



JCS12N65FC

主要参数 MAIN CHARACTERISTICS

ID	12 A
VDSS	650 V
Rdson (@Vgs=10V)	0.52 Ω
Qg	30 nC

用途

- 高频开关电源
- 电子镇流器
- UPS 电源

产品特性

- 低栅极电荷
- 低 Crss (典型值 5pF)
- 开关速度快
- 产品全部经过雪崩测试
- RoHS 产品

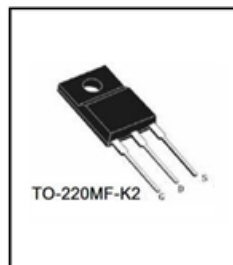
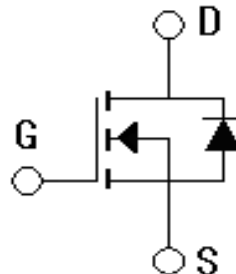
APPLICATIONS

- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- UPS

FEATURES

- Low gate charge
- Low Crss (typical 5pF)
- Fast switching
- 100% avalanche tested
- 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
JCS12N65FC-O-F2-N-B	JCS12N65F	TO-220MF-K2	否 NO	条管 Tube	2.20 g(typ)



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
		JCS12N65FC	
最高漏极—源极直流电压 Drain-Source Voltage	V_{DSS}	650	V
连续漏极电流 Drain Current -continuous	I_D $T=25^\circ\text{C}$ $T=100^\circ\text{C}$	12*	A
		7.6*	A
最大脉冲漏极电流 (注 1) Drain Current -pulse (note 1)	I_{DM}	48*	A
最高栅源电压 Gate-Source Voltage	V_{GSS}	± 30	V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	E_{AS}	880	mJ
雪崩电流 (注 1) Avalanche Current (note 1)	I_{AR}	12.0	A
重复雪崩能量 (注 1) Repetitive Avalanche Current (note 1)	E_{AR}	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	5	V/ns
耗散功率 Power Dissipation	P_D $T_C=25^\circ\text{C}$ -Derate above 25°C	50	W
		0.4	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 CHARACTERISTIC

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单 位 Units
关态特性 Off –Characteristics						
漏—源击穿电压 Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	650	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	$I_D=250\mu A$, referenced to $25^\circ C$	-	0.68	-	V/ $^\circ C$
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V, T_C=25^\circ C$	-	-	10	μA
		$V_{DS}=520V, T_C=125^\circ C$	-	-	100	μA
正向栅极体漏电流 Gate-body leakage current, forward	I_{GSSF}	$V_{DS}=0V, V_{GS}=30V$	-	-	100	nA
反向栅极体漏电流 Gate-body leakage current, reverse	I_{GSSR}	$V_{DS}=0V, V_{GS}=-30V$	-	-	-100	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	2	3.0	4	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D=6.0A$	-	0.52	0.62	Ω
正向跨导 Forward Transconductance	g_{fs}	$V_{DS} = 40V, I_D=6.0A$ (note 4)	-	7.3	-	S
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{iss}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	1750	-	pF
输出电容 Output capacitance	C_{oss}		-	185	-	pF
反向传输电容 Reverse transfer capacitance	C_{rss}		-	5	-	pF





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
开关特性 Switching –Characteristics						
延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{DD}=325V, I_D=12A, R_G=25\Omega,$ $V_{GS}=10V$ (note 4, 5)	-	37.1	48.5	ns
上升时间 Turn-On rise time	t_r		-	69.6	90.5	ns
延迟时间 Turn-Off delay time	$t_{d(off)}$		-	75.2	99.1	ns
下降时间 Turn-Off Fall time	t_f		-	49.6	67.2	ns
栅极电荷总量 Total Gate Charge	Q_g	$V_{DS}=480V,$ $I_D=12A$ $V_{GS}=10V$ (note 4, 5)	-	33.1	48.3	nC
栅—源电荷 Gate-Source charge	Q_{gs}		-	9.17		nC
栅—漏电荷 Gate-Drain charge	Q_{gd}		-	11		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	-	-	12	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	48	A
正向最大连续电流 Maximum Continuous Drain-Source Diode Forward Current	V_{SD}	$V_{GS}=0V, I_S=12A$	-	-	1.39	V
反向恢复时间 Reverse recovery time	t_{rr}	$V_{GS}=0V, I_S=12A$ $di_F/dt=100A/\mu s$ (note 4)	-	427	-	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	3.5	-	μC

