

1. General Descriptions of EUT

Equipment		Referenced Device	Model Variant Device
FCC ID		2AUS4-NFD1	2AUS4-NFD1A1
FCC Granted Date		2021/11/18	N/A
Product		Neat Bar Pro	Neat Bar Pro
Brand		neat.	neat.
Test Model		NF-D1	NF-D1
RF characteristics		WLAN 2.4GHz 2412 – 2462 MHz	WLAN 2.4GHz 2412 – 2462 MHz
		WLAN 5GHz 5180.0 - 5240.0 MHz 5260.0 - 5320.0 MHz 5500.0 - 5700.0 MHz 5745.0 - 5825.0 MHz	WLAN 5GHz 5180.0 - 5240.0 MHz 5260.0 - 5320.0 MHz 5500.0 - 5700.0 MHz 5745.0 - 5825.0 MHz
		BT-LE (1Mbps & 2Mbps) 2402 – 2480 MHz	BT-LE (1Mbps & 2Mbps) 2402 – 2480 MHz
		BT-EDR 2402 – 2480 MHz	BT-EDR 2402 – 2480 MHz
		24GHz Radar	Not Support (Hardware remove)
Hardware	Difference	With 24GHz Radar component	Removing all component relative to 24GHz Radar
	Identical	Identical internal printed circuit board layouts	
		Have a common design and components except 24GHz Radar component	

2. Referenced Device RF characteristics

2.1 WLAN 2.4GHz mode

Modulation Type	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM for OFDMA
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n (HT20/HT40): up to 300Mbps VHT20/VHT40: up to 400Mbps 802.11ax: up to 573.5Mbps
Operating Frequency	2412MHz~ 2462MHz

2.2 WLAN 5GHz mode

Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM for OFDMA
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: up to 54Mbps 802.11n up to 300Mbps 802.11ac: up to 866.7Mbps 802.11ax: up to 1201Mbps
Operating Frequency	5180~5240MHz, 5260~5320MHz, 5500~5700MHz, 5745~5825MHz

2.3 BT-LE mode

Modulation Type	GFSK
Modulation Technology	DTS
Transfer Rate	Up to 2Mbps
Operating Frequency	2402MHz ~ 2480MHz

2.4 BT-EDR mode

Modulation Type	GFSK, $\pi/4$ -DQPSK, 8DPSK
Modulation Technology	FHSS
Transfer Rate	Up to 3Mbps
Operating Frequency	2402MHz ~ 2480MHz

2.5 24G Radar mode

Modulation Type	CW
Operating Frequency	24 ~ 24.25GHz

3. Variant Device RF characteristics

3.1 WLAN 2.4GMHz mode

Modulation Type	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM for OFDMA
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n (HT20/HT40): up to 300Mbps VHT20/VHT40: up to 400Mbps 802.11ax: up to 573.5Mbps
Operating Frequency	2412MHz~ 2462MHz

3.2 WLAN 5GMHz mode

Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM for OFDMA
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: up to 54Mbps 802.11n up to 300Mbps 802.11ac: up to 866.7Mbps 802.11ax: up to 1201Mbps
Operating Frequency	5180~5240MHz, 5260~5320MHz, 5500~5700MHz, 5745~5825MHz

3.3 BT-LE mode

Modulation Type	GFSK
Modulation Technology	DSS
Transfer Rate	Up to 2Mbps
Operating Frequency	2402MHz ~ 2480MHz

3.4 BT-EDR mode

Modulation Type	GFSK, $\pi/4$ -DQPSK, 8DPSK
Modulation Technology	FHSS
Transfer Rate	Up to 3Mbps
Operating Frequency	2402MHz ~ 2480MHz

