



Test Report issued under the responsibility of:



TEST REPORT
IEC 60669-1
Switches for household and similar fixed-electrical installations
Part 1: General requirements

Report Number..... : 220702504SHA-001
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Name of Testing Laboratory preparing the Report : Intertek Testing Services Shanghai

Applicant's name : Panasonic Manufacturing Ayuthaya Co., Ltd.
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Test specification:

Standard : IEC 60669-1:2017
Test procedure..... : CB scheme
Non-standard test method : N/A

Test Report Form No. : IEC60669_1F

Test Report Form(s) Originator : VDE
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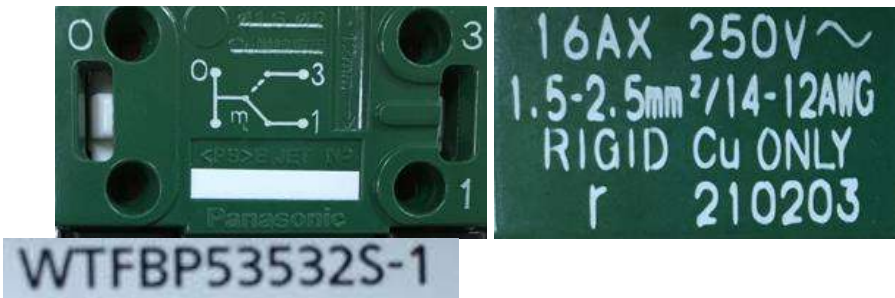
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Test item description	Switch for fixed installation	
Trade Mark	Panasonic	
Manufacturer	Same as applicant	
Model/Type reference	WTFBP51512*-1, WTFBP52522*-1, WTFBP53532*-1, WTFBP5004*-1, WTFBP5411*-1, WTFBP51552*-1, WTFBP52562*-1, WTFBP53572*-1	
Ratings	10A or 10AX or 16AX, 250V~	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/> CB Testing Laboratory:	Intertek Testing Services Shanghai	
Testing location/ address	Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China	
Tested by (name, function, signature).....	Marco Huang (Project Engineer)	<i>Marco</i>
Approved by (name, function, signature)	Kent Wu (Mandated Reviewer)	<i>Kent Wu</i>
<input type="checkbox"/> Testing procedure: CTF Stage 1:		
Testing location/ address		
Tested by (name, function, signature).....		
Approved by (name, function, signature)		
<input type="checkbox"/> Testing procedure: CTF Stage 2:		
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name, function, signature)		
Approved by (name, function, signature)		
<input type="checkbox"/> Testing procedure: CTF Stage 3:		
<input type="checkbox"/> Testing procedure: CTF Stage 4:		
Testing location/ address		
Tested by (name, function, signature).....		
Witnessed by (name, function, signature)		
Approved by (name, function, signature)		
Supervised by (name, function, signature).....		

<p>List of Attachments (including a total number of pages in each attachment): Photo attachment (20 pages in total): page 43 to 62.</p>	
<p>Summary of testing:</p>	
<p>Tests performed (name of test and test clause): 1. Full tests: WTFBP5411Q-1, WTFBP5004Y-1, WTFBP53532S-1. Clause 13 and 24: WTFBP53572S-1. All test results refer to report 210902195SHA-001 except clause 8, 13 and 23. After checking, samples have no any changes in basic structure except the new added models have LED light. For temperature rise test, only the highest values are recorded. 2. Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty. 3. We conclude that the products described in this test report comply with the standard according to the testing results on the submitted samples.</p>	<p>Testing location: Intertek Testing Services Shanghai Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China</p>
<p>Summary of compliance with National Differences (List of countries addressed): N/A</p>	
<p>Copy of marking plate: (example)</p>  <p>WTFBP53532S-1</p>	
<p>Note: Other models have the same marking formats as above except the model number, current rating and circuit diagram.</p>	

Test item particulars	
Pattern number	See page 6
Contact opening (gap)	normal gap / mini-gap / micro-gap / without contact gap
Degree of protection against access to hazardous parts and against harmful effects due to the ingress of solid foreign objects	IP2X / IP4X / IP5X
Degree of protection against harmful effects due to the ingress of water	IPX0 / IPX4 / IPX5 / IPX6
Method of actuating	rotary / tumbler / rocker / push-button / cord-operated / momentary contact
Method of application	surface-type / flush-type / semi flush-type / panel-type / architrave-type
Method of installation	design A / design B
Type of terminals	screw-type (rigid) / screw-type (rigid and flexible) / screwless (rigid) / screwless (rigid and flexible)
Flexible cable outlet	without / with
Rated voltage (V)	250V~
Rated current (A).....	See page 6
Possible test case verdicts:	
- test case does not apply to the test object.....	N/A
- test object does meet the requirement.....	P (Pass)
- test object does not meet the requirement.....	F (Fail)
Testing	
Date of receipt of test item	2022-07-27
Date (s) of performance of tests	2022-07-27 to 2022-08-15


General remarks:	
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</p> <p>This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.</p>	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC60069-2:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) : Same as applicant	

General product information and other remarks:

The devices are 24 models of push-button switches for fixed installation. All of them are with the similar outlines and similar switch modules. The differences among them are listed as below.

Model No.	Pattern No.	Rated current	Color	Indicator type	Description
WTFBP51512S-1	6	16AX	Silver	-	1 gang 2 way switch
WTFBP51512Q-1	6	16AX	Brown		
WTFBP51512Y-1	6	16AX	Gold		
WTFBP52522S-1	6+6	16AX	Silver	-	2 gang 2 way switch
WTFBP52522Q-1	6+6	16AX	Brown		
WTFBP52522Y-1	6+6	16AX	Gold		
WTFBP53532S-1	6+6+6	16AX	Silver	-	3 gang 2 way switch
WTFBP53532Q-1	6+6+6	16AX	Brown		
WTFBP53532Y-1	6+6+6	16AX	Gold		
WTFBP5004S-1	7	10AX	Silver	-	1 gang intermediate switch
WTFBP5004Q-1	7	10AX	Brown		
WTFBP5004Y-1	7	10AX	Gold		
WTFBP5411S-1	1	10A	Silver	-	1 gang 1 way doorbell switch
WTFBP5411Q-1	1	10A	Brown		
WTFBP5411Y-1	1	10A	Gold		
WTFBP51552S-1	6	16AX	Silver	LED	1 gang 2 way switch
WTFBP51552Q-1	6	16AX	Brown		
WTFBP51552Y-1	6	16AX	Gold		
WTFBP52562S-1	6+6	16AX	Silver	LED	2 gang 2 way switch
WTFBP52562Q-1	6+6	16AX	Brown		
WTFBP52562Y-1	6+6	16AX	Gold		
WTFBP53572S-1	6+6+6	16AX	Silver	LED	3 gang 2 way switch
WTFBP53572Q-1	6+6+6	16AX	Brown		
WTFBP53572Y-1	6+6+6	16AX	Gold		

The * can be Q, S or Y.

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
8	MARKING		
8.1	General		
	Switches are marked with:		
	a) rated current(s) (A or AX)	16AX, 10AX, 10A	P
	b) rated voltage(s) (V)	250V	P
	c) symbol for nature of supply	~	P
	d) manufacturer's or responsible vendor's name, trade mark or identification mark	Panasonic	P
	e) type reference	See page 3	P
	f) symbol for mini-gap construction (m).....	m	P
	g) symbol for micro-gap construction (μ)		N/A
	h) symbol for semiconductor switching device (without contact gap) (ϵ)		N/A
	i) first IP characteristic numeral, if declared higher than 4, in which case the second characteristic numeral is also marked.....	IP2X	N/A
	j) second IP characteristic numeral, if declared higher than 2, in which case the first characteristic numeral is also marked.....	IPX0	N/A
	i & j) suitable for smooth and even wall only (IPXX)		N/A
	i & j) suitable for smooth and even wall and for rough wall (test wall of figure 21) ().....		N/A
	k) length of insulation to be removed before the insertion of the conductor into the screwless-type terminal.....	12mm	P
	l) symbol for the suitability to accept rigid conductors only (r)	r	P
	In addition the following information shall be given in the manufacturer's documentation:		
	m) for SBL loads: the rated power in watts and the type of load if the switch is tested according to 19.3 :	SBL 100/200W stated in the instruction sheet	P
8.2	Symbols		
	Symbols used: as required in the standard		P
	The symbol "AX" may be replaced by the symbol "X". For the marking with rated current and rated voltage the figures may be used alone		N/A
	The marking for the nature of supply shall be placed next to the marking for rated current and rated voltage		P
8.3	Visibility of markings		
	Markings are clearly visible with normal or corrected vision, without additional magnification		P

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Markings as given in 8.1 a), b), c), d), e) and, if applicable, f), g), h), k), and l) shall be placed on the main part of the switch		P
	Parts such as cover plates, which are necessary for safety purposes and are intended to be sold separately, are marked with the manufacturer's or responsible vendor's name, trade mark or identification mark and type reference		N/A
	Markings as given in 8.1 i) and j), when applicable, are marked so as to be easily discernible when the switch is mounted and wired as in normal use		N/A
	Markings are placed on parts which cannot be removed without the use of a tool		P
8.4	Marking on terminals for phase conductors		
	Terminals intended for the connection of phase conductors (supply conductors) are identified unless the method of connection is of no importance, is self-evident or is indicated on a wiring diagram	Indicated on a wiring diagram	P
	Indications not placed on screws or other easily removable part		P
	Alternatively, the surface of such terminals shall be bare brass or copper, other terminals being covered with a metallic layer of another colour		N/A
	For switches of pattern numbers 2, 3, 03 and 6/2, terminals associated with any one pole have similar identification, if applicable, differing from that of the terminals associated with the other poles, unless the relationship is self-evident		N/A
8.5	Marking on terminals for neutral and earth conductors		
	Neutral terminals: N		N/A
	Earthing terminals: [earth symbol (IEC 60417-5019:2006-08)]		N/A
	Markings not placed on screws or other easily removable parts		N/A
	Terminals for conductors not forming part of the main function of the switch:		
	- clearly identified unless their purpose is self-evident, or		N/A
	- indicated in a wiring diagram fixed to the accessory		N/A
	Identification of switch terminals may be achieved by:		
	- their marking with graphical symbols according to IEC 60417 or colours and/or alphanumeric system, or		N/A
	- their physical dimension or relative location		N/A
8.6	Marking of the switch position		

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Switches marked to indicate the switch position: they are so marked that the direction of movement of the actuating member to its different positions or the actual position is clearly indicated		N/A
	Switches having more than one actuating member: marking indicates the effect achieved by the operation		P
	Marking clearly visible on the front of the switch		P
	Not possible to fix cover, cover plate, or removable actuating members in an incorrect position		P
	Symbols for "on" and "off" not used for indication of switch positions unless clearly indicate the direction of movement of the actuating members	Not used	P
8.7	Additional requirements for marking		
	Special precautions necessary to take when installing the switch: details of these and clear information given in an instruction sheet which accompanies the switch	Instruction sheet provided	P
	Instruction sheets are written in the official language(s) of the country in which the switch is to be sold		P
8.8	Durability		
	Marking durable and easily legible. Test: 15 s with water and 15 s with 95 % n-hexane.		P
9	CHECKING OF DIMENSIONS		
	Switches and boxes comply with the appropriate standard sheets, if any	Checked with CEE7 standard sheet XIII as a reference	P
10	PROTECTION AGAINST ELECTRIC SHOCK		
10.1	Prevention of access to live parts		
	Switches: live parts not accessible		P
	Switches designed to be fitted with pilot lights supplied at voltage other than ELV have means to prevent direct contact with the lamp		N/A
	Specimen is mounted as in normal use and fitted with conductors as specified		P
	Test probe B of IEC 61032 is applied in every possible position, an electrical indicator with a voltage between 40 V and 50 V being used to show contact with the relevant part		P
	Switches having enclosures or covers in thermoplastic or elastomeric material: additional test carried out at 35 °C ± 2 °C. Switches are subjected for 1 min to a force of 75 N, applied through the tip of test probe 11 of IEC 61032		P
	Test finger applied to thin-walled knock-outs with a force of 10 N		N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	During the test: switches not deform and no live parts accessible with test probe 11 of IEC 61032		P
10.2	Requirements for operating parts		
	Knobs, operating levers, push buttons, rockers and the like: of insulating material, unless:		P
	- accessible metal parts separated from metal parts of mechanism by double or reinforced insulation, or		N/A
	- reliably connected to earth		N/A
	Requirement does not apply to removable keys or intermediate parts, such as chains or rods		N/A
10.3	Requirements for accessible metal parts		
10.3.1	Accessible parts of switches when in normal use are made of insulating material as specified.		P
10.3.2	Metal covers or cover plates are protected by supplementary insulation made by insulating linings or insulating barriers.		N/A
	Insulating linings or insulating barriers:		
	- cannot be removed without being permanently damaged, or designed that		N/A
	- cannot be replaced in an incorrect position; if they are omitted, accessories are rendered inoperable or manifestly incomplete; there is no risk of accidental contact between live parts and metal covers or cover plates; precautions are taken to prevent creepage distances or clearances becoming less than the values specified in clause 23		N/A
	Linings or barrier comply with the tests of clauses 16 and 23		N/A
10.3.3	Earthing of metal covers or cover plates: connection of low resistance		N/A
10.4	Requirements for insulation of the mechanism		
	Metal parts of the mechanism which are not insulated from live parts: not protrude from enclosure		N/A
	Switches operated by means of a removable key or similar device: metal parts of mechanism insulated from live parts		N/A
10.5	Requirements for insulation of the mechanism with respect to the surrounding environment		
	Metal parts of mechanism not accessible and insulated from accessible metal parts, unless		P
	- separated from live parts (creepage distances and clearances have at least twice the value specified in clause 23), or		N/A
	- reliably connected to earth		N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Unenclosed stack-type switches having a metal spindle pivoting in a metal base plate: creepage distances and clearances between live parts and the spindle, and between metal parts of the mechanism and base plate, have at least twice the values specified in clause 23		N/A
10.6	Requirements for switches operated indirectly		
	Switches operated by means of a removable key or an intermediate part: key or an intermediate part can only touch parts which are insulated from live parts		N/A
	Key or intermediate part: insulated from metal parts of mechanism, unless		N/A
	Creepage distances and clearances between live parts and metal parts of mechanism have at least twice the values specified in clause 23		N/A
10.7	Requirements for switches with replaceable pull cord		
	Cord-operated switches: impossible to touch live parts when fitting or replacing the pull cord		N/A
11	PROVISION FOR EARTHING		
11.1	General		
	Accessible metal parts: provided with, or permanently and reliably connected to, an earthing terminal (does not apply to the metal cover plates mentioned in 10.3.2)		N/A
	Small screws and the like, isolated from live parts, are not considered as accessible parts which can become live in the event of an insulation fault		N/A
11.2	Earthing terminals		
	Earthing terminals: with screw clamping or screwless terminals and comply with clause 12		N/A
11.3	Requirements for surface-type switches		
	Surface-type switches with an enclosure of insulating material, with IP > X0 and more than one cable inlet, are provided with:		
	- an internal fixed earthing terminal, or		N/A
	- adequate space for a floating terminal allowing the connection of an incoming and outgoing conductor		N/A
11.4	Test for earthing connection		
	Connection between earthing terminal and accessible metal parts: of low resistance		N/A
	Test current equal to 1,5 I _n or 25 A (A)		
	Resistance ≤ 0,05 Ω (Ω)		
12	TERMINALS		
12.1	General		

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Switches provided with screw-type terminals or with screwless terminals..... : Screwless terminals		P
	Clamping means of terminals: not serve to fix any other components		P
	All the test on terminals, with the exception of the test of 12.3 11, made after the test of 15.1		P
	Rigid solid conductors shall be of class 1, rigid stranded conductors shall be of class 2 and flexible conductors shall be of class 5 according to IEC 60228		P
12.2	Terminals with screw clamping for external copper conductors		
12.2.1	Terminals with screw clamping having cross-sectional areas as shown in Table 4		N/A
	- for rigid copper conductors only, or		N/A
	- for both rigid and flexible copper conductors (tests carried out with rigid and then repeated with flexible conductors)		N/A
	Rated current (A)		
	Type of conductor (rigid / flexible)		
	Smallest / largest cross-sectional area (mm ²)		
	Diameter of largest conductor (mm).....		
	Figure of terminal	1 / 2 / 3 / 4 / 5	
	Minimum diameter D (minimum dimensions) of conductor space: required (mm); measured (mm) ... :		N/A
12.2.2	Terminals allow the conductor to be connected without special preparation		N/A
12.2.3	Terminals with screw clamping have adequate mechanical strength		N/A
	Screws and nut for clamping the conductors have metric ISO thread or a comparable thread		N/A
	Screws not of soft metal such as zinc or aluminium		N/A
12.2.4	Terminals with screw clamping are resistant to corrosion		N/A
12.2.5	Terminals with screw clamping clamp the conductor(s) without undue damage to the conductor(s)	See appended table 12.2.5	N/A
	For screws having a hexagonal head with slot for tightening, test shall be made twice, first the torque applying to the hexagonal head and then applying the torque by means of a screwdriver		N/A
	During the test: conductor not slip out, no break near clamping unit and no damage		N/A
12.2.6	Terminals with screw clamping clamp the conductor reliably between metal surfaces	See appended table 12.2.6	N/A
	During the test: conductor not move noticeably		N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
12.2.7	Terminals with screw clamping are designed or placed that the conductor cannot slip out while the clamping screws or nuts are tightened	See appended table 12.2.7	N/A
	After the test: no wire of the conductor escaped outside the clamping unit thus reducing creepage distances and clearances to values lower than those indicated in table 23		N/A
12.2.8	Terminals not work loose from their fixing to the switch		N/A
	Movement of the terminal is allowed as long as it is sufficiently limited so as to prevent noncompliance with this document		N/A
	Use of sealing compound or resin is considered to be sufficient, provided that:		
	- the sealing compound or resin is not subject to stress during normal use, and		N/A
	- the effectiveness of the sealing compound or resin is not impaired by temperatures attained by the terminal		N/A
	Torque test:		
	- rated current (A)..... :		
	- solid rigid copper conductor of the largest cross-sectional area (mm ²) (table 4)		
	- torque (Nm) (table 5 or appropriate figures 1, 2, 3, 4)..... :		
	Screws and nuts tightened and loosened 5 times. During the test: terminals not work loose and show no damage		N/A
12.2.9	Clamping screws or nuts of earthing terminals: adequately locked against accidental loosening, not possible to loosen them without the aid of a tool		N/A
12.2.10	Earthing terminals: no risk of corrosion		N/A
	Body of brass or other metal no less resistant to corrosion		N/A
	If the body is a part of a frame or enclosure of aluminium alloy, precautions are taken to avoid the risk of corrosion		N/A
12.2.11	Pillar terminals: distance g no less than the value specified in figure 1: required (mm); measured (mm):		N/A
	Mantle terminals: distance g no less than the value specified in figure 5: required (mm); measured (mm):		N/A
12.2.12	Lug terminals:		N/A
	- used only for switches having rated current ≥ 40 A		N/A
	- fitted with spring washers or equally effective locking means		N/A
12.3	Screwless terminals for external copper conductors		
12.3.1	Screwless terminals of the type suitable for:		

