

N-沟道功率 MOS 管/ N-CHANNEL POWER MOSFET

SIF20N50F

●特点：热阻低 开关速度快 输入阻抗高 符合RoHS规范

●FEATURES: ■LOW THERMAL RESISTANCE ■FAST SWITCHING ■HIGH INPUT RESISTANCE
■RoHS COMPLIANT

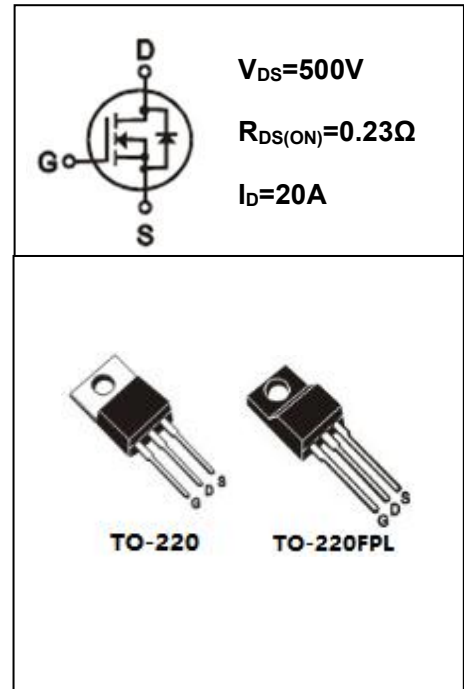
●应用：电子镇流器 电子变压器 开关电源

●APPLICATION: ■ELECTRONIC BALLAST ■ELECTRONIC TRANSFORMER ■SWITCH MODE POWER SUPPLY

●最大额定值 (TC=25°C)

●Absolute Maximum Ratings (Tc=25°C) TO-220FPL

参数 PARAMETER	符号 SYMBOL	额定值 VALUE	单位 UNIT
漏-源电压 Drain-source Voltage	V_{DS}	500	V
栅-源电压 gate-source Voltage	V_{GS}	±30	V
漏极电流 Continuous Drain Current TC=25°C	I_D	20*	A
漏极电流 Continuous Drain Current TC=100°C	I_D	13*	A
最大脉冲电流 Drain Current — Pulsed ①	I_{DM}	80*	A
耗散功率 Power Dissipation	P_D	TO-220:260	W
		TO-220FPL:45	
最高结温 Junction Temperature	T_J	150	°C
存储温度 Storage Temperature	T_{STG}	-55-150	°C
单脉冲雪崩能量 Single Pulse Avalanche Energy②	E_{AS}	1400	mJ



*漏极电流由最高结温限制

*Drain current limited by maximum junction temperature

●电特性 (Tc=25°C)

●Electronic Characteristics (Tc=25°C)

参数 PARAMETER	符号 SYMBOL	测试条件 TEST CONDITION	最小值 MIN	典型值 TYP	最大值 MAX	单位 UNIT
漏-源击穿电压 Drain-source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	500			V
击穿电压温度系数 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A$, Referenced to 25°C		0.6		V/°C
栅极开启电压 Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	3.0		5.0	V
漏-源漏电流 Drain-source Leakage Current	I_{DSS}	$V_{DS}=500V,$ $V_{GS}=0V, T_J=25^\circ C$			1	μA
		$V_{DS}=400V,$ $V_{GS}=0V, T_J=125^\circ C$			10	μA
跨导 Forward Transconductance	g_{fs}	$V_{DS}=15V, I_D=10A$ ③		16		S

● 订单信息/ORDERING INFORMATION:

包装形式/PACKING	订货编码/ORDERING CODE	
	普通塑封料/ Normal Package Material	无卤塑封料/Halogen Free
TO-220FPL 条管装/TUBE PACKING	/	SIF20N50F TO-220FPL-TU-HF
TO-220 条管装/TUBE PACKING	SIF20N50F TO-220-TU	SIF20N50F TO-220-TU-HF

