



N 沟道增强型场效应晶体管

N-CHANNEL MOSFET

FHP18N20B

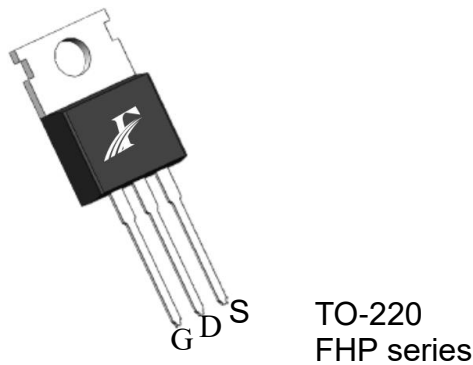
主要参数 MAIN CHARACTERISTICS

ID	18 A
VDSS	200 V
Rdson-typ (@Vgs=10V)	130 mΩ
Qg-typ	23 nC

用途 APPLICATIONS

高频开关电源	High efficiency switch mode power supplies
逆变电源	Power management for inverter systems
电机驱动	Motor drive

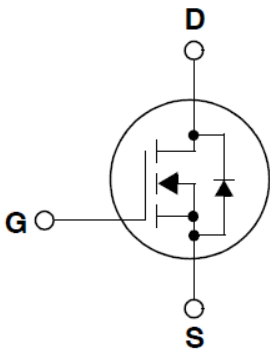
封装形式 Package



产品特性 FEATURES

低栅极电荷	Low gate charge
低 Crss (典型值 3.5 pF)	Low Crss (typical 3.5 pF)
开关速度快	Fast switching
100%经过 Rg 测试	100% Rg tested
100%经过雪崩测试	100% avalanche tested
100%经过热阻测试	100% DVDS tested
高抗 dv/dt 能力	Improved dv/dt capability
平面工艺	Plane technology
RoHS 产品	RoHS product

等效电路 Equivalent Circuit



绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

项目 Parameter	符号 Symbol	数值 Value	单位 Unit
		FHP18N20B	
最高漏极—源极直流电压 Drain-Source Voltage	V _{DS}	200	V
连续漏极电流* Drain Current -continuous *	I _D (T _C =25℃)	18	A
	I _D (T _C =100℃)	11	A
最大脉冲漏极电流 (注 1) Drain Current – pulse (note 1)	I _{DM}	72	A
最高栅源电压 Gate-Source Voltage	V _{GS}	±30	V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	E _{AS}	112.5	mJ
雪崩电流 (注 1) Avalanche Current (note 1)	I _{AR}	15	A
重复雪崩能量 (注 1) Repetitive Avalanche Current (note 1)	E _{AR}	21	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	5.0	V/ns
耗散功率 Power Dissipation	P _D (T _C =25℃)	130	W
	-Derate above 25℃	1.04	W/℃
最高结温及存储温度 Operating and Storage Temperature Range	T _J , T _{STG}	150, -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	200	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /Δ T _J	I _D =250μA, referenced to 25℃	-	0.25	-	V/℃
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =200V,V _{GS} =0V, T _C =25℃	-	-	1	μA
		V _{DS} =160V, T _C =125℃	-	-	100	μA
栅极体漏电流 Gate-body leakage current	I _{GSS} (F/R)	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 =250μA	2.0	-	4.0	V
静态导通电阻 Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V , I _D =11A	-	130	150	mΩ
正向跨导 Forward Transconductance	g _{fs}	V _{DS} = 10V, I _D =18A (note 4)	-	12	-	S
动态特性 Dynamic Characteristics						
栅电阻 Gate Resistance	R _g	f=1.0MHz,V _{DS} OPEN	-	0.9	-	Ω
输入电容 Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	890	-	pF
输出电容 Output capacitance	C _{oss}		-	75	-	
反向传输电容 Reverse transfer capacitance	C _{rss}		-	3.5	-	
开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	t _{d(on)}	V _{DD} =100V, I _D =18A, R _G =20Ω V _{GS} =10V (note 4, 5)	-	15	-	ns
上升时间 Turn-On rise time	t _r		-	52	-	ns
延迟时间 Turn-Off delay time	t _{d(off)}		-	46	-	ns
下降时间 Turn-Off Fall time	t _f		-	37	-	ns
栅极电荷总量 Total Gate Charge	Q _g	V _{DS} =160V , I _D =18A , V _{GS} =10V (note 4, 5)	-	23	-	nC
栅－源电荷 Gate-Source charge	Q _{gs}		-	8	-	nC
栅－漏电荷 Gate-Drain charge	Q _{gd}		-	6	-	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		-	-	18	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}		-	-	72	A
正向压降 Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =18A	-	-	1.2	V
反向恢复时间 Reverse recovery time	t _{rr}	V _{GS} =0V, I _S =18A ,dI _F /dt=100A/μs (note 4)	-	195	-	ns
反向恢复电荷 Reverse recovery charge	Q _{rr}		-	1.47	-	μC