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- for rigid copper conductors only, or		P
	- for both rigid and flexible copper conductors (tests carried out with rigid and then repeated with flexible conductors)		N/A
	12.3 is not applicable to switches provided with		
	- screwless terminals requiring the fixing of special devices to the conductors before clamping in the screwless terminal		N/A
	- screwless terminals requiring twisting of the conductors		N/A
	- screwless terminals providing direct contact to the conductors by means of edges or points penetrating the insulation		N/A
12.3.2	Screwless terminals provided with clamping units which allow the proper connection of rigid or of rigid and flexible conductors having nominal cross-sectional areas as shown in table 8		P
	Rated current (A)	16AX, 10AX, 10A	
	Type of conductor (rigid / flexible)	rigid	
	Smallest / largest cross-sectional area (mm ²)	1,5 / 2,5	
	Diameter of largest rigid conductor (mm).....	2,13	
	Diameter of largest flexible conductor (mm)	-	
12.3.3	Screwless terminals allow the conductor to be connected without special preparation		P
12.3.4	Parts of screwless terminals intended for carrying current of materials as specified in 22.5		P
12.3.5	Screwless terminals clamp specified conductors with sufficient contact pressure without undue damage to the conductor		P
	Conductor clamped between metal surfaces		P
12.3.6	It is clear how the connection and disconnection of the conductors is to be made		P
	Disconnection of a conductor require an operation, other than a pull, so that can be made manually with or without a general-purpose tool		P
	It is not possible to confuse the opening for the use of a tool with the opening intended for the conductor		P
12.3.7	Screwless terminals intended for the interconnection of two or more conductors:		
	- the clamping of one of the conductors is independent of the clamping of the other conductor(s)		P
	- during the connection or disconnection the conductors can be connected or disconnected either at the same time or separately		P
	- each conductor introduced in a separate clamping unit		P

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	It is possible clamp securely any number of conductors up to the maximum as designed. Number of conductors; Nominal cross-sectional area (mm ²) : 1 or 2; 1,5-2,5		P
12.3.8	Screwless terminals: adequate insertion obvious and over-insertion prevented		P
	Screwless terminals of switches: undue insertion of the conductor prevented by a stop if further insertion is liable to reduce creepage distances and/or clearances required in table 23, or to influence the mechanism		P
12.3.9	Screwless terminals properly fixed to the switch		P
	Not work loose when conductors are connected or disconnected		P
	Self-hardening resins used to fix terminals which are not subject to mechanical stress		N/A
12.3.10	Screwless terminals withstand mechanical stresses occurring in normal use	See appended table 12.3.10	P
	During application of the pull, conductor not come out of the terminal		P
	Test with apparatus shown in figure 9	See appended table 12.3.10	P
	During the test conductors not move noticeably in the clamping unit		P
	After these tests: neither terminals nor clamping means have worked loose and conductors show no deterioration		P
12.3.11	Screwless terminals withstand electrical and thermal stresses occurring in normal use	See appended table 12.3.11	P
	After the test: inspection show no changes		P
	Repetition of test according to 12.3.10: screwless terminals withstand mechanical stresses occurring in normal use	See appended table 12.3.11	P
	During application of the pull conductor not come out of the terminal		P
	Test with apparatus shown in figure 10	See appended table 12.3.11	P
	- measured after 24 th and 192 th temperature cycle		P
	- measured after any three of 48 th , 72 th , 96 th , 120 th , 144 th or 168 th temperature cycle		P
	During the test conductors not move noticeably in the clamping unit		P
	After these tests: neither terminals nor clamping means have worked loose and conductors show no deterioration		P
12.3.12	Screwless terminals: connected rigid solid conductor remains clamped, even when deflected during normal installation	See appended table 12.3.12	P
13	CONSTRUCTIONAL REQUIREMENTS		

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
13.1	Mechanical requirements for insulating means		
	Insulating lining, barriers and like: adequate mechanical strength and secured in a reliable manner		N/A
13.2	Installation requirements		
	Switches constructed so as to permit:		
	- easy introduction into the terminal and reliable connection of the conductors in the terminals, except for lead wires of pilot lights		P
	- correct positioning of the conductors		P
	- easy fixing of the switch to a wall or in a box		P
	- adequate space between the underside of the main part and the surface on which the main part is mounted or between the sides of the main part and the enclosure (cover or box)		P
	Surface-type switches: fixing means do not damage insulation of the cable		N/A
	Switches comprising screwless terminals: connecting and/or disconnecting means of the screwless terminals cannot be activated by the conductors during and after installation of the switch in a box or on a wall		P
	Compliance is checked by inspection and in case of doubt by the following test		P
	The test is carried out with a solid copper conductor having the smallest cross-sectional area, as specified in 12.3.2 (mm ²) : 1,5		P
	If it is not possible to exert a force onto the connecting / disconnecting means, the product is deemed to comply with the requirements of this sub clause without further tests		P
	During the application of the pull, the conductor do not come out of the screwless terminal		P
	Switches classified as design A: permit easy positioning and removal of the cover or cover plate, without displacing the conductors or activating the connecting and/or disconnecting means of screwless terminals		P
13.3	Fixing of covers, cover plates and actuating members		
13.3.1	Covers, cover-plates and actuating members or parts of them intended to ensure protection against electric shock:		
	- held in place at two or more points by effective fixings	Cover plate fixed by snap-in	P
	- fixed by means of a single fixing, e.g. by a screw, provided that they are located by another means (e.g. by a shoulder)		N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Where the fixing of covers, cover plates or actuating members of switches of design A serves to fix the main part there are means to maintain the main part in position, even after removal of the covers, cover plates or actuating members.		P
13.3.2	Covers, cover plates or actuating members whose fixing is of the screw-type:		
	Compliance checked by inspection only		N/A
13.3.3	Covers, cover plates or actuating members whose fixing is not dependent on screws and whose removal is obtained by applying a force in a direction approximately perpendicular to the mounting / supporting surface (see table 12):		
	- when their removal may give access, with the test probe B of IEC 61032, to live parts:	by the tests of 20.5	N/A
	- when their removal may give access, with the test probe B of IEC 61032, to non-earthed metal parts separated from live parts in such a way that creepage distances and clearances have the values at least equal to those shown in table 23:	by the tests of 20.6	N/A
	- when their removal may give access, with the test probe B of IEC 61032, only to	by the tests of 20.7	N/A
	- insulating parts, or		N/A
	- earthed metal parts, or		N/A
	- metal parts separated from live parts in such a way that creepage distances and clearances have at least twice the values shown in table 23, or		N/A
	- live parts of SELV circuits not greater than 25 V AC and 60 V DC:		N/A
13.3.4	Covers, cover-plates or actuating members whose fixing is not dependent on screws and whose removal is obtained by using a tool, in accordance with the manufacturer's instructions given in an instruction sheet or catalogue:		
	By the same tests of 13.3.3 except that the covers, cover plates, actuating members or parts of them need not come out when applying a force not exceeding 120 N in directions perpendicular to the mounting / supporting surface	Cover plate	P
13.4	Openings in normal use		
	Switches: no free openings in their enclosures according to their IP classification		P
13.5	Attachment of knobs		
	Knobs of rotary switches securely attached to the shaft or part operating the mechanism		N/A
	- axial pull be applied for 1 min to try to pull off the actuating member		N/A
	- axial pull is likely to be applied in normal use, the force is 30 N		N/A
	- axial pull is unlikely to be applied in normal use, the force is 15 N		N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- knob of switches having only one direction of operation: turned 100 times in the reverse direction		N/A
	During the test: knob not become detached		N/A
13.6	Mounting means		
	Screws or other means for mounting the switch on a surface or in a box or enclosure: easily accessible from the front		P
	Fixing means not serve any other fixing purpose		P
13.7	Combination of switches		
	Combinations of switches, or of switches and socket-outlets, comprising separate bases: correct position of each main part is ensured		P
	Fixing of each main part be independent of the fixing of the combination to the mounting surface		P
13.8	Accessories combined with switches		
	Accessories combined with switches: comply with their standard		N/A
13.9	Surface-type switches having an IP code higher than IP20		
	Surface-type switches with IP > 20 are in according to their classification when fitted with conduits or with sheathed cables		N/A
	Surface-type switches with IPX4, IPX5 and IPX6 have provisions for opening a drain hole		N/A
	Switches provided with a drain hole: it is not less than 5 mm in diameter, or 20 mm ² in area with a width and a length not less than 3 mm : Ø mm / mm ²		N/A
	Drain hole: effective		N/A
	Lid springs (if any): of corrosion resistant material (bronze or stainless steel)		N/A
13.10	Installation in a box		
	Switches to be installed in a box: conductor ends can be prepared after the box is mounted in position, but before the switch is fitted in the box		P
	Main part has adequate stability when mounted in the box		P
13.11	Connection of a second current-carrying conductor		
	Surface-type switches with IP > IPX0, pattern numbers 1, 5 and 6, with more than one inlet opening, provided with:		
	- fixed additional terminal complying with the requirements of clause 12, or		N/A
	- adequate space for a floating terminal		N/A
13.12	Inlet openings		
	Inlet openings: allow the introduction of the conduit or the sheath of the cable		N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Surface-type switches: intended conduit or the sheath of the cable can enter at least 1 mm into the enclosure		N/A
	Inlet openings for conduit entries of surface-type switches: capable of accepting conduit sizes of 16, 20, 25 or 32 or a combination of at least two of these sizes not excluding two of the same size..... :		N/A
	Inlet openings for cable entries of surface-type switches: capable of accepting cables having the dimensions specified in table 13 or be as specified by the manufacturer: rated current (A); limits of external diameter of cables min/max (mm) :		N/A
13.13	Provision for back entry from a conduit		
	Surface-type switches: provision for back entry (if are intended)		N/A
13.14	Switch provided with membranes or the like for inlet openings		
	Switch is provided with membranes or the like for inlet openings: replaceable		N/A
13.15	Requirements for membranes in inlet openings		
13.15.1	Membranes are reliably fixed and not displaced by the mechanical and thermal stresses occurring in normal use		N/A
	Test on membranes subjected to the ageing treatment specified in 15.1 and fitted with the switches		
	Switches placed at 40 °C for 2 h. Force of 30 N applied for 5 s by means of the tip of test probe 11 of IEC 61032. During the test: no deformation, live parts not accessible		N/A
	Membranes likely to be subjected to an axial pull: axial pull of 30 N applied for 5 s. During the test: membranes not come out		N/A
	Test repeated with membranes not subjected to any treatment		N/A
13.15.2	Membranes be so designed and made of such material that: Introduction of the cables into the switch is permitted when the ambient temperature is low.		N/A
	Test on membranes not subjected to the ageing treatment, those without opening being suitably pierced:		
	Switches kept at a temperature of (-15 ± 2) °C for 2 h: possibility to introduce cables of the heaviest type through the membranes		N/A
	After the test: no harmful deformation, cracks or similar damage		N/A
13.16	Pilot light units		

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Pilot light units comply with IEC 60669-2-1:2002, IEC 60669-2-1:2002/AMD1:2008 and IEC 60669-2-1:2002/AMD2:2015, 101.1.1.1 and Clause 102, as far as applicable	For models with LED indicator	P
14	MECHANISM		
14.1	Indication of the position		
	Actuating member of a switch, when released, automatically take up the position corresponding to that of moving contacts		P
14.2	Rest and intermediate position		
	Moving contact of switches can come to rest only in "on" and "off" positions		P
	Intermediate position permissible if:		
	- it corresponds to the intermediate position of the actuating member, and		N/A
	- the insulation between fixed and moving contacts is adequate. Electric strength test as specified in 16.3: test voltage a.c. for 1 min (V)	500 V / 750 V / 1250 V / 2000 V	N/A
14.3	Undue arcing		
	No undue arcing in slowly operation		P
	Test carried out at the end of the test of clause 19.1: breaking of the circuit 10 times, actuating member moved over a period of 2 s. During the test: no sustained arcing		P
14.4	Making and breaking		
	Switches of pattern numbers 2, 3, 03 and 6/2 make and break all poles substantially simultaneously		N/A
	Neutral pole of switches of pattern number 03 not make after or break before the other poles		N/A
14.5	Action of the mechanism without cover or cover plate		
	Action of the mechanism: independent of the presence of cover or cover plate. Test: no flicker		P
14.6	Cord-operated switches: effecting a change by application and removal of a steady pull not exceeding:		
	- 45 N applied vertically, and		N/A
	- 65 N applied at 45° ± 5°		N/A
15	RESISTANCE TO AGEING, PROTECTION PROVIDED BY ENCLOSURES OF SWITCHES, AND RESISTANCE TO HUMIDITY		
15.1	Resistance to ageing		
	Switches are resistant to ageing		P
	Parts intended for decorative purposes only, such as certain lids, are removed		N/A
	Switches and boxes placed for 7 days (168 h) in a heating cabinet at 70 °C ± 2 °C		P

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- no crack visible after test with normal or corrected vision without additional magnification		P
	- no sticky or greasy material as a result of heat		P
	- no trace of cloth (forefinger pressed with 5 N)		P
	- no damage		P
15.2	Protection provided by enclosures of switches		
15.2.1	General		
	Enclosure of the switch provides protection against access to hazardous parts, against harmful effect due to ingress of solid foreign objects and against effects due to ingress of water in accordance with the IP classification of the switch	IP20	P
15.2.2	Protection against access to hazardous parts and against harmful effects due to ingress of solid foreign objects		
15.2.2.1	General		
	Glands: torque (Nm) (2/3 of torque applied in 20.4) :		
	Screws of the enclosure: torque (Nm) (2/3 table 5)		
	Parts which can be removed without the aid of a tool are removed		N/A
	Glands are not filled with sealing compound or the like		N/A
15.2.2.2	Protection against access to hazardous parts		
	Appropriate test according to IEC 60529.....	IP2X	P
15.2.2.3	Protection against harmful effects due to ingress of solid foreign objects		
	Appropriate test according to IEC 60529.....	IP2X	N/A
	For the test of the first characteristic numeral 5, enclosures of switches are considered to be of category 2 (see IEC 60529:1989 and IEC 60529:1989/AMD1:1999, 13.4); dust not penetrate in a quantity to interfere with satisfactory operation or impair safety		N/A
	For the test of the first characteristic numeral 6, enclosures of switches are considered to be of category 1 (see IEC 60529:1989, 13.6); no dust penetrate		N/A
15.2.3	Protection against harmful effects due to ingress of water		
	Enclosure of switches provide a degree of protection against harmful effects due to ingress of water in accordance with their IP classification		N/A
	Appropriate test according to IEC 60529.....	IPX0	N/A
	Flush-type and semi-flush-type switches fixed:		
	- in a test wall using an appropriate box in accordance with the manufacturer's instructions		N/A
	- in a test wall according to figure 21		N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Screws of the enclosure: torque (Nm) (2/3 table 5)		
	Glands: torque (Nm) (2/3 of torque applied in table 22)		
	Specimens withstand an electric strength test specified in 16.3 which is started within 5 min of completion of the test to 15.2		N/A
15.3	Resistance to humidity		
	Switches proof against humidity which may occur in normal use		P
	Compliance checked by a humidity treatment described in 15.3, carried out in a humidity cabinet containing air with relative humidity maintained between 91 % and 95 %. Specimens kept in the cabinet for:		
	- 2 days (48 h) for switches with IPX0	48h	P
	- 7 days (168 h) for switches with IP>X0		N/A
	After this treatment: specimens show no damage		P
16	INSULATION RESISTANCE AND ELECTRIC STRENGTH		
16.1	General		
	One pole of any pilot lights (if available), are disconnected for this test		P
	Insulation resistance and electric strength of switches be adequate		P
16.2	Test for measuring the insulation resistance		
	The insulation resistance measured 1 min after application of 500 V DC	See appended table 16.2	P
	In addition, if electrically independent pattern numbers are combined in a common base, additional tests for each combination performed		P
16.3	Electric strength test		
	Electric strength: AC test voltage applied for 1 min	See appended table 16.3	P
	In addition, if electrically independent pattern numbers are combined in a common base, additional tests for each combination performed		P
17	TEMPERATURE RISE		
17.1	General		
	Switches so constructed that the temperature rise in normal use is not excessive	See appended table 17	P
	No oxidation or any other deterioration of contacts		P
17.2	Switches incorporating pilot lights		
	Switches incorporating or intended to incorporate pilot lights are designed that in normal use temperature of the accessible surface is not excessive	See appended table 17	P
18	MAKING AND BREAKING CAPACITY		
18.1	General		

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	For the purpose of this test, pilot lights are disconnected		P
	Switches have adequate making and breaking capacity		P
	- model / type reference	WTFBP5411Q-1 WTFBP5004Y-1 WTFBP53532S-1	
	- pattern number	1, 6+6+6 and 7	
	- rated voltage (V)	250	
	- rated current (A).....	WTFBP5411Q-1:10A WTFBP5004Y-1:10AX WTFBP53532S-1:16AX	
	- nominal cross-sectional area as for the test of clause 17 (mm ²)	2,5	
18.2	Overload		
	Test with cos ϕ 0,3 alternating current		
	- test voltage (1,1 V _n) (V).....	275	
	- test current (1,25 I _n) (cos ϕ 0,3) (A)	WTFBP5411Q-1 and WTFBP5004Y-1:12,5 WTFBP53532S-1:20	
	- 200 operations; rate (operations per minute)	WTFBP5411Q-1 and WTFBP5004Y-1:30 WTFBP53532S-1:15	
	- samples number	A, B, C	
	During the test: copper wire F not melt, specimens function correctly, no sustained arcing or welding of contacts		P
	After the test: specimens show no damage		P
	During the test: specimens are not lubricated		P
18.3	Overload test with filament lamps		
	Test with a number of tungsten filament lamps or a number of halogen filament lamps (switches with I _n ≤ 16 A / V _n ≤ 250 V and switches of pattern numbers 3 and 03 with V _n > 250 V)		
	- test voltage (V _n) (V)	240	
	- test current (≥ 1,2 I _n) (A)	WTFBP5004Y-1:12 WTFBP53532S-1:19,2	
	- number of 200 W tungsten filament lamps	WTFBP5004Y-1:15 WTFBP53532S-1:23	
	- 200 operations; rate (operations per minute)	WTFBP5004Y-1:30 WTFBP53532S-1:15	
	- samples number	A, B, C	

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	During the test: copper wire F not melt, specimens function correctly, no sustained arcing or welding of contacts		P
	After the test: specimens show no damage		P
19	NORMAL OPERATION		
19.1	Test for switches intended for inductive loads		
	For the purpose of this test, pilot lights are disconnected		N/A
	Switches withstand, without excessive wear or other harmful effect, the mechanical, electrical and thermal stresses occurring in normal use		P
	- model / type reference	WTFBP5411Q-1 WTFBP5004Y-1 WTFBP53532S-1	
	- pattern number	1, 6+6+6 and 7	
	- nominal cross-sectional area per clause 18 (mm ²):	2,5	
	- test voltage (Vn) (V)	250	
	- test current (In) (cos φ 0,6) (A)	WTFBP5411Q-1 and WTFBP5004Y-1:10 WTFBP53532S-1:16	
	- number of operations per table 18	40000	
	- rate (operations per minute)	WTFBP5411Q-1 and WTFBP5004Y-1:30 WTFBP53532S-1:15	
	- samples number	A, B, C	
	During the test: copper wire F not melt, specimens function correctly, no sustained arcing or welding of contacts		P
	Reduced electric strength per clause 16	See appended table 19.1	P
	Reduced temperature rise test per clause 17	See appended table 19.1	P
	After the tests the specimens not show:		
	- wear impairing their further use		P
	- discrepancy between the position of the actuating member (if indicated) and that of the moving contacts		P
	- deterioration of enclosures, insulating lining or barriers		P
	- seepage of sealing compound		N/A
	- loosening of electrical or mechanical connections		P
	- displacement of moving contacts of switches pattern number 2, 3, 03 or 6/2		N/A
	During the test, specimens are not lubricated		P