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参数 PARAMETER	符号 SYMBOL	测试条件 TEST CONDITION	最小值 MIN	典型值 TYP	最大值 MAX	单位 UNIT
栅极漏电流 Gate-body Leakage Current ($V_{DS} = 0$)	I_{GSS}	$V_{GS} = \pm 30V$			± 100	nA
漏-源导通电阻 Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 10A$ ③		0.23	0.28	Ω
输入电容 Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 25V$ $F = 1.0MHz$		2410		pF
输出电容 Output Capacitance	C_{oss}			306		
反向传输电容 Reverse transfer Capacitance	C_{rss}			48		
开启延迟 Turn-on Delay Time	$T_d(on)$	$V_{DD} = 250V, I_D = 20.0A$ $R_G = 25\Omega$ ③		28		ns
上升时间 Rise Time	T_r			54		
关断延迟 Turn -Off Delay Time	$T_d(off)$			68		
下降时间 Fall Time	T_f			37		
栅极电荷 Total Gate Charge	Q_g	$I_D = 20A, V_{DS} = 400V$ $V_{GS} = 10V$ ③		51		nC
栅源电荷 Gate-to-Source Charge	Q_{gs}			14		nC
栅漏电荷 Gate-to-Drain Charge	Q_{gd}			20		nC
二极管正向电流 Continuous Diode Forward Current	I_S				20	A
二极管正向压降 Diode Forward Voltage	V_{SD}	$T_j = 25^\circ C, I_S = I_f$ $V_{GS} = 0V$ ③			1.5	V
反向恢复时间 Reverse Recovery Time	t_{rr}	$T_j = 25^\circ C, I_f = 20A$ $di/dt = 100A/\mu s$ ③		520		ns
反向恢复电荷 Reverse Recovery Charge	Q_{rr}			5.2		μC

● 热特性
● Thermal Characteristics

参数 PARAMETER	符号 SYMBOL	最大值 MAX		单位 UNIT
		TO-220	TO-220FPL	
热阻结-壳 Thermal Resistance Junction-case	R_{thJC}	0.48	2.78	$^\circ C/W$
热阻结-环境 Thermal Resistance Junction-ambient	R_{thJA}	62.5	62.5	$^\circ C/W$

注释(Notes):

- ① 脉冲宽度：以最高节温为限制
Repetitive rating: Pulse width limited by maximum junction temperature
- ② Starting $T_j = 25^\circ C, V_{DD} = 50V, L = 7mH, R_G = 25\Omega, I_{AS} = 20A$
- ③ 脉冲测试：脉冲宽度 $\leq 300\mu s$ ，占空比 $\leq 2\%$
Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

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● 特性曲线:

