

主要参数 MAIN CHARACTERISTICS

ID	120 A
VDSS	150 V
Rdson-typ (@Vgs=10V)	6.8 mΩ
Qg-typ	72 nC

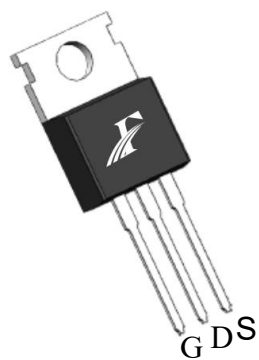
用途 APPLICATIONS

UPS	Uninterruptible Power Supplies
逆变器	Power Management in Inverter System

产品特性 FEATURES

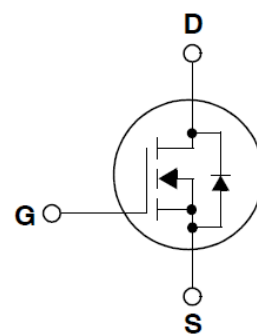
低栅极电荷	Low gate charge
低 Crss (典型值 11 pF)	Low Crss (typical 11 pF)
开关速度快	Fast switching
100%经过雪崩测试	100% avalanche tested
100%经过热阻测试	100% DVDS tested
100%经过 Rg 测试	100% Rg tested
高抗 dv/dt 能力	Improved dv/dt capability
SGT 工艺	SGT technology
RoHS 产品	RoHS product

封装形式 Package



TO-220
FHP series

等效电路 Equivalent Circuit



绝对最大额定值 ABSOLUTE RATINGS (Tc25℃)

项目 Parameter	符号 Symbol	数值 Value	单位 Unit
		FHP120N15F7A	
最高漏极-源极直流电压 Drain-Source Voltage	VDS	150	V
连续漏极电流* Drain Current -continuous *	ID (Tc=25℃) (Silicon Limited)	140	
	ID (Tc=25℃) (Package Limited)	120	A
	ID (Tc=100℃) (Silicon Limited)	98	A
最大脉冲漏极电流 (注 1) Drain Current – pulse (note 1)	IDM	480	A
最高栅源电压 Gate-Source Voltage	VGS	±20	V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	EAS	338	mJ
雪崩电流 (注 1) Avalanche Current (note 1)	IAS	26	A
重复雪崩能量 (注 1) Repetitive Avalanche Current (note 1)	EAR	125	mJ
耗散功率 Power Dissipation	PD (TC=25℃)	227	W
	-Derate above 25℃	1.81	W/℃
最高结温及存储温度 Operating and Storage Temperature Range	TJ, TSTG	-55~+175	℃
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	TL	260	℃

*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	150	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /Δ T _J	I _D =250μA, referenced to 25℃	-	0.15	-	V/℃
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =150V, V _{GS} =0V, T _C =25℃	-	-	1	μA
		V _{DS} =120V, 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 =50A	-	6.8	7.4	mΩ
正向跨导 Forward Transconductance	g _{fs}	V _{DS} = 10V, I _D =50A (note 4)	-	57	-	S
动态特性 Dynamic Characteristics						
栅电阻 Gate Resistance	R _g	f=1.0MHz, V _{DS} OPEN	-	2.2	-	Ω
输入电容 Input capacitance	C _{iss}	V _{DS} =75V, V _{GS} =0V, f=1.0MHz	-	5240	-	pF
输出电容 Output capacitance	C _{oss}		-	412	-	
反向传输电容 Reverse transfer capacitance	C _{rss}		-	10	-	
开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	t _{d(on)}	V _{DS} =75V, I _D =50A, R _G =1.6Ω V _{GS} =10V (note 4, 5)	-	22	-	ns
上升时间 Turn-On rise time	t _r		-	115	-	ns
延迟时间 Turn-Off delay time	t _{d(off)}		-	44	-	ns
下降时间 Turn-Off Fall time	t _f		-	105	-	ns
栅极电荷总量 Total Gate Charge	Q _g	V _{DS} =75V , I _D =50A , V _{GS} =10V (note 4, 5)	-	72	-	nC
栅—源电荷 Gate-Source charge	Q _{gs}		-	18	-	nC
栅—漏电荷 Gate-Drain charge	Q _{gd}		-	10	-	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		-	-	120	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}		-	-	480	A
正向压降 Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =50A	-	-	1.3	V
反向恢复时间 Reverse recovery time	t _{rr}	V _{GS} =0V, I _S =50A ,dI _F /dt=100A/μs (note 4)	-	45	-	ns
反向恢复电荷 Reverse recovery charge	Q _{rr}		-	12	-	nC

