

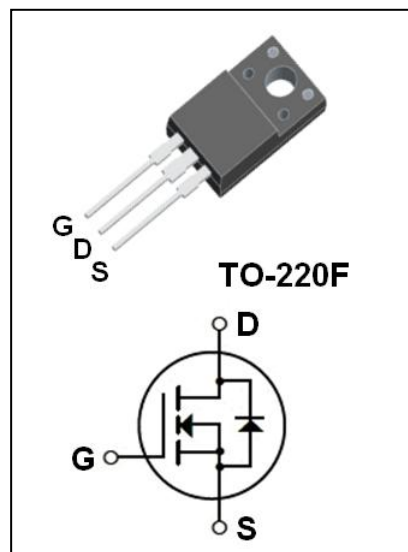


700V N-Channel Super Junction Power MOSFET

■ 13.0A, 700V, $R_{DS(on)(Typ)} = 310m\Omega @ V_{GS}=10V$

- Low Gate Charge
- Low C_{RSS}
- 100% Avalanche Tested
- Fast Switching
- Improved dv/dt Capability

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



Symbol	Parameter	Value	Unit
V _{DSS}	Drain-Source Voltage	700	V
I _D	Drain Current - Continuous(Tc=25°C) - Continuous(Tc=100°C)	13.0*	A
		8.2*	A
I _{DM}	Drain Current -Pulsed (Note1)	52*	A
V _{GSS}	Gate-Source Voltage	± 30	V
E _{AS}	Single Pulsed Avalanche Energy (Limit Reference Value) (Note2)	248	mJ
I _{AR}	Avalanche Current (Note1)	5.0	A
E _{AR}	Repetitive Avalanche Energy (Note1)	5.9	mJ
dv/dt	Peak Diode Recovery dv/dt (Note3)	8.5	V/ns
P _D	Power Dissipation(T _C =25°C) -Derate above 25°C	36	W
		0.29	W/°C
T _j	Operating Junction Temperature	150	°C
Tstg	Storage Temperature Range	-55 to+150	°C

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.47	°C /W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	80	°C /W

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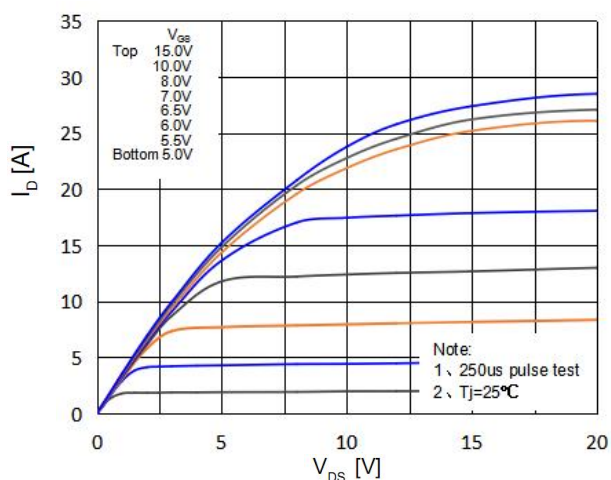
Electrical Characteristics(Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Conditons	Min	Typ	Max	Unit
Off Characteristics						
BV _{DSS}	Drain-source Breakdown Voltage	V _{GS} =0V ,I _D =250μA	700	--	--	V
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250μA (Referenced to 25°C)	--	0.70	--	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =700V,V _{GS} =0V	--	--	1	μA
		V _{DS} =560V,Tc=125°C	--	--	10	μA
I _{GSSF}	Gate-Body Leakage Current,Forward	V _{GS} =+30V, V _{DS} =0V	--	--	100	nA
I _{GSSR}	Gate-Body Leakage Current,Reverse	V _{GS} =-30V, V _{DS} =0V	--	--	-100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250μA	2.0	--	4.5	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =10 V, I _D =6.5A	--	310	350	mΩ
g _{FS}	Forward Transconductance	V _{DS} =20 V, I _D =6.5A (Note4)	--	6.3	--	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =100V,V _{GS} =0V, f=1.0MHz	--	1050	--	pF
C _{oss}	Output Capacitance		--	46	--	pF
C _{rss}	Reverse Transfer Capacitance		--	1.1	--	pF
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} = 350 V, I _D = 13 A, R _G = 25 Ω (Note4,5)	--	23	--	ns
t _r	Turn-On Rise Time		--	47	--	ns
t _{d(off)}	Turn-Off Delay Time		--	63	--	ns
t _f	Turn-Off Fall Time		--	36	--	ns
Q _g	Total Gate Charge	V _{DS} = 560 V, I _D =13.0 A, V _{GS} = 10 V (Note4,5)	--	27.1	--	nC
Q _{gs}	Gate-Source Charge		--	9.1	--	nC
Q _{gd}	Gate-Drain Charge		--	12.2	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	13.0	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	52	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V,I _S =13.0A	--	--	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =13A, d I _F /dt=100A/μs (Note4)	--	350	--	ns
Q _{rr}	Reverse Recovery Charge		--	4.8	--	μC

