


1.0 Reference and Address			
Report Number	200224124GZU-001	Original Issued: 13-Apr-2020	Revised: None
Standard(s)	Automatic Electrical Controls - Part 1: General Requirements [UL 60730-1:2016 Ed.5] Automatic Electrical Controls - Part 1: General Requirements [CSA E60730-1:2015 Ed.5]		
Applicant	Shenzhen Sonoff Technologies Co., Ltd.	Manufacturer	Shenzhen Yindao Micro-electronics Co., Ltd
Address	Room 1001, 10F, Building 8, Lianhua Industrial Park, Longyuan Road, Longhua District, Shenzhen, Guangdong	Address	7F, Block 5, Jingsheng Industrial Park, Huawang Road, Dalang Street, Longhua District, Shenzhen, Guangdong 518109
Country	China	Country	China
Contact	Patton Pang; Jerry Shi	Contact	Jie Zhou; Dihua Wu
Phone	86-18194017416; 86-13380305412	Phone	86-13923732756; 86-18002501871
FAX	--	FAX	--
Email	patton.pang@itead.cc; jerry.shi@itead.cc	Email	yindao.2007@163.com;
Manufacturer2	Dongguan SI Electronic Co., Ltd		
Address	Floor 1& Floor 2, Bldg B, Fuzhu 1st Street, Yinyang Industrial Zone, Zhangyang Zhangmutou Town, Dongguan, Guangdong 523637		
Country	China		
Contact	Liu Hui		
Phone	86-13929272740		
FAX	--		
Email	sales@si-ltd.com		

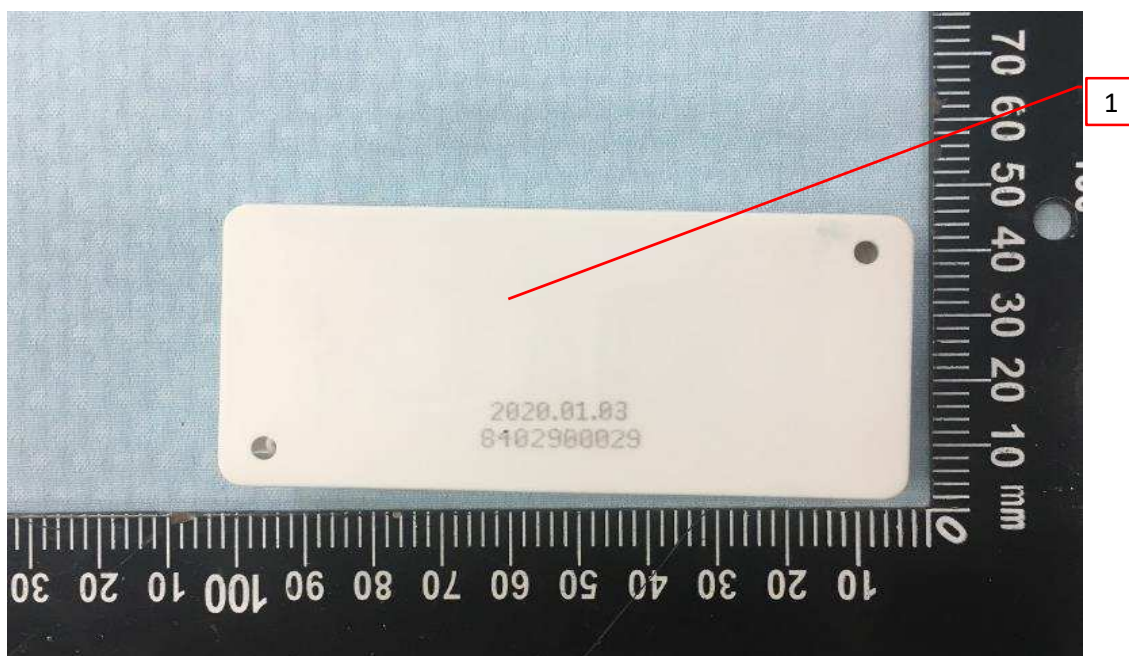
2.0 Product Description	
Product	Wi-Fi Smart Switch
Brand name	 (Sonoff)
Description	The products covered by this report is independently mounted smart switch. Indoor use only. This device works with app "eWelink". It can be turned the power live wire ON/OFF wirelessly by "eWelink" app which connects to the mobile devices. It can work as a signal repeater. The devices also can be easily turned ON/OFF by simply pressing the switch button on the product.
Models	BASICR2, RFR2
Model Similarity	RFR2 is same as BASICR2 except the RFR2 with RF control and BASICR2 without RF control.
Ratings	Input : 100~240V~, 50/60Hz 10A Max Output: 100~240V~, 50/60Hz 10A General Use(Max. load) Wiring: 16-18AWG SOL/STR copper conductor only, Tightening torque: 3.5 lb-in
Other Ratings	NA