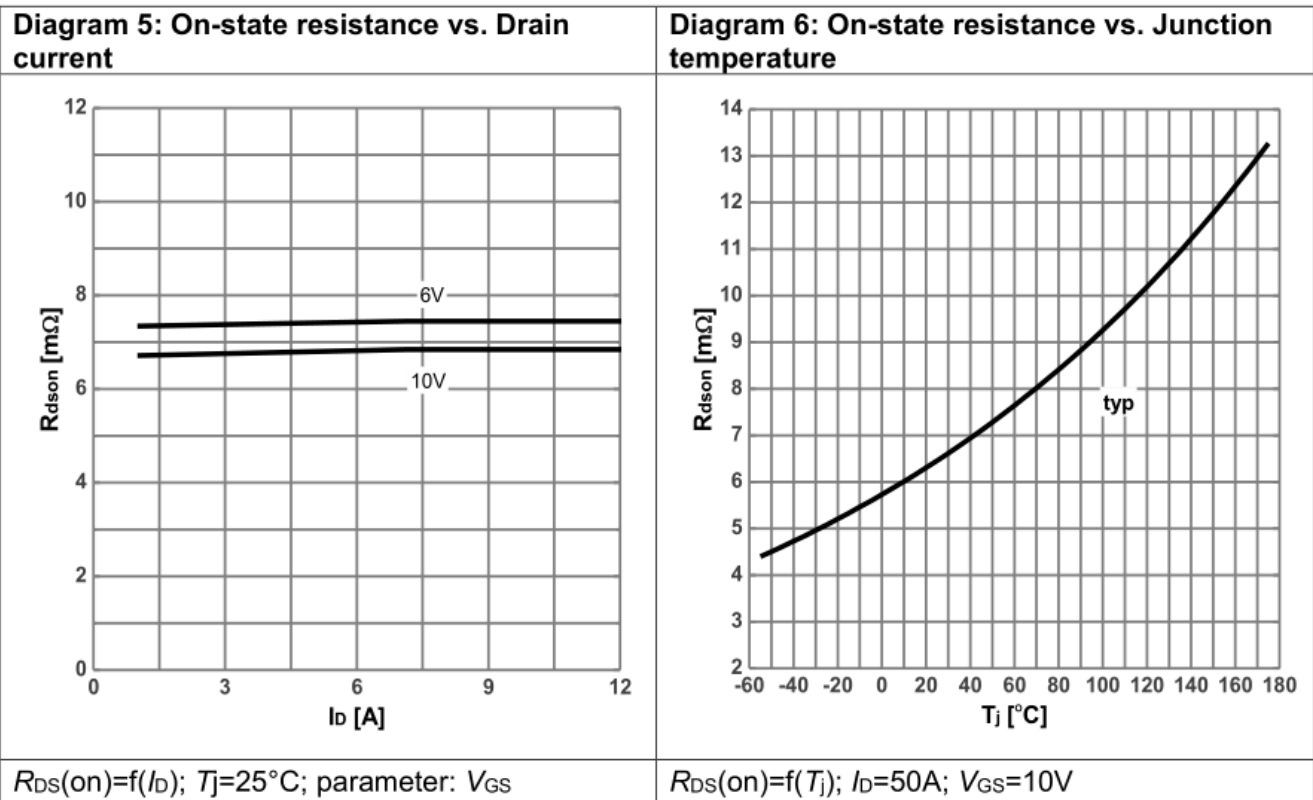
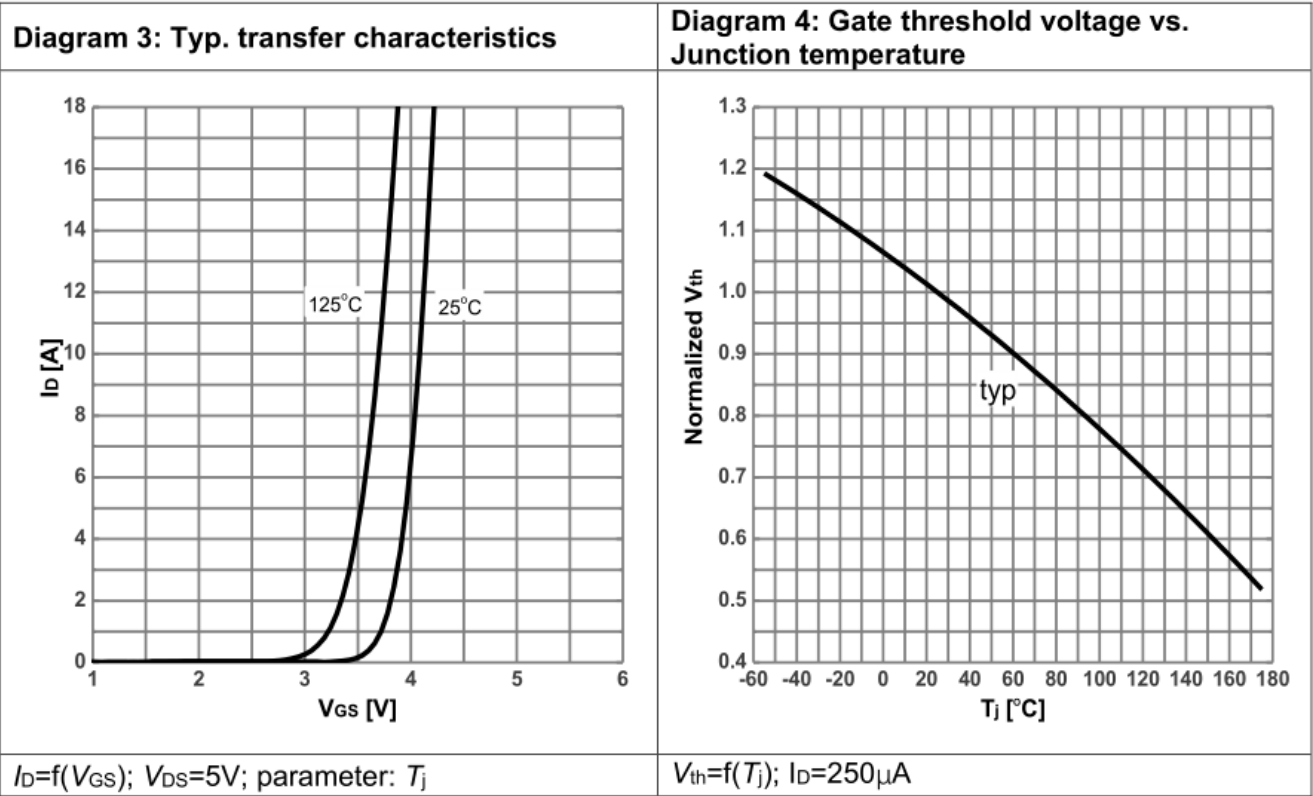
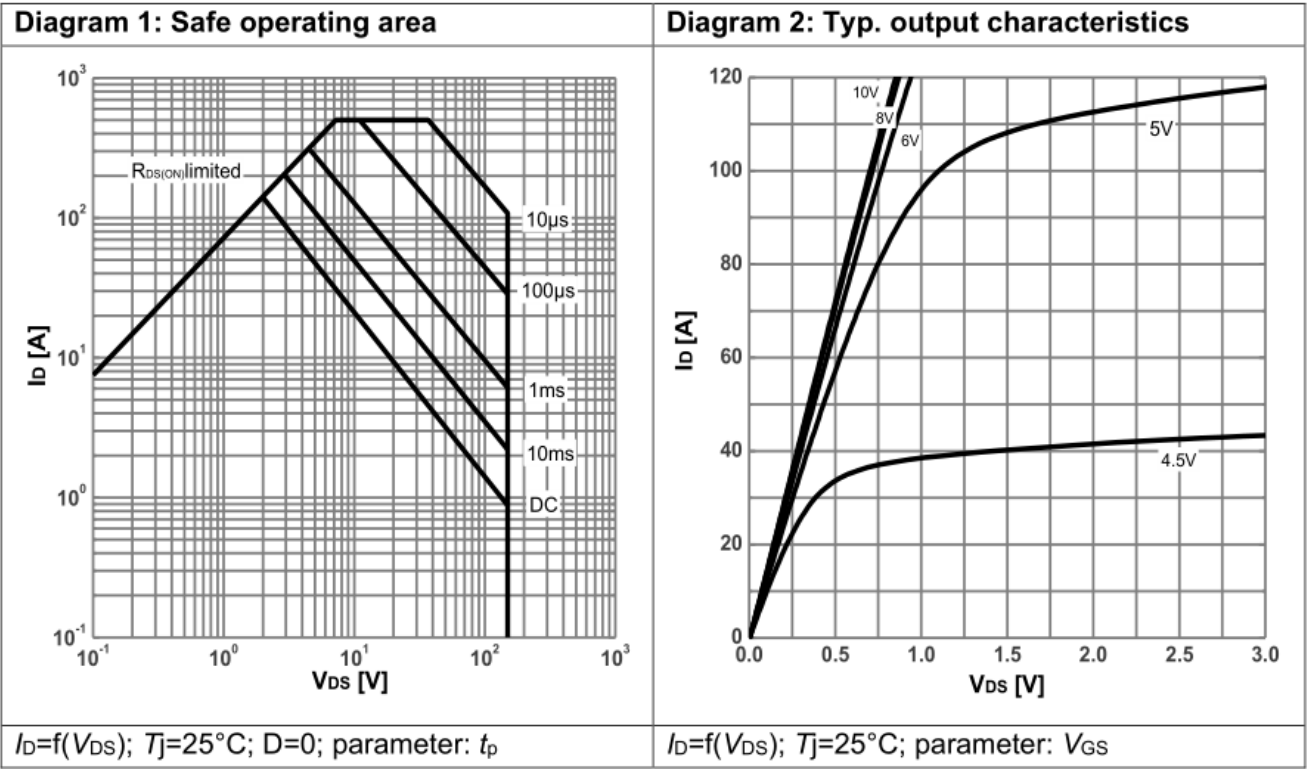
热特性 THERMAL CHARACTERISTIC

