



RF EXPOSURE Test Report

Report No.: MTi231207011-04E5

Date of issue: 2024-09-05

Applicant: IC Nexus Co., Ltd

Product: SBC_NSD_EC

Model(s): EC3810, EC3807, EC3805, EC3810-HL,
EC3810-HL-KK3, EC3807-HL, EC3807-HL-KK3,
EC3805-HL, EC3805-HL-KK3, NSD3810, NSD3810-HL,
NSD3810-HL-KK3, NSD3807, NSD3807-HL,
NSD3807-HL-KK3, NSD3805, NSD3805-HL,
NSD3805-HL-KK3, SBC3800, EC3800,
NSD3815-HL-OUV, EC3815-HL-OUV

FCC ID: 2ACLCECNSDSBC380M60

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.cn>

Instructions

1. The report shall not be partially reproduced without the written consent of the laboratory;
2. The test results of this report are only responsible for the samples submitted;
3. This report is invalid without the seal and signature of the laboratory;
4. This report is invalid if transferred, altered or tampered with in any form without authorization;
5. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.



Test Result Certification	
Applicant:	IC Nexus Co., Ltd
Address:	6F-1, No.3-2 Park Street, Nankang Software Park(NKSP), Taipei 115, Taiwan ROC
Manufacturer:	IC Nexus Co., Ltd
Address:	6F-1, No.3-2 Park Street, Nankang Software Park(NKSP), Taipei 115, Taiwan ROC
Factory:	IC Nexus Co., Ltd
Address:	6F-1, No.3-2 Park Street, Nankang Software Park(NKSP), Taipei 115, Taiwan ROC
Product description	
Product name:	SBC_NSD_EC
Trademark:	ICNexus
Model name:	EC3810
Serial Model:	EC3807, EC3805, EC3810-HL, EC3810-HL-KK3, EC3807-HL, EC3807-HL-KK3, EC3805-HL, EC3805-HL-KK3, NSD3810, NSD3810-HL, NSD3810-HL-KK3, NSD3807, NSD3807-HL, NSD3807-HL-KK3, NSD3805, NSD3805-HL, NSD3805-HL-KK3, SBC3800, EC3800, NSD3815-HL-OUV, EC3815-HL-OUV
Standards:	N/A
Test procedure:	KDB 447498 D01 v06
Date of Test	
Date of test:	2024-02-24 to 2024-09-02
Test result:	Pass

Test Engineer	:	<i>Letter Lan.</i>
		(Letter Lan)
Reviewed By	:	<i>David Lee</i>
		(David Lee)
Approved By	:	<i>Leon Chen</i>
		(Leon Chen)



RF EXPOSURE EVALUATION

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

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*300/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE Calculation Method

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

R = distance between observation point and center of the radiator in cm (20cm)

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.



Measurement Result

BT/BLE:

Operation Frequency: 2402-2480MHz

ANT Gain: 2.35dBi

Power density limited: 1mW/ cm²

BR+EDR:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	5.86	5±1	6	3.981	2.35	1.72	0.0014	1
2441		5.29	5±1	6	3.981	2.35	1.72	0.0014	1
2480		6.05	6±1	7	5.012	2.35	1.72	0.0017	1
2402	π/4-DQPSK	7.02	7±1	8	6.310	2.35	1.72	0.0022	1
2441		6.34	6±1	7	5.012	2.35	1.72	0.0017	1
2480		7.62	7±1	8	6.310	2.35	1.72	0.0022	1
2402	8DPSK	7.62	7±1	8	6.310	2.35	1.72	0.0022	1
2441		6.88	6±1	7	5.012	2.35	1.72	0.0017	1
2480		8.10	8±1	9	7.943	2.35	1.72	0.0027	1

BLE:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK-1M	6.46	6±1	7	5.012	2.35	1.72	0.0017	1
2440		5.78	5±1	6	3.981	2.35	1.72	0.0014	1
2480		5.72	5±1	6	3.981	2.35	1.72	0.0014	1
2402	GFSK-2M	5.79	5±1	6	5.012	2.35	1.72	0.0017	1
2440		5.71	5±1	6	3.981	2.35	1.72	0.0014	1
2480		5.54	5±1	6	3.981	2.35	1.72	0.0014	1

2.4G WIFI:

