# 研吉简介

研吉电子是以研发QC3.0,USB TYPE-C,USB TYPE-C PD充电器、移动电源，车充为主导的专业型方案公司，我们的技术团队均来自于在行业内从业多年，有资深经验的顶尖RD人员。更有像Didoes、Fairchild、STM、Semi-High、Hunteck、CT Micro、MagnaChip、LITEON、龙腾、东微、等原厂,都是我们的长期战略合作伙伴，可以第一时间拿到最新的技术及样品支持。

研吉可以为客户提供最专业的方案和PCBA，在市场竞争越来越加剧的现状下，为客户节省了研发费用，更直接缩短了研发周期，让客户以最高的效率去抢占市场份额。

# 产品特征

- 5V5A  最大输出25W
- 4USB均采智能自动识别IC，识别Apple 设备并带限流；
- 支持：1USB: Ipad 5V2.4A
- 1USB: Ipone 5V1A
- 1USB: Ipone 5V1A
- 1USB:Ipod  500mA

# Target specification

| Description | Min | Type | Max | Units | Conditions |
|---|---|---|---|---|---|
| **input** | | | | | |
| Voltang | 90 | | 264 | VAC | |
| Frequency | 47 | 50/60 | 63 | Hz | |
| No-Load input power(230Vac) | 30 | 50 | 75 | mW | |
| **Output** | | | | | |
| Output Voltage | 5 | 5.2 | 5.4 | V | |
| Output Current | 0 | | 5 | A | |
| Output Power | | 25 | | W | |
| Output Ripple Voltage | | | 120 | mVp-p | Iout=5A @25℃,20MHzbandwidth |
| Common Mode Noise | | | 2 | Vp-p | 30k-500kHz,Load with 5ohm Resistor |
| Output Over Current Protection | 5.3 | | 5.7 | | Hiccup,Auto Restart |
| Ambient Temperature | | | 45 | ℃ | |
| **Efficlency** | | | | | |
| Averang Efficiency (COC-Tie 2) | 83.7 | | 87 | % | **Measured at end of output DC-Cable,115Vac＆230Vac @ 25℃** |
| **EMI** | **Pass EN55022 CIASS B with 6dB Margin** | | | | |

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# Key Performance

| Item | Spec | Test Conditions | Test Data | Result |
|---|---|---|---|---|
| Output Voltage | 5.0-5.3V | 90-264Vac@0-4A | 5.10-5.20 | Pass |
| Ripple | <120mVp-p | 90-264Vac@0-4A | 80mV | Pass |
| Standby Power | <75mW | 230Vac@0A | 65mW | Pass |
| Dynamic | 4.5-5.5V | 90-264Vac@4.0-0.4A<br>10mS 0.5A/uS | 4.80-5.44V | Pass |
| Common Mode Noise | <2Vp-p | 90-264Vac@2A<br>30K-500kHZ | 1.2Vp-p | Pass |
| ESD | 18kV | 230Vac@4A | 20kV | Pass |
| | | | | |

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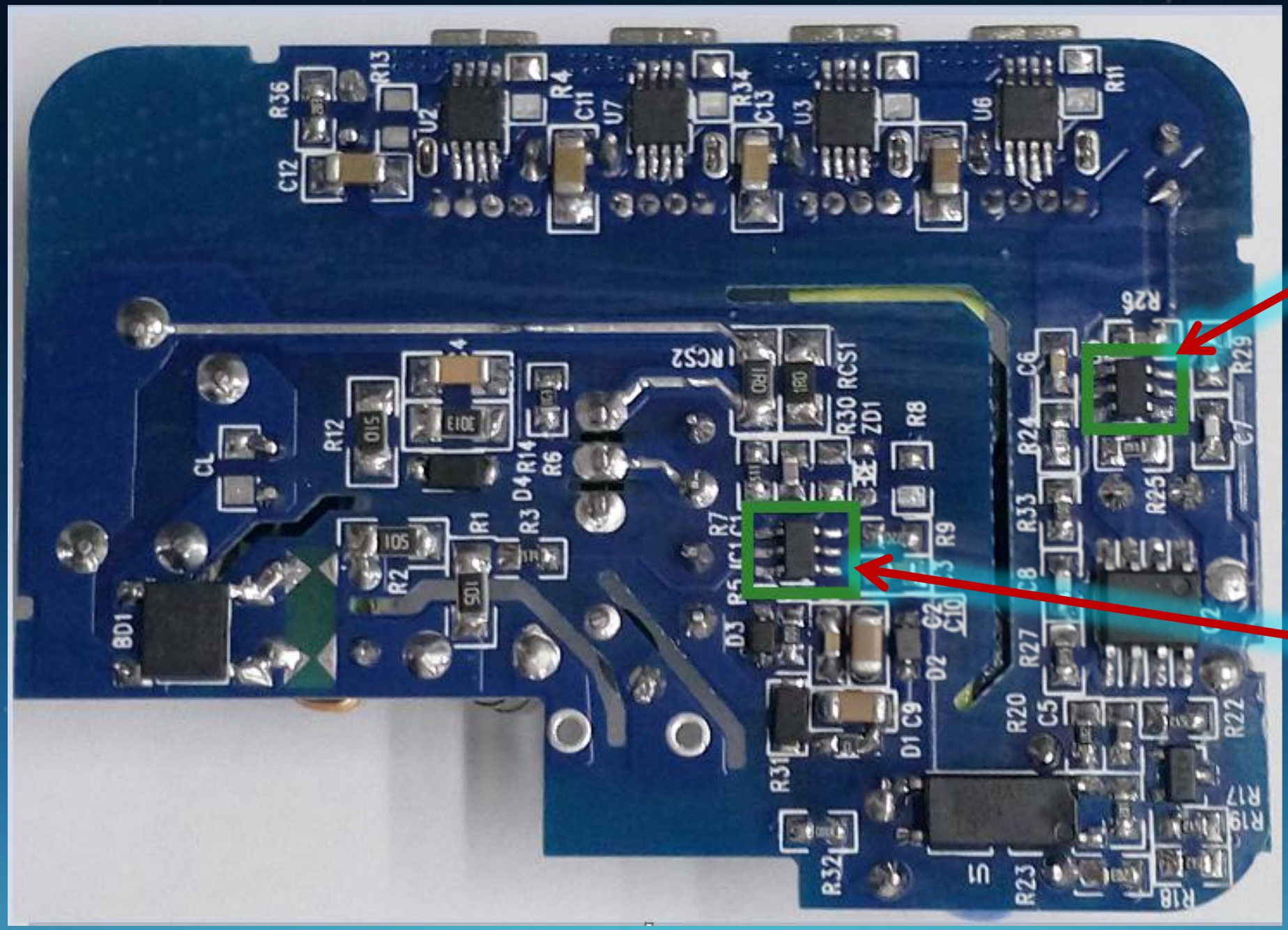
# PHOTO-BOTTOM