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	No sustained arcing in slowly operation (sub clause 14.3)		P
19.2	Test for switches intended for externally ballasted lamp loads		
	Switches intended for externally ballasted lamp loads withstand, without excessive wear or other harmful effect, the electrical and thermal stresses occurring when controlling externally ballasted lamp circuits		P
	- model / type reference	WTFBP5004Y-1 WTFBP53532S-1	
	- pattern number	1, 6+6+6 and 7	
	- nominal cross-sectional area per clause 18 (mm ²):	2,5	
	- rate (operations per minute)	WTFBP5004Y-1:30 WTFBP53532S-1:15	
	- test voltage (Vn); test current (In) (cos φ 0,9); number of operations with load A	250; 16; 5000 for WTFBP53532S-1 250; 10; 10000 for WTFBP5004Y-1	
	- test voltage (Vn); 100 operations with load B	250	
	- samples number	D, E, F	
	During the test: copper wire F not melt, specimens function correctly, no sustained arcing or welding of contacts		P
	Reduced electric strength per clause 16	See appended table 19.2	P
	Reduced temperature rise test per clause 17	See appended table 19.2	P
	After the tests it is possible to make and break the switch by hand, and specimen not show:		
	- wear impairing their further use		P
	- discrepancy between the position of the actuating member (if indicated) and that of the moving contacts		P
	- deterioration of enclosures, insulating lining or barriers		P
	- loosening of electrical or mechanical connections		P
	- seepage of sealing compound		N/A
	- displacement of moving contacts of switches pattern number 2, 3 or 6/2		N/A
19.3	Test for switches intended for self-ballasted lamp loads		
	Switches intended for self-ballasted lamp (SBL) loads withstand, without excessive wear or other harmful effect, the electrical and thermal stresses occurring when controlling self-ballasted lamp circuits		P

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- model / type reference	WTFBP5004Y-1 WTFBP53532S-1	
	- pattern number	1, 6+6+6 and 7	
	- nominal cross-sectional area per clause 18 (mm ²):	2,5	
	- test voltage (Vn) (V)	250	
	- test current (Ipeak) (A).....	108 for WTFBP5004Y-1 170 for WTFBP53532S-1	
	- number of operations per table 18	40000	
	- rate (operations per minute)	WTFBP5004Y-1:30 WTFBP53532S-1:15	
	- samples number	G, H, I	
	During the test: copper wire F not melt, specimens function correctly, no sustained arcing or welding of contacts		P
	Reduced electric strength per clause 16	See appended table 19.3	P
	Reduced temperature rise test per clause 17	See appended table 19.3	P
	After these tests, it is possible to make and break the switch by hand in the test circuit and the specimen not show:		
	- wear impairing further use		P
	- discrepancy between the position of the actuating member and that of the moving contacts		P
	- deterioration of the enclosures, insulating lining or barriers		P
	- loosening of electrical or mechanical connections		P
	- seepage of sealing compound		N/A
	- displacement of the moving contacts of switches of pattern numbers 2, 3 or 6/2		N/A
20	MECHANICAL STRENGTH		
20.1	General		
	Accessories, surface mounting boxes, screwed glands and shrouds have adequate mechanical strength so as to withstand the stresses imposed during installation and use		P
20.2	Pendulum hammer test		
	For all types of switches and for boxes: impact test (9 blows)	See appended table 20.2	P
	After the test: no damage, live parts no become accessible		P
20.3	Test on the main parts of surface-type switches		
	Main parts of surface-type switches are first fixed to a cylinder of rigid steel sheet of radius equal to 4,5 times the distance between fixing holes (mm) .. :		N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Main parts are then fixed in a similar manner to a flat steel sheet		N/A
	Torque applied to fixing screws (Nm) :	0,5 Nm / 1,2 Nm	
	During and after the test: main parts show no damage		N/A
20.4	Screwed glands		
	Screwed glands of switches with that have IP code higher than IP20: torque test		
	- diameter of cylindrical metal test rod (mm) :		
	- type of material..... :	metal / moulded material	
	- torque for 1 min (table 22) (Nm)..... :		
	After the test: no damage of glands and enclosure of the specimens		N/A
20.5	Covers, cover plates or actuating members – accessibility to live parts		
20.5.1	General		
	Force necessary for covers, cover-plates or actuating members to come off or not to come off (accessibility with the test finger to live parts)		
20.5.2	Verification of the non-removal of covers, cover-plates or actuating member		
	Force applied for 1 min in direction perpendicular to the mounting surface :	40 N / 80 N	N/A
	Covers, cover-plates or actuating members not come off		N/A
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 13)		N/A
	Covers, cover-plates or actuating members not come off		N/A
	After the test: no damage		N/A
20.5.3	Verification of the removal of covers, cover plates or actuating members		
	Force not exceeding 120 N applied 10 times in direction perpendicular to the mounting / supporting surface: covers, cover-plates or actuating members come off		N/A
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 13)		N/A
	Covers, cover-plates or actuating members come off		N/A
	After the test: no damage		N/A
20.6	Covers, cover plates or actuating members – accessibility to non-earthed metal parts separated from live parts		
	Test is made as described in 20.5, but applying, for 20.5.2, the following forces:	10 N / 20 N	P

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
20.7	Covers, cover plates or actuating members – accessibility to insulating parts, earthed metal parts, the live parts of SELV ≤ 25 V AC or metal parts separated from live parts		
	Test is made as described in 20.5, but applying, for 20.5.2, the force of 10 N for all covers, cover plates, or actuating members		N/A
20.8	Covers, cover plates or actuating members – application of gauges		
	Test with gauge of figure 14 applied according to figure 15 for verification of the outline of covers, cover-plates or actuating members: distances between face C of gauge and outline of side under test, not decrease : complying / not complying		
20.9	Grooves, holes and reverse tapers		
	Test with gauge according to figure 17 applied as shown in figure 18 (1 N): gauge not enter more than 1 mm : complying / not complying		
20.10	Additional test for cord-operated switch		
	Operating members of cord-operated switch have adequate strength		N/A
	Pull test: pull 100 N for 1 min (normal use); pull of 50 N for 1 min (unfavourable direction). After the test:		
	- switch show no damage		N/A
	- operating member not broken and cord-operated switch still operate		N/A
21	RESISTANCE TO HEAT		
21.1	General		
	Switches and boxes are sufficiently resistant to heat		P
	Decorative parts are not subjected to the test		N/A
21.2	Basic heating test		
	Switches kept for 1 h in a heating cabinet at a temperature of 100 °C ± 2 °C		
	During the test: no change impairing their further use and sealing compound, if any, not flow		P
	After the test: no access to live parts, markings still legible		P
21.3	Ball-pressure test on parts of insulating material necessary to retain current-carrying parts and parts of the earthing circuit in position		
	Parts of insulating material necessary to retain current-carrying parts and parts of the earthing circuit in position: ball-pressure test (1 h, 125 °C)	See appended table 21.3	P
21.4	Ball-pressure test on parts of insulating material not necessary to retain current-carrying parts and parts of the earthing circuit in position		
	Parts of insulating material not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though in contact with them: ball-pressure test (1 h)	See appended table 21.4	P

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
22	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		
22.1	General		
	Connections withstand mechanical stresses		P
	Thread-forming or thread-cutting screws used only if supplied together with the piece in which they are intended to be inserted	Not used	N/A
	Thread-cutting screws intended to be used during installation are captive with the relevant part of the accessory		N/A
	Screws and nuts which transmit contact pressure are of metal and are in engagement with a metal thread		N/A
	Threaded part torque test	See appended table 22.1	N/A
22.2	Correct insertion of screws		
	Screws in engagement with a thread of insulating material: correct introduction into the screw hole or nut ensured		N/A
22.3	Contact pressure of electrical connections		
	Contact pressure: not transmitted through insulating material other than ceramic, pure mica or other material no less suitable unless there is sufficient resiliency in metallic parts		P
22.4	Screws and rivets, used both as electrical and mechanical connections		
	Screws and rivets which serve as electrical as well as mechanical connections shall be locked against loosening and/or turning		N/A
22.5	Material of current-carrying parts		
	Current-carrying parts of metal having mechanical strength, electrical conductivity and resistance to corrosion adequate:		
	Requirement of 22.5 does not apply to screws, nuts, washers, clamping plates and similar parts of terminals		P
	- copper		N/A
	- alloy with at least 58 % copper for parts made from cold-rolled sheet or with at least 50 % copper for other parts	>58%	P
	- stainless steel with at least 13 % chromium and not more than 0,09 % carbon		N/A
	- steel with electroplated coating of zinc (ISO 2081): service condition ISO no. (1/2/3); IP (X0/X4/X5/X6); thickness (µm)..... :		N/A
	- steel with electroplated coating of nickel and chromium (ISO 1456): service condition ISO no. (2/3/4); IP (X0/X4/X5/X6); thickness (µm)..... :		N/A
	- steel with electroplated coating of tin (ISO 2093): service condition ISO no. (2/3/4); IP (X0/X4/X5/X6); thickness (µm)..... :		N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Current-carrying parts subjected to mechanical wear: not of steel with electroplated coating		N/A
	Metals having a great difference of electrochemical potential: not used in contact with each other		N/A
22.6	Contacts subjected to sliding actions		
	Contacts subjected to sliding action: of metal resistant to corrosion		N/A
22.7	Thread-forming and thread-cutting screws		
	Thread-forming screws and thread-cutting screws not used for the connection of current-carrying parts	Not used	P
	Thread-forming screws and thread-cutting screws used to provide earthing continuity: not necessary to disturb the connection and at least two screws are used for each connection		N/A
23	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND		
23.1	General		
	Creepage distances, clearances and distances through sealing compound no less than the values shown in table 23	See appended table 23.1	P
	Sub clause 23.1 does not apply to pilot light units. Requirements for pilot light units are given in 13.16		P
23.2	Insulating compound		
	Insulating compound: not protrude above the edge of the cavity in which it is contained		N/A
24	RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT, TO FIRE AND TO TRACKING		
24.1	Resistance to abnormal heat and to fire		
	Parts of insulating material which might be exposed to thermal stresses due to electric effects and the deterioration of which might impair the safety are not unduly affected by abnormal heat and fire		P
	Glow-wire test according to IEC 60695-2-10 and IEC 60695-2-11	See appended table 24.1	P
24.2	Resistance to abnormal heat and to fire		
	Parts of insulating material retaining live parts in position of switches with IP>X0: of material resistant to tracking		N/A
	Tracking test with solution A of IEC 60112	See appended table 24.2	N/A
25	RESISTANCE TO RUSTING		
	Ferrous parts protected against rusting		P
	Test: 10 min in a 10 % solution of ammonium chloride in water at a temperature of (+20 ± 5) °C., 10 min in a box containing air saturated with moisture at a temperature of (+20 ± 5) °C., 10 min in a heating cabinet at a temperature of (+100 ± 5) °C		
	No signs of rust		P

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
26	EMC REQUIREMENTS		
26.1	Immunity		
	No immunity tests necessary		P
26.2	Emission		
	No emission tests necessary		P

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict

12.2.5	TABLE: Test with apparatus shown in figure 10 (screw terminals)			N/A
	Rated current (A)			
	Type of conductors	rigid solid / rigid stranded / flexible		
	Smallest/largest cross-sectional area per table 4 (mm ²)			
	Number of conductors			
	Nominal diameter of thread (mm); torque per table 5 (Nm)			
Cross-sectional area (mm ²)	Diameter of bushing hole per table 6 (mm)	Height H per table 6 (mm)	Mass (kg)	Remarks
<i>Supplementary information:</i>				

12.2.6	TABLE: Pull test (screw terminals)			N/A
	Rated current (A)			
	Smallest/largest cross-sectional area per table 4 (mm ²)			
	Nominal diameter of thread (mm); torque 2/3 per table 5 (Nm)			
Cross-sectional area (mm ²)	Number of conductors	Type of conductors (rigid solid / rigid stranded / flexible)	Pull per table 7 applied for 1 min (N)	Remarks
<i>Supplementary information:</i>				

12.2.7	TABLE: Tightening test (screw terminals)			N/A
	Rated current (A)			
	Nominal diameter of thread (mm); torque 2/3 per table 5 (Nm)			
Largest cross-sectional area per table 2 (mm ²)	Permissible number of conductors	Type of conductors (rigid solid / rigid stranded / flexible)	Number of wires and nominal diameter of wires	Remarks
<i>Supplementary information:</i>				

IEC 60669-1					
Clause	Requirement + Test			Result - Remark	Verdict
12.3.10	TABLE: Mechanical stresses occurring in normal use (screwless terminals)				P
	Rated current (A)			16; 10	
	Largest/smallest cross-sectional area per table 8 (mm ²)			1,5/2,5	
	Number of connection (after that conductor subjected to a pull of 30 N for 1 min) / disconnection	Type of conductor (solid / rigid stranded / flexible)	Cross-sectional area (mm ²)	Remarks	
	5 times	rigid solid	2,5	Pass	
	5 times	rigid solid	1,5	Pass	
	once	rigid stranded	2,5	Pass	
	once	rigid stranded	1,5	Pass	
	TABLE: Test with apparatus shown in figure 9				
	Rated current (A)			16; 10	
	Type of conductors			<u>rigid solid</u> / <u>rigid stranded</u> / flexible	
	Smallest/largest cross-sectional area per table 8 (mm ²)			1,5/2,5	
	number of conductors			1 or 2	
	Cross-sectional area (mm ²)	Diameter of bushing hole per table 6 (mm)	Height H per table 6 (mm)	Mass (kg)	Remarks
	1,0	6,5	260	0,4	Pass
	2,5	9,5	280	0,7	Pass
<i>Supplementary information:</i>					

IEC 60669-1							
Clause	Requirement + Test	Result - Remark				Verdict	
12.3.11	TABLE: Electrical and thermal stresses occurring in normal use					P	
Test a)	Test carried out for 1 h connecting rigid solid conductors:						
	test current per table 9 (A)	22					
	nominal cross-sectional area (mm ²)	2,5					
	Screwless terminal number	Voltage drop (mV)			Required voltage drop		
	1	5			≤ 15 mV		
	2	6			≤ 15 mV		
	3	6			≤ 15 mV		
	4	5			≤ 15 mV		
	5	6			≤ 15 mV		
Test b)	Temperature cycles test) carried out on terminals subjected to Test a):						
	test current per table 9 (A)	22					
	nominal cross-sectional area (mm ²)	2,5					
	allowed voltage drop (mV)	≤ 22,5 mV or 2 times 24 th cycle value (mV)					
	Screwless terminal number	1	2	3	4	5	Remarks
	voltage drop after 24 th cycle	5	6	7	5	6	Pass
	voltage drop after 48 th cycle	6	7	7	6	7	Pass
	voltage drop after 72 th cycle	7	8	7	8	7	Pass
	voltage drop after 96 th cycle	7	8	8	8	8	Pass
	voltage drop after 120 th cycle	9	10	10	9	10	Pass
	voltage drop after 144 th cycle	10	9	10	10	11	Pass
	voltage drop after 168 th cycle	11	11	11	13	13	Pass
	voltage drop after 192 th cycle	13	12	12	13	13	Pass
12.3.10	TABLE: mechanical stresses occurring in normal use						
	Rated current (A)	16; 10					
	Largest/smallest cross-sectional area per table 8 (mm ²)	1,5/2,5					
	Number of connection (after that conductor subjected to a pull of 30 N for 1 min) / disconnection	Type of conductor (solid / rigid stranded / flexible)		Cross-sectional area (mm ²)		Remarks	
	5 times	rigid solid		2,5		Pass	
	5 times	rigid solid		1,5		Pass	
	once	rigid stranded		2,5		Pass	
	once	rigid stranded		1,5		Pass	
	TABLE: Test with apparatus shown in figure 9						
	Rated current (A)	16; 10					

IEC 60669-1					
Clause	Requirement + Test			Result - Remark	Verdict
	Type of conductors.....			rigid solid / rigid stranded / flexible	
	Smallest/largest cross-sectional area per table 8 (mm ²)			1,5/2,5	
	Number of conductors.....			1 or 2	
Cross-sectional area (mm ²)	Diameter of bushing hole per table 6 (mm)	Height H per table 6 (mm)	Mass (kg)	Remarks	
1,5	6,5	260	0,4	Pass	
2,5	9,5	280	0,7	Pass	
<i>Supplementary information:</i>					

12.3.12	TABLE: Deflection test (principle of test apparatus shown in figure 10a)						P
	Test carried out for 1 h connecting rigid solid conductors:						
	test current (A) (equal rated current)			16; 10			
	required voltage drop (mV)			≤ 25 mV			
Type of conductor	Smallest			Largest			Remarks
cross-sectional area per table 10 (mm ²)	1,5			2,5			
force per table 11 (N)	0,5			1,0			
screwless terminal number	1	2	3	1	2	3	
starting point (X = deflection original point)	X	X+10°	X+20°	X	X+10°	X+20°	
voltage drop 1 st deflection (mV)	5	6	5	5	6	5	Pass
voltage drop 2 nd deflection (mV)	6	6	7	6	6	6	Pass
voltage drop 3 rd deflection (mV)	6	7	7	8	8	7	Pass
voltage drop 4 th deflection (mV)	8	7	8	8	8	7	Pass
voltage drop 5 th deflection (mV)	10	9	9	8	8	9	Pass
voltage drop 6 th deflection (mV)	11	10	10	11	10	10	Pass
voltage drop 7 th deflection (mV)	11	11	12	12	10	11	Pass
voltage drop 8 th deflection (mV)	12	13	13	13	12	12	Pass
voltage drop 9 th deflection (mV)	14	13	13	14	13	12	Pass
voltage drop 10 th deflection (mV)	15	14	15	15	14	14	Pass
voltage drop 11 th deflection (mV)	17	16	15	16	15	15	Pass
voltage drop 12 th deflection (mV)	18	17	18	17	16	17	Pass
<i>Supplementary information:</i>							

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
16.2	TABLE: Insulation resistance		P
Item per table 15	test voltage applied between:	measured (M Ω)	required (M Ω)
1	Between all poles connected together and the body, with the switch in the "on" position.	199	5
2	Between each pole in turn and all other poles connected to the body, with the switch in the "on" position.	199	2
3	Between the terminals which are electrically connected together when the switch is in the "on" position, the switch being in the "off" position: - mini-gap construction	199	2
8	Between live parts and metal knobs, push-buttons and the like.	199	-
<i>Supplementary information:</i>			

16.3	TABLE: Dielectric strength		P
	Rated voltage (V)..... :	250	
item per table 15	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)
1	Between all poles connected together and the body, with the switch in the "on" position.	2000	No
2	Between each pole in turn and all other poles connected to the body, with the switch in the "on" position.	2000	No
3	Between the terminals which are electrically connected together when the switch is in the "on" position, the switch being in the "off" position: - mini-gap construction	2000	No
8	Between live parts and metal knobs, push-buttons and the like.	4000	No
<i>Supplementary information:</i>			

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
17	TABLE: Temperature rise measurements		P
	Rated current (A)	16; 10	
	Nominal cross-sectional area (mm ²)	2,5	
	Terminal screws: torque (Nm) (2/3 table 5).....	-	
	Test current per table 16 passed for 1 h (A).....	20; 13,5	
	Rated voltage of pilot light (V).....	250	
	Samples number	A, B, C	
thermocouple locations		max. measured temperature rise (K)	allowed temperature rise (K)
Terminals		Max.29	45
Non-metallic cover plate		Max.10	55
Non-metallic outside handle		Max.10	45
<i>Supplementary information:</i>			

