Manuals+ — User Manuals Simplified.

**DEXATEK
DK9178C
Connector
BLE Module**

DEXATEK DK9178C Connector BLE Module User Manual

Contents

DEXATEK
Subsidiary of Ennoconn

DEXATEK DK9178C Connector BLE Module

Data Sheet

Product	BLE Module
Solution	Nordic nRF52832 aQFN Package
Model NO.	DK9178C (u.FL Connector)

Overall Introduction

Dexatek's DK9178C is a BT 5 stack (Bluetooth low energy or BLE) module designed based on Nordic nRF52832 SoC solution, which incorporates: GPIO, SPI, UART, I2C, I2S, PMD, PWM, ADC, and NFC interfaces for connecting peripherals and sensors Ideal solution for designs requiring Bluetooth 5 functionality networking. Provides ultra-low power consumption and excellent wireless range with +4 dBm transmission Power and long range (encoded physical layer) Bluetooth 5 capabilities. New circuits are added TX power and reduces sleep current for perfect power management.

Application

- Home automation
- Building automation

- Industrial

- Health/fitness sensor and monitor devices

- Key fobs and wrist watches

- Remote controls

- Gaming controllers

- Remote control toys

- Mouse

- Keyboard

- Gaming

Product Specification

Feature

- Bluetooth ® 5.3 , 2.4 GHz transceiver,

- LE 2M PHY, LE 1M PHY

    - 1 Mbps, 2 Mbps Bluetooth® low energy mode

    - Proprietary 2.4 GHz – 2 Mbps, 1 Mbps

- nRF52832, ARM ® Cortex ® M4 32-bit processor with FPU, 64 MHz

- 512kB Flash and 64kB RAM

- Radio

- GFSK at 1 Mbps and 2 Mbps, QPSK at 250 Kbps

- -96 dBm sensitivity in Bluetooth ® low energy mode

- -20 to +4 dBm TX power, configurable in 4 dB steps

- Power Management

- 1.7 V to 3.6 V regulated supply

    - Security features

- AES HW encryption with EasyDMA

    - Peripheral interface / Hardware

- Type 2 NFC-A tag with wake-on field

- Touch-to-pair support

- Programmable peripheral interconnect (PPI)

- 32 general purpose I/O pins (GPIO)

- EasyDMA automated data transfer between memory and peripherals

- Nordic SoftDevice ready with support for concurrent multiprotocol

- 12-bit, 200 ksps ADC – 8 configurable channels with programmable gain

- 64 level comparator

- 15 level low-power comparator with wake-up from System OFF mode

- Temperature sensor

- 3×4 channel PWM unit with EasyDMA

- Audio peripherals – I2 S, digital microphone interface (PDM)

- 5x 32-bit timer with counter mode

- Up to 3x SPI master/3x SPI slave with EasyDMA

- Up to 2x I2 C compatible two-wire master/slave

- UART (CTS/RTS) with EasyDMA
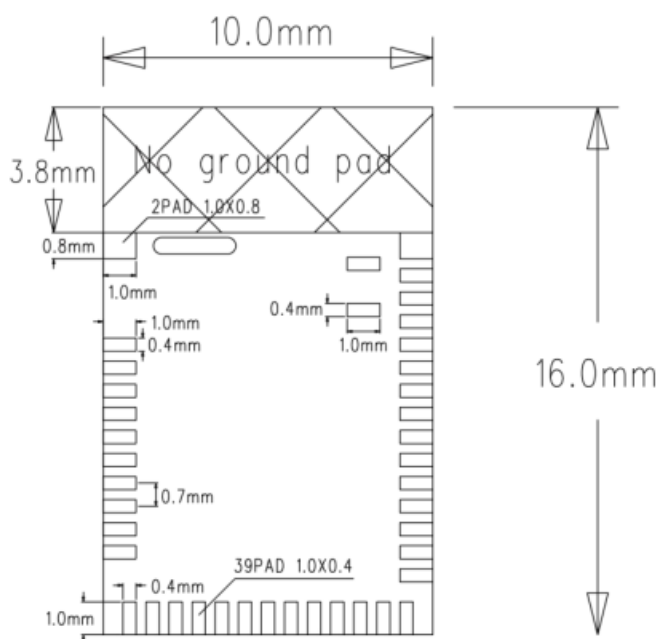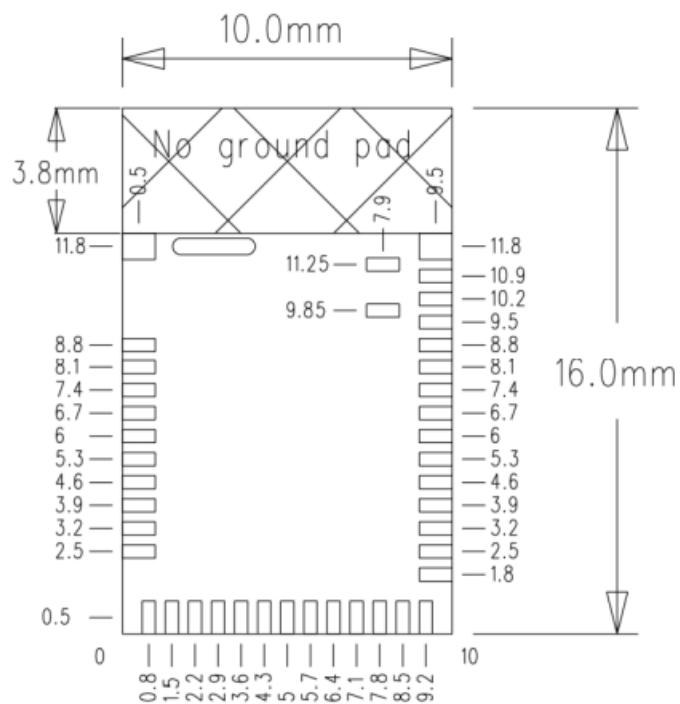- Quadrature decoder (QDEC)
- 3x real-time counter (RTC)
    - Operation Temperature: -40 °C to 85 °C