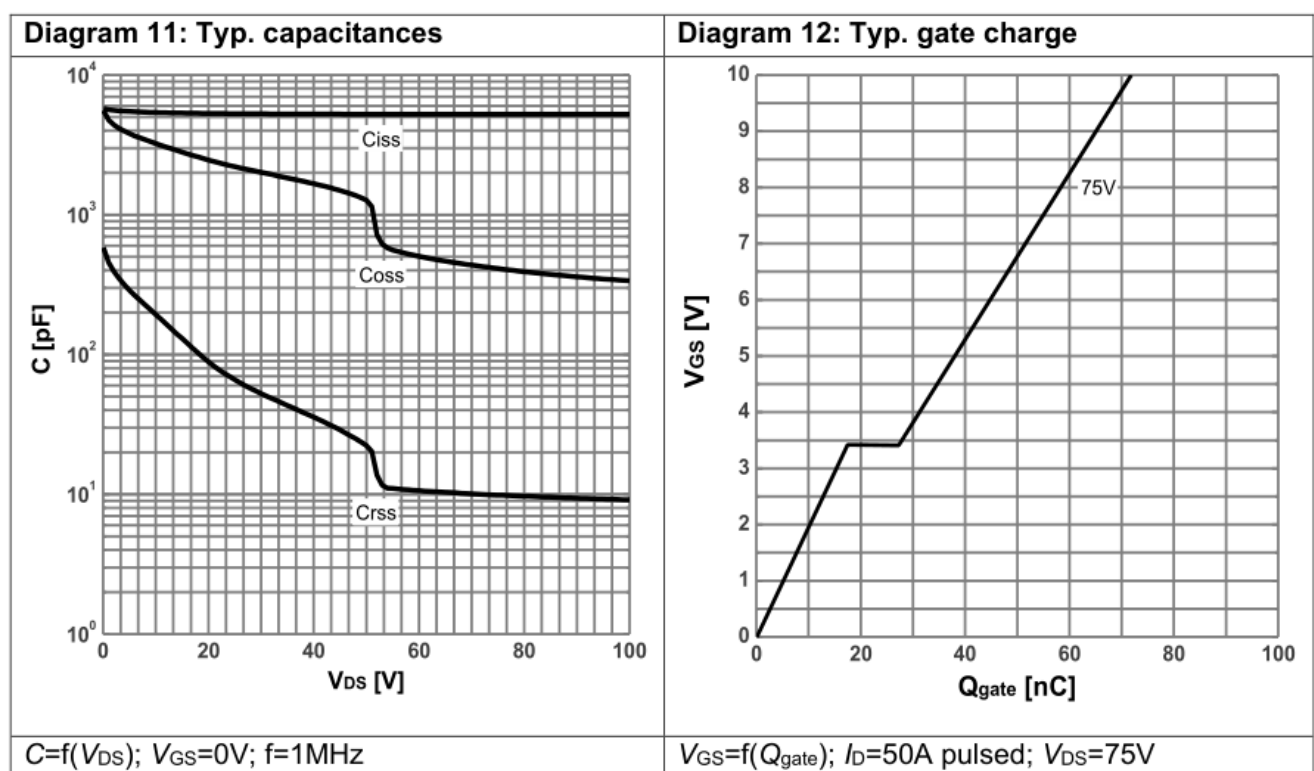
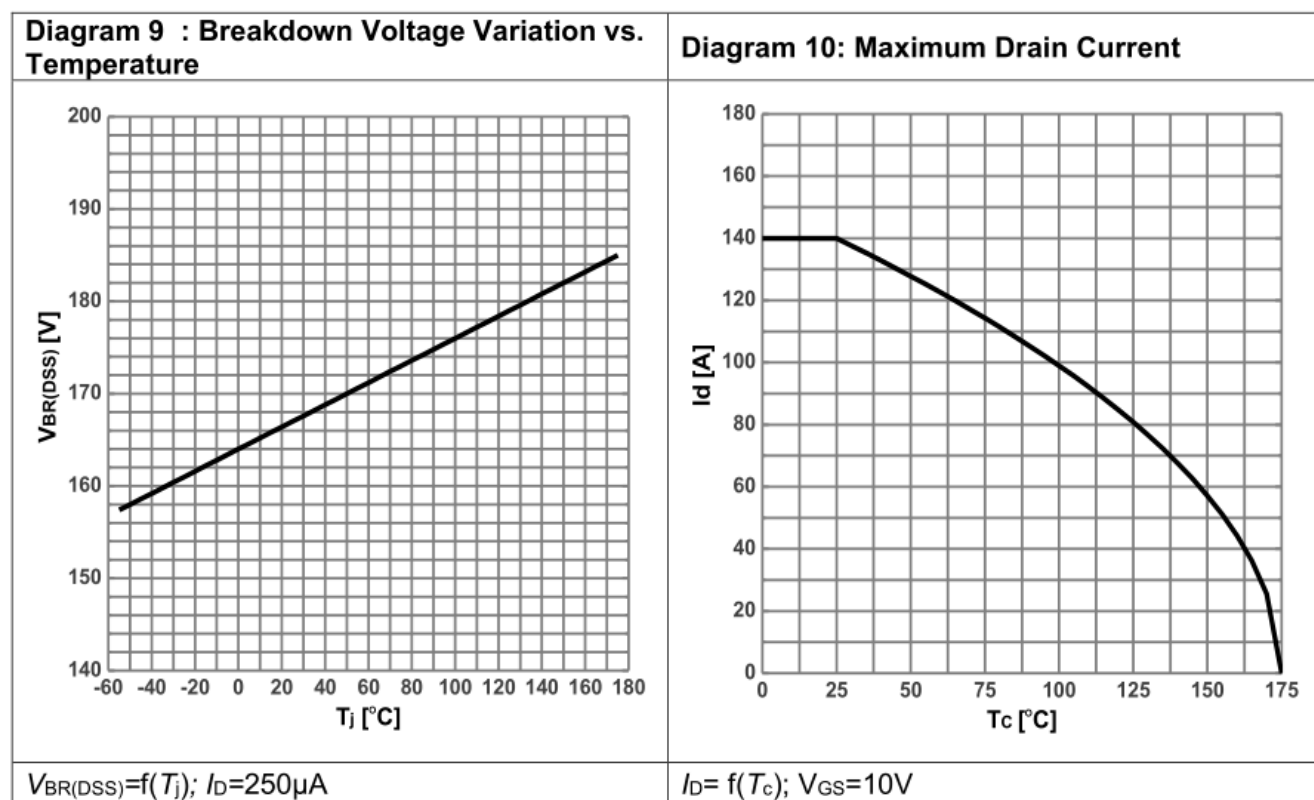
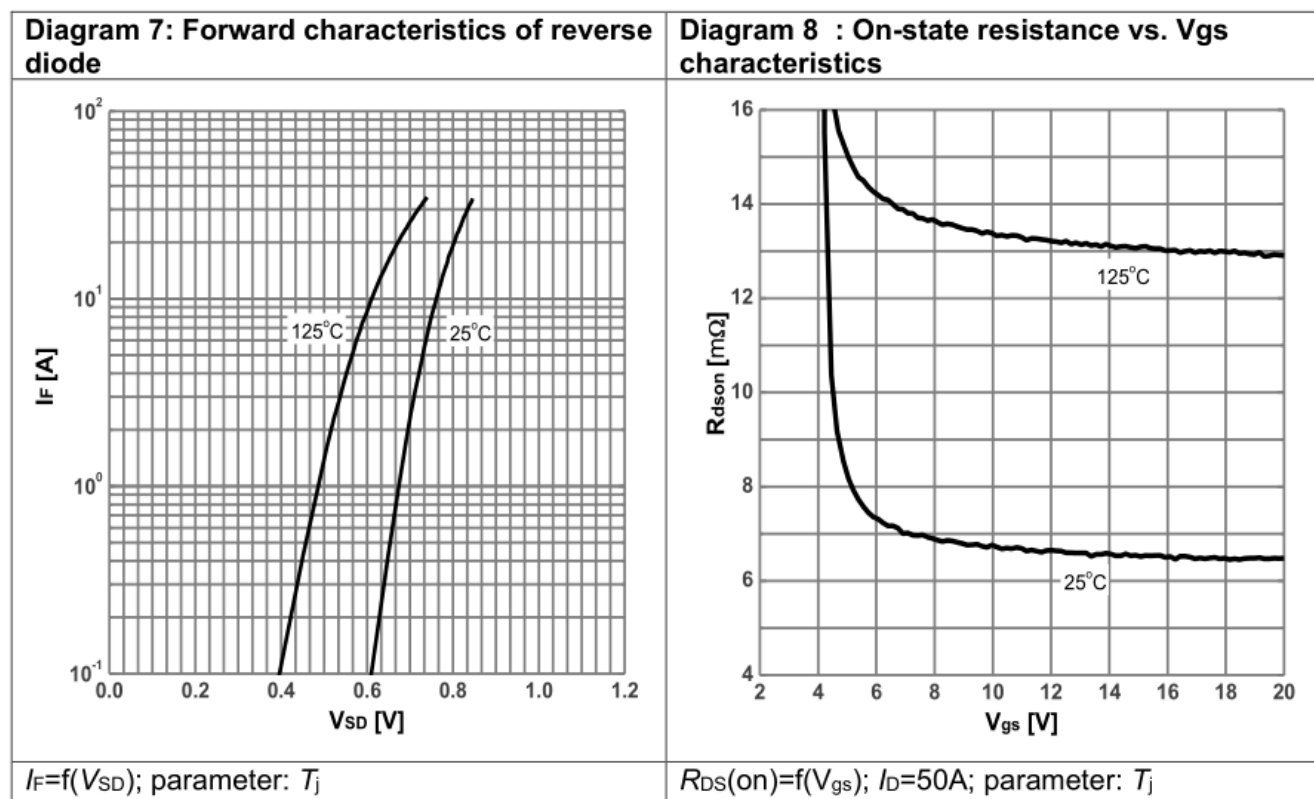
项目 Parameter	符号 Symbol	FHP120N15F7A	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	0.66	℃/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	62.5	℃/W

