## WIRELESS CONNECTIVITY
### Product Leaflet

### Bluetooth® Low Energy

<table>
<thead>
<tr>
<th>SERIES</th>
<th>PAN1740A</th>
<th>PAN1762</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATUS</td>
<td>Mass Production</td>
<td>Mass Production</td>
</tr>
<tr>
<td>PART NUMBER</td>
<td>ENW1852A1KF</td>
<td>ENW1853A1KF</td>
</tr>
<tr>
<td>RF CATEGORY</td>
<td>Bluetooth® 5.0</td>
<td>Bluetooth® 5.0</td>
</tr>
<tr>
<td>SOFTWARE &amp; DRIVER</td>
<td>SDK by Dialog</td>
<td>SDK by Toshiba</td>
</tr>
<tr>
<td>INTEGRATED CIRCUIT</td>
<td>DA14585</td>
<td>TC35680</td>
</tr>
<tr>
<td>SIZE [mm]</td>
<td>9.0 x 9.5 x 1.8</td>
<td>15.6 x 8.7 x 1.9</td>
</tr>
<tr>
<td>RX SENSITIVITY [dBm]</td>
<td>-93 @ 1MB/s</td>
<td>-95 @ 1MB/s</td>
</tr>
<tr>
<td>TX POWER [MAX.] [dBm]</td>
<td>+0</td>
<td>+8</td>
</tr>
<tr>
<td>POWER SUPPLY [V]</td>
<td>2.2 to 3.3</td>
<td>1.9 to 3.6</td>
</tr>
<tr>
<td>POWER CONSUMPTION</td>
<td>Tx: 4.9mA, 3V @ 0dBm Rx: 4.9mA, 3V</td>
<td>Tx: 5.2mA, 3V @ 0dBm Rx: 5.1mA, 3V</td>
</tr>
<tr>
<td>SLEEP MODE CURRENT</td>
<td>Sleep Mode (Full RAM Retention): 4µA Deep Sleep Mode: 520nA</td>
<td>Sleep Mode (Full RAM Retention): 2.5µA Deep Sleep Mode: 50nA</td>
</tr>
<tr>
<td>INTERFACES</td>
<td>GPIO, UART, SPI+, I2C, ADC, 3-axis QD</td>
<td>GPIO, UART, SPI, I2C, ADC, PWM, Wake-Up Inputs</td>
</tr>
<tr>
<td>MICROCONTROLLER AND MEMORY</td>
<td>ARM® Cortex®-M0 96kB SRAM, 64kB OTP</td>
<td>ARM® Cortex®-M0 512kB RAM, 128kB Flash BT Stack in ROM</td>
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<tr>
<td>OPERATING TEMP. [°C]</td>
<td>-40 to +85</td>
<td>-40 to +85</td>
</tr>
<tr>
<td>EVALUATION KIT</td>
<td>ENW1852AXKF (Dongle)</td>
<td>ENW1853AXKF (Dongle Kit)</td>
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</table>

