



# JCS80N70F

## 主要参数 MAIN CHARACTERISTICS

$I_D$	85 A
$V_{DSS}$	70 V
$R_{dson-max}$ (@ $V_{GS}=10V$ )	8.5 m $\Omega$
$Q_g-typ$	76 nC

### 产品用途

- 用于高功率 DC/DC 转换和功率开关
- 直流电机控制和 D 类放大器

### APPLICATIONS

- High power DC/DC converters and switch mode power supply
- DC Motor control and Class D Amplifier

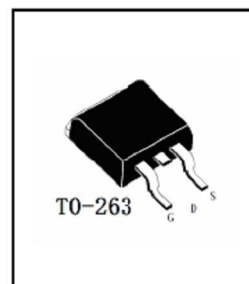
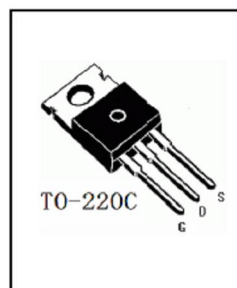
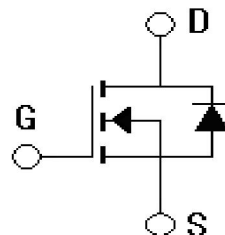
### 产品特性

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

### FEATURES

- Low gate charge
- Low  $C_{RSS}$
- 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	无卤素 Halogen Free	包装 Packaging	器件重量 Device Weight
JCS80N70CF-O-C-N-B	JCS80N70CF	TO-220C	否 NO	条管 Tube	2.06g(typ)
JCS80N70SF-O-S-N-A	JCS80N70SF	TO-263	否 NO	卷盘 Reel	1.93 g(typ)
JCS80N70SF-O-S-N-B	JCS80N70SF	TO-263	否 NO	条管 Tube	1.93 g(typ)





## 绝对最大额定值 ABSOLUTE RATINGS (Tc=25°C)

项 目 Parameter	符 号 Symbol	数 值 Value	单 位
		JCS80N70CF/SF	Unit
最高漏极-源极直流电压 Drain-Source Voltage	V <sub>DSS</sub>	70	V
连续漏极电流 Drain Current-continuous	I <sub>D</sub> T=25°C T=100°C	85	A
		68	A
最大脉冲漏极电流 (注1) Drain Current – pulse (note 1)	I <sub>DM</sub>	340	A
最高栅源电压 Gate-Source Voltage	V <sub>GSS</sub>	±20	V
单脉冲雪崩能量 (注2) Single Pulsed Avalanche Energy (note 2)	E <sub>AS</sub>	975	mJ
雪崩电流 (注1) Avalanche Current(note 1)	I <sub>AR</sub>	85	A
重复雪崩能量 (注1) Repetitive Avalanche Energy (note 1)	E <sub>AR</sub>	25	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 <sub>D</sub> T <sub>C</sub> =25°C -Derate above 25°C	250	W
		1.67	W/°C
最高结温及存储温度 Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55~+175	°C
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T <sub>L</sub>	300	°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	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	70	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=1mA$ , referenced to $25^\circ C$	-	0.08	-	$V/^\circ C$
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=70V, V_{GS}=0V, T_C=25^\circ C$	-	-	1	$\mu A$
		$V_{DS}=56V, T_C=125^\circ C$	-	-	10	$\mu A$
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	$R_{DS(ON)}$	$V_{GS} = 10V, I_D=40A$	-	7.4	8.5	m $\Omega$
栅极电阻 Gate Resistance	$R_G$	$f=1.0MHz, \text{ open drain}$	-	3.5	-	$\Omega$
正向跨导 Forward Transconductance	$g_{fs}$	$V_{DS} = 35V, I_D=40A$ (note 4)	-	68	-	S
<b>动态特性 Dynamic Characteristics</b>						
输入电容 Input capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	-	4400	-	pF
输出电容 Output capacitance	$C_{oss}$		-	480	-	pF
反向传输电容 Reverse transfer capacitance	$C_{rss}$		-	240	-	pF





## 电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics					
延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{DD}=35V, I_D=40A, R_G=25\Omega$ $V_{GS}=10V$ (note 4, 5)	-	18	ns
上升时间 Turn-On rise time	$t_r$		-	54	ns
延迟时间 Turn-Off delay time	$t_{d(off)}$		-	55	ns
下降时间 Turn-Off Fall time	$t_f$		-	35	ns
栅极电荷总量 Total Gate Charge	$Q_g$	$V_{DS}=56V,$ $I_D=40A$ $V_{GS}=10V$ (note 4, 5)	-	76	nC
栅-源电荷 Gate-Source charge	$Q_{gs}$		-	18	nC
栅-漏电荷 Gate-Drain charge	$Q_{gd}$		-	25	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		$I_S$	-	-	85 A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		$I_{SM}$	-	-	340 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)	-	58	ns
反向恢复电荷 Reverse recovery charge	$Q_{rr-}$		-	183	nC