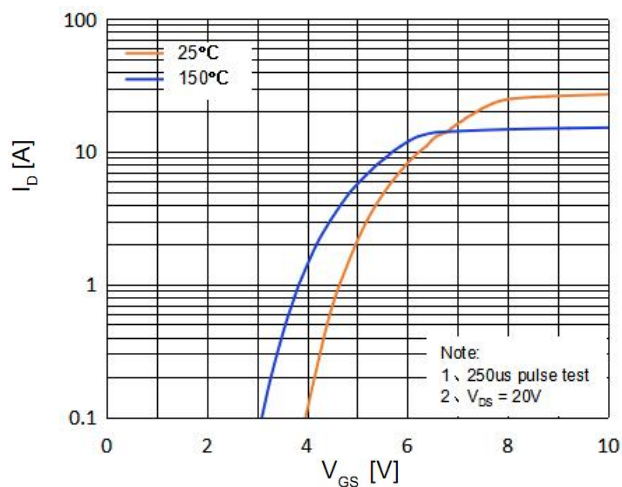
Notes:

- 1、Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.
- 2、L = 18mH, $I_{AS}=5.0A$, $V_{DD}=100V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$.
- 3、 $I_{SD}\leq 13.0A$, $di/dt\leq 200A/\mu s$, $V_{DD}\leq BV_{DSS}$, Starting $T_J=25^\circ C$.
- 4、Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 5、Essentially Independent of Operating Temperature.

