

**-2A, -20V, P-Channel MOSFET****Features** $R_{DS(ON)} \leq 120m\Omega @ V_{GS} = -4.5V$ $R_{DS(ON)} \leq 170m\Omega @ V_{GS} = -2.5V$

Industry-standard pinout SOT-23 Package

Compatible with Existing Surface Mount Techniques

RoHS Compliant, Halogen-Free

APPLICATIONS

Load switch for portable

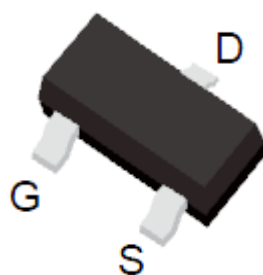
DC/DC converter

FEATURE

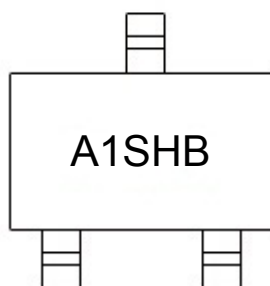
High Density Cell Design For Ultra

Low On-Resistance

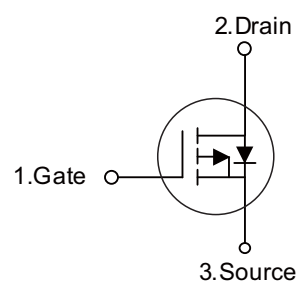
Advanced trench process technology



SOT-23 top view



Marking and pin Assignment



Schematic Diagram

Package Marking and Ordering Information

Device model	Marking	Packing	Device Package	Reel (PCS)	BOX (PCS)	Per Carton (PCS)
H2301	A1SHB	Tape and Reel	SOT-23	3000	45000	180000

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Drain-Source Voltage	V_{DSS}		-20	V
Gate-Source Voltage	V_{GSS}		± 10	
Continuous Drain Current	I_D	$T_C = 25^\circ\text{C}$	-2	A
Pulsed Drain Current ^{Note1}	I_{DM}	$T_C = 25^\circ\text{C}$	-10	
Power Dissipation	P_D	$T_A = 75^\circ\text{C}$	0.7	W
Operating and Storage Temperature	T_J, T_{stg}		-55 to +150	$^\circ\text{C}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)**Off Characteristic**

Gate-source leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$	--	--	± 100	nA
-----------------------------	-----------	-----------------------------	----	----	-----------	----

On Characteristics

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Drain-Source on-Resistance ^{Note3}	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-2A$	--	120	135	m Ω
		$V_{GS}=-2.5V, I_D=-1.8A$	--	140	170	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	-0.4	-0.7	-1	V
Forward Transconductance ¹	g_{FS}	$V_{DS}=-5V, I_D=-2A$	4	--	--	S

Dynamic Characteristics

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$V_{GS}=-0V$ $V_{DS}=-10V$ $f=1.0MHz$	--	190	--	pF
Output capacitance	C_{oss}		--	25	--	
Reverse transfer capacitance	C_{rss}		--	25	--	
Gate to source charge	Q_{gs}	$V_{DS}=-10V$ $I_D=-2.0A$ $V_{GS}=-4.5V$	--	3.0	--	nC
Gate to drain charge	Q_{gd}		--	0.5	--	
Gate charge total	Q_g		--	0.8	--	

Switching Characteristics

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=-10V$ $V_{GS}=-4.5V$ $I_D=-2A$ $R_L=5\Omega$ $R_G=3\Omega$	--	10	--	nS
Rise time	t_r		--	5	--	
Turn-off delay time	$t_{d(off)}$		--	21	--	
Fall time	t_f		--	7	--	

Drain-Source Diode Characteristics and Maximum Ratings

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Maximum Continuous Drain to Source Diode Forward Current	I_S	$T_C=25^{\circ}\text{C}$	--	--	-2.0	A
Drain to Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-2A$	--	--	-1.2	V

Notes:

- 1、Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2、PulseTest: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 3、Repetitive rating: pulse width limited by max. junction temperature.
- 4、Surface mounted on 1 in square Cu board.