- 注释：
- 1：脉冲宽度由最高结温限制
 - 2：L=1mH, IAS=26A, VDD=50V, RG=25 Ω,起始结温 TJ=25℃
 - 3：ISD ≤120A,di/dt ≤100A/μs,VDD≤BV_{DSS},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=26A, VDD=50V, RG=25 Ω,Starting TJ=25℃
 - 3：ISD ≤120A,di/dt ≤100A/μs,VDD≤BV_{DSS}, Starting TJ=25℃
 - 4：Pulse Test: Pulse Width ≤300μs,Duty Cycle≤2%
 - 5：Essentially independent of operating temperature

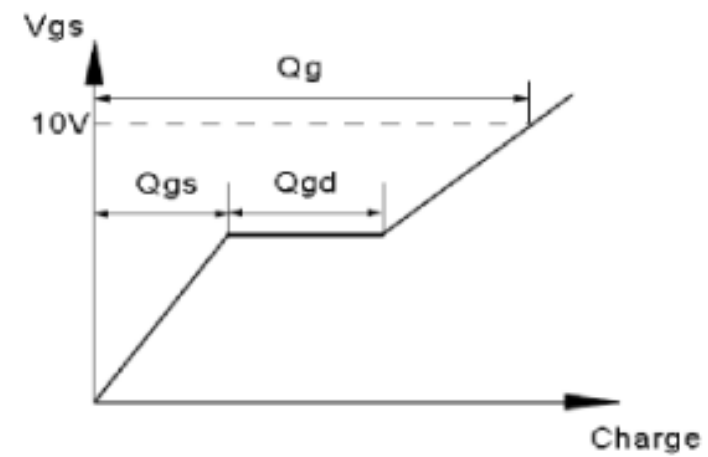
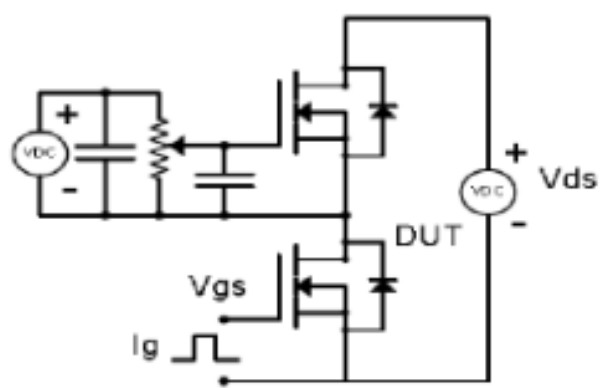
特性曲线 Typical Characteristics



