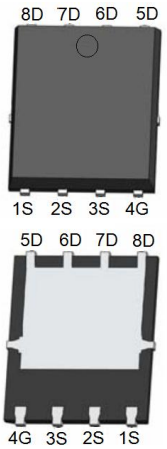
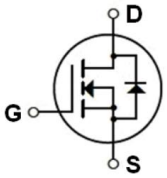
HSK50N10

100V N-Channel MOSFET



DFN5*6



● Features：

- 50A, 100V,$R_{DS(on)(Typ)}$ =13mΩ@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	100	V
I_D	Drain Current - Continuous(Tc=25°C)	50*	A
	- Continuous(Tc=100°C)	31.6*	A
I_{DM}	Drain Current -Pulsed	200*	A
V_{GSS}	Gate-Source Voltage	±20	V
E_{AS}	Single Pulsed Avalanche Energy （Limit Reference Value） (Note5)	74	mJ
P_D	Power Dissipation(T_C =25°C)	73	W
	-Derate above 25°C	0.58	W/°C
Tj	Operating Junction Temperature	150	°C
Tstg	Storage Temperature Range	-55 to+150	°C

Thermal Characteristics

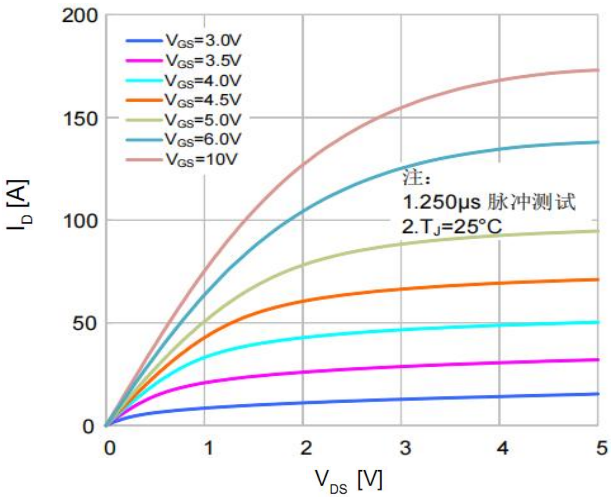
Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance,Junction to Case (Note2)	1.71	°C /W

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

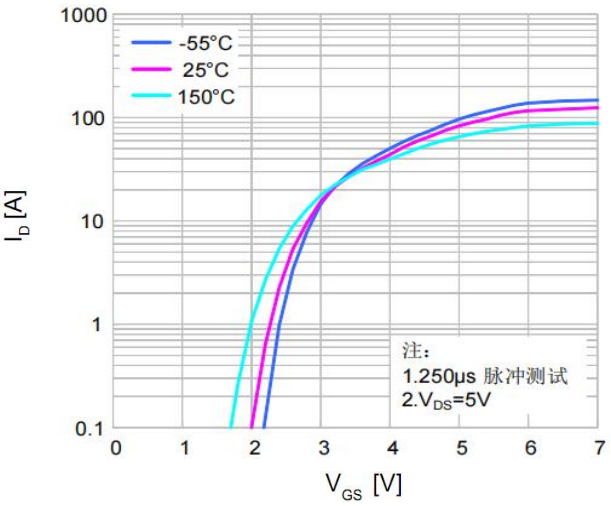
Symbol	Parameter	Test Conditons	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain-source Breakdown Voltage	V_{GS}=0V ,I_D=250μA	100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V,V_{GS}=0V	--	--	1	μA
I_{GSSF}	Gate-Body Leakage Current,Forward	V_{GS}=+20V, V_{DS}=0V	--	--	100	nA
I_{GSSR}	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	1.2	1.7	2.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS}=10 V, I_D=25A	--	13	17	mΩ
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS}=6 V, I_D=25A	--	15	20	mΩ
Dynamic Characteristics (Note4)						
C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V, f=1.0MHz	--	1280	--	pF
C_{oss}	Output Capacitance		--	510	--	pF
C_{rss}	Reverse Transfer Capacitance		--	43	--	pF
Switching Characteristics (Note4)						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 50 V, I_D =20 A, R_G =3.05 Ω, V_{GS}=10V	--	5.6	--	ns
t_r	Turn-On Rise Time		--	29	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	28	--	ns
t_f	Turn-Off Fall Time		--	9.9	--	ns
Q_g	Total Gate Charge	V_{DS} = 80 V, I_D =20A, V_{GS} = 10 V	--	24	--	nC
Q_{gs}	Gate-Source Charge		--	5.3	--	nC
Q_{gd}	Gate-Drain Charge		--	5.9	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current (Note2)		--	--	50	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	200	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} =0V,I_S=25A (Note3)	--	--	1.3	V
t_{rr}	Reverse Recovery Time	V_{GS} =0V, I_S=20A, d I_F /dt=100A/μs (Note3)	--	41	--	ns
Q_{rr}	Reverse Recovery Charge		--	42	--	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} =13A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C.