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

FIG-1: Power Dissipation

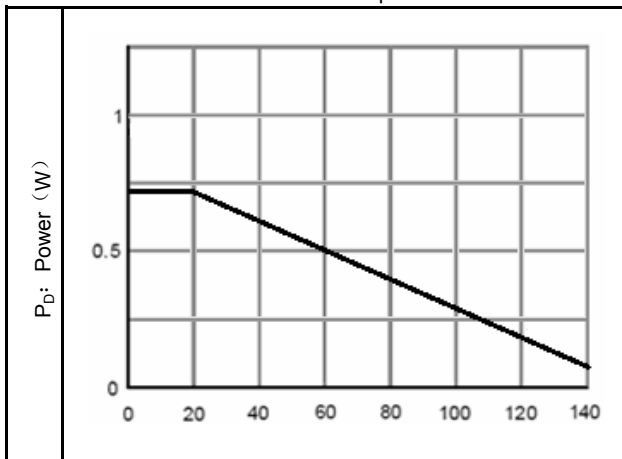
 T_J Junction Temperature (°C)

FIG-2: Drain Current

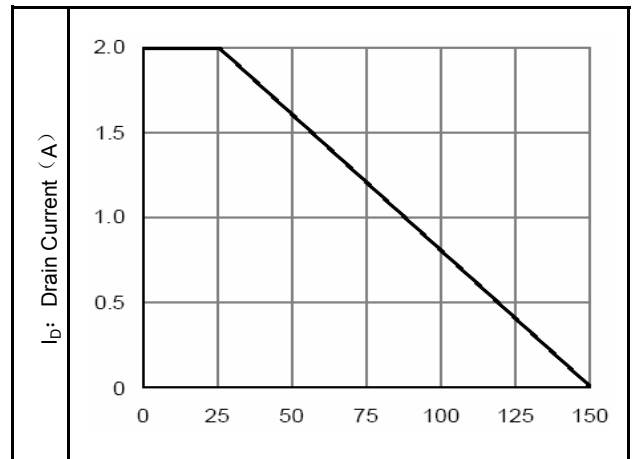
 T_J Junction Temperature (°C)

FIG-3: Output Characteristics

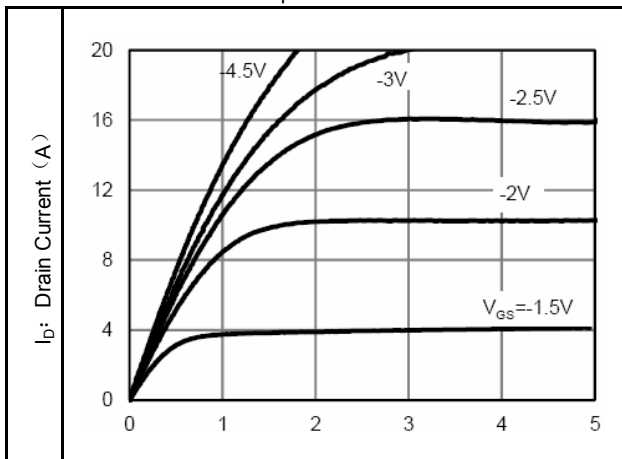
 V_{DS} : Drain-Source Voltage (V)

FIG-4: Drain-Source On-Resistance

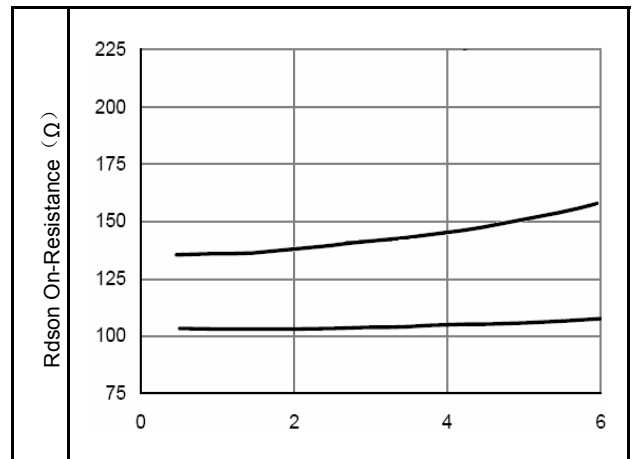
 I_D : Drain Current (A)