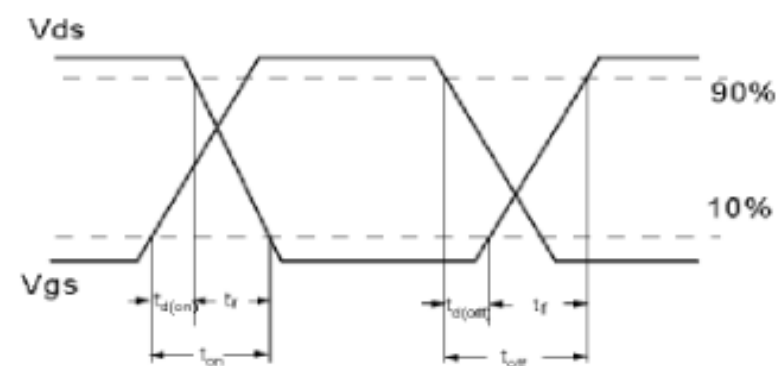
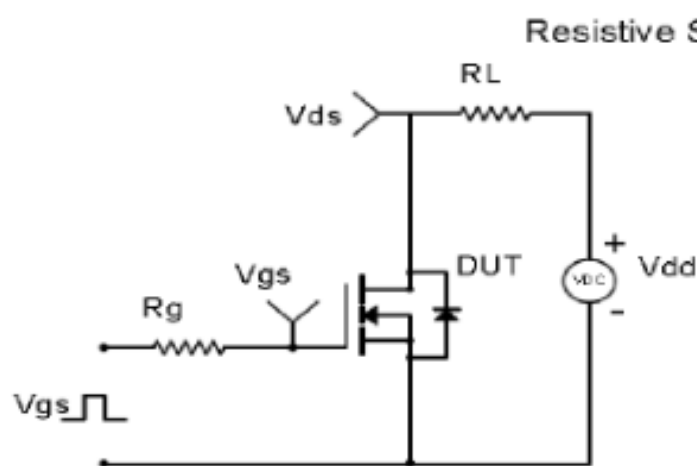


Test Circuit & Waveform

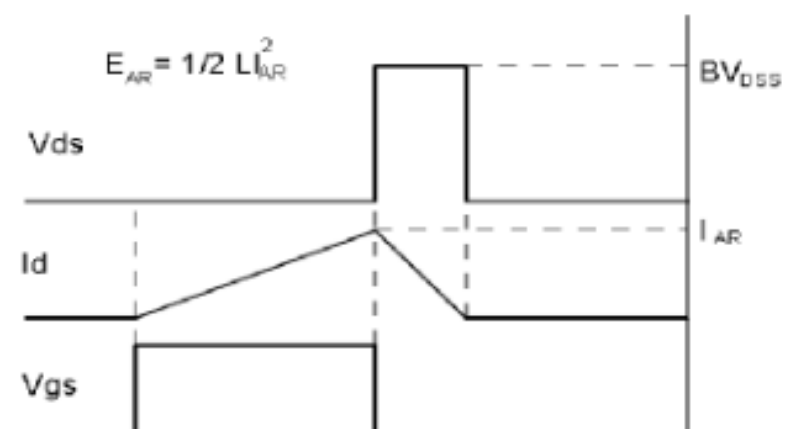
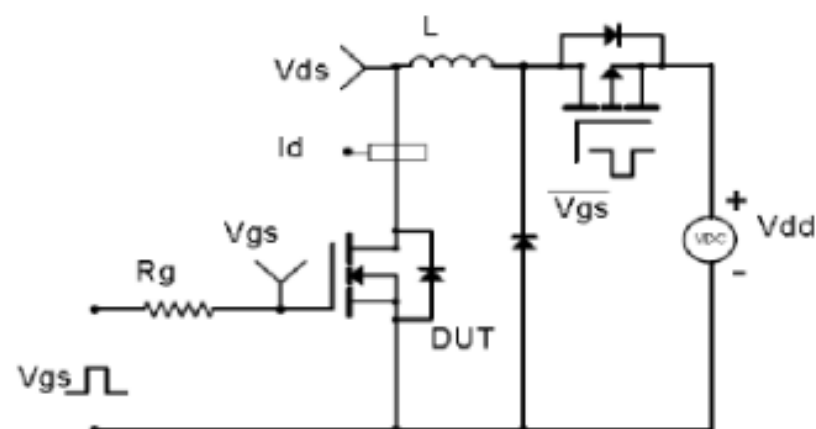
Gate Charge Test Circuit & Waveform



