Data Sheet

Product	BLE Module
Solution	Nordic nRF52810 aQFN Package
Model NO.	DK9178D (u.FL Connector)

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1. Overall Introduction

Dexatek's DK9178D is a BT 5 stack (Bluetooth low energy or BLE) module designed based on Nordic nRF52810 SoC solution, which incorporates: GPIO, SPI, UART, I2C, I2S, PMD, PWM and ADC interfaces for connecting peripherals and sensors

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.

1.1 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

1.2 Product Specification

Feature

- Bluetooth ® 5 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
- nRF52810, ARM ® Cortex ® M4 32-bit processor with FPU, 64 MHz
- 192kB Flash and 24kB RAM

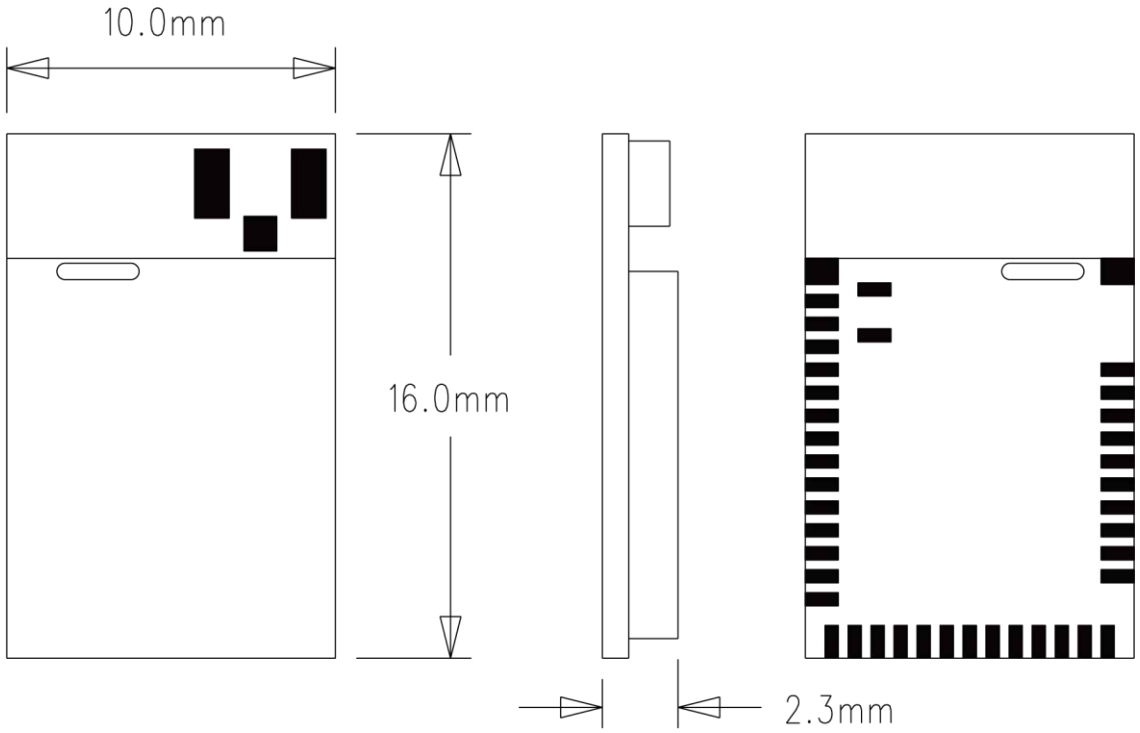
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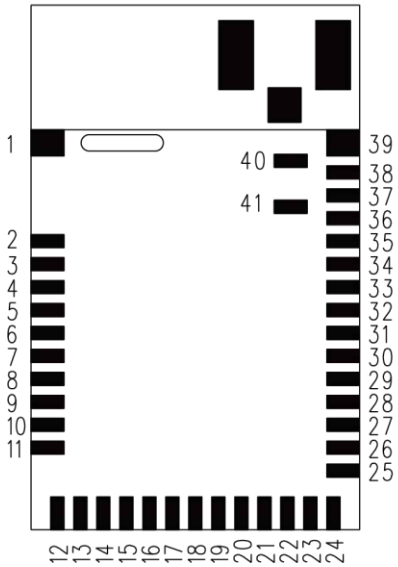
- Radio
  - GFSK at 1 Mbps and 2 Mbps,
  - -96 dBm sensitivity in Bluetooth ® low energy mode
  - -20 to +4 dBm TX power, configurable in 4 dB steps
- Power Management
  - 1.7 V to 3.6 V supply voltage range
- Security features
  - AES HW encryption with EasyDMA
- Peripheral interface / Hardware
  - Programmable peripheral interconnect (PPI)
  - 32 general purpose I/O pins (GPIO)
  - Nordic SoftDevice ready with support for concurrent multiprotocol
  - 12-bit, 200 ksps ADC – 8 configurable channels with programmable gain
  - 64 level comparator
  - 4-channel pulse width modulator (PWM) unit with EasyDMA
  - digital microphone interface (PDM)
  - 3x 32-bit timer with counter mode
  - SPI master/slave with EasyDMA
  - Up to 2x I2 C compatible two-wire master/slave
  - UART (CTS/RTS) with EasyDMA
  - Quadrature decoder (QDEC)
  - 2x real-time counter (RTC)
- Operation Temperature: -40 °C to 85 °C

