



## TEST CAPABILITIES

In addition to manufacturing sites, IQD has a dedicated test facility which supports customer design enquiries. This is located in the UK alongside the main warehouse.

The aim of this test facility is to help customers with their projects right from initial design, through to volume production, with full testing and problem-solving where required. With IQD's extensive expertise in frequency products and various testing capabilities we strive to provide a service that is more than you expect.

Various types of products can be measured, ranging from standard crystals and oscillators all the way up to high-end technology rubidium oscillators.

IQD's test facility is used for both IQD and Würth Elektronik customers.

## GENERAL LABORATORY SETUP

With a total floor area covering around 80 m<sup>2</sup> the lab consists of four rooms: electrical testing room, climatic testing room, mechanical testing room and R&D room.

- Temperature controlled 25 °C ± 2 °C
- Humidity monitored between 45% to 75%
- ESD controlled in accordance with BS EN 61340-5-1
- All equipment calibrated to traceable standards
- Frequency reference with  $<1 \times 10^{-12}$  frequency accuracy
- Test fixtures available to cover a range of IQD products for most of the test equipment
- Standard testing performed in accordance with the following:
  - BS EN 168000: Harmonized system of quality assessment for electronic components. Generic specification. Quartz crystal units
  - BS EN 169000: Harmonized system of quality assessment for electronic components. Generic specification. Quartz crystal controlled oscillators
  - AEC-Q200: Stress test qualification for passive components

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# CRYSTALS

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## TESTING CAPABILITY

In addition to standard laboratory network analysers, IQD has dedicated crystal measurement network analyser equipment which conforms to BE ES 60444 part 1 through to part 11.

IQD also has test fixtures to cover most crystals offered by IQD.

### Equipment

- Saunders and Associate 250B
- Kolinker KH1820

### Measurement capability

- Main crystal parameters:  
FL, FR, FS, C0, C1, CL, C0/C1, L, Q, trim, DLD,  
spurious, power, and more than 100 other crystal  
values and attributes

## CRYSTAL BEHAVIOUR OVER TEMPERATURE

IQD has three chambers dedicated to measuring crystal performance over temperature.

### Equipment

- X2 Sanders and Associates W2200
- Saunders and Associates 4220MR  
(chamber)

### Measurement capability

- The following can be measured over a range of -55  
to 150 °C:  
FL, FR, FS, C0, C1, CL, C0/C1, L, Q, trim, DLD,  
spurious, power, and more than 100 other crystal  
values and attributes

# OSCILLATORS

## TESTING CAPABILITY

IQD uses industrial specific equipment which has been designed in-house specifically for our range of SPXOs, VCXOs, TCXOs, OCXOs as well as disciplined OCXOs and rubidium oscillators.

### Equipment

- Power supply unit E3632a
- DMM 34461a
- Oscilloscope TDS5104
- Frequency counter 53230a

### Measurement capability

- Frequency
- Current draw
- Waveform parameters (rise and fall time, duty cycle, and more than 100 other waveform values and attributes)

## OSCILLATOR BEHAVIOUR OVER TEMPERATURE

IQD has three chambers dedicated to measuring oscillator performance over temperature.

### Equipment

- Saunders and Associates W2800
- Saunders and Associates 4220MR (chamber)

### Measurement capability

- Frequency
- Current draw
- Waveform parameters (rise and fall time, duty cycle, and more than 100 other waveform values and attributes)

## PHASE NOISE

Through many years of experience we have developed test fixtures that minimises the effect on phase noise.

### Equipment

- Agilent E5052B

### Measurement capability

- Phase Noise
- Phase Jitter

## SHORT TERM STABILITY

IQD has a number of frequency counters and appropriate software to measure short term stability, including:

### Equipment

- Pendulum CNT91
- Keysight 53230a

### Measurement capability

- TIE, MTIE, TDEV, ADEV, AVAR

# CRYSTALS & OSCILLATORS

## AGEING

IQD has dedicated equipment to measure the ageing effect of crystal and crystal oscillators.

### Equipment

- In-house developed systems for crystals, MHz oscillators, TCXO's & watch crystals
- Ageing system PRA2360

### Capability

- Frequency change over time
- Accelerated ageing

## BURN IN

IQD has a number of ovens used to offer a static burn in service to customers, which reduces the ageing effect seen in the application.

### Equipment

- Sanyo Gallenkemp OMT

### Capability

- Pre-ageing

## MECHANICAL STRESS ANALYSIS

IQD has the ability to perform the following mechanical tests:

- PCB Flex
- Termination strength
- Solderability
- Resistance to solder heat (reflow profiling)
- Fine and gross leak testing
- Optical inspection
- Dimensions checks

## TAPE AND REEL SERVICES

IQD can reel bulk product and also splice cut tape product.

### Equipment

- TM50 V-tech (makes complete reels)
- Splicer: joins two lengths of reel together or adds leader and follower to a tape

### Capability

- Re-reeling
- Tape splicing

## ADDITIONAL SERVICES / CAPABILITIES

In addition to the above highlights, IQD has various other equipment to support customer needs. Furthermore, samples as well as technical and application support are normally offered free of charge, as well as various seminars and webinars.

IQD has over 20 lab benches dedicated to support customers from design stage through to full production. As part of IQD's services, the team can evaluate customers PCBs, measure start-up time at specific temperatures, monitor long term frequency stability or measure sub ppb changes correlated with weather.

Together with existing equipment, IQD can create or adjust test fixtures for new requirements.

IQD's engineering and sales teams are happy to discuss other customer-specific testing requirements for specific applications and designs.

Please contact IQD for more information.