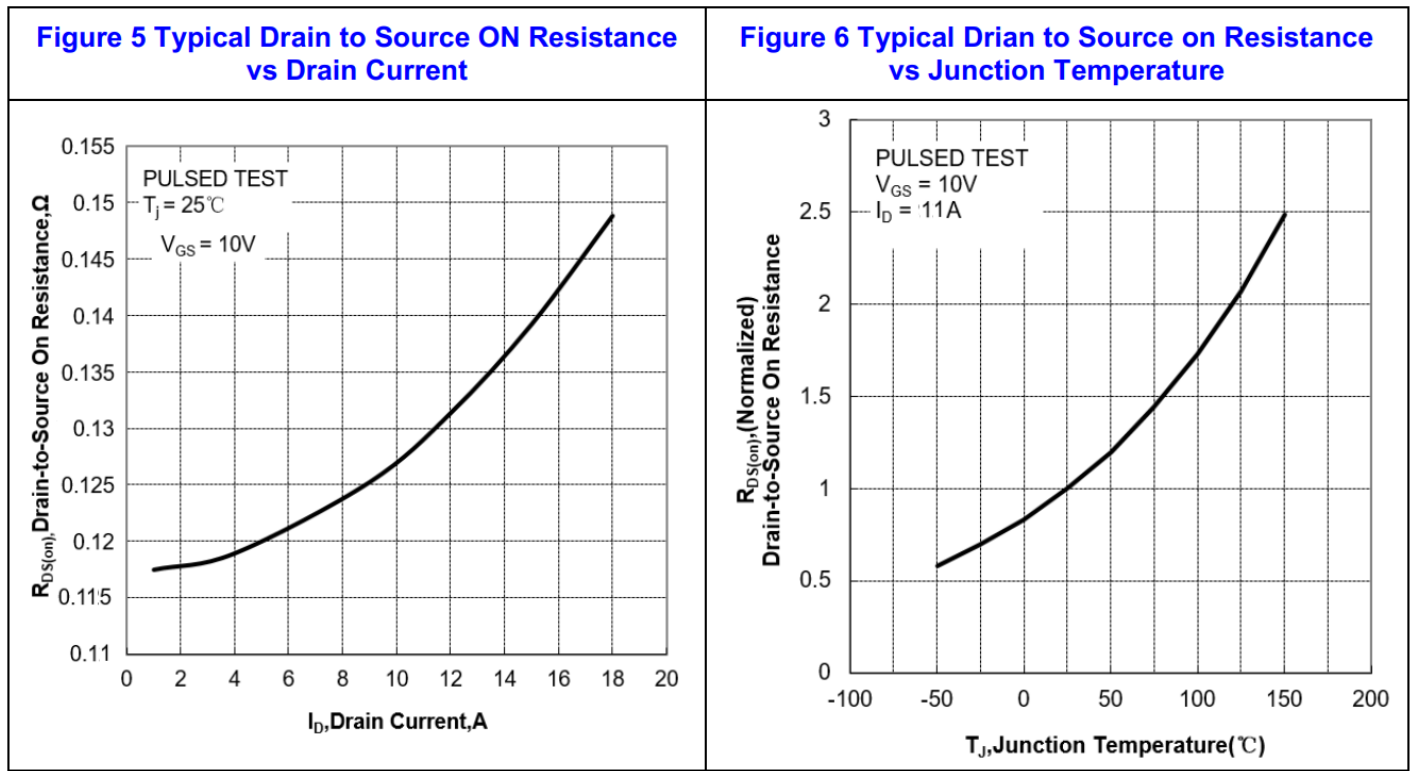
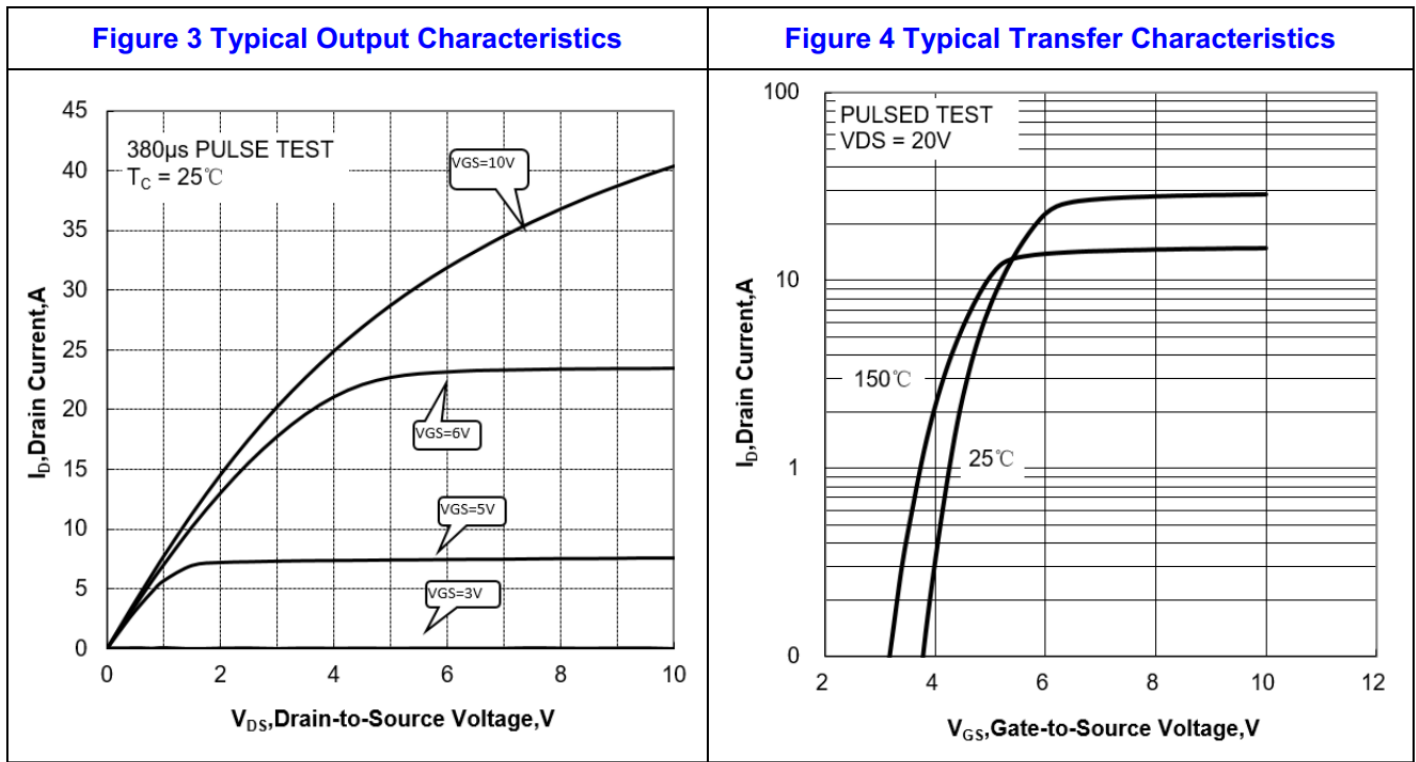