3.0 Product Photographs

Photo 1 - Front view of model BASICR2



Photo 2 - Back view of model BASICR2



3.0 Product Photographs

Photo 3 - Internal view of model BASICR2

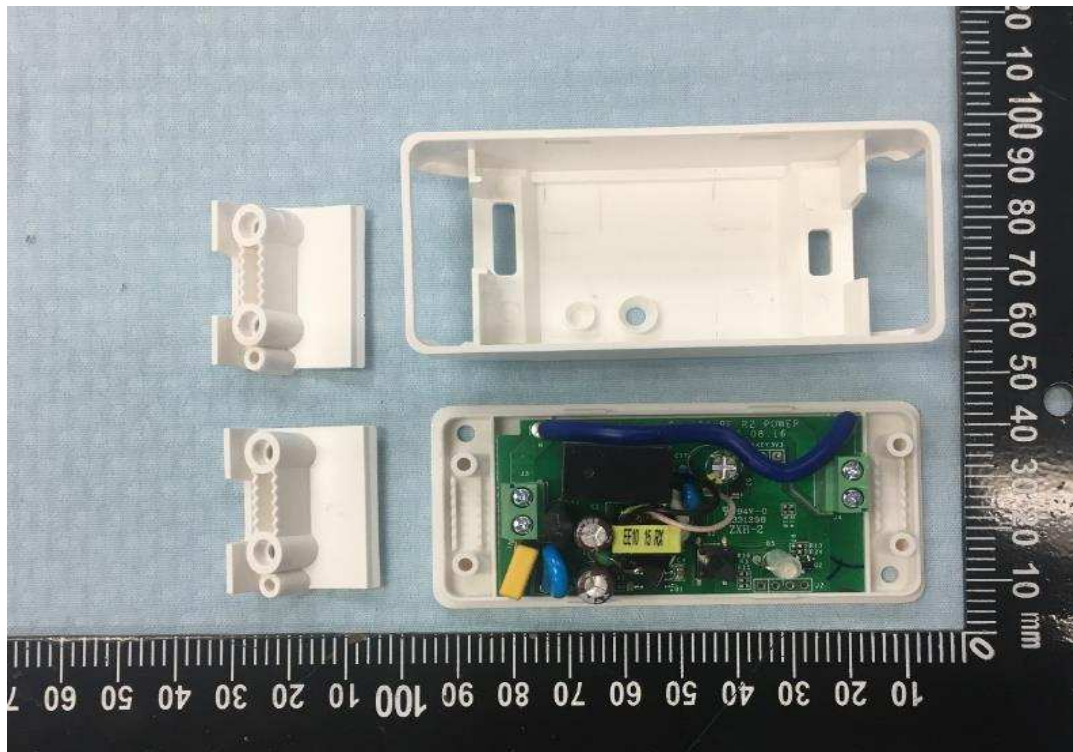
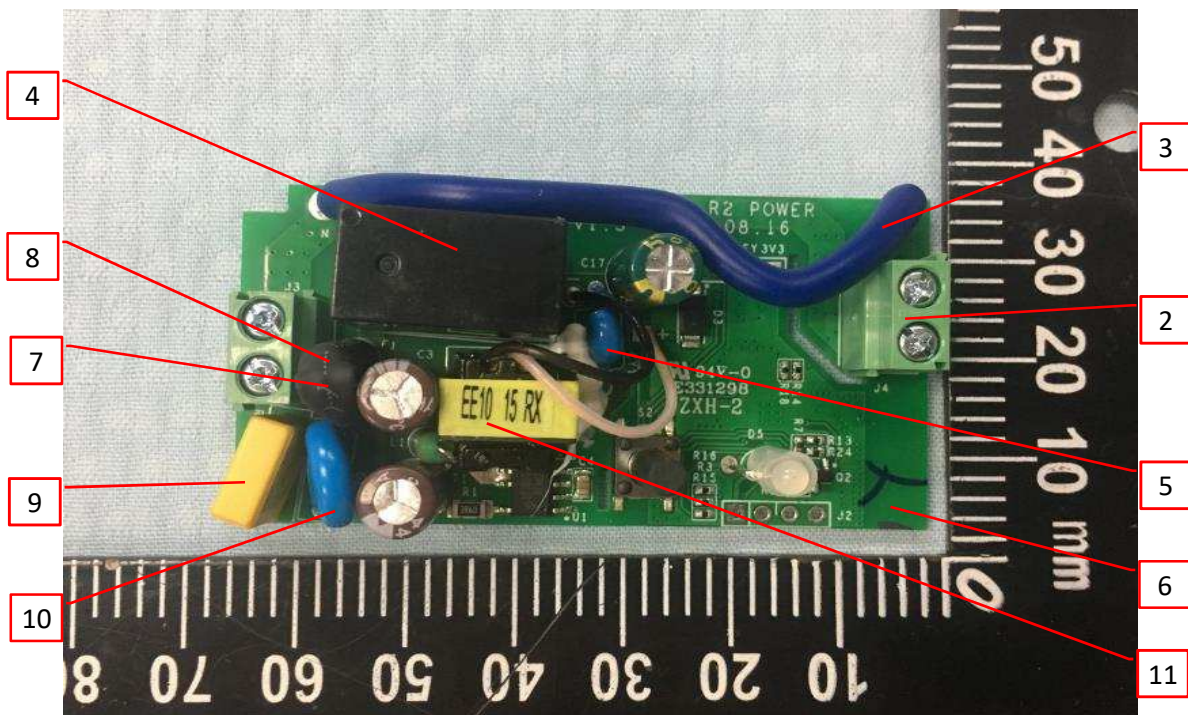