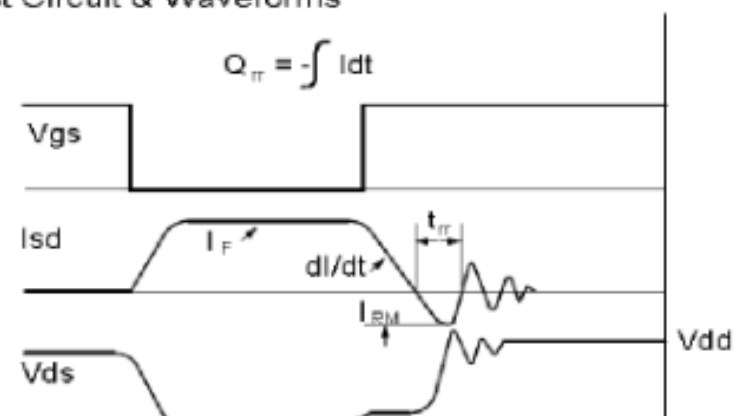
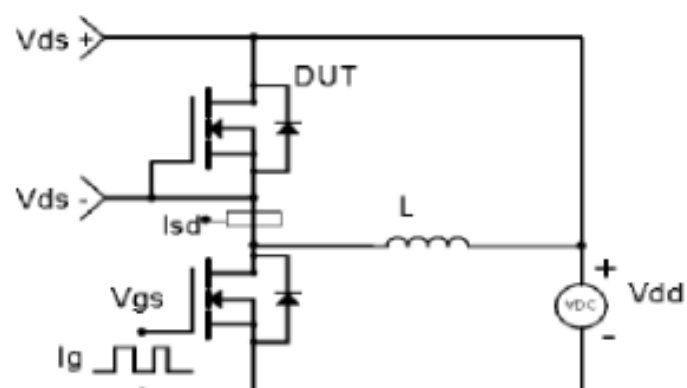
Resistive Switching Test Circuit & Waveforms



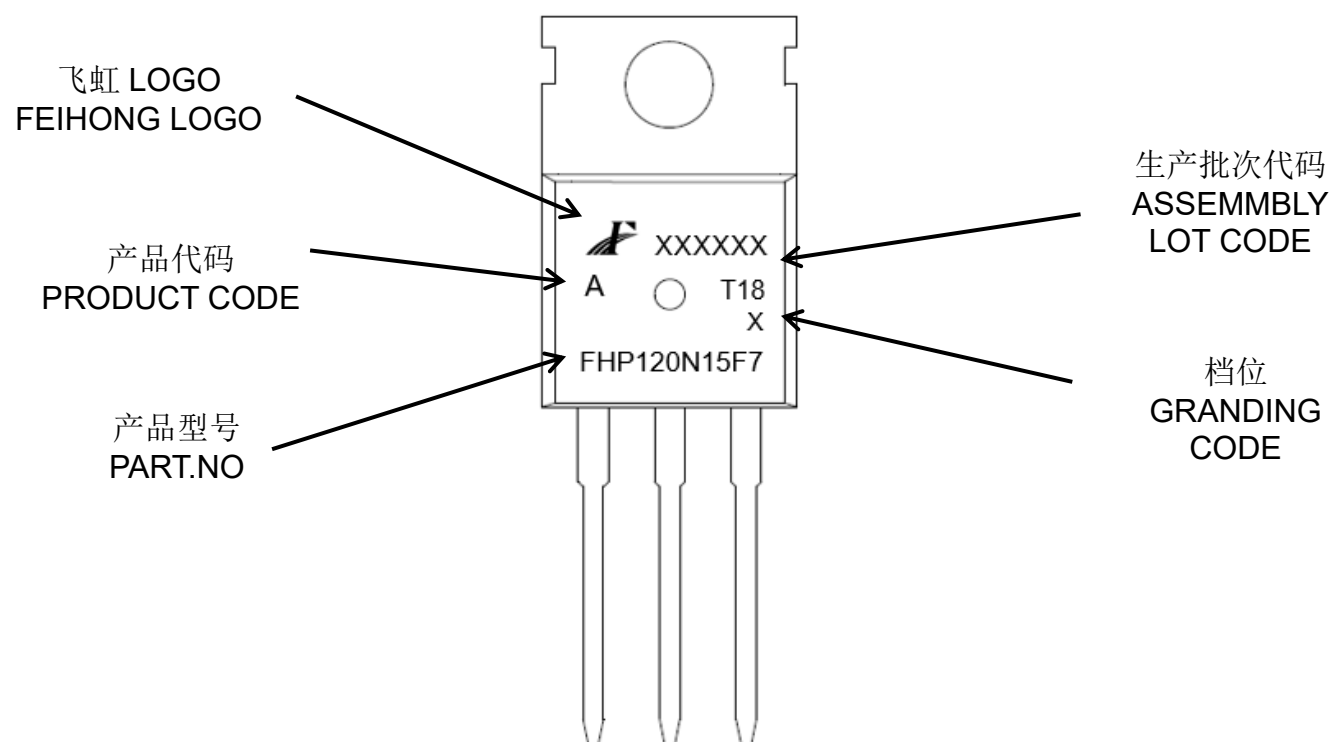
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



