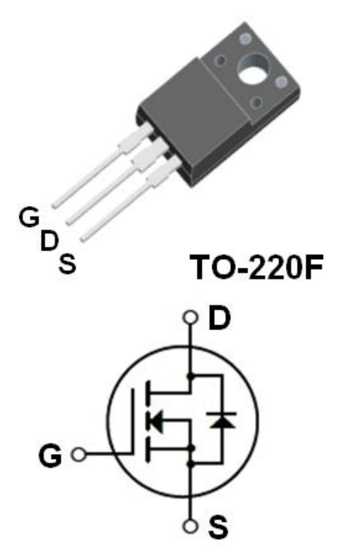
HSF80N06-S

60V N-Channel MOSFET



● **Features:**

- 80A, 60V,$R_{DS(on)(Typ)}$ =8.5mΩ@V_{GS}=10V
- Low Gate Charge
- Low C_{rss}
- 100% Avalanche Tested
- Fast Switching
- Improved dv/dt Capability

● **Application:**

- High Frequency Switching Mode Power Supply
- Active Power Factor Correction

Absolute Maximum Ratings(Tc=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	60	V
I_D	Drain Current - Continuous(Tc=25°C)	80*	A
	- Continuous(Tc=100°C)	50.6*	A
I_{DM}	Drain Current -Pulsed	240*	A
V_{GSS}	Gate-Source Voltage	±20	V
E_{AS}	Single Pulsed Avalanche Energy （Limit Reference Value） (Note5)	186	mJ
P_D	Power Dissipation(T_C =25°C)	50	W
	-Derate above 25°C	0.4	W/°C
Tj	Operating Junction Temperature	150	°C
Tstg	Storage Temperature Range	-55 to+150	°C

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{θJC}$	Thermal Resistance,Junction to Case (Note2)	2.5	°C /W

Electrical Characteristics(Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Conditons	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain-source Breakdown Voltage	V_{GS}=0V ,I_D=250μA	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V	--	--	1	μA
I_{GSSF}	Gate-Body Leakage Current,Forward	V_{GS}=+20V, V_{DS}=0V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current,Reverse	V_{GS}=-20V, V_{DS}=0V	--	--	-100	nA
On Characteristics (Note3)						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	1.0	1.8	2.8	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS}=10 V, I_D=40A	--	8.5	11.0	mΩ
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS}=6 V, I_D=40A	--	10.5	14.0	mΩ
Dynamic Characteristics (Note4)						
C_{iss}	Input Capacitance	V_{DS}=30V,V_{GS}=0V, f=1.0MHz	--	1010	--	pF
C_{oss}	Output Capacitance		--	405	--	pF
C_{rss}	Reverse Transfer Capacitance		--	23	--	pF
Switching Characteristics (Note4)						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 30 V, I_D =15 A, R_G =3Ω, V_{GS}=10V	--	8.2	--	ns
t_r	Turn-On Rise Time		--	55	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	21	--	ns
t_f	Turn-Off Fall Time		--	9	--	ns
Q_g	Total Gate Charge	V_{DS} =48 V, I_D =15A, V_{GS} = 10 V	--	18.1	--	nC
Q_{gs}	Gate-Source Charge		--	6.0	--	nC
Q_{gd}	Gate-Drain Charge		--	2.9	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current (Note2)		--	--	80	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	240	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} =0V,I_S=40A (Note3)	--	--	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS} =0V, I_S=15A, d I_F /dt=100A/μs (Note3)	--	58	--	ns
Q_{rr}	Reverse Recovery Charge		--	53	--	nC

Notes:

1、Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.

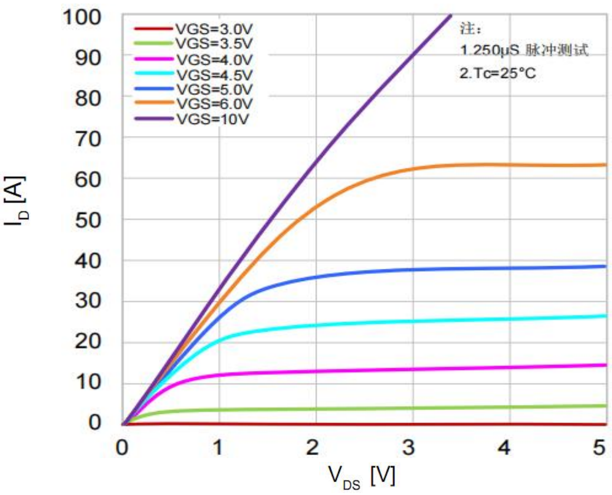
2、Surface Mounted on FR4 Board, t ≤ 10 sec.