Product Dimension

PCB Dimensions & Pin Indication
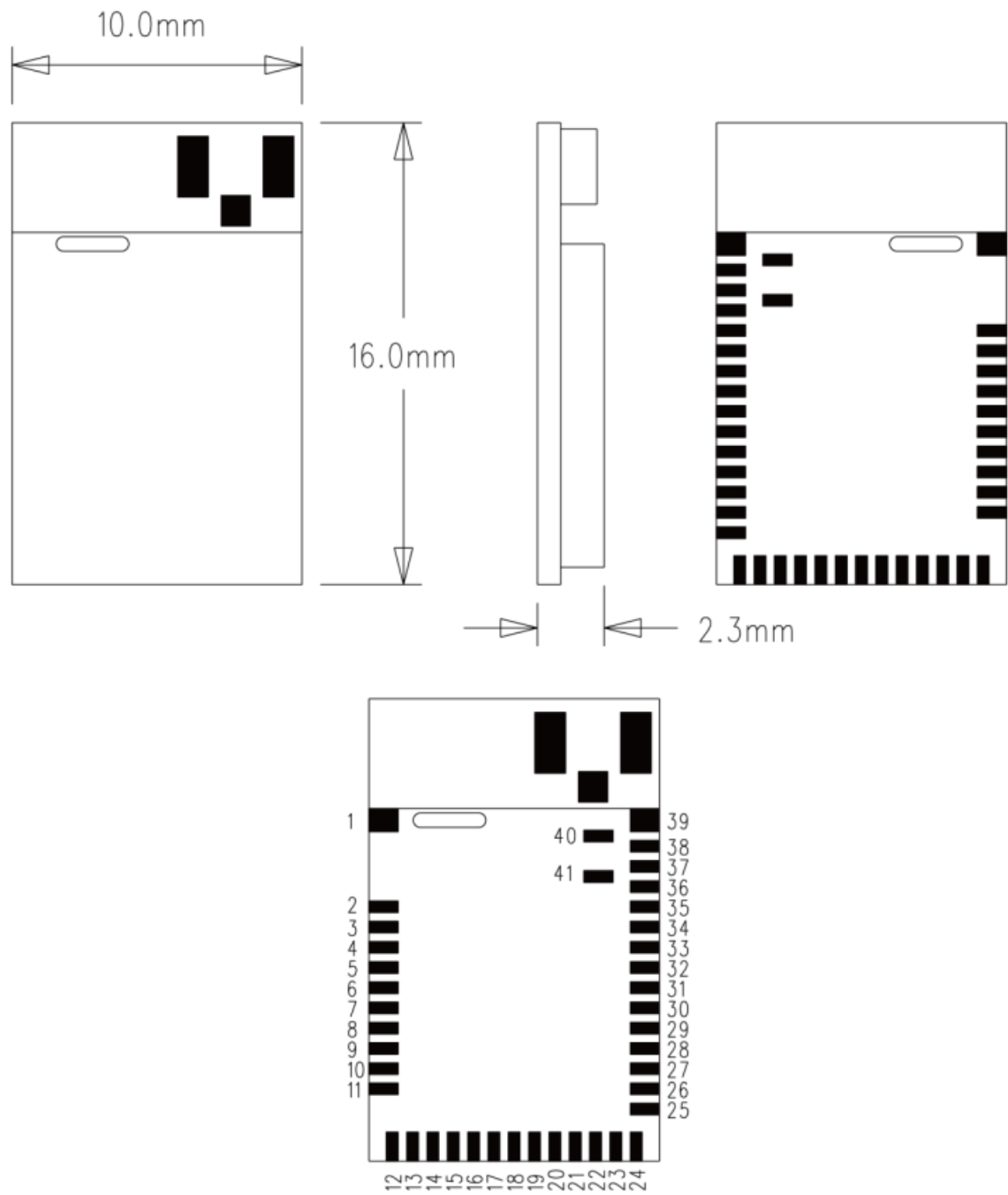
PCB Dimensions & Pin Indication

RF Layout Suggestion (aka Keep-Out Area)
Please follow below instruction to avoid from having Ground Pad in the area of our RF test pad. Otherwise, it may cause shortage to the module

No Ground-Pad Area

10

3.8

Ground Area

Top layer

Pin Assignment

Pin	Name	Function	Description
1	GND	Ground	The pad must be connected to a solid ground plane
2	P0.25	Digital I/O	General purpose I/O
3	P0.26	Digital I/O	General purpose I/O
4	P0.27	Digital I/O	General purpose I/O
5	P0.28	Digital I/O	General purpose I/O
	AIN4	Analog input	SAADC/COMP/LPCOMP input
6	P0.29	Digital I/O	General purpose I/O
	AIN5	Analog input	SAADC/COMP/LPCOMP input

