

DESCRIPTION

This circuit is designed specifically for $\alpha 3$ IC evaluation. After several modifications, the inner circuit design can reach high completion of security design and transmission efficiency. It can help developers to evaluate and develop products of wireless power supply system in a short time. Components allocation on PCB is designed precisely, and the circuit layout fits the excellent heat dissipation and low noise performance. Designers can take it for references.

FEATURES

- 5V to 16V wide operating input range; standby current consumption 1mA.
- System operation frequency from 50KHz to 500KHz.
- Once the object is identified, the IC will output power by automatic adjustment.
- Provide the protection of power overload and metal sensing.
- LED light indicates the charging activity.
- Function along with $\beta 3$ Rx Evaluation Board.

APPLICATIONS

- For electronics product that power is under 20W.
- Effective sensing distances less than 20mm.

20W Tx Evaluation Board

| Board Number | FDT IC Number |
|--------------|-----------------|
| 20W Tx | $\alpha 3$ ES01 |

| Board Number | FDT IC Number |
|--------------|------------------|
| 20W Tx | $\alpha 3$ SOIC8 |

*ES01= Engineer Sample Rev1.0

Engineering sample is packed in DIP8.

The official package is SOIC8. This PCB can be packed in both kinds.



Fu Da Tong Technology Co., Ltd.
10F-5, No.38C, Chung-Cheng Rd.
Chung-Ho City, (235) Taipei County, Taiwan
http://www.rfidpower.com.tw

ELECTRICAL CHARACTERISTICS

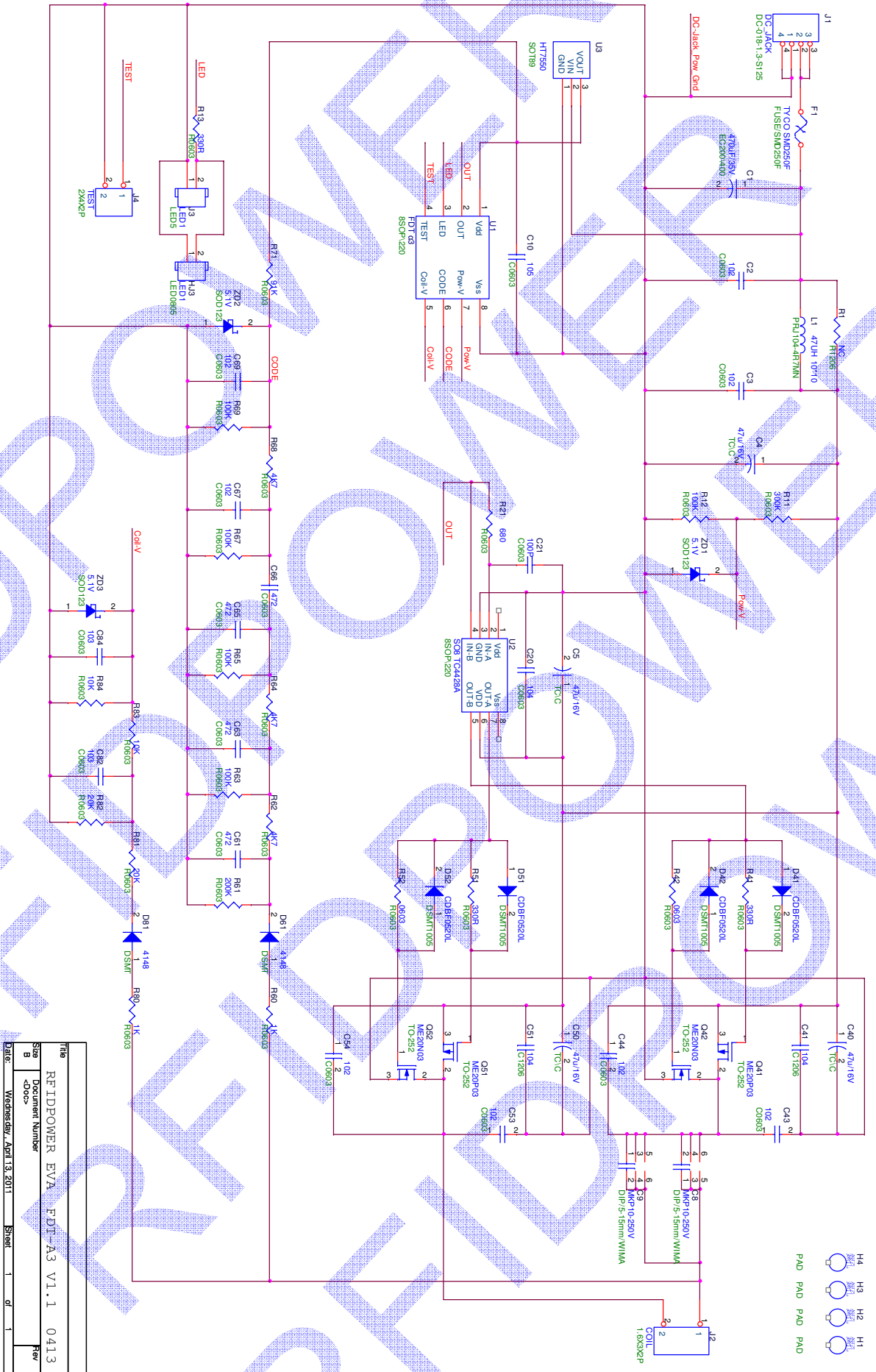
| Parameters | Symbol | Condition | Min | Typ | Max | Units |
|-------------------------------|--------|------------|-----|-----|------|-------|
| Operating Voltage | Pow-in | Standard | 4.5 | - | 16 | V |
| Supply Current (Standby) | I | Standard | 0.3 | 1 | 1.5 | mA |
| Supply Current (In operation) | I | Standard | 10 | - | 2000 | mA |
| Maximum Power Output | Pow-Tx | Pow-in=6V | | | 5 | W |
| Maximum Power Output | Pow-Tx | Pow-in=9V | | | 10 | W |
| Maximum Power Output | Pow-Tx | Pow-in=12V | | | 20 | W |

