



PIM Testing with the Kaelus iPA 40 Watt Portable PIM Analyzer

Application Note

Introduction

Passive intermodulation (PIM) is a well-known problem in cellular systems. Downlink signals at the cell site mix at passive, non-linear junctions in the RF path, creating new signals at different frequencies to the original downlink signals. If the new signals fall in an operator's uplink band, they can elevate the noise floor and degrade system performance.

Commercial PIM analyzers have historically been designed to operate at tone levels of 20 watts (+43 dBm) per carrier. This power level was chosen in accordance with IEC 62037, the international standard for PIM testing on passive RF devices, and it has served the industry well.

Indeed, in the nearly 20 years since IEC 62037 was first published, the 20W standard has consistently proven itself effective in characterizing the linearity of RF devices and systems, even as cellular signals have evolved from relatively simple narrowband waveforms like AMPS and GSM, into the complex, wideband modulation schemes used in modern 4G LTE networks.

Despite the success of the 20W standard, situations can arise in site verification in which a 20W carrier level is not enough. This can be the case for when low level external PIM is below the noise floor of the spectrum monitor. The higher power levels of the transmitting tones will generate higher levels of PIM, allowing the spectrum monitor to measure the PIM levels.

With that in mind, Kaelus is pleased to announce the release of the iPA-0707D 40W Portable PIM Analyzer. The iPA-0707D 40W PIM analyzer offers all of the features and operating modes of previous iPA models, but with the maximum carrier power increased to 40W (+46 dBm).



iPA-0707D 40W Portable PIM Analyzer

Key Features of the iPA 40W Portable PIM Analyzer

A summary of the key features of the iPA 40W PIM analyzer is as follows:

- 40W (+46 dBm) maximum output power per carrier, able to be reduced to +30 dBm in steps of 1 dB
- Same size, weight, ruggedness as the Kaelus 20W iPA
- Same intuitive user interface as 20W iPA
- Compatible with Unify
- Same functionality as 20W iPA
- Compatible with Kaelus RTF module
- Compatible with Kaelus ACE Calibration Extender – allows users to self-calibrate their iPA on-site with minimal downtime

Refer to the iPA 40W Portable PIM Analyzer datasheet for detailed specifications.

External PIM Finder Measurement with the 40W iPA

As well as using the 40W iPA-0707 for standard PIM testing, the key benefit of the 40W iPA is to be able to measure low level External PIM with standard spectrum monitors. At 20W, the PIM level is below the Noise floor of the spectrum monitor, at 40W Tx tones the PIM level is large enough to be measured.

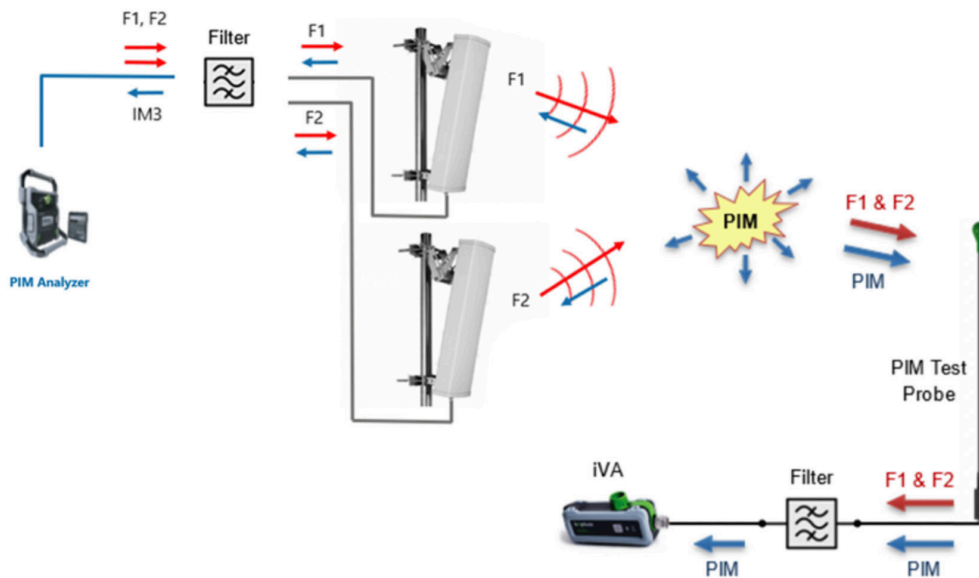


Diagram illustrating Kaelus PIM Finder principle of operation.

Refer to Kaelus App Note [Identification of External PIM sources with Kaelus PIm Finder](#) for further details on locating external PIM.

iPA-0707 Upgrade Option

An option is available for 20W iPA-0707 to be upgraded to 40W. The upgrade will be performed at a local service centre, primarily requiring a swapping in and out of the HPA.

An upgrade will take about a week, the unit will be returned as a 40W unit, with a new battery, full service and 12 months calibration.

Contact your local sales rep for further details.