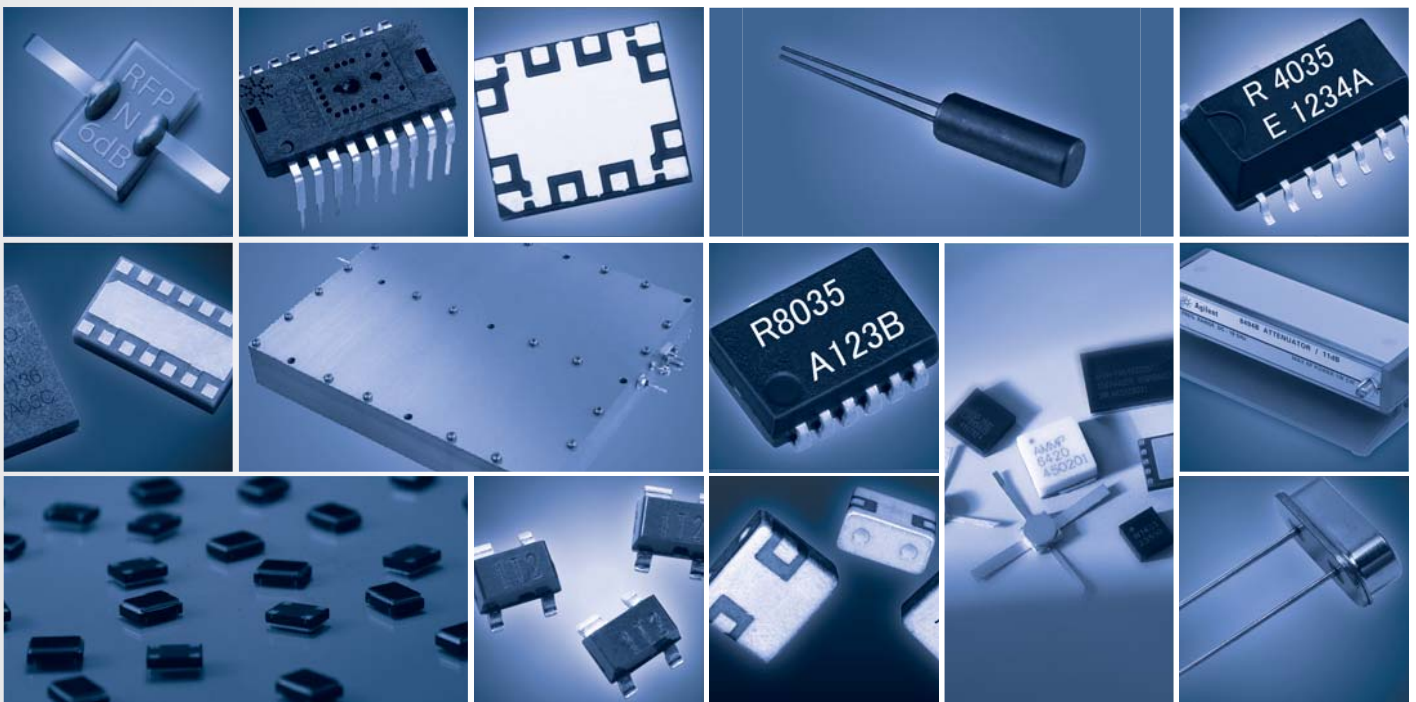


# RF and Frequency control

European leader in advanced  
technology solutions



Get in touch:

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consult. design. integrate.

## About Acal BFi

Acal BFi are Europe's leading provider of advanced technology solutions, operating in 12 countries throughout Europe.

We offer products across specialist technology areas, each with a dedicated pan-European sales team. Customers use our design-led expertise and expert consultation services to find the best technology solutions for their design, prototype and production needs.

