ASK8822

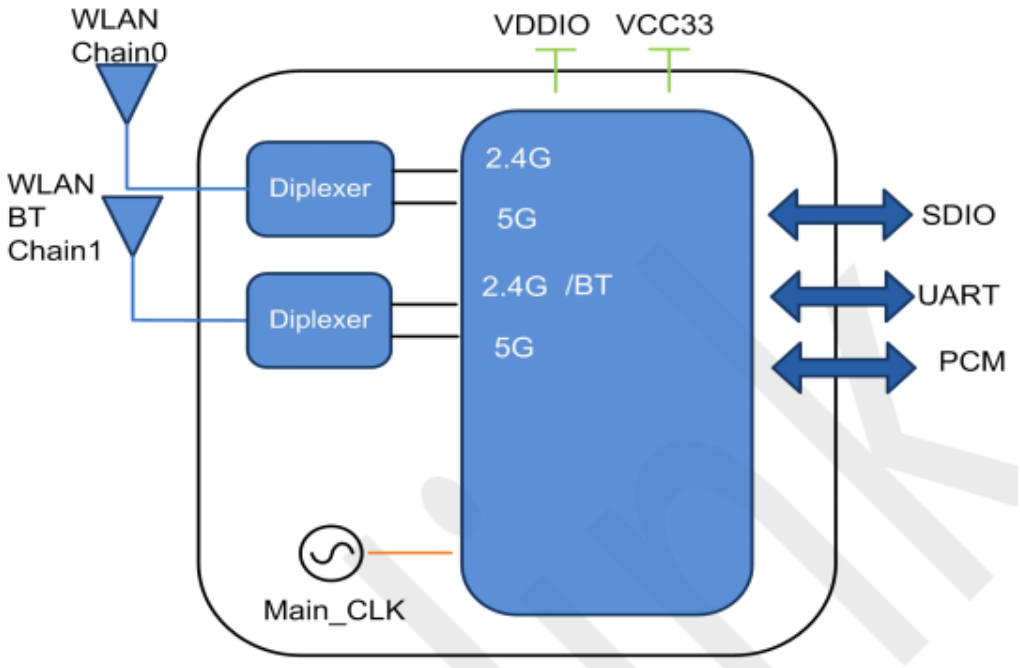
WIFI+BT Combo Module

Wi-Fi Dual-band 2X2 11ac +Bluetooth 4.2

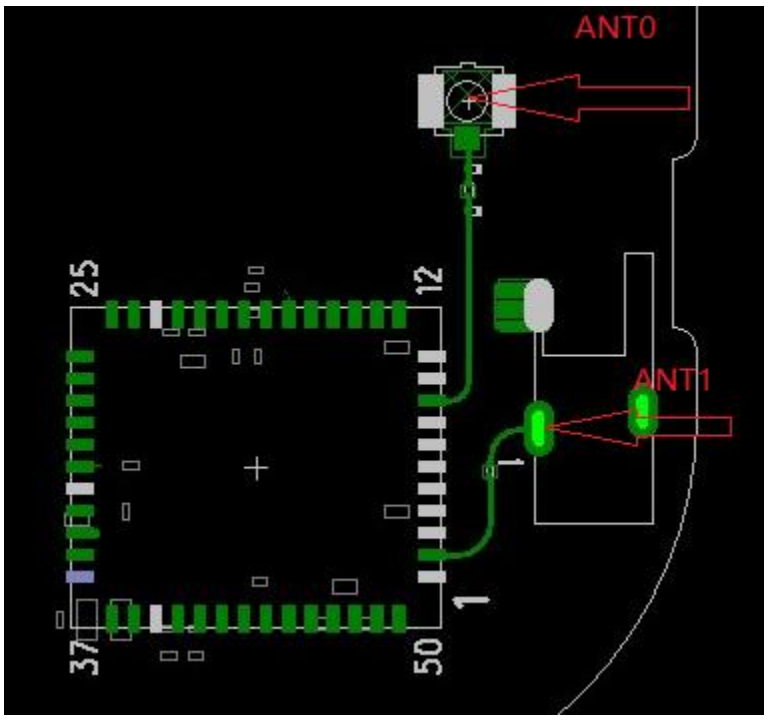
Features

- Highly integrated wireless local area network (WLAN) system-on-chip (SOC) for 5GHZ 802.11ac, or 2.4G/5G 802.11n WLAN applications.
- Dual-stream spatial multiplexing up to 867 Mbps data rate.
- Supports 20/40MHz at 2.4GHz and supports 20/40/80MHz at 5GHz.
- Supports low power SDIO3.0 interface for WLAN and UART/PCM interface for Bluetooth.
- Supports Bluetooth V4.2 system.
- Supports WLAN-Bluetooth coexistence.
- Supports Bluetooth for class1 and class2 power level transmissions without requiring an external PA.
- BT host digital interface:
  - HCI UART (up to 4 Mbps)
  - PCM for audio data
- Module has 2 antenna ports, BT port combine with WLAN1.

Block Diagram:



Antenna Layout



General Specification

Model Name	ASK8822
Product Description	Support Wi-Fi/Bluetooth functionalities
Dimension	L x W x H: 15 x 13 x 2.15 mm (typical)
Wi-Fi Interface	Support SDIO V3.0
BT Interface	UART / PCM
Operating temperature	0°C to 70°C
Storage temperature	-40°C to 125°C

Recommended Operating Rating

	Min.	Typ.	Max.	Unit
Operating Temperature	0	25	70	deg.C
VCC33	3.15	3.3	3.45	V
VDDIO	1.7	1.8 or 3.3	3.45	V

Wi-Fi RF Specification

2.4GHz RF Specification

Feature	Description			
WLAN Standard	IEEE 802.11 b/g/n Wi-Fi compliant			