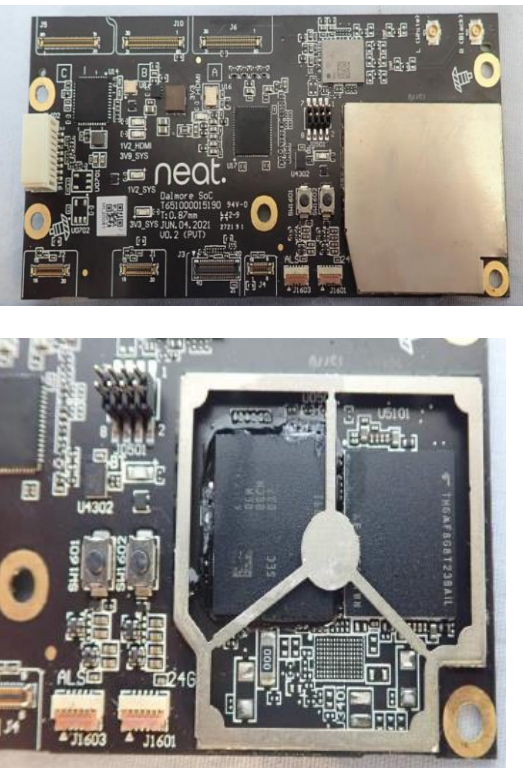
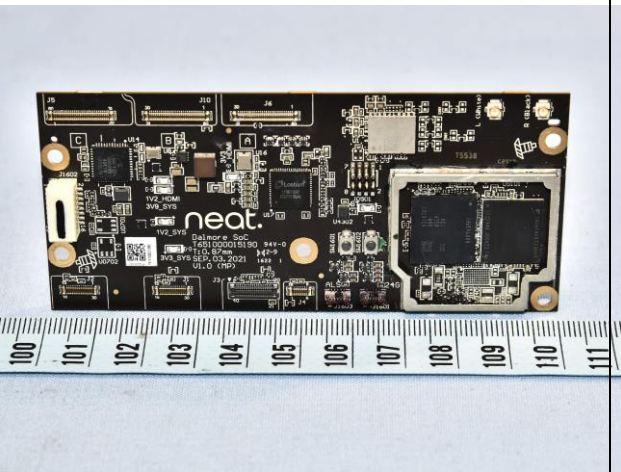
4. Device Materials

Referenced Device	Model variant
FCC ID: 2AUS4-NFD1	FCC ID: 2AUS4-NFD1A1
Plastic	Plastic

5. Device Form Factor & Photos

Referenced Device	Model variant
FCC ID: 2AUS4-NFD1	FCC ID: 2AUS4-NFD1A1
	

6. PCB Photos

Referenced Device	Model variant
FCC ID: 2AUS4-NFD1	FCC ID: 2AUS4-NFD1A1
WiFi/BT Module	WiFi/BT Module
	 **All is the same with original except removing all component relative to 24GHz Radar

24GHz module:



7. Referencing test items

7.1 Part 15C WLAN 2.4GHz Mode

FCC Clause	Test Items	Referenced Test Data	Note
15.247(b)	RF Output Power	Y	
15.247(e)	Power Spectral Density	Y	
15.247(a)(2)	6 dB Bandwidth	Y	
15.247(d)	Conducted Out of Band Emissions	Y	
15.207	AC Power Conducted Emissions	Y	
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Y	
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Y	
15.203	Antenna Requirement	Y	

7.2 Part 15E WLAN 5GHz Mode

FCC Clause	Test Items	Referenced Test Data	Note
15.407(a)(2)	26 dB Bandwidth	Y	
15.407(a)(1) 15.407(a)(2) 15.407(a)(3)	RF Output Power	Y	
15.407(a)(1) 15.407(a)(2) 15.407(a)(3)	Power Spectral Density	Y	
15.407(e)	6 dB Bandwidth	Y	
---	Occupied Bandwidth	Y	
15.407(g)	Frequency Stability	Y	
15.407(b)(9)	AC Power Conducted Emissions	Y	
15.407(b)(9)	Unwanted Emissions below 1 GHz	Y	
15.407(b) (1/10) 15.407(b) (2/10) 15.407(b) (3/10) 15.407(b) (4(i)/10)	Unwanted Emissions above 1 GHz	Y	
15.203	Antenna Requirement	Y	

7.3 Part 15C BT-LE Mode

FCC Clause	Test Items	Referenced Test Data	Note
15.247(b)	RF Output Power	Y	
15.247(e)	Power Spectral Density	Y	
15.247(a)(2)	6 dB Bandwidth	Y	
15.247(d)	Conducted Out of Band Emissions	Y	
15.207	AC Power Conducted Emissions	Y	
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Y	
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Y	
15.203	Antenna Requirement	Y	

7.4 Part 15C BT-EDR Mode

FCC Clause	Test Items	Referenced Test Data	Note
15.247 (a)(1)	RF Output Power	Y	
15.247(a)(1) (iii)	Number of Hopping Frequency Used	Y	
15.247(a)(1) (iii)	Dwell Time on Each Channel	Y	
15.247(a)(1)	Hopping Channel Separation	Y	
15.247(a)(1)	20 dB Bandwidth	Y	
15.247(d)	Conducted Out of Band Emissions	Y	
15.207	AC Power Conducted Emissions	Y	
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Y	
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Y	
15.203	Antenna Requirement	Y	

All Operating bands for RF exposure evaluation

Applied Standard: FCC Part 2			
FCC Clause	Test Items	Referenced Test Data	Note
2.1091	Radiofrequency radiation exposure evaluation: mobile devices.	N	