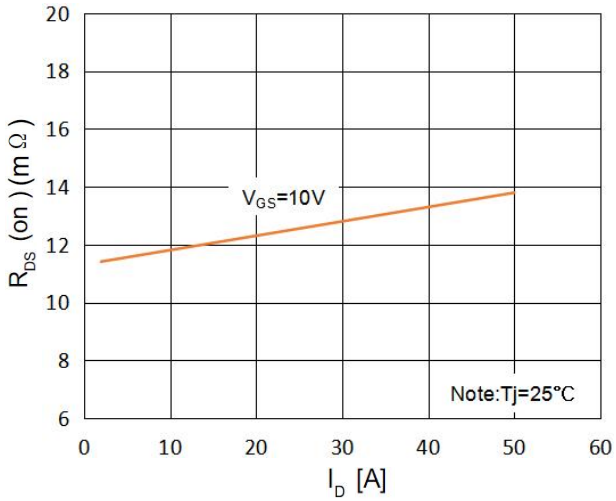
On-Regin Characteristics



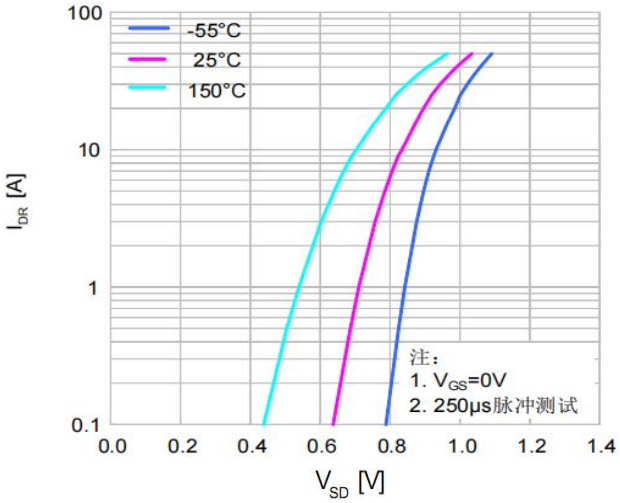
Transfer Characteristics



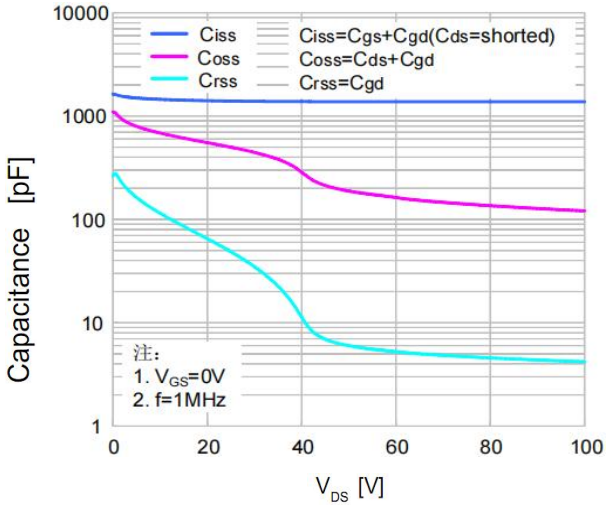
On-Resistance Variation vs. Drain Current and Gate Voltage



