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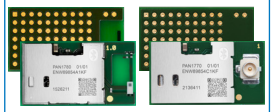
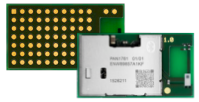
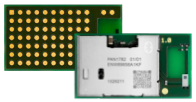
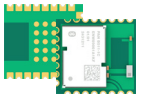
Wireless Connectivity | Product Leaflet

	Bluetooth® Low Energy	Bluetooth® LE & IEEE® 802.15.4					Bluetooth® Dual Mode
					COMING SOON 	COMING SOON 	
SERIES	**PAN1740A**	**PAN1780 / PAN1770**	**PAN1781**	**PAN1782**	**PAN1783(A)**	**PAN B511-1**	**PAN13x6C/2**
RF CATEGORY	**Bluetooth® 5.0**	**Bluetooth® 5.3, IEEE® 802.15.4 & NFC-A**	**Bluetooth® 5.3, IEEE® 802.15.4**	**Bluetooth® 5.3, IEEE® 802.15.4 & NFC-A**	**Bluetooth® 5.4, IEEE® 802.15.4 & NFC-A**	**Bluetooth® 5.4, IEEE® 802.15.4**	**Bluetooth® 5.1 Dual Mode (BR, EDR, Bluetooth® LE)**
FREQUENCY [GHz]	2.4	2.4	2.4	2.4	2.4	2.4	2.4
INTEGRATED CIRCUIT	Renesas DA14585	Nordic nRF52840	Nordic nRF52820	Nordic nRF52833	Nordic nRF5340	Nordic nRF54L15	TI CC2564C
HOST MODE	Hosted or standalone	Hosted or standalone	Hosted or standalone	Hosted or standalone	Hosted or standalone	Hosted or standalone	Hosted
MICROCONTROLLERS AND MEMORY	ARM® Cortex®-M0 64kB OTP, 96kB SRAM	ARM® Cortex®-M4F 1MB Flash, 256kB RAM	ARM® Cortex®-M4 256kB Flash, 32kB RAM	ARM® Cortex®-M4 512kB Flash, 128kB RAM	Dual ARM® Cortex®-M33 App: 1MB Flash, 512kB RAM, Network: 256kB Flash, 64kB RAM	ARM® Cortex®-M33 1.5MB Flash, 256kB RAM Opt: 4MB Flash memory	-
SOFTWARE & DRIVERS	SmartSnippets™ Studio	nRF Connect SDK / AT: nBlue™	nRF Connect SDK	nRF Connect SDK	nRF Connect SDK	nRF Connect SDK	HCI
CERTIFIED ANTENNA	Integrated chip	PAN1780: Integrated chip PAN1770: Terminal (via U.FL)	Integrated chip	Integrated chip	PAN1783: Integrated chip PAN1783A: Bottom Pad	B511-1C: Integrated chip B511-1B: Bottom Pad	Integrated chip
REGULATORY CERTIFICATIONS	CE RED, FCC, ISED	CE RED, FCC, ISED, MIC, KCC, RCM, SRRC PAN1770/80AT: CE RED, FCC, ISED	CE RED, FCC, ISED, MIC, KCC, RCM, SRRC	CE RED, FCC, ISED	CE RED, FCC, ISED*	CE RED, FCC, ISED, MIC*	CE RED, FCC, ISED
