



ZHEJIANG UNI-NE Technology CO., LTD

浙江宇力微新能源科技有限公司



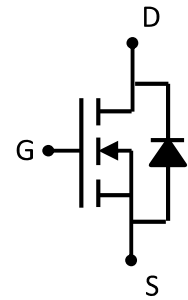
APG054N10D Data Sheet

V 1.1

版权归浙江宇力微新能源科技有限公司

Feature

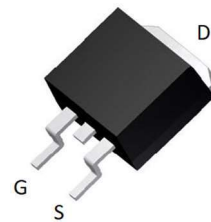
- 100V,120A
 $R_{DS(ON)} < 5.4m\Omega @ V_{GS}=10V$
- Split Gate Trench Technology
- Provide Excellent $R_{DS(ON)}$ And Low Gate Charge



Schematic diagram

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)
G054N10D	APG054N10D	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}	± 20	V
Continuous Drain Current ($T_a = 25^\circ\text{C}$)	I_D	120	A
Continuous Drain Current ($T_a = 100^\circ\text{C}$)	I_D	84	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	440	A
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	225	mJ
Power Dissipation	P_D	192	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.65	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

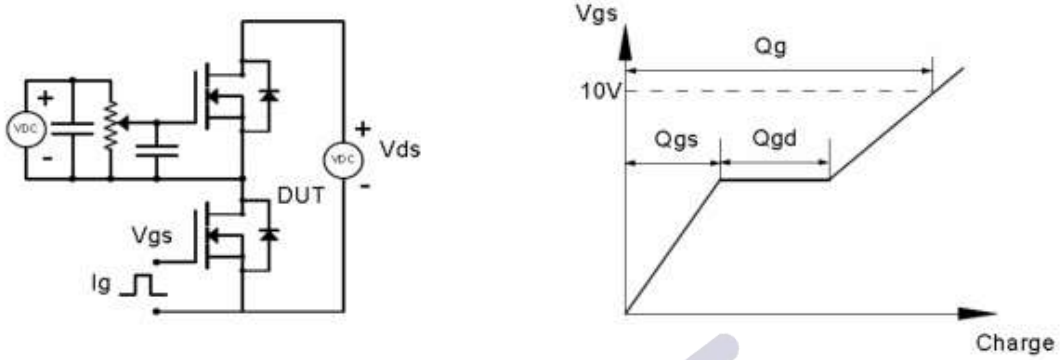
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	100	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage ⁽³⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
Drain-source on-resistance ⁽³⁾	R _{DS(on)}	V _{GS} =10V, I _D =20A	-	4.5	5.4	mΩ
Gate Resistance	R _G	f =1MHz	-	3.5	-	Ω
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f =1MHz	-	3244	-	pF
Output Capacitance	C _{oss}		-	1075	-	
Reverse Transfer Capacitance	C _{rss}		-	52	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =50V, RL=2.5Ω V _{GS} =10V, R _G =6Ω	-	22	-	ns
Turn-on rise time	t _r		-	36	-	
Turn-off delay time	t _{d(off)}		-	49	-	
Turn-off fall time	t _f		-	31	-	
Total Gate Charge	Q _g	V _{DS} =50V, I _D =20A, V _{GS} =10V	-	51	-	nC
Gate-Source Charge	Q _{gs}		-	15	-	
Gate-Drain Charge	Q _{gd}		-	13	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V _{DS}	V _{GS} =0V, I _S =20A	-	-	1.2	V
Diode Forward current ⁽⁴⁾	I _S		-	-	120	A
Reverse recovery time	T _{rr}	I _S =15A, V _{GS} =0V, dI _F /dt=100A/us		58		ns
Reverse recovery charge	Q _{rr}	I _S =15A, V _{GS} =0V, dI _F /dt=100A/us		90		nC

Notes:

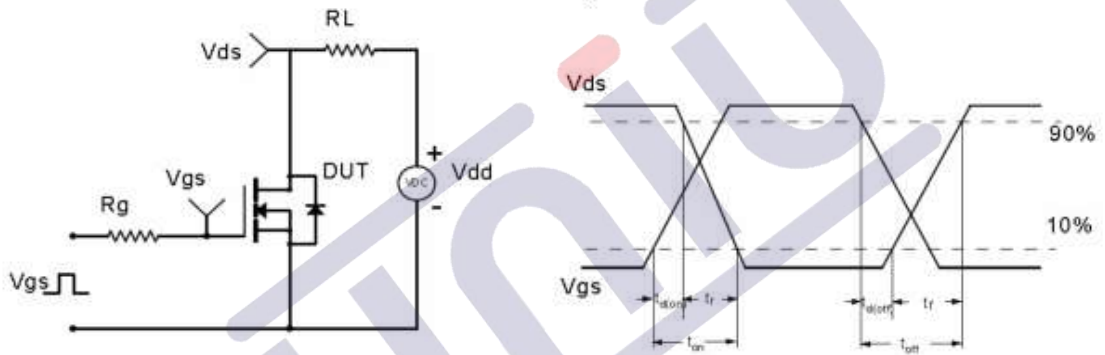
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: T_J=25°C, V_{DD}=50V, R_G=25Ω, L=0.5mH
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board, t≤10 sec

