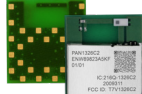
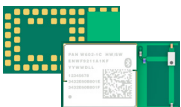
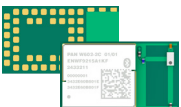
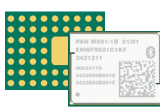
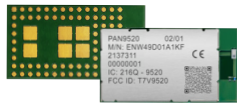


Wireless Connectivity | Product Leaflet

SERIES	Bluetooth® LE & IEEE® 802.15.4					Bluetooth® Dual Mode	Bluetooth® Low Energy
							
	PAN B611-1	PAN1783(A)	PAN1780 / PAN1770	PAN1782	PAN1781	PAN13x6C/2	PAN1740A
	Bluetooth® 6.0, IEEE® 802.15.4	Bluetooth® 5.4, IEEE® 802.15.4 & NFC-A	Bluetooth® 5.3, IEEE® 802.15.4 & NFC-A	Bluetooth® 5.3, IEEE® 802.15.4 & NFC-A	Bluetooth® 5.3, IEEE® 802.15.4	Bluetooth® 5.1 Dual Mode (BR, EDR, Bluetooth® LE)	Bluetooth® 5.0
	2.4	2.4	2.4	2.4	2.4	2.4	2.4
	Nordic nRF54L15	Nordic nRF5340	Nordic nRF52840	Nordic nRF52833	Nordic nRF52820	TI CC2564C	Renesas DA14585
	ARM® Cortex®-M33 1.5MB Flash, 256kB RAM Opt: add 4MB Flash memory	Dual ARM® Cortex®-M33 App: 1MB Flash, 512kB RAM, Network: 256kB Flash, 64kB RAM	ARM® Cortex®-M4F 1MB Flash, 256kB RAM	ARM® Cortex®-M4 512kB Flash, 128kB RAM	ARM® Cortex®-M4 256kB Flash, 32kB RAM	-	ARM® Cortex®-M0 64kB OTP, 96kB SRAM
	nRF Connect SDK	nRF Connect SDK	nRF Connect SDK / AT: nBlue™	nRF Connect SDK	nRF Connect SDK	HCI	SmartSnippets™ Studio
	B611-1C: Integrated chip B611-1B: Terminal & FPC (via Bottom Pad)	PAN1783: Integrated chip PAN1783A: Terminal (via Bottom Pad)	PAN1780: Integrated chip PAN1770: Terminal (via U.FL)	Integrated chip	Integrated chip	Integrated chip	Integrated chip
	CE RED, FCC, ISCED, MIC*	CE RED, FCC, ISCED	CERED, FCC, ISCED, MIC, KCC, RCM, SRRC PAN1770/80AT: CE RED, FCC, ISCED	CE RED, FCC, ISCED	CE RED, FCC, ISCED, MIC, KCC, RCM, SRRC	CE RED, FCC, ISCED	CE RED, FCC, ISCED
SIZE [mm]	10.35 x 9.8 x 1.9	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	9.0 x 9.5 x 1.8 (w/ Ant); 9.0 x 6.5 x 1.8 (w/o Ant)	9.0 x 9.5 x 1.8
Rx SENSITIVITY [dBm]	-96 @ 1Mb/s -104 @ 125kb/s	-97 @ 1Mb/s -103 @ 125kb/s	-95 @ 1Mb/s -103 @ 125kb/s	-96 @ 1Mb/s -103 @ 125kb/s	-95 @ 1Mb/s -103 @ 125kb/s	-90	-93 @ 1MB/s