## Get in touch

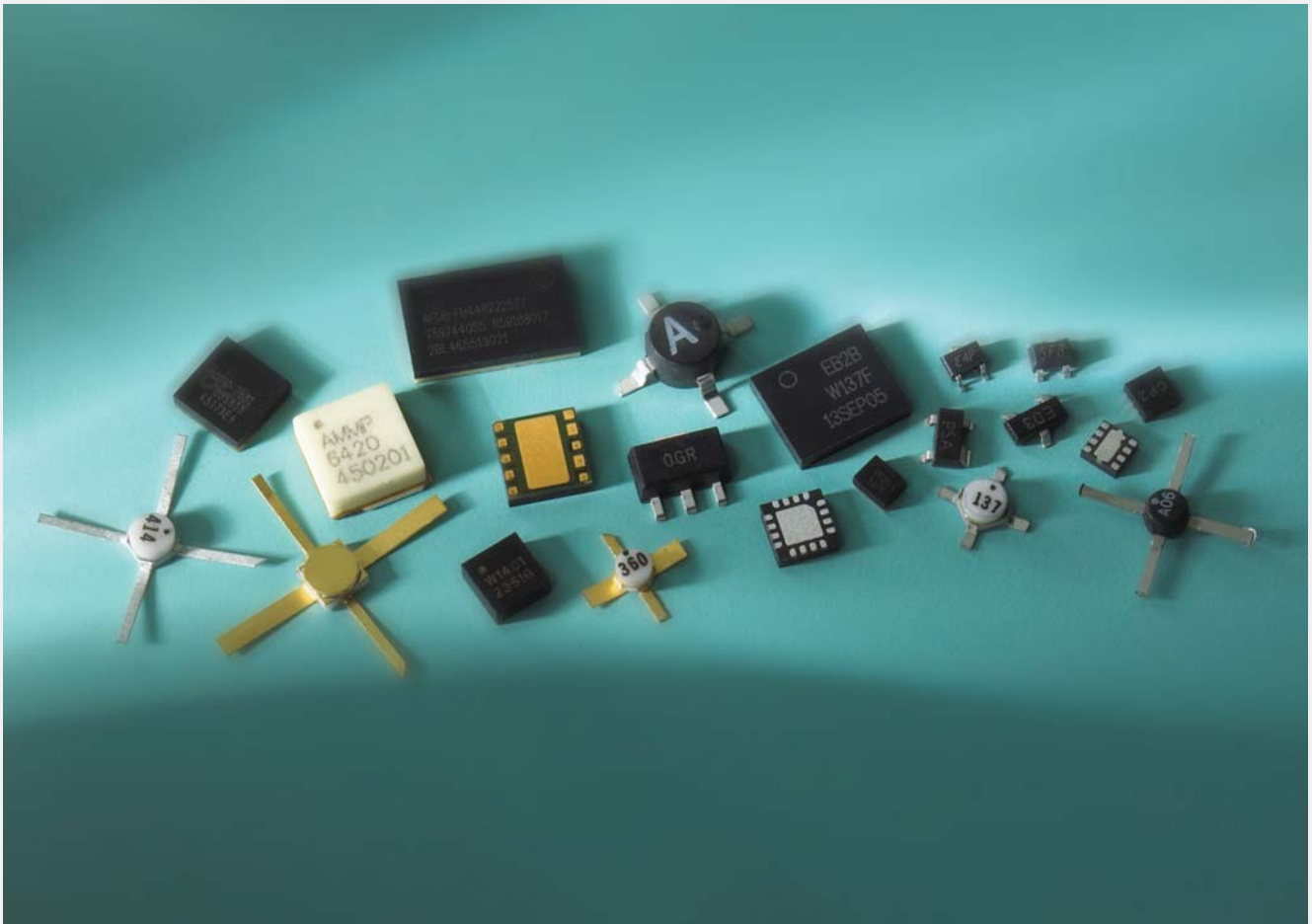
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## Products and support

- |                       |                                 |
|-----------------------|---------------------------------|
| Cables and Connectors | Electromechanical               |
| Embedded computing    | Fibre optics                    |
| Imaging               | M2M and Wireless modules        |
| Magnetic components   | Photonics                       |
| Power                 | <b>RF and Frequency control</b> |
| Semiconductors        | Sensors                         |



## The best RF solutions for your business

We offer our customers local technical advice, support and guidance, ensuring you have access to the best technical solution for your needs. Our leading product portfolio means we have access to the latest components as well as anticipated product releases, allowing us to give you the right guidance every time. We have the experience to support both established and emerging markets, matching our comprehensive product range to the continually evolving needs of the RF segment.