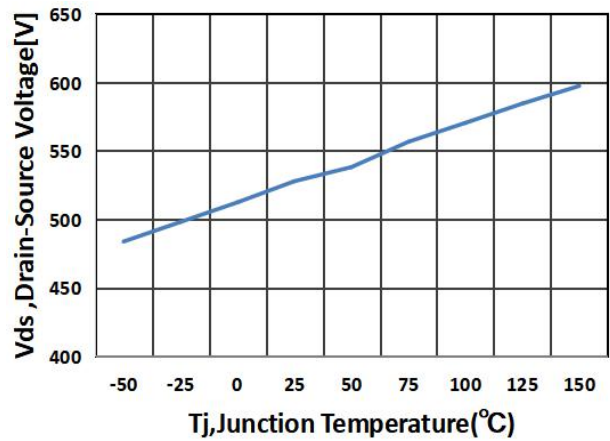
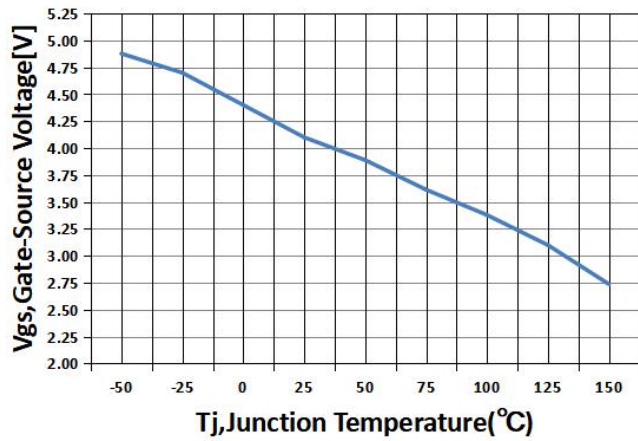
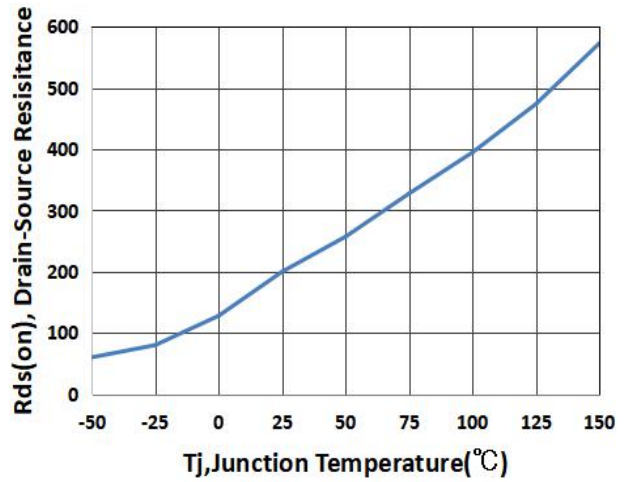
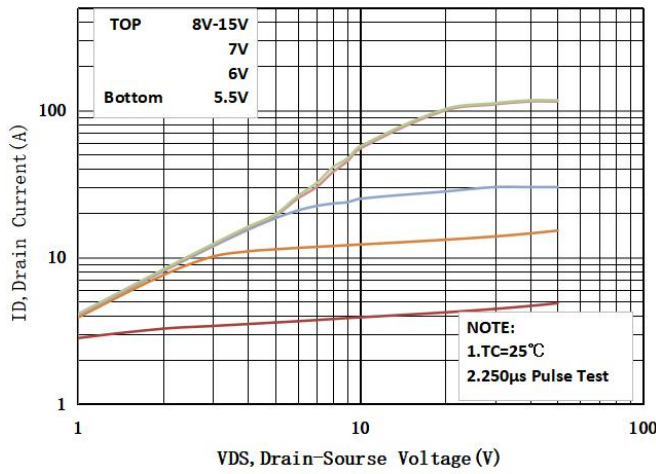


Fig3 Gate Threshold Voltage Variation vs. Temperature

Fig4 Breakdown Voltage Variation

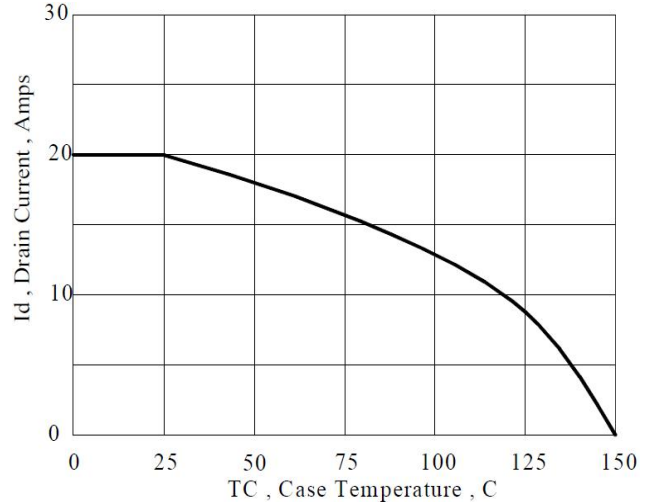
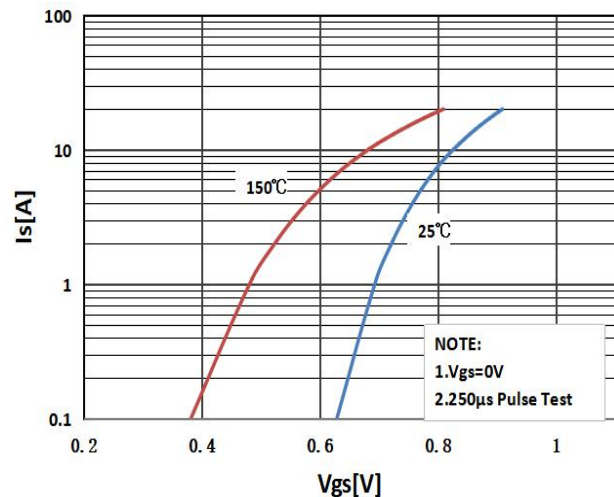