19.1	TABLE: Test for switches intended for inductive loads (clause 19.1)			P
	Reduced electric strength per clause 16			
item per table 15	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)	
1	Between all poles connected together and the body, with the switch in the "on" position.	1500	No	
2	Between each pole in turn and all other poles connected to the body, with the switch in the "on" position.	1500	No	
3	Between the terminals which are electrically connected together when the switch is in the "on" position, the switch being in the "off" position: - mini-gap construction	1500	No	
8	Between live parts and metal knobs, push-buttons and the like.	3000	No	
	Reduced temperature rise test per clause 17			
	Rated current passed for 1 h (A)	16; 10		
thermocouple locations		max. measured temperature rise (K)	allowed temperature rise (K)	
Terminals		Max.42	≤ 45	
<i>Supplementary information:</i>				

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
19.2	TABLE: Test for switches intended for externally ballasted lamp loads (clause 19.2)		P
	Reduced electric strength per clause 16		
item per table 15	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)
1	Between all poles connected together and the body, with the switch in the "on" position.	1500	No
2	Between each pole in turn and all other poles connected to the body, with the switch in the "on" position.	1500	No
3	Between the terminals which are electrically connected together when the switch is in the "on" position, the switch being in the "off" position: - mini-gap construction	1500	No
8	Between live parts and metal knobs, push-buttons and the like.	3000	No
	Reduced temperature rise test per clause 17		
	Rated current passed for 1 h (A)	16; 10	
thermocouple locations		max. measured temperature rise (K)	allowed temperature rise (K)
Terminals		Max.30	≤ 45
<i>Supplementary information:</i>			

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
19.3	TABLE: Test for switches intended for self-ballasted lamp loads (clause 19.3)		P
	Reduced electric strength per clause 16		
item per table 15	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)
1	Between all poles connected together and the body, with the switch in the "on" position.	1500	No
2	Between each pole in turn and all other poles connected to the body, with the switch in the "on" position.	1500	No
3	Between the terminals which are electrically connected together when the switch is in the "on" position, the switch being in the "off" position: - mini-gap construction	1500	No
8	Between live parts and metal knobs, push-buttons and the like.	3000	No
	Reduced temperature rise test per clause 17		
	Rated current passed for 1 h (A)	16; 10	
	thermocouple locations	max. measured temperature rise (K)	allowed temperature rise (K)
	Terminals	Max.24	≤ 45
<i>Supplementary information:</i>			

20.2	TABLE: Impact resistance			P
part of enclosure tested per table 21 (A, B, C, D)	blows per part	height of fall (mm)	comments	
A	5 blows	80	Pass	
B	4 blows	80	Pass	
<i>Supplementary information:</i>				

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict

21.3	TABLE: Ball pressure test of thermoplastic materials			P
	Allowed impression diameter (mm).....	≤ 2 mm		
part under test	material designation	test temperature (°C)	impression diameter (mm)	
Cover, Inner handle and separator of switch module	PBT	125	1,6	
Body and release button of switch module	Urea	125	1,3	
LED block	PA	125	1,6	
<i>Supplementary information:</i>				

21.4	TABLE: Ball pressure test of thermoplastic materials			P
	Allowed impression diameter (mm).....	≤ 2 mm		
part under test	material designation	test temperature (°C) ⁽¹⁾	impression diameter (mm)	
Non-metallic cover plate, Plate body, Lens	PC	70	1,2	
Outside handle	PC/ABS	70	1,2	
Frame	ABS	70	1,2	
Push button of switch module	POM	70	1,2	
<i>Supplementary information:</i>				
⁽¹⁾ 70 °C / 40 °C + highest temperature rise determined during the test of clause 17				

22.1	TABLE: Threaded part torque test					N/A
threaded part identification	diameter of thread (mm)	column number (I, II, or III)	applied torque (Nm)	times (5/10)	no damage	
<i>Supplementary information:</i>						

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict

23.1	TABLE: Creepage distances, clearances and distances through sealing compound							P
	Rated voltage (V).....	250						
item per table 23	creepage distance dcr, clearance cl and distance through sealing compound dtsc at/of:	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	required dtsc (mm)	dtsc (mm)	
1 / 6	Between internal live parts which are separated when the contacts are open	≥ 1,2	>2,0	≥ 3	>3,5	-	-	
2 / 7	Between live parts of different polarity including all terminals for external wiring.	≥ 3	>3,5	≥ 3	>3,5	-	-	
3 / 8	Between live parts and - metal frames supporting the base of flush-type switches	≥ 3	>4,0	≥ 3	>4,0	-	-	
	- screws or devices for fixing main parts, covers or cover-plates	≥ 3	>4,0	≥ 3	>4,0	-	-	
5 / 13	Between live parts and accessible unearthed metal parts, with exception of screws and the like	≥ 4,5	>6,0	≥ 4,5	>6,0	-	-	
9	Between live parts and - exclusively earthed metal boxes with the switch mounted in the most unfavourable position	≥ 3	>5,0	-	-	-	-	
	- unearthed metal boxes, without insulating lining, with the switch mounted in the most unfavourable position	≥ 4,5	>5,0	-	-	-	-	
<i>Supplementary information:</i>								

24.1	TABLE: Glow-wire test			P
part under test	material designation	test temperature (°C)	remarks	
Cover of switch module	PBT	850	Pass	
Body of switch module	Urea	850	Pass	
LED block	PA	850	Pass	
Non-metallic cover plate, Plate body	PC	650	Pass	
Outside handle	PC/ABS	650	Pass	
Frame	ABS	650	Pass	
Push button of switch module	POM	650	Pass	
<i>Supplementary information:</i>				

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
24.2	TABLE: Resistance to tracking		N/A
	Number of drops.....	: 50	
	part under test	material designation	test voltage (V)
			flashover / breakdown (Yes/No)
			175
<i>Supplementary information:</i>			

Additional evaluation for LED indicator based on IEC 60669-2-1: 2002 + A1: 2008 + A2: 2015

101	ABNORMAL CONDITIONS		
	Electronic switches do not create hazard under abnormal conditions		P
101.1.1.1	Fault conditions test: temperature rises not exceed the values given in table 102, column concerning clause 101	See appended table 101.1.1.1	P
	Temperature limited by a fuse: additional test carried out in case of doubt	See appended table 101.1.1.1	N/A
101.1.1.1	TABLE: fault conditions test		
	cross-sectional area of conductor not less than 1,5 mm ² (mm ²) (table 15)	2,5	—
	terminal screws: torque (Nm) (2/3 table 3 or appropriate figures 1, 2, 3, 4)	-	—
	rated current (A) / rated load (W or VA)	16	—
	rated voltage (V)	250	—
	test voltage between 0,9 and 1,1 Vn (V), whichever is the more unfavourable	275	—
	fault conditions simulated	remarks	verdict
	Short circuit the two pins of LED indicator module	LED not work, no hazard observed	P
	TABLE: temperature rise measurements No significant heat occurred by fault conditions		P

Photo attachment

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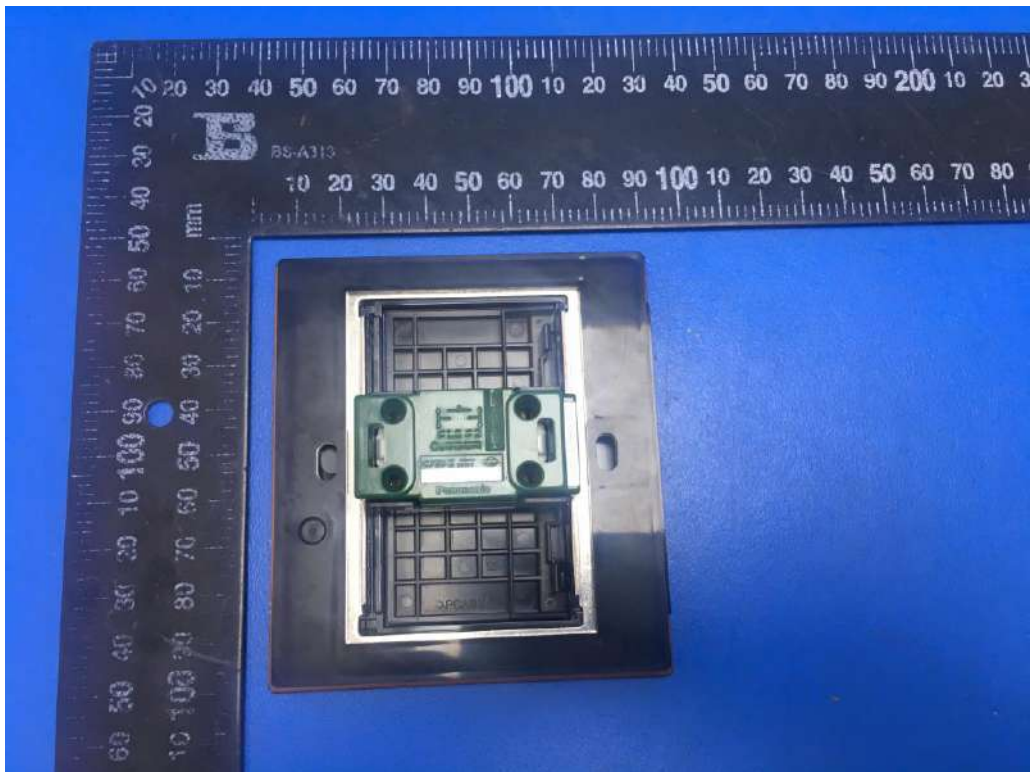
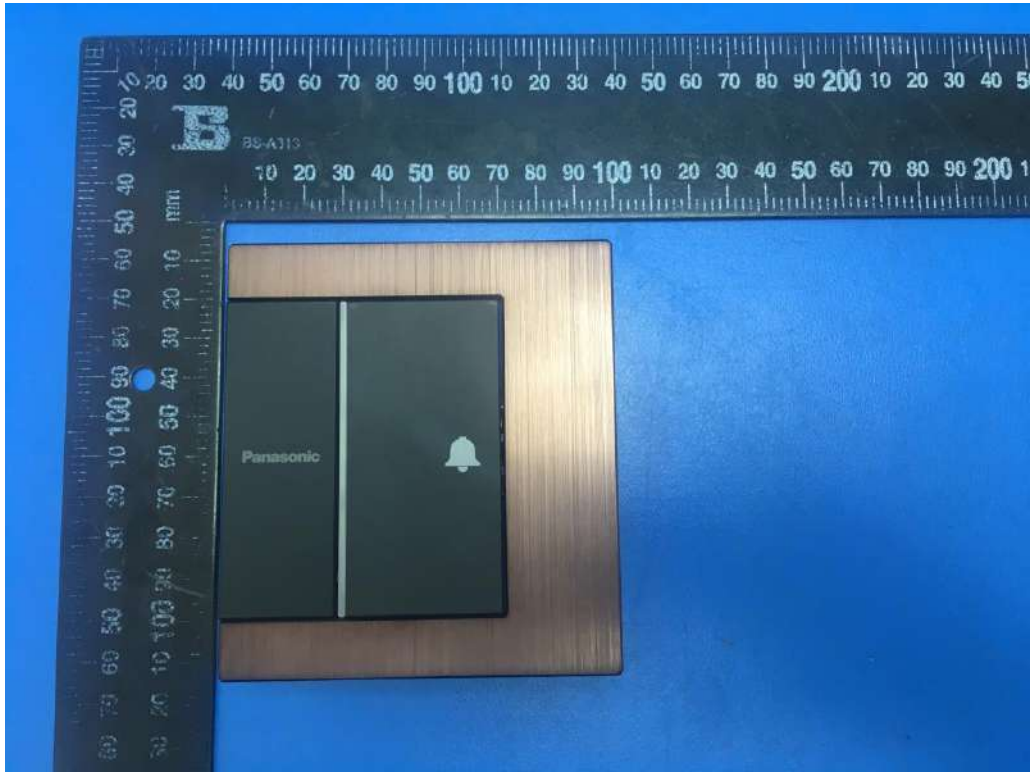


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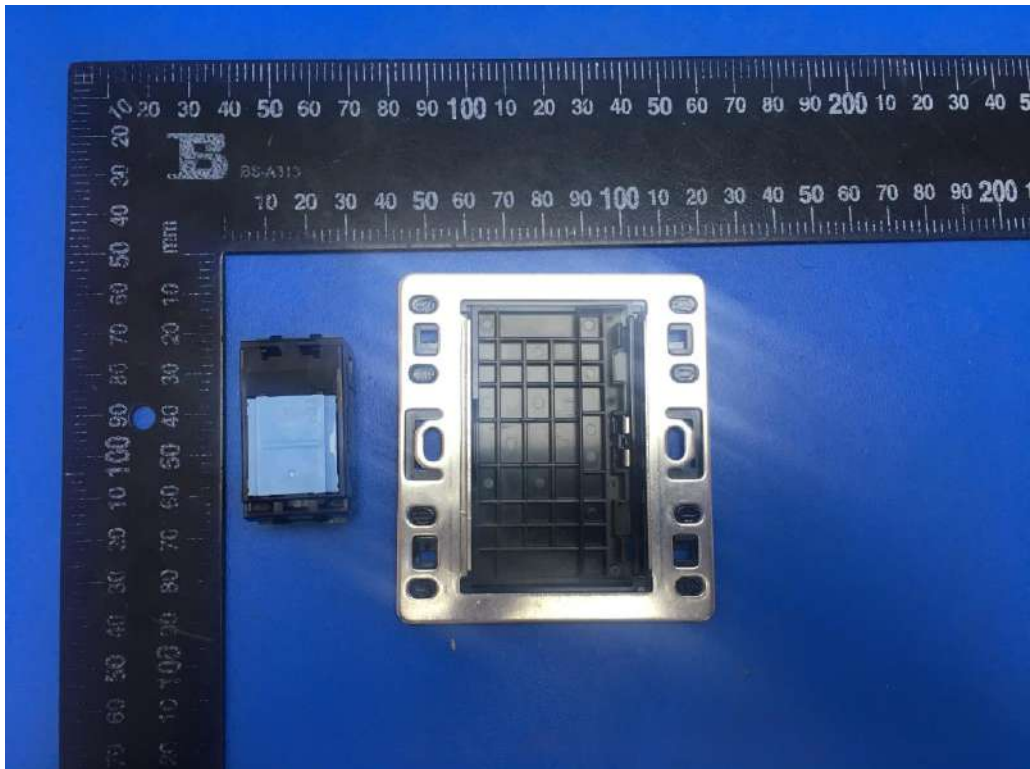
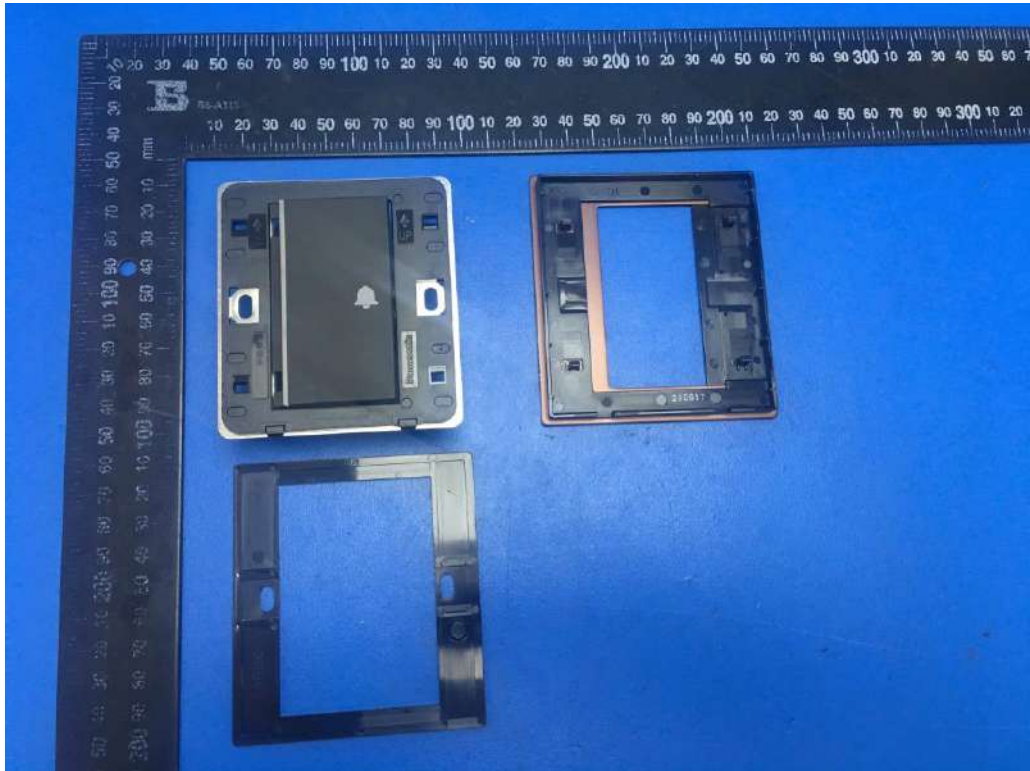


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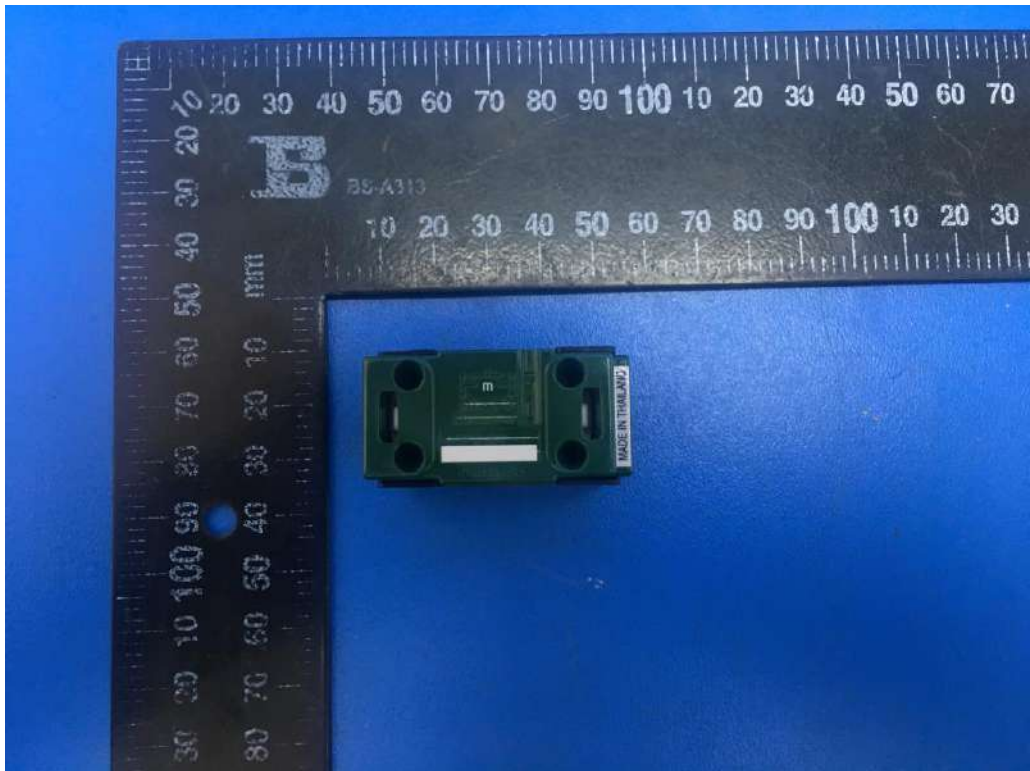
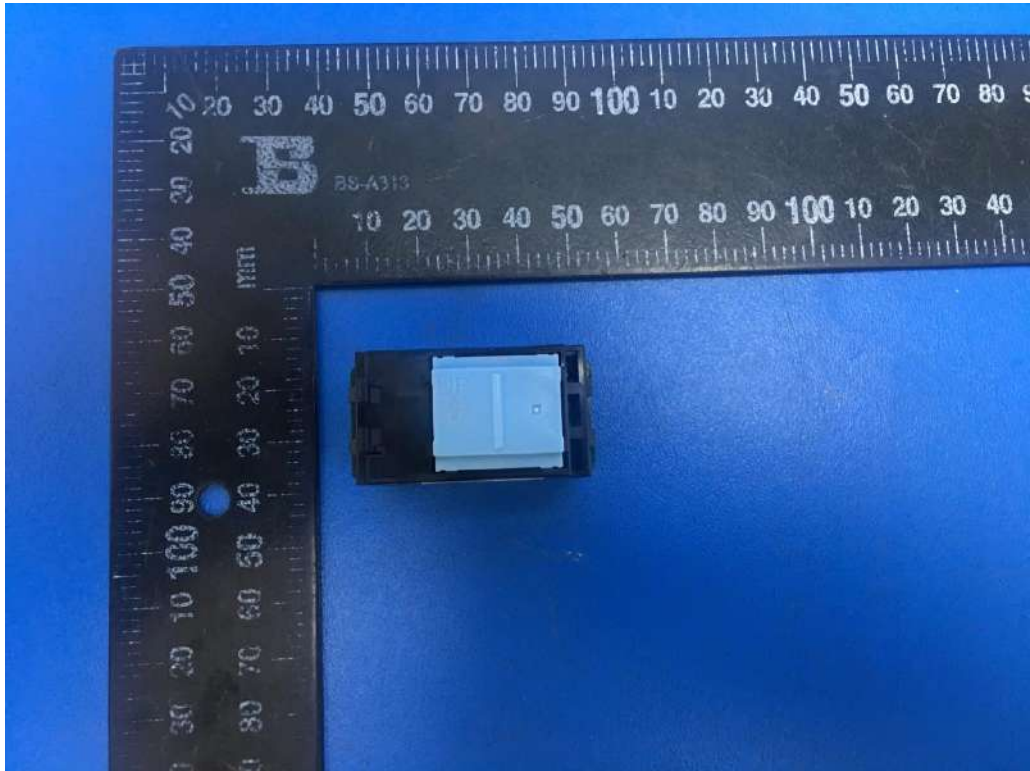