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# 核心器件:DIODES -APR3125A

DIODES INCORPORATED

Lead-free Green

A Product Line of
Diodes Incorporated

BCD

**AP3125A/V/L/R**

**GREEN MODE PWM CONTROLLER**

NEW PRODUCT

## Description

The AP3125A/V/L/R is a current mode PWM controller which is optimized for high performance, low standby power and cost effective offline flyback converters.

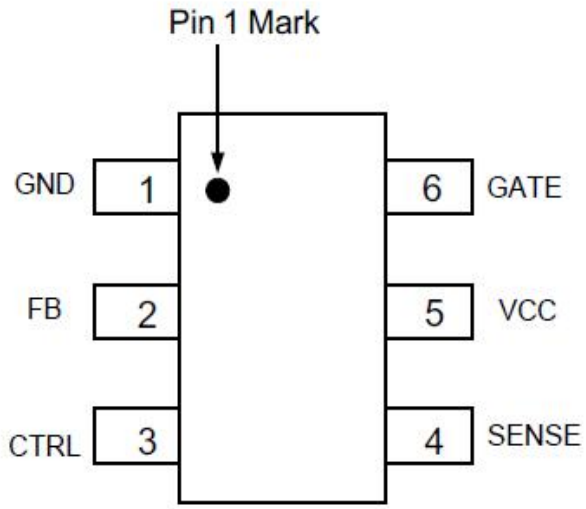
The PWM switching frequency at normal operation is internally fixed (about 65kHz). In middle load, the IC will enter green mode to improve system efficiency with the help of frequency foldback. A minimum switching frequency (about 20kHz) is set to avoid the audible noise. In no load or light load, the IC will enter the burst mode to minimize standby power. Furthermore, the frequency dithering function is built-in to reduce EMI emission.

Internal slope compensation allows more stable Peak-Current Mode control over wide range of input voltage and load conditions. Internal line compensation ensures constant output power limit over entire universal line voltage range.

Comprehensive protection features are included, such as cycle-by-cycle current limit (OCP), VCC Over Voltage Protection (VOVP), internal OTP, Over Load Protection (OLP) and pins' fault protection. The versatile latch functions can be implemented using a minimal number of external components.

## Pin Assignments

(Top View)




**SOT26**

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# 核心器件:DIODES -AP345

DIODES INCORPORATED

Lead-free Green

**APR345**

**SECONDARY SIDE SYNCHRONOUS RECTIFICATION CONTROLLER**

## Description

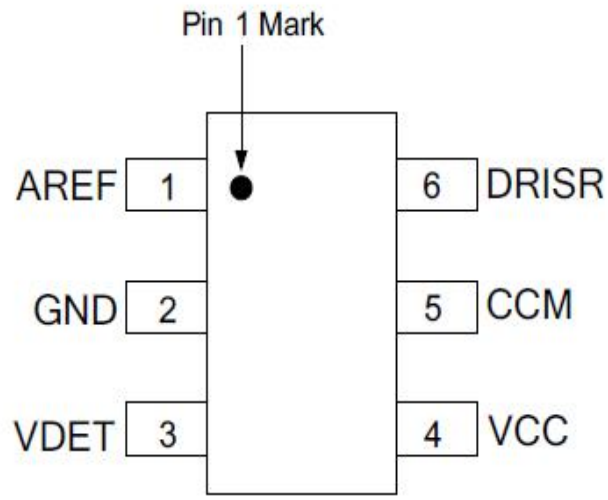
APR345 is a secondary side MOSFET driver for synchronous rectification, supports CCM, DCM and Quasi-Resonant Flyback Topologies.

The synchronous rectification can effectively reduce the secondary side rectifier power dissipation and provide high performance solution. By sensing primary MOSFET gate-to-source voltage, APR345 can output ideal drive signal with less external components. It can provide high performance solution for 5V to 12V output voltage application.

The APR345 is available in SOT26 package.