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2. Product Dimension

2.1. PCB Dimensions & Pin Indication

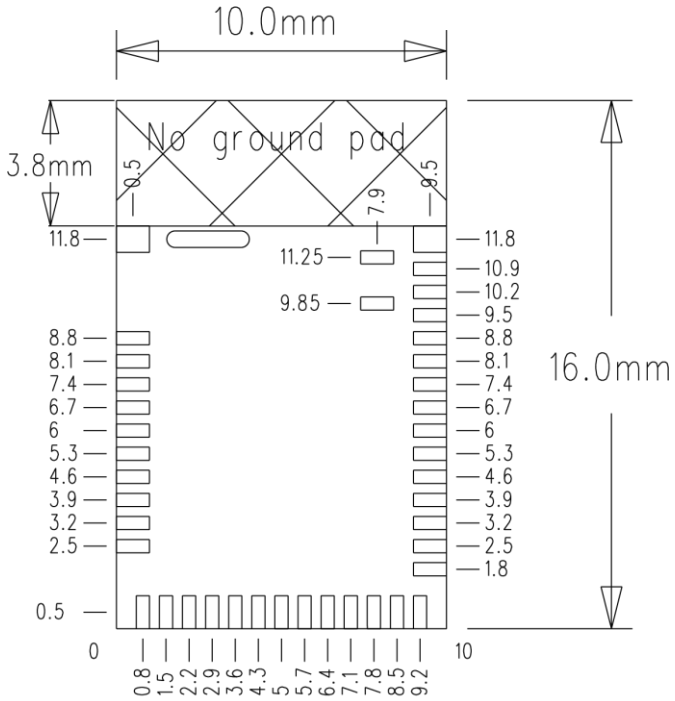


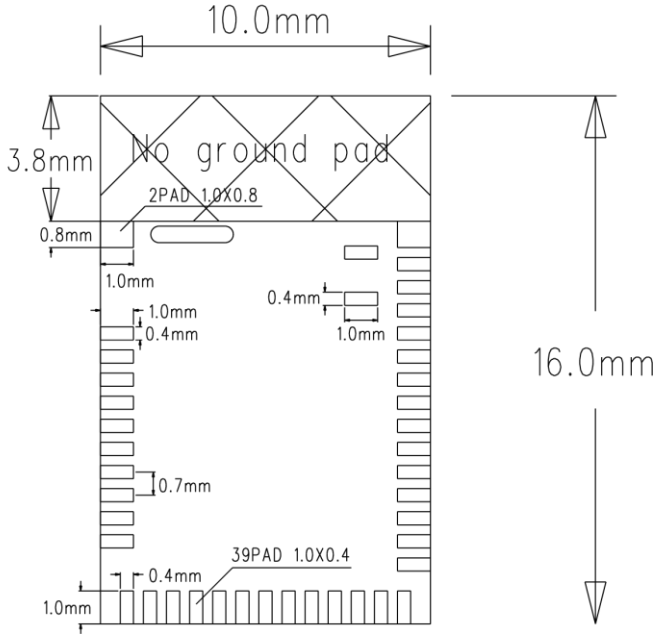


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2.2. Recommended Layout of Solder Pad