7	P0.30	Digital I/O	General purpose I/O
	AIN6	Analog input	SAADC/COMP/LPCOMP input
8	P0.31	Digital I/O	General purpose I/O
	AIN7	Analog input	SAADC/COMP/LPCOMP input
9	DEC4	Power	1.3 V regulator supply decoupling Input from DC/DC regulator Output from 1.3 V LDO
10	DCC	Power	DC/DC regulator output
11	VDD	Power	Power supply
12	GND	Ground	The pad must be connected to a solid ground plane
13	P0.00	Digital I/O	General purpose I/O
	XL1	Analog input	Connection for 32.768 kHz crystal (LFXO)
14	P0.01	Digital I/O	General purpose I/O
	XL2	Analog input	Connection for 32.768 kHz crystal (LFXO)
15	P0.02	Digital I/O	General purpose I/O
	AIN0	Analog input	SAADC/COMP/LPCOMP input
16	P0.03	Digital I/O	General purpose I/O
	AIN1	Analog input	SAADC/COMP/LPCOMP input
17	P0.04	Digital I/O	General purpose I/O
	AIN2	Analog input	SAADC/COMP/LPCOMP input
18	P0.05	Digital I/O	General purpose I/O
	AIN3	Analog input	SAADC/COMP/LPCOMP input
19	P0.06	Digital I/O	General purpose I/O
20	P0.07	Digital I/O	General purpose I/O

21	P0.08	Digital I/O	General purpose I/O
22	P0.09	Digital I/O	General purpose I/O
	NFC1	NFC input	NFC antenna connection
23	P0.10	Digital I/O	General purpose I/O
	NFC2	NFC antenna connection	NFC antenna connection
24	GND	Ground	The pad must be connected to a solid ground plane
25	P0.11	Digital I/O	General purpose I/O
26	P0.12	Digital I/O	General purpose I/O

27	P0.13	Digital I/O	General purpose I/O
28	P0.14	Digital I/O	General purpose I/O
	TraceData(3	Trace port output	Trace port output
29	P0.15	Digital I/O	General purpose I/O
	TraceData(2	Trace port output	Trace port output
30	P0.16	Digital I/O	General purpose I/O
	TraceData(1	Trace port output	Trace port output
31	P0.17	Digital I/O	General purpose I/O
32	P0.18	Digital I/O	General purpose I/O
	TraceData(0	Trace port output	Trace port output
33	P0.19	Digital I/O	General purpose I/O
34	P0.20	Digital I/O	General purpose I/O
	TraceCLK		Trace port clock output
35	P0.21	Digital I/O	General purpose I/O
	RESET		Configurable as system reset pin
36	SWDCLK	Digital input	Serial wire debug clock input for debug and programming
37	SWDIO	Digital I/O	Serial wire debug I/O for debug and programming
38	P0.22	Digital I/O	General purpose I/O
39	GND	Ground	The pad must be connected to a solid ground plane
40	P0.24	Digital I/O	General purpose I/O
41	P0.23	Digital I/O	General purpose I/O

Main Chip Solution

RF IC	Crystal Frequency
Nordic NRF 52832	**32MHZ**

32MHz crystal and RF (VDD) DC/DC inductor (Reg1) are already inside the module.
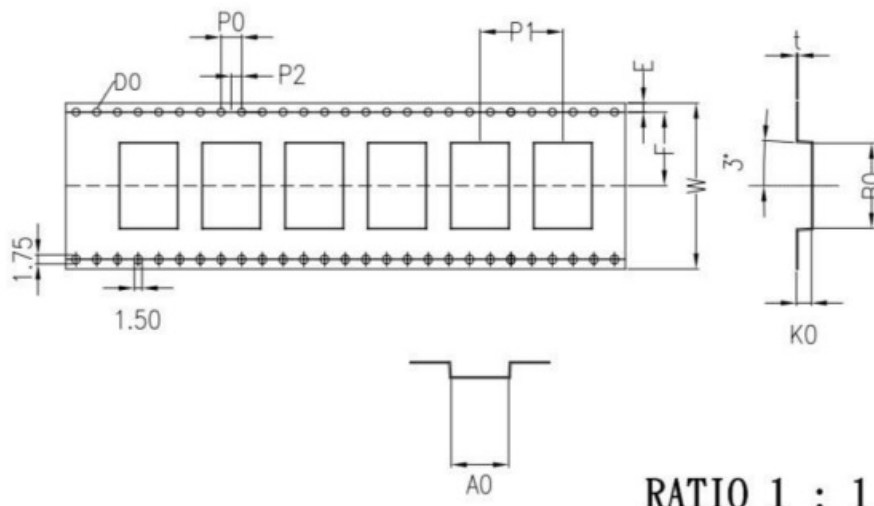
Shipment Packaging Information

Model	Antenna	Photo
DK9178C	u.FL Connector	

- Unit Weight of Module: 0.68g (±0.02g)
- Packaging Type: Anti-static Tape & Reel

	Tape & Reel
MPQ(Min. Package Qty)	600 pcs per reel
Carton Contents (per Carton)	600 pcs
Carton Dimension L*W*H cm	37*36*6
Gross Weight	About 1.9kgs

