DK9185
Wi-Fi 802.11a/b/g/n and BLE 5.0
Module Specification

V1.0

Revision History

This table describes the changes to the Specification.

Version	Date	Description
1.0	2021-07-16	Official Release

1. Introduction

DK9185 series is a compact, surface mount with low power (2.4GHz/5GHz) 802.11a/b/g/n Wireless LAN(WLAN) module.
It combines a high-performance ARM v8m MCU, a low power v9 Cortex-M0 MCU, WLAN MAC, a 1T1R capable WLAN baseband, and RF function.
It also provides a bunch of configurable GPIOs which are configured as digital peripherals for different applications and control usage. Since its small size, outstanding performance at low power consumption and low cost, the DK9185 is leading the way for the new generation of Wi-Fi modules.
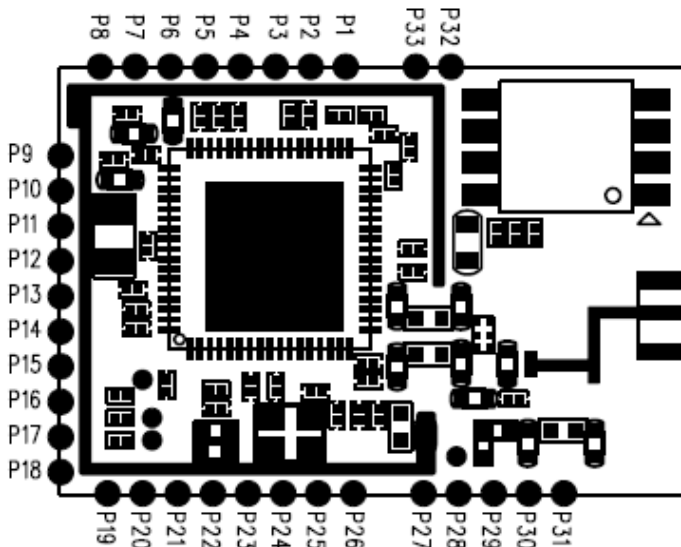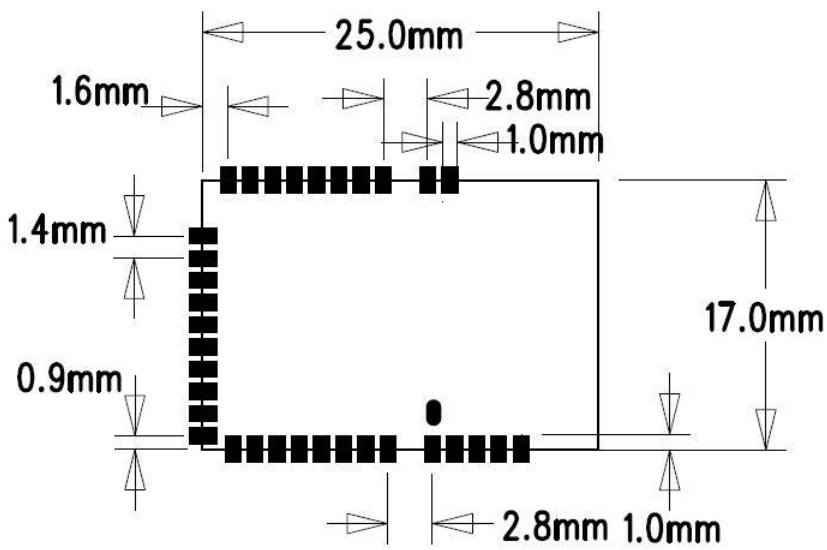
2. Features

- KM4:ARM latest v8M architecture with Cortex-M4F instruction compatible (up to 200MHz)
- KM0:ARM latest v8M architecture with Cortex-M0 instruction compatible (up to 20MHz)
- IEEE 802.11a/b/g/n 1x1, 2.4GHz & 5GHz
- 1T1R One Transmit and one Receive Path
- Peripheral interfaces: UART/I2C/I2S/SPI/GPIO