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2.3. 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



Top layer

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2.4. 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

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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

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3. Main Chip Solution

RF IC	Crystal Frequency
Nordic NRF52810	**32MHZ**

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

4. Shipment Packaging Information

Model	Antenna	Photo
DK9178D	u.FL Connector	

※Unit Weight of Module: 0.68g (±0.02g)

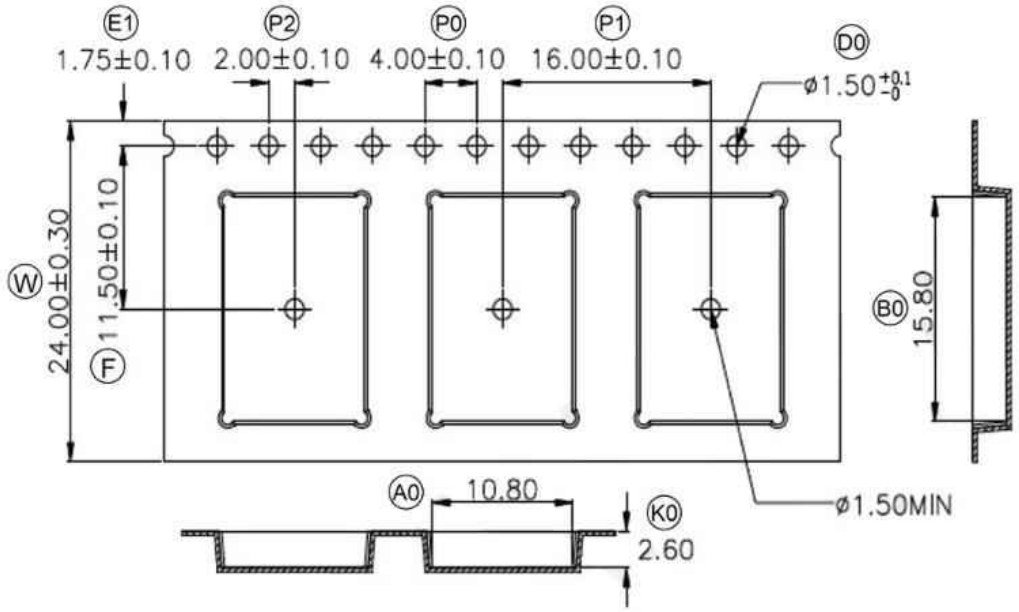
※Packaging Type: Anti-static Tape & Ree

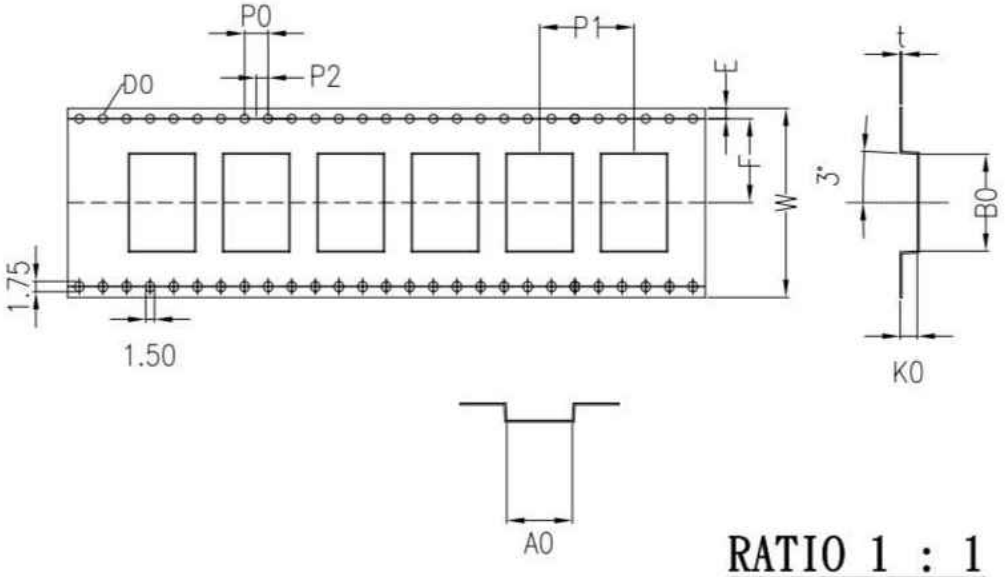
	Tape & Reel
MPQ (Min. Package Qty)	600 pcs per reel
Carton Contents (per Carton)	600 pcs
Carton Dimension L*W*H cm	37*36*6
Gross Weight	About 1.9kgs