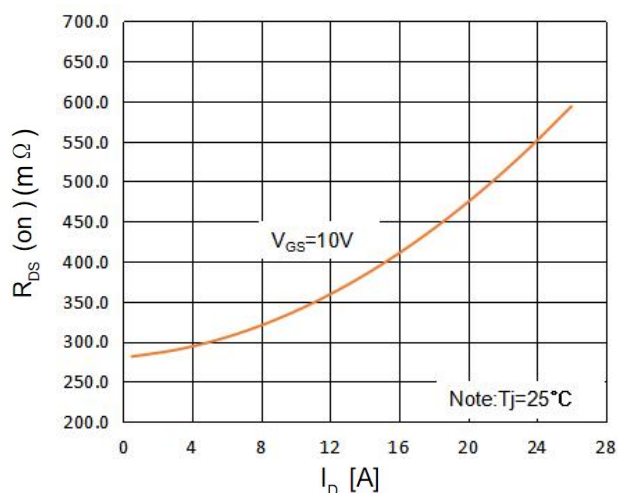
On-Regin Characteristics



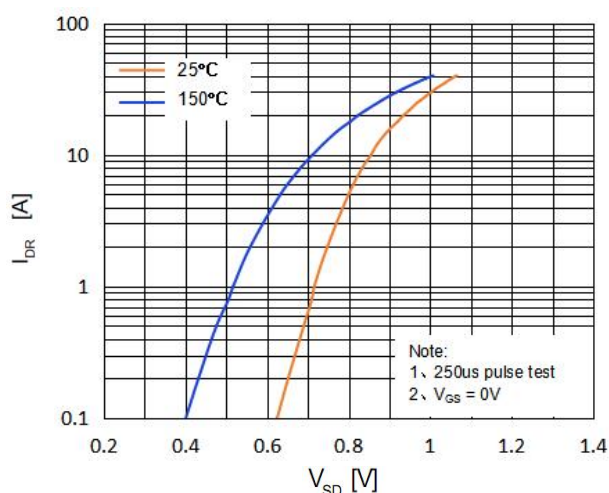
Transfer Characteristics



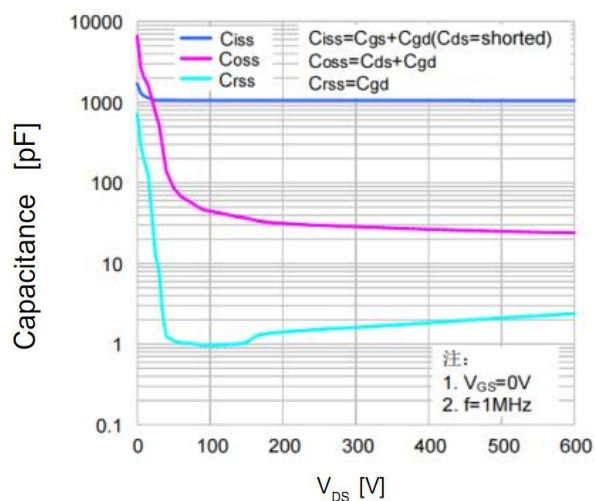
On-Resistance Variation vs. Drain Current and Gate Voltage



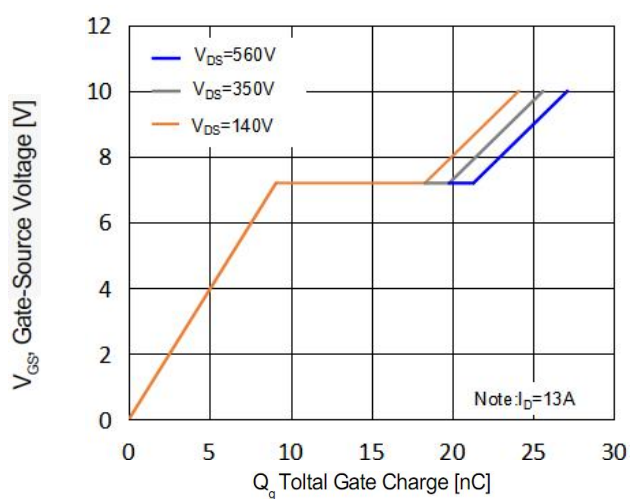
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitance Characteristics



Gate Charge Characteristics

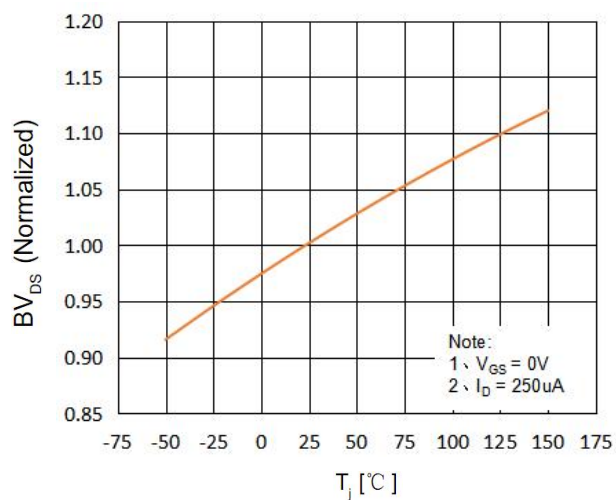




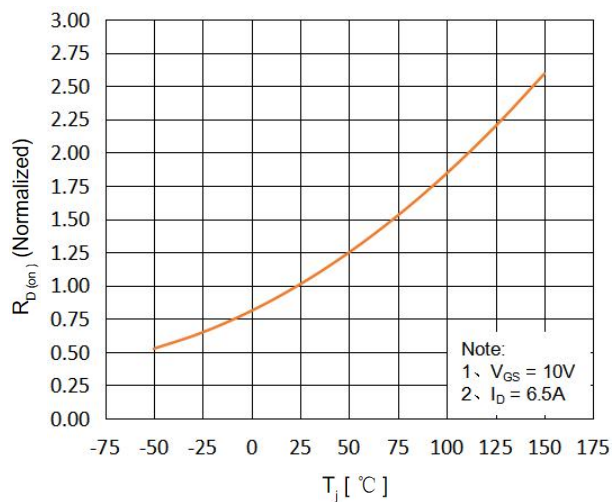
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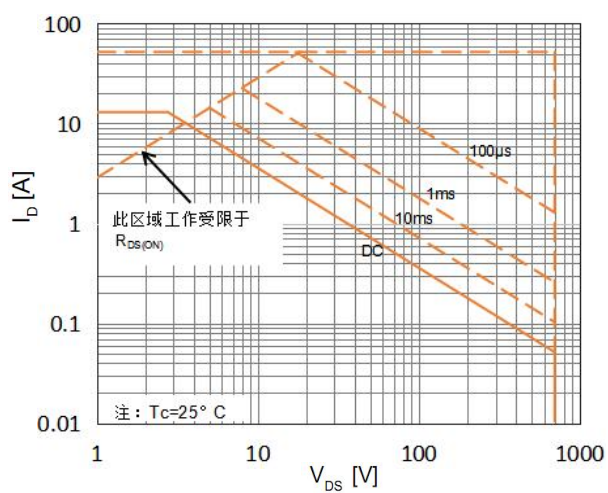
**Breakdown Voltage Variation
vs. Temperature**



