



ZHEJIANG UNIÜ-NE Technology CO., LTD

浙江宇力微新能源科技有限公司



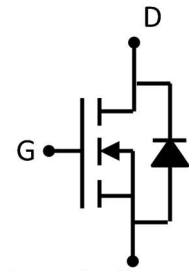
## APG042N01D Data Sheet

V 1.1

版权归浙江宇力微新能源科技有限公司

## Feature

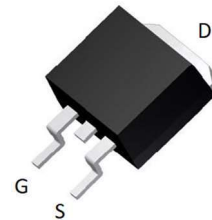
- 100V,145A  
 $R_{DS(ON)} < 4.2m\Omega @ V_{GS}=10V$
- Advanced Trench Power MOSFET
- Provide Excellent  $R_{DS(ON)}$  And Low Gate Charge



Schematic diggram

## Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch
- Rectifier



TO-263 top view

## Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G042N01D	APG042N01D	TO-263		-	800

## ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_c = 25^\circ\text{C}$ )	$I_D$	145	A
Continuous Drain Current ( $T_c = 100^\circ\text{C}$ )	$I_D$	105	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	380	A
Single Pulsed Avalanche Energy <sup>(2)</sup>	$E_{AS}$	660	mJ
Power Dissipation	$P_D$	215	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.44	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

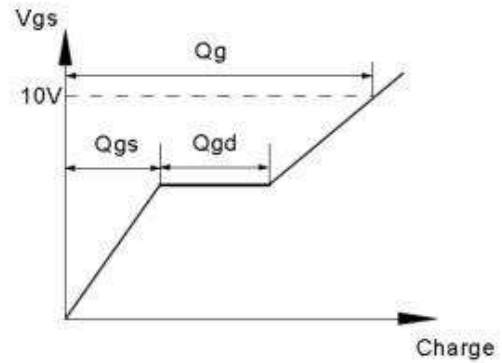
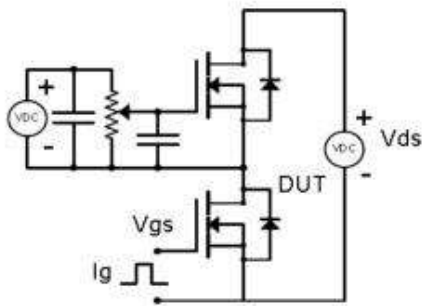
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	100	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	-	-	1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±100	nA
Gate threshold voltage <sup>(3)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2	3	4	V
Drain-source on-resistance <sup>(3)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 70A	-	3.7	4.2	mΩ
Forward tranconductance <sup>(3)</sup>	g <sub>FS</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 70A	-	122	-	S
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1MHz	-	5678	-	pF
Output Capacitance	C <sub>oss</sub>		-	673	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	27	-	
<b>Switching characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 50V, I <sub>D</sub> = 70A, V <sub>GS</sub> = 10V, R <sub>G</sub> = 25Ω	-	25	-	ns
Turn-on rise time	t <sub>r</sub>		-	33	-	
Turn-off delay time	t <sub>d(off)</sub>		-	37	-	
Turn-off fall time	t <sub>f</sub>		-	18	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 50V, I <sub>D</sub> = 70A, V <sub>GS</sub> = 10V	-	48.5	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	2	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	32	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(3)</sup>	V <sub>DS</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 140A	-	-	1.2	V
Diode Forward current <sup>(4)</sup>	I <sub>S</sub>		-	-	140	A
Reverse recovery time	T <sub>rr</sub>	I <sub>S</sub> = 70A, V <sub>GS</sub> = 0V, dI <sub>F</sub> /dt = 100A/us		71		ns
Reverse recovery charge	Q <sub>rr</sub>	I <sub>S</sub> = 70A, V <sub>GS</sub> = 0V, dI <sub>F</sub> /dt = 100A/us		144		nC

