

13N50C

主要参数

Main Characteristics

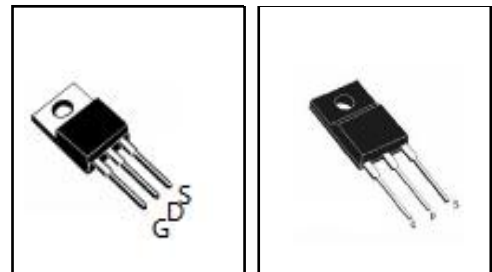
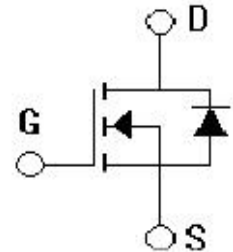
I_D	13A
V_{DS}	500 V
$R_{ds(on)}$ (@ $V_{GS}=10V$)	0.37 Ω

用途

高频开关电源
电子镇流器
UPS 电源

Applications

High efficiency switch mode power supplies
Electronic lamp ballasts
UPS Power



产品特性

低栅极电荷
低 C_{rss} (典型值 25pF)
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} (typical 25pF)
Fast switching
100% avalanche tested
Improved dv/dt capability
RoHS product

产品中有害有毒物质或元素的名称及含量

部件名称 含量要求	有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
	≤0.1%	≤0.1%	≤0.01%	≤0.1%	≤0.1%	≤0.1%
引线框	○	○	○	○	○	○
塑封树脂	○	○	○	○	○	○
管 芯	○	○	○	○	○	○
内引线	○	○	○	○	○	○
焊 料	×	○	○	○	○	○
说 明	○：表示该元素的含量在 SJ/T11363-2006 标准的限量要求以下。 ×：表示该元素的含量超出 SJ/T11363-2006 标准的限量要求。					

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
最高漏极—源极直流电压 Drain-Source Voltage	V _{DSS}	500		V
连续漏极电流 Drain Current -continuous	I _D	13.0		A
最大脉冲漏极电流（注 1） Drain Current – pulse（note 1）	I _{DM}	52.0		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}	1225		mJ
雪崩电流（注 1） Avalanche Current（note 1）	I _{AR}	13.0		A
重复雪崩能量（注 1） Repetitive Avalanche Current（note 1）	E _{AR}	17		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	4.5		V/ns
耗散功率 Power Dissipation	P _D	TO-220	168	W
		TO-220MF	48	
最高结温 Operating Junction Temperature	T _J	+150		℃
存储温度 Storage Temperature Range	T _{STG}	-55~+150		℃
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T _L	300		℃

*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
关态特性 Off –Characteristics						
漏—源击穿电压 Drain-Source Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	500	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} / ΔT _J	I _D =250μA, referenced to 25℃	-	0.5	-	V/℃
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =500V, V _{GS} =0V, TC=25℃	–	0.0049	1	μA
正向栅极体漏电流 Forward Gate-body leakage current	I _{GSSF}	V _{DS} =0V, V _{GS} =+30V	-	10	100	nA
反向栅极体漏电流 Reverse Gate-body leakage current	I _{GSSR}	V _{DS} =0V, V _{GS} =-30V	-	10	-100	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	2.0	3.1	4.0	V
静态导通电阻 Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V , I _D =6.5A	-	0.35	0.45	Ω
正向跨导 Forward Transconductance	g _{fs}	V _{DS} = 50V, I _D =6.25A	-	10	-	S
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C _{iss}	V _{DS} =25,V _{GS} =0V f=1.0MHz	-	1800	2300	pF
输出电容 Output capacitance	C _{oss}		-	245	320	pF
反向传输电容 Reverse transfer capacitance	C _{rss}		-	25	35	pF
开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	t _{d(on)}	V _{DD} =250V I _D =13A R _G =25Ω	-	40	90	ns
上升时间 Turn-On rise time	t _r		-	140	290	ns
延迟时间 Turn-Off delay time	t _{d(off)}		-	100	210	ns
下降时间 Turn-Off Fall time	t _f		-	85	180	ns
栅极电荷总量 Total Gate Charge	Q _g	V _{DS} =400V ,I _D =13A	-	45	60	nC
栅—源电荷 Gate-Source charge	Q _{gs}	V _{GS} =10V	-	11	-	nC
栅—漏电荷 Gate-Drain charge	Q _{gd}		-	22	-	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	IS		-	-	13	A
正向最大脉冲电流 Maximum Pulsed Drain-Source	ISM		-	-	52	A
正向压降 Drain-Source Diode Forward	VFSD	VGS=0V, IS=13A	-	0.87	1.4	V
反向恢复时间 Reverse recovery time	trr	VGS=0V, IS=13A dIF/dt=100A/μs	-	290	-	ns
反向恢复电荷 Reverse recovery charge	Qrr		-	2.6	-	μC