FIG-5: Transfer Characteristics

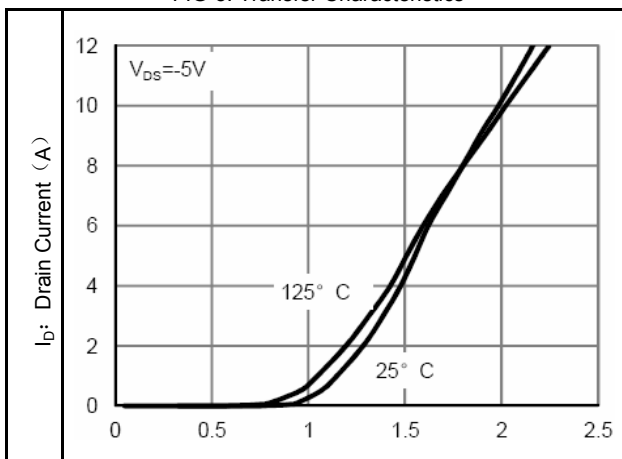
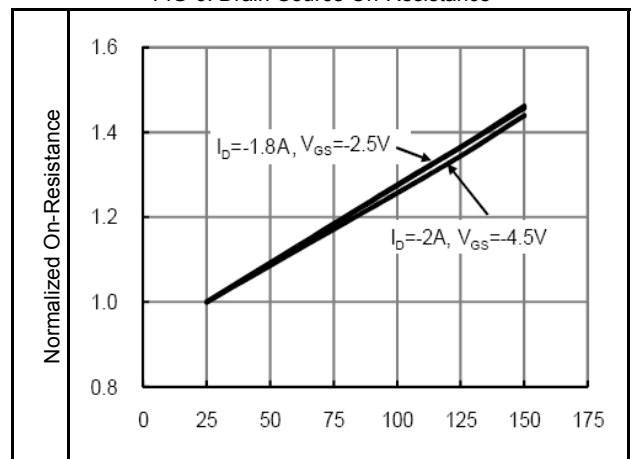
 V_{GS} : Gate-Source Voltage (V)

FIG-6: Drain-Source On-Resistance

 T_J : Junction Temperature (°C)



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

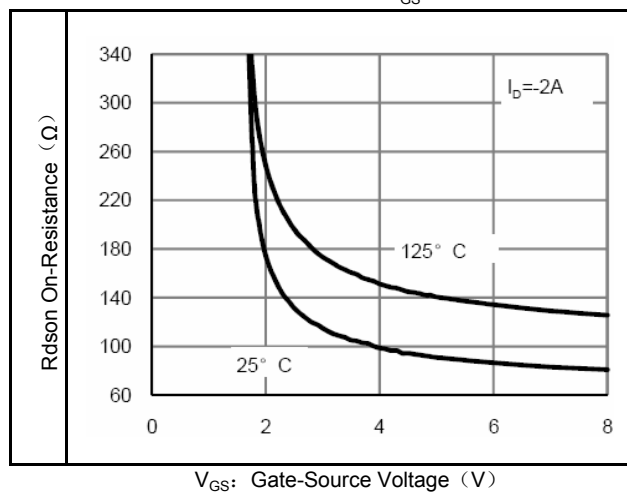
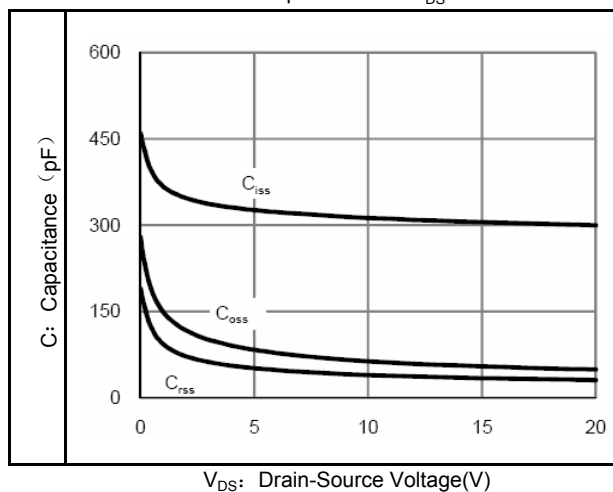
FIG-7: $R_{DS(on)}$ vs V_{GS} FIG-8: Capacitance vs V_{DS} 