**Notes:**

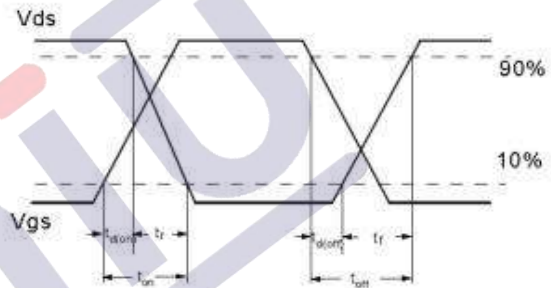
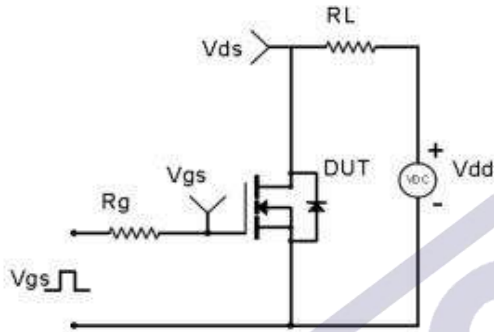
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: T<sub>J</sub> = 25°C, V<sub>DD</sub> = 50V, R<sub>G</sub> = 20 Ω, L = 0.5mH
3. Pulse Test: pulse width ≤ 300μs, duty cycle ≤ 2%
4. Surface Mounted on FR4 Board, t ≤ 10 sec

**Test Circuit & Waveform**

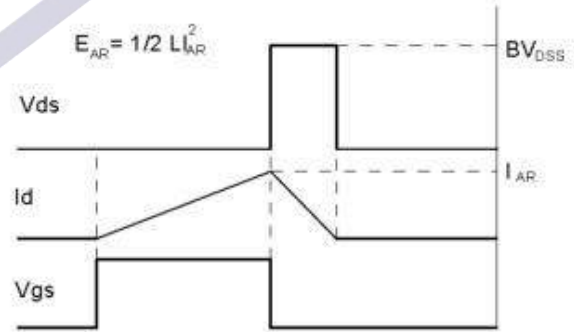
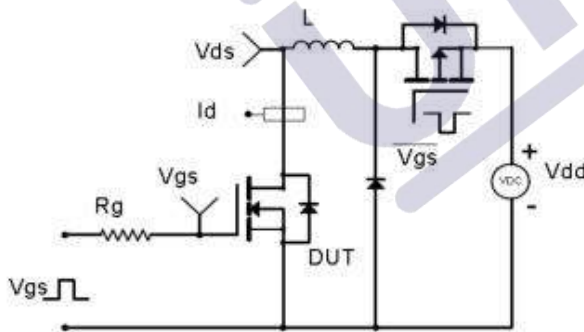
Gate Charge Test Circuit & Waveform



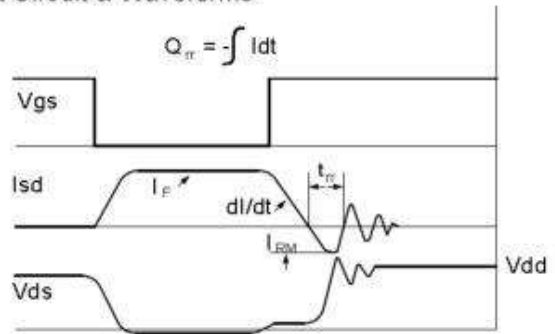
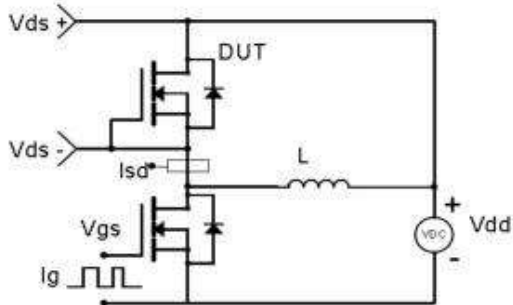
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Electronic and Thermal Characteristics