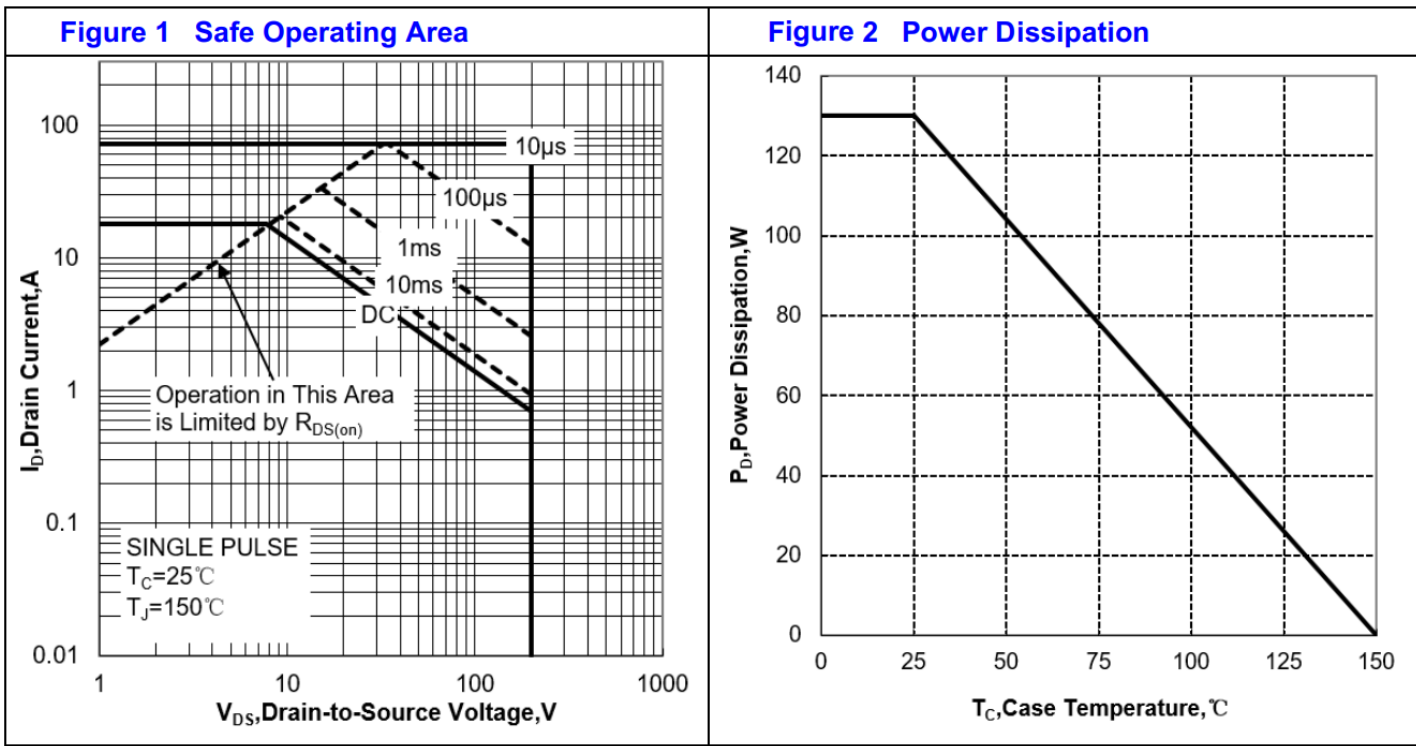
热特性 THERMAL CHARACTERISTIC

