







Engineered with design simplicity in mind, Panasonic's RF Modules provide a superior developer experience and shortens time to market due to the quick implementation of Bluetooth® communication. Bluetooth® Modules by Panasonic deliver best-in-class power efficiency and enable any application requiring long battery life.

	Bluetooth® Low Energy				Bluetooth® Dual Mode	
						
Series	PAN1720 / PAN1721	PAN1740	PAN1760A	PAN1762	PAN1026A	PAN1326B/C
Status	Mass Production	Mass Production	Mass Production	Pre-Production	Mass Production	Mass Production
Part Number	ENW898xxxxKF*	ENW89846A1KF	ENW89847A3KF	ENW89853A1KF	ENW89837A5KF	ENW89823x4KF*
RF Category	Bluetooth® Low Energy v4.0	Bluetooth® Low Energy v4.2	Bluetooth® Low Energy v4.2	Bluetooth® Low Energy v5.0	Bluetooth® v4.2 Dual Mode (BR, LE)	Bluetooth® v4.1/v4.2 Dual Mode (BR, EDR, LE)
Software / Profile	nBlue™ by BlueRadios Inc. / TI SW stack	Embedded Profiles	Embedded Profiles / AT-Command Mode	Embedded Profiles	SPP and GATT	HCI
Used ICs	CC2540 / CC2541	DA14580	TC35678	TC35680	TC35661-551	CC2564C
Size [mm]	15.6 x 8.7 x 1.8	9.0 x 9.5 x 1.8	15.6 x 8.7 x 1.9	15.6 x 8.7 x 1.9	15.6 x 8.7 x 1.8	9.0 x 9.5 x 1.8
Rx Sensitivity [dBm]	-94	-93	-93	-105 @ 125 kb/s	-89	-93
Tx Power (max.) [dBm]	+4 / 0	+0	+0	+8	+4	+10 / +12
Power Supply [V]	2.0 to 3.6	2.35 to 3.3	1.8 to 3.6	1.9 to 3.6	2.8 to 3.6	1.8 to 4.8
Current Consumption (max.)	Tx: 23mA @ -6dBm Rx: 18mA Sleep Mode: <1µA	Tx: 4.9mA Rx: 4.9mA Sleep Mode: <1µA	Tx: 3.3mA Rx: 3.3mA Deep Sleep Mode: 50nA	Tx: 11mA Rx: 5.1mA Deep Sleep Mode: 50nA	ACL, DH1: 46mA Sleep Mode: <2mA	Tx, EDR: 40mA Sleep Mode: 135µA
Interfaces	GPIO, UART, PAN1720: USB; PAN1721: I²C	GPIO, UART, SPI, I²C, 3-axis QD, ADC	GPIO, UART, SPI, I²C, ADC	SPI, I²C, UART, PWM, Wake-Up inputs, ADC, GPIO	GPIO, UART	GPIO, PCM, UART
Microcontroller and Memory	8051 µC 8KB RAM, 256KB Flash	ARM® Cortex®-M0 42KB SRAM, 32 KB OTP	ARM® Cortex®-M0 83KB RAM, 256KB Flash	ARM® Cortex®-M0 51KB RAM, 128KB Flash	ARM 7	
Operating Temp. [°C]	-40 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85
Evaluation Kit	ENW89820AYxF (PAN1720 Dongle Kit) ENW89835AY1F (PAN1721 Dongle Kit)	ENW89846AYKF (Dongle Kit) ENW89846AVKF (EMK)	ENW89847AWKF (Dongle Kit)	ENW89848AVKF (EMK)	ENW89837AUKEF (Dongle Kit) ENW89837AWKFEF (EMK)	ENW89819AYKF (EMK)

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- Design and specification are subject to change without notice.
- Ask Panasonic for technical specification before purchase and/or use.
- If there is any doubt regarding the safety of this product, kindly inform Panasonic immediately for technical consultation.
- Same color indicates same form factor and compatible pinout for major functions.