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4.1 Tape & Reel Packaging



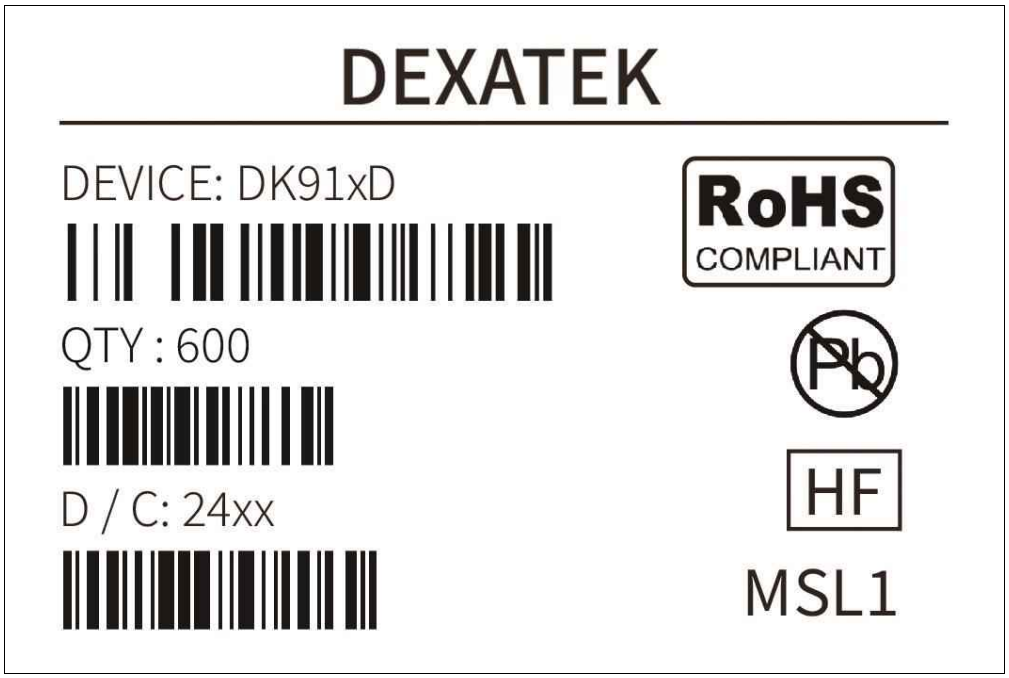


RATIO 1 : 1

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

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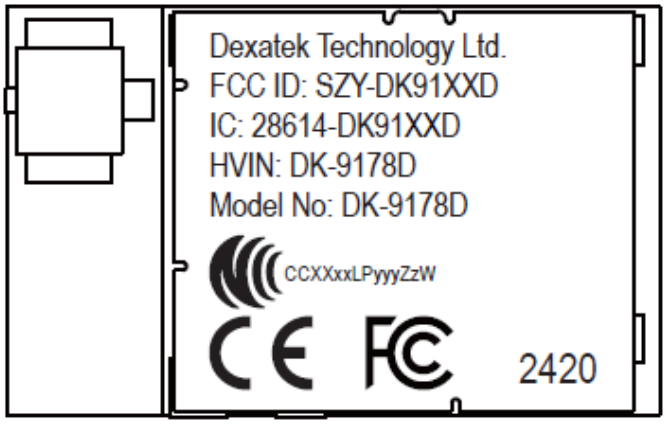
Part Number	DK91xxD
Quantity	600 pcs
Date Code	24xx

