



广东高普达集团股份有限公司

Gopod Group Limited

佛山市劲电科技有限公司

Foshan Gpower Technology Co., Ltd.

No./编号:

客户承认书

SPECIFICATION FOR APPROVAL

CUSTOMER/客户: _____

CUSTOMER P.N./客户物料号: _____

MODEL NO./产品型号: _____ **P445** _____

PRODUCT NO./产品编号: _____

SAMPLE DATE/送样日期: _____

CUSTOMER AUTHORIZED SIGNATURE/客户承认签核		

Please return to us one copy of "SPECIFICATION FOR APPROVAL" with your approved signature./客户确认签字，盖章后请回传一份承认书给我司。

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**** Table Of Content/目录 ****

1. SCOPE/适用范围	3
1.1. Description/产品描述	3
2. Input Characteristics/输入特性	3
3. Output Characteristics/输出特性	4
4. Environment Requirements/环境要求	5
4.1. Operating Temperature and Relative Humidity/操作温/湿度要求	5
4.2. Storage Temperature and Relative Humidity/存储温/湿度要求	5
4.3. Vibration/振动	5
4.4. Drop in/跌落	5
5. Reliability Requirements/可靠性要求	5
5.1. Burn-in/煲机	5
5.2. MTBF/平均故障间隔时间	5
6. EMI/EMS Standards/EMI/EMS 标准	6
6.1. EMI Standards/EMI 标准	6
6.2. EMS Standards/EMS 标准	6
7. Safety Standards/安规标准	8
8. Match. Outline Drawing/外观示意图	9
9. I/O Marking Drawing/铭牌示意图	10
10. Package Drawing/包装示意图	11
11. Sample Test Report/样品测试报告	12

1. SCOPE 适用范围

This product is a consumer product. It can be used for intelligent identification and charging of Bluetooth devices, mobile phones, tablets and other digital electronic products. It is an AC to DC converter with TYPE-C1/C2 travel smart quick charger.

本产品是一款消费类产品，可为蓝牙设备，各种手机、平板电脑等数码类电子产品进行智能识别充电。是一款 AC to DC 转换器，输出接口为 TYPE-C1/C2(双 C 口)旅行智能快速充电器。

1.1. Description 描述

- ☒ TYPE-C1/C2 CHARGER 充电器 ☐ SMPS Adaptor(Desk-top) /桌面型适配器
☐ Open Frame /开放式结构 ☐ Others /其他

“*” is the company's production and QA dept must test items. “*”是公司生产及 QA 部必测项目。

2. Input Characteristics 输入特性

2.1	Input voltage range 输入电压范围	90Vac - 264Vac
2.2 *	Normal voltage range 额定输入电压范围	100Vac - 240Vac
2.3	Input frequency range 频率范围	47Hz-63Hz
2.4 *	Rated input frequency 额定频率	50Hz/60Hz
2.5 *	Max input AC 最大输入电流	1.2A max at full load condition
2.6	Inrush current(cold start) 浪涌电流	60A max at 264Vac input

3. Output Characteristics 输出特性

3.1 * Test project 测试项目(Type-C1,C2 ports PD fast charge mode/ PD 快充模式)45W				
Port output/输出	MIN (V/A)/最小	Standard (V/A)/标准	MAX (V/A)/最大	Remark/备注
5Voltage /5V 电压	4.75	5.0	5.25	
Current /电流	0.0	3.0	3.6	
9Voltage /9V 电压	8.55	9.0	9.45	
Current /电流	0.0	3.0	3.6	
12Voltage /12V 电压	11.4	12.0	12.6	
Current /电流	0.0	3.0	3.6	
15Voltage /15V 电压	14.25	15	15.75	
Current /电流	0	3.0	3.6	
20Voltage /20V 电压	19	20	21	
Current /电流	0	2.25	2.6	