QUICK START GUIDE

Warning! After the circuit is electrified, there will be high-voltage alternating current at both ends of J2 transmission coil. Please do not touch the contacts in case of an electric shock.

1. First of all, connecting the coil to circuit. The resonant capacitor on circuit (C8, C9) needs to be modified along with coil inductance. The cross-reference table can be referred to $\alpha 3$ IC datasheet. 0.1 μ F capacitor of this evaluation board works best with 15~28 μ H coil inductance. Correct capacitor and inductance will meet the expected transmission efficiency.
2. Connecting the Pow_in and GND on circuit to the direct current power supply. Voltage should be between 5V and 16V. As soon as turning the power on, the circuit will also be turned on and be in standby mode.
3. In standby mode, the LED light is off, and the working current of Pow_in should be less than 2mA.
4. When the receiving coil with $\beta 3$ Rx gets close to the circuit transmission coil, it will initiate the power supply automatically. The LED light will shine which means the circuit is in charging mode.
5. There is a sophisticated inspection mechanism built in this circuit. Any disturbances or dangers will lead the circuit to stop working. Before delivery, every circuit must pass security check and work properly. If the circuit can not work during your test, please contact Fu Da Tong Technology for further information.

EVALUATION BOARD SCHEMATIC



| | | | | | | |
|-------|---------------------------|-------|---|--------|------|------|
| File | REFIDPOWER EVA | | | EDT-A3 | V1.1 | 0413 |
| Size | Document Number | | | | | |
| B | Doco | | | | | |
| Date: | Wednesday, April 13, 2011 | Sheet | 1 | of | 1 | |