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)			
Number of Channels	2.4GHz：Ch1 ~ Ch11			
Spectrum Mask	Min. b/g/n	Typ. b/g/n	Max. b/g/n	Unit b/g/n
1st side lobes(to fc ± 11MHZ)	-	-43/-30/-40	-	dBr
2st side lobes(to fc ± 22MHZ)	-	-52/-33/-58	-	dBr
Freq. Tolerance	-20/-20/-20	-	20/20/20	ppm

Test Items	TYP Test Value	Standard Value
SISO Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps PER @ -92 dBm	≤-83
	- 2Mbps PER @ -90 dBm	≤-80
	- 5.5Mbps PER @ -87 dBm	≤-79
	- 11Mbps PER @ -85 dBm	≤-76
SISO Receive Sensitivity (11g,20MHz) @10% PER	- 6Mbps PER @ -89 dBm	≤-85
	- 9Mbps PER @ -88 dBm	≤-84
	- 12Mbps PER @ -87 dBm	≤-82
	- 18Mbps PER @ -84 dBm	≤-80
	- 24Mbps PER @ -81 dBm	≤-77
	- 36Mbps PER @ -78 dBm	≤-73
	- 48Mbps PER @ -73 dBm	≤-69
	- 54Mbps PER @ -71 dBm	≤-68
SISO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -89 dBm	≤-85
	- MCS=1 PER @ -86 dBm	≤-82
	- MCS=2 PER @ -84 dBm	≤-80
	- MCS=3 PER @ -80 dBm	≤-77
	- MCS=4 PER @ -77 dBm	≤-73
	- MCS=5 PER @ -72 dBm	≤-69
	- MCS=6 PER @ -71 dBm	≤-68
	- MCS=7 PER @ -69 dBm	≤-67
SISO Receive Sensitivity (11n ,40MHz) @10% PER	- MCS=0, PER @ -88 dBm	≤-82
	- MCS=1, PER @ -85 dBm	≤-79
	- MCS=2, PER @ -83 dBm	≤-77
	- MCS=3, PER @ -79 dBm	≤-74
	- MCS=4, PER @ -76 dBm	≤-70

	- MCS=5, PER @ -71 dBm	≤-66
	- MCS=6, PER @ -70 dBm	≤-65
	- MCS=7, PER @ -68 dBm	≤-64
Maximum Input Level	802.11b : -10 dBm	
802.11g/n : -20 dBm		