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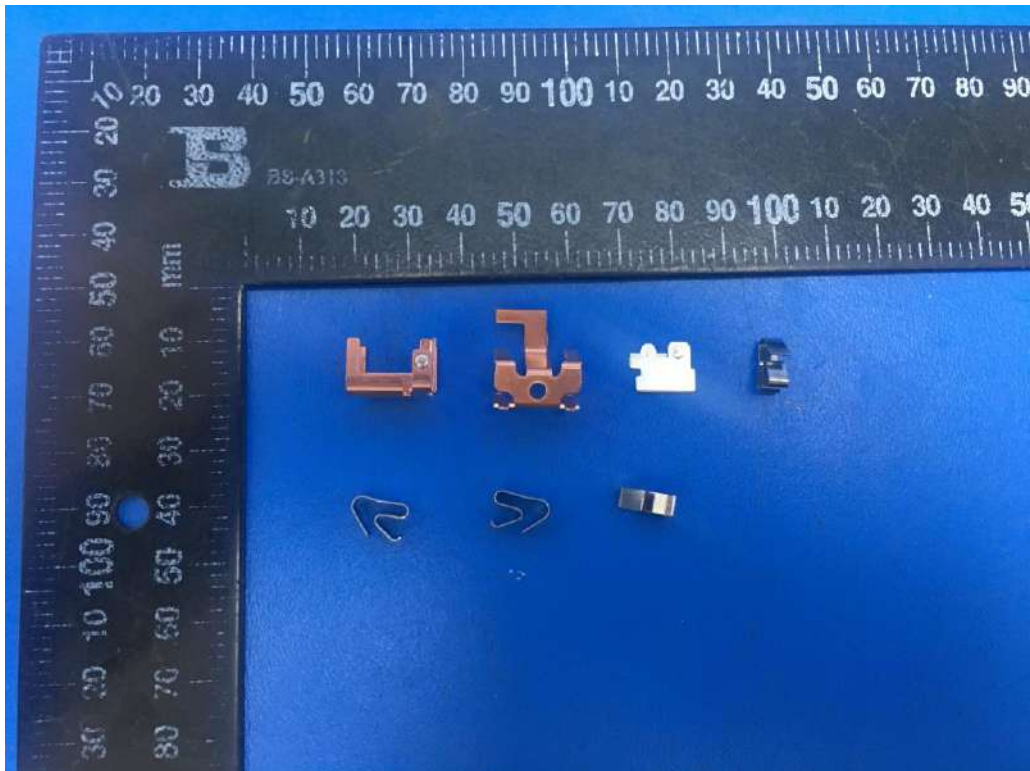
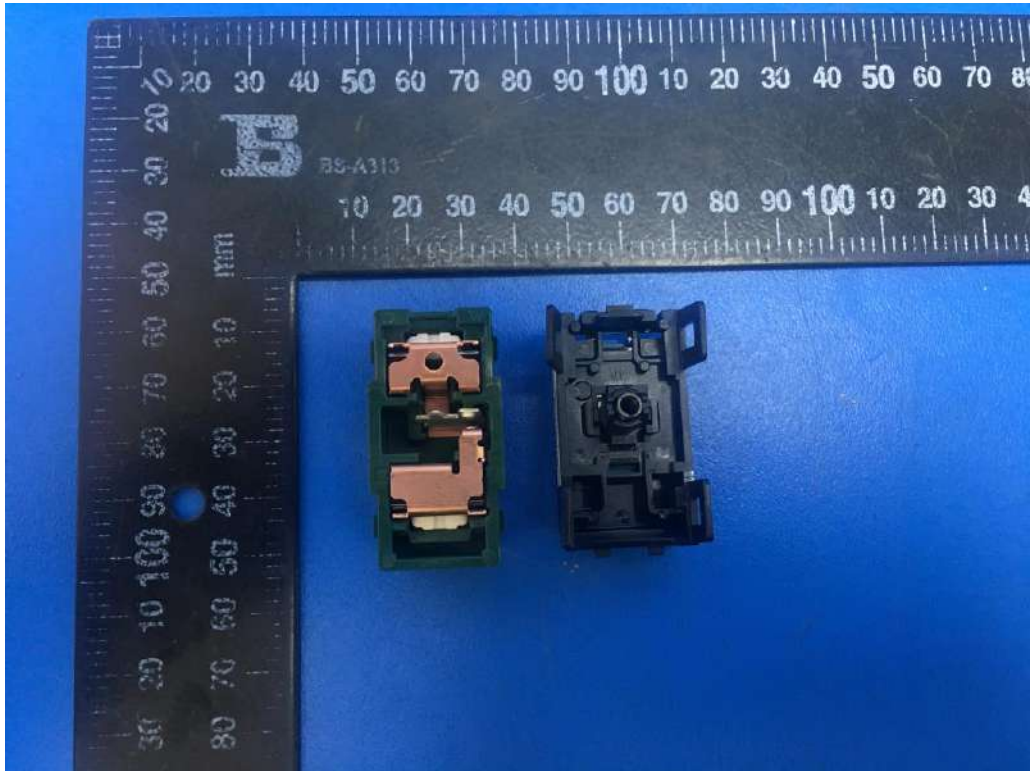


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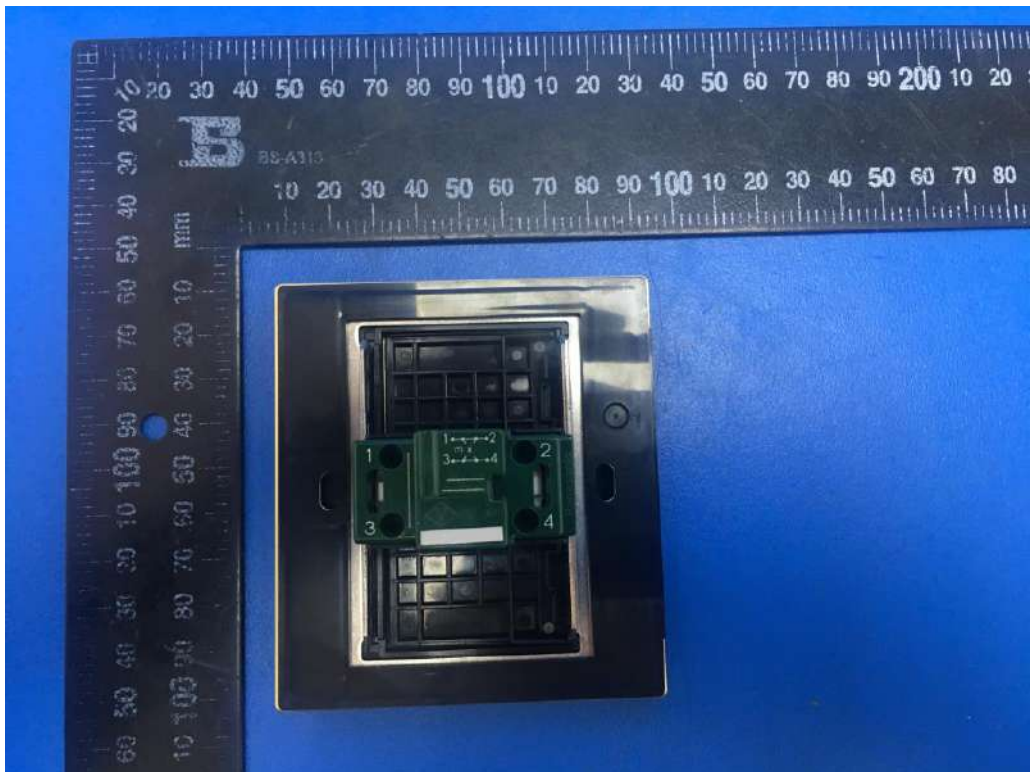
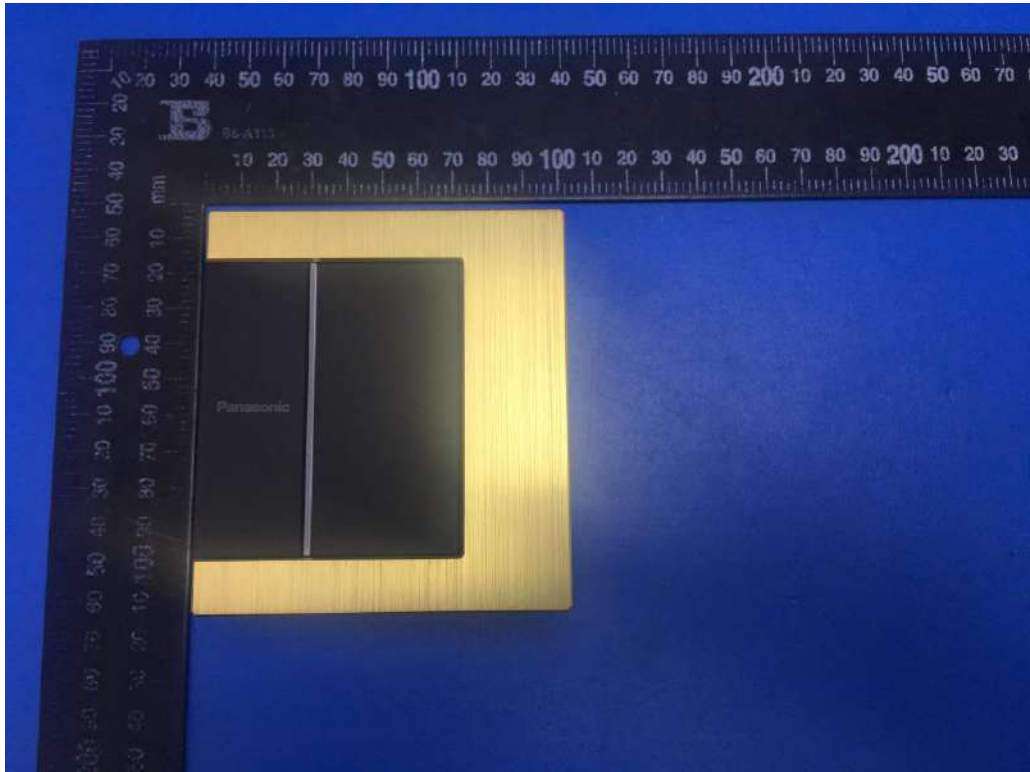


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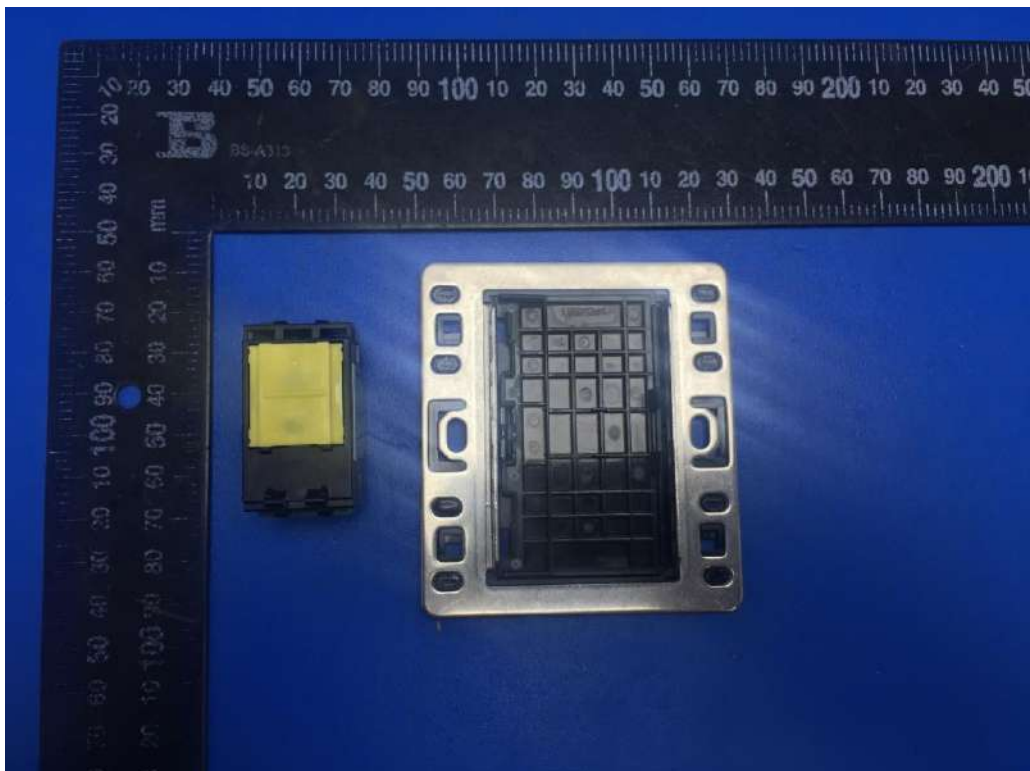
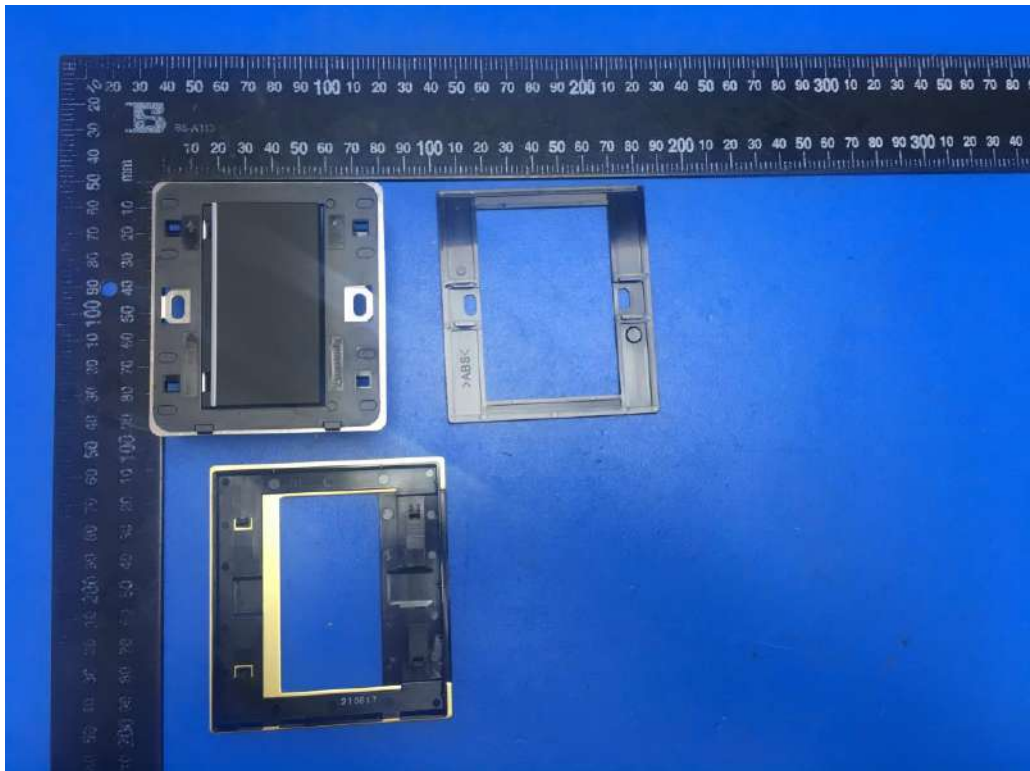