EVALUATION BOARD BILL OF MATERIALS

| Position | Parts | Description | Package | Q'ty | Manufacturer | Part Number |
|---------------------|-------------------|-------------|----------|------|--------------|-----------------|
| C1 | Electrolytic Cap | 470uF/35V | 10X15 | 1 | Any | |
| C2,C3,C43,C44,C53 | Ceramic Cap | 1nF /50V | 0603 | 6 | Any | |
| C54C67,C69 | Ceramic Cap | 1nF /50V | 0603 | 2 | Any | |
| C4,C5,C40,C50 | Tantalum Cap | 47uF/16V | C-SIZE | 4 | Any | |
| C8 | Polypropylene Cap | 0.1uF/250V | DIP-15mm | 2 | WIMA | MKP10 |
| C10 | Ceramic Cap | 1uF/16V | 0603 | 1 | Any | |
| C20,C41,C51 | Ceramic Cap | 0.1uF/50V | 0603 | 3 | Any | |
| C21 | Ceramic Cap | 100pF/50V | 0603 | 1 | Any | |
| C61,C63,C65,C66 | Ceramic Cap | 4700pF/50V | 0603 | 4 | Any | |
| C82,C84 | Ceramic Cap | 10nF /50V | 0603 | 2 | Any | |
| D41,D42,D51,D52 | Schottky Diodes | 20V | 0603 | 4 | COMCHIP | CDBF0520L-F |
| D61,D81 | Diodes | 100V | 1206 | 2 | COMCHIP | CDSNC4148-F |
| F1 | Resettable Fuses | 2.5A | 250 | 1 | TYCO | SMD250F-2 |
| HJ3 | LED | Red | 0805 | 1 | Any | |
| U1 | IC | $\alpha 3$ | SOIC8 | 1 | FDT | $\alpha 3$ 1101 |
| J1 | Connector | DC JACK | SMT | 1 | Any | |
| L1 | Inductance | 4.7UH | SMD | 1 | Prejection | PRJ104-4R7 |
| Q41,Q51 | MOSFET | P-MOS-30V | OT-252 | 2 | Matsuki | ME20P03-F |
| Q42,Q52 | MOSFET | N-MOS-30V | OT-252 | 2 | Matsuki | ME20N03-F |
| R11 | Film Res | 300K | 0603 | 1 | Any | |
| R12,R63,R65,R67,R69 | Film Res | 100K | 0603 | 5 | Any | |
| R13,R41,R42,R51,R52 | Film Res | 330R | 0603 | 5 | Any | |
| R21 | Film Res | 680R | 0603 | 1 | Any | |
| R60,R80 | Film Res | 1K | 0603 | 2 | Any | |
| R61 | Film Res | 200K | 0402 | 1 | Any | |
| R62,R64,R68 | Film Res | 4.7K | 0603 | 3 | Any | |
| R71 | Film Res | 91K | 0603 | 1 | Any | |
| R81,R82 | Film Res | 20K | 0603 | 2 | Any | |
| R83,R84 | Film Res | 10K | 0603 | 2 | Any | |
| U2 | IC | DRIVER | SO8 | 1 | Microchip | TC4428 |
| U3 | IC | LDO | SOT89 | 1 | Hotek | HT7550 |
| ZD1,ZD2,ZD3 | Zener Diode | 5.1V 500mW | SOD123 | 3 | Any | |