热特性 Thermal Characteristics

项 目 Parameter	符 号 Symbol	最大 Max		单 位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	T0-220	0.74	℃/W
		T0-220MF	2.58	
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	T0-220	62.5	℃/W
		T0-220MF	62.5	

注释:

1: 脉冲宽度由最高结温限制

Pulse width limited by maximum junction temperature

2: L=14.5mH, IAS=13A, VDD=50V, RG=25Ω,
起始结温 TJ=25℃

L=14.5mH, IAS=13A, VDD=50V, RG=25 Ω, Starting TJ=25℃

3: ISD ≤13A, di/dt ≤300A/μs, VDD≤BVDSS,
起始结温 TJ=25℃

ISD ≤13A, di/dt ≤300A/μs, VDD≤BV_{DSS}, Starting TJ=25℃

4: 脉冲测试: 脉冲宽度≤300μs, 占空比≤2%

Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%

5: 基本与工作温度无关

Essentially independent of operating temperature

特征曲线 Typical Characteristics (curves)

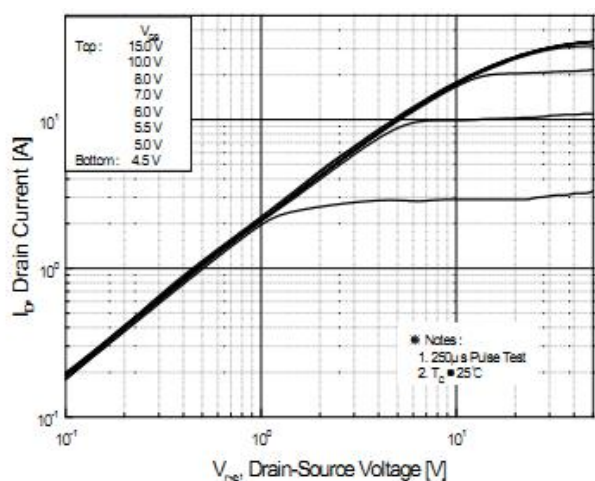


Figure 1. On-Region Characteristics

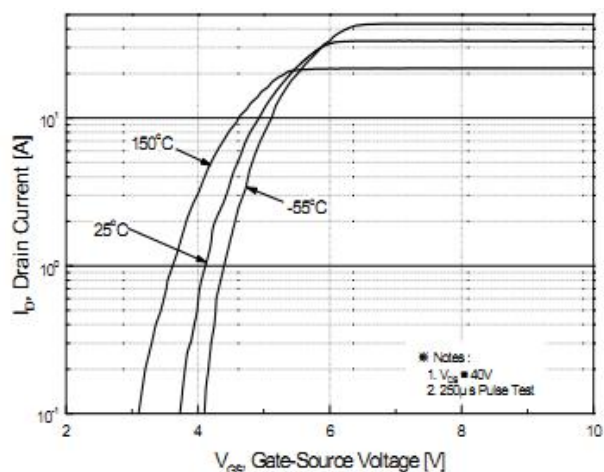


Figure 2. Transfer Characteristics

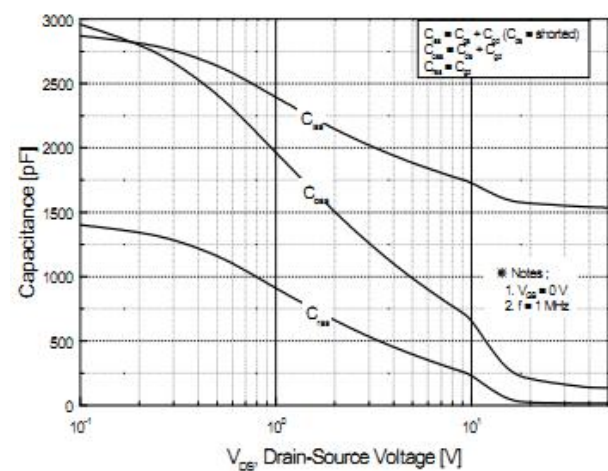
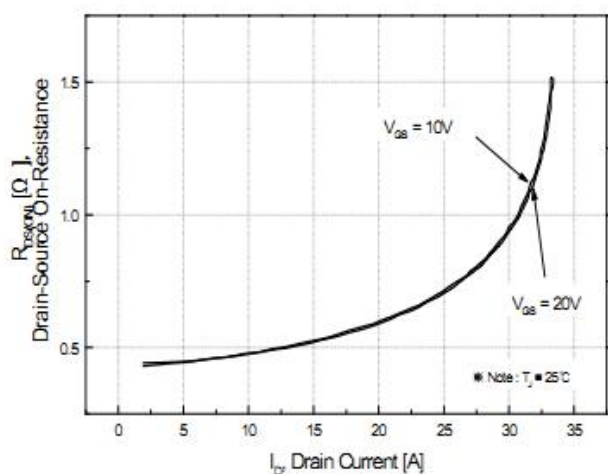