Tape & Reel Packaging
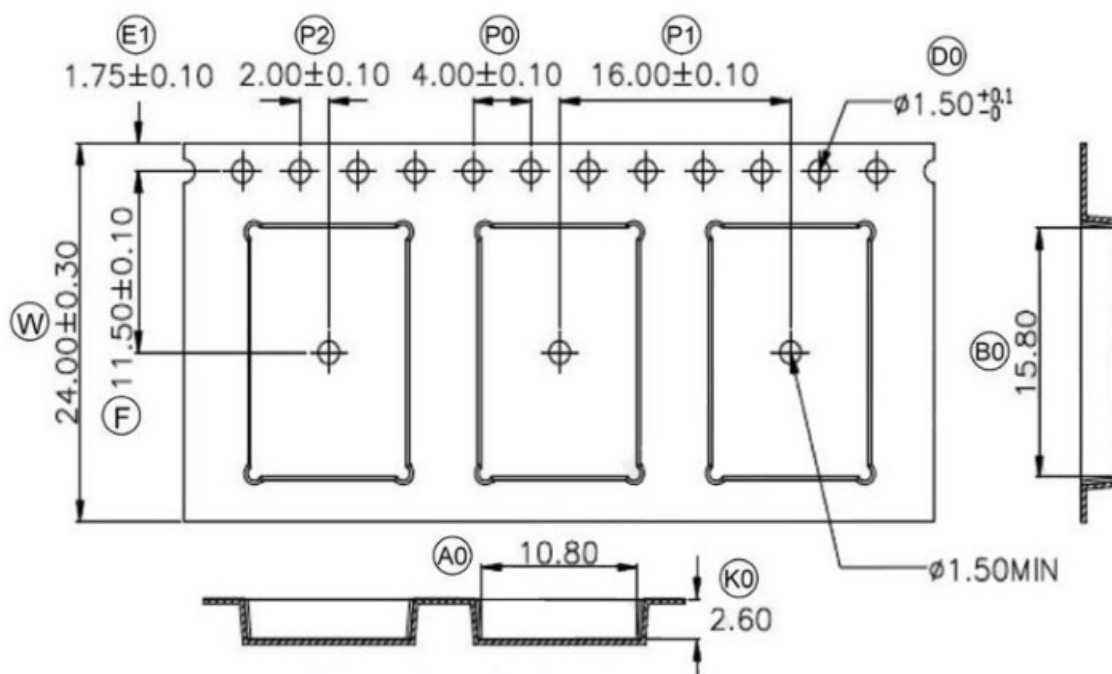
ITEM	SPEC
W	$32.00^{+0.30}_{-0.30}$
Ao	$11.10^{+0.10}_{-0.10}$
Bo	$16.40^{+0.10}_{-0.10}$
Ko	$2.90^{+0.10}_{-0.10}$
P1	$16.00^{+0.10}_{-0.10}$
F	$14.20^{+0.15}_{-0.15}$
E	$1.75^{+0.10}_{-0.10}$
D0	$1.50^{+0.10}_{-0.00}$
D1	$0.00^{+0.10}_{-0.00}$
Po	$4.00^{+0.10}_{-0.10}$
P2	$2.00^{+0.15}_{-0.15}$
t	$0.40^{+0.05}_{-0.05}$

RATIO 1 : 1

DEXATEK

DEVICE: DK91xxC

QTY : 600

D / C: 24xx

RoHS COMPLIANT

HF

MSL1

Part Number	DK91xxC
Quantity	600 pcs
Date Code	24xx

Marking on Metal Shield

Label

Dexatek Technology Ltd.
FCC ID: SZY-DK91XXC
IC: 28614-DK91XXC
HVIN: DK-9178C
Model No: DK-9178C

CCAN24Y10800T2

CE FC 2420
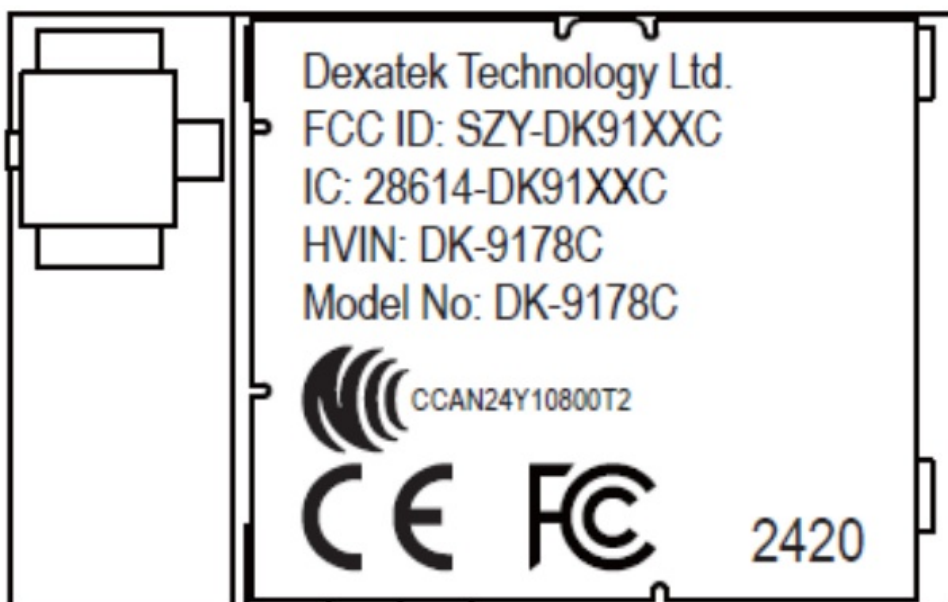
Specification

Any technical spec shall refer to Nordic's official documents as final reference.