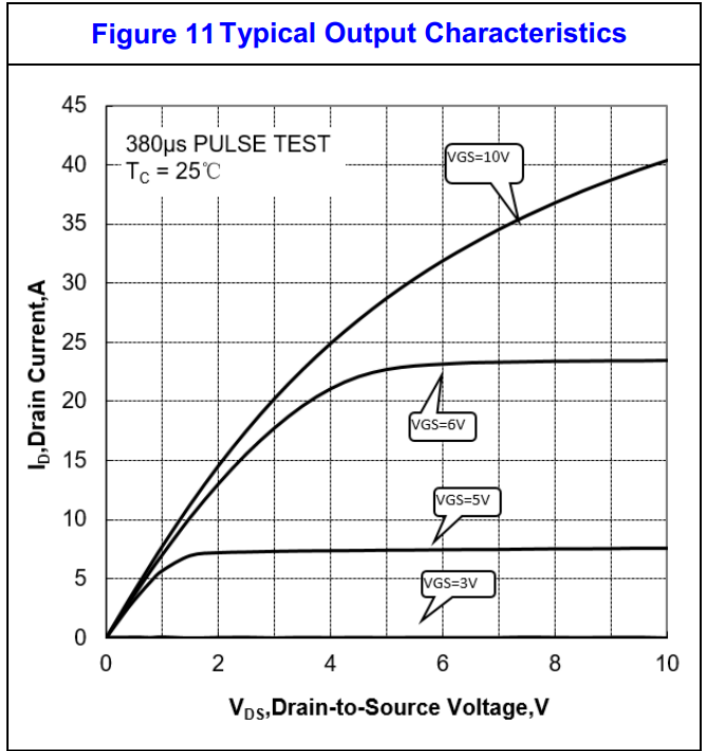
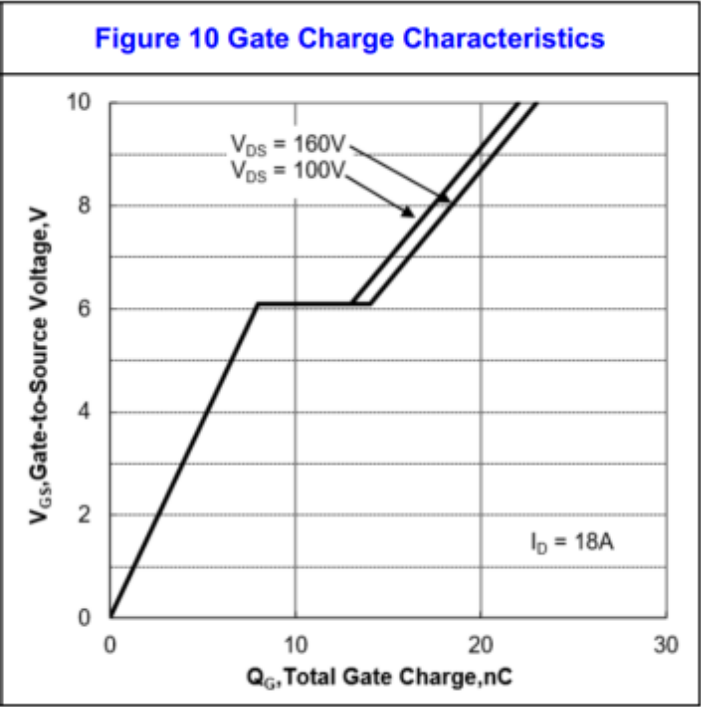
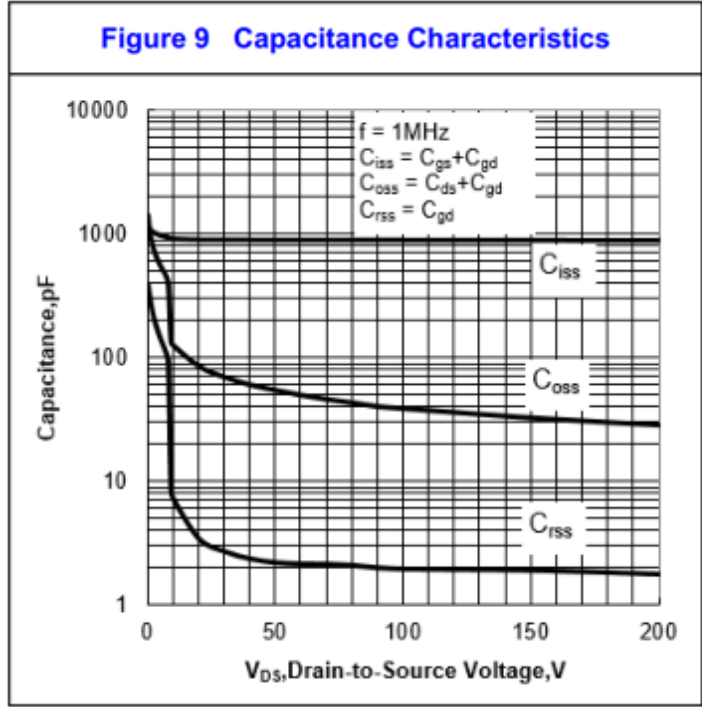
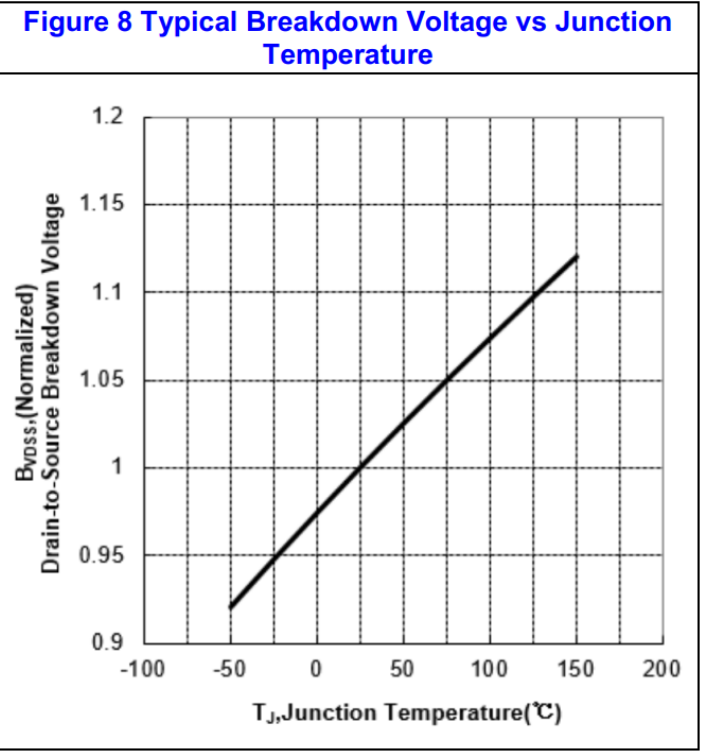