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4.2. Marking on Metal Shield

4.2.1. Label



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5. Specification

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

5.1. Absolute Maximum Ratings

	Note	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
$V_{I/O}$, VDD > 3.6 V		-0.3	3.9	V
Radio				
RF input level			10	dBm
Environmental QFN package				
Storage temperature		-40	+125	°C
MSL	Moisture Sensitivity Level		2	
ESD HBM	Human Body Model		4	kV
ESD HBM Class	Human Body Model Class		3A	
ESD CDM	Charged Device Model		1	kV
Environmental WLCSP 2.482 x 2.464 mm package				
Storage temperature		-40	+125	°C
MSL	Moisture Sensitivity Level		1	
ESD HBM	Human Body Model		2	kV
ESD HBM Class	Human Body Model Class		2	
ESD CDM	Charged Device Model		1	kV
Flash memory				
Endurance		10 000		Write/erase cycles
Retention		10 years at 40°C		

5.2. 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

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5.3. Electrical Specifications

5.3.1. 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 Mbps		±170		kHz
$f_{DELTA,BLE,1M}$	Frequency deviation @ BLE 1 Mbps		±250		kHz
$f_{DELTA,2M}$	Frequency deviation @ 2 Mbps		±320		kHz
$f_{DELTA,BLE,2M}$	Frequency deviation @ BLE 2 Mbps		±500		kHz
fsk_{SPS}	On-the-air data rate	1		2	Mbps

5.3.2. Radio Current Consumption (Transmitter)

Symbol	Description	Min.	Typ.	Max.	Units
$I_{TX,PLUS4dBM,DCDC}$	TX only run current (DCDC, 3V) P_{RF} =+4 dBm		7.0		mA
$I_{TX,PLUS4dBM}$	TX only run current P_{RF} = +4 dBm		15.4		mA
$I_{TX,0dBM,DCDC}$	TX only run current (DCDC, 3V)P_{RF} = 0dBm		4.6		mA
$I_{TX,0dBM}$	TX only run current P_{RF} = 0dBm		10.1		mA
$I_{TX,MINUS4dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -4dBm		3.6		mA
$I_{TX,MINUS4dBM}$	TX only run current P_{RF} = -4 dBm		7.8		mA
$I_{TX,MINUS8dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -8 dBm		3.2		mA
$I_{TX,MINUS8dBM}$	TX only run current P_{RF} = -8 dBm		6.8		mA
$I_{TX,MINUS12dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -12 dBm		2.9		mA
$I_{TX,MINUS12dBM}$	TX only run current P_{RF} = -12 dBm		6.2		mA
$I_{TX,MINUS16dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -16 dBm		2.7		mA
$I_{TX,MINUS16dBM}$	TX only run current P_{RF} = -16 dBm		5.7		mA
$I_{TX,MINUS20dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -20 dBm		2.5		mA
$I_{TX,MINUS20dBM}$	TX only run current P_{RF} = -20 dBm		5.4		mA
$I_{TX,MINUS40dBM,DCDC}$	TX only run current DCDC, 3V P_{RF} = -40 dBm		2.1		mA
$I_{TX,MINUS40dBM}$	TX only run current P_{RF} = -40 dBm		4.3		mA

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5.3.3. Radio Current Consumption (Receiver)

Symbol	Description	Min.	Typ.	Max.	Units
$I_{RX,1M,DCDC}$	RX only run current (DCDC, 3V) 1 Mbps / 1 Mbps BLE		4.6		mA
$I_{RX,1M}$	RX only run current 1 Mbps / 1 Mbps BLE		10.0		mA
$I_{RX,2M,DCDC}$	RX only run current (DCDC, 3V) 2 Mbps / 2 Mbps BLE		5.2		mA
$I_{RX,2M}$	RX only run current 2 Mbps / 2 Mbps BLE		11.2		mA
$I_{START,RX,1M,DCDC}$	RX start-up current (DCDC, 3 V) 1 Mbps / 1 Mbps BLE		3.5		mA
$I_{START,RX,1M}$	RX start-up current 1 Mbps / 1 Mbps BLE		6.7		mA