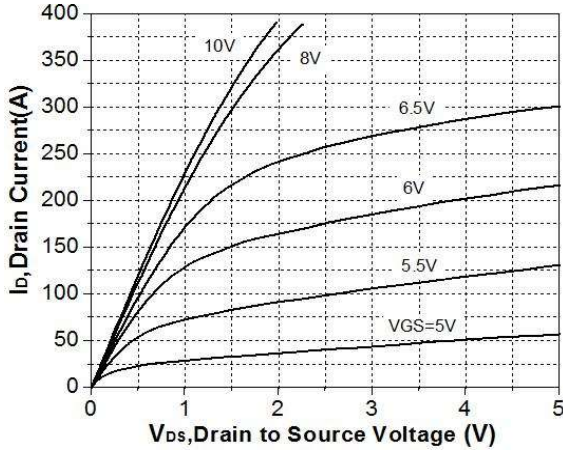


Figure 1. On-Region Characteristics

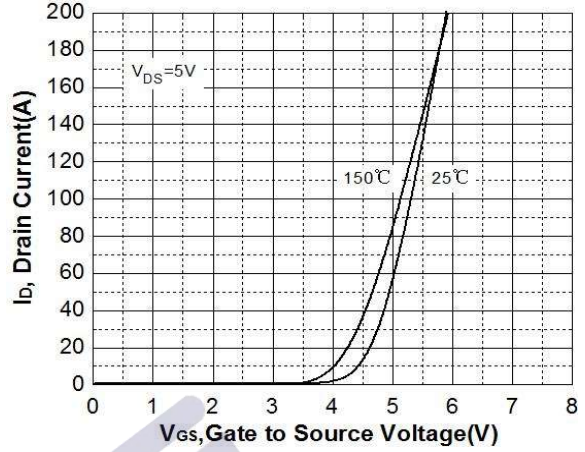


Figure 2. Transfer Characteristics

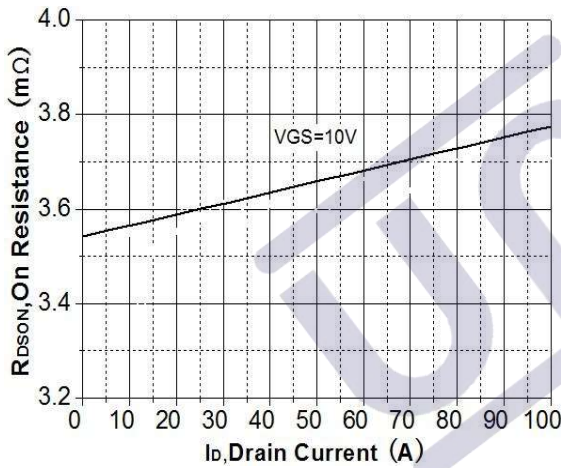


Figure 3. On-Resistance Variation vs Drain Current

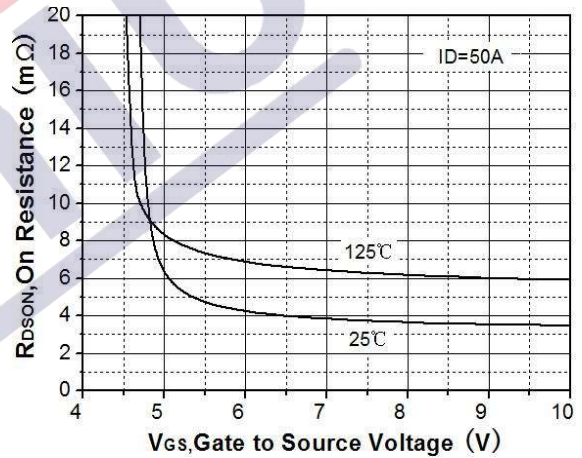


Figure 4. On-Resistance Vs Gate to Source Voltage

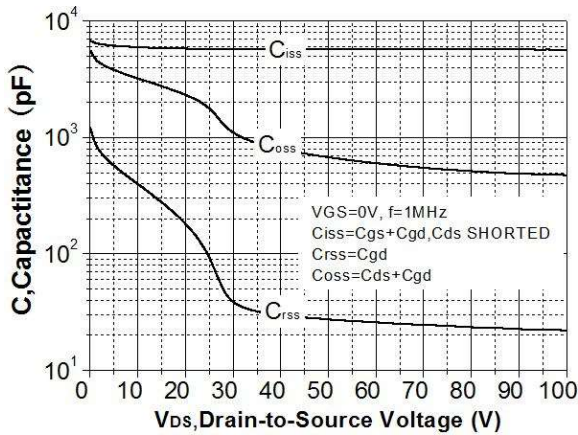


Figure 5. Capacitance Characteristics

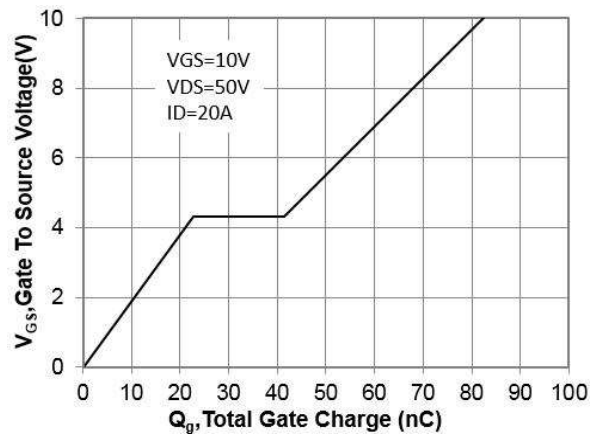


Figure 6. Gate Charge Characteristics



Typical Electronic and Thermal Characteristics