Absolute Maximum Ratings

	Min.	Max.	Unit
Supply voltages			
VDD	-0.3	+3.9	V
VSS		0	V
I/O pin voltage			
$V_{I/O}$, VDD ≤3.6 V	-0.3	VDD + 0.3 V	V
$V_{I/O}$, VDD >3.6 V	-0.3	3.9 V	V
NFC antenna pin current			
$I_{NFC1/2}$		80	mA
Radio			
RF input level		10	dBm
Environmental QFN48, 6×6 mm package			
Storage temperature	-40	+125	°C
MSL (moisture sensitivity level)		2	
ESD HBM (human body model)		4	kV
ESD CDM (charged device model)		1000	V
Environmental WLCSP, 3.0×3.2 mm package			
Storage temperature	-40	+125	°C
MSL		1	
ESD HBM		2	kV
ESD CDM		500	V
Flash memory			
Endurance	10 000		Write/erase cycles
Retention	10 years at 85°C		

Operating Conditions

Symbol	Parameter	Notes	Min.	Nom.	Max.	Units
VDD	Supply voltage, independent of DCDC enable		1.7	3.0	3.6	V
t_{R_VDD}	Supply rise time (0 V to 1.7 V)				60	ms
TA	Operating temperature		-40	25	85	°C

Electrical Specifications

General Radio Characteristics

Symbol	Description	Min.	Typ.	Max.	Units
f_{OP}	Operating frequencies	2360		2500	MHz
$f_{PLL,PROG,RES}$	PLL programming resolution		2		kHz
$f_{PLL,CH,SP}$	PLL channel spacing		1		MHz
$f_{DELTA,1M}$	Frequency deviation @ 1 Msps		±170		kHz
$f_{DELTA,BLE,1M}$	Frequency deviation @ BLE 1Msps		±250		kHz
$f_{DELTA,2M}$	Frequency deviation @ 2 Msps		±320		kHz
$f_{DELTA,BLE,2M}$	Frequency deviation @ BLE 2 Msps		±500		kHz
fsk	On-the-air data rate	1		2	Msps

Radio Current Consumption (Transmitter)

Symbol	Description	Min.	Typ.	Max.	Units
$_{TX,PLUS4dBM,DCDC}$	TX only run current (DCDC, 3V) P_{RF} =+4 dBm		7.5		mA
$_{TX,PLUS4dBM}$	TX only run current P_{RF} = +4 dBm		16.6		mA
$_{TX,0dBM,DCDC}$	TX only run current (DCDC, 3V)P_{RF} = 0dBm		5.3		mA
$_{TX,0dBM}$	TX only run current P_{RF} = 0dBm		11.6		mA
$_{TX,MINUS4dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -4dBm		4.2		mA
$_{TX,MINUS4dBM}$	TX only run current P_{RF} = -4 dBm		9.3		mA
$_{TX,MINUS8dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -8 dBm		3.8		mA
$I_{TX,MINUS8dBM}$	TX only run current P_{RF} = -8 dBm		8.4		mA
$I_{TX,MINUS12dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -12 dBm		3.5		mA
$I_{TX,MINUS12dBM}$	TX only run current P_{RF} = -12 dBm		7.7		mA
$I_{TX,MINUS16dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -16 dBm		3.3		mA
$I_{TX,MINUS16dBM}$	TX only run current P_{RF} = -16 dBm		7.3		mA
$I_{TX,MINUS20dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -20 dBm		3.2		mA
$I_{TX,MINUS20dBM}$	TX only run current P_{RF} = -20 dBm		7.0		mA
$I_{TX,MINUS40dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -40 dBm		2.7		mA
$I_{TX,MINUS40dBM}$	TX only run current P_{RF} = -40 dBm		5.9		mA
$I_{START,TX,DCDC}$	TX start-up current DCDC, 3V, P_{RF} = 4 dBm		4.0		mA
$I_{START,TX}$	TX start-up current, P_{RF} = 4 dBm		8.8		mA

Radio Current Consumption (Receiver)

Symbol	Description	Min.	Typ.	Max.	Units
$I_{RX,1M,DCDC}$	RX only run current (DCDC, 3V) 1Msps / 1Msps BLE		5.4		mA
$I_{RX,1M}$	RX only run current 1Msps / 1Msps BLE		11.7		mA
$I_{RX,2M,DCDC}$	RX only run current (DCDC, 3V) 2Msps / 2Msps BLE		5.8		mA
$I_{RX,2M}$	RX only run current 2Msps / 2Msps BLE		12.9		mA
$I_{START,RX,DCDC}$	RX start-up current (DCDC 3V)		3.5		mA
$I_{START,RX,LDO}$	RX start-up current (LDO 3V)		7.5		mA