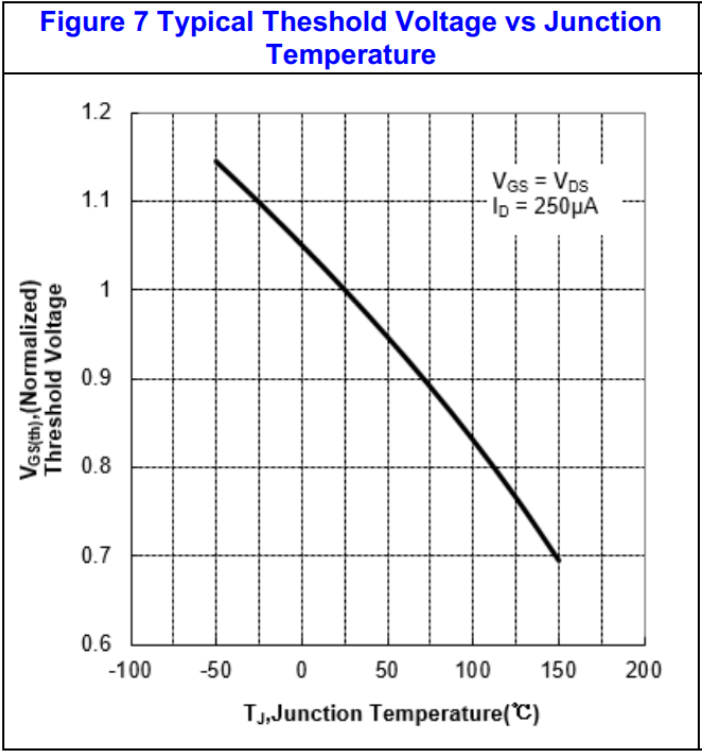
项目 Parameter	符号 Symbol	最大值 Max	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	0.96	℃/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	62.5	℃/W