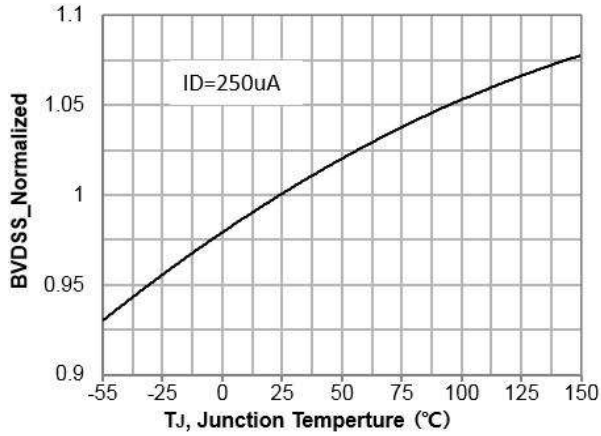


Figure 7. Breakdown Voltage Variation vs Temperature

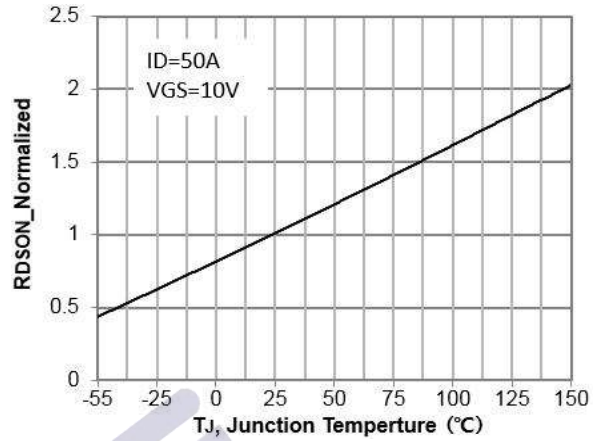


Figure 8. On-Resistance Variation vs Temperature

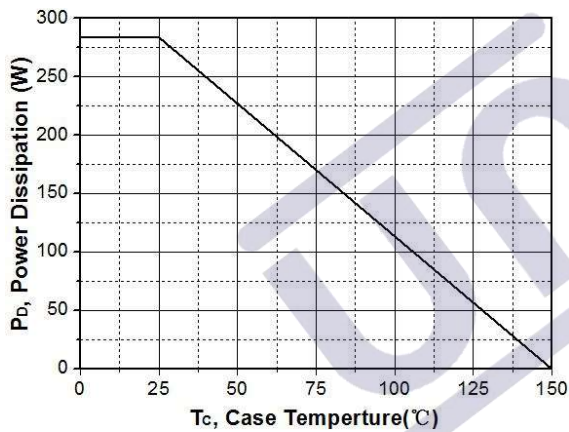


Figure 9. Power Dissipation

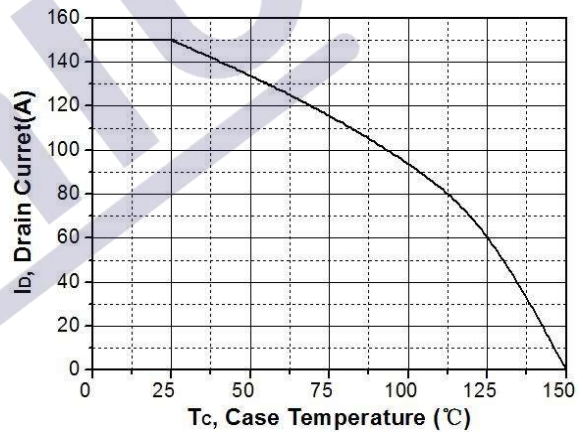


Figure 10. Drain Current Derating

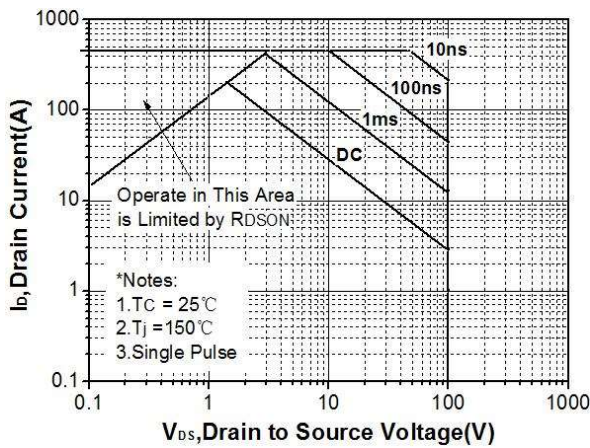


Figure 11. Maximum Safe Operating Area

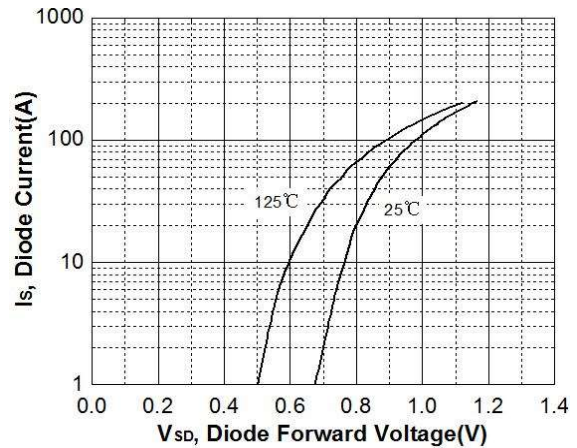
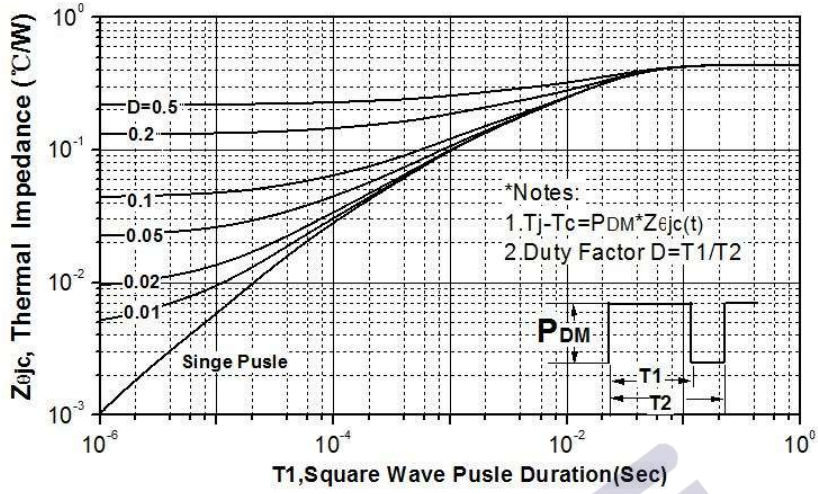
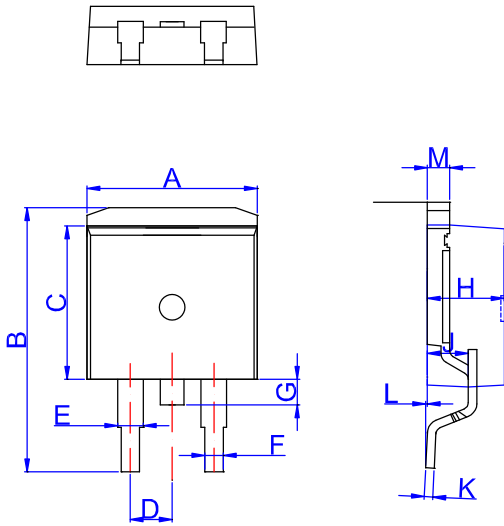