SIZE [mm]	9.0 x 9.5 x 1.8	15.6 x 8.7 x 2.0	15.6 x 8.7 x 2.0	15.6 x 8.7 x 2.0	15.6 x 8.7 x 2.0	ca. 10.35 x 9.8 x 1.9	9.0 x 9.5 x 1.8 (w/ Ant); 9.0 x 6.5 x 1.8 (w/o Ant)
Rx SENSITIVITY [dBm]	-93 @ 1MB/s	-95 @ 1Mb/s -103 @ 125kb/s	-95 @ 1Mb/s -103 @ 125kb/s	-96 @ 1Mb/s -103 @ 125kb/s	-97 @ 1Mb/s -103 @ 125kb/s		-90
Tx POWER (MAX.)[dBm]	+0	+8 (Chip Antenna)	+8	+8	+3 (Chip Antenna)	+8	+10 (Chip Antenna) +11.5 (no Antenna)
POWER SUPPLY [V]	2.2 to 3.3	1.7 to 5.5	1.7 to 5.5	1.7 to 5.5	1.7 to 5.5		1.7 to 4.8
CURRENT CONSUMPTION	Tx: 4.9mA, 3V @ 0dBm Rx: 4.9mA , 3V	Tx: 4.8mA, 3.3V @ 0dBm Rx: 4.8mA, 3.3V	Tx: 4.9mA @ 0dBm Rx: 4.7mA	Tx: 4.9mA @ 0dBm Rx: 4.7mA	Tx: 3.4mA @ 0dBm Rx: 2.7mA		Tx: 40mA, 3.3V @ 8dBm Rx: 20mA, 3.3V
SLEEP MODE CURRENT	Sleep Mode (Full RAM Retention): 4µA Deep Sleep Mode: 520nA	Wake-on-RTC: 1.5µA Off Mode: 0.4µA	Wake-on-RTC: 1.2µA Off Mode: 0.3µA	Wake-on-RTC: 1.5µA Off Mode: 0.6µA	Wake-on-RTC: 1.5µA Off Mode: 0.9µA		Deep Sleep Mode: 105 µA
INTERFACES	GPIO, UART, SPI+, I2C, ADC, 3-axis QD	GPIO, UART, QSPI, I2C, I2S, ADC, PDM, PWM, NFC-A, USB2.0	GPIO, UART, SPI, I2C, USB2.0, QDEC	GPIO, UART, QSPI, I2C, I2S, ADC, PDM, PWM, COMP, NFC-A USB2.0	GPIO, UART, QSPI, I2C, I2S, ADC, PDM, NFC-A, USB2.0		GPIO, UART, PCM
OPERATING TEMP. [°C]	-40 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85
PART NUMBER	ENW89852A1KF	ENW89854A1KF (PAN1780) ENW89854A3KF (PAN1780AT) ENW89854C1KF (PAN1770)	ENW89857A1KF	ENW89858A1KF	ENW89860A1KF (Chip Antenna) ENW89860C1KF (Bottom Pad)	ENW89861A1KF (Chip Antenna) ENW89861C1KF (Bottom Pad)	ENW89823A5KF (Chip Antenna) ENW89823C4KF (Bottom Pad)
EVALUATION KIT	ENW89852AXKF (Dongle) ENW89852AWKF (Dongle Kit)	ENW89854AUKF (PAN1780 EVB) ENW89854AVKF (PAN1780AT EVB) ENW89854CXKF (PAN1770 EVB)	ENW89857AXKF (EVB)	ENW89858AXKF (EVB)	ENW89860AXKF (EVB)		ENW89823AXKF (PAN1326C2 EVB) ENW89823CXKF (PAN1316C EVB)
STATUS	Mass Production	Mass Production	Mass Production	Mass Production	In Development	In Development	Mass Production