- 注释:
- 1: 脉冲宽度由最高结温限制
 - 2: L=1mH, IAS=15A, VDD=50V, RG=25 Ω,起始结温 TJ=25℃
 - 3: ISD ≤18A,di/dt ≤300A/μs,VDD≤BVDSS,起始结温 TJ=25℃
 - 4: 脉冲测试: 脉冲宽度 ≤300μs,占空比≤2%
 - 5: 基本与工作温度无关

- Notes:
- 1: Pulse width limited by maximum junction temperature
 - 2: L=1mH, IAS=15A, VDD=50V, RG=25 Ω,Starting TJ=25℃
 - 3: ISD ≤18A,di/dt ≤300A/μs,VDD≤BVDSS, Starting TJ=25℃
 - 4: Pulse Test: Pulse Width ≤300μs,Duty Cycle≤2%
 - 5: Essentially independent of operating temperature

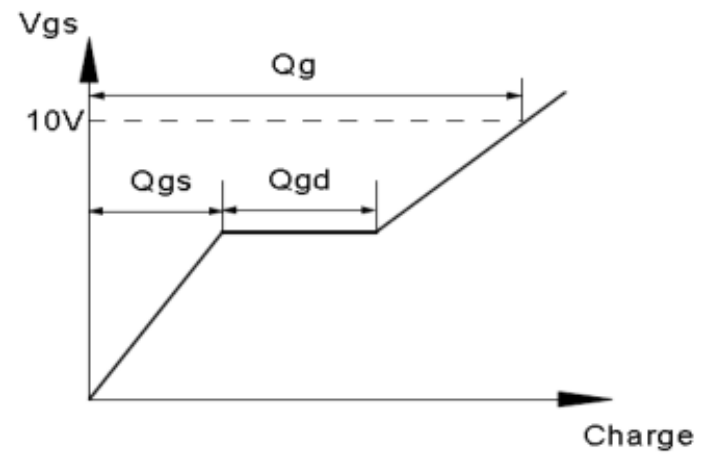
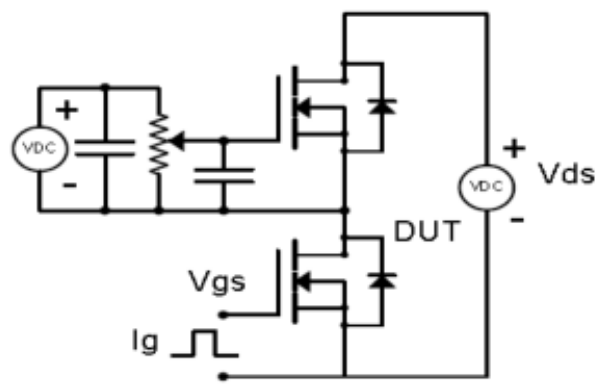
Typical Performance Characteristics



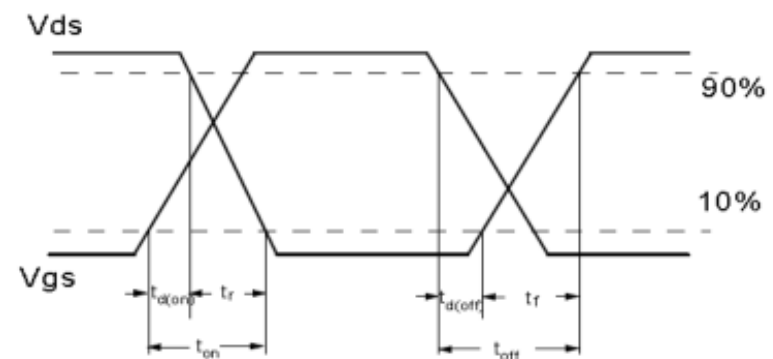
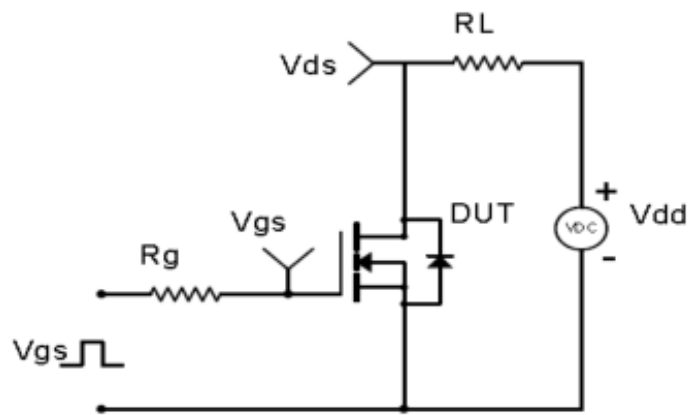


Test Circuit & Waveform

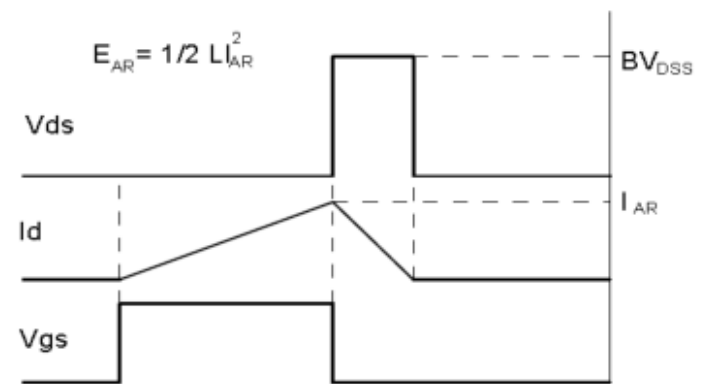
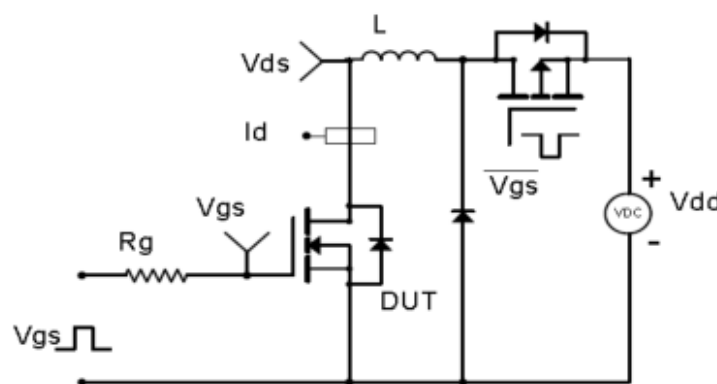
Gate Charge Test Circuit & Waveform