5GHz RF Specification

Conditions: VBAT=3.3V ; VDDIO=3.3V ; Temp:25°C

Feature	Description
WLAN Standard	IEEE 802.11a/n/ac 2x2, Wi-Fi compliant
Frequency Range	4.900 GHz ~ 5.845 GHz (5.0 GHz ISM Band)
Number of Channels	5.0GHz：Please see the table[1]

Test Items	Test Value	Standard Value
SISO Receive Sensitivity	- 6Mbps PER @ -88 dBm	≤-85
(11a,20MHz) @10% PER	- 9Mbps PER @ -87 dBm	≤-84
	- 12Mbps PER @ -86 dBm	≤-82
	- 18Mbps PER @ -83 dBm	≤-80
	- 24Mbps PER @ -80 dBm	≤-77
	- 36Mbps PER @ -77 dBm	≤-73
	- 48Mbps PER @ -72 dBm	≤-69
	- 54Mbps PER @ -70 dBm	≤-68
SISO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -88 dBm	≤-85
	- MCS=1 PER @ -85 dBm	≤-82
	- MCS=2 PER @ -83 dBm	≤-80
	- MCS=3 PER @ -80 dBm	≤-77
	- MCS=4 PER @ -76 dBm	≤-73
	- MCS=5 PER @ -71 dBm	≤-69
	- MCS=6 PER @ -70 dBm	≤-68
	- MCS=7 PER @ -69 dBm	≤-67
SISO Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0 PER @ -85 dBm	≤-82
	- MCS=1 PER @ -82 dBm	≤-79
	- MCS=2 PER @ -80 dBm	≤-77
	- MCS=3 PER @ -77 dBm	≤-74
	- MCS=4 PER @ -73 dBm	≤-70
	- MCS=5 PER @ -69 dBm	≤-66

	- MCS=6 PER @ -68 dBm	≤-65
	- MCS=7 PER @ -67 dBm	≤-64
SISO Receive Sensitivity (11ac,20MHz) @10% PER	- MCS=0, NSS1 PER @ -86 dBm	≤-82
	- MCS=1, NSS1 PER @ -84 dBm	≤-80
	- MCS=2, NSS1 PER @ -82 dBm	≤-77
	- MCS=3, NSS1 PER @ -79 dBm	≤-73
	- MCS=4, NSS1 PER @ -75 dBm	≤-69
	- MCS=5, NSS1 PER @ -70 dBm	≤-68
	- MCS=6, NSS1 PER @ -69 dBm	≤-67
	- MCS=7, NSS1 PER @ -68 dBm	≤-62
	- MCS=8, NSS1 PER @ -65 dBm	≤-60
SISO Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=0, NSS1 PER @ -84 dBm	≤-79
	- MCS=1, NSS1 PER @ -81 dBm	≤-77
	- MCS=2, NSS1 PER @ -79 dBm	≤-74
	- MCS=3, NSS1 PER @ -76 dBm	≤-70
	- MCS=4, NSS1 PER @ -73 dBm	≤-66
	- MCS=5, NSS1 PER @ -68 dBm	≤-65
	- MCS=6, NSS1 PER @ -67 dBm	≤-64
	- MCS=7, NSS1 PER @ -66 dBm	≤-59
	- MCS=8, NSS1 PER @ -65 dBm	≤-57
	- MCS=9, NSS1 PER @ -64 dBm	≤-55
SISO Receive Sensitivity (11ac,80MHz) @10% PER	- MCS=0, NSS1 PER @ -81 dBm	≤-79
	- MCS=1, NSS1 PER @ -78 dBm	≤-76
	- MCS=2, NSS1 PER @ -76 dBm	≤-74
	- MCS=3, NSS1 PER @ -72 dBm	≤-71
	- MCS=4, NSS1 PER @ -69 dBm	≤-67
	- MCS=5, NSS1 PER @ -66 dBm	≤-63
	- MCS=6, NSS1 PER @ -64 dBm	≤-62
	- MCS=7, NSS1 PER @ -62 dBm	≤-61
	- MCS=8, NSS1 PER @ -58 dBm	≤-56
	- MCS=9, NSS1 PER @ -60 dBm	≤-54
Maximum Input Level	802.11a/n : -30 dBm	

