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Spring-Mounted Measurement Adapter Saves Costs

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The mobile industry is under cost pressure. What can be done to reduce product cost beyond R&D and product design? Manufacturers have not fully tapped into savings from RF fine-tuning during product assembly or test and measurement during product qualification.

When tested, RF products are usually mated manually. Traditional push-pull adapters cannot be used for automated testing, as they are not self-centering and require manual feeding. SPINNER's EasyDock can significantly reduce costs by automating RF measurement and quality tests, testing faster without sacrificing quality or measurement precision.

For conventional push-pull mechanisms, the measurement adapters are manually fed to the test device. This is unsuitable for automated movement processes, since the positioning of the test device to the adapter is not guaranteed to be 100 percent aligned. A certain amount of tolerance cannot be avoided, which the measurement adapter has to reliably compensate for.

These requirements are met entirely by the EasyDock, a spring-mounted measurement adapter that guarantees perfect contact and

reliable operation, even when the axes of the test device and the adapter are not perfectly aligned. Also, the precision of the measurement process is not affected by mechanical tolerances.

PRECISION MATING

The EasyDock tolerates deviations in all planes and directions. The conical intake ensures that the adapter and the test device slide together reliably, even if they are not centered and aligned. Moreover, they do not have to meet each other at a right angle, since the adapter compensates for tilt, and the spring-loaded mounting evens out variances in distance. These mechanical compensations are crucial for automated testing, as they protect the devices and measurement interfaces.

When testing, the EasyDock first centers itself within the test device. Then the devices are tightened together for mating. Over the entire mating process, the EasyDock ensures a constant contact pressure of 80 N, which maintains a correct and reproducible electrical contact for the measurement and ensures consistent data.

The ability to compensate for misalignment enables the EasyDock to test RF products with

Cables and Connectors



▲ Fig. 1 The EasyDock portfolio includes 7-16, 4.3-10, 4.1-9.5 and N measurement interfaces.

more than one interface. Devices such as couplers, diplexers, base stations and antennas can be tested within one stroke, provided multiple EasyDock adapters are installed on a dedicated measurement frame.

The EasyDock is available for all common mobile industry interfaces. The portfolio (see **Figure 1**) includes 7-16, 4.3-10, 4.1-9.5 and N interfaces and hosts 7-16, 4.3-10, N and 3.5 mm interfaces on the rear, contacting the measurement cable or device. The adapter can be mounted on a front panel or housing, either as a bulkhead or four-hole flange.

PIM MEASUREMENT

Since passive intermodulation (PIM) is one of the most crucial aspects for the mobile communication industry, SPINNER has designed the EasyDock 7-16 and 4.3-10 measurement interfaces for PIM measurements. While a

contact pressure of 80 N is sufficient for PIM measurements on a 4.3-10 interface, it is not sufficient for a typical 7-16 interface. To address this, the 7-16 EasyDock interface was adapted to ensure proper PIM measurement with 80 N contact pressure. This allows simultaneous PIM tests of devices with many connectors and is also suitable for products with a high connector density, such as antennas.

An EasyDock adapter featuring either a 7-16 or 4.3-10 measurement interface (front or rear) supports PIM measurements up to -162 dBc IM3. The EasyDock can be combined with SPINNER's low PIM switch and low PIM rotary joint for automating test systems where movement and rotation are required or where test procedures switch between PIM and VSWR measurements.

COST SAVINGS

Tests with the EasyDock have shown significant savings – up to 80 percent compared to manually mated test procedures. Design to cost measures have improved the CAPEX position of manufacturers. Now, EasyDock adds OPEX savings to significantly reduce production costs.



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