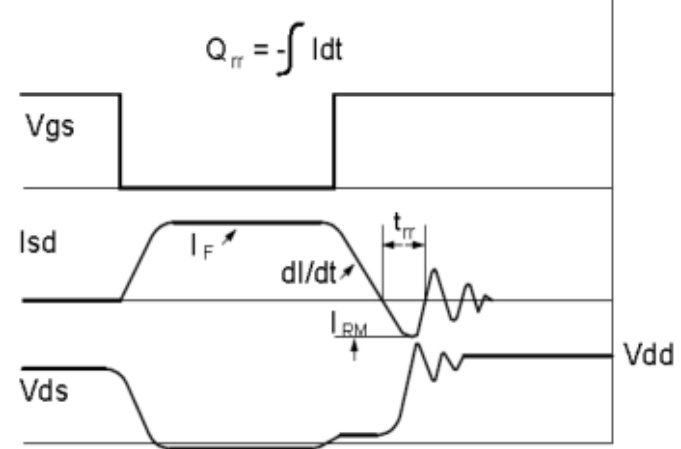
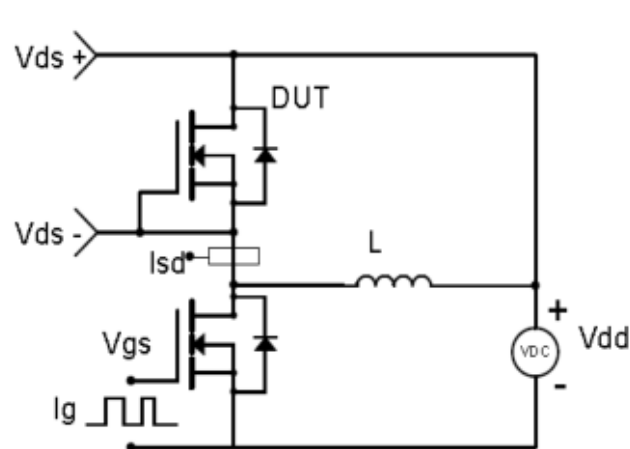
Resistive Switching Test Circuit & Waveforms



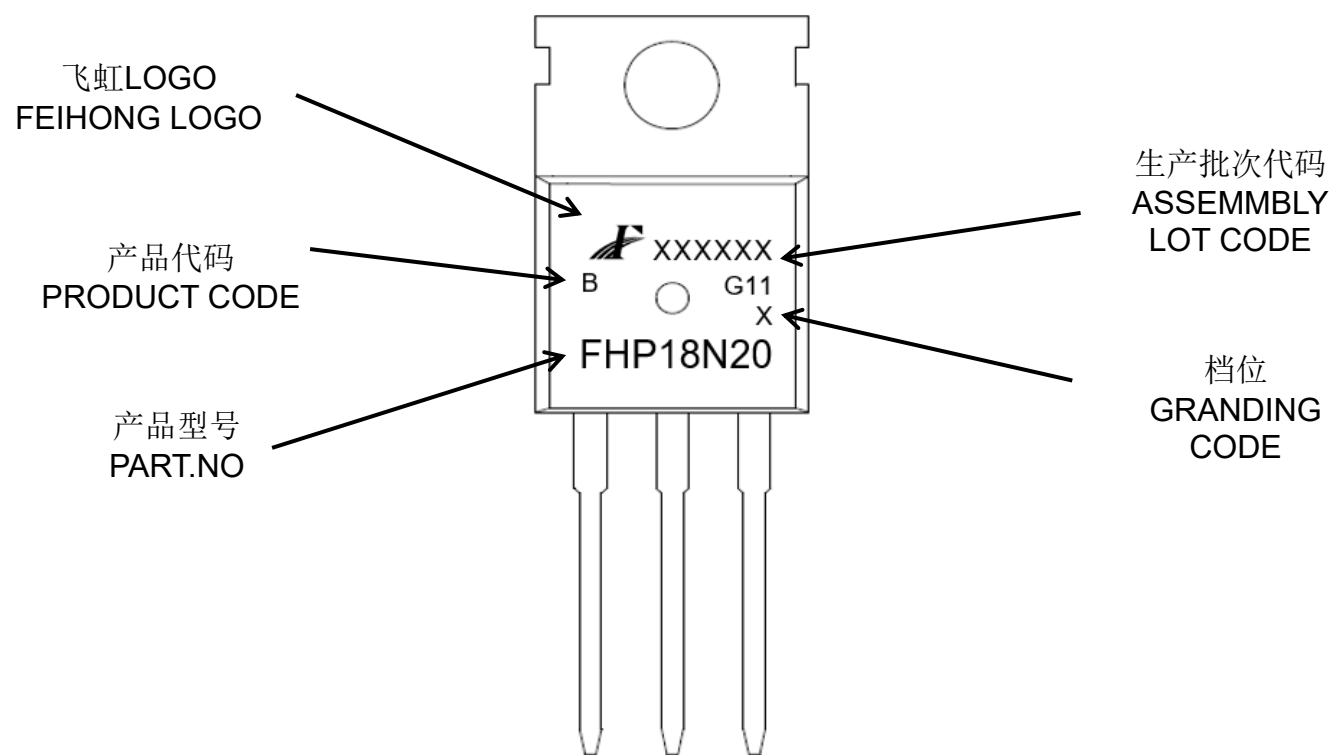
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