Figure 12. Body-diode Forward Characteristics

Typical Electronic and Thermal Characteristics



**TO-263 Package Information**



TO-263

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.90		10.20	0.390		0.402
B	14.70		15.80	0.579		0.622
C	9.4		9.6	0.37		0.378
D		2.54			0.100	
E	1.20		1.40	0.047		0.055
F	0.75		0.85	0.029		0.033
G			1.75			0.069
H	4.40		4.70	0.173		0.185
J	2.30		2.70	0.091		0.106
K	0.38		0.55	0.015		0.022
L	0	0.10	0.25	0	0.004	0.010
M	1.25		1.35	0.049		0.053



## 1.版本记录

DATE	REV.	DESCRIPTION
2022/04/19	1.0	First Release
2023/11/10	1.1	Layout adjustment

## 2.免责声明

浙江宇力微新能源科技有限公司保留对本文档的更改和解释权力，不另行通知！客户在下单前应获取我司最新版本资料，并验证相关信息是否最新和完整。量产方案需使用方自行验证并自担所有批量风险责任。未经我司授权，该文件不得私自复制和修改。产品不断提升，以追求高品质、稳定性强、可靠性高、环保、节能、高效为目标，我司将竭诚为客户提供性价比高的系统开发方案、技术支持等更优秀的服务。

版权所有 浙江宇力微新能源科技有限公司/绍兴宇力半导体有限公司

## 3.联系我们

浙江宇力微新能源科技有限公司

总部地址：绍兴市越城区斗门街道袍渚路25号中节能科创园45幢4/5楼 电话：

0575-85087896（研发部）

传真：0575-88125157

E-mail: htw@uni-semic.com

无锡地址：无锡市锡山区先锋中路6号中国电子（无锡）数字芯城1#综合楼503室

电话：0510-85297939

E-mail: zh@uni-semic.com

深圳地址：深圳市宝安区西乡街道南昌社区宝源路泳辉国际商务大厦410

电话：0755-84510976

E-mail: htw@uni-semic.com