

Prüfbericht-Nr.: <i>Test report no.:</i>	NN22ARYF 003	Auftrags-Nr.: <i>Order no.:</i>	168377937	Seite 1 von 3 <i>Page 1 of 3</i>	
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2022-06-14		
Auftraggeber: <i>Client:</i>	Shenzhen Sonoff Technologies Co.,Ltd. 3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China				
Prüfgegenstand: <i>Test item:</i>	Smart Temperature and Humidity Monitoring Switch				
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	THR316, THR320, THR316D, THR320D (Trademark: SONOFF)				
Auftrags-Inhalt: <i>Order content:</i>	Test Report				
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 2: Section 2.1091 CFR47 FCC Part 1: Section 1.1310 KDB 447498 D01 General RF Exposure Guidance v06 FCC KDB Publication 865664 D02 v01r02				
Wareneingangsdatum: <i>Date of sample receipt:</i>	2022-06-14	Please refer to Photo Document			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003291051-001 A003284877-001				
Prüfzeitraum: <i>Testing period:</i>	2022-06-22 - 2022-09-19				
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von: <i>tested by:</i>		genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i> 2022-10-25	Signed by: Breeze Jiang	Ausstellungsdatum: <i>Issue date:</i> 2022-10-25	Signed by: Lin Lin		
Stellung / Position:	Assistant Project Manager	Stellung / Position:	Reviewer		
Sonstiges / Other:	FCC ID: 2APN5THR320D HVIN: THR320D				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>				
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet	5 = mangelhaft 5 = poor
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested	5 = poor N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

v05

1. Radio Frequency Exposure

RESULT:

Pass

Test standard : FCC Part 2: Section 2.1091
CFR47 FCC Part 1: Section 1.1310
KDB 447498 D01 General RF Exposure Guidance v06
FCC KDB Publication 865664 D02 v01r02

1.1 Product Technical Information

The EUT is a Smart Temperature and Humidity Monitoring Switch, which supports 2.4GHz Wi-Fi 802.11 b/g/n and Bluetooth wireless technology.

For details refer to the User Manual, Technical Description and Circuit Diagram.

General Information of EUT	Value
Kind of Equipment	Smart Temperature and Humidity Monitoring Switch
Type Designation	THR316, THR320, THR316D, THR320D
Operating Voltage	AC 100-240V, 50/60Hz
FCC ID	2APN5THR320D
HVIN	THR320D
Technical Specification of Bluetooth	
Operating Frequency	2402-2480MHz
Type of Modulation	GFSK
Data Rate	1Mbps
Channel Number	40 channels for Bluetooth BLE
Channel Separation	1MHz
Antenna Type	FPC Antenna
Antenna Number	1
Antenna Gain	2.37 dBi
Technical Specification of Wi-Fi 802.11 b/g/n	
Operating Frequency:	2412 - 2462 MHz for 802.11b/g/n(HT20) 2422 - 2452 MHz for 802.11n(HT40)
Type of Modulation:	DSSS(DBPSK/DQPSK/CCK) OFDM(BPSK/QPSK/16QAM/64QAM)
Data Rate:	1/2/5.5/11 Mbps for 802.11b 6/9/12/18/24/36/48/54 Mbps for 802.11g MCS0 ~ MCS7 Mbps for 802.11n(HT20) MCS0 ~ MCS7 Mbps for 802.11n(HT40)
Channel Number:	11 channels for 802.11b/g/n(HT20) 7 channels for 802.11n(HT40)
Channel Separation:	5 MHz
Antenna Type:	FPC Antenna
Number of Antenna:	1
Antenna Gain :	2.37dBi

➤ **Product Classification**

This device defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at 20 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

Max 2.37 dBi for 2.4GHz Wi-Fi antenna, Max 2.37 dBi for 2.4GHz Bluetooth antenna

➤ **Radio Frequency Exposure Limit**

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)
300-1,500	--	--	f/1500
1,500-100,000	--	--	1.0

➤ **Radio Frequency Exposure Calculation Formula**

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. mW/cm²)
 P = power input to the antenna (in appropriate units, e.g., mW)
 G = power gain of the antenna in the direction of interest relative to an isotropic radiator
 R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

or:

$$S = \frac{EIRP}{4\pi R^2}$$

where: EIRP = equivalent (or effective) isotropically radiated power

a) RF Exposure Evaluation (worse case)

Mode	*Measured RF Output Power (dBm)	EIRP (dBm)	Distance (cm)	Power Density (mW/cm ²)	FCC Limit (mW/cm ²)
2.4G Wi-Fi	23.75	26.12	20	0.081	1.0
Bluetooth	9.62	11.99	20	0.003	1.0

Note:

- *2.4GHz Band RF Output Power: Refer to NN22ARYF 001
- *Bluetooth RF Output Power: Refer to NN22ARYF 002

1) For Bluetooth + 2.4GHz Wi-Fi: Cannot all simultaneous transmitting

➤ **Conclusion**

Therefore the maximum calculations result of above are meet the requirement of Radio Frequency Exposure (MPE) limit.