## Pin Assignments

(Top View)




**SOT26**

## Features

- Synchronous Rectification for CCM, DCM Operation Flyback
- Eliminate Resonant Ring Interference
- Fewest External Components
- **Totally Lead-free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Applications

- Adapters/Chargers for Cell/Cordless Phones, ADSL Modems, MP3 and Other Portable Apparatus

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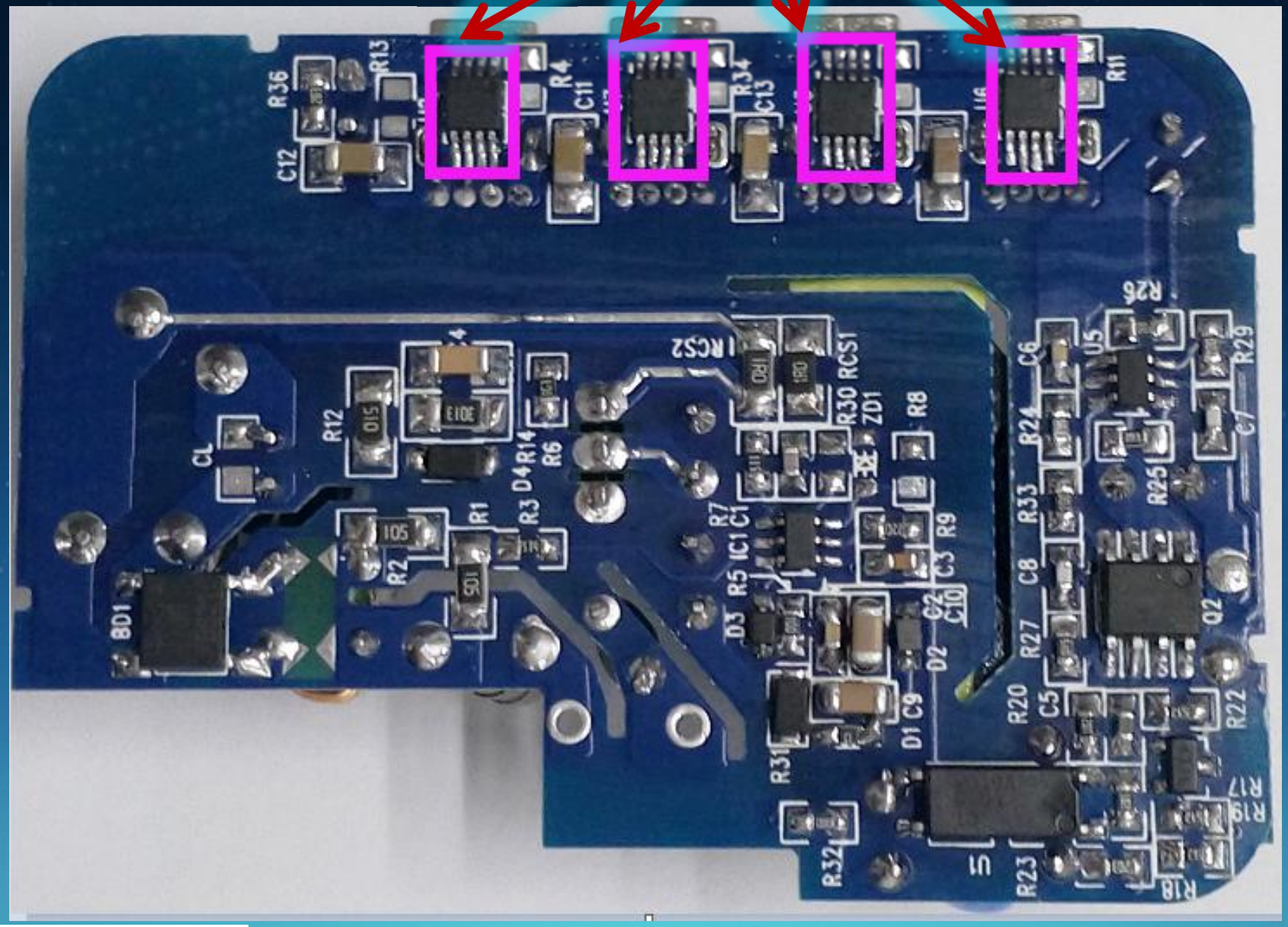
# PHOTO-BOTTOM

智能识别+限流：
**Semi-high**
**UC2501**

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# 核心器件:SIME-HIGH-UC2501

Semi-High
Innovation for life

**UC2501**

**USB Charger Emulator with Adjustable Power Switch**

## FEATURES

- 45 mΩ High-Side MOSFET
- 1.0~4.0 A (typ.) Adjustable Current Limit
- ±7.5% Current Limited Accurate at 3.1A
- Meet Apple® Current Requirements
- Low Average Current in OUT shorted GND
- Support Apple® Devices fast charging (Apple® 2.1A / 2.4A mode)
- Support Samsung Galaxy Tab Devices fast Charging
- Support BC1.2 & YD/T 1591-2009 Charging Spec
- Built-in Soft-Start
- Support single layer PCB layout.
- 4.5 ~ 6.5V Single Supply Operation.
- Available EMSOP8, ESOP8 package.

## APPLICATIONS

- USB Charger
- USB Wall Adapter
- Car Charger

## DESCRIPTION

The UC2501 integrated USB charger emulators with automatic host charger identification circuitry and high performance adjustable current limiting power switch. An automatic USB charger identification circuit allows mobile power supply can automatically provides the correct modes on the data lines to charger compliant devices among the Apple, Samsung and BC1.2 modes.