Transmitter Specification

Symbol	Description	Min.	Typ.	Max.	Units
P_{RF}	Maximum output power		4	6	dBm
P_{RFC}	RF power control range		24		dB
P_{RFCR}	RF power accuracy			±4	dB
$P_{RF1,1}$	1st Adjacent Channel Transmit Power 1 MHz (1 Msps Nordic proprietary mode)		-25		dBc
$P_{RF2,1}$	2nd Adjacent Channel Transmit Power 2 MHz (1 Msps Nordic proprietary mode)		-50		dBc
$P_{RF1,2}$	1st Adjacent Channel Transmit Power 2 MHz (2 Msps Nordic proprietary mode)		-25		dBc
$P_{RF2,2}$	2nd Adjacent Channel Transmit Power 4 MHz (2 Msps Nordic proprietary mode)		-50		dBc
$P_{RF1,2,BLE}$	1st Adjacent Channel Transmit Power 2 MHz (2 Msps BLE mode)		-20		dBc
$P_{RF2,2,BLE}$	2nd Adjacent Channel Transmit Power 4 MHz (2 Msps BLE mode)		-50		dBc

RSSI Specification

Symbol	Description	Min.	Typ.	Max.	Units
$RSSI_{ACC}$	RSSI Accuracy Valid range -90 to -20 dBm		±2		dB
$RSSI_{RESOLUTION}$	RSSI resolution		1		dB
$RSSI_{PERIOD}$	Sample period		0.25		us

Receiver Operation

Symbol	Description	Min.	Typ.	Max.	Units
$P_{RX,MAX}$	Maximum received signal strength at < 0.1% BER		0		dBm
$P_{SENS,IT,1M}$	Sensitivity, 1Msps nRF mode[16]		-93		dBm
$P_{SENS,IT,SP,1M,BLE}$	Sensitivity, 1Msps BLE ideal transmitter, <=37 bytes BER=1E-3[17]		-96		dBm
$P_{SENS,IT,LP,1M,BLE}$	Sensitivity, 1Msps BLE ideal transmitter >=128 bytes BER=1E-4 [18]		-95		dBm
$P_{SENS,IT,2M}$	Sensitivity, 2Msps nRF mode[19]		-89		dBm

RX Selectivity

Symbol	Description			Min.	Typ.	Max.	Units
$C/I_{1M,co\text{-}channel}$	1Msps mode, Co-Channel interference				9		dB
$C/I_{1M,-1MHz}$	1 Msps mode, Adjacent (-1 MHz) interference				-2		dB
$C/I_{1M,+1MHz}$	1 Msps mode, Adjacent (+1 MHz) interference				-10		dB
$C/I_{1M,-2MHz}$	1 Msps mode, Adjacent (-2 MHz) interference				-19		dB
$C/I_{1M,+2MHz}$	1 Msps mode, Adjacent (+2 MHz) interference				-42		dB
$C/I_{1M,-3MHz}$	1 Msps mode, Adjacent (-3 MHz) interference				-38		dB
$C/I_{1M,+3MHz}$	1 Msps mode, Adjacent (+3 MHz) interference				-48		dB
$C/I_{1M,\pm6MHz}$	1 Msps mode, Adjacent (≥6 MHz) interference				-50		dB
$C/I_{1MBLE,co\text{-}channel}$	1 Msps BLE mode, Co-Channel interference				6		dB
$C/I_{1MBLE,-1MHz}$	1 Msps BLE mode, Adjacent (-1 MHz) interference				-2		dB
$C/I_{1MBLE,+1MHz}$	1 Msps BLE mode, Adjacent (+1 MHz) interference				-9		dB
$C/I_{1MBLE,-2MHz}$	1 Msps BLE mode, Adjacent (-2 MHz) interference				-22		dB
$C/I_{1MBLE,+2MHz}$	1 Msps BLE mode, Adjacent (+2 MHz) interference				-46		dB
$C/I_{1MBLE,>3MHz}$	1 Msps BLE mode, Adjacent (≥3 MHz) interference				-50		dB
$C/I_{1MBLE,image}$	Image frequency Interference				-22		dB
$C/I_{1MBLE,image,1MHz}$	Adjacent (1 MHz) interference to in-band image frequency				-35		dB
$C/I_{2M,co\text{-}channel}$	2Msps mode, Co-Channel interference				10		dB
$C/I_{2M,-2MHz}$	2 Msps mode, Adjacent (-2 MHz) interference				6		dB
$C/I_{2M,+2MHz}$	2 Msps mode, Adjacent (+2 MHz) interference				-14		dB
$C/I_{2M,-4MHz}$	2 Msps mode, Adjacent (-4 MHz) interference				-20		dB
$C/I_{2M,+4MHz}$	2 Msps mode, Adjacent (+4 MHz) interference				-44		dB
$C/I_{2M,-6MHz}$	2 Msps mode, Adjacent (-6 MHz) interference				-42		dB
$C/I_{2M,+6MHz}$	2 Msps mode, Adjacent (+6 MHz) interference				-47		dB
$C/I_{2M,\geq12MHz}$	2 Msps mode, Adjacent (≥12 MHz) interference				-52		dB
$C/I_{2MBLE,co\text{-}channel}$	2 Msps BLE mode, Co-Channel interference				7		dB
$C/I_{2MBLE,\pm2MHz}$	2 Msps BLE mode, Adjacent (±2 MHz) interference				0		dB
$C/I_{2MBLE,\pm4MHz}$	2 Msps BLE mode, Adjacent (±4 MHz) interference				-47		dB
$C/I_{2MBLE,\geq6MHz}$	2 Msps BLE mode, Adjacent (≥6 MHz) interference				-49		dB
$C/I_{2MBLE,image}$	Image frequency Interference				-21		dB
$C/I_{2MBLE,image,2MHz}$	Adjacent (2 MHz) interference to in-band image frequency				-36		dB