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3.2 * Test project 测试项目 (1Type-c+QC3.0 ports PD+QC3.0)			
Rated Output /额定输出	Average efficiency under 25%, 50%, 75%, 100%负载下, 效率平均值	No-load power/ 空载功耗.	备注 Remark
5V/3.0A	>83	≤0.3W	At 115/230Vac. (Test after working for 30minutes. 工作 30 分钟后测试)
9V/3.0A	>86		
12V/3.0A	>86		
15V/3.0A	>86		
20V/2.25A	>87		

3.3 * Test project 测试项目	
* Single port short circuit protection 短路保护	Short circuit will enter the burp protection mode, and will automatically recover after the short circuit disappears. 短路时将会进入打嗝保护模式, 短路消失后会自动恢复
* Total output power 总输出功率	Total output power≤45W 总输出功率≤45W
* Turn on delay time 启动延迟时间	3s max at 115Vac to 240Vac input & full load 满载状态下最大 3 秒
Rise time 上升时间	20ms max at 115Vac input and max load output. 当输入 115Vac 和输出最大负载时, 最大上升时间为 20ms
Hold up time 保持时间	a. 10ms min at full load & 115Vac/60Hz input, turn off at worst case 在最差情况关机 b. 20ms min at full load & 230Vac/50Hz input, turn off at worst case 在最差情况关机
Output Overshoot/Undershoot 输出过冲/欠冲	10% max when power supply turn on/off 在电源开启或关闭的时候, 最大 10%
Output Load Transient Response 输出负载瞬态响应	Output voltage within ±5%, load step from 25% to 50% to 25%, 50% to 75% to 50%, R/S: 0.25A/uS Transient response recovery time :200uS Dynamic response overshoot: ±5% 输出电压在±5%之间, 负载变化: 从 25%到 50%到 25%, 50%到 75%到 50%, 斜率: 0.25A/uS, 动态响应恢复时间: 200uS, 动态响应过冲±5%
Over voltage protection 过压保护	Product protection with output voltage exceeding 25V 输出电压超过 25V 保护



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Over temperature protection 过温保护	IC requires built-in over-temperature protection. When IC temperature exceeds 135 degrees, it must stop output automatically. IC 需要内置过温保护, 当 IC 温度超过 135 度时候, 要能自动停止输出
* Total output short circuit power 总输出短路功率	When there is a short circuit, the output power is less than 5W and it will not damage the product. After the short circuit disappears, it will resume automatically. 当输出短路时功率小于 5W, 但不会损坏产品, 短路消失后会自动恢复正常.

3.5 Charging Protocol & Intelligent Identification 充电协议与智能识别

C1/C2 口协议

- | | |
|--|---|
| ☒ Support PD3.0 or PD2.0 | ☒ Support QC3.0/QC2.0 |
| ☒ Support AFC | ☒ Support DCP-1.5A |
| ☒ Support SCP | ☐ Support PE2.0/PE1.1 |
| ☒ Support FCP | ☐ Support BC1.2 |
| ☒ Support PPS | ☒ Support Apple2.4A |
| ☐ Support directly charging at low voltage 支持低压直充 | |

功率分配:

C1/C2: (5V3A, 9V3A, 12V3A, 15V3A, 20V2.25A) MAX: 45W

PPS: PPS: 3.3V-11V 4.05A

C1+C2: MAX 20W(5V3A, 9V2.22A, 12V1.67A) + MAX 20W(5V3A, 9V2.22A, 12V1.67A)

PPS: 3.3-11V/2A

3.6 * Output Ripple 输出纹波

output voltage ripple 输出电压纹波	纹波值 (mV)	
5V	≤ 150	Measurement is done by 20MHz bandwidth oscilloscope and the output paralleled a 0.1uF ceramic capacitor and a 10uF electrolysis capacitor. (Under the condition of rated input and rated output) 量测时示波器选用 20MHz 带宽限制, 输出端要并联一颗 0.1uF 的陶瓷电容和一颗 10uF 的电解电容. (在额定输入及输出的条件下检测)
9V	≤ 150	
12V	≤ 150	
15V	≤ 150	
20V	≤ 150	
REMARK 备注		Unless otherwise specification, output load must set at CR mode. 除非另有说明输出负载必须设置在 CR 模式