Photo 4 - Internal component of model BASICR2



3.0 Product Photographs

Photo 5 - Internal component of model BASICR2

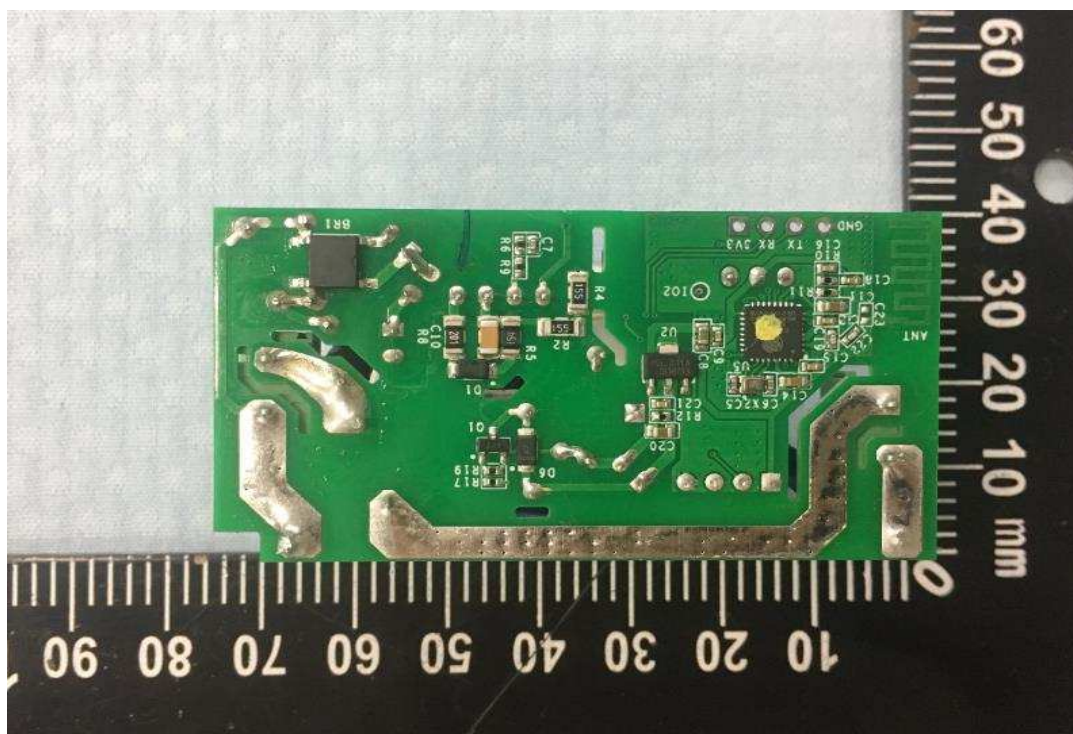


Photo 6 - Front view of model RFR2



3.0 Product Photographs

Photo 7 - Back view of model RFR2

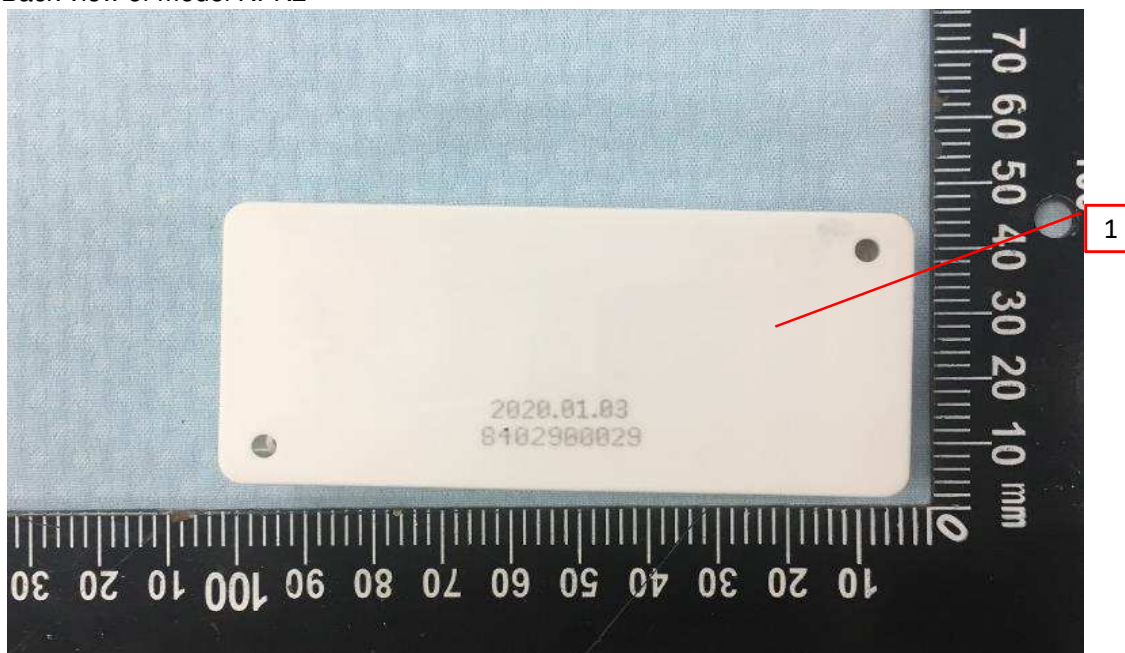
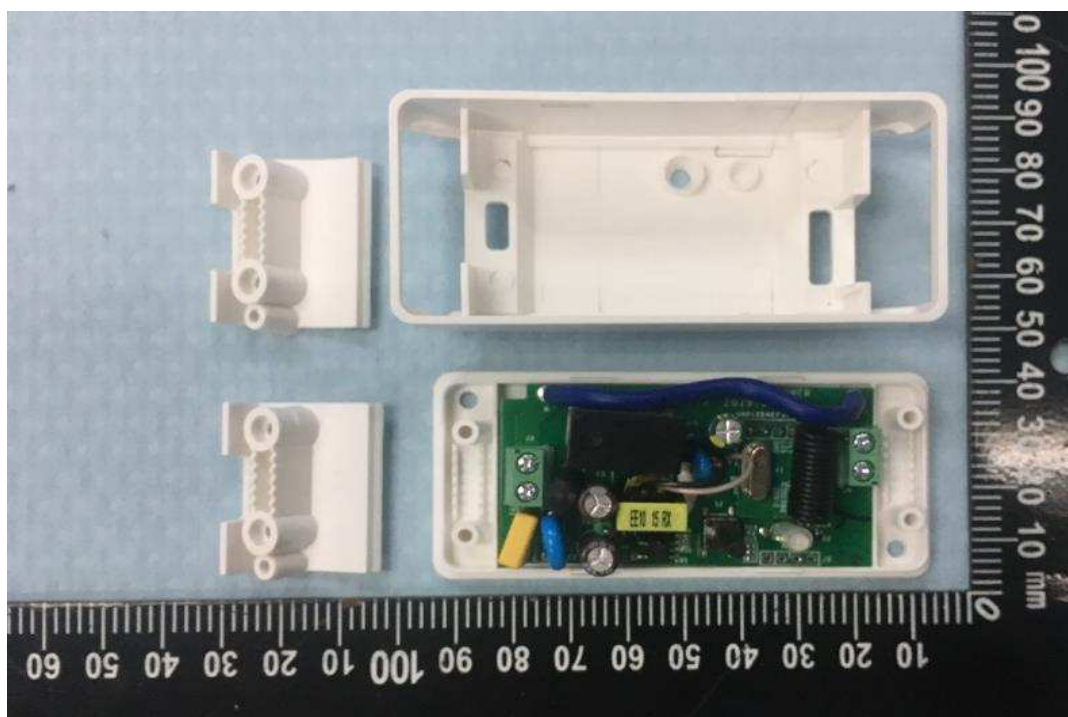


Photo 8 - Internal view of model RFR2



3.0 Product Photographs

Photo 9 - Internal component of model RFR2

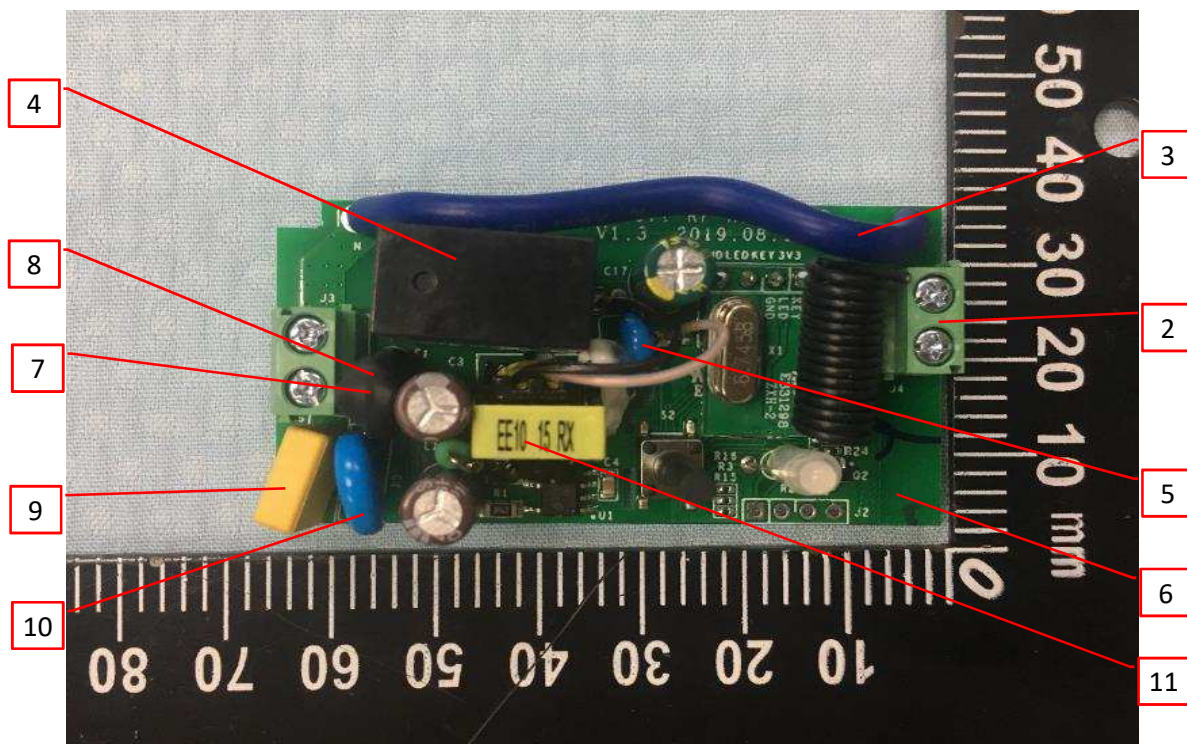
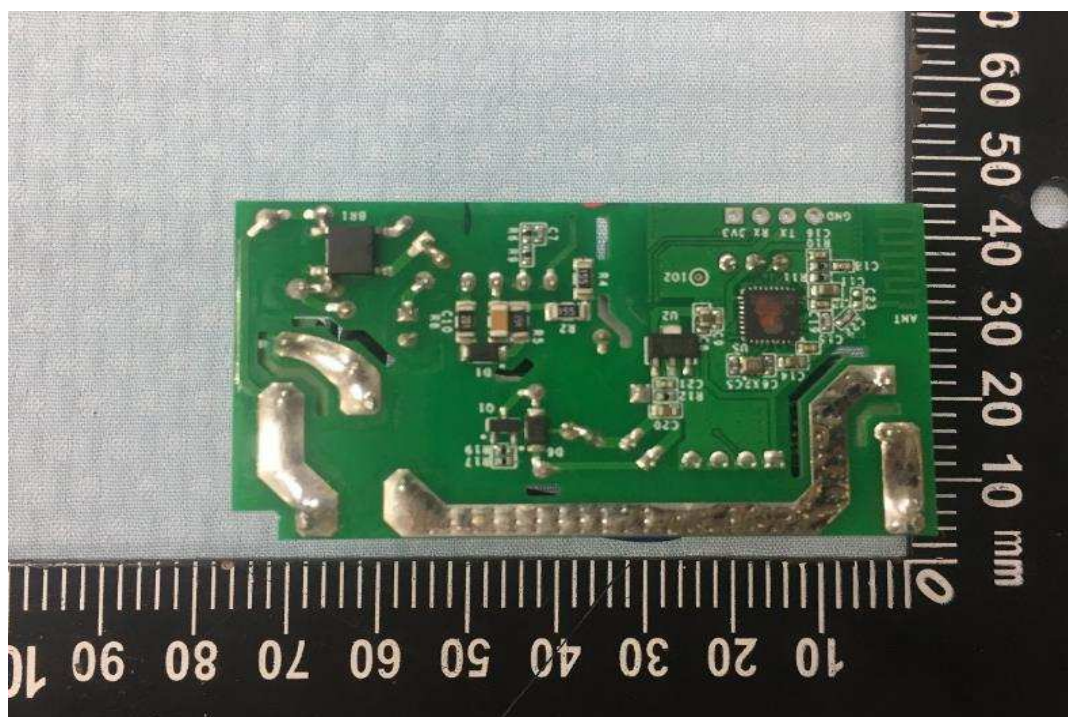