FIG-9: Gate Charge

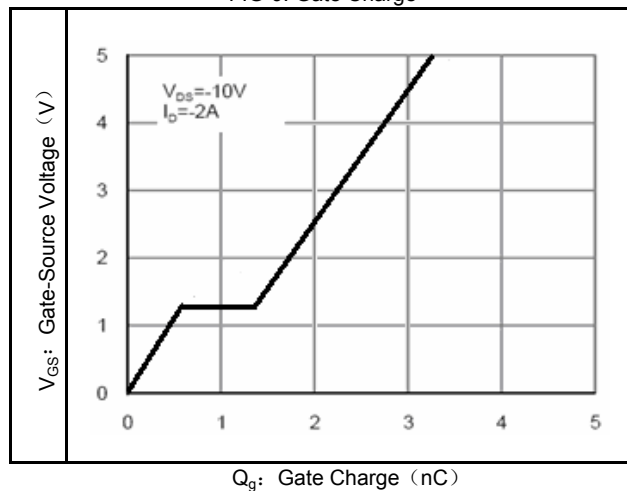


FIG-10: Source- Drain Diode Forward

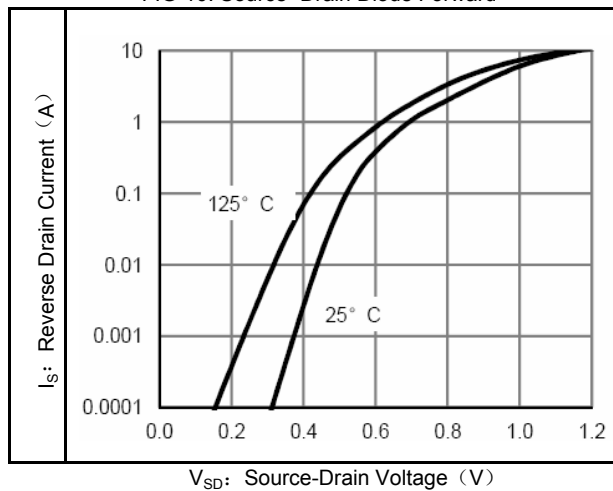
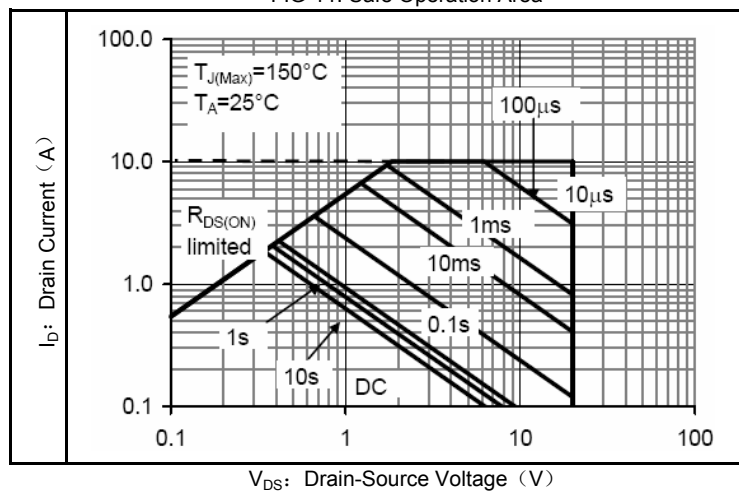