8. Spot- Check Test Plan (Amount of sample: 1 sample)

8.1 WLAN 2.4GHz Mode

Equipment Class	FCC Rule Part	Test Items	Frequency Band	Test Modes	Test Channel
DTS	FCC Part 15C	Conducted output power	2412-2462 MHz	802.11 b/g/n/ac/ax	Low/ Mid/ High
		AC Power Conducted Emissions		One channel with maximum power among 802.11 b/g/n/ax	One channel with maximum power
		Radiated emission above 1 GHz– Band edge and Harmonics		One channel with maximum power among 802.11 b/g/n/ax	One channel with maximum power
		Radiated emission up to 1 GHz		One channel with maximum power among 802.11 b/g/n/ax	One channel with maximum power

8.2 WLAN 5GHz Mode

Equipment Class	FCC Rule Part	Test Items	Frequency Band	Test Modes	Test Channel
NII	FCC Part 15E	Conducted output power	5180-5240MHz, 5260-5320MHz, 5500-5700MHz 5745-5825MHz	802.11 a/n/ac/ax	Low/ Mid/ High for each sub band
		AC Power Conducted Emissions		One channel with maximum power among 802.11 a/n/ac/ax	One channel with maximum power
		Radiated emission above 1 GHz– Band edge and Harmonics		One channel with maximum power among 802.11 a/n/ac/ax	One channel with maximum power
		Radiated emission up to 1 GHz		One channel with maximum power among 802.11 a/n/ac/ax	One channel with maximum power

8.3 BT-LE Mode

Equipment Class	FCC Rule Part	Test Items	Frequency Band	Test Modes	Test Channel
DTS	FCC Part 15C	Conducted output power	2402-2480 MHz	LE1M & LE2M	Low/ Mid/ High
		AC Power Conducted Emissions		One channel with maximum power among LE1M & LE2M	One channel with maximum power
		Radiated emission above 1 GHz– Band edge and Harmonics		One channel with maximum power among LE1M & LE2M	One channel with maximum power
		Radiated emission up to 1 GHz		One channel with maximum power among LE1M & LE2M	One channel with maximum power

8.4 BT-EDR Mode

Equipment Class	FCC Rule Part	Test Items	Frequency Band	Test Modes	Test Channel
DSS	FCC Part 15C	Conducted output power	2402-2480 MHz	GFSK & 8DPSK	Low/ Mid/ High
		AC Power Conducted Emissions		One channel with maximum power among GFSK & 8DPSK	One channel with maximum power
		Radiated emission above 1 GHz– Band edge and Harmonics		One channel with maximum power among GFSK & 8DPSK	One channel with maximum power
		Radiated emission up to 1 GHz		One channel with maximum power among GFSK & 8DPSK	One channel with maximum power

Note: RF Conducted output power were confirmed and the same as Referenced Device

RF Exposure (MPE) Evaluation

Equipment Class	Rule Part	Evaluation Items	Frequency Band (MHz)	Evaluation Modes	Evaluation Channel
DTS NII DSS	Part 2.1091	MPE Calculation	Bluetooth (2402-2480) WLAN 2.4 GHz (2412-2462) WLAN 5 GHz (5180-5825)	Maximum RF Output Power (EIRP) : Single bands	Worst Channel (Maximum RF Output Power (EIRP))

9. Acceptance criteria for spot check

Test Items	Frequency	Deviation Tolerance	Acceptance criteria
Conducted Output power	All operating band	+/- 1.0dB	The test result compare to the test result of Referenced device must be within Deviation Tolerance and calculated EIRP must be lower than limitation for each operating band.
AC Power Conducted Emissions	150kHz~30MHz	+/- 3.0dB	The each band worst value of test result for variant device compare to the test result of Referenced device must be within Deviation Tolerance and must be lower than limitation.
Unwanted Emissions below 1 GHz	9 kHz ~ 30 MHz	+/- 2.38dB	The each band worst value of test result for variant device compare to the test result of Referenced device must be within Deviation Tolerance and must be lower than limitation.
	30 MHz ~ 1 GHz	+/- 5.70dB	
Unwanted Emissions above 1 GHz	1 GHz ~ 6 GHz	+/- 4.83dB	The each band worst value of test result for variant device compare to the test result of Referenced device must be within Deviation Tolerance and must be lower than limitation.
	6 GHz ~ 18 GHz	+/- 5.37dB	
	18 GHz ~ 40 GHz	+/- 5.24dB	

***Spot check test result comply with Acceptance Criteria, data referencing is applicable.**