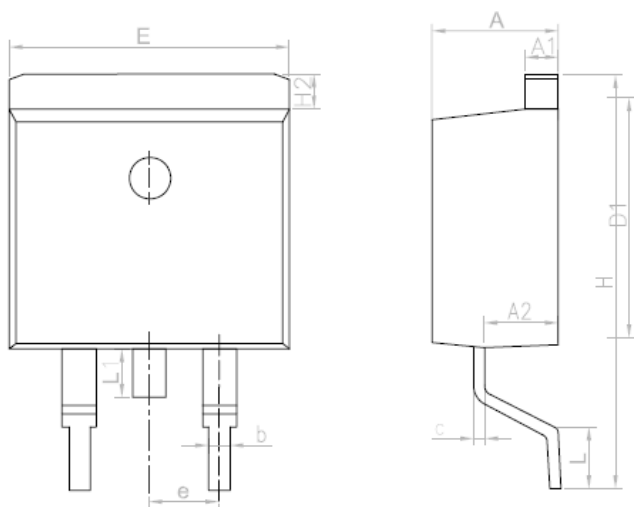


符号 symbol	MIN	MAX
A	4.30	4.70
B	1.10	1.40
b	0.70	0.95
c	0.40	0.65
D	15.20	16.20
D2	9.00	9.40
E	9.70	10.10
e	2.39	2.69
F	1.25	1.40
L	12.60	13.60
L2	2.80	3.20
Q	2.60	3.00
Q1	2.20	2.60
P	3.50	3.80



TO-263

单位 Unit: mm



SYMBOL	MM	
	MIN	MAX
A	4.30	4.80
A1	1.12	1.42
A2	2.54	2.84
b	0.67	1.00
c	0.29	0.52
D1	8.40	9.00
E	9.80	10.46
e	2.54BSC	
H	14.00	16.00
H2	1.12	1.45
L	1.50	3.10
L1	1.45	1.70





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### 联系方式

#### 吉林华微电子股份有限公司

公司地址：吉林省吉林市深圳街 99 号

邮编：132013

总机：86-432-64678411

传真：86-432-64665812

网址：[www.hwdz.com.cn](http://www.hwdz.com.cn)

### CONTACT

#### JILIN SINO-MICROELECTRONICS CO., LTD.

ADD: No.99 Shenzhen Street, Jilin City, Jilin Province, China.

Post Code: 132013

Tel: 86-432-64678411

Fax: 86-432-64665812

Web Site: [www.hwdz.com.cn](http://www.hwdz.com.cn)