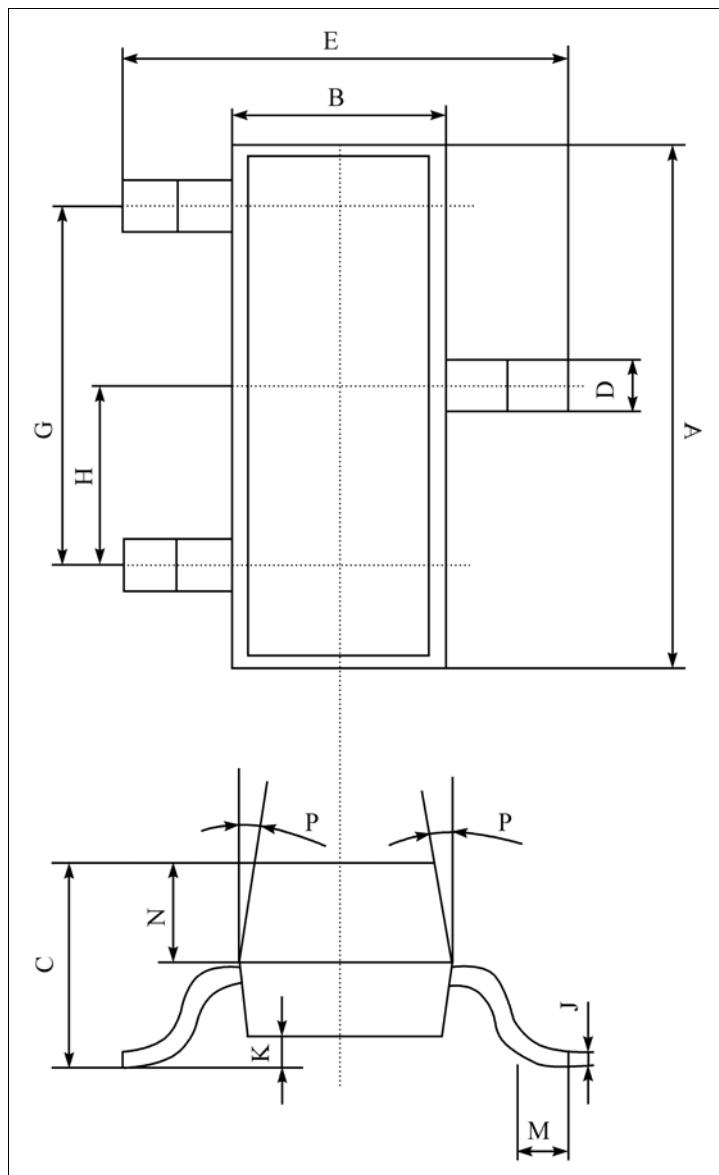
FIG-11: Safe Operation Area





SOT-23-3L PACKAGE OUTLINE DIMENSIONS

单位 (UNIT) : mm

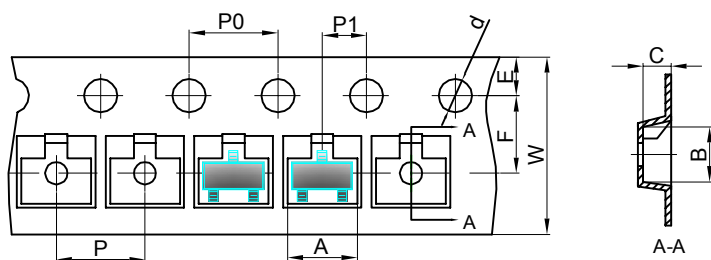


序号	数值及公差
A	2.90±0.10
B	1.30±0.10
C	1.00±0.10
D	0.40±0.10
E	2.40±0.20
G	1.90±0.10
H	0.95±0.05
J	0.13±0.05
K	0.00-0.10
M	≥0.20
N	0.60±0.10
P	7±2°