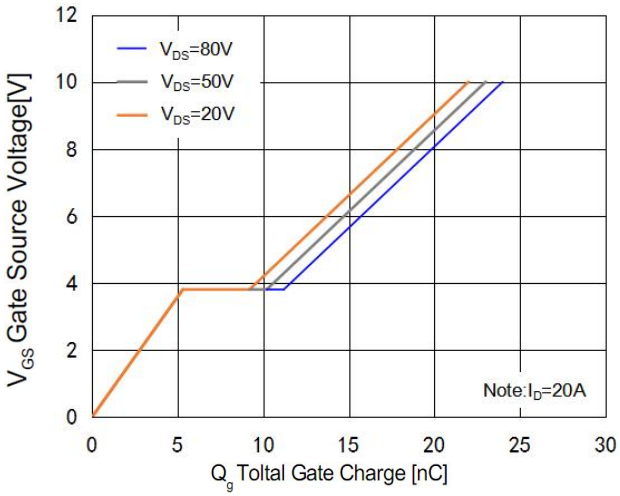
Body Diode Forward Voltage Variation vs. Source Current and Temperature



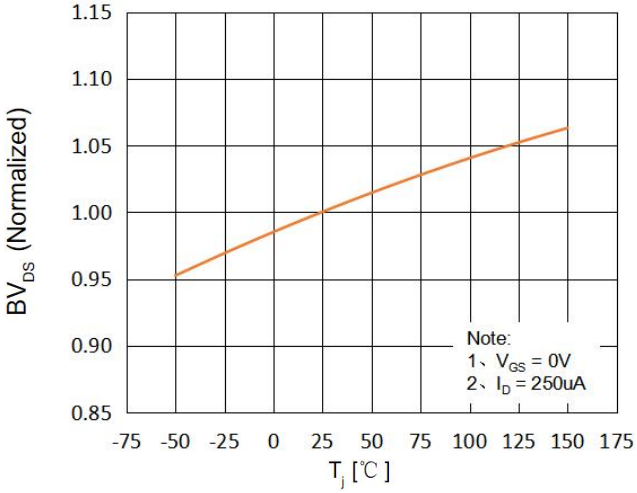
Capacitance Characteristics



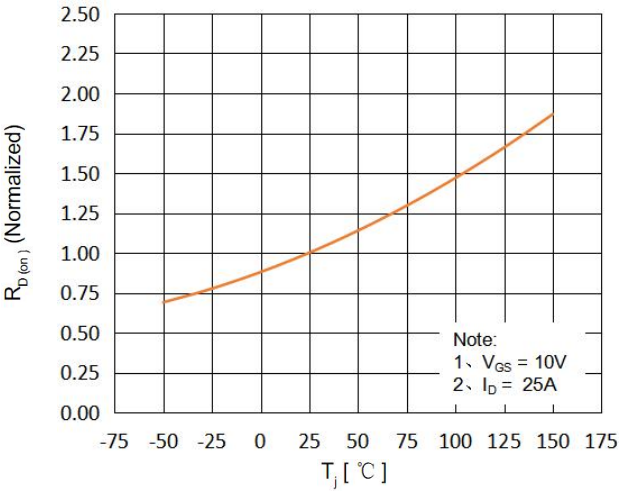
Gate Charge Characteristics



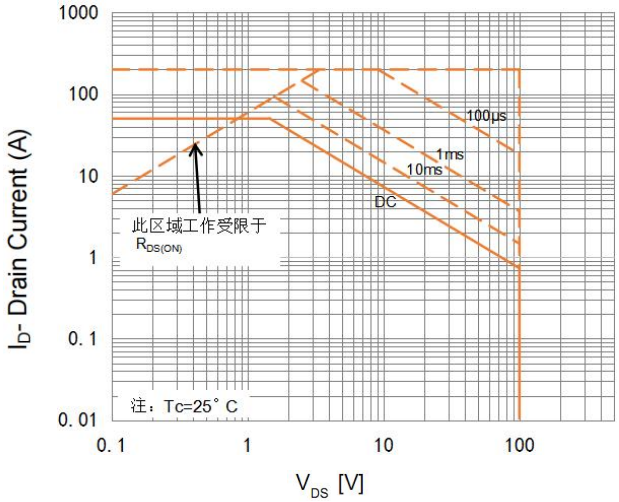
Breakdown Voltage Variation vs. Temperature