The UC2501 is a 45mΩ power switch intended for applications where heavy capacitive loads and short-circuits are likely to be encountered. This also provides hiccup mode when OUT voltage is less than 2.85V or OTSD.

The UC2501 provides an ENB pin to turn on or turn off UC2501 and an SEL pin to select 10W or 12W mode in application.

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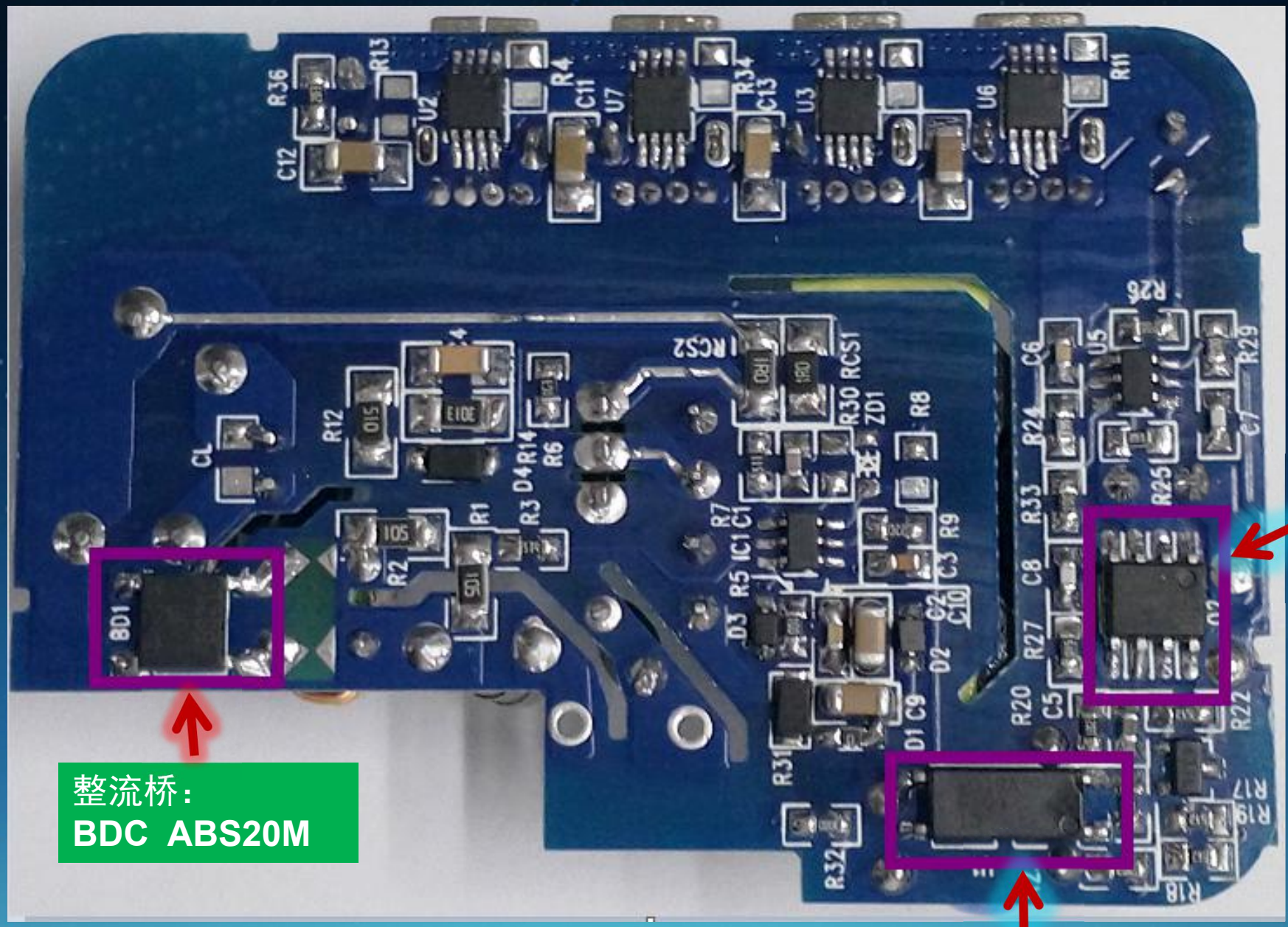
# PHOTO-BOTTOM




SR MOS:HUNTECH
HGS090N06SL

整流桥:
**BDC ABS20M**

光耦:
**CT -CT1019**

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# 核心器件

Hunteck

## HGS090N06SL　P-1

60V N-Ch Power MOSFET

Feature

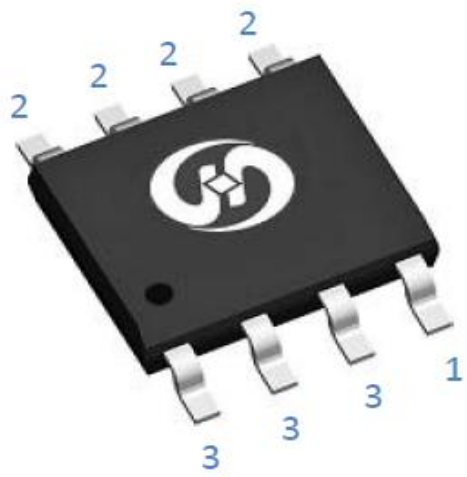
- ◇ High Speed Power Switching,Logic level
- ◇ Enhanced Body diode dv/dt capability
- ◇ Enhanced Avalanche Ruggedness
- ◇ 100% UIS Tested, 100% Rg Tested
- ◇ Lead Free, Halogen Free