Packing
SOT-23 包装规格
SMD片式表面贴封装
包装方式: 载带卷盘包装
Tape & Reel, 3Kpcs/Reel
每卷数量3000只 (3Kpcs/Reel)
每盒数量45000只 (45Kpcs/BOX)
每箱数量180000只 (180Kpcs/Cartons)

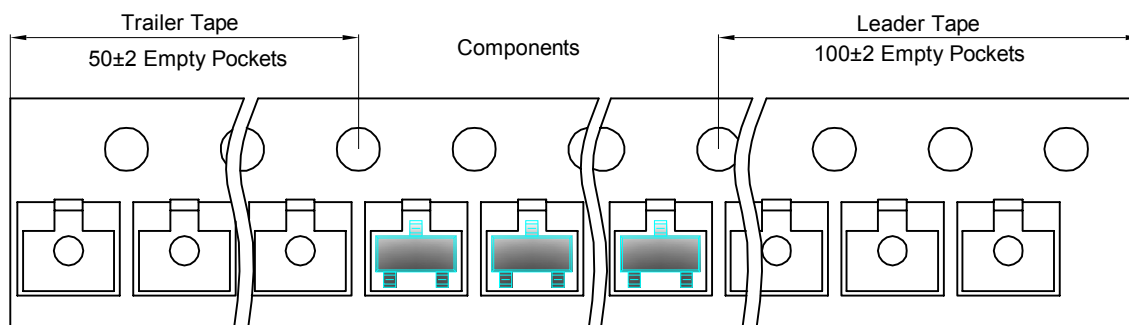


SOT-23 Tape and reel

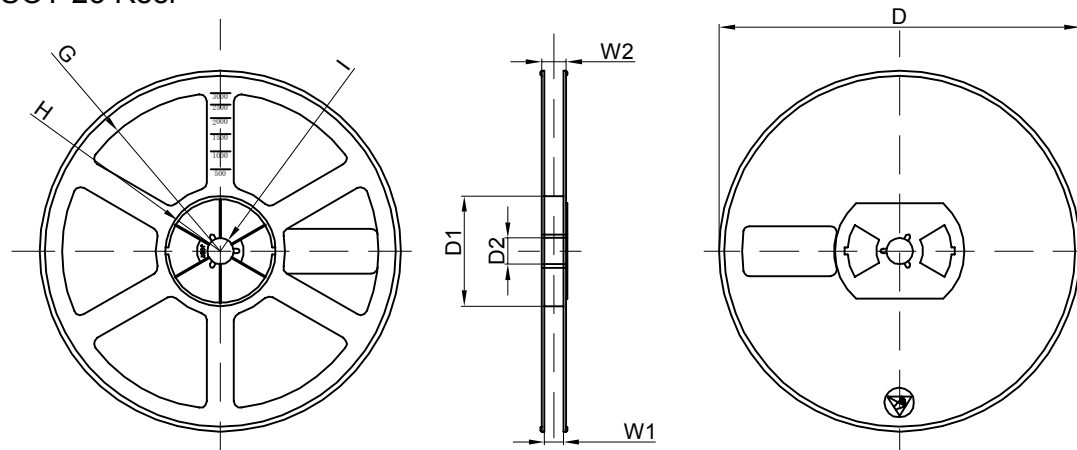


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer



SOT-23 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	45,000 pcs	192×192×193	180,000 pcs	404×404×214	



Manufacturers version information

2021-02-24 , HAOHAI™ Product Data-1.0

2023-04-27 , HAOHAI™ Product Data-1.1



WARN, Letters, patterns, are officially registered my trademark counterfeiting, theft are all violations, violators will be held liable !

SHENZHEN HAOHAI ELECTRONICS CO., LTD.

Room 404-405, 4th floor, Esun Creative Technology Building, No.22,
Jia'an South Road, Bao'an District, Shenzhen, Guangdong Province, China

TEL: +86-755-29955080、29955081、29955082、29955083

FAX: +86-755-27801767

<http://www.szhhe.com>

E-mail: kkg@kkg.com.cn

<http://www.kkg.com.cn>