热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大值 Value	单 位 Unit
		JCS12N65FC	
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	2.5	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	$^{\circ}C/W$

注:

- 1: 脉冲宽度由最高结温限制
- 2: $L=11.8mH, I_{AS}=12A, V_{DD}=50V, R_G=25\Omega$, 起始结温 $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 12A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, 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:

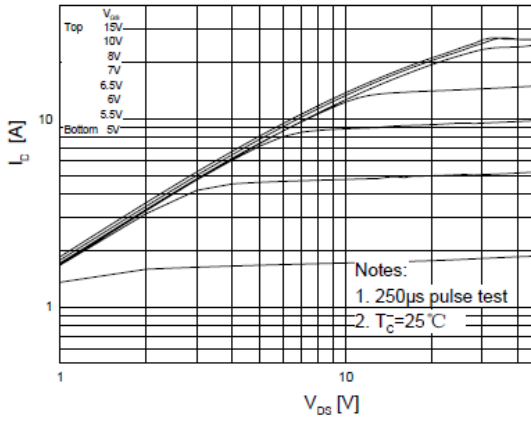
- 1: Pulse width limited by maximum junction temperature
- 2: $L=11.8mH, I_{AS}=12A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 12A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 5: Essentially independent of operating temperature



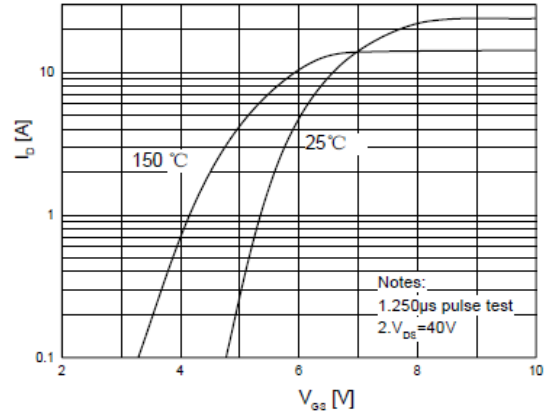


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

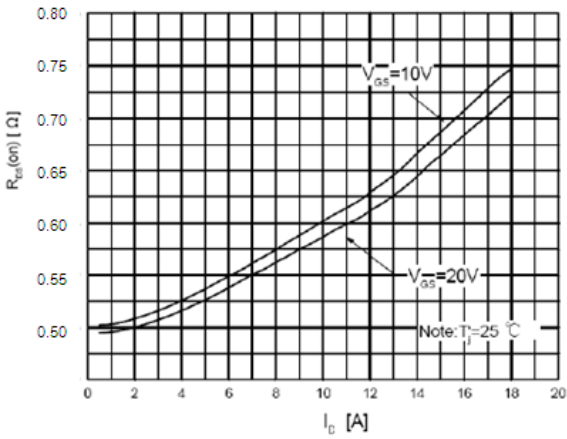
On-Region Characteristics



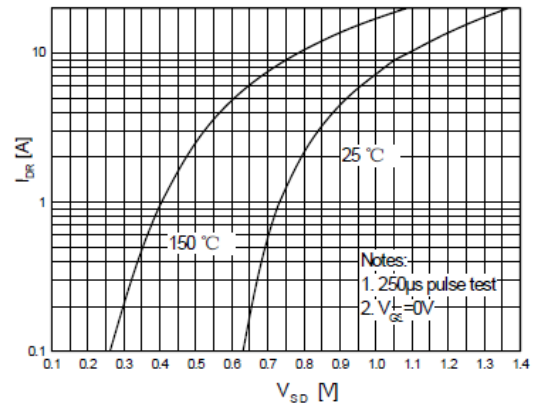
Transfer Characteristics



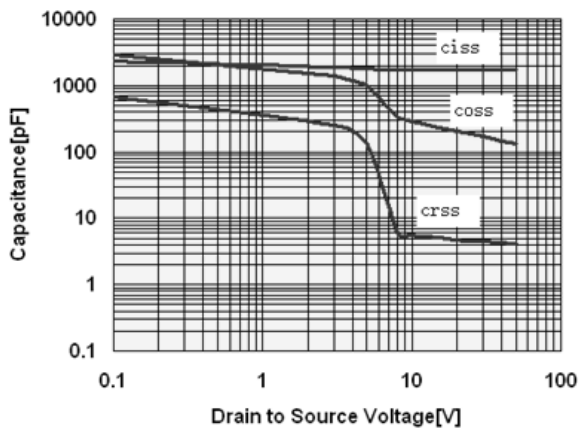
On-Resistance Variation vs Drain Current