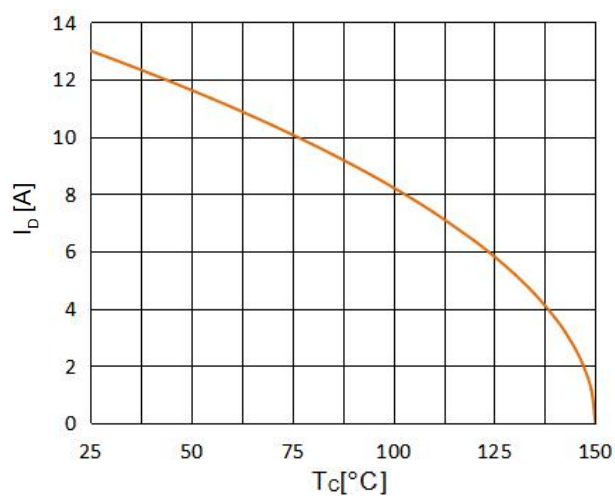
**On-Resistance Variation
vs. Temperature**



Maximum Safe Operating Area



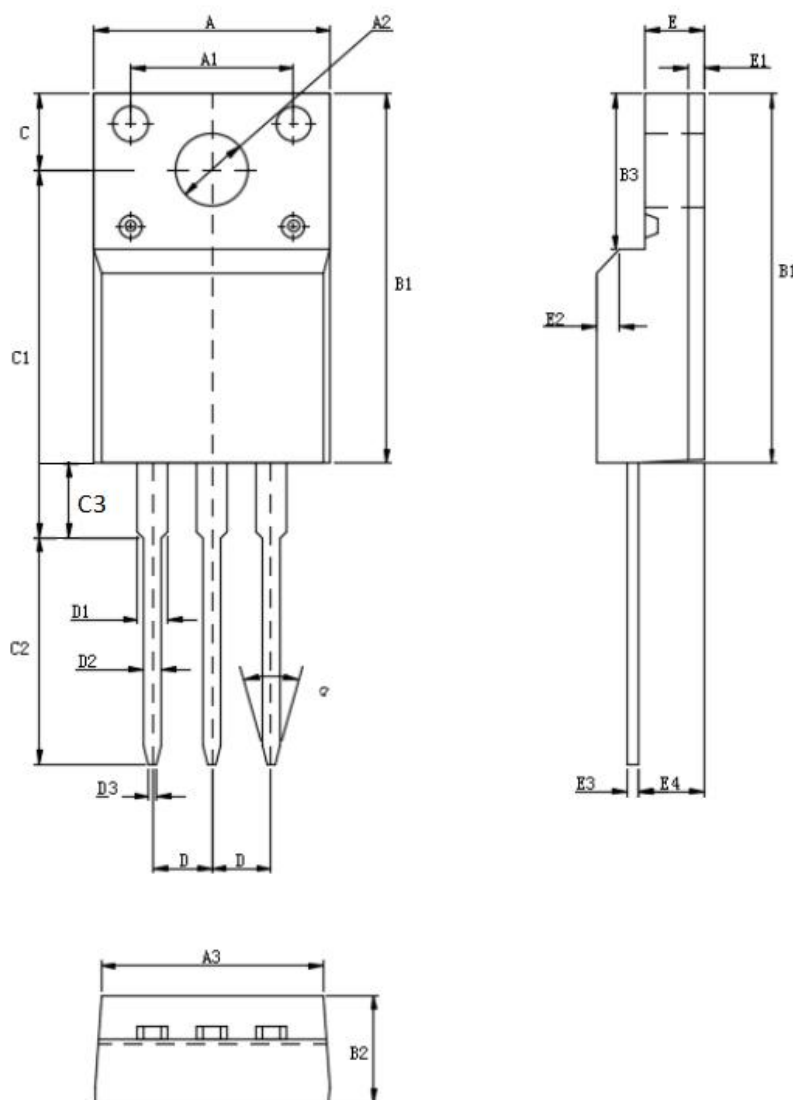
**Maximum Drain Current
Vs. Case Temperature**



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				



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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	2022-12-20	首次发行