4. Specification

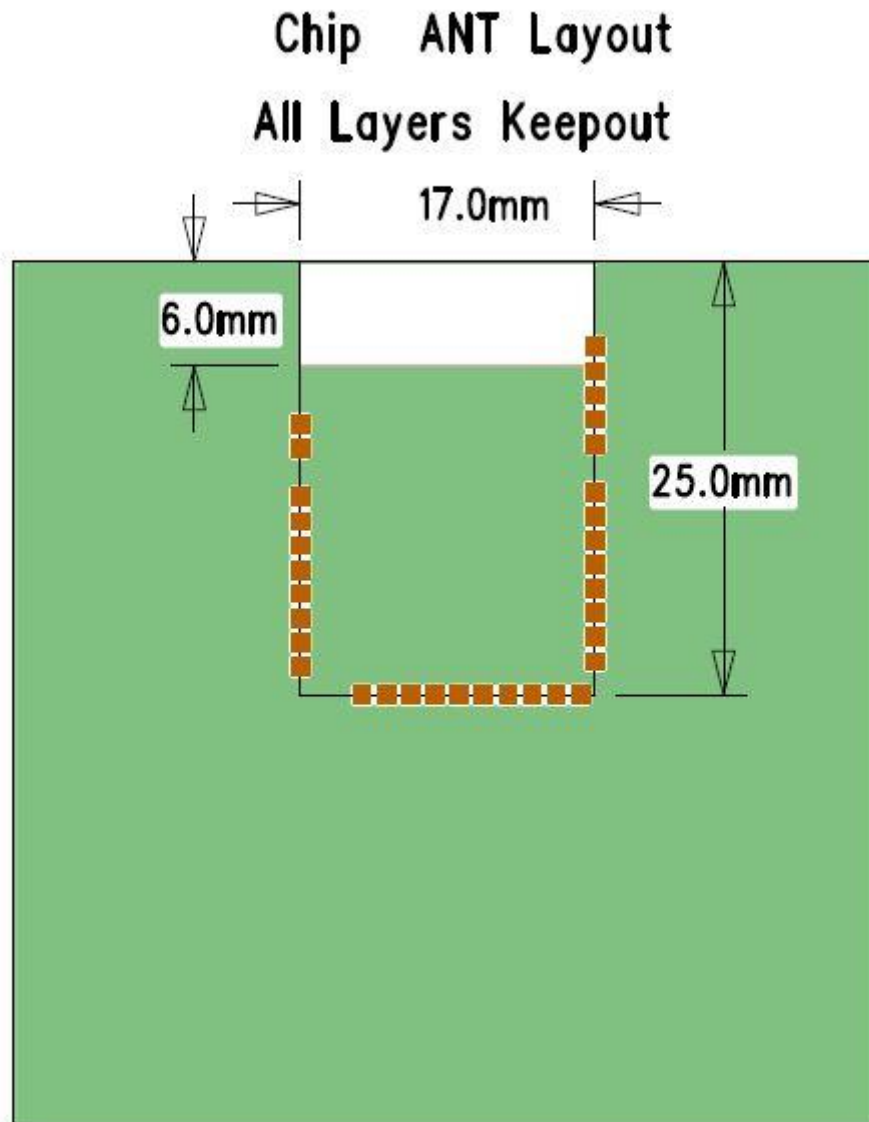| Model	
Antenna	Chip Antenna
Main Chip	RTL-8721DM-VA1
Wireless Standards	802.11 a/b/g/n 1x1, 2.4GHz & 5GHz+ Bluetooth 5.0
Data Rates	20MHz/40MHz up to MCS7
Wireless Security	WPA/WAP2
Tx Output Power(W-Fi)	2G-> 18dbm@11b, 17dbm@11g, 16dbm@11n 5G-> 15dbm@11g, 14dbm@11n
Receiver Sensitivity(W-Fi)	11Mbps-82dbm,54Mbps-71dBm, 65Mbps-67dbm
Tx Output Power (BT)	+4.5dbm
Receiver Sensitivity(BT)	Max.-70dbm
Processor	KM4 : ARM Cortex-M4F ; KM0 : ARM Cortex-M0
SRAM	KM4 : 512KB ; KM0 : 64KB
External flash	Size : 32Mb=4MB
PWM	4
ADC	1
UART	1
I$_2$C	1
GPIO	8
Voltage:	DC 3.3V
Input power consumption	Max.450mA @3.3V
Dimension(L×W×H)	17.4×13.7×1.9 mm
Environment	Operating Temperature: -20℃~75℃
	Storage Temperature: -40℃~85℃
	Operating Humidity: 10%~90% non-condensing
	Storage Humidity: 5%~90% non-condensing