Photo 10 - Internal component of model RFR2



4.0 Critical Components						
Photo #	Item no. ¹	Name	Manufacturer/ trademark ²	Type / model ²	Technical data and securement means	Mark(s) of conformity ³
1,2,6,7	1	Enclosure	SABIC INNOVATIVE PLASTICS US L L C	940(f1)	PC, minimum thickness 1.2 mm, V-0, 80°C, HWI 3, HAI 4, CTI 2. Upper and lower enclosures are fixed together physical fixed. Dimension:88x38.5x23.5mm.	cURus
4,9	2	Input /Output Terminal	Dongguan Changhe Electronics Co., Ltd	CA350-04 (@6)	10A, 300V, 14-24AWG, SOL/STR	UR
4,9	3	Internal wire	Various	Various	Min. 18AWG, 80°C, 300V, VW-1	cURus, cETLus recognised
4,9	4	Relay	Zhejiang Fanhar Electronics Co., Ltd.	W11-1A2STLE-H	10A, 250V, 85°C, GP LOAD	cURus
			Xiamen Hongfa Electroacoustic Co., Ltd.	HF32FV	10A, 250V, 85°C, GP LOAD	cURus
			Shenzhen Golden Electrical Appliance Co., Ltd	GI-1A-5LH	10A, 250V, 85°C, GP LOAD	cURus
4,9	5	Y-capacitor	Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	CD221K	Y1, 0.22nF, 250V, 125°C	cURus
			Various	Various	Y1, 0.22nF, 250V, 125°C	cURus
4,9	6	PCB	Jiangxi Zhong Xin Hua Electronics Industry Co., Ltd	ZXH-2	V-0, 130°C	UR
			Various	Various	Minimum V-0, 130°C	UR
4,9	7	Fuse	Dongguan Deeho Electronic Co Ltd	KNP1W 10R 5%	10Ω, 1W	cURus
			Various	Various	10Ω, 1W	cURus
4,9	8	Heat-shrinkable tube	Various	Various	Min.300V, 105°C	cURus
4,9	9	X-capacitor	Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	MPX	Max. 0.047 uF, 275 Vac,110°C, X2 type	cURus
			Various	Various	Max. 0.047 uF, 275 Vac,110°C, X2 type	cURus

4.0 Critical Components						
Photo #	Item no. ¹	Name	Manufacturer/ trademark ²	Type / model ²	Technical data and securement means	Mark(s) of conformity ³
4,9	10	Varistor (MOV)	Hongzhi Enterprises Ltd.	HEL10D471K	300VAC, 125°C In=3kA	cURus
			Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	10D471K	300VAC, 125°C In=3kA	cURus
			HuiZhou Lien Shun Electronic Co., Ltd.	10D471K	300VAC, 125°C In=3kA	cURus
4,9	11	Transformer	Shenzhen Xinchuanglong Electronics Co., Ltd. Grid	EE10-LP3669A 5V0.5A	Class A. Refer to Illustration 10 of Section 7.0.	NR
4,9	11a	Magnet Wire (Not shown)	SHANTOU SHENGANG ELECTRICAL INDUSTRIAL CO LTD	xUEW/155	155°C	UR
				QA-x/155		
4,9	11b	Triple Insulation Wire (Not shown)	Shenzhen Darun Science And Technology Co., Ltd	DRTIW-F	155°C	UR
4,9	11c	Bobbin (Not shown)	CHANGSHU SOUTH-EAST PLASTIC CO LTD	PF2A5-151J	V-0, 150°C	cURus
4,9	11d	Teflon tube (Not shown)	Shenzhen Woer Heat Shrinkable Material Co.,Ltd	WF	600V, 200°C	UR
4,9	11e	Insulation tape (Not shown)	SUZHOU MAILADUONA ELECTRIC MATERIAL CO LTD	JY312#	130°C	UR
4,9	11f	Varnish(Not shown)	Zhuhai Changxian New Materials Technology Co., Ltd	E962	130°C	UR
NOTES: 1) Not all item numbers are indicated (called out) in the photos, as their location is obvious. 2) "Various" means any type, from any manufacturer that complies with the "Technical data and securement means" and meets the "Mark(s) of conformity" can be used. 3) Indicates specific marks to be verified, which assures the agreed level of surveillance for the component. "NR" - indicates Unlisted and only visual examination is necessary. "See 5.0" indicates Unlisted components or assemblies to be evaluated perio						

5.0 Critical Unlisted CEC Components

No Unlisted CEC components are used in this report.