Test Circuit & Waveform

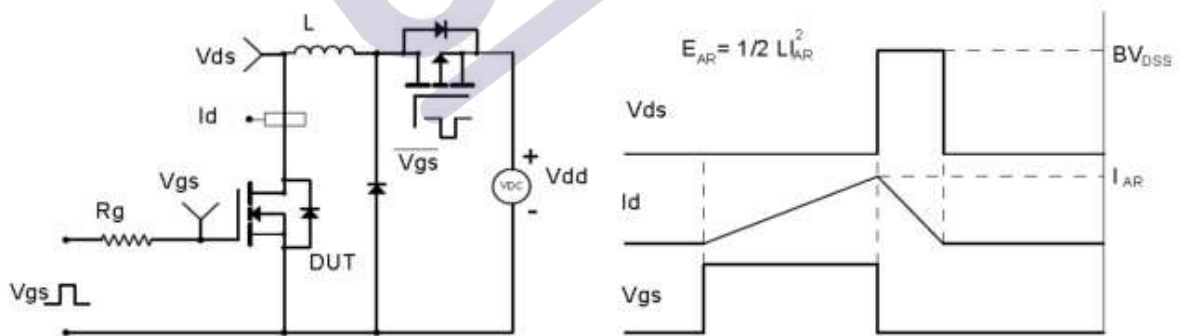
Gate Charge Test Circuit & Waveform



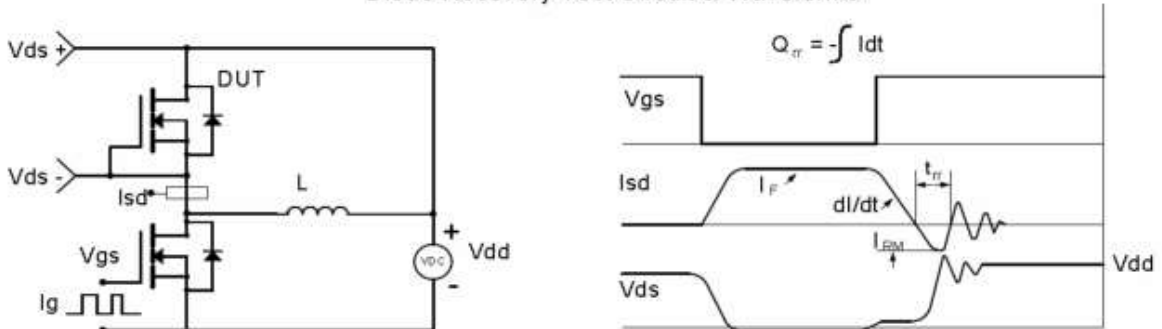
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Electrical Characteristics Diagrams