- Qualification of all products: CE, FCC, IC, Bluetooth® QDID if applicable.
- Different software/profile options available.
- Non antenna version for some modules available.

* x is a parameter to be defined.

Long life, reliability and excellent performance – Panasonic offers *Bluetooth*® Low Energy in combination with all important short range RF technologies: WiFi® (2.4GHz & 5GHz), IEEE 802.15.4 or NFC

	NFC + BLE	IEEE 802.15.4 + BLE	Wi-Fi® + BLE	Wi-Fi®	
Series	PAN1761	PAN4620	PAN9026	PAN9010/PAN9020	PAN9420
Status	Mass Production	Pre-Production	Mass Production	Mass Production	Mass Production
Part Number	ENW89848A1KF	ENWC9B01A1EF	ENWF9202A1EF (EU) ENWF9201A1EF (US) ENWF9203A1EF (CA)	ENW49801A1JF (Antenna) ENW49801C1JF (Non-antenna)	ENW49C02A6KF (EU) ENW49C01A6KF (US/CA)
RF Category	<i>Bluetooth</i> ® Low Energy v4.1 + NFC Tag Type 3	IEEE® 802.15.4 + <i>Bluetooth</i> ® Low Energy v4.2	Wi-Fi® Radio 2.4 GHz & 5 GHz 802.11 a/b/g/n + <i>Bluetooth</i> ® 5.0 (BR, EDR, LE)	Wi-Fi® Radio 802.11 b/g/n	Wi-Fi® Embedded 802.11 b/g/n
Software / Profile	Embedded Profiles	NXP's <i>Bluetooth</i> ®, Thread & ZigBee Stack	Linux	Linux / Android Driver	Full Embedded
Used ICs	TC35670-006	KW41Z	88W8977	88W8782	88MW300
Size [mm]	15.6 x 8.7 x 1.8	15.6 x 8.7 x 1.9	17.5 x 10.0 x 2.6	22.75 x 13.5 x 2.42	29.0 x 13.5 x 2.66
Rx Sensitivity [dBm]	-90	-93	-98 @ 1M-DSSS	-98 @ 1M-DSSS	-97 @ 1M-DSSS
Tx Power (max.) [dBm]	+0	+3	+17 @ 11b	+18 @ 11b	+16 @ 11b
Power Supply [V]	1.8 to 3.6	1.8 to 4.2	1.8 to 3.3	3.0 to 3.6	3.0 to 3.6
Current Consumption (max.)	Tx: 5.5mA Rx: 5.5mA Sleep Mode: <0.1µA	Tx: 7.6mA Rx: 8.5mA Low Power Mode: 182nA	Tx: 400mA @ 11Mbps Rx: 70mA @ 11Mbps Power Down Mode: 150µA	Tx: 400mA @ 11Mbps Rx: 105mA @ 11Mbps Power Down Mode: 200µA	Tx: 310mA @ 11Mbps Rx: 75mA @ 11Mbps Power Down Mode: <1mA
Interfaces	GPIO, UART, I²C, NFC Wake-Up, etc.	UART, SPI, I²C, TSI, ADC & DAC	SDIO 3.0, HS UART	USB 2.0	2x UART, SPI
Microcontroller and Memory	64KB EEPROM, 1.5KB EEPROM NFC memory	ARM® Cortex®-M0+ 128KB SRAM, 512KB Flash			2MB Flash
Operating Temp. [°C]	-30 to +85	-40 to +85	-30 to +85	0 to +70	-40 to +85
Evaluation Kit	ENW89848AVKF (EMK)	ENWC9B01AQEF (Daughter Board)	ENWF9201AXEF (i.MX) ENWF9201AYEF (Dongle Kit)	ENW49802AYJF (KIT)	ENW49C01AYKF (EMK) ENW49C01AXKF (Arduino Shield)

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