4. Environment Requirements 环境要求

4.1. Operating Temperature and Humidity 操作温/湿度

0°C to 25°C

10%RH to 90%RH

4.2. Storage Temperature and Humidity 存储温/湿度

-20°C to 80°C

5%RH to 95%RH non-condensing, 2000 meters below sea level 低于海拔 2000 米

4.3. Vibration 振动

Sweep frequency: 10 to 300Hz, acceleration: 1.0G(breadth: 3.5mm). Vibrate for 1 hour along the X, Y, and Z perpendicular axes

扫描频率: 10 to 300Hz, 加速度: 1.0G(位移: 3.5mm), X, Y, Z 三垂直坐标轴向各振动 1 小时

4.4. * Drop in 跌落

Test method: 1 corner, 3 edges, 6 surfaces, height: 100cm, once for each test, falling onto hardwood board.

Requirement: the plug can be bended, scratch can be existed, but the structure should not be damaged, and can work normally.

测试方法: 1 角, 3 棱, 6 面, 跌落高度 100 厘米, 各 1 次, 跌落到硬木板上

判定标准: 插脚可以弯曲, 外壳可以有伤, 但外观不能有结构性损毁, 且能正常工作

5. Reliability Requirements/可靠性要求

5.1. * Burn-in 老化

The product must undergo 100% burning-in before shipment to ensure the quality.

产品在出货前必须经过 100%的煲机, 以保证产品的品质。

5.2. MTBF

The MTBF shall be at least 30,000 hours at 25°C max and normal input condition

在正常输入和环境温度最高为 25 摄氏度的情况下, 平均故障间隔时间至少是 30000 小时

6. EMS Standards 标准

6-1-1 EN 61000-4-2,electrostatic discharge(ESD) requirement/静电抗扰度要求

Discharge characteristic/静电规格	Test level/ 测试条件	Test criteria/ 测试标准
Air discharge/ 空气放电	+/-8KV	B
Contact discharge/ 接触放电	+/-4KV	B

6-1-2 EN 61000-4-3,radiated electromagnetic field susceptibility(rs)/辐射骚扰场强

Test level 测试条件	Test criteria 测试标准
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3V/m (r.m.s)	A
80-1000MHz, 80%AM(1KHz) sine-wave	

6-1-3 EN 61000-4-4, electric fast transients(burst) immunity requirement/电快速瞬变脉冲群

Coupling/测试端口	Test level/测试条件	Test criteria/测试标准
AC-input/交流输入	0.5KV	A
AC-input/交流输入	1KV	B

6-1-4 EN 61000-4-5, surge capability requirement/浪涌抗扰度要求

Surge voltage 雷击电压	Test criteria 测试标准
Common mode/共模 +/-1KV	A
Differential mode/差模 +/-1KV	