Fig5 Typical Source-Drain Diode Forward Voltage

Fig6 Maximum Drain Current Vs. Case Temperature

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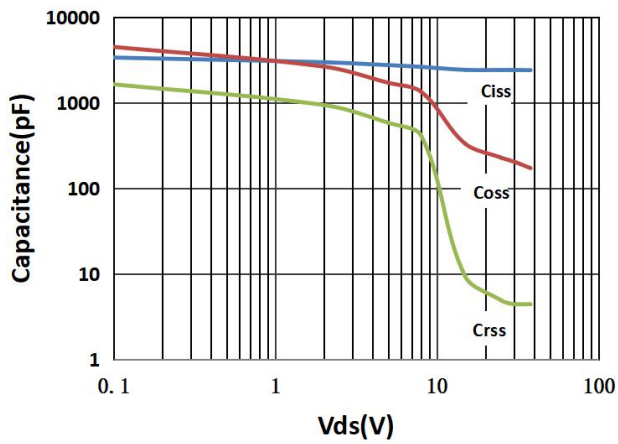


Fig7 Capacitance Characteristics

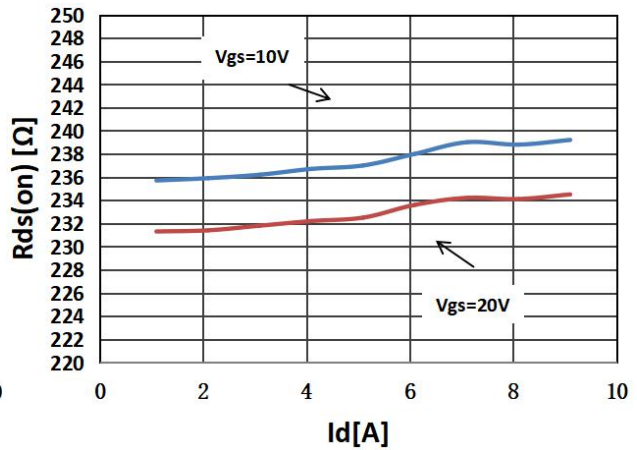


Fig8 On-Resistance Variation VS. Drain Current and Gate Voltage

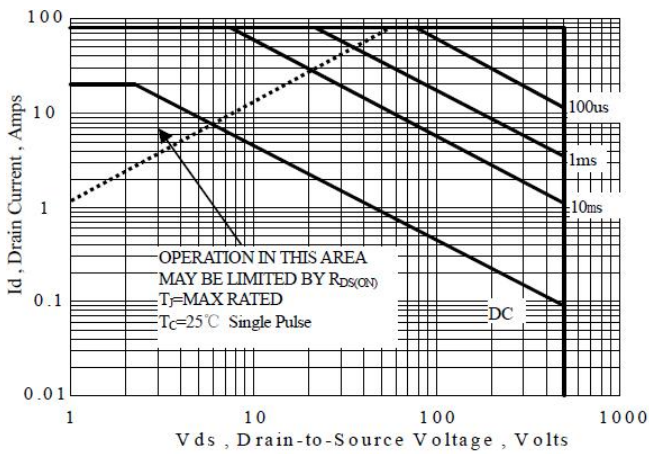


Fig9 Maximum Safe Operating Area (TO-220FPL)