### Bluetooth® LE & IEEE® 802.15.4

<table>
<thead>
<tr>
<th>SERIES</th>
<th>PAN1780</th>
<th>PAN4420</th>
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</thead>
<tbody>
<tr>
<td>STATUS</td>
<td>Pre-Production</td>
<td>Mass Production</td>
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<tr>
<td>PART NUMBER</td>
<td>ENW1854A1KF</td>
<td>ENW1854A3KF (PAN1780AT)</td>
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<tr>
<td>RF CATEGORY</td>
<td>Bluetooth® 5.0, IEEE® 802.15.4 &amp; NFC-A</td>
<td>Bluetooth® Low Energy 4.2 &amp; IEEE® 802.15.4</td>
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<tr>
<td>SOFTWARE &amp; DRIVER</td>
<td>SDK by Nordic AT Command by Panasonic</td>
<td>SDK by NXP</td>
</tr>
<tr>
<td>INTEGRATED CIRCUIT</td>
<td>nRF52840</td>
<td>KW41Z</td>
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<tr>
<td>SIZE [mm]</td>
<td>15.6 x 8.7 x 2.0</td>
<td>15.6 x 8.7 x 1.9</td>
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<tr>
<td>RX SENSITIVITY [dBm]</td>
<td>-95 @ 1MB/s</td>
<td>-103 @ 125kB/s</td>
</tr>
<tr>
<td>TX POWER [MAX.] [dBm]</td>
<td>+8</td>
<td>+3.5</td>
</tr>
<tr>
<td>POWER SUPPLY [V]</td>
<td>1.7 to 5.5</td>
<td>1.8 to 4.2</td>
</tr>
<tr>
<td>POWER CONSUMPTION</td>
<td>Tx: 4.8mA, 3.3V @ 0dBm Rx: 4.8mA, 3.3V</td>
<td>Tx: 6.1mA, 3.6V @ 0dBm Rx: 6.8mA, 3.6V</td>
</tr>
<tr>
<td>SLEEP MODE CURRENT</td>
<td>Wake-up: RTC: 1.5µA Off Mode: 0.4µA</td>
<td>Low Power Mode: 0.67µA</td>
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<tr>
<td>INTERFACES</td>
<td>GPIO, UART, SPI+, I2C, I2S, ADC, PDM, PWV, NFC-A, USB2.0</td>
<td>UART, SPI, I2C, ADC &amp; DAC, TSI</td>
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<tr>
<td>MICROCONTROLLER AND MEMORY</td>
<td>ARM® Cortex®-M0 96kB SRAM, 64kB OTP</td>
<td>ARM® Cortex®-M4F 256kB RAM, 1MB Flash</td>
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<tr>
<td>OPERATING TEMP. [°C]</td>
<td>-40 to +85</td>
<td>-40 to +85</td>
</tr>
<tr>
<td>EVALUATION KIT</td>
<td>ENW1854AXKF (Dongle)</td>
<td>ENW1854AXKF (Dongle Kit)</td>
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</tbody>
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**Industrial IoT**

**Smart Home/Building**

**Beacons**

**Medical Devices**

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**Wireless Connectivity**

**Product Leaflet**

Panasonic Wireless Connectivity solutions encompass a wide range of technologies, with a focus on helping design engineers increase their product’s speed-to-market.

The product portfolio covers all of today’s latest communication protocols with ready-to-use modules for Bluetooth® Low Energy and Classic. Panasonic offers Bluetooth® Low Energy in combination with all important short range RF technologies: Wi-Fi® (2.4GHz & 5GHz), IEEE® 802.15.4 and NFC-A.

Engineered with design simplicity in mind, Panasonic’s Wireless Solutions allow design engineers to quickly extend wireless communication into their feature set.

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<th>STATUS</th>
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<tbody>
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<td>PAN1026A</td>
<td>ENW989376KF</td>
<td>Mass Production</td>
<td>ENW989376KF</td>
<td>Mass Production</td>
<td>ENW989376KF</td>
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<td>PAN1326C2</td>
<td>ENV923A5KF</td>
<td>Mass Production</td>
<td>ENV923A5KF</td>
<td>Mass Production</td>
<td>ENV923A5KF</td>
<td>Mass Production</td>
</tr>
</tbody>
</table>

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**SERIES**

**RF CATEGORY**

- **Bluetooth® Dual Mode**
  - PAN1026A: Bluetooth® 4.2 Dual Mode (BR, Bluetooth® LE)
  - PAN1326C2: Bluetooth® 4.2 Dual Mode (BR, EDR, Bluetooth® LE)
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: Wi-Fi® Radio 2.4 GHz & 5.0 GHz 802.11 a/b/g/n & Bluetooth® 5.0 (BR, EDR, Bluetooth® LE)
- **Wi-Fi®**
  - PAN9420: Wi-Fi® Embedded 802.11 b/g/n

**SOFTWARE & DRIVER**

- **Bluetooth® Dual Mode**
  - PAN1026A: HCI (SPP & GATT)
  - PAN1326C2: HCI
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: Linux Drivers by Marvell
- **Wi-Fi®**
  - PAN9420: AT Command by Panasonic