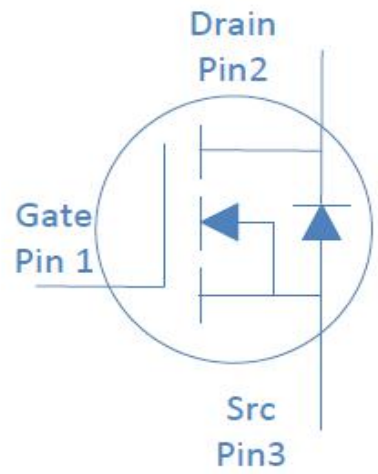
| | | | |
|---|---|---|---|
| $V_{DS}$ | | 60 | V |
| $R_{DS(on),typ}$ | $V_{GS}$=10V | 7.5 | mΩ |
| $R_{DS(on),typ}$ | $V_{GS}$=4.5V | 10.2 | mΩ |
| $I_D$ | | 14 | A |

Application

- ◇ Synchronous Rectification in SMPS
- ◇ Hard Switching and High Speed Circuit
- ◇ DC/DC in Telecoms and Inductrial

SOIC-8




| Part Number | Package | Marking |
|---|---|---|
| HGS090N06SL | SOIC-8 | GS090N06SL |

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# CT1010, CT1011, CT1012, CT1013
# CT1014, CT1017, CT1018, CT1019
## DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

### Features

- High isolation 5000 VRMS
- CTR flexibility available see order information
- Extra low coupling capacitance
- DC input with transistor output
- Temperature range - 55 °C to 110 °C
- Regulatory Approvals
  - UL - UL1577 (E364000)
  - VDE - EN60747-5-5(VDE0884-5)
  - CQC – GB4943.1, GB8898
  - IEC60065, IEC60950
- Creepage distance > 8 mm
- Green Package

### Applications

- Switch mode power supplies
- Computer peripheral interface
- Microprocessor system interface

### Description

The CT1010, CT1011, CT1012, CT1013, CT1014, CT1017, CT1018, CT1019 series consists of a photo transistor optically coupled to a gallium arsenide Infrared-emitting diode in a 4-lead SOP Package.

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# 核心器件

LITE-ON SEMICONDUCTOR

## ABS20M

**GLASS PASSIVATED SURFACE MOUNT BRIDGE RECTIFIER**

**REVERSE VOLTAGE – 1000 Volts**
**FORWARD CURRENT – 2 Amperes**

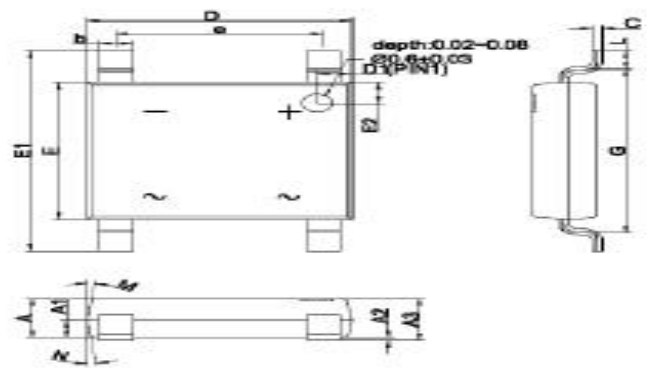
### FEATURES

- Ideal for printed circuit board
- Reliable low cost construction utilizing molded plastic technique

### MECHANICAL DATA

- Case Material: "Green" molding compound, UL flammability classification 94V-0,(No Br. Sb. Cl.) "Halogen-free"
- UL recognized file # E364304
- Polarity indicator: As marked on the body
- Weight: 98 mg ( Approximate)
- Marking Code: ABS20M

### ABS




| ABS | | |
|---|---|---|
| DIM | MIN | MAX |
| A | 1.20 | 1.30 |
| A1 | 0.43 | 0.63 |
| A2 | 0.00 | 0.10 |
| A3 | 1.20 | 1.40 |
| b | 0.50 | 0.80 |
| C | 0.10 | 0.30 |
| D | 4.85 | 5.25 |
| D1 | 0.45 | 0.85 |
| e | 4.00 TYP. | |
| E | 4.25 | 4.65 |
| E1 | 6.40 | 6.80 |
| E2 | 0.45 | 0.85 |
| G | 5.20 | 5.60 |
| L | 0.40 | 0.80 |
| M | 7° TYP. | |
| N | 7° TYP. | |
| All dimension in millimeter | | |

### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

### ABSOLUTE RATINGS

| PARAMETER | | SYMBOL | VALUE | UNIT |
|---|---|---|---|---|
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 1000 | V |
| Maximum DC blocking voltage | | $V_{DC}$ | 1000 | V |
| Average rectified output current per device | | $I_{(AV)}$ | 2 | A |
| Peak forward surge current 8.3ms single half sine-wave superimposed on rated load | @ $T_A$=25°C<br>@ $T_A$=125°C (Note 1) | $I_{FSM}$ | 55<br>44 | A |
| Peak forward surge current 1ms single half sine-wave superimposed on rated load | @ $T_A$=25°C<br>@ $T_A$=125°C (Note 1) | $I_{FSM}$ | 110<br>88 | A |
| $I^2t$ rating for fusing ( t = 8.3ms) | | $I^2t$ | 10.37 | $A^2S$ |
| Operating and storage temperature range | | $T_J$ ,$T_{STG}$ | -55 to +150 | °C |