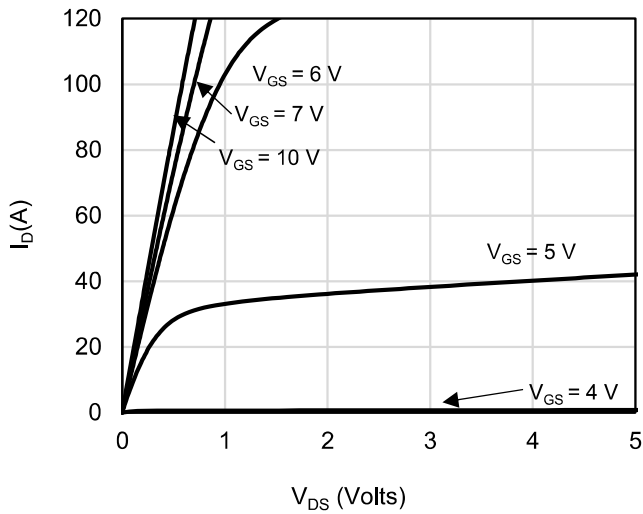


Figure 1: On-Region Characteristics

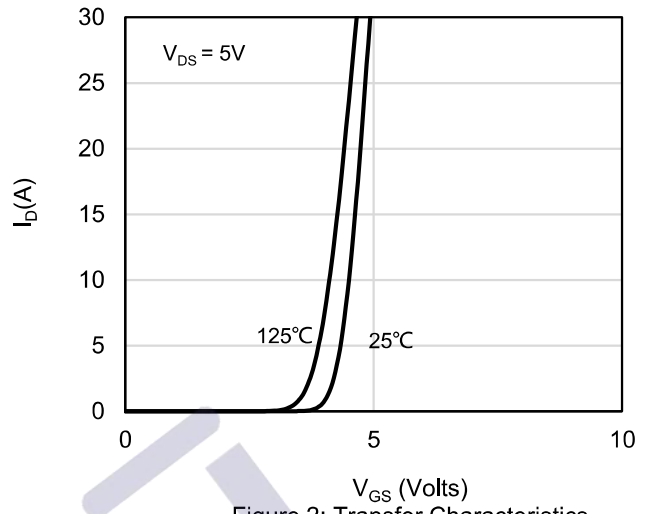


Figure 2: Transfer Characteristics

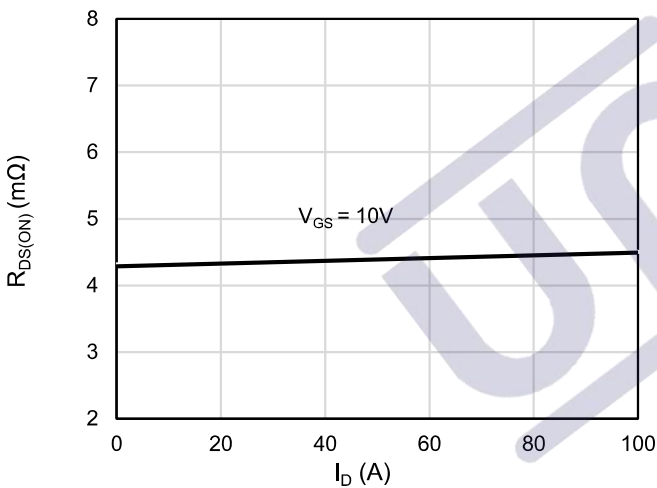


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

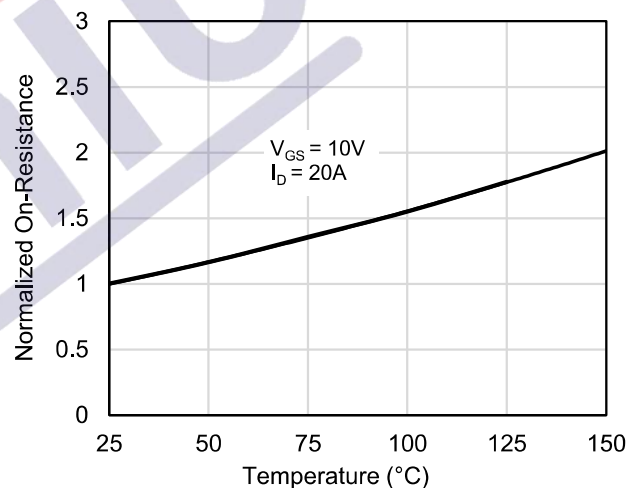


Figure 4: On-Resistance vs. Junction Temperature

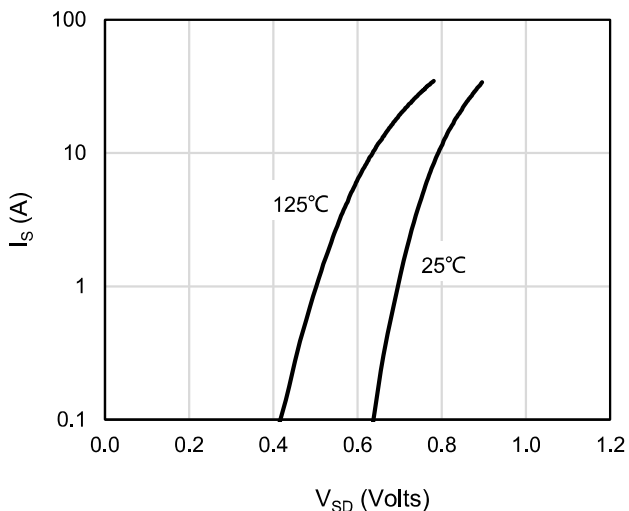


Figure 7: Body-Diode Characteristics