Operation Frequency: WIFI 802.11b/g/n HT20: 2412-2462MHz,

ANT Gain: 2.35 dBi

 Power density limited: 1mW/ cm²

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	Numeric		
2412	802.11b	15.52	15±1	16	39.811	1.72	0.01361	1
2437		15.05	15±1	16	39.811	1.72	0.01361	1
2462		15.44	15±1	16	39.811	1.72	0.01361	1
2412	802.11g	15.35	15±1	16	39.811	1.72	0.01361	1
2437		15.06	15±1	16	39.811	1.72	0.01361	1
2462		15.36	15±1	16	39.811	1.72	0.01361	1
2412	802.11n H20	15.30	15±1	16	39.811	1.72	0.01361	1
2437		15.00	15±1	16	39.811	1.72	0.01361	1
2462		15.28	15±1	16	39.811	1.72	0.01361	1

5G WIFI:

Operation Frequency:

U-NII-1: 5150 MHz to 5250 MHz, U-NII-3: 5725 MHz to 5850 MHz

ANT Gain:

U-NII-1 Gain: 3 dBi, U-NII-3 Gain: 3 dBi

UNII-1

Channel Freq. (MHz)	modulation	EIRP (dBm)	Tune-up power (dBm)	Max		Antenna Gain	Evaluation result at 20cm Power density(mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power				
				(dBm)	(mW)	Numeric		
5180	11a	16.30	16±1	17	50.119	2.00	0.01989	1
5200	11a	16.48	16±1	17	50.119	2.00	0.01989	1
5240	11a	16.16	16±1	17	50.119	2.00	0.01989	1
5180	11n (HT20)	16.33	16±1	17	50.119	2.00	0.01989	1
5200	11n (HT20)	16.62	16±1	17	50.119	2.00	0.01989	1
5240	11n (HT20)	16.15	16±1	17	50.119	2.00	0.01989	1
5180	11ac (HT20)	16.35	16±1	17	50.119	2.00	0.01989	1
5200	11ac (HT20)	16.74	16±1	17	50.119	2.00	0.01989	1
5240	11ac (HT20)	16.19	16±1	17	50.119	2.00	0.01989	1
5190	11ac (HT40)	16.20	16±1	17	50.119	2.00	0.01989	1
5230	11ac (HT40)	16.07	16±1	17	50.119	2.00	0.01989	1
5210	11ac (HT80)	16.17	16±1	17	50.119	2.00	0.01989	1



UNII-3

Channel Freq. (MHz)	modulation	EIRP (dBm)	Tune-up power (dBm)	Max		Antenna Gain	Evaluation result at 20cm Power density(mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power				
				(dBm)	(dBm)	(dBm)	(mW)	Numeric
5745	11a	15.71	16±1	17	50.119	2.00	0.01989	1
5785	11a	15.83	16±1	17	50.119	2.00	0.01989	1
5825	11a	16.28	16±1	17	50.119	2.00	0.01989	1
5745	11n (HT20)	15.66	16±1	17	50.119	2.00	0.01989	1
5785	11n (HT20)	15.52	16±1	17	50.119	2.00	0.01989	1
5825	11n (HT20)	16.23	16±1	17	50.119	2.00	0.01989	1
5745	11ac (HT20)	15.44	16±1	17	50.119	2.00	0.01989	1
5785	11ac (HT20)	15.42	16±1	17	50.119	2.00	0.01989	1
5825	11ac (HT20)	16.25	16±1	17	50.119	2.00	0.01989	1
5755	11ac (HT40)	16.90	16±1	17	50.119	2.00	0.01989	1
5795	11ac (HT40)	16.07	16±1	17	50.119	2.00	0.01989	1
5775	11ac (HT80)	16.19	16±1	17	50.119	2.00	0.01989	1

Conclusion:
SIMULTANEOUS TRANSMISSIONS

When a number of sources at different frequencies, and/or broadband sources, contribute to the total exposure, it becomes necessary to weigh each contribution relative to the MPE. To comply with the MPE, the fraction of the MPE in terms of E2, H2 (or power density) incurred within each frequency interval should be determined and the sum of all such fractions should not exceed unity. In order to ensure compliance with the MPE for a controlled environment, the sum of the ratios of the power density to the corresponding MPE should not exceed unity. That is

$$\sum_{i=1}^n \frac{S_i}{MPE_i} \leq 1$$

Simultaneous transmit:

Operating Band	The Max. MPE ratio
BR&EDR	0.0022
BLE	0.0017
2.4G WIFI	0.01361
5G WIFI	0.01989

So the simultaneous transmitting antenna pairs as below:

$$BR\&EDR+BLE +2.4G\ WIFI =0.0022+0.0017+0.01361=0.01751$$

$$BR\&EDR+BLE +5G\ WIFI =0.0022+0.0017+0.01989=0.02379$$

For the max result: $0.02379 \leq 1.0$ SAR, No SAR is required.

----END OF REPORT----