3、Pulse Test : Pulse Width ≤300 μ s, Duty Cycle≤2%.

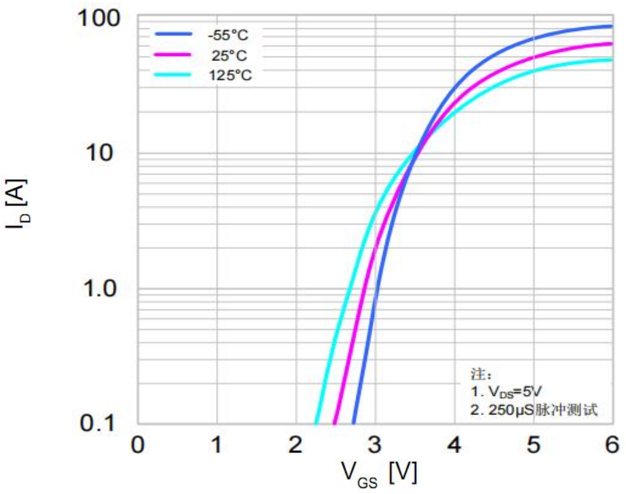
4、Guaranteed by design, not subject to production.

5、EAS condition：L = 1.0mH, I_{AS} =15A, V_{DD} = 30V, R_G = 25 Ω, Starting T_J = 25°C.

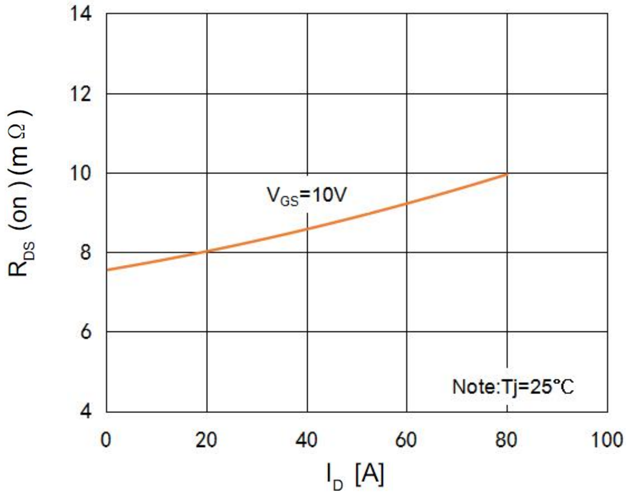
On-Regin Characteristics



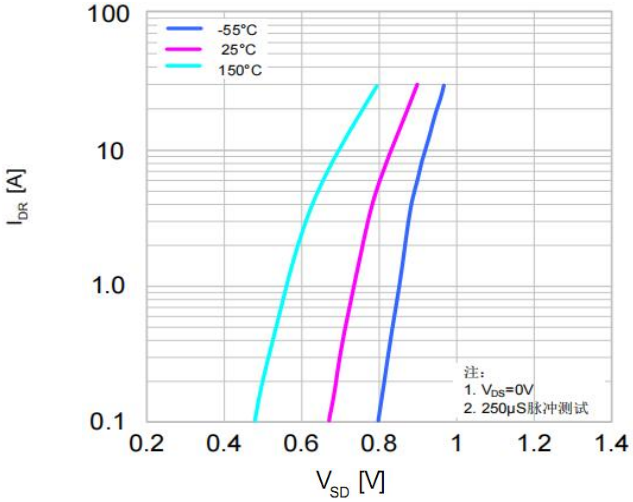
Transfer Characteristics



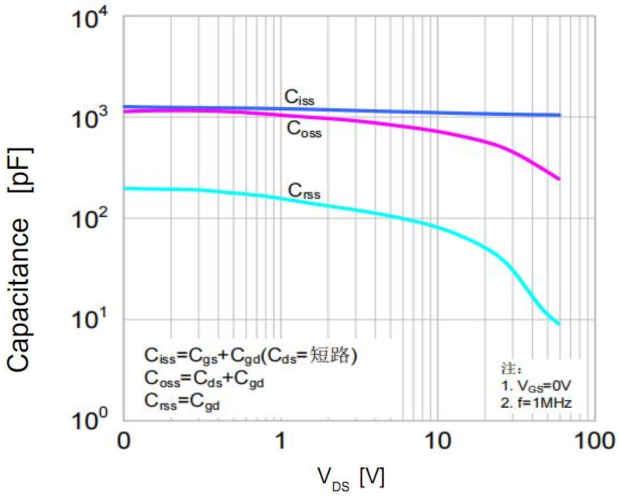
On-Resistance Variation vs. Drain Current and Gate Voltage