6.0 Critical Features
<u>Recognized Component</u> - A component part, which has been previously evaluated by an accredited certification body with restrictions and must be evaluated as part of the basic product considering the restrictions as specified by the Conditions of Acceptability.
<u>Listed Component</u> - A component part, which has been previously Listed or Certified by an accredited Certification Organization with no restrictions and is used in the intended application within its ratings.
<u>Unlisted Component</u> - A part that has not been previously evaluated to the appropriate designated component standard. It may also be a Listed or Recognized component that is being used outside of its evaluated Listing or component recognition.
<u>Critical Features/Components</u> - An essential part, material, subassembly, system, software, or accessory of a product that has a direct bearing on the product's conformance to applicable requirements of the product standard.
<u>Construction Details</u> - For specific construction details, reference should be made to the photographs and descriptions. All dimensions are approximate unless specified as exact or within a tolerance. In addition to the specific construction details described in this Report, the following general requirements also apply.
1. <u>Spacing</u> - In primary circuits, 2.5 mm minimum spacing are maintained through air and 2.5 mm minimum spacing maintained over surfaces of insulating material between current-carrying parts of opposite polarity and between such parts and dead-metal parts or low voltage circuits.
2. <u>Mechanical Assembly</u> - Components such as switches, fuseholders, connectors, wiring terminals and display lamps are mounted and prevented from shifting or rotating by the use of lockwashers, starwashers, or other mounting format that prevents turning of the component.
3. <u>Corrosion Protection</u> - All ferrous metal parts are protected against corrosion by painting, plating or the equivalent.
4. <u>Accessibility of Live Parts</u> - All uninsulated live parts in primary circuitry are housed within a non-metallic enclosure constructed with no openings other than those specifically described in Sections 4.
5. <u>Grounding</u> - All exposed dead-metal parts and all dead-metal parts within the enclosure that are exposed are connected to the grounding lead of the power supply cord.
6. <u>Polarized Connection</u> - This product is provided with a polarized power supply connection. All single pole switches and fuses are connected only to the ungrounded supply circuit conductor.
7. <u>Internal Wiring</u> - Internal wiring is routed away from sharp or moving parts. Internal wiring leads terminating in soldered connections are made mechanically secure prior to soldering. Recognized Component separable (quick disconnect) connectors of the positive detent type, closed loop connectors, or other types specifically described in the text of this report are also acceptable as internal wiring terminals. At points where internal wiring passes through metal walls or partitions, the wiring insulation is protected against abrasion or damage by plastic bushings or grommets.
8. <u>Schematics</u> - Refer to Sec. 7.0 Illustration 1 - 6 for schematics requiring verification during Field Representative Inspection Audits.
9. <u>Markings</u> - The product is marked by a permanent method such as molding into polymeric enclosure or printing, painting onto polymeric enclosure as follows: 1. Applicant's name or trade mark: refer to Brand name in Section 2.0. 2. Model number: refer to Models in Section 2.0. 3. Electrical ratings: refer to ratings in Section 2.0 4. ETL logo and Control Number: 5012297(for Manufacturer Yingdao), 5017124(for Manufacturer SI). 5. Date of manufacturer.
10. <u>Installation, Operating and Safety Instructions</u> - Instructions for installation and use of this product are provided by the manufacturer.

Illustration 1 - Main power Circuit diagram of model BASICR2/RFR2.

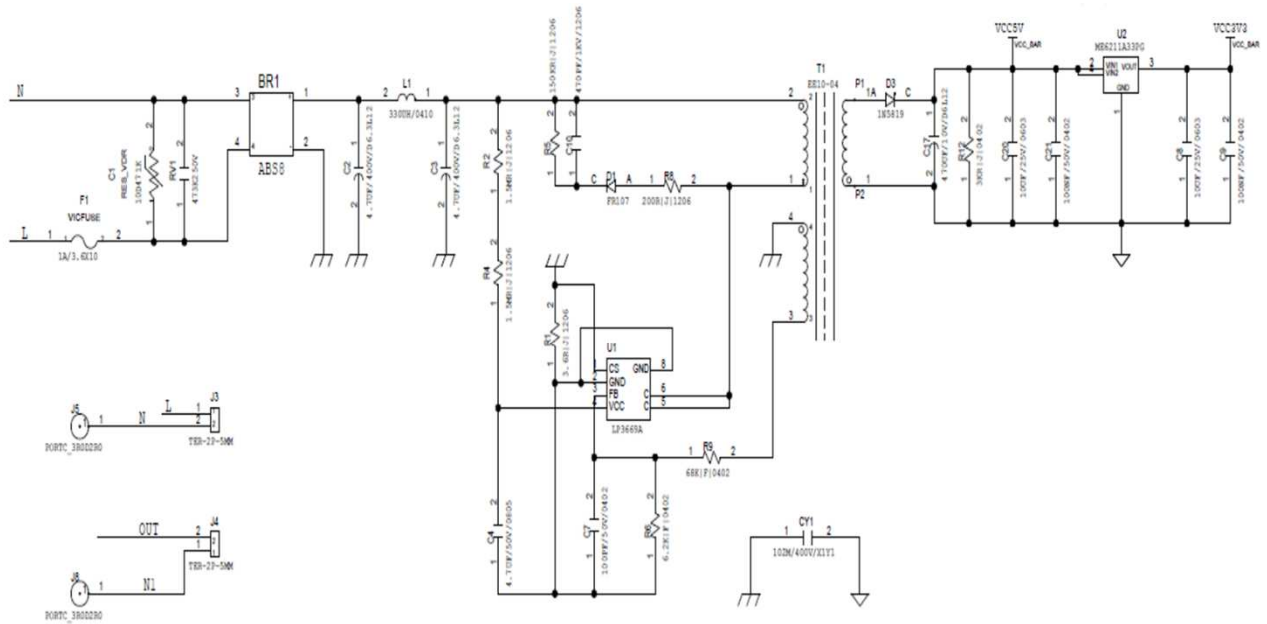
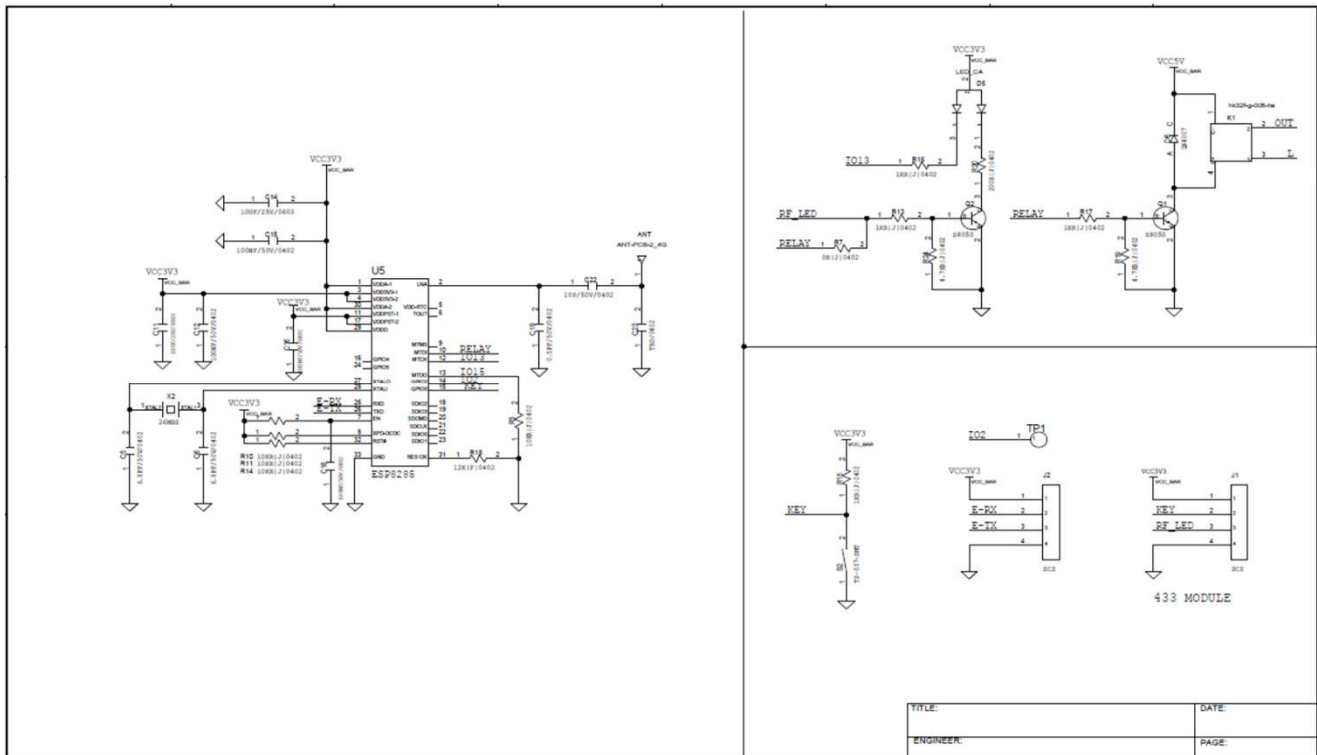
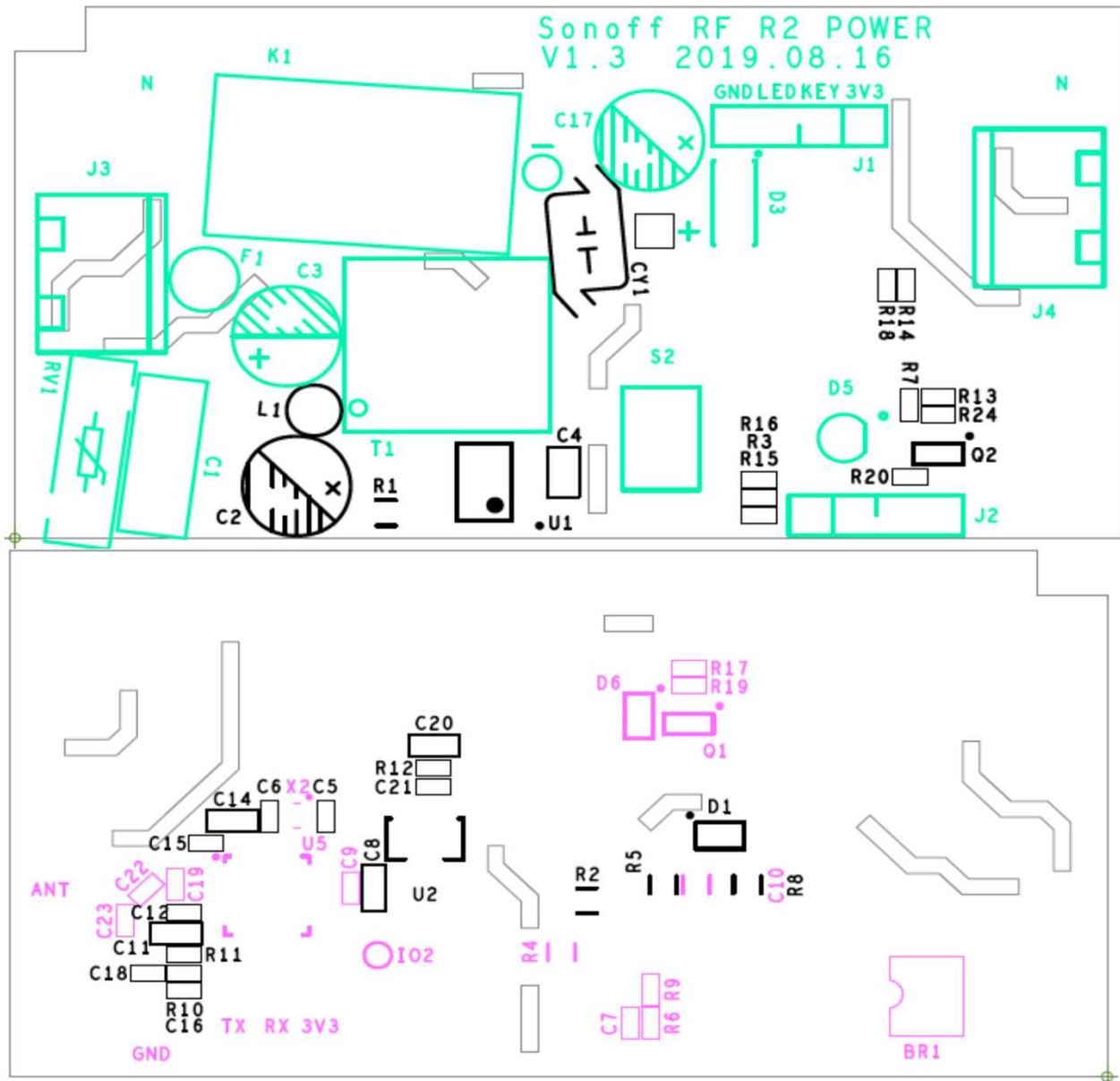