### STATIC ELECTRICAL CHARACTERISTICS

| PARAMETER | TEST CONDITION | | SYMBOL | MAX. | UNIT |
|---|---|---|---|---|---|
| Forward voltage (Note1) | $I_F$ = 1A | $T_A$ = 25°C | $V_F$ | 0.95 | V |
| Leakage current | $V_R$ = 1000V | $T_A$ = 25°C<br>$T_A$ = 125°C (Note1) | $I_R$ | 10<br>100 | uA |
| Typical junction capacitance (Note 2) | | | $C_J$ | 12.34 | pF |

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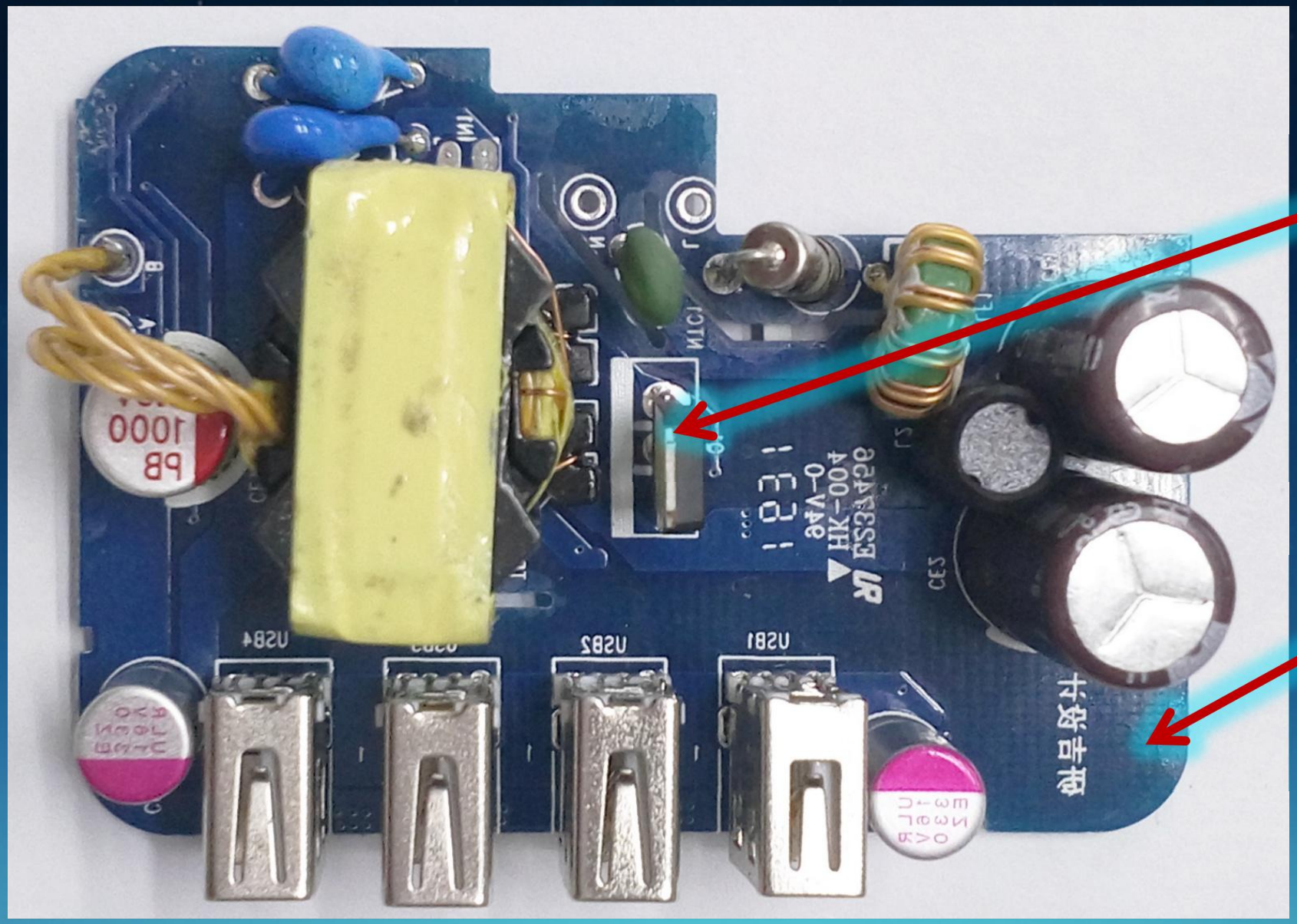
# PHOTO -TOP

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# 核心器件介绍

- 高压MOS来自于东微半导体主推规格OSG60R380A

## 产品介绍

东微半导体 ORIENTAL SEMICONDUCTOR

为适应电源系统高效率小型化的需求，东微半导体推出了新型的GreenMOS™系列高压MOSFET及SFGMOS™系列中低压高速MOSFET产品。采用独特专利器件结构和制造工艺，GreenMOS™和SFGMOS™产品具有比常规MOSFET更快的开关速度及更柔和的开关曲线，在获得极低的动态损耗的同时最大限度抑制了开关震荡。不仅可以大大提高系统效率、降低发热量，同时简化了系统EMI设计。GreenMOS™系列产品覆盖600-800V全系列，最大提供高达80A静态电流的规格，最高工作频率达到2MHz，可以满足各种电源系统的需求。SFGMOS™系列产品提供60-200V耐压，内阻低至2.5mΩ。基于其高效率低温升的特点，东微半导体的功率器件产品特别适用于快速充电器、LED电源、通讯、服务器电源、电动车充电桩、电机驱动等系统。

| Product Name | Package | Vdss(V) | Id(A) | Rdson_typ(Ω) | Rdson_max(Ω) |
|---|---|---|---|---|---|
| OSG60R380A | TO251 | 600 | 11 | 0.33 | 0.38 |