*Planned

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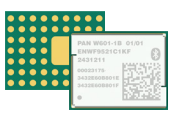
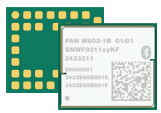
	Wi-Fi® & Bluetooth® LE					Wi-Fi®
			NEW 	COMING SOON 	COMING SOON 	
SERIES	**PAN9026**	**PAN9028**	**PAN9019(A)**	**PAN W601-1**	**PAN W602**	**PAN9520**
RF CATEGORY	**Wi-Fi® 4 (802.11 a/b/g/n) & Bluetooth® 5.0 (BR, EDR, LE)**	**Wi-Fi® 5 (802.11 a/b/g/n/ac) & Bluetooth® 5.2 (BR, EDR, LE)**	**Wi-Fi® 6 (802.11 a/b/g/n/ac/ax) & Bluetooth® 5.4 (BR, EDR, LE) (& IEEE® 802.15.4)**	**Wi-Fi® 6E (802.11 a/b/g/n/ac/ax) & Bluetooth® 5.4 (BR, EDR, LE)**	**Wi-Fi® 6 (802.11 (a)/b/g/n/ax) & Bluetooth® 5.4 (LE)**	**Wi-Fi® 4 (802.11 b/g/n)**
FREQUENCY [GHz]	2.4 & 5	2.4 & 5	2.4 & 5	2.4, 5 & 6	PAN W602-1: 2.4 PAN W602-2: 2.4 & 5	2.4
INTEGRATED CIRCUIT	NXP 88W8977	NXP 88W8987	NXP IW611 (PAN9019) / IW612 (PAN9019A)	Synaptics SYN43711	TI CC3301 (W602-1) / CC3351 (W602-2)	Espressif ESP32-S2
HOST MODE	Hosted	Hosted	Hosted	Hosted	Hosted	Hosted or Embedded
MICROCONTROLLERS AND MEMORY	-	-	-	-	-	Xtensa® 32-bit LX7 320 kB SRAM, 128 kB ROM Opt: QSPI Flash and PSRAM
SOFTWARE & DRIVERS	Linux / i.MX RT Support	Linux / Android / i.MX RT Support	Linux / Android / i.MX RT Support	Linux / Android / selected MCUs	Linux / FreeRTOS for selected MCUs	ESP-IDF by Espressif Arduino IDE
CERTIFIED ANTENNA	Integrated chip	Integrated chip / Terminal (via bottom pad)	Via bottom pad: chip / (Flex)PCB / Terminal	Integrated chip	W602-1C: Integrated chip W602-1B: Bottom Pad	Integrated chip
REGULATORY CERTIFICATIONS	CE RED, FCC, ISED	CE RED, FCC, ISED	CE RED, FCC, ISED, MIC, RCM*	CE RED, FCC, ISED, RCM, MIC*	CE RED, FCC, ISED, RCM*	CE RED, FCC, ISED
SIZE [mm]	17.5 x 10.0 x 2.6	24.0 x 12.0 x 2.8	15.3 x 12.0 x 2.5	14.0 x 9.8	W602-xC: 15.3 x 8.8 x 1.8 W602-xB: 10.0 x 8.8 x 1.8	24.0 x 13.0 x 3.1
RX SENSITIVITY [dBm]	-98 @ 1M-DSSS	-98 @ 1M-DSSS	-98 @ 1M 802.11b		-99	-97 @ IEEE 802.11b
TX POWER (MAX.)[dBm]	+17 @ IEEE 802.11b	+16 @ IEEE 802.11b	+17@ IEEE 802.11ax	+20	+20	+19.8 @ IEEE 802.11b
POWER SUPPLY [V]	1.8 to 3.3	3.3 with PMIC (88PG823) 1.1, 1.8, 2.2, 3.3 without PMIC	1.8 and 3.3	1.8, 3.3 - 5	3.3 and 1.8	3.0 - 3.6
CURRENT CONSUMPTION	Tx: 400mA @ 11Mb/s Rx: 70mA @ 11Mb/s	Tx: 320mA @ 11Mb/s Rx: 60mA @ 11Mb/s	Tx:192mA @802.11ax, 5GHz Rx:180mA @802.11ax, 5GHz	Tx: 370mA @802.11ax 6GHz Rx: 59mA @802.11ax 6GHz	Tx: 92mA @802.11ax 2.4GHz Rx: 62mA @802.11ax 2.4GHz	Tx: 190mA, 3.3V @ 19.5 dBm Rx: 63mA, 3.3V @ 1 Mb/s
SLEEP MODE CURRENT	Power Down Mode: 150µA	Power Down Mode: 150µA	Power Down Mode: 190uA	Power Down Mode: 100uA	Power Down Mode: 12uA	Deep sleep mode <100 µA
INTERFACES	SDIO 3.0, HS UART, PCM	GPIO, SDIO 3.0, HS UART, PCM	SDIO 3.0, HS UART, SPI, I²S/PCM	PCIe2, UART, I2S, SDIO3	SDIO, SPI, UART	GPIO, UART, SPI, I2C, I2S, RMT, PWM, USB, LCD, ADC & DAC
OPERATING TEMP. [°C]	-30 to +85	-30 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85
PART NUMBER	ENWF9202A1EF (EU) ENWF9201A1EF (US) ENWF9203A1EF (CA) ENWF9208A1EF (Multi-region)	ENWF9408A1EF (with PMIC) ENWF9408A2EF (without PMIC)	ENWF9501C1KF ENWF9511C1KF (incl. IEEE® 802.15.4)	ENWF9521A1KF (Chip Antenna) ENWF9521C1KF (Bottom Pad)	ENWF9211A1KF (Chip Antenna) ENWF9211C1KF (Bottom Pad)	ENW49D01A1KF (4MB Flash / 2MB RAM) ENW49D02A1KF (1MB Flash)
EVALUATION KIT	ENWF9201AWEF (mSDIO Dongle) ENWF9201AYEF (SDIO Dongle Kit)	ENWF9408AVEF (mSD Dongle) ENWF9408AMEF (M.2 EVB)	ENWF9501CMKF (PAN9019 M2E EVD) ENWF9511CMKF (PAN9019A M2E EVD)	ENWF9521AMKF (W601-1C M2) ENWF9521CMKF (W601-1B M2)	ENWF9211AMKF (W602-1C M2) ENWF9211CMKF (W602-1B M2)	ENW49D01AZKF (EVB 4 MB Flash, 2 MB RAM)
STATUS	Mass Production	Mass Production	Mass Production	In Development	In Development	Mass Production

*Planned

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