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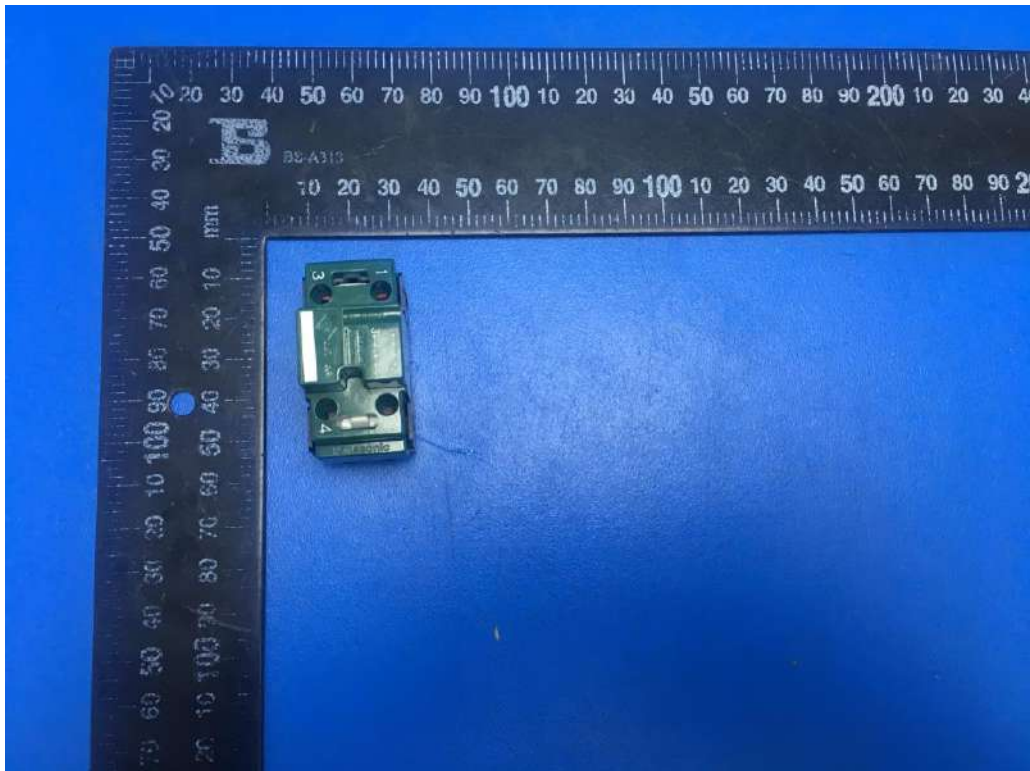
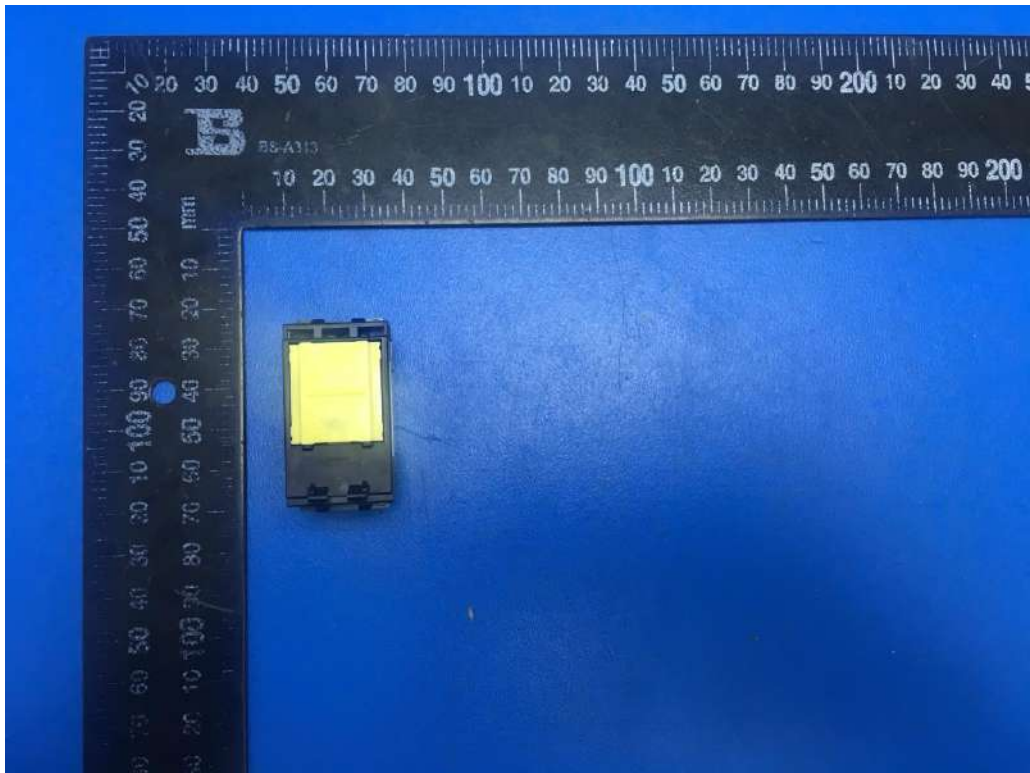


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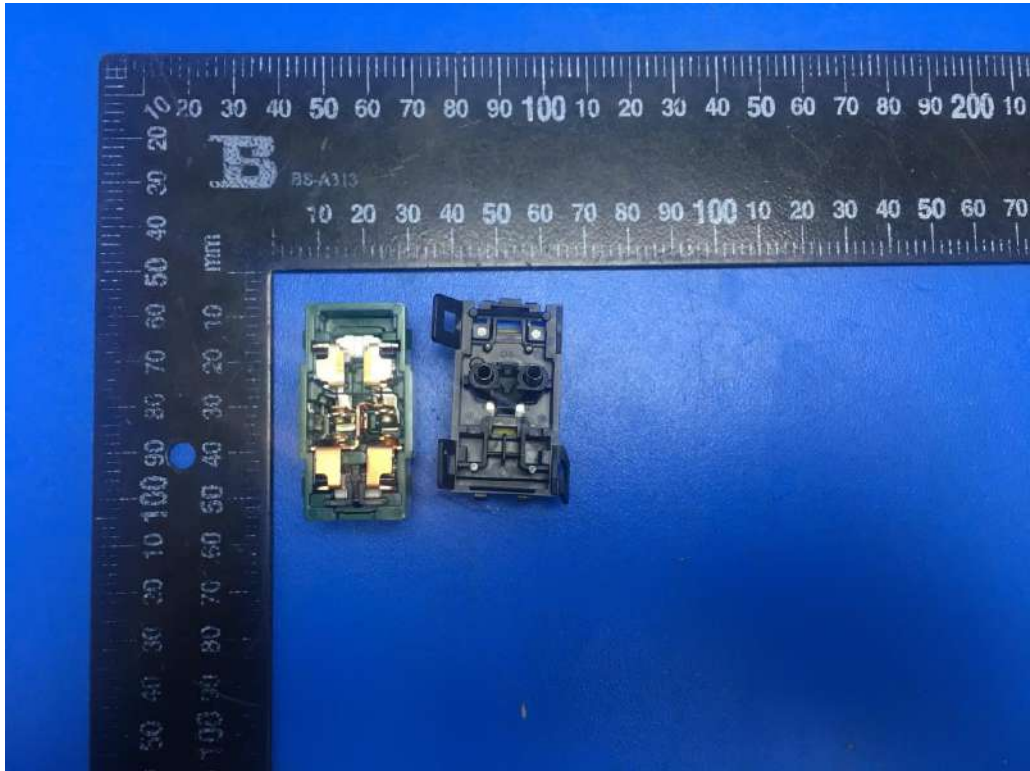


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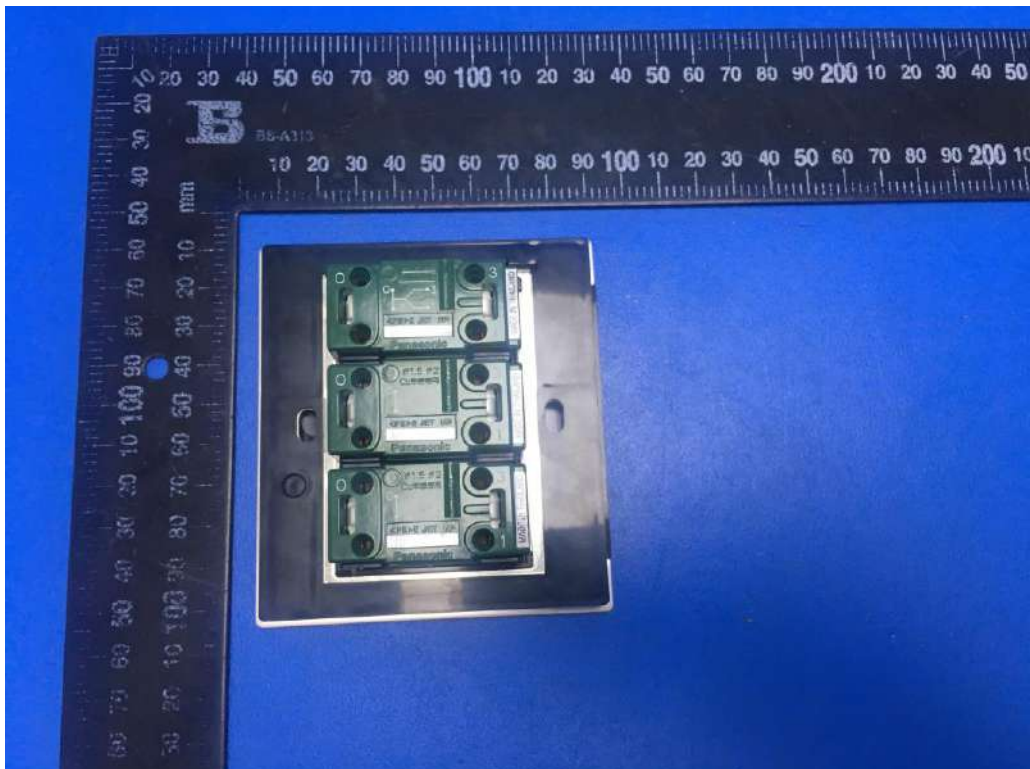
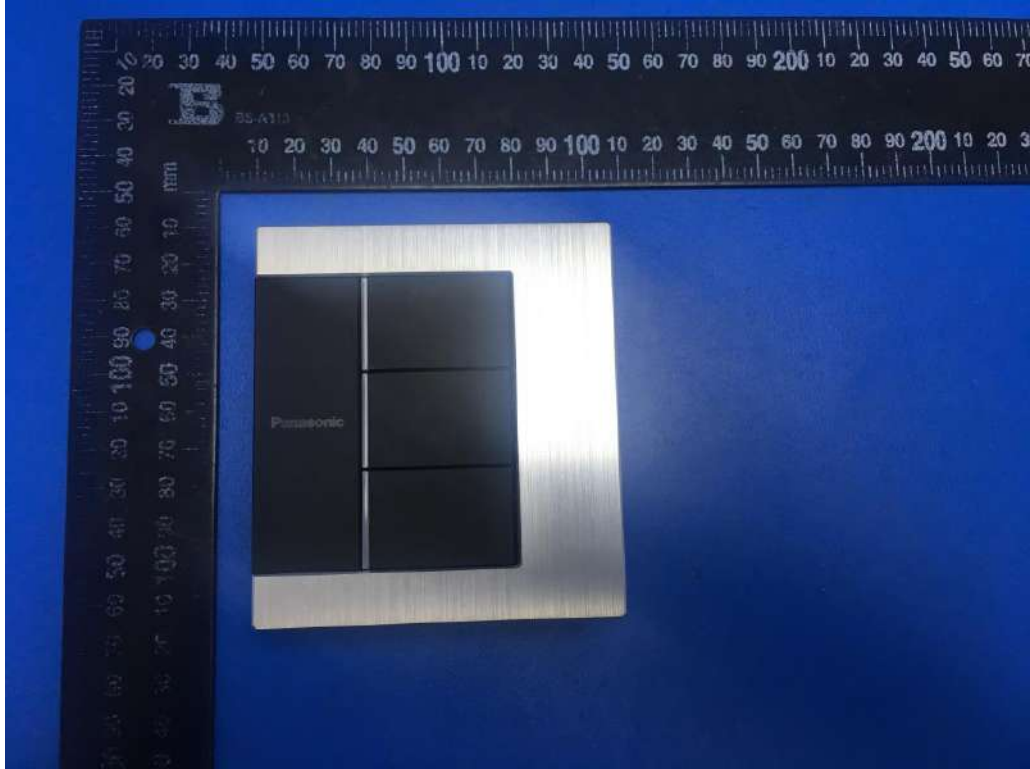


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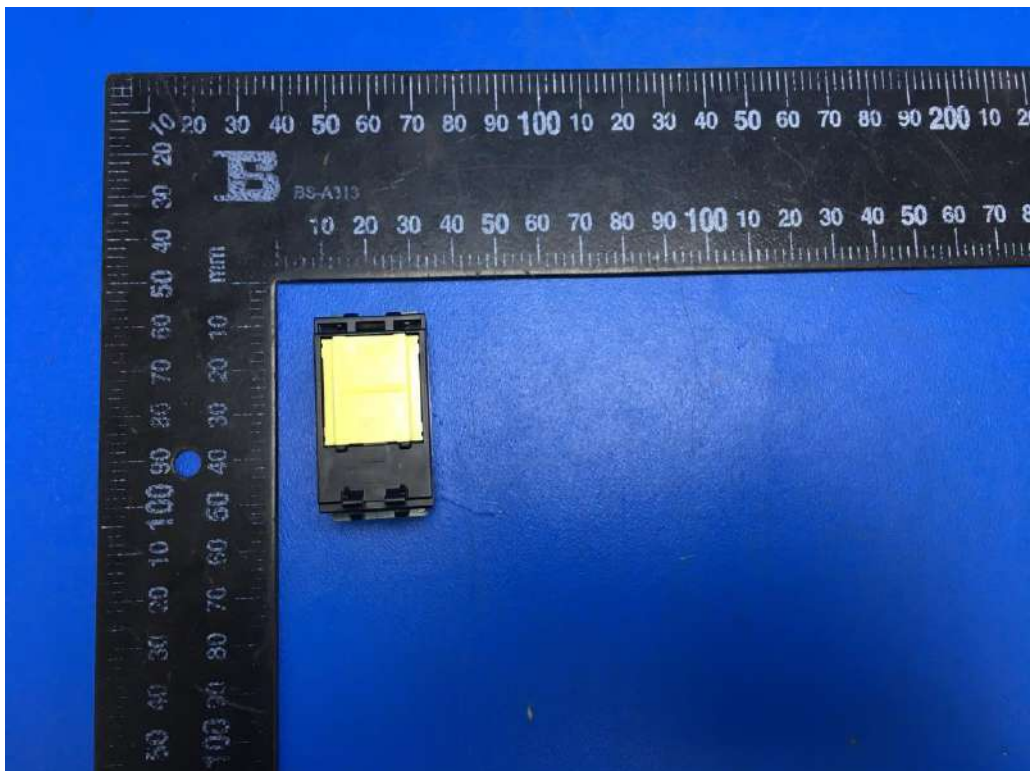
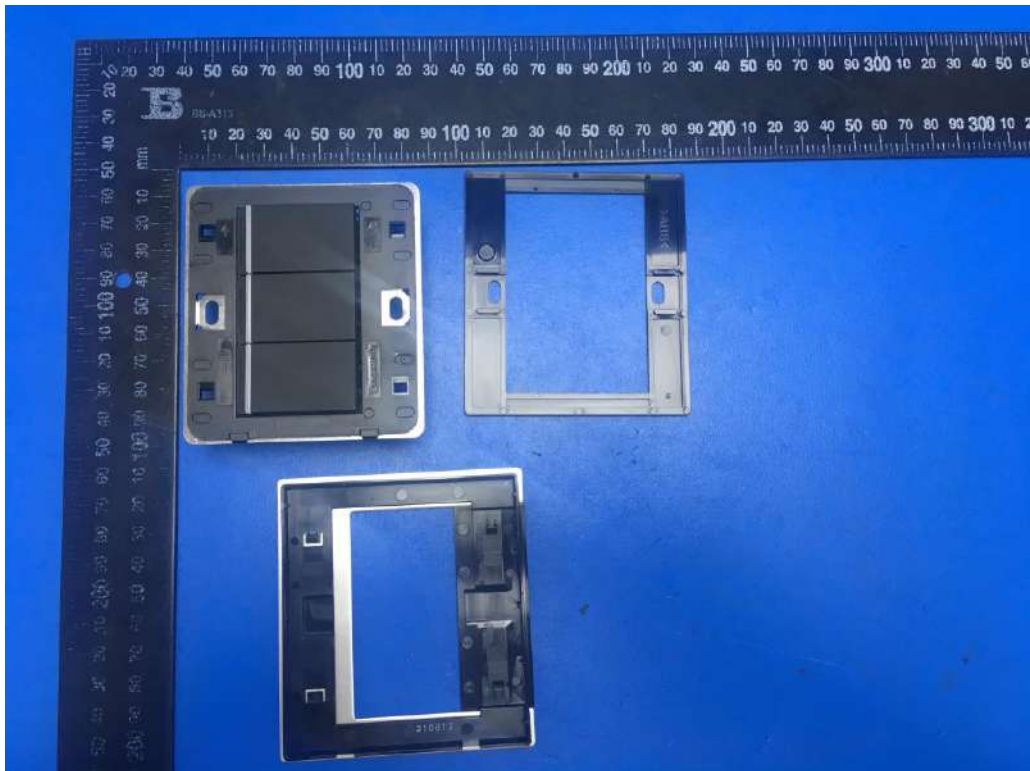


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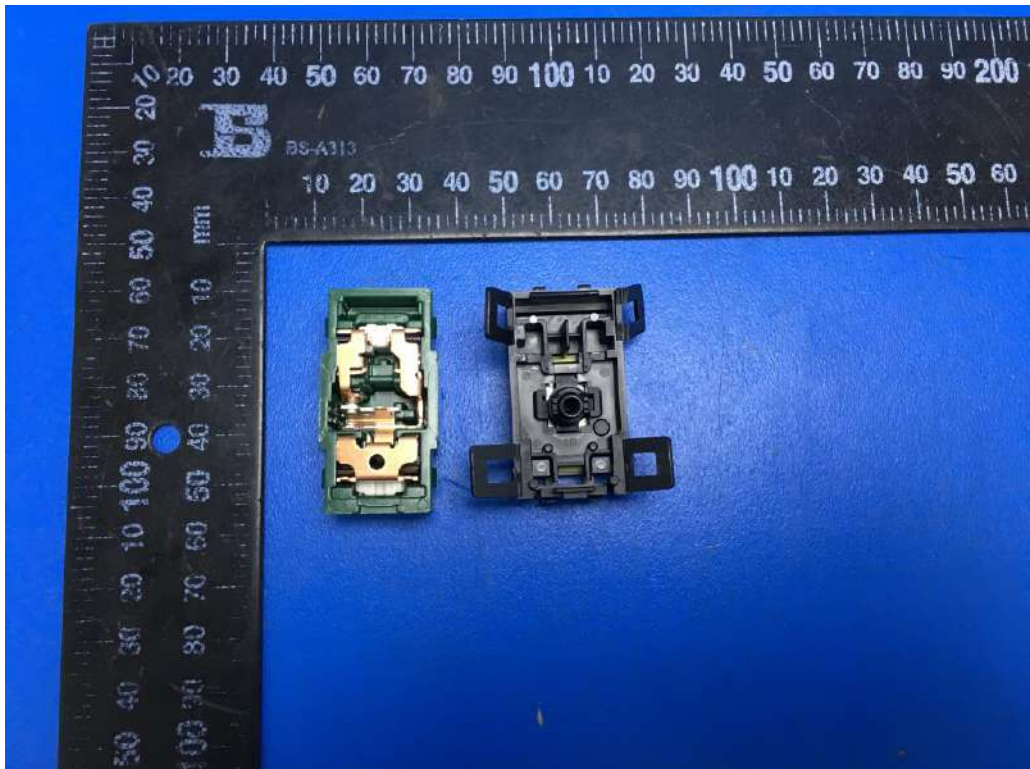
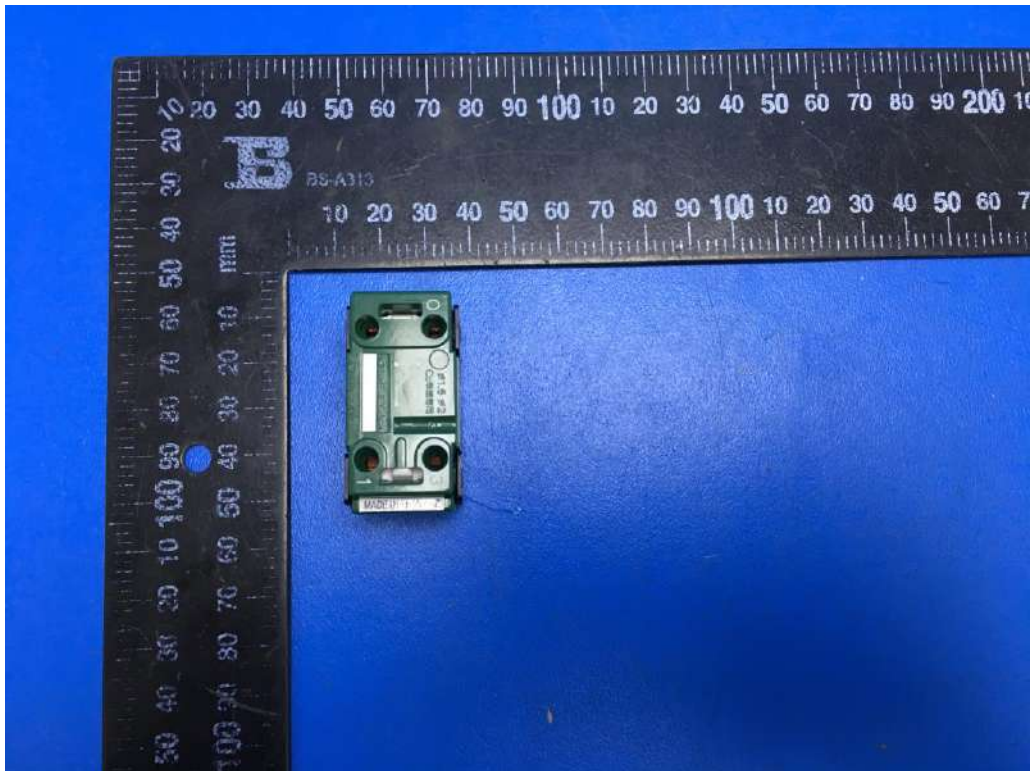