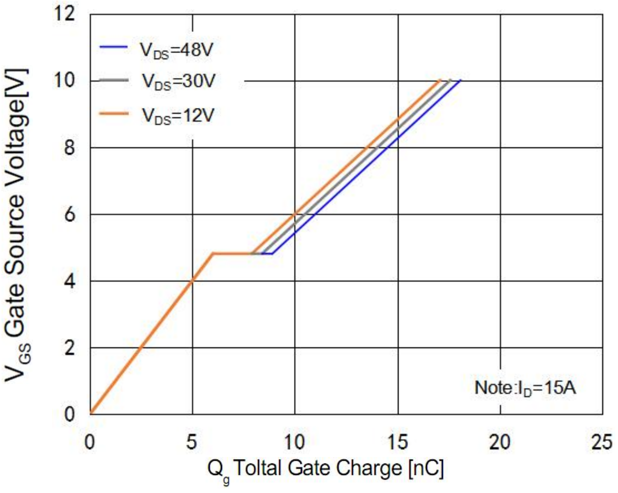
Body Diode Forward Voltage Variation vs. Source Current and Temperature



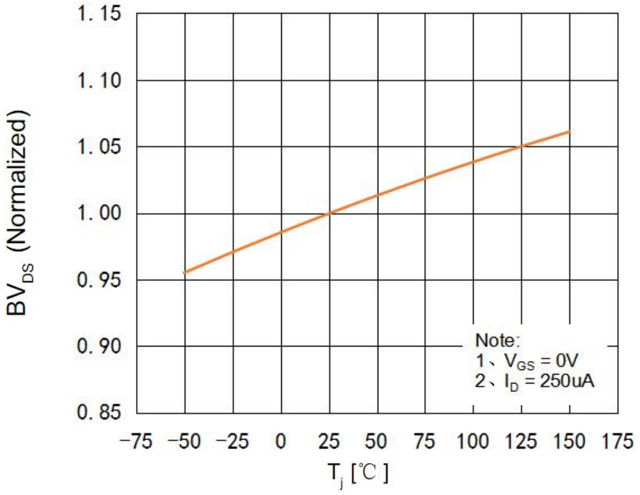
Capacitance Characteristics



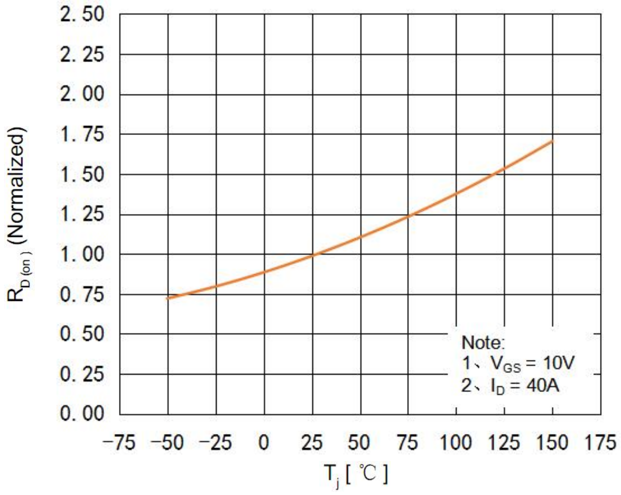
Gate Charge Characteristics



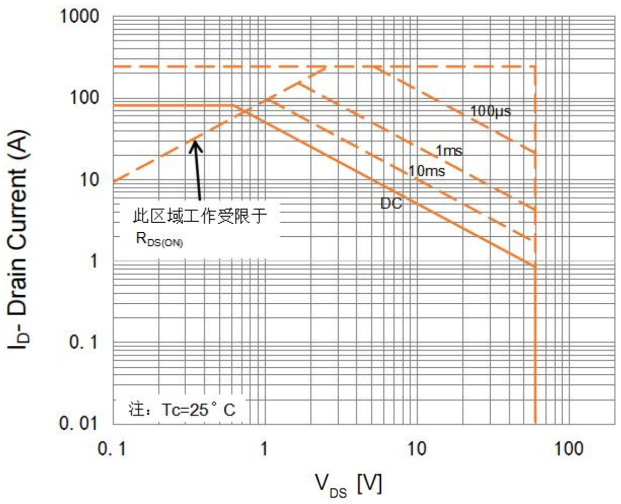
Breakdown Voltage Variation vs. Temperature