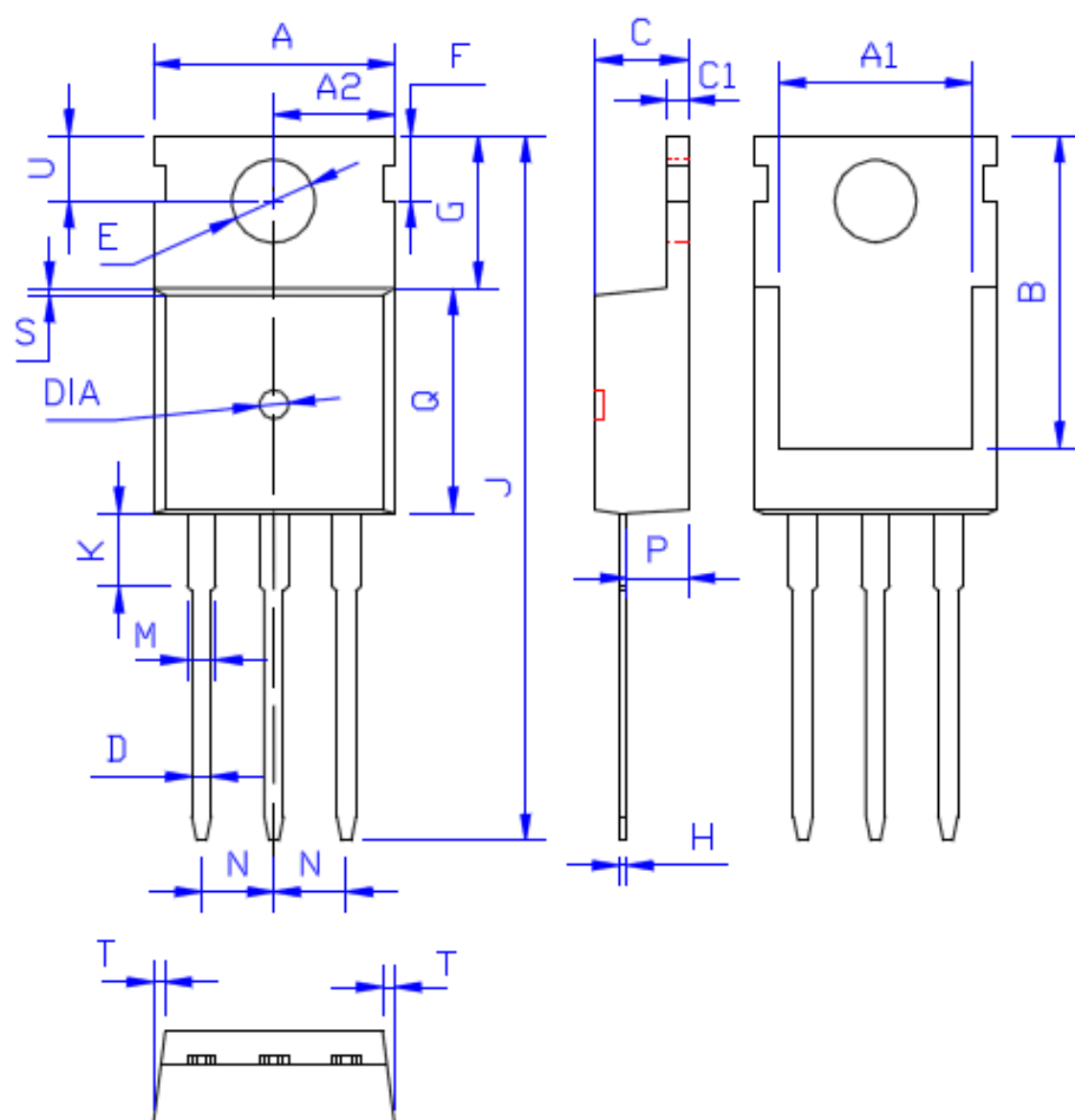
印记 Marking:



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)