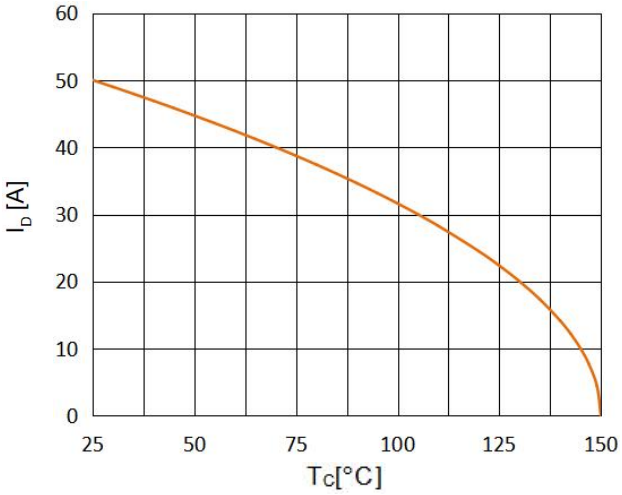
On-Resistance Variation vs. Temperature



Maximum Safe Operating Area



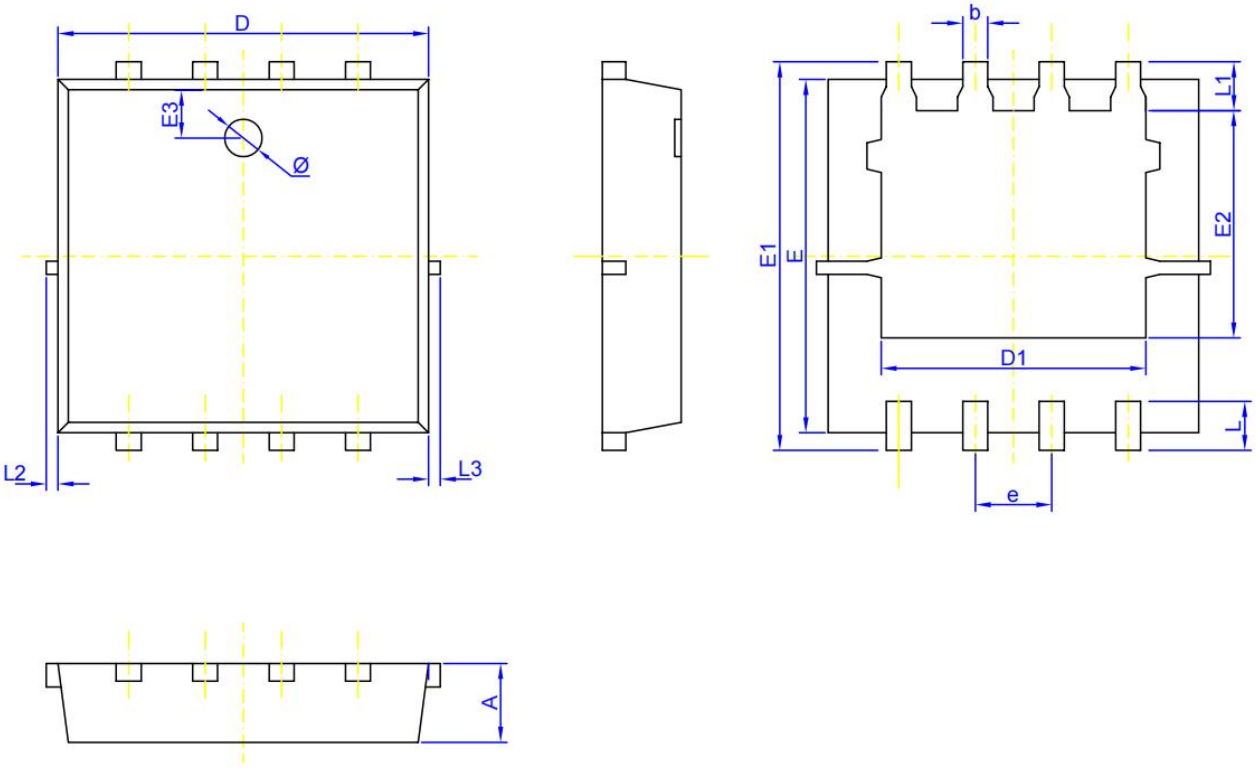
Maximum Drain Current Vs. Case Temperature



DFN5*6-8L Package Dimensions

UNIT：mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	0.90	1.00	1.10	b	0.25	0.30	0.35
D	4.95	5.05	5.15	e	1.22	1.27	1.32
D1	4.21	4.41	4.61	L	0.585	0.685	0.785
E	5.65	5.85	6.05	L1	0.525	0.625	0.725
E1	5.95	6.15	6.35	ϕ	1.00	1.20	1.40
E2	3.55	3.75	3.95	L2	0～0.10		
E3	0.90	1.10	1.30	L3	0～0.10		



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	2023-3-20	首次发行