Tx POWER (MAX.) [dBm]	+8	+3 (Chip Antenna)	+8 (Chip Antenna)	+8	+8	+10 (Chip Antenna) +11.5 (no Antenna)	+0
POWER SUPPLY [V]	1.7 to 3.6	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	2.2 to 3.3
CURRENT CONSUMPTION	Tx: 4.8mA @ 0dBm Rx: 3.3 mA	Tx: 3.4mA @ 0dBm Rx: 2.7mA	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: 40mA, 3.3V @ 8dBm Rx: 20mA, 3.3V	Tx: 4.9mA, 3V @ 0dBm Rx: 4.9mA, 3V
SLEEP MODE CURRENT	Wake-on-RTC: 0.8µA Off Mode: 0.6µA	Wake-on-RTC: 1.5µA Off Mode: 0.9µA	Wake-on-RTC: 1.5µA Off Mode: 0.4µA	Wake-on-RTC: 1.5µA Off Mode: 0.6µA	Wake-on-RTC: 1.2µA Off Mode: 0.3µA	Deep Sleep Mode: 105 µA	Sleep Mode (Full RAM Retention): 4µA Deep Sleep Mode: 520nA
INTERFACES	GPIO, UART, QSPI, SPI, I2C, PWM, ADC, NFC	GPIO, UART, QSPI, I2C, I2S, ADC, PDM, NFC-A, USB2.0	GPIO, UART, QSPI, I2C, I2S, ADC, PDM, PWM, NFC-A, USB2.0	GPIO, UART, QSPI, I2C, I2S, ADC, PDM, PWM, COMP, NFC-A USB2.0	GPIO, UART, SPI, I2C, USB2.0, QDEC	GPIO, UART, PCM	GPIO, UART, SPI+, I2C, ADC, 3-axis QD
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	ENW89861A01F (-1C Premium: Flash + X'TAL) ENW89861B01F (-1C Standard: X'TAL) ENW89861C01F (-1C Economy) ENW89861D01F (-1B Premium: Flash + X'TAL) ENW89861E01F (-1B Standard: X'TAL) ENW89861F01F (-1B Economy)	ENW89860A1KF (Chip Antenna) ENW89860C1KF (Bottom Pad)	ENW89854A4KF (PAN1780APP) ENW89854A3KF (PAN1780AT) ENW89854C2KF (PAN1770APP)	ENW89858A1KF	ENW89857A1KF	ENW89823A5KF (Chip Antenna) ENW89823C4KF (Bottom Pad)	ENW89852A1KF
EVALUATION KIT	ENW89861AXKF (PAN B611-1C EVB) ENW89861DXKF (PAN B611-1B EVB)	ENW89860AXKF (PAN1783 EVB) ENW89860CXKF (PAN1783A EVB)	ENW89854AUKF (PAN1780 EVB) ENW89854AVKF (PAN1780AT EVB) ENW89854CXKF (PAN1770 EVB)	ENW89858AXKF (EVB)	ENW89857AXKF (EVB)	ENW89823AXKF (PAN1326C2 EVB) ENW89823CXKF (PAN1316C EVB)	ENW89852AXKF (Dongle) ENW89852AWKF (Dongle Kit)
STATUS	Mass Production	Mass Production	Mass Production	Mass Production	Mass Production	Mass Production	Mass Production