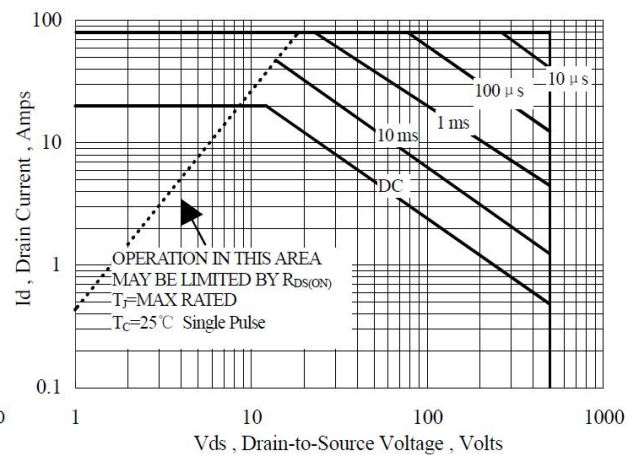
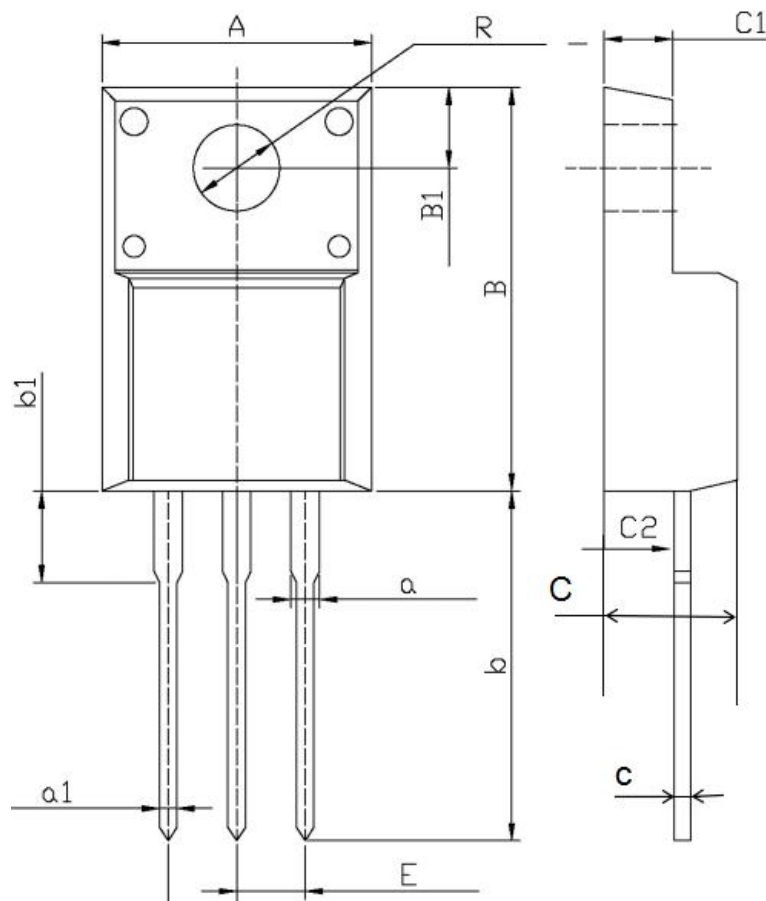


Fig10 Maximum Safe Operating Area (TO-220)

TO-220FPL 封装机械尺寸 TO-220FPL MECHANICAL DATA

单位:毫米/UNIT: mm

符号 SYMBOL	最小值 min	典型值 nom	最大值 max	符号 SYMBOL	最小值 min	典型值 nom	最大值 max
A	9.90		10.36	a	1.08		1.48
B	15.40		16.40	a1	0.70		0.90
B1	3.05		3.55	E	2.34		2.75
C	4.40		5.00	C1	2.25		2.85
c	0.40		0.60	C2	2.45		3.05
b	12.40		13.50	R	2.90		3.35
b1	2.60		3.60				



TO-220 封装机械尺寸 TO-220 MECHANICAL DATA

单位：毫米/UNIT: mm

符号 SYMBOL	最小值 min	典型值 nom	最大值 max	符号 SYMBOL	最小值 min	典型值 nom	最大值 max
A	4.00		4.80	E	9.90		10.70
B	1.20		1.50	e		2.54	
B1	1.00		1.40	F	1.10		1.45
b1	0.65		1.00	L	12.50		14.50
c	0.35		0.75	L1	3.00	3.50	4.00
D	15.00		16.50	Q	2.50		3.00
D1	5.90		6.90	Q1	2.00		3.00
				ϕP	3.60		3.90