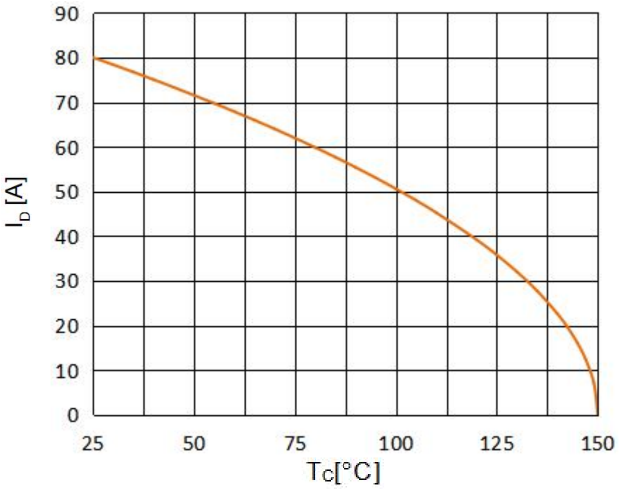
On-Resistance Variation vs. Temperature



Maximum Safe Operating Area



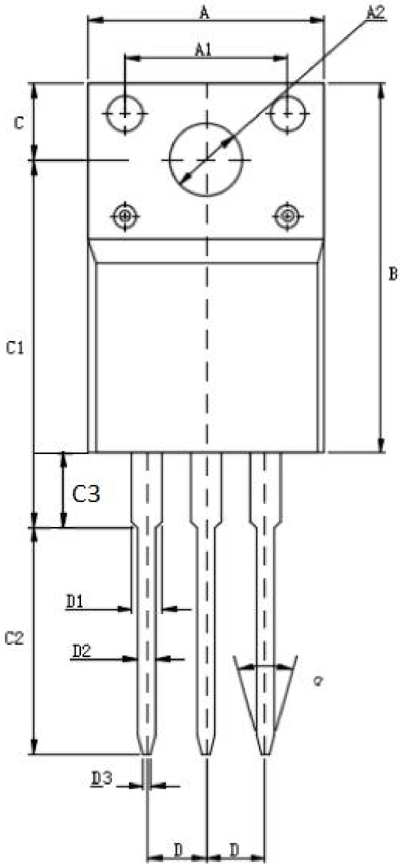
Maximum Drain Current Vs. Case Temperature

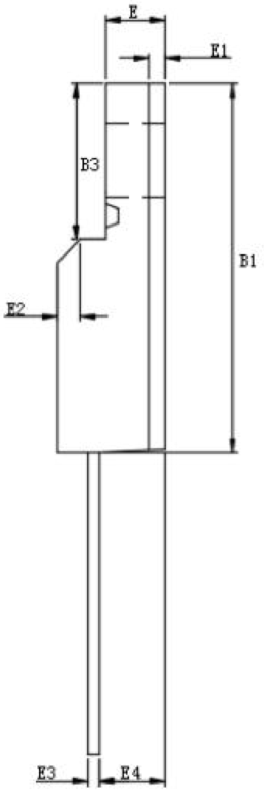


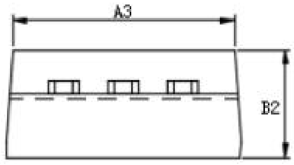
TO-220F Package Dimensions

UNIT：mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	9.80		10.60	D		2.54	
A1		7.00		D1	1.15		1.47
A2	2.90		3.40	D2	0.60		0.90
A3	9.10		9.90	D3	0.20		0.50
B1	15.40		16.40	E	2.24		2.84
B2	4.35		4.95	E1		0.70	
B3	6.00		7.40	E2		1.0 × 45°	
C	3.00		3.70	E3	0.35		0.65
C1	15.00		17.00	E4	2.30		3.30
C2	8.80		10.80	α（度）		30°	
C3	2.60		3.60				







注意事项：

1、在电路设计时请不要超过器件的最大额定值，否则会影响整机的可靠性。

2、MOSFET产品为静电敏感型器件，使用时应注意采取防静电保护措施，如佩戴防静电手环、设备接地等。

3、如需安装散热片，请注意控制扭力大小及散热片的平整度。

4、该规格书由华科公司制作，并可能不定期更改，恕不另行通知。

5、如有疑问，请及时联系我司销售代表。

版本履历表：

序号	版本号	修改时间	修改记录
1	V1.0	2023-3-28	首次发行