**INTEGRATED CIRCUIT**

- **Bluetooth® Dual Mode**
  - PAN1026A: TC35661-551
  - PAN1326C2: CC2564C
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: 88MV977
- **Wi-Fi®**
  - PAN9420: 88MV300

**SIZE [mm]**

- **Bluetooth® Dual Mode**
  - PAN1026A: 15.6 x 8.7 x 1.9
  - PAN1326C2: 9.0 x 9.5 x 1.8
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: 17.5 x 10.0 x 2.6
- **Wi-Fi®**
  - PAN9420: 29.0 x 13.5 x 2.66

**RX SENSIVITY [dBm]**

- **Bluetooth® Dual Mode**
  - PAN1026A: -90 @ 1MB/s
  - PAN1326C2: -90 @ 1MB/s
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: -98 @ 1MB/s
- **Wi-Fi®**
  - PAN9420: -97 @ 1MB/s

**TX POWER [MAX.] [dBm]**

- **Bluetooth® Dual Mode**
  - PAN1026A: +4
  - PAN1326C2: +8
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: +17 @ IEEE 802.11b
- **Wi-Fi®**
  - PAN9420: +16 @ IEEE 802.11b

**POWER SUPPLY [V]**

- **Bluetooth® Dual Mode**
  - PAN1026A: 2.7 to 3.6
  - PAN1326C2: 1.7 to 4.8
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: 1.8 to 3.3
- **Wi-Fi®**
  - PAN9420: 3.0 to 3.6

**POWER CONSUMPTION**

- **Bluetooth® Dual Mode**
  - PAN1026A: ACL, DH1: 46mA, 3.3V
  - PAN1326C2: 40mA, 3.3V @ 8dBm
  - 20mA, 3.3V
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: Tx: 175mA, 1.8V @ 802.11b @ 11Mb/s
  - Rx: 65mA, 1.8V @ 802.11b
- **Wi-Fi®**
  - PAN9420: Tx: 170mA, 3.3V @ 802.11b @ 11Mb/s
  - Rx: 75mA, 3.3V @ 802.11b

**SLEEP MODE CURRENT**

- **Bluetooth® Dual Mode**
  - PAN1026A: Sleep Mode: 2mA
  - PAN1326C2: Deep Sleep Mode: 105μA
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: Power Down Mode: 150μA
- **Wi-Fi®**
  - PAN9420: Power Down Mode: <1mA

**INTERFACES**

- **Bluetooth® Dual Mode**
  - PAN1026A: GPIO, UART, PCM
  - PAN1326C2: GPIO, UART, PCM
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: SDIO 3.0, HS UART, PCM
- **Wi-Fi®**
  - PAN9420: 2x UART

**MICROCONTROLLER AND MEMORY**

- **Bluetooth® Dual Mode**
  - PAN1026A: (Dongle Kit)
  - PAN1326C2: (Dongle Kit)
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: (Dongle Kit)
  - PAN9420: (i.MX)
- **Wi-Fi®**
  - PAN9420: (EMK)
  - PAN9420: (Arduino Shield)

**OPERATING TEMP. [°C]**

- **Bluetooth® Dual Mode**
  - PAN1026A: -40 to +85
  - PAN1326C2: -40 to +85
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: -30 to +85
- **Wi-Fi®**
  - PAN9420: -40 to +85

**EVALUATION KIT**

- **Bluetooth® Dual Mode**
  - PAN1026A: ENW98937AXKF (Dongle)
  - PAN1026A: ENW98937AUKF (Dongle Kit)
  - PAN1326C2: ENW98919AYKF (EMK)
- **Wi-Fi® & Bluetooth® LE**
  - PAN9026: ENWF923A1EF (Dongle Kit)
  - PAN9026: ENWF923A1EF (i.MX)
- **Wi-Fi®**
  - PAN9420: ENW94901AYKF (EMK)
  - PAN9420: ENW94901AXEF (Arduino Shield)

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- 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.
- Qualification of all products: CE, FCC, IC, Bluetooth® QDID if applicable.
- Different software/profile options available.