Illustration 2 - Wifi control Circuit diagram of model BASICR2/RFR2.



7.0 Illustrations

Illustration 3 - Main circuit PCB LAYOUT of model BASICR2/RFR2.



7.0 Illustrations

Illustration 4 - RF control Circuit diagram of model RFR2.

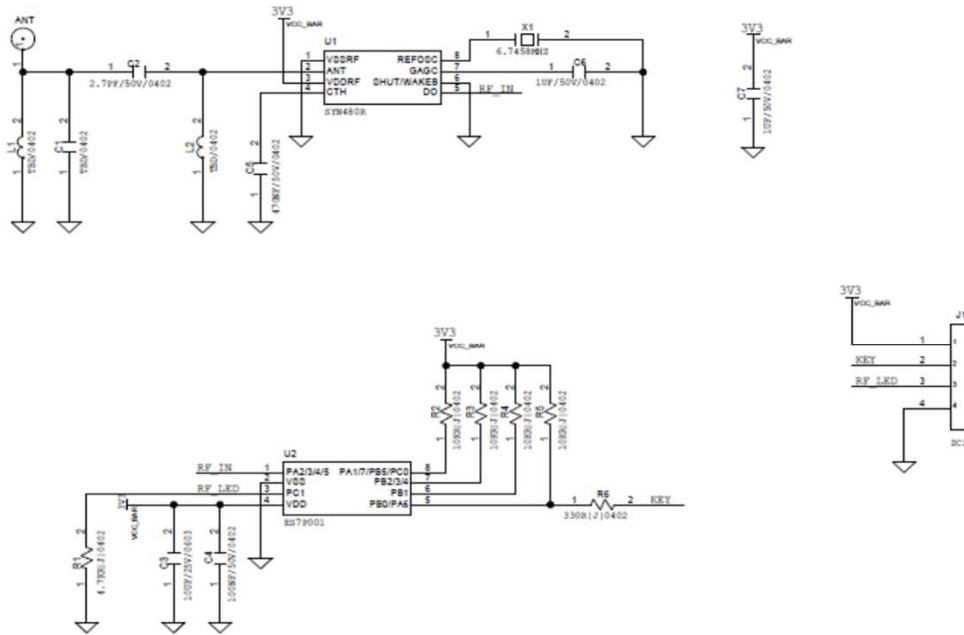
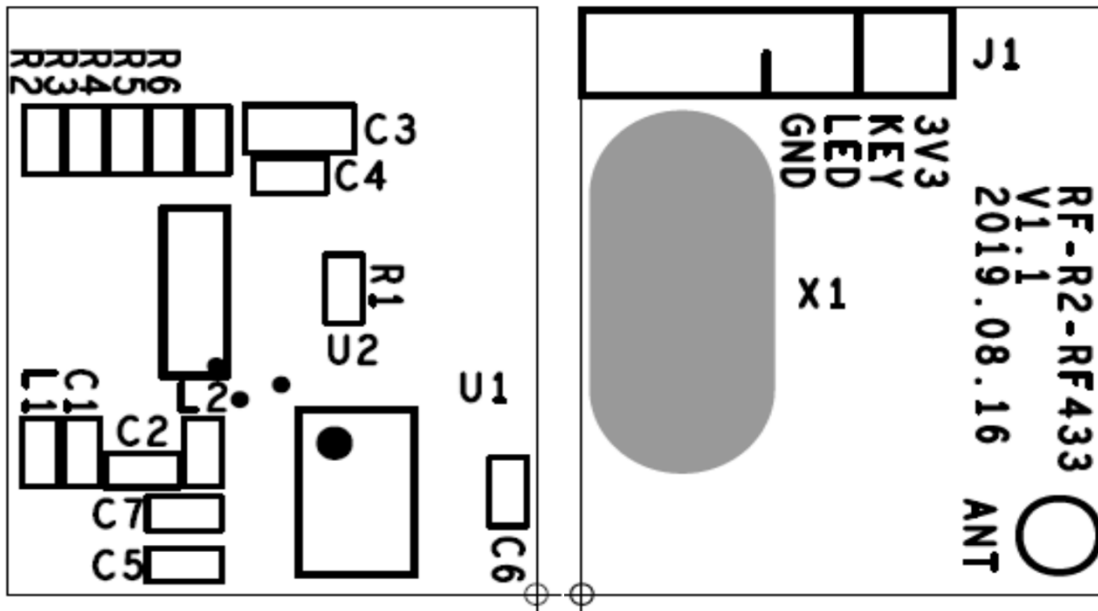