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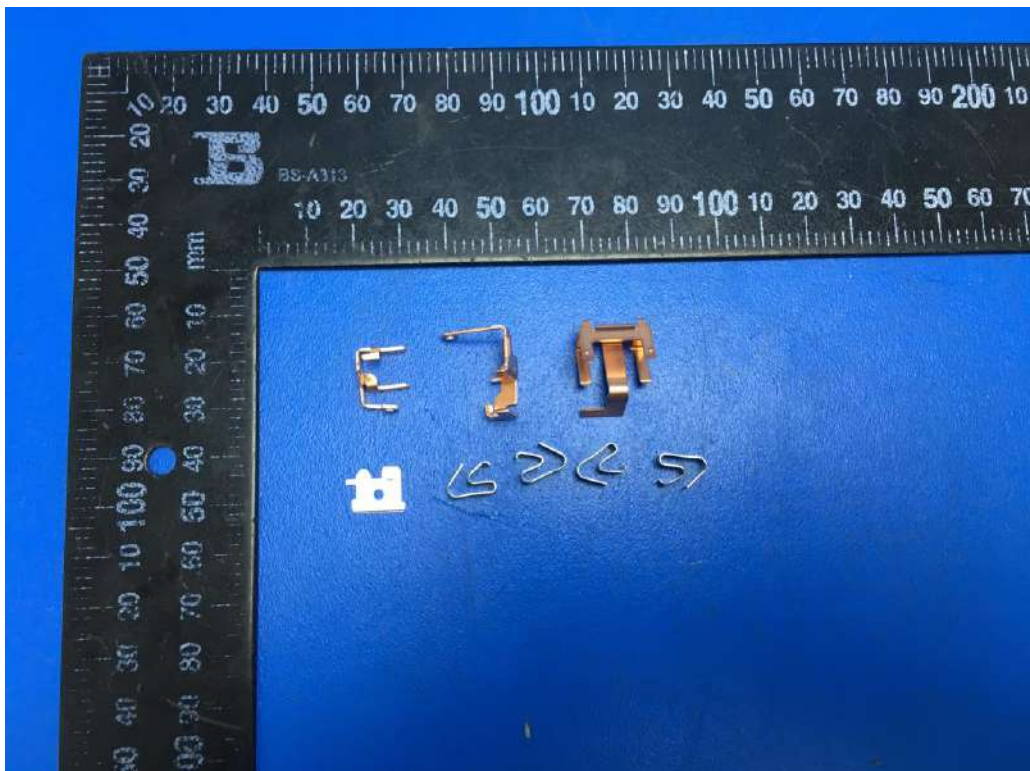
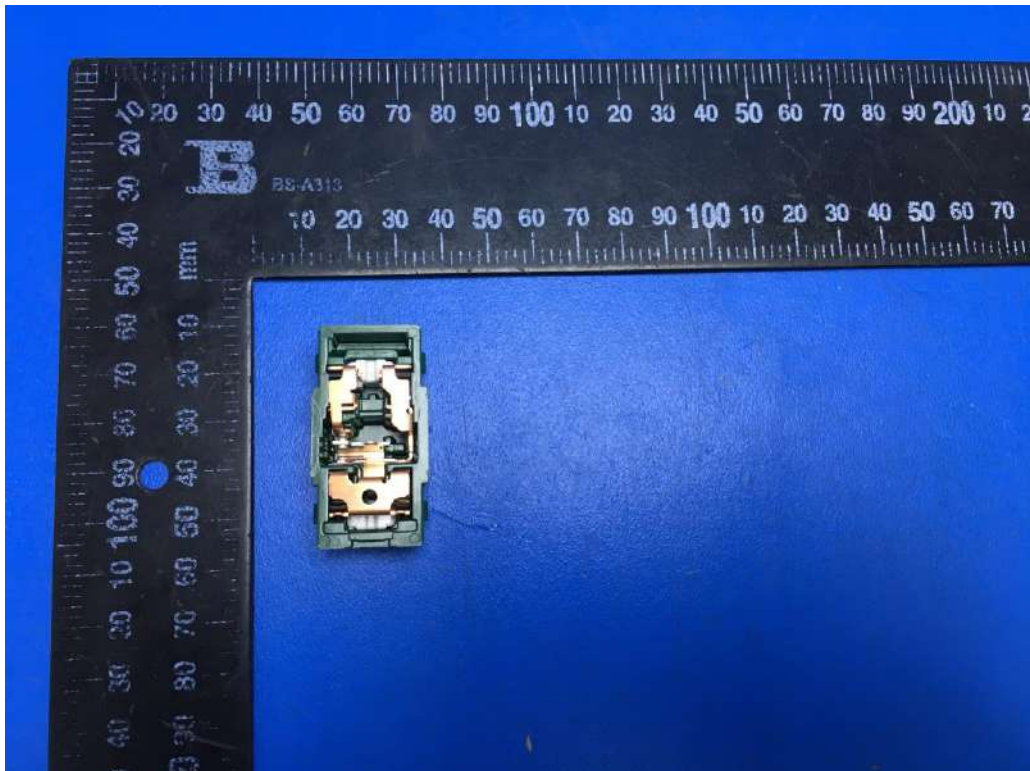


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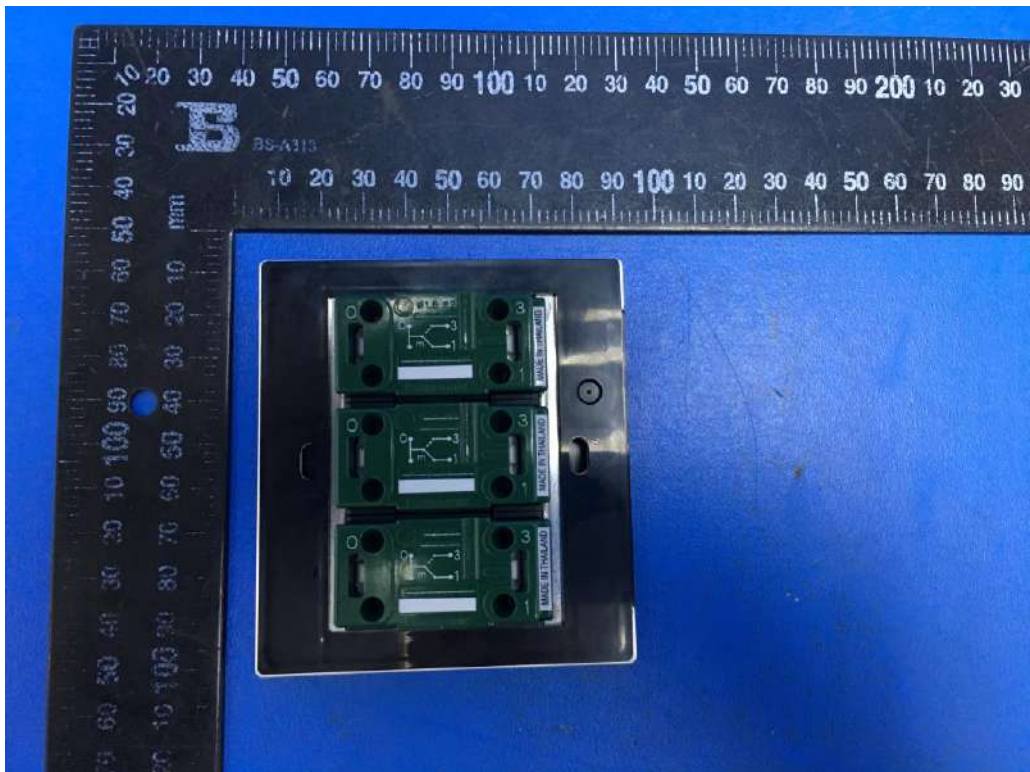
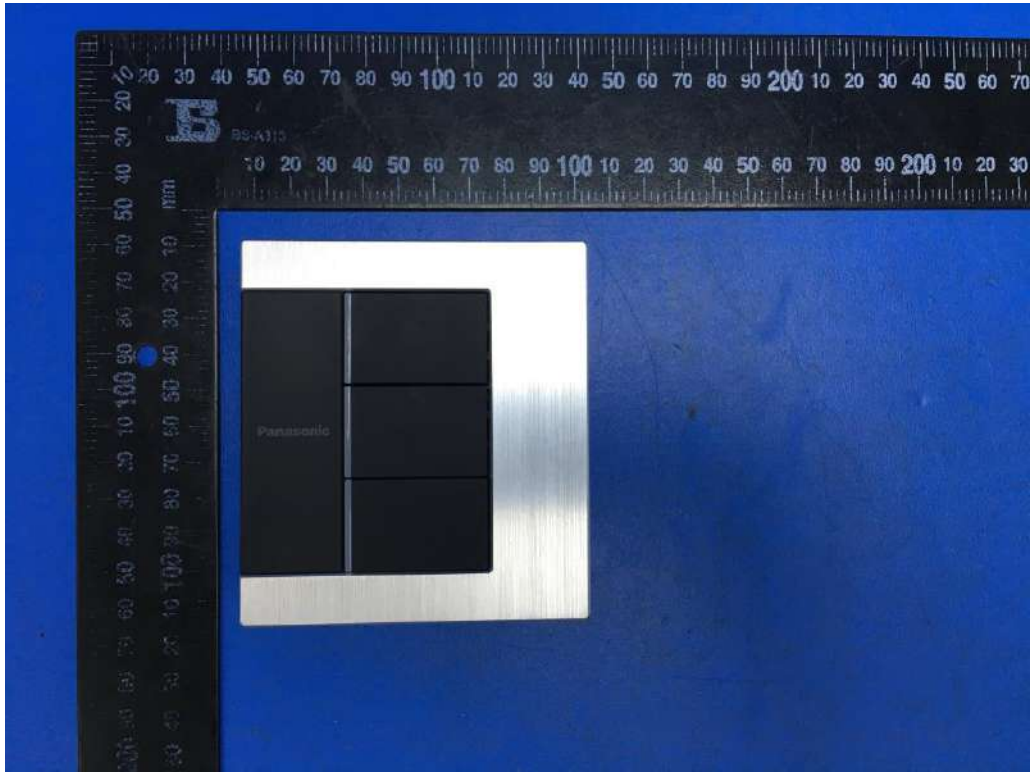


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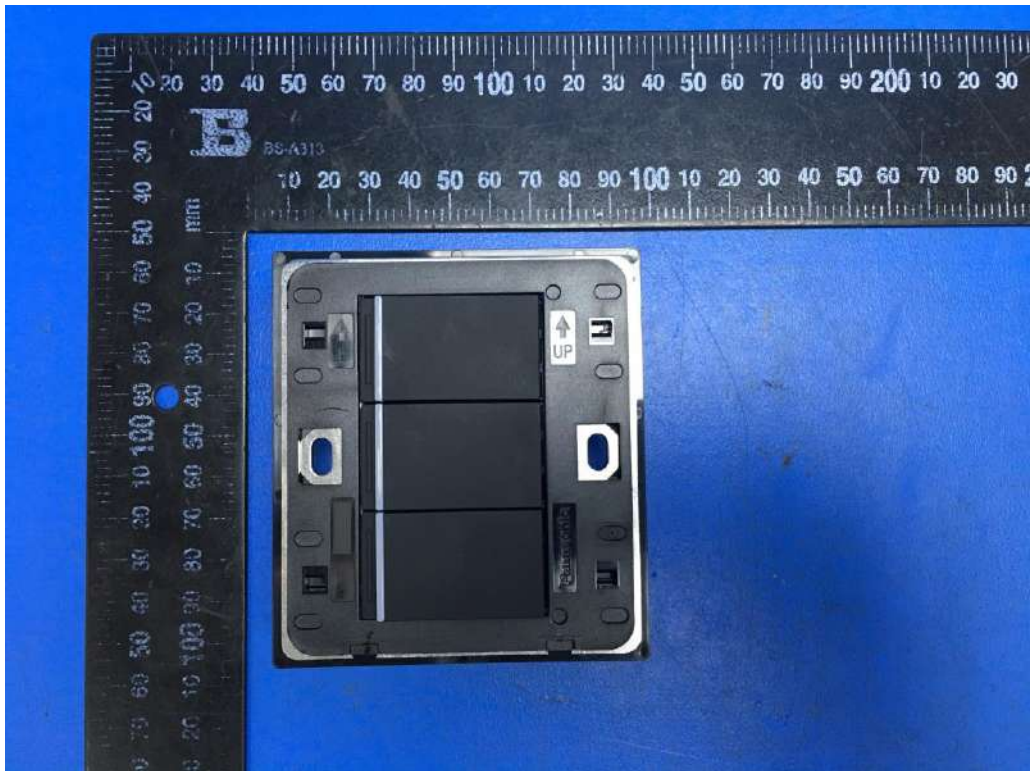
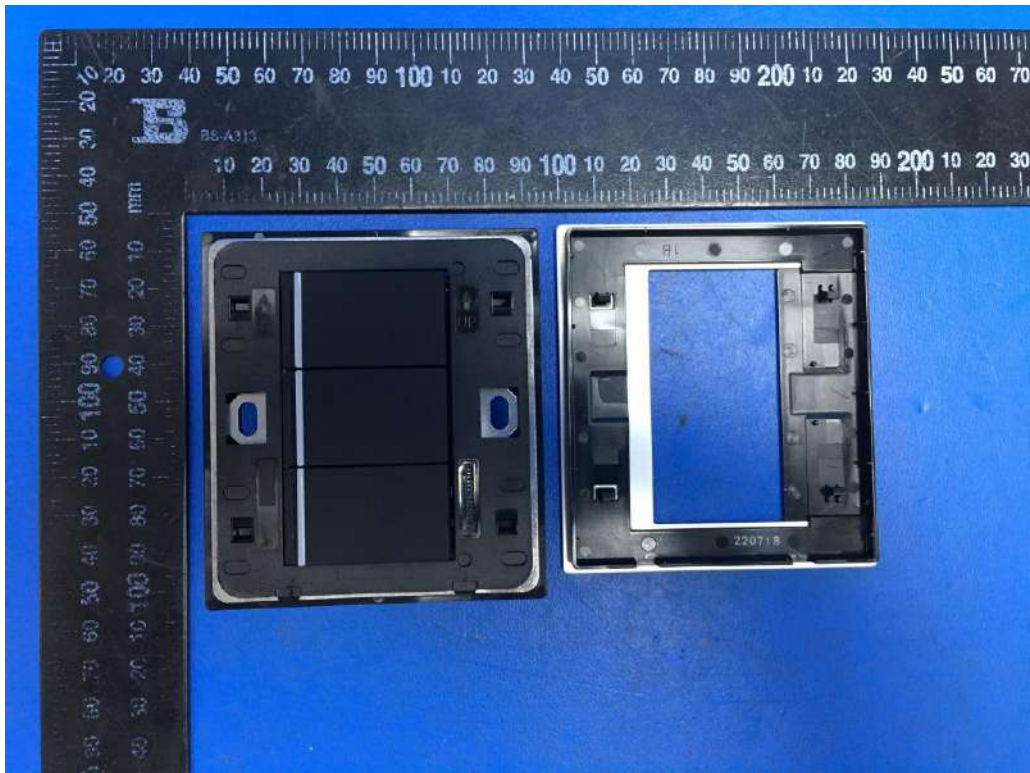


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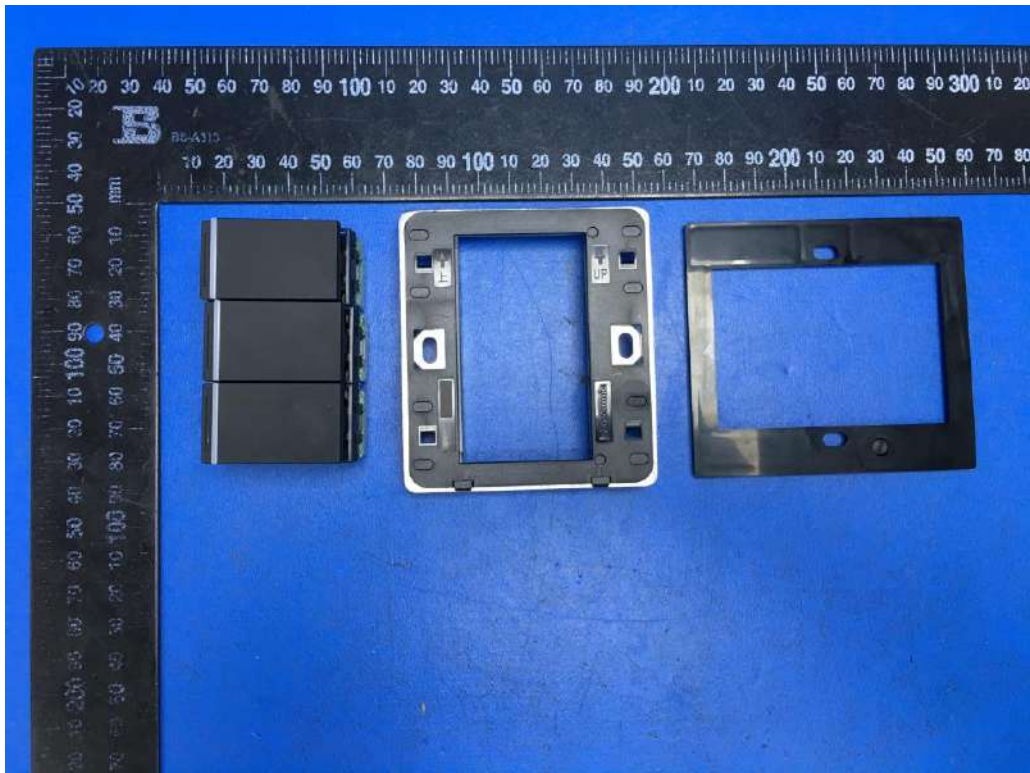