5.3.4. Transmitter Specification

Symbol	Description	Min.	Typ.	Max.	Units
P_{RF}	Maximum output power		4	8	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 Mbps)		-25		dBc
$P_{RF2,1}$	2nd Adjacent Channel Transmit Power 2 MHz (1 Mbps)		-50		dBc
$P_{RF1,2}$	1st Adjacent Channel Transmit Power 2 MHz (2 Mbps)		-25		dBc
$P_{RF2,2}$	2nd Adjacent Channel Transmit Power 4 MHz (2 Mbps)		-50		dBc

5.3.5. 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		µs

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5.3.6. 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, 1 Mbps nRF mode[14]		-93		dBm
$P_{SENS,IT,SP,1M,BLE}$	Sensitivity, 1 Mbps BLE ideal transmitter, <=37 bytes BER=1E-3[15]		-96		dBm
$P_{SENS,IT,LP,1M,BLE}$	Sensitivity, 1 Mbps BLE ideal transmitter >=128 bytes BER=1E-4 [16]		-95		dBm
$P_{SENS,IT,2M}$	Sensitivity, 2 Mbps nRF mode[17]		-89		dBm
$P_{SENS,IT,SP,2M,BLE}$	Sensitivity, 2 Mbps BLE ideal transmitter, Packet length <=37bytes		-93		dBm

5.3.7. RX Selectivity

Symbol	Description	Min.	Typ.	Max.	Units
$C/I_{1M,co\text{-}channel}$	1 Mbps mode, Co-Channel interference		9		dB
$C/I_{1M,-1MHz}$	1 Mbps mode, Adjacent (-1 MHz) interference		-2		dB
$C/I_{1M,+1MHz}$	1 Mbps mode, Adjacent (+1 MHz) interference		-10		dB
$C/I_{1M,-2MHz}$	1 Mbps mode, Adjacent (-2 MHz) interference		-19		dB
$C/I_{1M,+2MHz}$	1 Mbps mode, Adjacent (+2 MHz) interference		-42		dB
$C/I_{1M,-3MHz}$	1 Mbps mode, Adjacent (-3 MHz) interference		-38		dB
$C/I_{1M,+3MHz}$	1 Mbps mode, Adjacent (+3 MHz) interference		-48		dB
$C/I_{1M,\pm6MHz}$	1 Mbps mode, Adjacent (≥6 MHz) interference		-50		dB
$C/I_{1MBLE,co\text{-}channel}$	1 Mbps BLE mode, Co-Channel interference		6		dB
$C/I_{1MBLE,-1MHz}$	1 Mbps BLE mode, Adjacent (-1 MHz) interference		-2		dB
$C/I_{1MBLE,+1MHz}$	1 Mbps BLE mode, Adjacent (+1 MHz) interference		-9		dB
$C/I_{1MBLE,-2MHz}$	1 Mbps BLE mode, Adjacent (-2 MHz) interference		-22		dB
$C/I_{1MBLE,+2MHz}$	1 Mbps BLE mode, Adjacent (+2 MHz) interference		-46		dB
$C/I_{1MBLE,>3MHz}$	1 Mbps 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
$C/I_{2M,co\text{-}channel}$	2 Mbps mode, Co-Channel interference		10		dB
$C/I_{2M,-2MHz}$	2 Mbps mode, Adjacent (-2 MHz) interference		6		dB
$C/I_{2M,+2MHz}$	2 Mbps mode, Adjacent (+2 MHz) interference		-14		dB
$C/I_{2M,-4MHz}$	2 Mbps mode, Adjacent (-4 MHz) interference		-20		dB
$C/I_{2M,+4MHz}$	2 Mbps mode, Adjacent (+4 MHz) interference		-44		dB
$C/I_{2M,-6MHz}$	2 Mbps mode, Adjacent (-6 MHz) interference		-42		dB
$C/I_{2M,+6MHz}$	2 Mbps mode, Adjacent (+6 MHz) interference		-47		dB
$C/I_{2M,\geq12MHz}$	2 Mbps mode, Adjacent (≥12 MHz) interference		-52		dB