## Rely on our RF and microwave technical experts to ensure fast, dependable support

With an industry reputation as the 'go-to' specialist for RF and microwave components, we offer a service that is based on in-depth product knowledge, comprehensive understanding of the market and solid relationships with our customers. We are now able to offer even more expertise with the launch of our European Wireless Technical Competence Centre.

**consult. design. integrate.**

# Introducing the Acal BFi European Wireless Technical Competence Centre

The Acal BFi European Wireless Technical Competence Centre provides consultancy, turnkey design, and manufacturing to assist the successful design of wireless solutions across Europe.

Established in 2010, the Wireless Technical Competence Centre is situated in Zittau, Germany, and is home to our multi-discipline design team, including RF, hardware (analogue and digital) and software engineers.

The team have the expertise to provide:

- end-to-end project support
- complete system design
- prototype realisation and development, and
- manage third-party-contract manufacturers.



## RF filter design service

Our custom RF filter design service delegates the form, fit and functional design responsibility to our experienced engineers and supplier partnerships, allowing you to get on with the rest of your project.

### Designing to your requirements

- **In-house design experts** – our RF development teams draw on more than 25 years' experience in supporting customised RF filter solutions for a diverse range of applications, from consumer tracking to high-performance military radar solutions.
- **Shorter development cycles** – first article samples are typically available within a 4-6 week lead time.
- **Wide range of filter technologies** – sourced from industry-leading partners.
- **Wide range of packaging** – ensuring the most cost-effective filter design for the end environment.
- **Lower total cost of ownership** – your custom filter solution is supplied complete, tested, certified and ready to install in your system, reducing assembly time and stock-control problems.
- **Reliability** – all designs are manufactured in facilities accredited with ISO9001 and fully tested to pre-agreed parameters, giving you complete confidence.

## Key partners overview

Acal BFi work with the leading manufacturers in their field, offering you a complete solution for your RF and frequency control needs.



**ACT** (Advanced Crystal Technology) are the leading supplier of frequency control products.



**Anaren** are a major innovator of both standard and custom microwave and RF technology components.



**APA Wireless** custom design and manufacture high-performance VCOs, coaxial resonator oscillators, PLL synthesisers, non-ceramic stripline filters, and YIG replacement oscillators.



**Avago Technologies'** RF and microwave component innovations have been instrumental in driving the wireless revolution.



**Entropic** have a diverse portfolio of connectivity and system-on-a-chip (SoC) solutions that reliably and securely deliver and process digital video and audio content into and throughout the home.



**Epson** are the world's largest producer of high-quality, crystal-based electronic devices and applied technologies.



**Johanson Technology** are the leading provider of high-frequency ceramic solutions for cellular, WLAN, Bluetooth, RF/microwave, millimetre wave, as well as custom high-frequency ceramic solutions.



**Keysight Technologies** are a world-class manufacturer of millimetre-wave and microwave MMICs which provide superior performance over a wide bandwidth from DC to 50GHz.



**Power Module Technology** are a world leader in the development, manufacturing and supply of advanced minimised GPS antenna-modules.



**Sangshin** are a leading manufacturer of ceramic resonators, filters, duplexers, VCOs and PLL modules.



**Skyworks** are an innovator of high-performance analog semiconductors.



**Soshin** manufacture and supply a wide range of electronic components such as LTCC filters, hybrids, baluns, couplers, capacitors and unique LTCC process.



**Taitien** are a leading manufacturer of quartz-based frequency-control products, including crystals and oscillators.



**Tai-Saw (TST)** are recognised as the leading SAW (surface acoustic wave) device supplier in Taiwan, as well as the key OEM/ODM supplier of SAW products in the world.