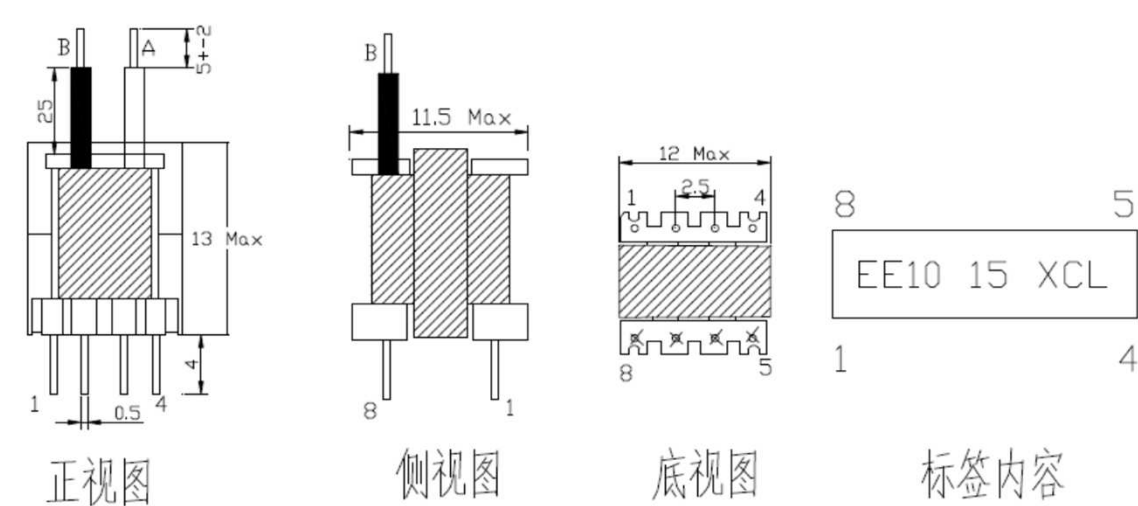
Illustration 5 - RF control PCB layout of model RFR2.



7.0 Illustrations

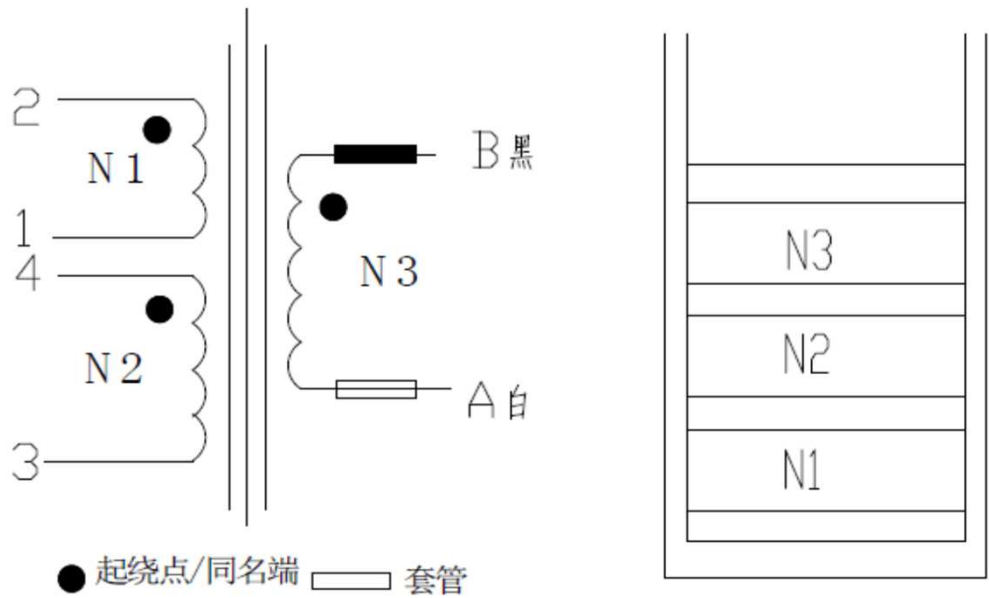
Illustration 6 - Specification of transformer EE10-LP3669A 5V0.5A

一. 外观图DIMENSION: (mm)



二. 电气原理图SCHEMATIC:

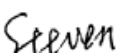

三. 线包结构图WINDING CONSTRUCTION:



四. 线圈绕制表 WINDING

序号 NO	绕线方式	脚位/PIN		槽位/SLOT		线径股数 WIRE SHARES	圈数 TURNS	套管/CASING		绝缘胶带 INSULATING TAPE	绕制方法WINDING METHOD
		入	出	入	出			入	出		
N1	顺时针绕	2	1			2UEW $\Phi 0.12\text{mm} \times 1\text{P}$	180TS			7mm/2TS	密绕 不交叉
N2	顺时针绕	4	3			2UEW $\Phi 0.12\text{mm} \times 1\text{P}$	14TS			7mm/2TS	居中 密绕 不交叉
N3	顺时针绕	B	A			TEX-E $\Phi 0.35\text{mm} \times 1\text{P}$	12TS	黑23L	白23L	7mm/2TS	密绕 不交叉