5GHz (20MHz) Channel table

Band range	Operating Channel Numbers	Channel center frequencies(MHz)

5180MHz~5240MHz	36	5180
	40	5200
	44	5220
	48	5240
5260MHz~5320MHz	52	5260
	56	5280
	60	5300
	64	5320
5550MHz~5700MHz	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	120	5600
	124	5620
	128	5640
	132	5660
	136	5680
	140	5700
5745MHz~5825MHz	149	5745
	153	5765
	157	5785
	161	5805
	165	5825

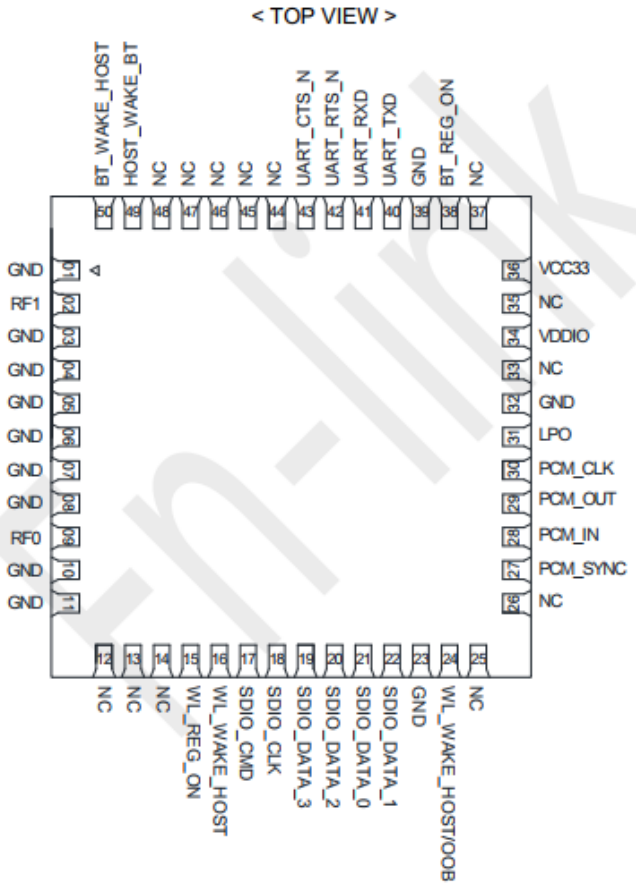
Bluetooth Specification

Bluetooth Specification

Feature	Description
General Specification	
Bluetooth Standard	Bluetooth V4.2
Host Interface	UART
Antenna Reference	Small antennas with 0~2 dBi peak gain
Frequency Band	2402 MHz ~ 2480 MHz
Number of Channels	79 channels
Modulation	GFSK, π/4-DQPSK,8DPSK

Pin Assignments

Pin Outline



Pin Definition

P:POWER I:INPUT O:OUTPUT VDDIO:1.8V or 3.3V

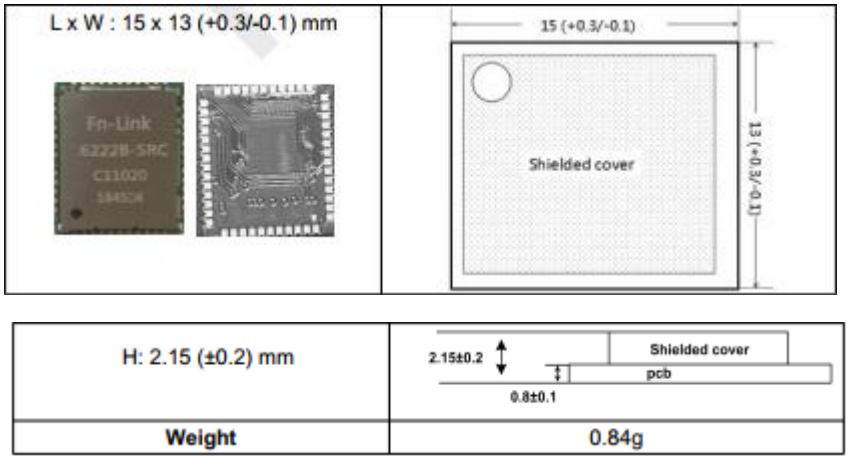
NO	Name	Type	Description	Voltage
1	GND	—	Ground connections	
2	RF1	I/O	RF I/O port chain1and BT	
3	GND	—	Ground connections	
4	GND	—	Ground connections	
5	GND	—	Ground connections	
6	GND	—	Ground connections	
7	GND	—	Ground connections	
8	GND	—	Ground connections	
9	RF0	I/O	RF I/O port chain0	
10	GND	—	Ground connections	
11	GND	—	Ground connections	