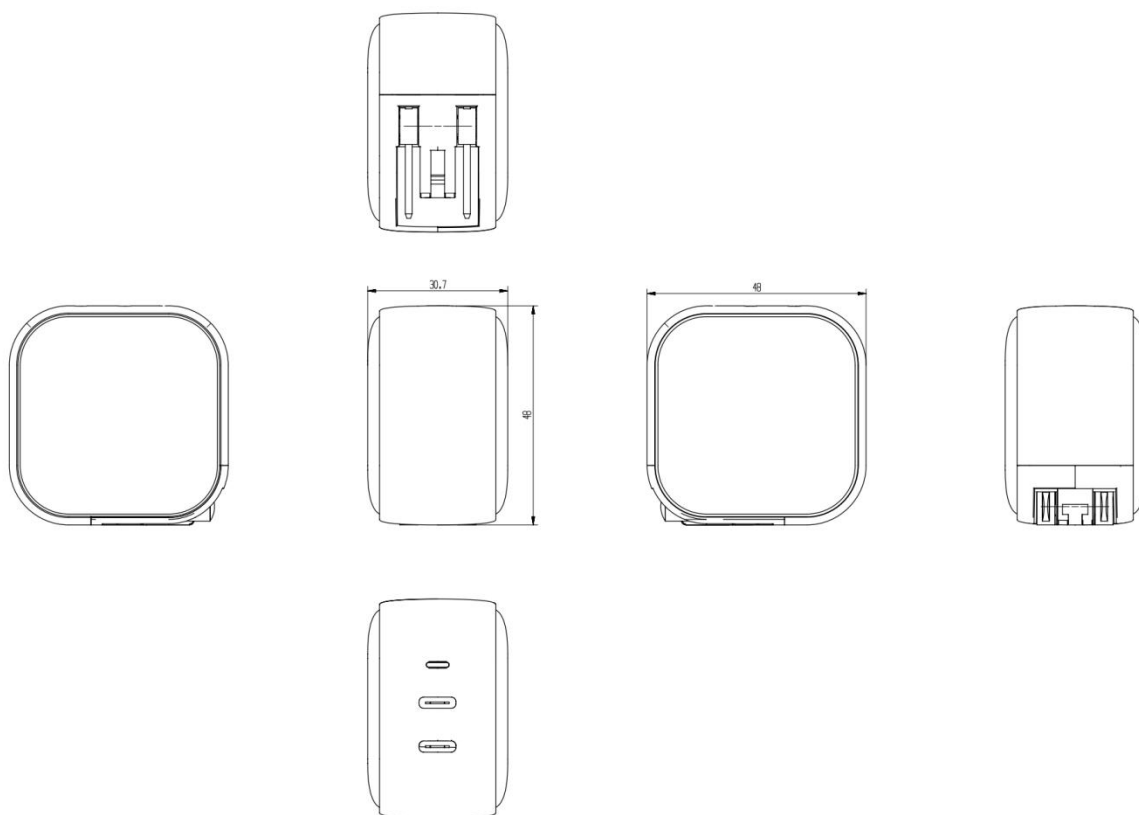
6-1-5 EN 61000-4-6, Induced radio frequency fields conducted disturbances immunity requirement/电源端子传导骚扰实验

Test level 测试条件	Test criteria 测试标准
3V	A
0.15-80 MHz, 80%AM(1KHz)	

6-1-6 Assessment criteria /评估标准

Acceptance criteria 可接受标准	Performance 性能
A	Agreed operational behavior within the specified limits 性能不允许变化；如果性能会发生变化，则变化的范围在产品规格书规定的范围内。
B	Time limited functional diminishment or malfunction during the tests is permitted. The function is self-reactivated by the unit following completion of the tests. 设备在测试过程中,性能降低允许在产品规格书要求范围内,干扰消除后,设备能恢复正常,不允许出现复位和任何方式的人工干预。
C	Malfunction is permitted. The function can be reactivated either by reconnection to the mains or by operator intervention. 在测试过程中,设备允许出现业务中断,测试完毕后允许自行恢复或者人工干预恢复(包括硬件上干预);测试中只允许初级防护器件损坏,并且更换损坏的初级防护器件后,设备能恢复正常

7. Outline Drawing 外观示意图



Shell material: ■PC Temperature resistance: 120°C

Shell material: □PC+ABS Temperature resistance: 95°C

外壳材质: ■PC 耐温: 120°C □PC+ABS 耐温: 95°C

Remark: PC material meets the requirement of spherical pressure test.

备注: PC 材质符合球压测试要求



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8. Marking Drawing 铭牌示意图

☒ Laser etching 镭雕

☐ Pad printing 丝印



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10. Package Drawing 包装示意图

Sample Test Report 样品测试报告