## 热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大 Max	单 位 Unit
		JCS80N70CF/SF	
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:  $L=0.27mH, I_{AS}=85A, R_G=25\Omega$ , 起始结温  $T_J=25^{\circ}C$
- 3:  $I_{SD} \leq 85A, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}$ , 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:

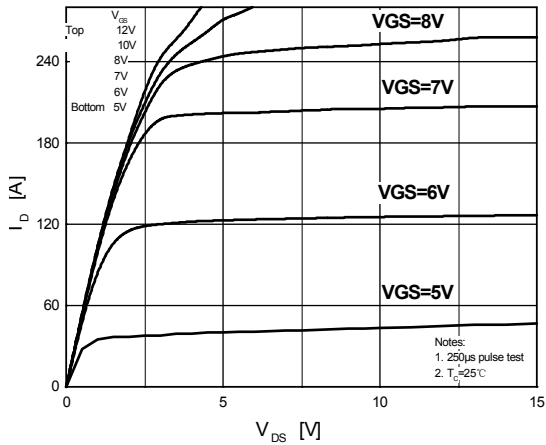
- 1: Pulse width limited by maximum junction temperature
- 2:  $L=0.27mH, I_{AS}=85A, R_G=25\Omega$ , Starting  $T_J=25^{\circ}C$
- 3:  $I_{SD} \leq 85A, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}$ , Starting  $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycles  $\leq 2\%$
- 5: Essentially independent of operating temperature



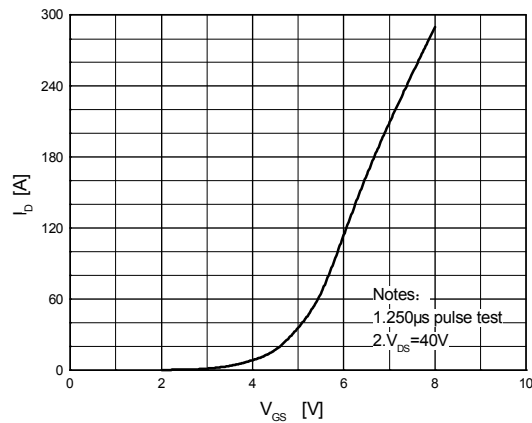


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

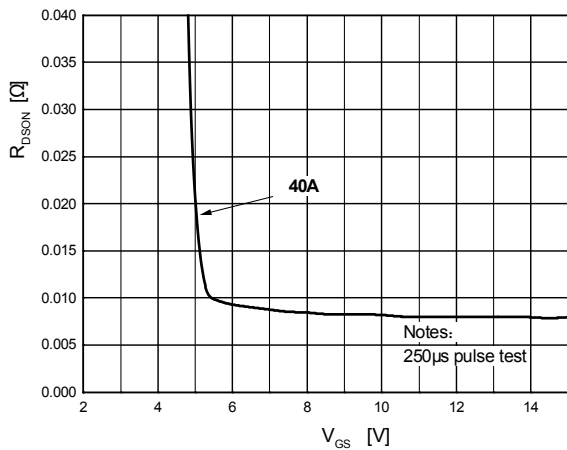
On-Region Characteristics



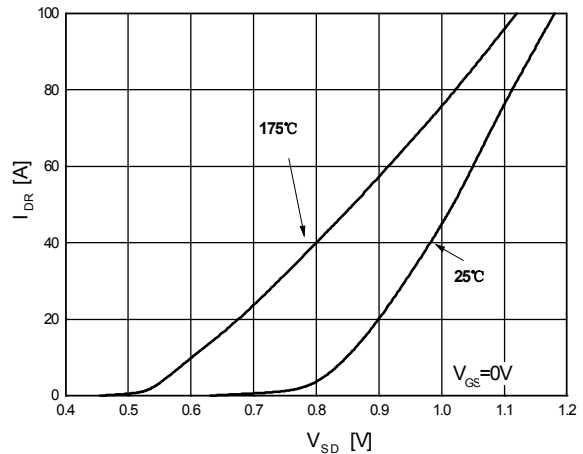
Transfer Characteristics



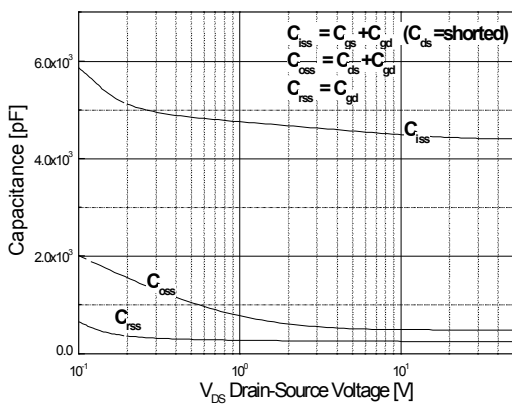
On-Resistance Variation vs. Drain Current and Gate Voltage