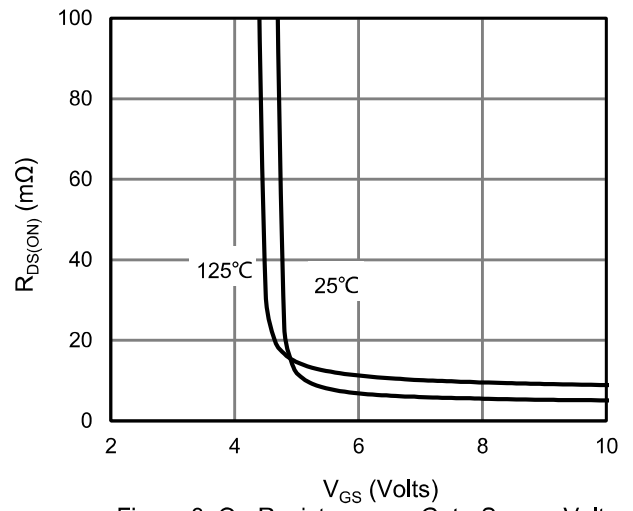


Figure 8: On-Resistance vs. Gate-Source Voltage

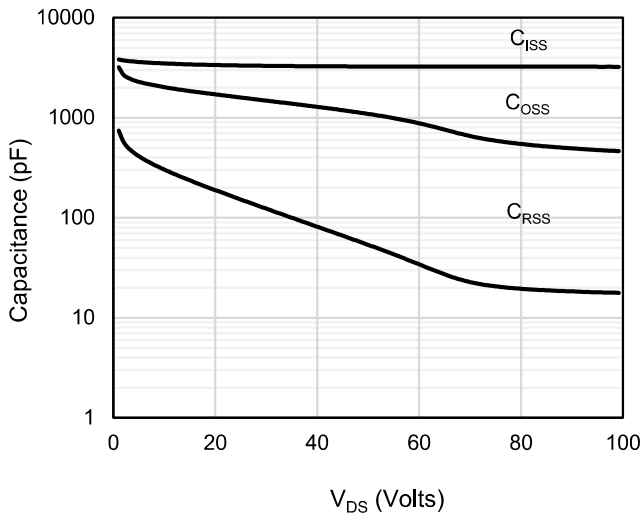


Figure 9: Capacitance Characteristics

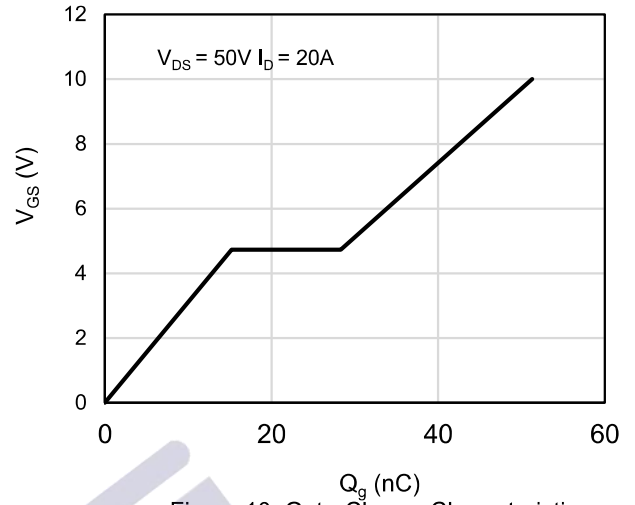


Figure 10: Gate-Charge Characteristics

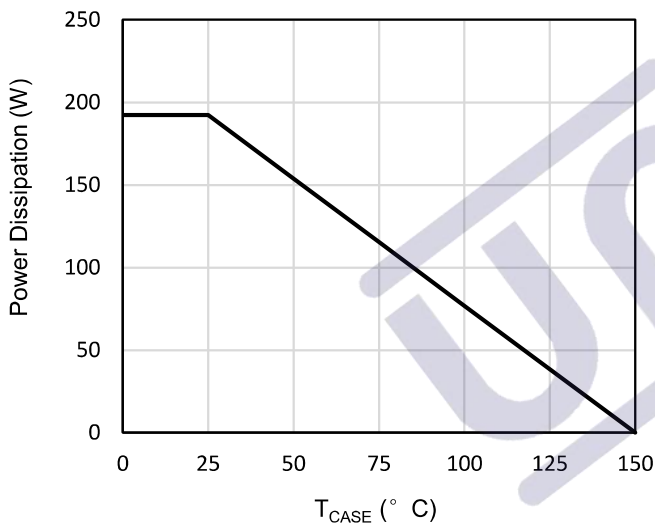


Figure 11: Power De-rating

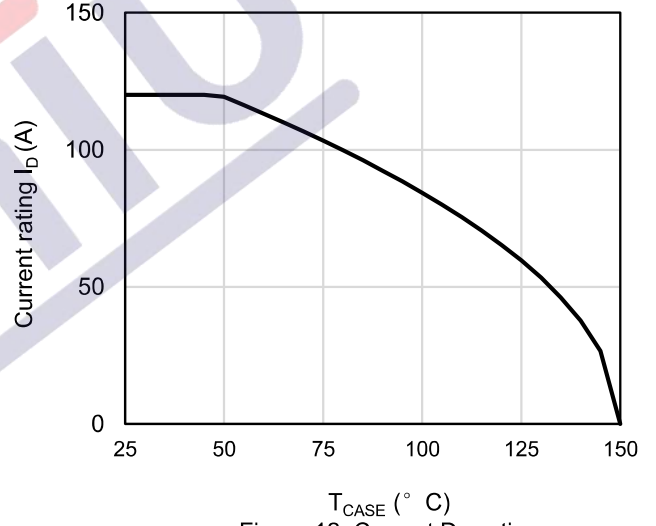


Figure 12: Current De-rating

