



HST120N12-L

120V N-Channel MOSFET

● Features:

■ 120A, 120V, $R_{DS(on)(Typ)} = 3.5m\Omega @ V_{GS}=10V$

■ Low Gate Charge

■ Low C_{rss}

■ 100% Avalanche Tested

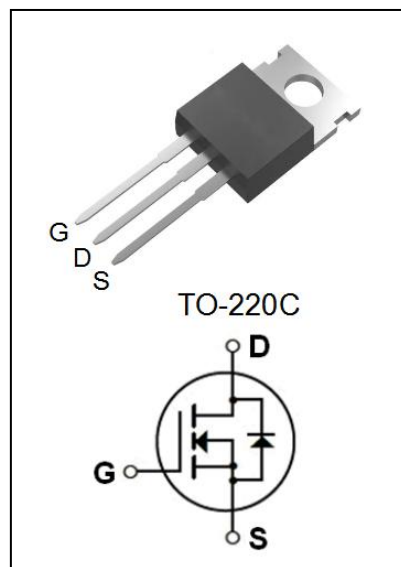
■ Fast Switching

■ Improved dv/dt Capability

● Application:

■ High Frequency Switching Mode Power Supply

■ Active Power Factor Correction



Absolute Maximum Ratings ($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	120	V
I_D	Drain Current - Continuous ($T_c=25^\circ\text{C}$, Silicon limit)	172	A
	Drain Current - Continuous ($T_c=25^\circ\text{C}$, Package limit)	120	A
	Drain Current - Continuous ($T_c=100^\circ\text{C}$, Silicon limit)	109	A
I_{DM}	Drain Current - Pulsed	480	A
V_{GSS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy (Limit Reference Value) (Note5)	462	mJ
P_D	Power Dissipation ($T_c = 25^\circ\text{C}$) -Derate above 25°C	245	W
		1.96	W/ $^\circ\text{C}$
T_j	Operating Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case (Note2)	0.51	$^\circ\text{C} / \text{W}$

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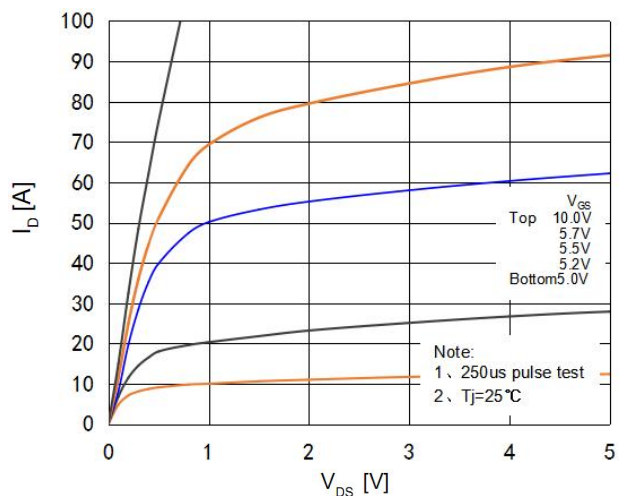
Electrical Characteristics(Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Conditons	Min	Typ	Max	Unit
Off Characteristics						
BV _{DSS}	Drain-source Breakdown Voltage	V _{GS} =0V ,I _D =250μA	120	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =120V,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	2.0	3.4	4.5	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =10 V, I _D =50A	--	3.5	4.5	mΩ
Dynamic Characteristics (Note4)						
C _{iss}	Input Capacitance	V _{DS} =50V,V _{GS} =0V, f=1.0MHz	--	6540	--	pF
C _{oss}	Output Capacitance		--	2430	--	pF
C _{rss}	Reverse Transfer Capacitance		--	83	--	pF
Switching Characteristics (Note4)						
t _{d(on)}	Turn-On Delay Time	V _{DD} = 50 V, I _D =50 A, R _G =4.7 Ω, V _{GS} =10V	--	14	--	ns
t _r	Turn-On Rise Time		--	60	--	ns
t _{d(off)}	Turn-Off Delay Time		--	41	--	ns
t _f	Turn-Off Fall Time		--	10	--	ns
Q _g	Total Gate Charge	V _{DS} = 60 V, I _D =50A, V _{GS} = 10 V	--	75	--	nC
Q _{gs}	Gate-Source Charge		--	31	--	nC
Q _{gd}	Gate-Drain Charge		--	10	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current (Note2)		--	--	120	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	480	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V,I _S =50A (Note3)	--	--	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =50A, d I _F /dt=100A/μs (Note3)	--	110	--	ns
Q _{rr}	Reverse Recovery Charge		--	180	--	nC