12	NC	I/O	No connect	
13	NC	—	No connect	
14	NC	—	No connect	
15	WL_REG_ON	I	Enable pin for WLAN device ON: pull high ; OFF: pull low External pull low to shut down WL	VDDIO
16	WL_WAKE_HOST	O	WLAN to wake-up HOST	VDDIO
17	SDIO_CMD	I/O	SDIO command line	1.8V or 3.3V
18	SDIO_ CLK	I/O	SDIO clock line	1.8V or 3.3V
19	SDIO_DATA_3	I/O	SDIO data line 3	1.8V or 3.3V
20	SDIO_DATA_2	I/O	SDIO data line 2	1.8V or 3.3V
21	SDIO_DATA_0	I/O	SDIO data line 0	1.8V or 3.3V
22	SDIO_DATA_1	I/O	SDIO data line 1	1.8V or 3.3V
23	GND	—	Ground connections	
24	OOB/ WL_WAKE_HOST	O	SDIO interrupt	VDDIO
25	NC	—	No connect	
26	NC	—	No connect	
27	PCM_SYNC	I/O	PCM sync signal	VDDIO
28	PCM_IN	I	PCM data input	VDDIO
29	PCM_OUT	O	PCM Data output	VDDIO
30	PCM_CLK	I/O	PCM clock	VDDIO
31	LPO	I	External Low Power Clock input	

			(32.768KHz) If not used keep NC	
32	GND	—	Ground connections	
33	NC	—	No connect	
34	VDDIO	P	I/O Voltage supply input	1.8V or 3.3V
35	NC	—	No connect	
36	VCC33	P	Main power voltage source input	3.3V
37	NC	—	No connect	
38	BT_REG_ON	I	Enable pin for Bluetooth device ON: pull high ; OFF: pull low External pull low to shut down BT	VDDIO
39	GND	—	Ground connections	
40	UART_TXD	O	Bluetooth UART interface	1.8V or

				3.3V
41	UART_RXD	I	Bluetooth UART interface	1.8V or 3.3V
42	UART_RTS_N	O	Bluetooth UART interface	1.8V or 3.3V
43	UART_CTS_N	I	Bluetooth UART interface	1.8V or 3.3V
44	NC	—	No connect	
45	NC	—	No connect	
46	NC	—	No connect	
47	NC	—	No connect	
48	NC	—	No connect	
49	HOST_WAKE_BT	I	HOST wake-up Bluetooth device	VDDIO
50	BT_WAKE_HOST	O	Bluetooth device to wake-up HOST	VDDIO