Figure 5. Capacitance Characteristics

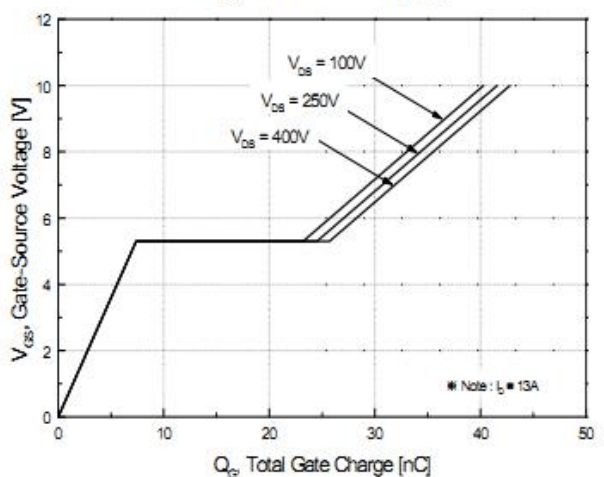
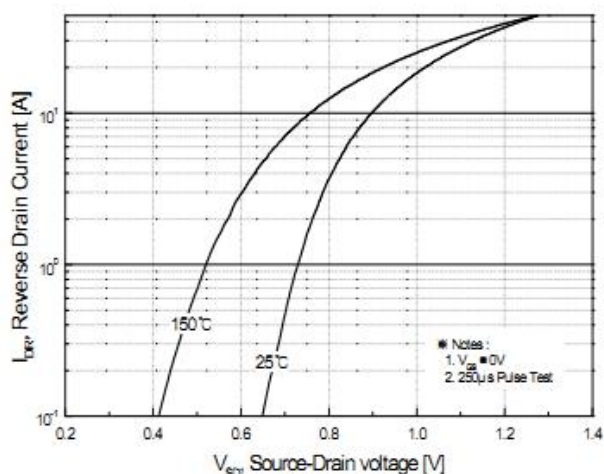