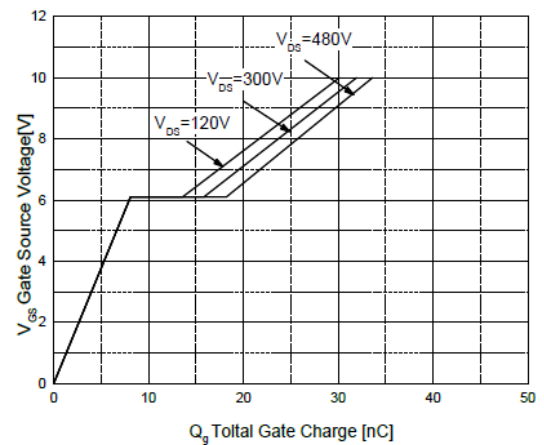
Body Diode Forward Voltage Variation



Capacitance Characteristics

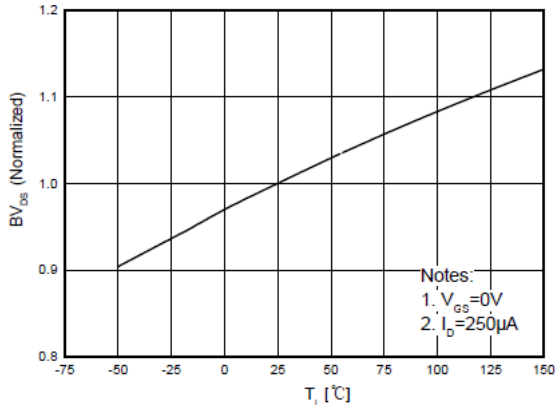


Gate Charge Characteristics

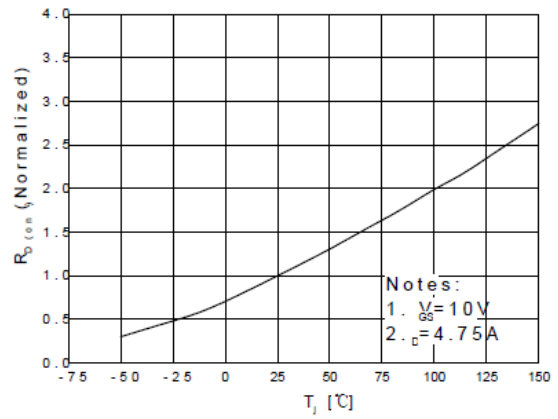




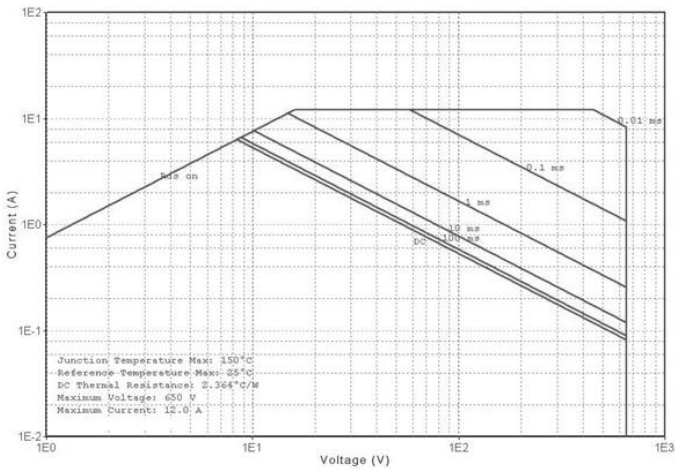
Breakdown Voltage Variation vs. Temperature