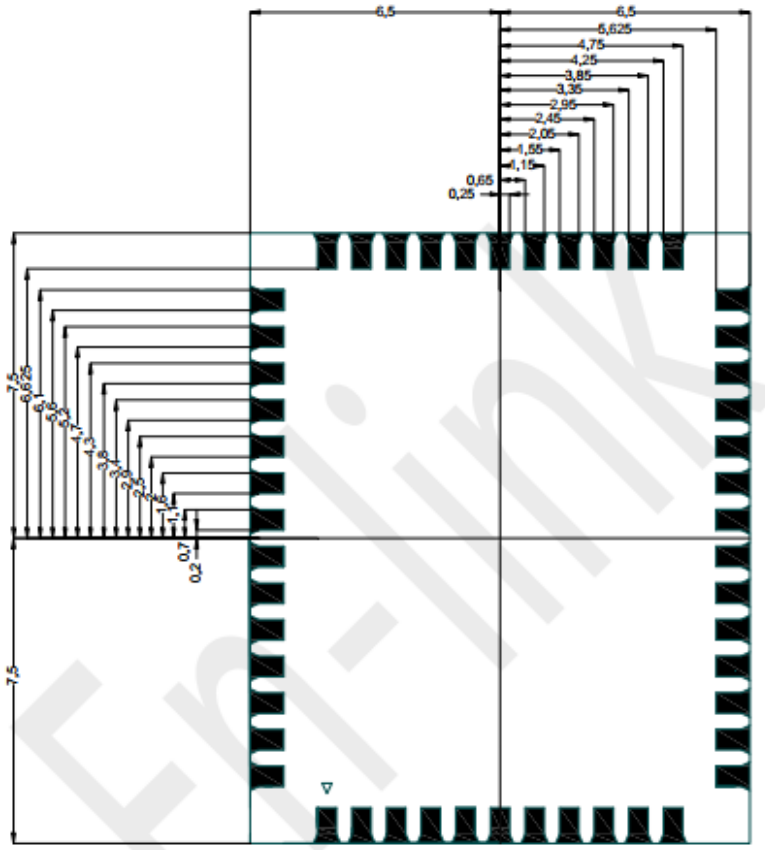
Module Picture & Dimensions

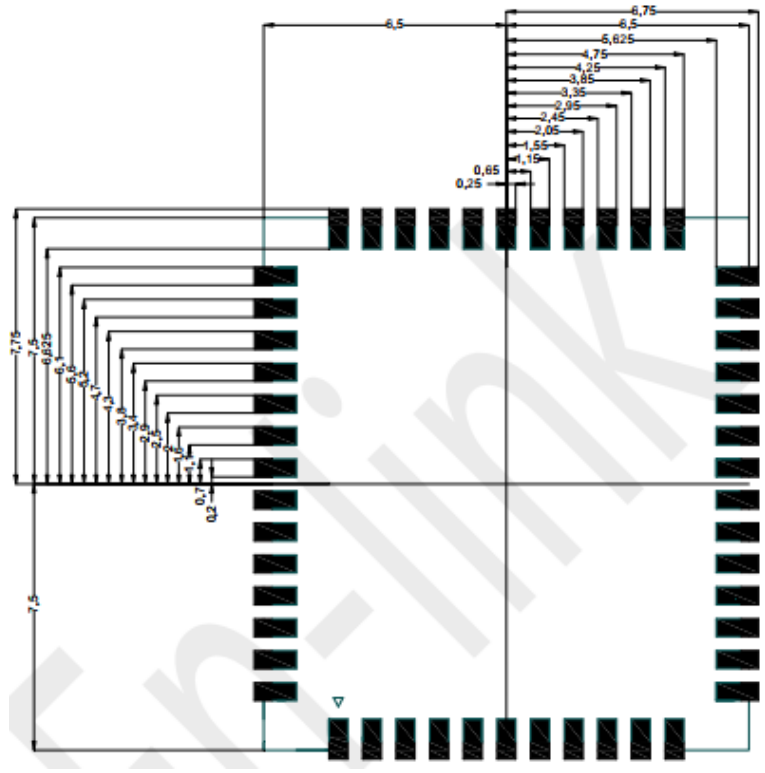


H: 2.15 (±0.2) mm	
Weight	0.84g

Model: ASK8822
FCC ID: 8N-ASK8822
IC: 1353A-ASK8822

Module Physical Dimensions

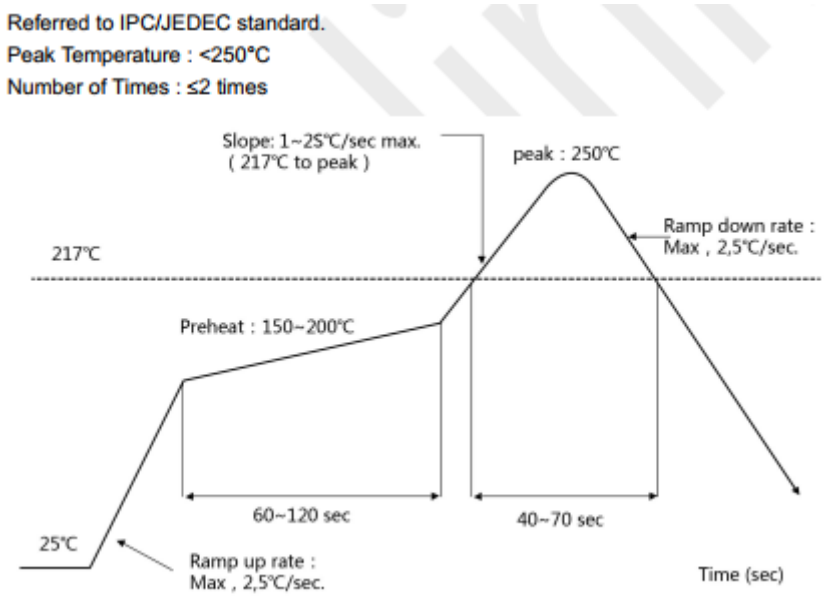




The Key Material List

Main	Inductor	2012 1uH, ±20%，0.8A，LQM21PN1R0MC0（MURATA）
Main	Diplexer	RFDIP160806BLM6T25
Alt	Diplexer	DPX166000DT-8093A1,1.6*0.8mm,6PIN (TDK）
Alt	Diplexer	LD18D2450LAN-D40/M (GLEAD)
Main	Shielding cover	RTL8822CS Copper, without positioning foot
Main	Crystal	2520 40MHz 10ppm 12pF E2SB40.0000F12G11RE (HOSONIC)
Main	Chipset	RTL8822CS-VL-CG 9X9mm

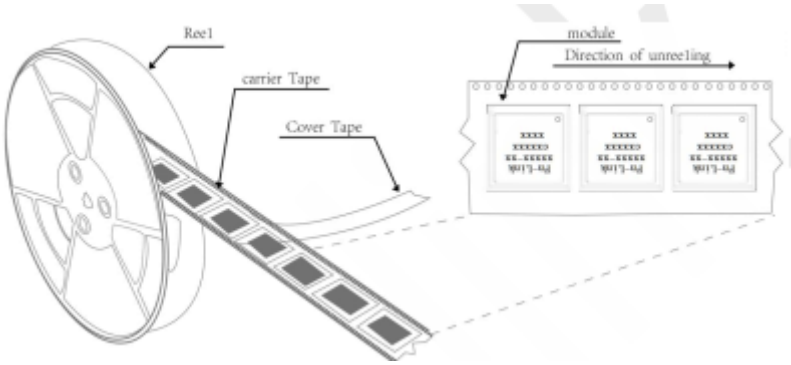
Recommended Reflow Profile



Package Information

Reel

A roll of 1500pcs



Federal Communications Commission (FCC) Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generate, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

RF exposure warning

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.

FCC KDB996369 D03v01 Requirements

List of applicable FCC rules

FCC Part 15 Subpart B, Part 15 Subpart C, Part 15 Subpart E

Summarize the specific operational use conditions

Not Applicable

Limited module procedures

Not Applicable

Trace antenna designs

Refer to Manual Antenna layout

RF exposure considerations

Refer to FCC certification requirements

Label and compliance information

Refer to FCC Label

Information on test modes and additional testing requirements

Not Applicable

Additional testing, Part 15 Subpart B disclaimer

Refer to FCC 15B Report

Industry Canada (IC)
CAN ICES-3 (B)/NMB-3(B)

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.
Cet appareil est conforme à la norme RSS d'Industrie Canada. Son fonctionnementestsujet aux deux conditions suivantes:
(1) ledispositif ne doit pas produire de brouillagepréjudiciable, et
(2) cedispositifdoit accepter tout brouillagereçu, y compris un brouillage susceptible de provoquer un fonctionnementindésirable.