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# 核心器件介绍

- PCB是世界标准生产厂家：卓荣电子，特别提供
- 卓荣电子，專業生產各種高精密單雙多層pcb，特別在電源，汽車及背光源有著特別的經驗技術，以先進的設備，多年的經驗在行業內得到優良的口碑

# 效率参数

| INPUT | Load | no load(mW) | Vout(V) | Iout(A) | Po(W) | Pin(W) | EFF(%) | Avg |
|---|---|---|---|---|---|---|---|---|
| 115Vac | 0 | 30 | 5.2 | 0 | 0 | 0.03 | 0.00% | 0.00% |
| | 10% | | 5.23 | 0.5 | 2.615 | 2.88 | 90.80% | 90.80% |
| | 25% | | 5.227 | 1.25 | 6.534 | 7.32 | 89.26% | 88.01% |
| | 50% | | 5.220 | 2.5 | 13.050 | 14.76 | 88.41% | |
| | 75% | | 5.200 | 3.75 | 19.500 | 22.24 | 87.68% | |
| | 100% | | 5.200 | 5 | 26.000 | 30 | 86.67% | |
| 230Vac | 0 | 50 | 5.2 | 0 | 0.000 | 0.05 | 0.00% | 0.00% |
| | 10% | | 5.23 | 0.5 | 2.615 | 2.95 | 88.64% | 88.64% |
| | 25% | | 5.23 | 1.25 | 6.538 | 7.47 | 87.52% | 87.44% |
| | 50% | | 5.220 | 2.5 | 13.050 | 14.89 | 87.64% | |
| | 75% | | 5.210 | 3.75 | 19.538 | 22.17 | 88.13% | |
| | 100% | | 5.200 | 5 | 26.000 | 30.07 | 86.46% | |

| mode | Vin | no load(mW) | 10% | 25% | 50% | 75% | 100% | Avg |
|---|---|---|---|---|---|---|---|---|
| 5V/5A | 115Vac | 30 | 90.80% | 89.26% | 88.41% | 87.68% | 86.67% | 88.01% |
| | 230Vac | 50 | 88.64% | 87.52% | 87.64% | 88.13% | 86.46% | 87.44% |