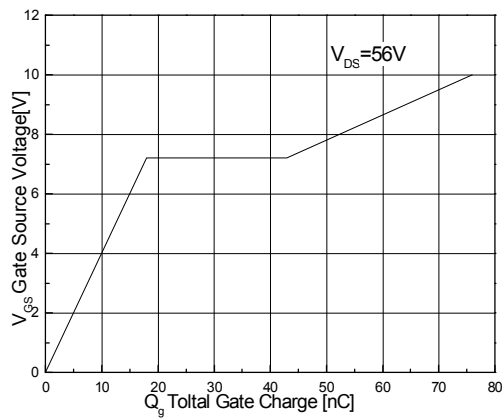
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitance Characteristics



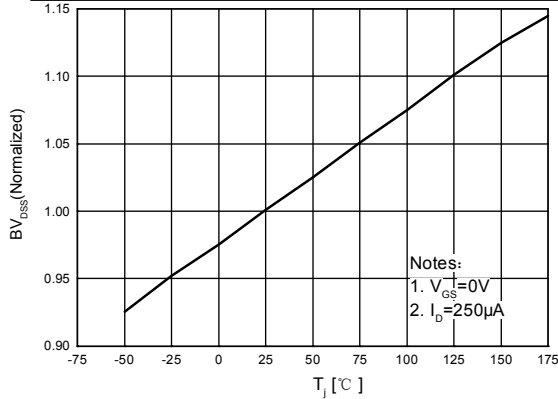
Gate Charge Characteristics



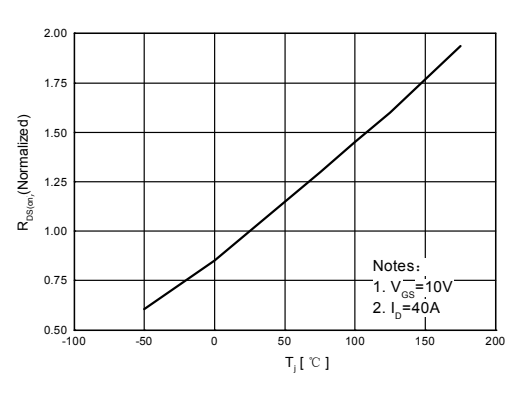


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

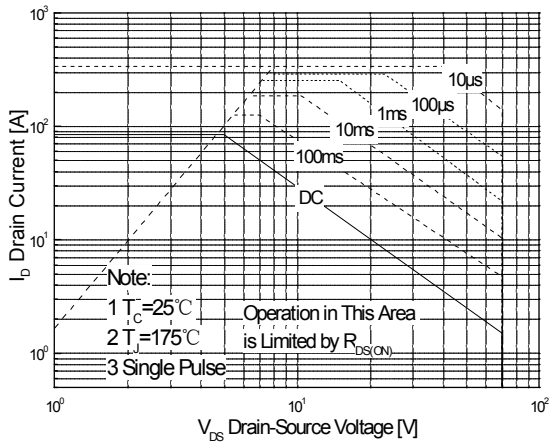
**Breakdown Voltage Variation vs. Temperature**



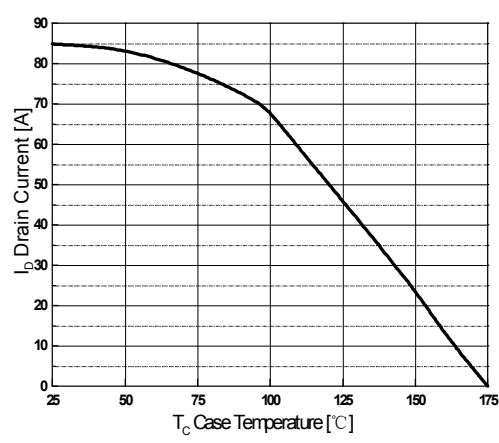
**On-Resistance Variation vs. Temperature**