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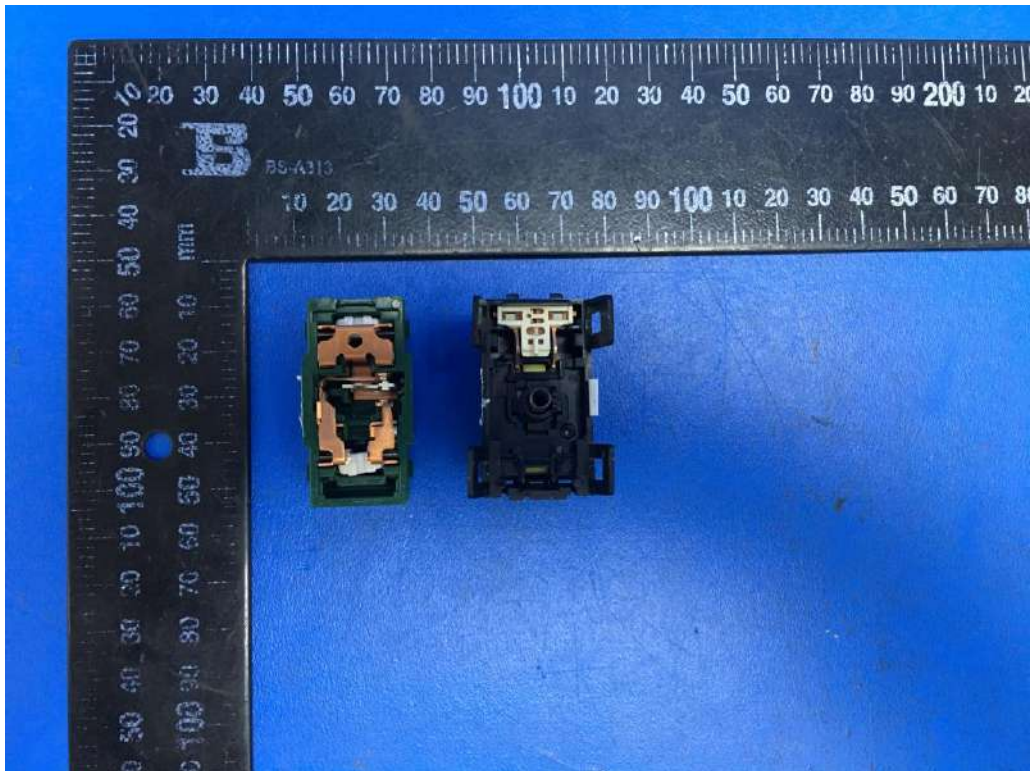
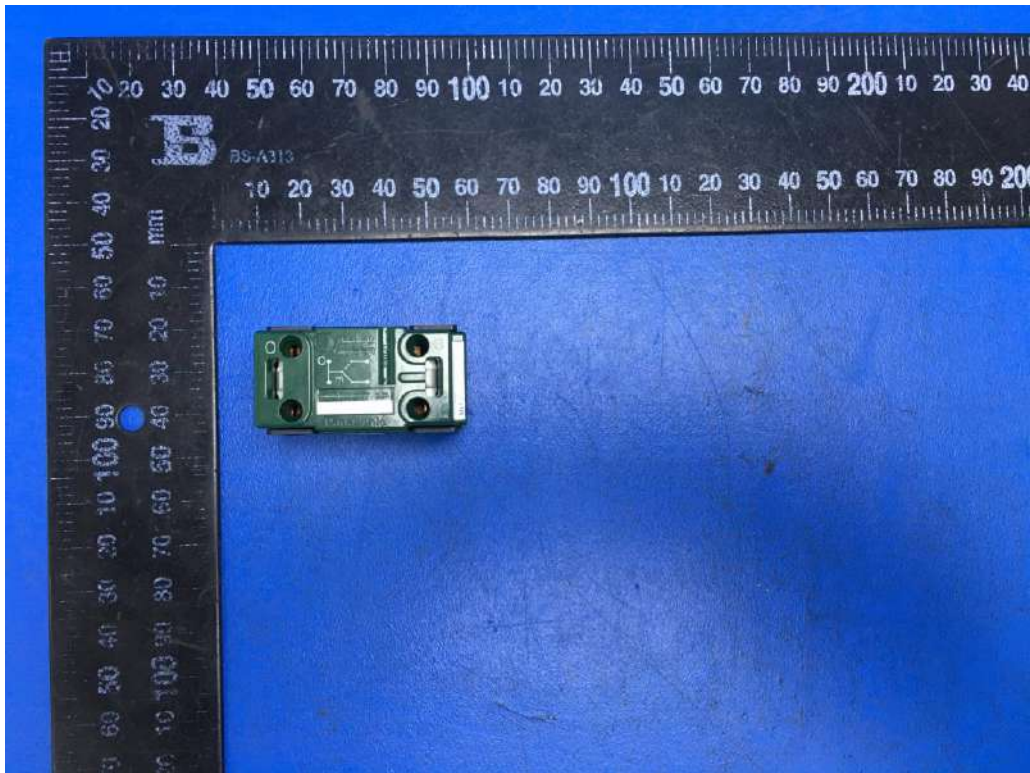


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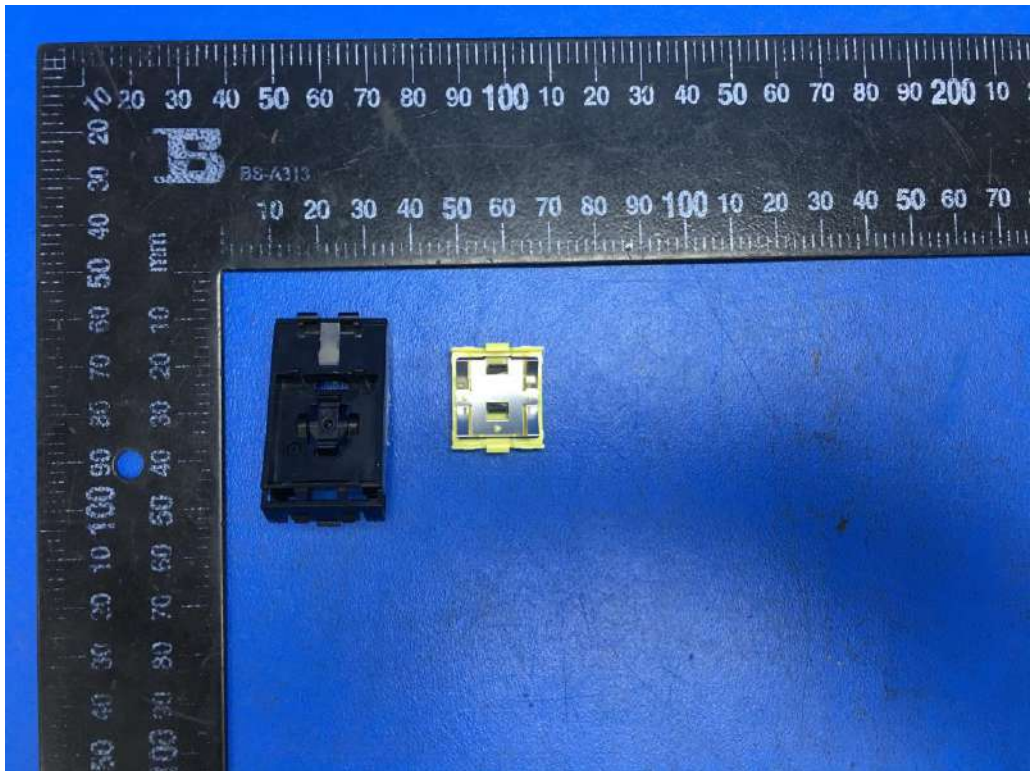
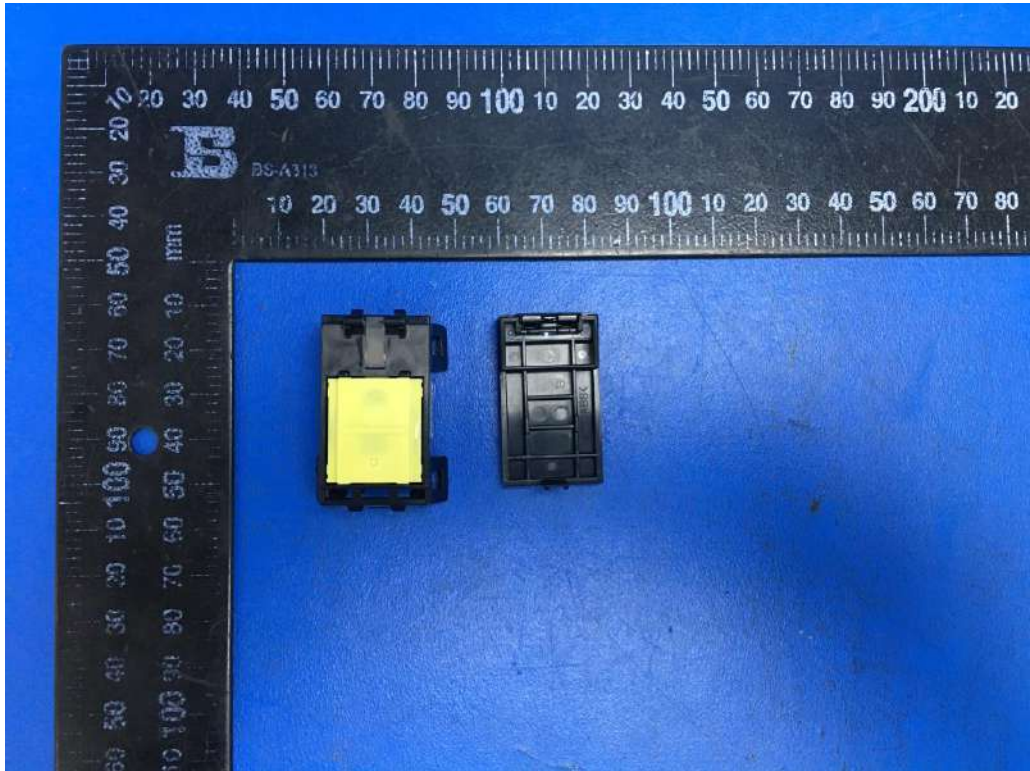


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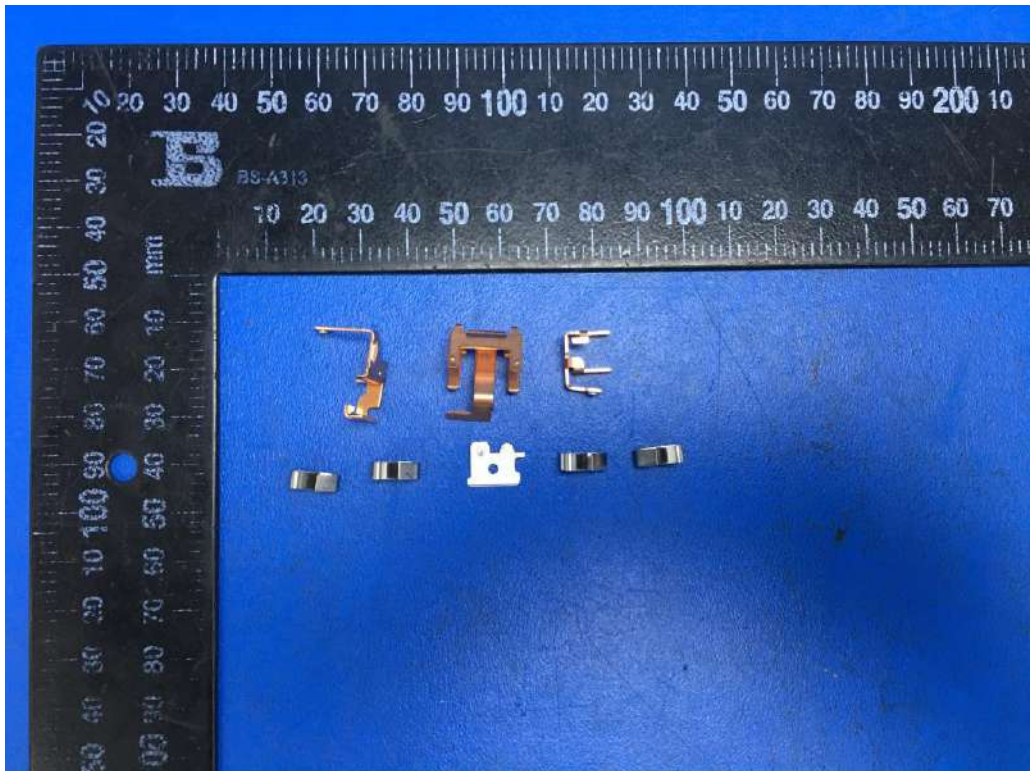
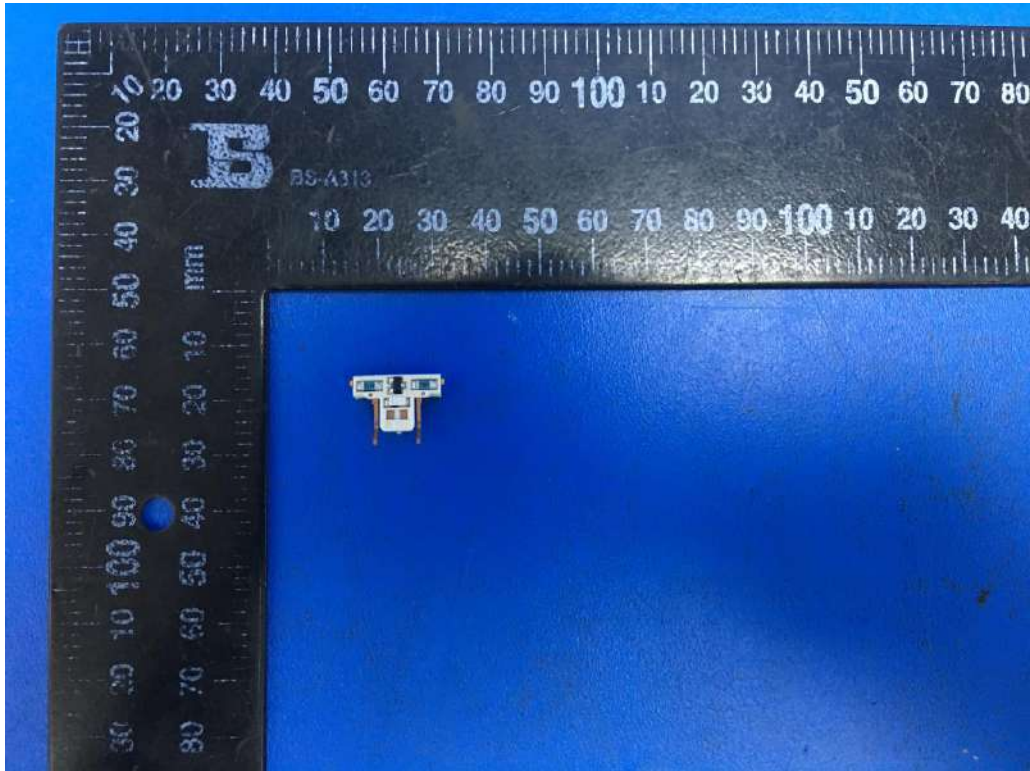


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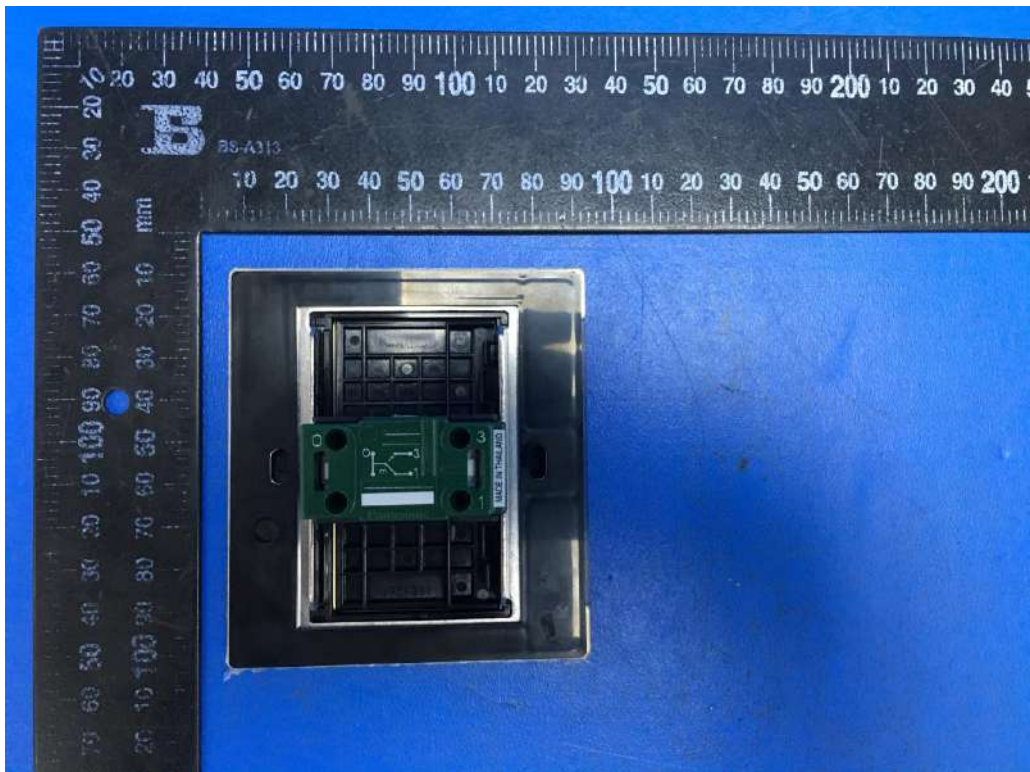
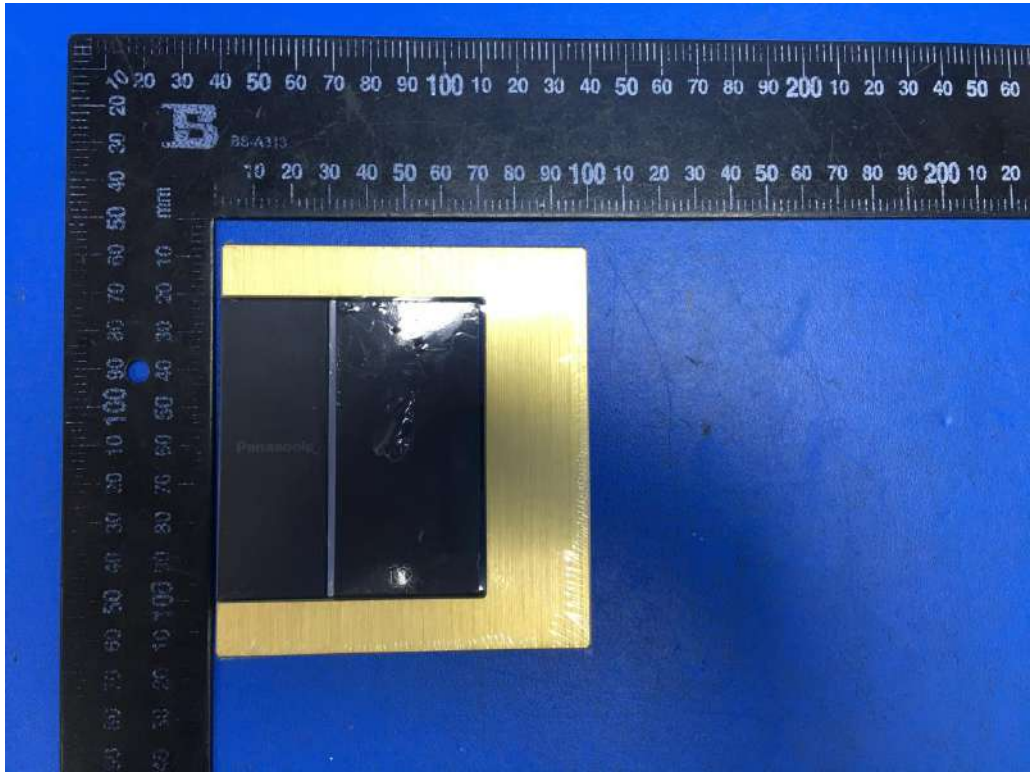


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