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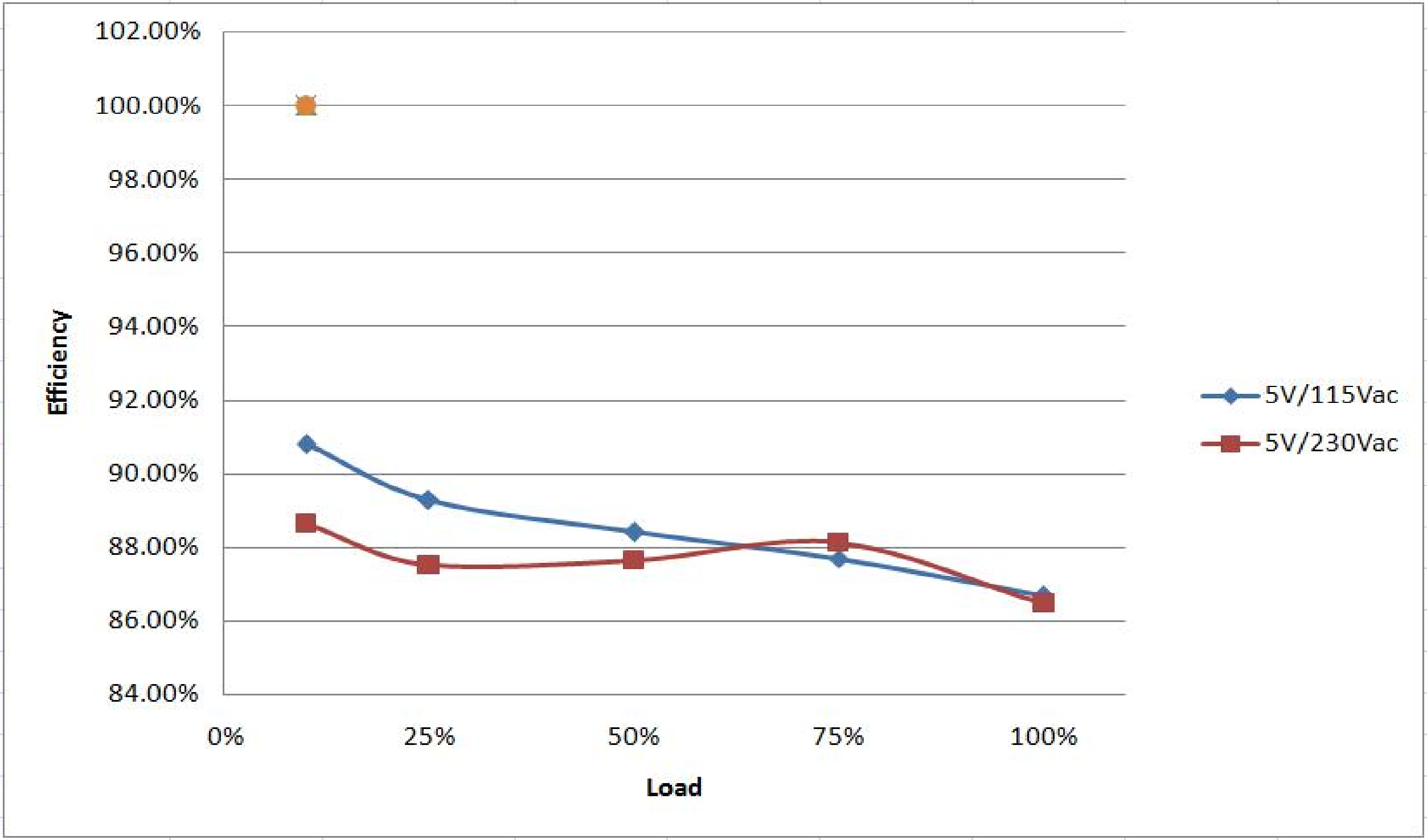
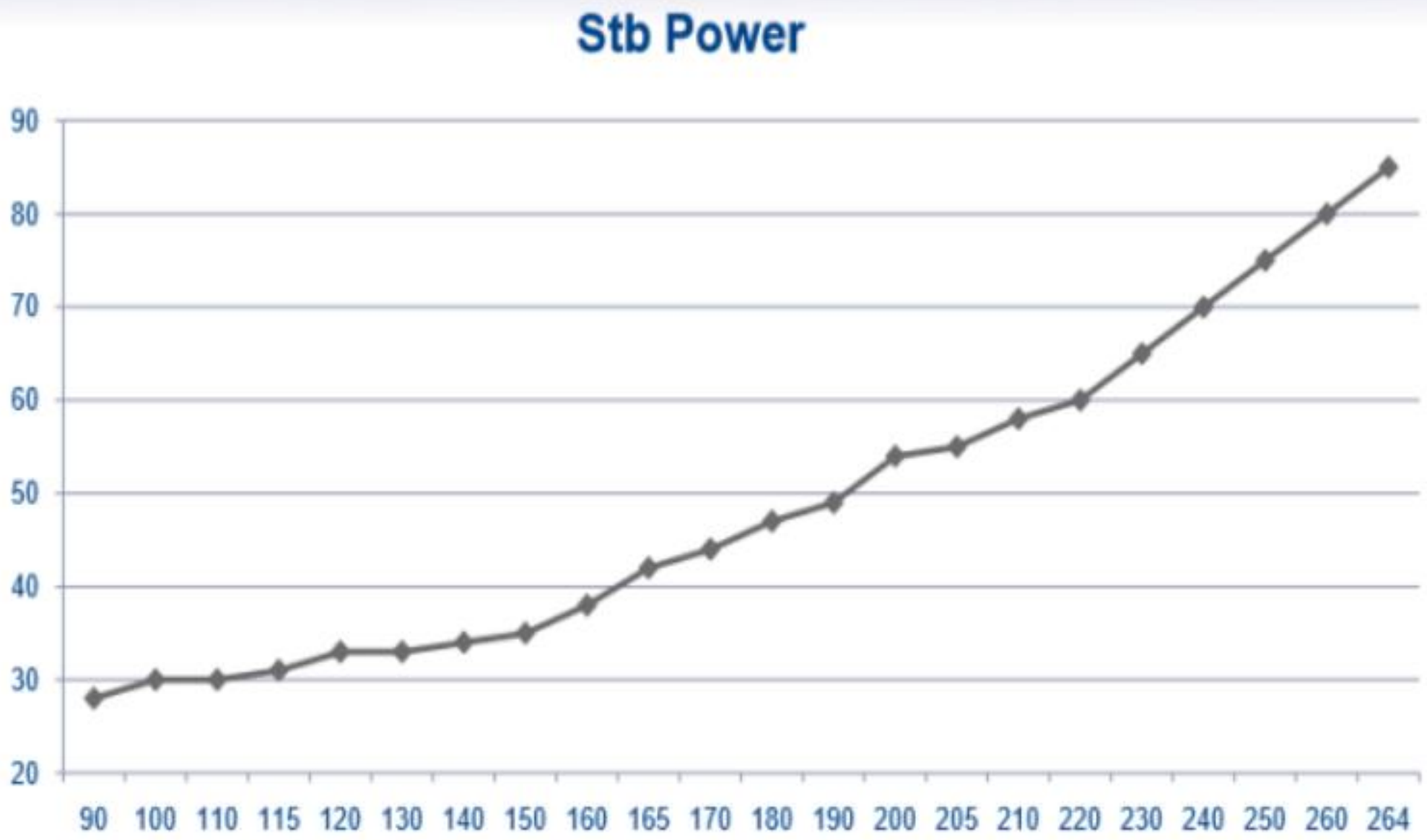
# 效率参数


102.00%
100.00%
98.00%
96.00%
94.00%
92.00%
90.00%
88.00%
86.00%
84.00%
Efficiency
0%
25%
50%
75%
100%
Load
5V/115Vac
5V/230Vac

# Standby Power

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**Standby power is 65mW @230Vac**

# 研 吉 电 子 有 限 公 司

Contacts：刘 斌

Mobile：13923898924

Mail：andy@yanji-tech.hk

Q Q：1043245626