8.0 Test Summary					
Evaluation Period	26-Feb-2020~19-Mar-2019		Project No.	200224124GZU	
Sample Rec. Date	24-Feb-2020	Condition	Prototype	Sample ID.	S200224124-001~012
Test Location	Intertek Testing Services Shenzhen Limited Guangzhou Branch Block E, No. 7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City				
Test Procedure	Testing Lab				
Determination of the result includes consideration of measurement uncertainty from the test equipment and methods. The product was tested as indicated below with results in conformance to the relevant test criteria.					
The following tests were performed:					
Test Description	UL 60730-1:2016 Ed.5 Clause	CSA E60730-1:2015 Ed.5 Clause			
Inaccessibility of live parts	8.1.9	8.1.9	--		
Protection against humid conditions	12.2	12.2	--		
Measurements of leakage current	12.3	12.3	--		
Insulation resistance and dielectric strength	13	13	--		
Heating	14	14	--		
Environmental stress	16.2	16.2	--		
Impact resistance	18.2	18.2	--		
Tumbling	18.6	18.6	--		
Threaded parts and connections	19	19	--		
Creepage distance, clearances and distance through solid insulation	20	20	--		
Abnormal operation	H.27	H.27	--		
Evaluation Period	26-Feb-2020~19-Mar-2020		Project No.	200225007GZU	
Sample Rec. Date	25-Feb-2020	Condition	Prototype	Sample ID.	S200225007-001
Test Location	Intertek Testing Services Shenzhen Limited Guangzhou Branch Block E, No. 7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City				
Test Procedure	Testing Lab				
Determination of the result includes consideration of measurement uncertainty from the test equipment and methods. The product was tested as indicated below with results in conformance to the relevant test criteria.					
The following tests were performed:					
Test Description	UL 60730-1:2016 Ed.5 Clause	CSA E60730-1:2015 Ed.5 Clause	--		
Conducted Emission	H.23.1.2	H.23.1.2	--		
Radiated Emission	H.23.1.2	H.23.1.2	--		
Surge Immunity	H.26.8	H.26.8	--		
Electrical Fast Transient/Burst Immunity	H.26.9	H.26.9	--		

8.1 Signatures			
A representative sample of the product covered by this report has been evaluated and found to comply with the applicable requirements of the standards indicated in Section 1.0.			
Completed by:	Steven Liang	Reviewed by:	Sunny Tang
Title:	Project Engineer	Title:	Reviewer
Signature:		Signature:	

9.0 Correlation Page For Multiple Listings

The following products, which are identical to those identified in this report except for model number and Listee name, are authorized to bear the ETL label under provisions of the Intertek Multiple Listing Program.

BASIC LISTEE	Shenzhen Sonoff Technologies Co., Ltd.
Address	Room 1001, 10F, Building 8, Lianhua Industrial Park, Longyuan Road, Longhua District, Shenzhen, Guangdong
Country	China
Product	Wi-Fi Smart Switch

MULTIPLE LISTEE 1	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	
MULTIPLE LISTEE 1 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 2	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	
MULTIPLE LISTEE 2 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 3	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	
MULTIPLE LISTEE 3 MODELS	BASIC LISTEE MODELS

10.0 General Information

The Applicant and Manufacturer have agreed to produce, test and label ETL Listed products in accordance with the requirements of this Report. The Manufacturer has also agreed to notify Intertek and to request authorization prior to using alternate parts, components or materials.

COMPONENTS

Components used shall be those itemized in this Intertek report covering the product, including any amendments and/or revisions.

LISTING MARK

The ETL Listing mark applied to the products shall either be separable in form, such as labels purchased from Intertek, or on a product nameplate or other media only as specifically authorized by Intertek. Use of the mark is subject to the control of Intertek.

The mark must include the following four items:

- 1) applicable country identifiers "US" and/or "C" or "US", "C" and "EU"
- 2) the word "Listed" or "Classified" or "Recognized Component" (whichever is appropriate)
- 3) a control number issue by Intertek
- 4) a product descriptor that identifies the standards used for certification. Example:

For US standards, the words, "Conforms to" shall appear with the standard number along with the word, "Standard" or "Std." Example: "Conforms to ANSI/UL Std. XX."

For Canadian standards, the words "Certified to CAN/CSA Standard CXX No. XX." shall be used, or abbreviated, "Cert. to CAN/CSA Std. CXX No. XX."

Can be used together when both standards are used.

Note: A facsimile must be submitted to Intertek, Attn: Follow-up Services for approval prior to use.

The facsimile need not have a control number. A control number will be issued **after signed Certification Agreements** have been received by the Follow-up Services office, approval of the facsimile of your proposed Listing Mark, satisfactory completion of the Listing Report, and scheduling of a factory assessment in your facility.

MANUFACTURING AND PRODUCTION TESTS

Manufacturing and Production Tests shall be performed as required in this Report.

FOLLOW-UP SERVICE

Periodic unannounced audits of the manufacturing facility (and any locations authorized to apply the mark) shall be scheduled by Intertek. An audit report shall be issued after each visit. Special attention will be given to the following:

1. Conformance of the manufactured product to the descriptions in this Report.
2. Conformance of the use of the ETL mark with the requirements of this Report and the Certification Agreement.
3. Manufacturing changes.
4. Performance of specified Manufacturing and Production Tests.

In the event that the Intertek representative identifies non-conformance(s) to any provision of this Report, the Applicant shall take one or more of the following actions:

1. Correct the non-conformance.
2. Remove the ETL Mark from non-conforming product.
3. Contact the issuing product safety evaluation center for instructions.

10.1 Evaluation of Unlisted Components

Because Unlisted Components are uncontrolled, and they do not fall under a third party follow up program, Intertek may require these components to be tested and/or evaluated at least once annually, more often for certain components, as part of the independent certification process. The Unlisted Components in Section 5.0 require testing and/or evaluation as indicated.

Note to Intertek Follow Up Inspector: The Component Evaluation Center, CEC, will notify you in writing when these components must be selected and sent to the CEC for re-evaluation

Ship the samples to:

Intertek Testing Services Shenzhen Limited Guangzhou Branch

ETL Component Evaluation Center

Block E, No. 7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City

CETDD Guangzhou, China.

Attn: Ms. Joey Kuang

Sample Disposition: Due to the destructive nature of the testing, all samples will be discarded at the conclusion of testing unless, the manufacturer specifically requests the return of the samples. The request for return must accompany the initial component shipment.

11.0 Manufacturing and Production Tests

The manufacturer agrees to conduct the following Manufacturing and Production Tests as specified:

Required Tests

Dielectric Voltage Withstand Test

11.1 Dielectric Voltage Withstand Test

Method

One hundred percent of production of the products covered by this Report shall be subjected to a routine production line dielectric withstand test.

The test shall be conducted on products, which are fully assembled. Prior to applying the test potential, all switches, contactors, relays, etc., should be closed so that all primary circuits are energized by the test potential. If all primary circuits cannot be tested at one time, then separate applications of the test potential shall be made.

The test voltage specified below shall be applied between primary circuits and accessible dead-metal parts. The test voltage may be gradually increased to the specified value but must be maintained at the specified value for one second or one minute as required.

Test Equipment

The test equipment shall incorporate a transformer with an essentially sinusoidal output, a means to indicate the applied test potential, and an audible and/or visual indicator of dielectric breakdown.

The test equipment shall incorporate a voltmeter in the output circuit to indicate directly the applied test potential if the rated output of the test equipment is less than 500VA.

If the rated output of the test equipment is 500VA or more, the applied test potential may be indicated by either:

- 1 - a voltmeter in the primary circuit;
- 2 - a selector switch marked to indicate the test potential; or
- 3 - a marking in a readily visible location to indicate the test potential for test equipment having a single test potential output.

In cases 2 and 3, the test equipment shall include a lamp or other visual means to indicate that the test potential is present at the test equipment output. All test equipment shall be maintained in current calibration.

Products Requiring Dielectric Voltage Withstand Test:

<u>Product</u>	<u>Test Voltage</u>	<u>Test Time</u>
All products covered by this Report.	1440V AC	1 s

The following changes are in compliance with the declaration of Section 8.1:

ED 16.3.15 (20-Apr-17) Mandatory