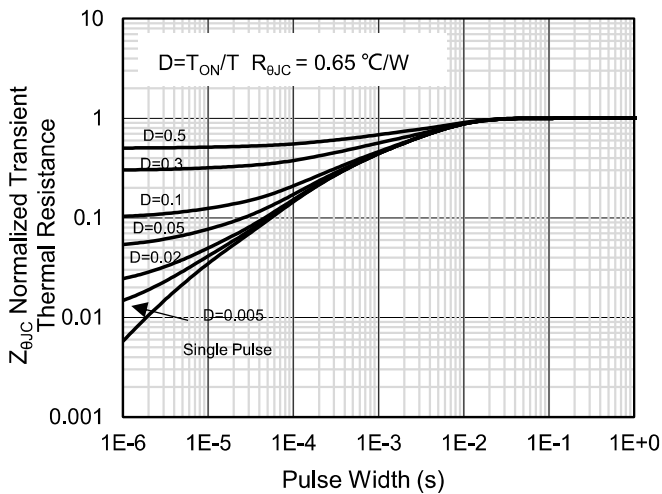


Figure 13: Normalized Maximum Transient Thermal Impedance

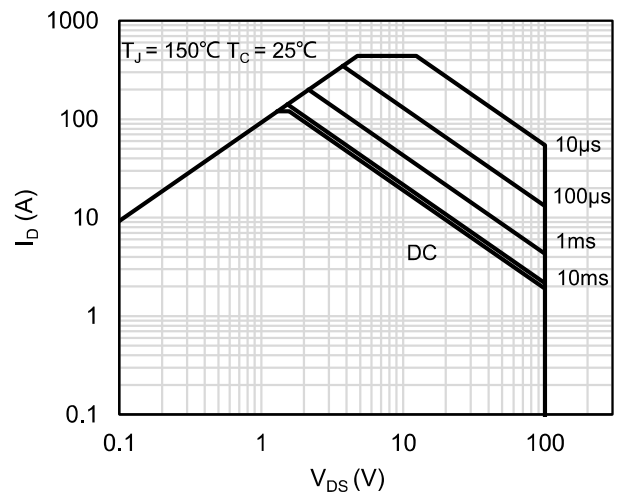
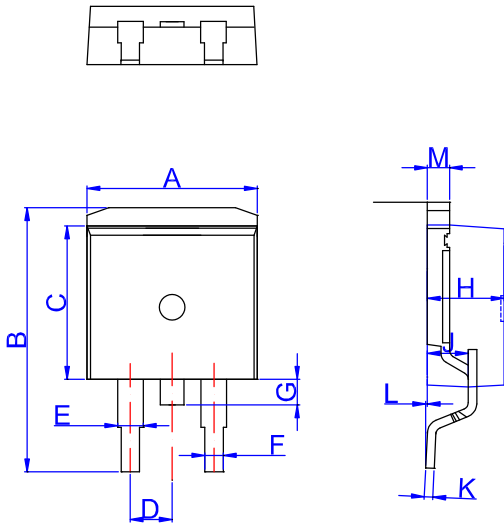


Figure 14: Maximum Forward Biased Safe Operating Area

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
2018/04/19	1.0	First Release
2021/11/15	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渎路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