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5.3.8. RX Intermodulation

Symbol	Description	Min.	Typ.	Max.	Units
$P_{IMD,5TH,1M}$	IMD performance, 1 Msps, 5th offset channel, Packet length <= 37 bytes		-33		dBm
$P_{IMD,5TH,1M,BLE}$	IMD performance, BLE 1 Msps, 5th offset channel, Packet length <= 37 bytes		-30		dBm
$P_{IMD,5TH,2M}$	IMD performance, 2 Msps, 5th offset channel, Packet length <= 37 bytes		-33		dBm
$P_{IMD,5TH,2M,BLE}$	IMD performance, BLE 2 Msps, 5th offset channel, Packet length <= 37 bytes		-31		dBm

5.3.9. Radio Timing

Symbol	Description	Min.	Typ.	Max.	Units
t_{TXEN}	Time between TXEN task and READY event after channel FREQUENCY configured. Compatible with old devices.	140		140	µs
$t_{TXEN,FAST}$	Time between TXEN task and READY event after channel FREQUENCY configured (Fast Mode)	40		40	µs
$t_{TXDISABLE,1M}$	Time between DISABLE task and DISABLED event when the radio was in TX for MODE = Nrf_1Mbit and MODE = Ble_1Mbit	6		6	µs
$t_{TXDISABLE,2M}$	Time between DISABLE task and DISABLED event when the radio was in TX and mode is set to 2 Mbps	4		4	µs
t_{RXEN}	Time between the RXEN task and READY event after channel FREQUENCY configured in default mode. Compatible with old devices.	140		140	µs
$t_{RXEN,FAST}$	Time between the RXEN task and READY event after channel FREQUENCY configured in fast mode	40		40	µs
t_{SWITCH}	The minimum time taken to switch from RX to TX or TX to RX when channel FREQUENCY unchanged		20		µs
$t_{RXDISABLE}$	Time between DISABLE task and DISABLED event when the radio was in RX	0		0	µs
$t_{TXCHAIN}$	Digital propagation delay (in radio only) when transmitting. Does not include EasyDMA access time.		0.6		µs
$t_{RXCHAIN}$	Digital propagation delay (in radio only) when receiving. Does not include EasyDMA access time.		9.4		µs
$t_{RXCHAIN,2M}$	Digital propagation delay in 2 Mbps mode (radio only) when receiving. Does not include EasyDMA access time.		5		µs

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5.3.10. CPU

Symbol	Description	Min.	Typ.	Max.	Units
W_{FLASH}	CPU wait states, running from flash	0		2	
W_{RAM}	CPU wait states, running from RAM			0	
CM_{FLASH}	CoreMark[1], running from flash		144		CoreMark
$CM_{FLASH/MHz}$	CoreMark per MHz, running from flash		2.25		CoreM MHz
$CM_{FLASH/mA}$	CoreMark per mA, running from flash, DCDC 3V		65		CoreMark/ mA

5.3.11. Power Management

Symbol	Description	Min.	Typ.	Max.	Units
$I_{ON_RAMOFF_EVENT}$	System ON, No RAM retention, Wake on any event		0.6		µA
$I_{ON_RAMON_EVENT}$	System ON, Full 24 kB RAM retention, Wake on any event		0.8		µA
$I_{ON_RAMON_POF}$	System ON, Full 24 kB RAM retention, Wake on any event, Power fail comparator enabled		0.8		µA
$I_{ON_RAMON_GPIOTE}$	System ON, Full 24 kB RAM retention, Wake on GPIOTE input (Event mode)		3.3		µA
$I_{ON_RAMON_GPIOTEPORT}$	System ON, Full 24 kB RAM retention, Wake on GPIOTE PORT event		0.8		µA
$I_{ON_RAMON_RTC}$	System ON, Full 24 kB RAM retention, Wake on RTC (running from LFRC clock)		1.5		µA
$I_{ON_RAMOFF_RTC}$	System ON, No RAM retention, Wake on RTC (running from LFRC clock)		1.4		µA
$I_{ON_RAMON_RTC_LFXO}$	System ON, Full 24 kB RAM retention, Wake on RTC (running from LFXO clock)		1.1		µA
$I_{ON_RAMOFF_RTC_LFXO}$	System ON, No RAM retention, Wake on RTC (running from LFXO clock)		1.0		µA
$I_{OFF_RAMOFF_RESET}$	System OFF, No RAM retention, Wake on reset		0.3		µA
$I_{OFF_RAMON_RESET}$	System OFF, Full 24 kB RAM retention, Wake on reset		0.5		µA