**Toshiba** are a leading supplier of high-performance gallium nitride (GaN) and gallium arsenide (GaAs) microwave devices that operate in S, C, X, Ku and Ka frequency bands.

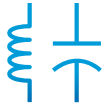


**Transcom** are experts in the design and mass production of high-performance GaAs devices for both high-power and low-noise applications.

# Key technologies and suppliers

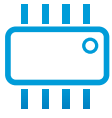
The Acal BFi RF and frequency control portfolio

	<h3>Amplifiers</h3>	<ul style="list-style-type: none"> <li>Gain block and driver</li> <li>Low noise (LNA)</li> <li>Modular PA (Pallett)</li> <li>Power amplifiers</li> <li>Variable gain (VGA)</li> <li>WiFi / WiMax</li> </ul>		 		
	<h3>Attenuators</h3>	<ul style="list-style-type: none"> <li>Digital</li> <li>Fixed attenuator pad</li> <li>Variable</li> </ul>				
	<h3>Baluns</h3>	<ul style="list-style-type: none"> <li>High power</li> <li>Chip</li> <li>SMT</li> <li>Connectorised</li> </ul>				
	<h3>Chip antennas</h3>	<ul style="list-style-type: none"> <li>Cellular</li> <li>GPS</li> <li>ISM</li> <li>Bespoke solutions</li> </ul>				
	<h3>Couplers / dividers</h3>	<ul style="list-style-type: none"> <li>Digital</li> <li>Fixed attenuator pad</li> <li>Variable</li> </ul>				
	<h3>Diodes</h3>	<ul style="list-style-type: none"> <li>Detector</li> <li>Limiter</li> <li>PIN</li> <li>Schottky</li> <li>Varactor</li> </ul>				
	<h3>Doublers / multipliers</h3>	<ul style="list-style-type: none"> <li>High frequency</li> <li>Packaged</li> <li>Bare die</li> </ul>				
	<h3>Filters</h3>	<ul style="list-style-type: none"> <li>Band pass</li> <li>Duplexer</li> <li>Low pass</li> </ul>				
	<h3>Front-end modules</h3>	<ul style="list-style-type: none"> <li>Cellular</li> <li>Smart energy / home Automation</li> <li>GPS / GNSS</li> <li>WiFi</li> <li>WiMAX</li> </ul>				
	<h3>Mixers, demodulators and modulators</h3>	<ul style="list-style-type: none"> <li>Direct quadrature</li> <li>Diversity / down converter</li> <li>Single channel mixer</li> <li>Up / down converter mixer</li> </ul>				



### RF capacitors and inductors

- Capacitors
- Inductors



### RF ICs

- Chip sets
- Media processors
- DBS / set-top box



### Switches

- High power
- High throw count
- LNB / DBS matrix switches
- Antenna diversity
- SPST / DT / 3T / 4T



### Transistors

- Power
- Small signal



### Oscillators and frequency control

- Ceramic resonators
- Crystals
- VCO and OCXO
- Oscillators
- PLL
- Real time clock
- TCXO and VCTCXO
- Watch crystals



	Amplifiers	Attenuators	Baluns	Chip antennas	Couplers and dividers	Diodes	Doublers and multipliers	Filters	Front-end modules	Mixers, modulators and demodulators	RF capacitors	RF inductors	RF ICs	Switches	Transistors	Oscillators and frequency control
ACT								•								•
Anaren		•	•		•		•			•						
APA Wireless																•
Avago Technologies	•	•				•		•	•	•			•		•	•
Entropic													•			
Epson																•
Johanson Technology			•	•	•			•			•	•	•			
Keysight Technologies	•												•	•		
Power Module Technology	•															
Sangshin		•		•				•								•
Skyworks	•	•			•	•	•		•	•	•		•	•	•	•
Soshin			•		•			•			•					
Taitien																•
Tai-Saw (TST)								•								•
Toshiba	•														•	
Transcom															•	



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