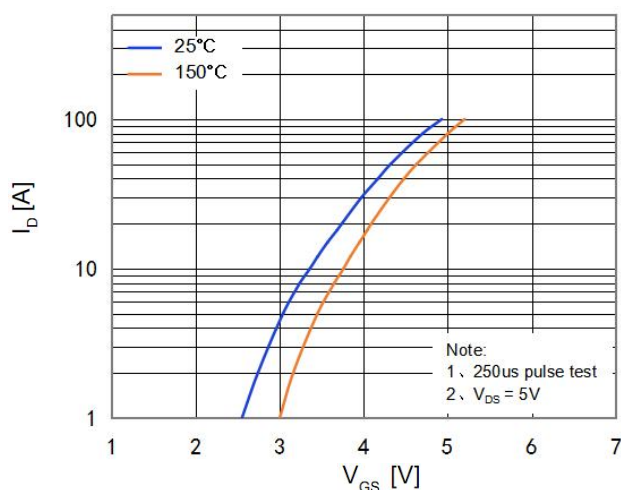
Notes:

- 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 = 0.5mH, I_{AS} =34A, V_{DD} = 60V, R_G = 25 Ω, Starting T_J = 25°C.

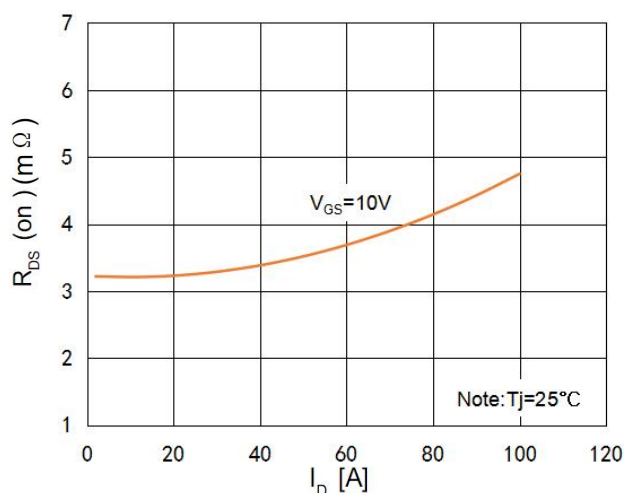
On-Regin Characteristics



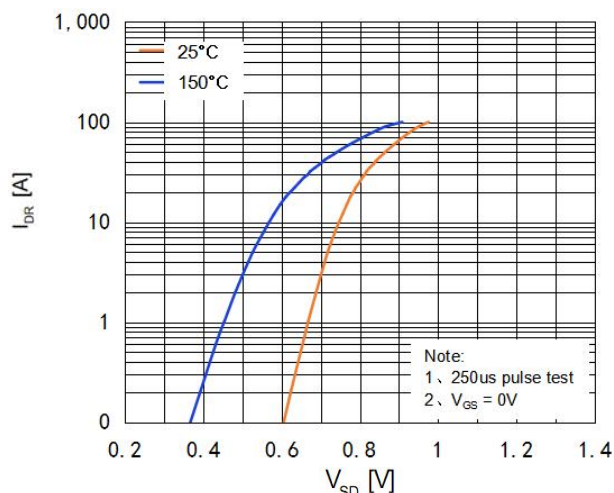
Transfer Characteristics



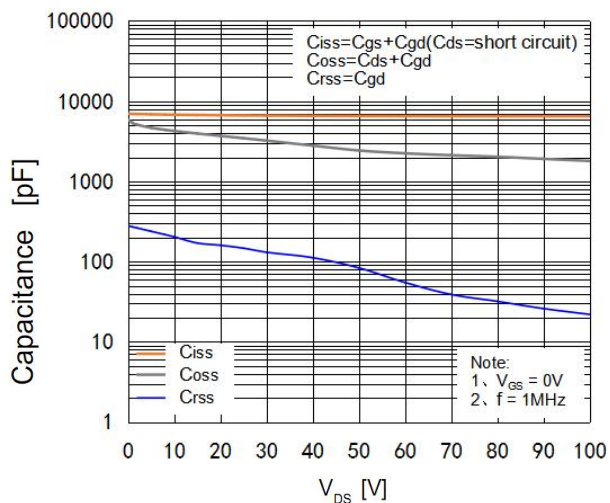
On-Resistance Variation vs. Drain Current and Gate Voltage



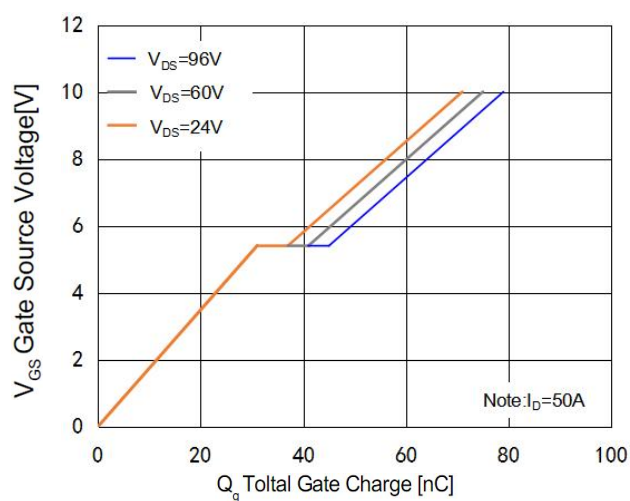
Body Diode Forward Voltage Variation vs. Source Current and Temperature