RX Intermodulation

Symbol	Description			Min.	Typ.	Max.	Units
$P_{IMD,1M}$	IMD performance, 1 Msps (3 MHz, 4 MHz, and 5 MHz offset)				-33		dBm
$P_{IMD,1M,BLE}$	IMD performance, BLE 1 Msps (3 MHz, 4 MHz, and 5 MHz offset)				-30		dBm
$P_{IMD,2M}$	IMD performance, 2 Msps (6 MHz, 8 MHz, and 10 MHz offset)				-33		dBm
$P_{IMD,2M,BLE}$	IMD performance, BLE 2 Msps (6 MHz, 8 MHz, and 10 MHz offset)				-32		dBm

Radio Timing

Symbol	Description	Min.	Typ.	Max.	Units
t_{TXEN}	Time between TXEN task and READY event after channel FREQUENCY configured		140		us
$t_{TXEN,FAST}$	Time between TXEN task and READY event after channel FREQUENCY configured (Fast Mode)		40		us
$t_{TXDISABLE}$	Time between DISABLE task and DISABLED event when the radio was in TX and mode is set to 1Msps		6		us
$t_{TXDISABLE,2M}$	Time between DISABLE task and DISABLED event when the radio was in TX and mode is set to 2Msps		4		us
t_{RXEN}	Time between the RXEN task and READY event after channel FREQUENCY configured in default mode		140		us
$t_{RXEN,FAST}$	Time between the RXEN task and READY event after channel FREQUENCY configured in fast mode		40		us
t_{SWITCH}	The minimum time taken to switch from RX to TX or TX to RX (channel FREQUENCY unchanged)		20		us
$t_{RXDISABLE}$	Time between DISABLE task and DISABLED event when the radio was in RX		0		us
$t_{TXCHAIN}$	TX chain delay		0.6		us
$t_{RXCHAIN}$	RX chain delay		9.4		us
$t_{RXCHAIN,2M}$	RX chain delay in 2Msps mode		5		us

CPU

Symbol	Description	Min.	Typ.	Max.	Units
W_{FLASH}	CPU wait states, running from flash, cache disabled	0		2	
$W_{FLASHCACHE}$	CPU wait states, running from flash, cache enabled	0		3	
W_{RAM}	CPU wait states, running from RAM			0	
$I_{DDFLASHCACHE}$	CPU current, running from flash, cache enabled, LDO		7.4		mA
$I_{DDFLASHCACHEDCDC}$	CPU current, running from flash, cache enabled, DCDC 3V		3.7		mA
$I_{DDFLASH}$	CPU current, running from flash, cache disabled, LDO		8.0		mA
$I_{DDFLASHDCDC}$	CPU current, running from flash, cache disabled, DCDC 3V		3.9		mA
I_{DDRAM}	CPU current, running from RAM, LDO		6.7		mA
$I_{DDRAMDCDC}$	CPU current, running from RAM, DCDC 3V		3.3		mA
$I_{DDFLASH/MHz}$	CPU efficiency, running from flash, cache enabled, LDO		125		µA/MHz
$I_{DDFLASHDCDC/MHz}$	CPU efficiency, running from flash, cache enabled, DCDC 3V		58		µA/MHz
CM_{FLASH}	CoreMark[5], running from flash, cache enabled		215		CoreM
$CM_{FLASH/MHz}$	CoreMark per MHz, running from flash, cache enabled		3.36		CoreM MHz
$CM_{FLASH/mA}$	CoreMark per mA, running from flash, cache enabled, DCDC 3V		58		CoreM mA

Power Management

Symbol	Description	Min.	Typ.	Max.	Units
$I_{ON\_RAMOFF\_EVENT}$	System ON, No RAM retention, Wake on any event		1.2		µA
$I_{ON\_RAMON\_EVENT}$	System ON, Full RAM retention, Wake on any event		1.5		µA
$I_{ON\_RAMOFF\_RTC}$	System ON, No RAM retention, Wake on RTC		1.9		µA
$I_{OFF\_RAMOFF\_RESET}$	System OFF, No RAM retention, Wake on reset		0.3		µA
$I_{OFF\_RAMOFF\_GPIO}$	System OFF, No RAM retention, Wake on GPIO		0.3		µA
$I_{OFF\_RAMOFF\_LPCOMP}$	System OFF, No RAM retention, Wake on LPCOMP		1.9		µA
$I_{OFF\_RAMOFF\_NFC}$	System OFF, No RAM retention, Wake on NFC field		0.7		µA
$I_{OFF\_RAMON\_RESET}$	System OFF, Full 64 kB RAM retention, Wake on reset		0.7		µA

Antenna

Below chart shows a few options of external antenna which has been tested and approved to use with DK9178C

#	Photo	ModelNo.	Type	Supplier	Gain	Certification
1		ANTX100ETH AB 2 4553	Ex ternal	Yag eo	≦ 2 d Bi	FCC, IC, NCC, CE
2		ANTX100P011 B 24003	PCB	Yag eo	2 .2dB i	FCC, IC, NCC, CE
3		ANTX100P111 B 24003	PCB	Yag eo	3 .3dB i	FCC, IC, NCC, CE

Reference Circuit

- This is a notification for circuit combinations and please refer below caution for specification, and carefully in detail description as applies to adapt on peripherals circuits.
- The module default is define on "LDO mode" and must add external 32.768 kHz crystal for MCU boot up.
- Pin DEC4 had built in 1?? decoupling capacitor in module.
- Please remove Y1/C7/C9 when using the internal 32MHz RC oscillator.
- When disable NFC function, please removal NFC Radio Frequency Coil and C235/C236/C237/C238 capacitor.
- Please add L1/L2/C2 in circuit if power setup "DC-DC" mode.

