

## NTPIM-XXXX Series PIM test systems

In order to meet the market demand for testing of the intermodulation for passive devices, Rflight specially designed NTPIM-XXXX Series PIM test system in cooperation with Keysight utilized its power meter and spectrum analyzer. The maximum output power of test port is over +48dBm (remark: allowed to improve to +53dBm at customer request), maximum intermodulation distortion accuracy is -168dBc with multiple protections. Especially the PIM test systems we built at the request of China Telecommunication Technology Labs (CTTL), with our own design we developed the TD-SCDMA intermodulation test modules which is the only officially approved by CTTL, it has been widely adopted by China Mobile, Huawei, Comba and Yutong etc. It is capable to undertake multi-band automatic tests through RF switch matrix controller, this system is characterized with logical design, excellent accuracy, effective heat radiation, convenient operation, high reliability.

Up till year 2015, Rflight is qualified supplier to Huawei, Nokia, Alcatel-Lucent, ZTE for testing power amplifier and PIM test systems. Rflight power amplifiers are widely used in China Mobile and all of the 3rd party inspection labs in China for set-up of its PIM test systems.



- Freq Coverage: 700BAND, DD800, CDMA800, EGSM900, GSM900, DCS1800, TD-SCDMA, PCS1900, TD-SCDMA2000, WCDMA2100, LTE2600
- System IMD3 distortion accuracy is over -173dBc, capable to test various passive components
- Test port power rate: 2 channel carrier wave signal, min. +20dBm to max. +48dBm (remarks: allowed to improve to +53dBm at customer request)
- Multi protections and inspection functions
- Flexible combinations, capable for multi-band automatic tests through RF switch matrix controller
- Capable for test of IMD3, 5, 7, 9, 11
- Periodic calibration through software program to ensure high test accuracy
- effective heat radiation, high reliability
- capable to present written test report
- through software control easily realize the test mode switching: point of frequency, sweep of frequency, transmit and reflect tests

### Software Operation Interface:



## NTPIM-XXXX Series PIM test systems, Specifications

### 1. Wideband Active Power Amplifier and Telecom Standards:

| Product Model | Telecom Standards                        | Transmit Band | Linear Output Power Rate |
|---------------|------------------------------------------|---------------|--------------------------|
| NTPM-0710     | DD800/CDMA/AMPS/GSM/EGSM                 | 728-960 MHz   | 20-46dBm Adjustable      |
| NTPIM-1822    | DCS 1800/PCS 1900/UMTS-FDD/TD-SCDMA AorB | 1805-2170 MHz | 20-46dBm Adjustable      |
| NTPIM-2527    | LTE2600                                  | 2500-2700 MHz | 20-46dBm Adjustable      |

### 2. Passive Equipment (reflective transmit intermodulation test):

| Model       | Telecom Standards | Transmit band | Receive band  | IM3 Receive band | Reflect IM3 test (+43dBm) |
|-------------|-------------------|---------------|---------------|------------------|---------------------------|
| NTPIM-800BD | DU800             | 790-822 MHz   | 832-862 MHz   | 832-854 MHz      | -170dBc(3rd IM)/43 dBm    |
| NTPIM-900B  | EGSM900           | 925-960 MHz   | 880-915 MHz   | 890-915 MHz      | -173dBc(3rd IM)/43 dBm    |
| NTPIM-1800B | DCS 1800          | 1805-1880 MHz | 1710-1785 MHz | 1730-1785 MHz    | -173dBc(3rd IM)/43 dBm    |
| NTPIM-1900B | PCS1900           | 1930-1990 MHz | 1850-1910 MHz | 1870-1910 MHz    | -173dBc(3rd IM)/43 dBm    |
| NTPIM-2100B | UMTS-FDD          | 2110-2170 MHz | 1930-1980 MHz | 1930-1980 MHz    | -173dBc(7rd IM)/43 dBm    |
| NTPIM-2600B | LTE2600           | 2620-2695 MHz | 2050-2060 MHz | 2050-2060 MHz    | -173dBc(3rd IM)/43 dBm    |

### 3. Module & Accessory for System Integration Automation:

| Module Name   | Module No    | Requirments        |
|---------------|--------------|--------------------|
| Switch Matrix | NTDPDT-4X20E | 40channels         |
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| Low PIM Load  | NTDTS-100    | (800-2700MHz 100W) |
| Cabinet       |              | 1.6m               |

### Key Technical Data:

#### □ Testing signal:

UMTS2100 IMD3,7 transmission signal  
DD800 / CDMA800/EGSM900/DCS1800/PCS1900 IMD3,5 transmission signal

#### Input signals:

Keysight MXG N518A or N5182A CW signal, 250KHz-3GHz

Test port power rate: 2 channel carrier wave signal, min. +20dBm to max. +46dBm

Output power accuracy: +/-0.35dB typical

System test ports output power were detected and corrected through Keysight U2001A power meter to ensure output power rate accuracy.

#### □ Receiver:

Utilize Keysight EXA N9010A or N9000A spectrum analyzer (250KHz-3GHz) for IMD3,5,7,9,11 intermodulation signal analysis

Average low noise:-145dBm, maximum

Dynamic range: 100dB, typical

Linear working condition max. signal input power: -60dBm

Max. Safe input power:20dBm

#### □ Safety:

Reflect power rate protection ( UUT protection): ≥50dBm (100w)

Over VSWR protection (VSWR≥3) Over heat protection (≥+60 C)

Test equipment protection

ESD protection to interfaces +/-2kV

#### □ System residual intermodulation:

Self intermodulation: ≤173dBc typical (reflect mode) (2x43dBm)

≤165dBc typical (transmit mode) (2x43dBm)

Capable to test multi-port base station antenna through software and RF switch matrix

System Uncertainty: <2dB@95% confidence level (3.8dB according to IEC)

Repeatability (GR&R): <20%

#### □ Size: 440mmX600mmX80mm (Active Module)

440mmX600mmX30mm (Passive Module)

#### □ Power supply: 100-240VAC, 50/60 Hz

Working Temperature: +5~+30°C

#### □ System software:

Test result can be saved through dedicated port, automatic generate test report in Word format, screenshot is allowed for all test data

Intermodulation system adopts power meter detecting system power output

System calibration items: Power rate calibrate, system intermodulation calibrate, system S parameter calibrate

System calibrate time: ≤1 hour

System calibrate time cycle: >1 month

Testing modes: point freq. test, time domain test, sweep freq. test, S parameter test

Telecom. interface: GPIB, USB, LAN

Recommended to use printer with USB port, either black&white or color printer