RF Exposure Report

Product Name ..... :	INTOUCH550A
Trademark ..... :	INSTORE SCREEN
Model No ..... :	INTOUCH550A
Series Model ..... :	INTOUCH55***, (* can be A-Z, a-z, 0-9, or blank for marketing purpose only)
FCC ID ..... :	2AI56-INTOUCH550A
Report No ..... :	T220525032-RF03
Test Standards ..... :	FCC Part 1.1310 FCC KDB Publication 447498 v06
Applicant ..... :	HKC Corporation Limited
Address of Applicant ..... :	Building 1,2,3,Huike Industrial Park, Minying Industrial Zone, ShuiTian, ShiYan, Baoan, Shenzhen, China
Manufacturer ..... :	Instorescreen LLC
Manufacturer Address ..... :	2338 Immokalee Rd, Unit 220 Naples, FL 34110
Date of Test Date ..... :	N/A
Date of Issue. ..... :	Jan 12,2023
Test Result ..... :	Compliance

Reviewed By : Jadil - yang

Approved Signatory : Tom. Qiao

The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CSIC within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit.

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1 TEST SUMMARY

1.1 Test Facility

Shenzhen Central Standard International Center Co., Ltd.
Roon 201, Building 1, Mogen Fashion Industrial Park, No. 10, Shilongzai Road, Xinshi Community, Dalang Street, Longhua District, Shenzhen

The test facility is recognized, certified or accredited by the following organizatios:
CNAS – Registration NO.: L11671
FCC - Registration NO.: 0031378433 Designation Number: CN1317
IC – CAB identifier: CN0051
A2LA – Lab Cert. No.: 6426.01

1.2 Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements and is documented in the Shenzhen Central Standard International Center Co., Ltd. quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.
Below is the best measurement capability for Shenzhen Central Standard International Center Co.,Ltd.

Test Items	Measurement Uncertainty
RF output power, conducted	±0.59dB
Remark: 1）This uncertainty represents an expanded uncertainty expressed at approximately the 95%. 2 ）Confidence level using a coverage factor of K=2.	

2 GENERAL INFORMATION

2.1 General Description of EUT

Product information	
Product Name:	INTOUCH550A
Trademark:	INSTORE SCREEN
Model No:	INTOUCH550A
Series Model:	INTOUCH55***, (* can be A-Z, a-z, 0-9, or blank for marketing purpose only)
Power supply:	100-240V~ 50/60Hz 1.5A
Hardware version:	T30G
Software version:	20220526
WIFI information	
Modulation:	DSSS for 802.11b OFDM for 802.11g/802.11n(HT20)
Operation frequency:	802.11b/802.11g/802.11n(HT20)：2412MHz~2462MHz
Operation bandwidth:	20 MHz
Channel separation:	5 MHz
Antenna type:	Dipole antenna
Antenna gain:	3.99dBi
Remark: For a more detailed features description, please refer to the manufacture's specifications or the user's manual. All models are same with each in hardware and electronic aspects, only model number are different for market strategy. For details refer to the User Manual, Technical Description and Circuit Diagram. Full tests were applied to model T220525032-Y01/01 only in this document.	

Remark：The above information and materials are provided by the Manufacturer.

2.2 Description of Test Modes and Test Frequency

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List WIFI:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	**2412**	08	2447
02	2417	09	2452
03	2422	10	2457
04	2427	**11**	**2462**
05	2432		
06	**2437**		
07	2442		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below.

Carrier Frequency Channel:

For 802.11b/g/n(20MHz)		
Test Channel	EUT Channel	Test Frequency (MHz)
lowest	CH01	2412
middle	CH06	2437
highest	CH11	2462

2.3 Measurement Instruments List

RF Connected Test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY50200391	Jun. 14, 2023
2	Power sensor	KEYSIGHT	U2021XA	MY55080015	Jun. 14, 2023
3	Power sensor	KEYSIGHT	U2021XA	MY54250016	Jun. 14, 2023
4	Power sensor	KEYSIGHT	U2021XA	MY54250020	Jun. 14, 2023
5	Power sensor	KEYSIGHT	U2021XA	MY54210030	Jun. 14, 2023
6	Vector Signal Generator	Agilent	N5182A	MY50140130	Jun. 14, 2023
7	Signal generator	Agilent	SML03	100925	Jun. 14, 2023
8	Power sensor Box	MWRFtest	N/A	N/A	N/A
9	RF Switch Box	MWRFtest	MW100-RF CB	N/A	N/A
10	MTS 8310	MWRFtest	V：2.0.0.0		

Note:

1. The cable loss has calculated in test result which connection between each test instruments.

2.4 Description Of The Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11b CH1	1 Mbps
Mode 2	TX IEEE 802.11b CH6	1 Mbps
Mode 3	TX IEEE 802.11 b CH11	1 Mbps
Mode 4	TX IEEE 802.11g CH1	6 Mbps
Mode 5	TX IEEE 802.11g CH6	6 Mbps
Mode 6	TX IEEE 802.11g CH11	6 Mbps
Mode 7	TX IEEE 802.11n 20 CH1	6.5 Mbps
Mode 8	TX IEEE 802.11n 20 CH6	6.5 Mbps
Mode 9	TX IEEE 802.11n 20 CH11	6.5 Mbps

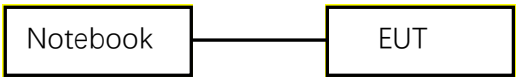
Note:
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.
(2) The battery is full-charged during the radiated and RF conducted test.

2.5 Test Software and Power Level

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

RF Function	Type	Mode Or Modulation type	Ant Gain(dBi)	Power Class	Software For Testing
WIFI(2.4G)	2.4G WIFI	802.11b	Ant：3.99	N/A	EspRFTestTool _v2.8_Manual
		802.11g		N/A	
		802.11n(HT20)		N/A	

2.6 Block Diagram Showing The Configuration Of System Tested



2.7 Description Of Necessary Accessories And Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories					
Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units					
Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-2	Notebook	Lenovo	ThinkPad E575	N/A	N/A
C-1	USB Cable	N/A	100cm	N/A	N/A

Note:
(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

3 Maximum Permissible Exposure (MPE)

3.1 RF Exposure Measurement

3.1.1 Limit

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.
Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b).

Frequency Range	Electric Field Strength	Magnetic Field Strength	Power Density
[MHz]	[V/m]	[A/m]	[mW/cm^2]
Limits for Occupational / controlled Exposures			
300 - 1500	--	--	f/300
1500 - 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
300 - 1500	--	--	f/1500
1500 - 100000	--	--	1.0

NOTE: f = Frequency in MHz

3.1.2 Friss Formula

Friss Transmission Formula: Pd = (Pout * G) / (4*pi*r^2)

Where
Pd = power density in mW/cm^2
Pout = output power to antenna in mW
G = gain of antenna in linear scale
Pi = 3.1416
R = Distance between observation point and the center of radiator in cm.

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.

3.1.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.

3.1.4 EUT Operating Conditions

EUT was enabled to transmit and receive at lowest, middle and highest channels.

3.1.5 Evaluation Result

Protocol	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Max. power of tune up (dBm)	Output Power to Antenna (mW)	Antenna Gain (dBi)	Power Density (mW/cm²)	Limit (mW/cm²)
802.11n	2437	9.93	10	10	3.99	0.0050	1

************************THE END*************************