PRINTED CIRCUIT BOARD LAYOUT

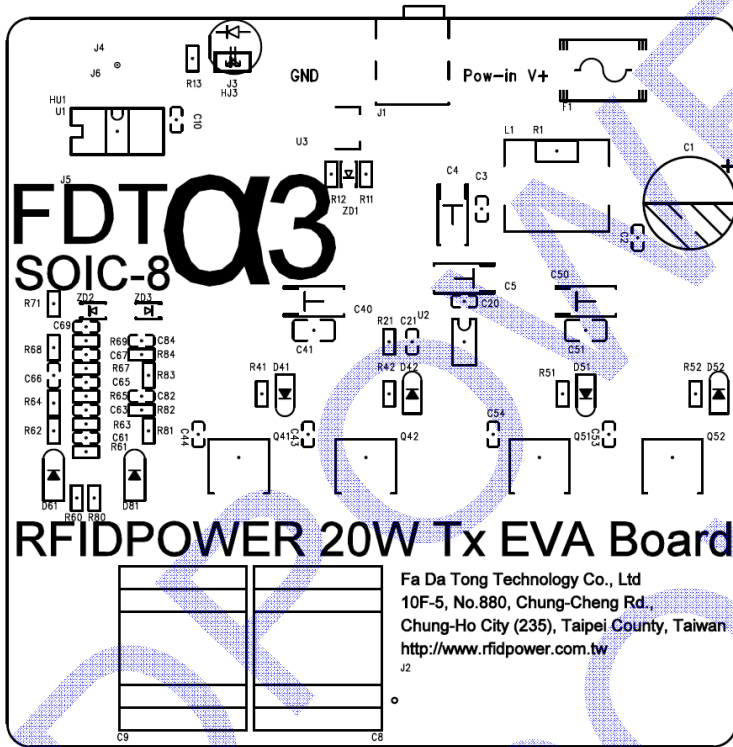


Figure 1—Top Silk Layer

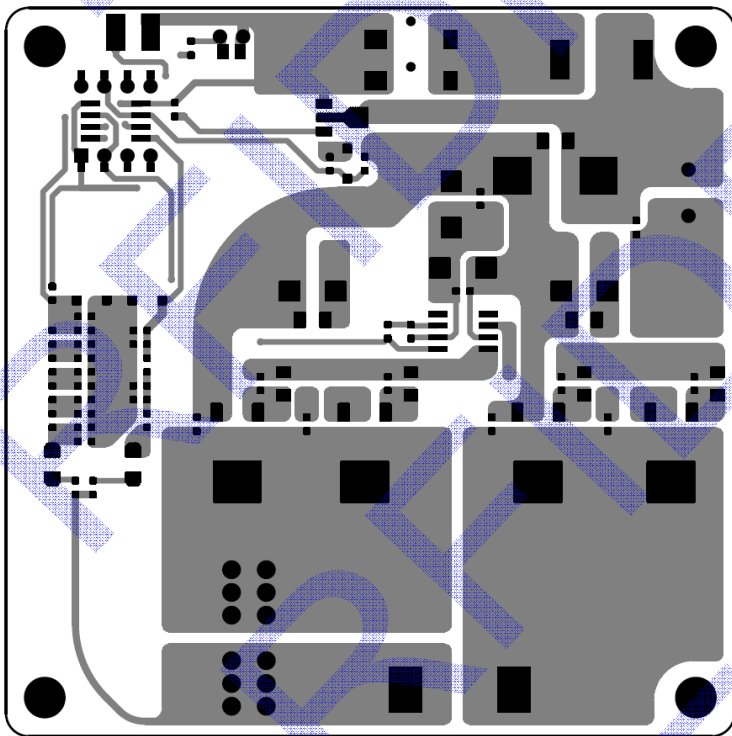


Figure 2—Top Layer

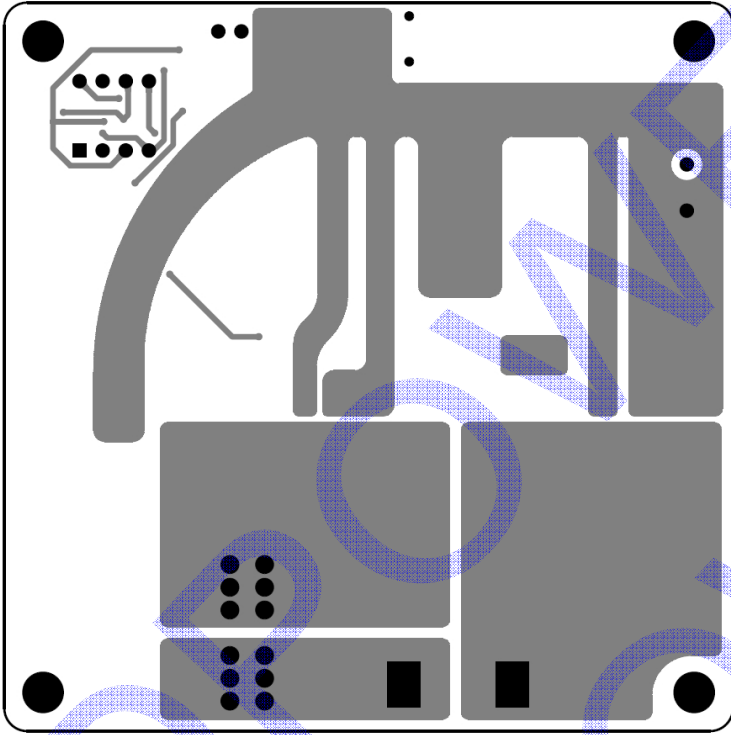


Figure 3—Bottom Layer

Fu DA Tong (FDT) Technology
WWW.RFIDPOWER.COM.TW
10F-5, No.880, Chung-Cheng Rd.,
Chung-Ho City (235), Taipei County, Taiwan
Mail: rd-01@rfidpower.com.tw