Notes and Cautions

1. Follow the conditions written in this specification, especially the control signals of this module.
2. The supply voltage should abide by the maximum ratings and must to supply within range of specification.
3. This module should not be mechanically stressed when installed.
4. Keep this module away from heat. Heat is the major cause of decreasing the life time of these modules.
5. Avoid assembly and use of the target equipment in conditions where the module temperature may exceed the maximum tolerance.
6. Keep this module away from other high frequency circuits.
7. Refer to the recommended pattern when designing a board.
8. Do not expose modules under direct sunlight for long duration. Modules should be kept away from humid and salty air conditions, and any corrosive gasses or substances. Store it within -40℃ to +125℃ before and after installation.

Basic Facts for nRF52 Family

Below chart shows basic spec for Nordic nRF52 family, which is helpful to understand the differences between each SoC. Any discrepancy shall refer to Nordic's technical document as final reference.

Solution	Nordic 52840	Nordic 52833	Nordic 52832	Nordic 52810
Antenna	Ipex		Ipex	
Antenna Vendor	X		X	
RAM (KB)	256KB	128KB	64KB	24KB
Internal Flash	1MB	512KB	512KB	192KB
External flash	X	X	X	X
PIN OUT	48	42	32	32
Shielding Case	O	O	O	O
Package	6x6mm QFN48	7x7mm aQFN™73	6x6mm QFN48	6x6mm QFN48
RF	BT5.3	BT5.3	BT5.3	BT5.3
PA	X	X	X	X
Operating Temp	-40~85C	-40~105C	-40~85C	-40~85C
Tx Power(MAX)	8dBm	8dBm	4dBm	4dBm
Supply Voltage	1.7V~5.5V	1.7V~5.5V	1.7V~3.6V	1.7V~3.6V

Useful Links

- Nordic Infocenter: Nordic Semiconductor Infocenter
- Nordic DevZone: Nordic Devzone Q&A
- Nordic Document: Nordic Techdoc
- Nordic Academy : Nordic DevAcademy
- nRF52832 Product Specification: nRF52832 – Versatile Bluetooth 5.2 **SoC-nordicsemi.com**

Full List of DEXATEK's BLE Modules

Nordic Solution	DEXATEK NO.	Antenna	RAM	Flash Memory
nRF52840	DK9177A	IPEX	256 kB	1 MB
nRF52832	DK9178C	IPEX	64 kB	512 kB
nRF52832	DK9180C	PCB	64 kB	512 kB
nRF52840	DK9181A	PCB	256 kB	1 MB
nRF52832	DK9182C	CHIP	64 kB	512 kB
nRF52840	DK9183A	CHIP	256 kB	1 MB
nRF52833	DK9177B	IPEX	128 kB	512 kB
nRF52810	DK9178D	IPEX	24 kB	192 kB
nRF52810	DK9180D	PCB	24 kB	192 kB
nRF52833	DK9181B	PCB	128 kB	512 kB
nRF52810	DK9182D	CHIP	24 kB	192 kB
nRF52833	DK9183B	CHIP	128 kB	512 kB

FCC Statement:

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.

NOTE: 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 or more 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and a human body.
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-DK91XXC. 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.

ISED Statement:
This device contains licence-exempt transmitter(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference,

2. This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and a human body.
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-DK91XXC. This 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.

Radiation Exposure Statement:
This equipment complies with FCC/ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and a human body. The transmitter module may not be co-located with any other transmitter or antenna. As long as 2 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 requirements required with this module installed.

IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC/ISED authorization is no longer considered valid and the

FCC/ISED ID cannot be used on the final product. In these circum stances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.
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-DK91XXC.

The grantee's FCC ID can be used only when all FCC/ISED compliance requirements are met. 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.

Manual Information To the End User
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

Frequently Asked Questions (FAQ)

- **Q: What are the typical applications of the DK9178C module?**
  A: The module is commonly used in home automation, industrial settings, health/fitness devices, gaming

peripherals, and more.

- **Q: What is the flash and RAM capacity of the module?**

  A: The DK9178C has 512kB of flash memory and 64kB of RAM.

Documents / Resources

[**DEXATEK DK9178C Connector BLE Module**](#) [pdf] User Manual
DK91XXC, SZY-DK91XXC, SZYDK91XXC, DK9178C Connector BLE Module, DK9178C, Connector BLE Module, BLE Module

References

- [**Nordic Semiconductor | Empowering Wireless Innovation - nordicsemi.com**](#)
- [**Nordic Semiconductor Online Learning Platform - Nordic Developer Academy**](#)
- [**Nordic Q&A - Nordic DevZone - Nordic DevZone**](#)
- [**Technical Documentation**](#)
- [**nRF52832 - Versatile Bluetooth 5.2 SoC - nordicsemi.com**](#)
- [**User Manual**](#)