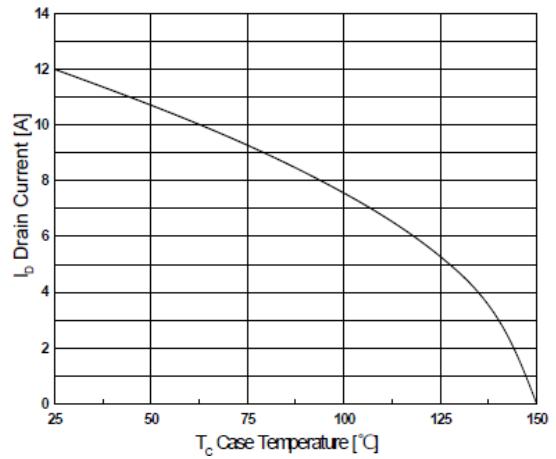
On-Resistance Variation vs. Temperature



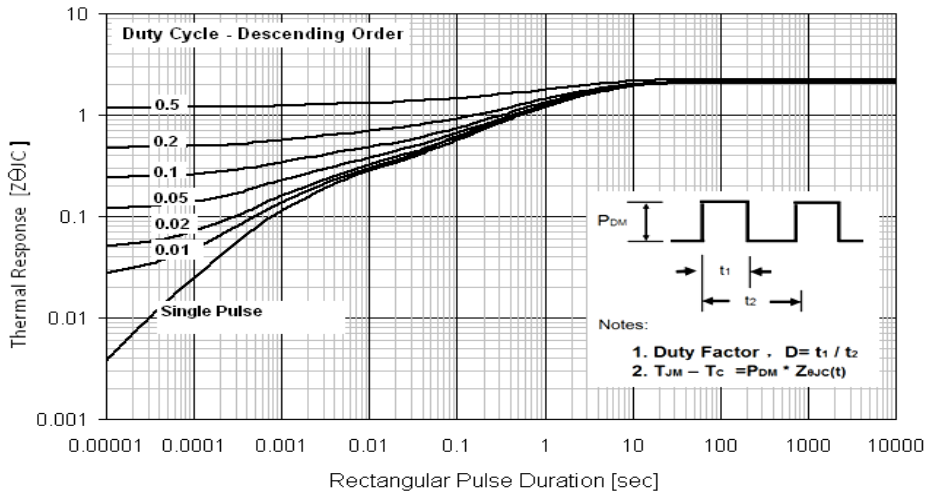
Maximum Safe Operating Area



Maximum Drain Current vs. Case Temperature



Transient Thermal Response Curve

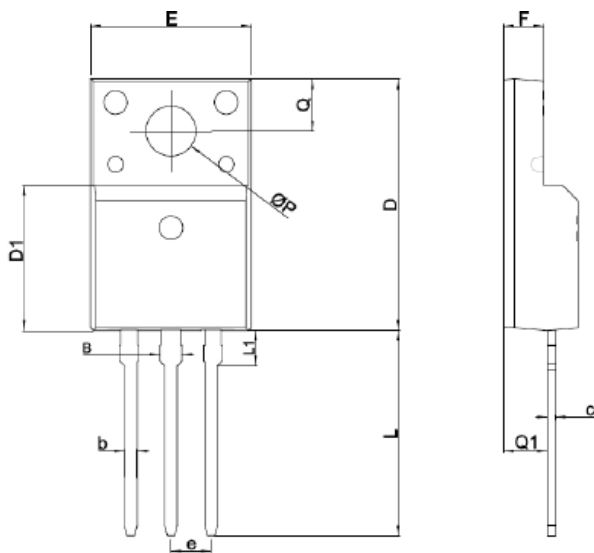




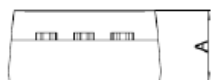
外形尺寸 PACKAGE MECHANICAL DATA

TO-220MF-K2

单位 Unit : mm



SYMBOL	mm	
	MIN	MAX
A	4.5	4.9
B		1.27
b	0.59	0.79
c	0.45	0.60
D	15.67	16.07
D1	8.97	9.37
e	2.54TYPE	
E	9.96	10.36
F	2.34	2.74
L	12.65	13.35
L1	1.80	2.20
Q	3.2	3.4
Q1	2.56	2.96
ΦP	3.08	3.28





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