Figure 6. Gate Charge Characteristics

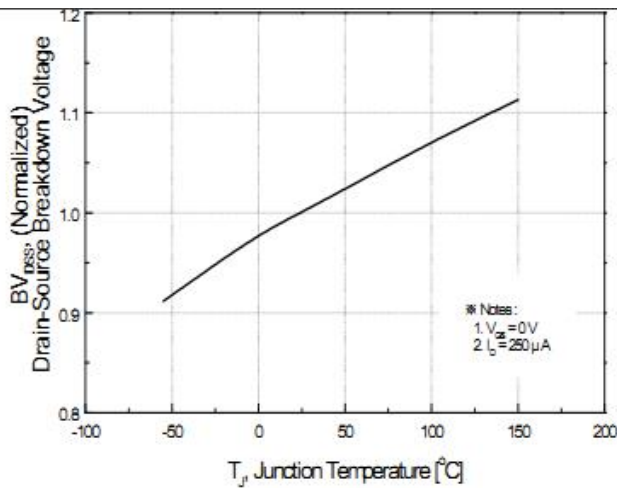


Figure 7. Breakdown Voltage Variation vs Temperature

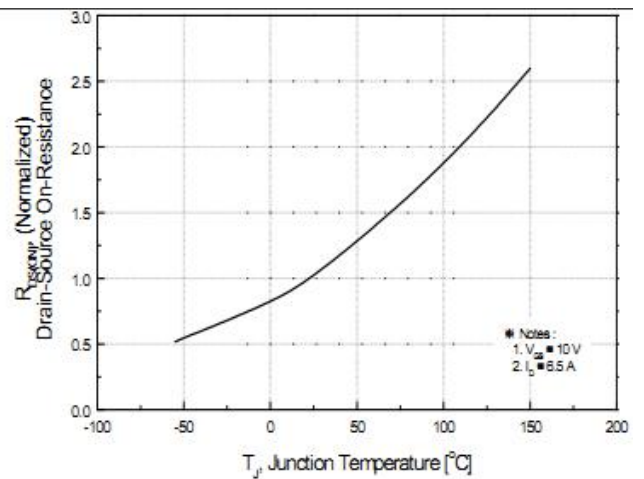


Figure 8. On-Resistance Variation vs Temperature

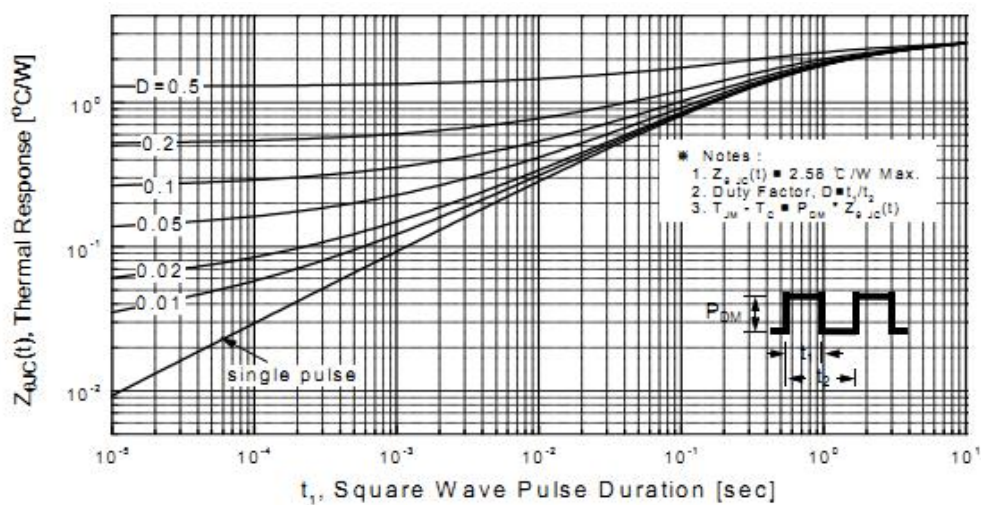
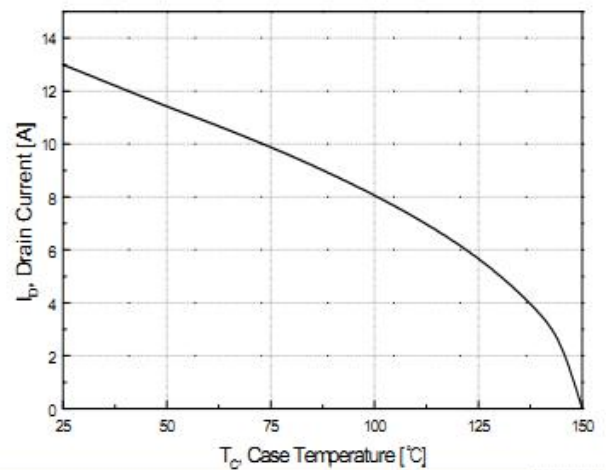
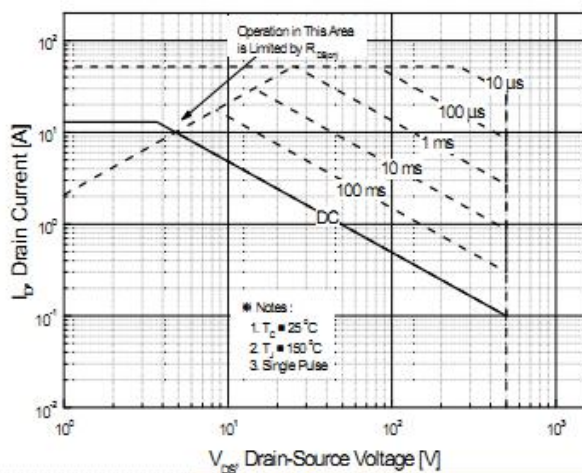


Figure 11. Transient Thermal Response Curve