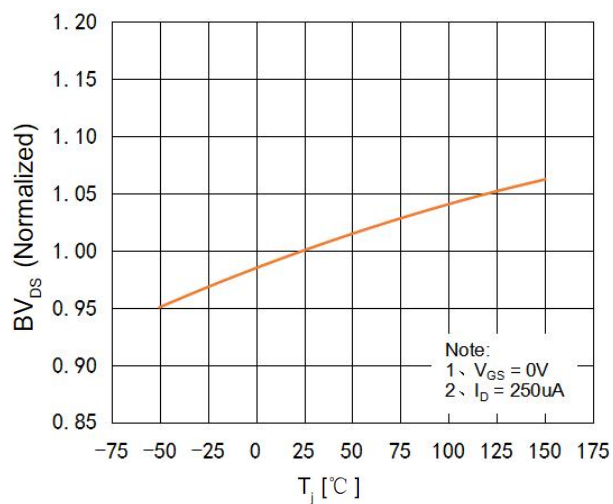
Capacitance Characteristics



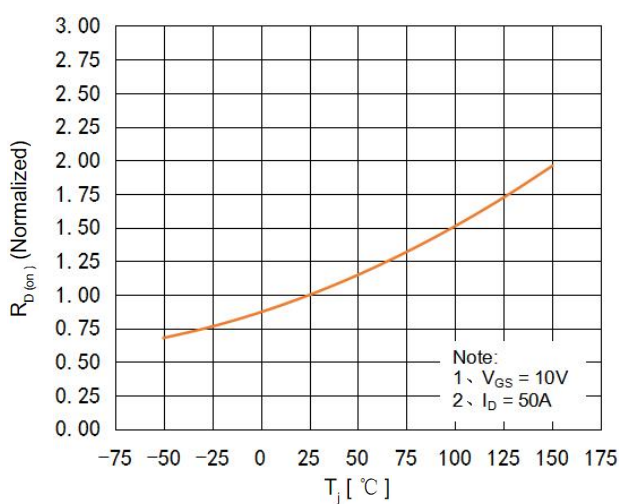
Gate Charge Characteristics



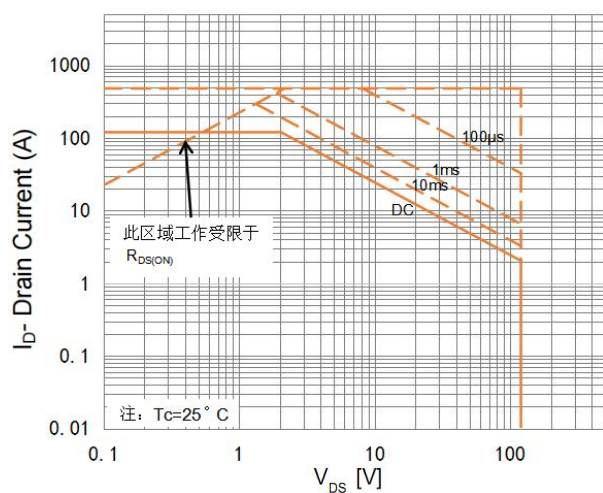
Breakdown Voltage Variation vs. Temperature