5. Layout Dimensions

	Pin define	Pin name	Pin number
P1	DGND	GND	
P2	GND	GND	
P3	ADC	PB[4]_ADC_0	44
P4	GPIO	PA[14]_RTS/GPIO	27
P5	GPIO	PA[15]_CTS/GPIO	28
P6	UART_TX	PA[12]_TX	25
P7	UART_RX	PA[13]_RX	26
P8	3V3	VDD	
P9	SCL	PB[5]_LP_I2C_SCL	45
P10	SDA	PB[6]_LP_I2C_SDA	46
P11	PWM	PB[7]_LP_PWM5	47
P12	GPIO	PB[26]_GPIO	63
P13	PWM	PA[28]_LP_PWM0	38
P14	PWM	PB[22]_LP_PWM2	60
P15	PWM	PB[23]_LP_PWM3	61
P16	I2C_SCL	PA[25]_BT_I2C_SCL	40
P17	I2C_SDA	PA[26]_BT_I2C_SDA	39
P18	FW_DEBUG	PA[16]_BT_FW_DEBUG	29
P19	GPIO	PB[29]_GPIO	64
P20	GPIO	PB[31]_GPIO	65
P21	GPIO	PA[0]_GPIO	2
P22	GPIO	PA[4]_GPIO	3
P23	GPIO	PA[2]_GPIO	4
P24	Hardware EN	CHIP_EN	6
P25	GPIO	PB[1]_GPIO	41
P26	GPIO	PB[2]_GPIO	42
P27	FW download	PB[3]_SWD_CLK	43
P28	FW download	NC	
P29	FW download	PA[27]_SWD_DATA	33
P30	FW download	NC	
P31	FW download	NC	
P32	UART_LOG_IN(RX)	PA8_LOG_RX	8
P33	UART_LOG_OUT(TX)	PA7_LOG_TX	7

6. RF Layout Suggestion

Please follow below instruction to avoid RF Performance lose.

Chip ANT Layout
All Layers Keepout
17.0mm
6.0mm
25.0mm

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, 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.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

If the identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module, Contains FCC ID: SZY-DK9185

Co-location of this module with other transmitters that operate simultaneously are required to be evaluated using the multi-transmitter procedures.

The host integrator must follow the integration instructions provided in this document and ensure that the composite-system end product complies with the requirements by a technical assessment or evaluation to the rules and to KDB Publication 996369.

The host integrator installing this module into their product must ensure that the final composite product complies with the requirements by a technical assessment or evaluation to the rules, including the transmitter operation and should refer to guidance in KDB 996369.

L'émetteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) L'appareil ne doit pas produire de brouillage;

(2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

If the identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module, Contains IC: 28614-DK9185

  Si le numéro d'identification n'est pas visible lorsque le module est installé à l'intérieur d'un autre appareil, alors l'extérieur de l'appareil dans lequel le module est installé doit également afficher une étiquette faisant référence au module fourni, Contient IC : 28614-DK9185

The Separation distance between the device and the user should be more than 20cm.
In Canada this device may only be operated indoors.

En Canada, ce dispositif est autorisé uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

Pour satisfaire aux exigences essentielles de la FCC et d'Industrie Canada concernant l'exposition, une distance minimum de 20 cm doit être respectée entre l'équipement et l'utilisateur ou des personnes se trouvant à proximité.

NCC statement:

「取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。」

For module:

此模組於取得認證後將依規定於模組本體標示審驗合格標籤，並要求平台廠商於平台上標示本產品內含發射器模組 (((CCXXxxLPyyyZzW

For WIFI 5G:

應避免影響附近雷達系統之操作。