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6. Antenna

Below chart shows a few options of external antenna which has been tested and approved to use with DK9178D

#	Photo	Model No.	Type	Supplier	Gain	Certification
1		ANTX100 ETHAB24553	External	Yageo	≦ 2 dBi	FCC, IC, NCC, CE
2		ANTX100 P011B24003	PCB	Yageo	≦2.2 dBi	FCC, IC, NCC, CE
3		ANTX100 P111B24003	PCB	Yageo	≦3.3 dBi	FCC, IC, NCC, CE

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7. 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.

4. This module should not be mechanically stressed when installed.

5. Keep this module away from heat. Heat is the major cause of decreasing the life time of these modules.

6. Avoid assembly and use of the target equipment in conditions where the module temperature may exceed the maximum tolerance.

7. Keep this module away from other high frequency circuits.

8. Refer to the recommended pattern when designing a board.

9. 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.

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8. 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 referto 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

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9. Useful Links

- Nordic Infocenter: Nordic Semiconductor Infocenter
- Nordic DevZone: Nordic Devzone Q&A
- Nordic Document: Nordic Techdoc
- Nordic Academy : Nordic DevAcademy
- nRF52810 Product Specification: nRF52810 - 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

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10. Statement

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-DK91XXD.

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.

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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.

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.

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.

Cet équipement est conforme aux limites d'exposition aux rayonnements de la ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et un corps humain.

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-DK91XXD.

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-DK91XXD.

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.

cet appareil destiné à fonctionner dans la bande 5 150-5 250 MHz est uniquement destiné à une utilisation en intérieur afin de réduire le risque d'interférence nuisible aux systèmes par satellite mobiles co-canaux.

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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-DK91XXD.
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.

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Déclaration d'exposition aux radiations :

Cet équipement est conforme aux limites d'exposition aux rayonnements FCC/ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et un corps humain.

Le module émetteur ne doit pas être colocalisé avec un autre émetteur ou antenne.
Tant que les 2 conditions ci-dessus sont remplies, aucun test supplémentaire de l'émetteur ne sera nécessaire. Cependant, l'intégrateur OEM est toujours responsable de tester son produit final pour toute exigence de conformité supplémentaire requise avec ce module installé.

REMARQUE IMPORTANTE : Dans le cas où ces conditions ne peuvent être remplies (par exemple certaines configurations d'ordinateur portable ou colocalisation avec un autre émetteur), alors l'autorisation FCC/ISED n'est plus considérée comme valide et l'identifiant FCC/ISED ne peut pas être utilisé sur le dernier émetteur. produit. Dans ces circonstances, l'intégrateur OEM sera responsable de réévaluer le produit final (y compris le transmetteur) et d'obtenir une autorisation FCC distincte.

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
sur lequel le module est installé doit également afficher une étiquette faisant référence au module fourni, contenant l'ID FCC : SZY-DK91XXD.
L'identifiant FCC du bénéficiaire ne peut être utilisé que lorsque toutes les exigences de conformité FCC/ISED sont respectées.

L'intégrateur hôte doit suivre les instructions d'intégration fournies dans ce document et s'assurer que le produit final du système composite est conforme aux exigences par une évaluation technique ou une évaluation des règles et de la publication KDB 996369.

L'intégrateur hôte installant ce module dans son produit doit s'assurer que le produit composite final est conforme aux exigences par une évaluation technique ou une évaluation des règles, y compris le fonctionnement de l'émetteur et doit se référer aux directives du KDB 996369.

Informations manuelles destinées à l'utilisateur final

L'intégrateur OEM doit veiller à ne pas fournir d'informations à l'utilisateur final sur la manière d'installer ou de retirer ce module RF dans le manuel d'utilisation du produit final qui intègre ce module. Le manuel de l'utilisateur final doit inclure toutes les informations/avertissements réglementaires requis, comme indiqué dans ce manuel.

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NCC statement:

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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

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