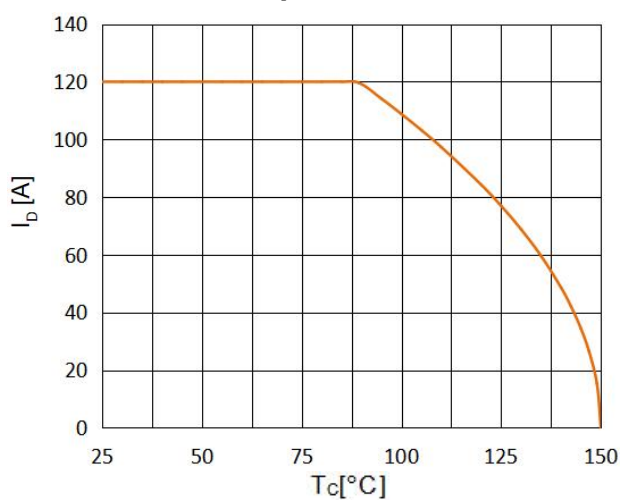
On-Resistance Variation vs. Temperature



Maximum Safe Operating Area



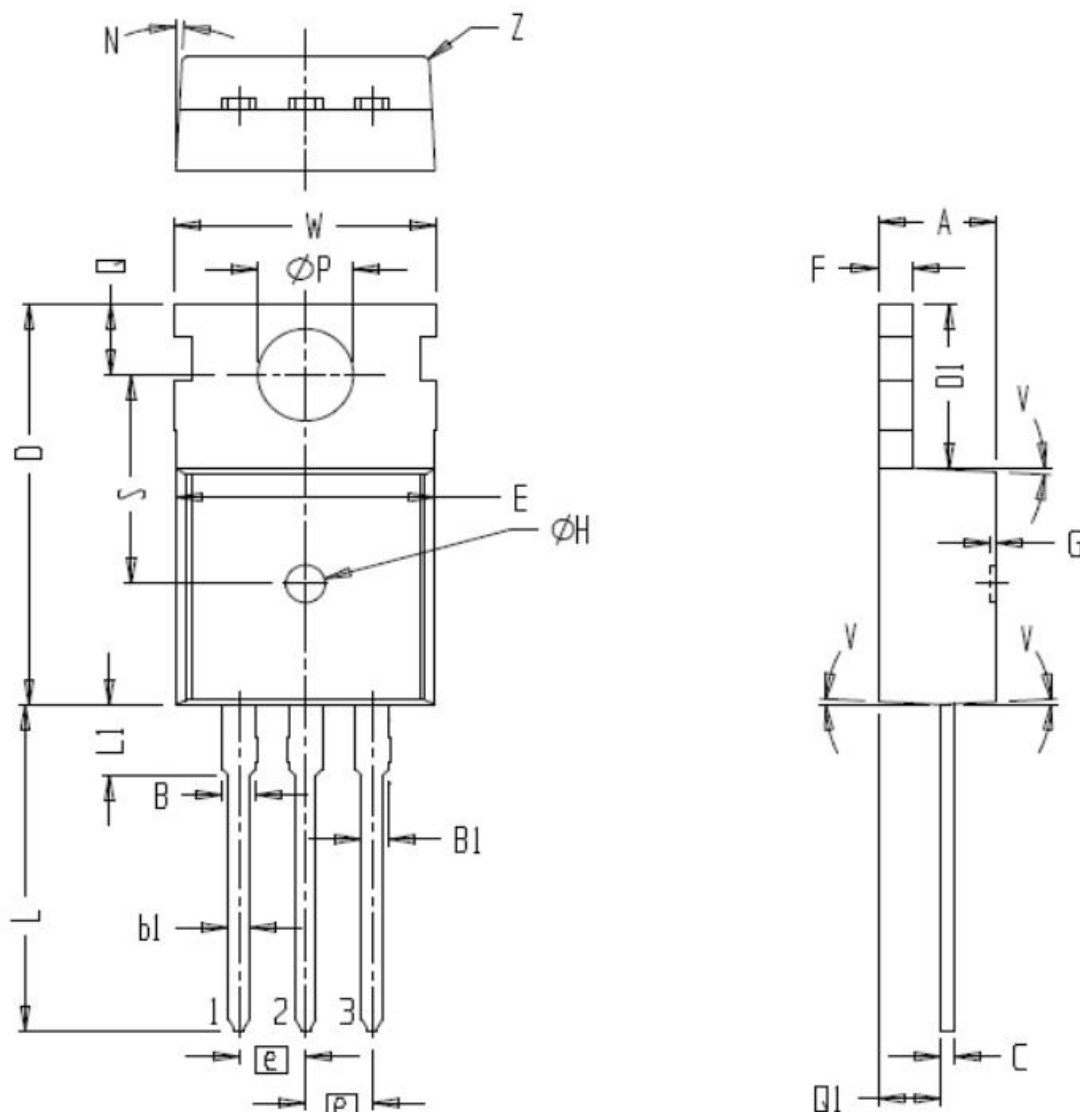
Maximum Drain Current Vs. Case Temperature



TO-220C Package Dimensions

UNIT: mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	4.00	4.40	4.80	E	9.40	9.90	10.40
B	1.17	1.32	1.47	e		2.54	
B1	0.91	1.06	1.21	F	1.15	1.30	1.45
b1	0.65	0.80	0.95	L	12.00	13.00	14.00
c	0.40	0.50	0.60	L1	2.50	3.00	3.50
D	14.90	15.90	16.90	Q	2.30	2.80	3.30
D1	6.10	6.60	7.10	Q1	1.90	2.40	2.90
W	9.50	10.00	10.50	ϕP	3.40	3.65	3.90
S		8.30		Z	0		0.20
ϕH		1.50		N		3 °	
G		0.10		V		3 °	



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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	2024-3-5	首次发行