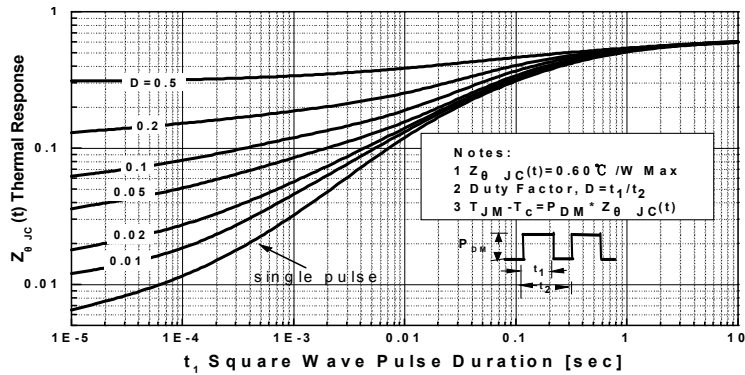
**Maximum Safe Operating Area For JCS80N70CF/SF**



**Maximum Drain Current vs. Case Temperature**



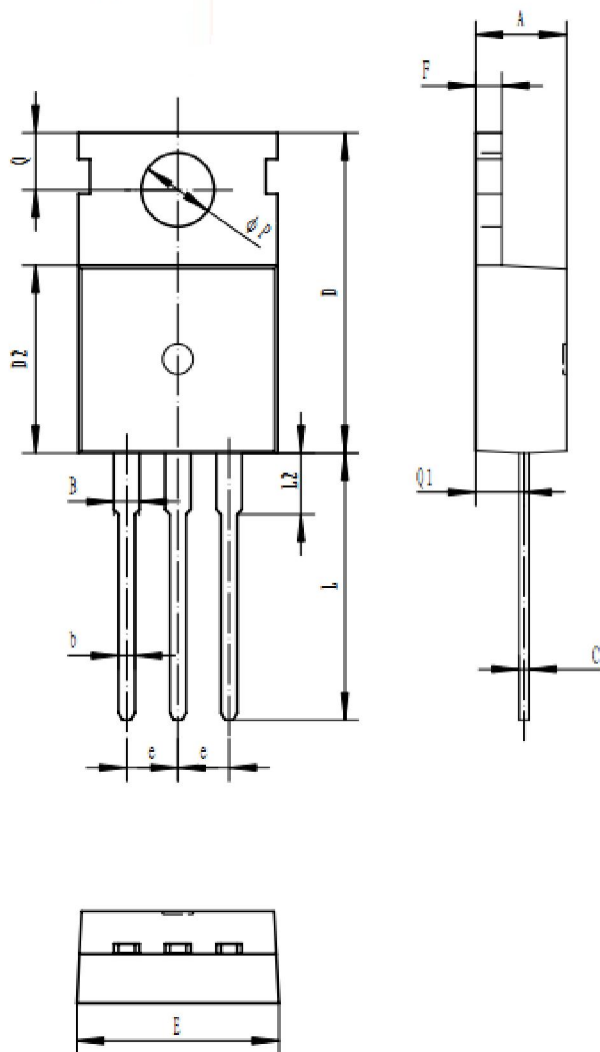
**Transient Thermal Response Curve**





TO-220C

单位 Unit: mm



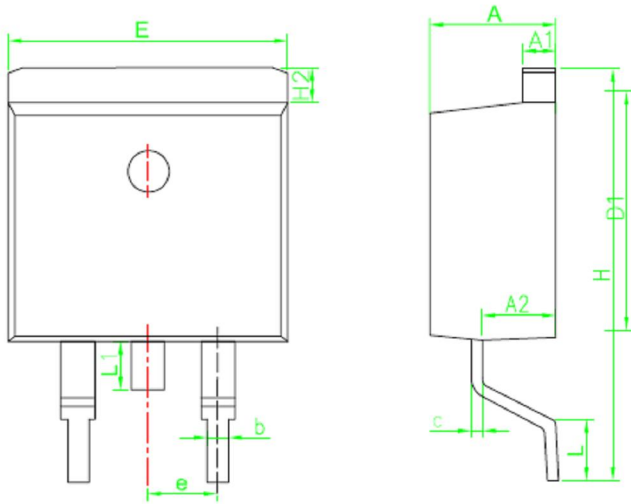
符号 symbol	MIN	MAX
A	4.30	4.70
B	1.22	1.40
b	0.70	0.95
c	0.40	0.65
D	15.20	16.20
D2	9.00	9.40
E	9.70	10.10
e	2.39	2.69
F	1.25	1.40
L	12.60	13.60
L2	2.80	3.20
Q	2.60	3.00
Q1	2.20	2.60
P	3.50	3.80





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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