*Planned

Wireless Connectivity | Product Leaflet

	Wi-Fi® & Bluetooth® LE					Wi-Fi®
						
SERIES	PAN9028	PAN W602-1	PAN W602-2	PAN9019(A)	PAN W601-1	PAN9520
RF CATEGORY	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/ax) & Bluetooth® 5.4 (LE)	Wi-Fi® 6 (802.11 (a)/b/g/n/ax) & Bluetooth® 5.4 (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® 4 (802.11 b/g/n)
FREQUENCY [GHz]	2.4 & 5	2.4	2.4 & 5 (20 MHz bandwidth)	2.4 & 5 (80 MHz bandwidth)	2.4, 5 & 6	2.4
INTEGRATED CIRCUIT	NXP 88W8987	TI CC3301	TI CC3351	NXP IW611 (PAN9019) / IW612 (PAN9019A)	Synaptics SYN43711	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 / Android / i.MX RT Support	Linux / FreeRTOS for selected MCUs	Linux / FreeRTOS for selected MCUs	Linux / Android / i.MX RT Support*	Linux / Android / selected MCUs	ESP-IDF by Espressif Arduino IDE
CERTIFIED ANTENNA	Integrated chip / Terminal (via bottom pad)	W602-1C: Integrated chip W602-1B: Bottom Pad	W602-2C: Integrated chip W602-2B: Bottom Pad	Via bottom pad: chip / (Flex)PCB / Terminal	Bottom Pad	Integrated chip
REGULATORY CERTIFICATIONS	CE RED, FCC, ISED	CE RED, FCC, ISED, MIC, RCM*	CE RED, FCC, ISED, MIC, RCM*	CE RED, FCC, ISED, MIC, RCM	CE RED, FCC, ISED, RCM, MIC*	CE RED, FCC, ISED
SIZE [mm]	24.0 x 12.0 x 2.8	W602-1C: 15.3 x 8.8 x 1.8 W602-1B: 10.0 x 8.8 x 1.8	W602-2C: 15.3 x 8.8 x 1.8 W602-2B: 10.0 x 8.8 x 1.8	15.3 x 12.0 x 2.5	14.0 x 9.8	24.0 x 13.0 x 3.1
RX SENSITIVITY [dBm]	-98 @ 1M-DSSS	-99	-99	-98 @ 1M 802.11b	-99	-97 @ IEEE 802.11b
TX POWER (MAX.) [dBm]	+16 @ IEEE 802.11b	+20	+20	+17 @ IEEE 802.11ax	+20	+19.8 @ IEEE 802.11b
POWER SUPPLY [V]	3.3 with PMIC (88PG823) 1.1, 1.8, 2.2, 3.3 without PMIC	3.3 and 1.8	3.3 and 1.8	1.8 and 3.3	1.8 and 3.3 - 5	3.0 - 3.6
CURRENT CONSUMPTION	Tx: 320mA @ 11Mb/s Rx: 60mA @ 11Mb/s	Tx: 92mA @ 802.11ax 2.4GHz Rx: 62mA @ 802.11ax 2.4GHz	Tx: 92mA @ 802.11ax 2.4GHz Rx: 62mA @ 802.11ax 2.4GHz	Tx: 192mA @ 802.11ax, 5GHz Rx: 180mA @ 802.11ax, 5GHz	Tx: 370mA @ 802.11ax 6GHz Rx: 59mA @ 802.11ax 6GHz	Tx: 190mA, 3.3V @ 19.5 dBm Rx: 63mA, 3.3V @ 1 Mb/s
SLEEP MODE CURRENT	Power Down Mode: 150µA	Power Down Mode: 12uA	Power Down Mode: 12uA	Power Down Mode: 190uA	Power Down Mode: 100uA	Deep sleep mode <100 µA
INTERFACES	GPIO, SDIO 3.0, HS UART, PCM	SDIO, SPI, UART	SDIO, SPI, UART	SDIO 3.0, HS UART, SPI, I²S/PCM	PCIe2, UART, I2S, SDIO3	GPIO, UART, SPI, I2C, I2S, RMT, PWM, USB, LCD, ADC & DAC
OPERATING TEMP. [°C]	-30 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85
PART NUMBER	ENWF9408A1EF (with PMIC) ENWF9408A2EF (without PMIC)	ENWF9211A1KF (PAN W602-1C) ENWF9211C1KF (PAN W602-1B)	ENWF9215A1KF (PAN W602-2C) ENWF9215C1KF (PAN W602-2B)	ENWF9501C1KF ENWF9511C1KF (incl. IEEE® 802.15.4)	ENWF9521C1KF (Bottom Pad)	ENW49D01A1KF (4MB Flash / 2MB RAM) ENW49D02A1KF (1MB Flash)
EVALUATION KIT	ENWF9408AVEF (mSD Dongle) ENWF9408AMEF (M.2 EVB)	ENWF9215AMKF (W602-2C M2) ENWF9215CMKF (W602-2B M2)	ENWF9215AMKF (W602-2C M2) ENWF9215CMKF (W602-2B M2)	ENWF9501CMKF (PAN9019 M2E EVD) ENWF9511CMKF (PAN9019A M2E EVD)	ENWF9521CMKF (W601-1B M2)	ENW49D01AZKF (EVB 4 MB Flash, 2 MB RAM)
STATUS	Mass Production	In Development	In Development	Mass Production	Announcement	Mass Production

*Planned