Caution:

1. The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
2. For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;
3. For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits as appropriate.
4. The high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.
5. DFS (Dynamic Frequency Selection) products that operate in the bands 5250-5350 MHz, 5470-5600MHz, and 5650-5725MHz.

Mise en garde:

1. Le dispositif destiné à être utilisé dans la bande de fréquences 5150–5250 MHz est destiné uniquement à une utilisation en intérieur afin de réduire le risque de brouillage préjudiciable causé par les systèmes mobiles à satellites dans le même canal;
2. Pour les dispositifs avec une ou plusieurs antennes détachables, le gain d'antenne maximal autorisé pour les dispositifs des bandes 5250-5350 MHz et

5470-5725 MHz doit être tel que l'équipement respecte encore les normes e.i.r.p. limite;

3. Pour les dispositifs avec une ou plusieurs antennes détachables, le gain d'antenne maximal autorisé pour les dispositifs de la bande 5725-5850 MHz doit être tel que l'équipement soit toujours conforme à la norme e.i.r.p. limites, le cas échéant.
4. Les radars à haute puissance sont attribués en tant qu'utilisateurs principaux (utilisateurs prioritaires) des bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer des interférences et / ou des dommages aux dispositifs LE-LAN.
5. Produits DFS (Dynamic Frequency Selection) fonctionnant dans les bandes de fréquences 5250-533 MHz, 5470-5600 MHz et 5650-5725 MHz.

IMPORTANT NOTE:

Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Déclarationd'exposition aux radiations:

Cetéquipementestconforme aux limitesd'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cetéquipementdoitêtreinstallé et utilisé avec un minimum de 20cm de distance entre la source de rayonnement et votre corps.

OEM Integration Instructions：

This device is intended only for OEM integrators under the following conditions：

The module can be used to installation in another host. The antenna must be installed such that 20 cm is maintained between the antenna and users, and the transmitter module may not be co-located with any other transmit or antenna. The module shall be only used with the integral antenna(s) that has been originally tested and certified with this module. As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirement with this module installed (for example, digital device emission, PC peripheral requirements, etc.)

IMPORTANT NOTE：

In the event that these conditions cannot be met (for example certain laptop configuration or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these and circumstance, the OEM integrator will be responsible for re-evaluating. The end product (including the transmitter) and obtaining a separate FCC authorization. The final end product must be labeled in a visible area with the following: "**Contains Transmitter Module FCC ID: H8N-ASK8822** or **Contains FCC ID: H8N-ASK8822**".

Antenna Specification:

Antenna Type	Frequency Band (GHz)	T_X Paths	Per Chain Max Antenna Gain (dBi)		Directional Gain (dBi)	
			Ant 0	Ant 1	For Power	For PSD
Wi-Fi Internal Antenna						
PIFA	2412 ~ 2462	2	2.40	1.98	2.40	5.41
	5150 ~ 5825	2	4.34	3.14	4.34	7.35
Bluetooth Internal Antenna						
PIFA	2402 ~ 2480	1	1.98		--	

IMPORTANT NOTE :

This Wireless Module (IC: 1353A-ASK8822) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

The Host Marketing Name (HMN) must be displayed (according to e-labelling requirements) or
indicated at any location on the exterior of the host product or product packaging or product literature,
which shall be available with the host product or online.
The host product shall be properly labelled to identify the modules within the host product. The Innovation, Science and Economic Development Canada certification label of a module shall be
clearly visible at all times when installed in the host product; otherwise, the host product must be
labelled to display the Innovation, Science and Economic Development Canada certification number for the module, preceded by the word “Contains” or similar wording expressing the same meaning, as
follows: **Contains IC: 1353A-ASK8822**.
Antenna Specification:

Antenna Type	Frequency Band (GHz)	T_X Paths	Per Chain Max Antenna Gain (dBi)		Directional Gain (dBi)	
			Ant 0	Ant 1	For Power	For PSD
Wi-Fi Internal Antenna						
PIFA	2412 ~ 2462	2	2.40	1.98	2.40	5.41
	5150 ~ 5825	2	4.34	3.14	4.34	7.35
Bluetooth Internal Antenna						
PIFA	2402 ~ 2480	1	1.98		--	