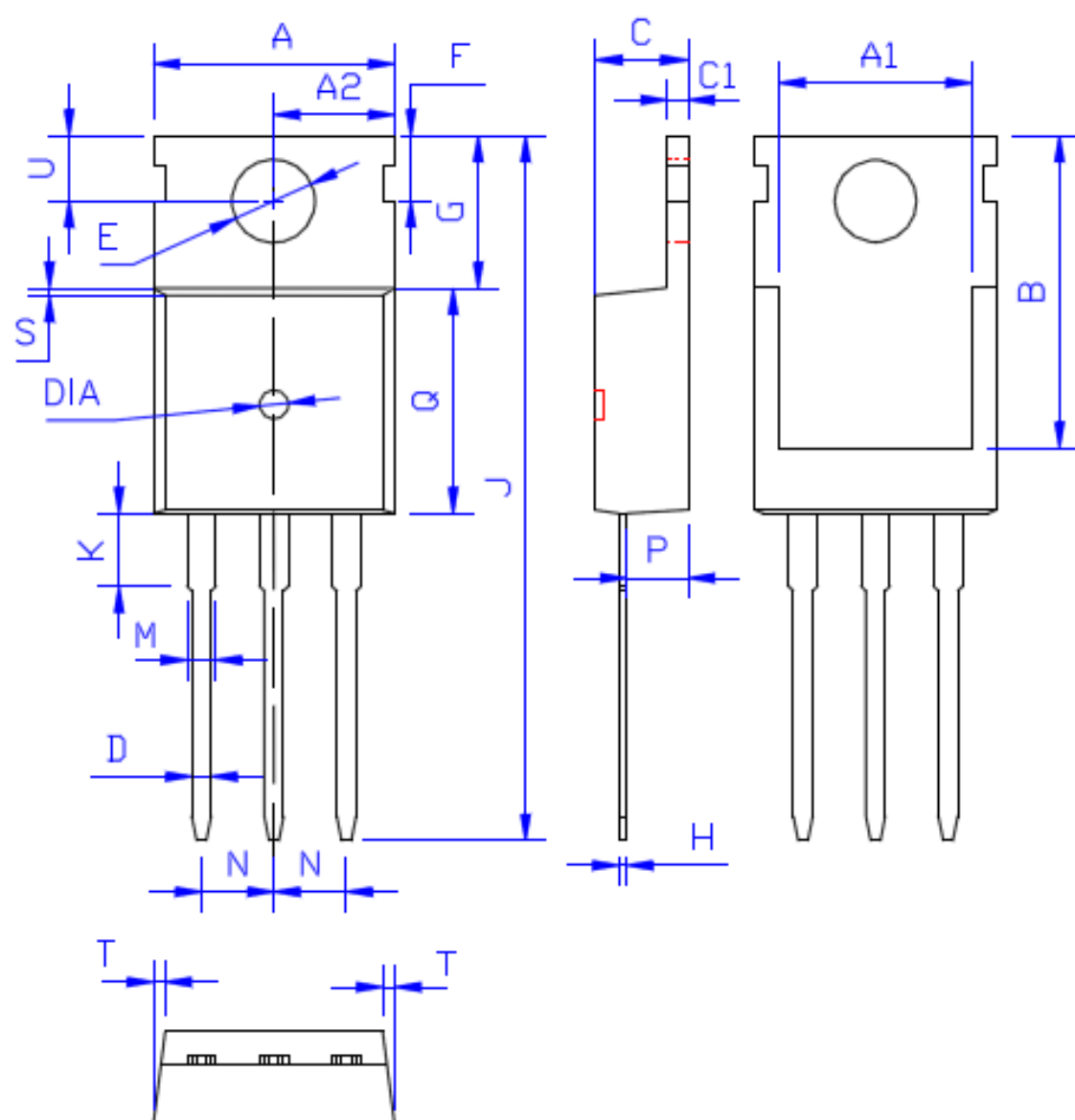
印记 Marking:



外形尺寸:

Package Dimension:

TO-220



DIM	MILLIMETERS
A	10.00 ± 0.30
A1	8.00 ± 0.30
A2	5.00 ± 0.30
B	13.20 ± 0.40
C	4.50 ± 0.20
C1	1.30 ± 0.20
D	0.80 ± 0.20
E	3.60 ± 0.20
F	3.00 ± 0.30
G	6.60 ± 0.40
H	0.50 ± 0.20
J	28.88 ± 0.50
K	3.00 ± 0.30
M	1.30 ± 0.30
N	Typical 2.54
P	2.40 ± 0.40
Q	9.20 ± 0.40
S	0.25 ± 0.15
T	0.25 ± 0.15
U	2.80 ± 0.30
DIA	宽 1.50 ± 0.10 深 0.50 MAX

(Unit: mm)