

WIRELESS CONNECTIVITY FOR
WEARABLES AND SMART
PRODUCTS BY ENDRICH



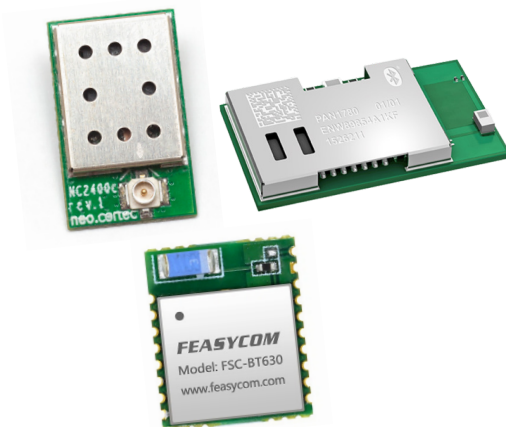
ENDRICH CONNECTIVITY MODULE SUPPLIERS

Wireless data transfer like audio, video, control messages or monitoring the status of devices are all possible through different protocols in different wireless technologies. At endrich we provide the most important solutions for wearable applications and smart products.

We at endrich have a strong focus on smart and wearable products. The high demands of consumers are constantly changing, so products and ideas have to be constantly developed further. There are several limitations especially for smart products or wearables where special requirements are needed. These limitations may be just in size or form factor but can also be related to specific technologies or protocols or even partly or fully customized products. Our strong relations with our suppliers, coupled with our competence in logistics, enable us to take a holistic approach in delivering the best-fitting solutions. This, in turn, allows you to focus on your core strengths.

APPLICATIONS:

- Headphones & hearing aids
- Smart watches
- Smart glasses
- Wireless thermostats
- Wireless remote smart home



Shenzhen Feasycom Technology Co., Ltd.:

- Founded 2013 in Shenzhen
- Wide range of product lines for WiFi, RFID BLE Mesh, Audio and Direction finding
- One-stop overall solution services
- 24/7 technical support

Panasonic Industry Europe GmbH:

- Established in 1918 – European product & support
- Located in Lüneburg, Germany with production in Slovakia
- Best support for WiFi, BLE mesh, audio and direction finding
- Built to last: <1 ppm failure rate

Neocortec A/S:

- Based in Copenhagen – Denmark
- Patented software protocol with no additional costs
- Extremely reliable AD-HOC mesh network
- Ultra-low power consumption & easy integration

Module Types:

- Bluetooth modules (Classic, LE up to v5.3)
- WLAN modules (IEEE 802.11 , b, g, n, ac, ax)
- Bluetooth and WiFi combo modules
- ISM band modules

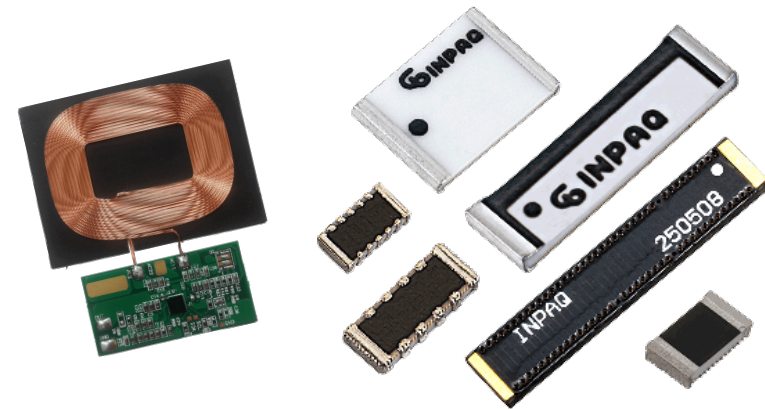
ENDRICH CONNECTIVITY ANTENNA SUPPLIERS

2J Antennas, s.r.o.:

- Located in Slovakia since 2002
- Up-to-date production facility and measurement chambers
- Competitive pricing & short delivery time
- Covering all common wireless technologies with > 500 antennas off the shelf

Inpaq Technology Co., Ltd.:

- Established in 1998 in Taiwan
- More than 5 Factories and 22 measurement chambers
- Deeply customized or standard solutions for antennas and WPC
- Covering all common wireless technologies



Antenna Types:

- Ceramic Patch
- Helix
- SMD type (Ceramic, LDS, FR4)
- External antennas (Screw mount, adhesive mount, magnetic mount, ...)
- Metal stamp
- Flexible PCB type
- LDS customized with multiple technologies

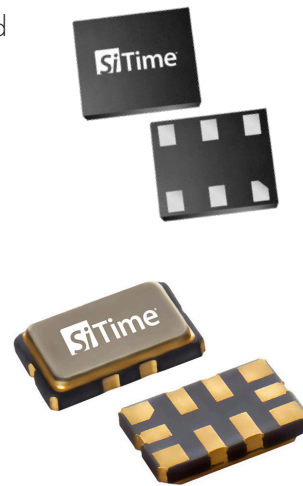
Wireless Power Charging & NFC:

- Coils
- Coils + Ferrite
- Coils + Ferrite + customized plastics molding

ENDRICH CONNECTIVITY TIMINGS SUPPLIERS

SiTime Corporation:

- Biggest MEMS oscillator manufacturer in the world
- Head office in USA
- Worldwide support
- MEMS oscillators (XO, TCXO, OCXO)
- MEMS RTC
- Small footprint 1.2 mm² CSP
- Ultra-low power from <1 μ A
- Robust clocking solutions
- Low jitter < 0.5 ps RMS



Mobile & IoT		Communications & Enterprise			
μPower 32 kHz TCXO 1.2 mm²	μPower TCXO 1.2 mm²	Low Jitter Oscillators	DCXO In-System Programmable	TCXO/ VTCXO/ DCTCXO	OCXO
SIT1552 $\pm 5, 10, 20$ ppm	SIT1576* ± 5 ppm 1 Hz-2.5 MHz 2.5 ns Jitter**	SIT8208/9* 1-220 MHz 0.5 ps Jitter**	SIT3907* 1-220 MHz $\pm 0.06-0.1$ ppm -40 to +105°C	SIT3388/9* 1-220 MHz $\pm 0.06-0.1$ ppm -40 to +105°C	SIT5711/2 1-220 MHz $\pm 5, \pm 8$ ppb -40 to +85°C
SIT1566/8 $\pm 5, 9$ ppm 2.5 ns Jitter**	μPower Oscillators 1.2 mm²	SIT9120 25-27.5 MHz 0.6 ps Jitter**	SIT3521/2* PCSP1 1-220 MHz 1-725 MHz 0.21 ps Jitter**	SIT3366/7* 1-220 MHz $\pm 0.1-0.25$ ppm -40 to +105°C	DCOXO
SIT1580* ± 3 ppm 2.5 ns Jitter**	SIT1569* 1 Hz-462.5 kHz ± 50 ppm	SIT9121/2* 1-625 MHz 0.6 ps Jitter**	VCKO	SIT1555 1-40 MHz ± 0.5 ppm -40 to +105°C	SIT5721/2 1-220 MHz $\pm 5, \pm 8$ ppb -40 to +85°C
μPower 32 kHz Oscillators	SIT1579* 1 Hz-2.5 MHz ± 50 ppm	SIT9365 25-325 MHz 0.21 ps Jitter**	SIT3807 1.5-45 MHz	SIT1566/7* 1-220 MHz $\pm 0.5-2.5$ ppm -40 to +105°C	
SIT1532/3 1508 & 2012	SIT1581* 1 Hz-2.5 MHz $\pm 30, 50$ ppm 2.5 ns Jitter**	SIT9366/7* 1-725 MHz 0.21 ps Jitter**	SIT3808/9* 1-220 MHz	SIT5021/2* 1-625 MHz ± 5 ppm	
SIT1572 ± 50 ppm 1508 2.5 ns Jitter**	SIT1534 1 Hz-32 kHz 2012 Option		SIT3372/3* 1-725 MHz $\pm 10-50$ ppm 0.21 ps Jitter**		
SIT1573 ± 100 ppm 1508	SIT8021* 1-20 MHz 60-280 μ A				

Citizen Finedevice CO.,LTD.:

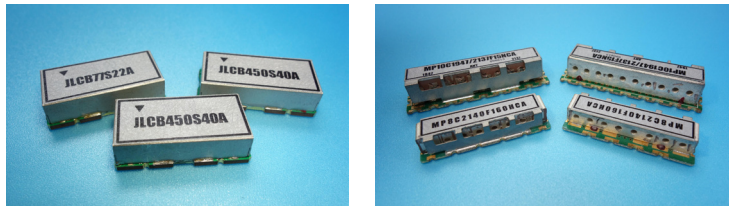
- Headquarters in Japan
- Crystal Units expert since 60+ years
- Integrated production system from crystal chip to finished products in one house. (full production flow)
- High precision up to ± 5 ppm
- Small package down to 1.6 x 1mm
- Broadest product portfolio of kHz / tuning fork quartzes

Model	Package	Dimension (Max.mm)	Frequency range (kHz)	Operating Temperature Range	CM130				
CM315D							L:7.0 W:1.5 H:1.4	32.768	-40°C ~ +85°C
CM315DL		L:3.2 W:1.5 H:0.9	32.768	-40°C ~ +85°C	CM415		L:4.1 W:1.5 H:0.9	32.768	-40°C ~ +85°C
CM315H				-40°C ~ +125°C					
CM315E		L:3.2 W:1.5 H:0.9	32.768	-40°C ~ +85°C	CM2012H		L:2.0 W:1.2 H:0.6	32.768	-40°C ~ +85°C
CFS-145		Φ :1.5 H:5.1	32.768	-20°C ~ +70°C	CM1610H		L:1.6 W:1.0 H:0.5	32.768	-40°C ~ +85°C
CFS-206		Φ :2.0 H:6.2	32.768	-20°C ~ +70°C	HC-49/ U-S		L:11.5 W:4.66 H:3.5	3.5 ~ 50.0	-20°C ~ +70°C
CFV-206		Φ :2.0 H:6.1	32.768	-40°C ~ +85°C	HCM49		L:11.4 W:4.7 H:4.3	3.5 ~ 50.0	-40°C ~ +85°C
CMR200T		Φ :2.0 H:6.1	32.768	-40°C ~ +85°C	CS325S		L:3.2 W:2.5 H:0.6	12.0 ~ 54.0	-40°C ~ +85°C
CMJ206T		L:8.6 W:2.7 H:2.4	32.768	-40°C ~ +85°C					

ENDRICH CONNECTIVITY TIMINGS SUPPLIERS

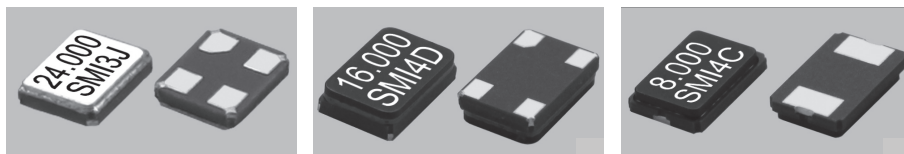
Chequers Electronic (China) Ltd.:

- Chequers Electronic (China) Ltd.:
- Headquarters in Hong Kong
- High quality quartzes, oscillators, resonators, duplexers and filters
- Free samples and circuit design verification
- Competitive pricing



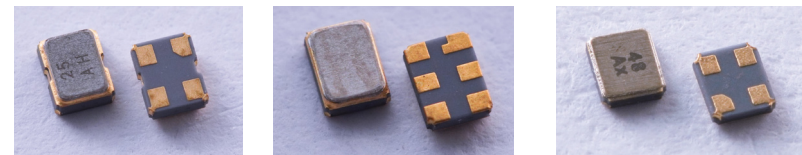
SMI INC.:

- Head office in Japan
- Specialized in crystal quartzes and oscillators



Tai-Saw Technology Co., LTD.:

- Headquarters Taiwan (est. 1997)
- SAW, TC-SAW / BAW, FBAR devices:
RF filter, IF filter, resonator, duplexer, sensor
- Oscillator : XO, VCO, VCTCXO, VCXO, TCXO, OCXO
- Design, modeling, processing & handling, RF circuit design, RF testing



OUR BENEFITS:

- Local support
- Free consulting for best wireless technology selection
- Rapid prototyping, layout review and measurements
- Standard products vs. customized solutions
- Holistic system solutions for wide range of products
- Various Logistics arrangements possible
- Long lifecycles and high-quality standards

Endrich is a trusted partner since 1976