

***"To be the best and to be the number one"***

is our guideline to do business. We are resolved to set up the benchmark for power amplifier industry

Founded at the beginning of 2004, Rflight Communication Electronic Corporation is a high technology private company dedicated to manufacture, R&D and service of RF Microwave high power solid state amplifiers and PIM testing system products in the fields of wireless communication, defense, EMC, medical and industrial applications. We have a group of over 50 experienced microwave and telecommunication engineers total around 100 employees who working innovatively to develop the best products to meet the most demanding market requirements.

Our main products are **High Power Amplifiers, Solid State Power Amplifiers, Wideband Amplifiers, Dedicated Frequency Amplifiers & Sub-systems** as well as **PIM test systems** all of which were independently developed by our R&D team. The product frequency span from **4KHz to 40GHz**, power from **1W to 10KW**. Our quality assurance system was ISO9001 certified to ensure the total quality control of each product and each process. In year 2008 we are officially contracted with **Keysight(earlier Agilent) Technologies as Solution Partner** for PIM & EMC test system development and manufacturing. With various CE, FCC & CSA certifications it opens up the door to the world market especially US & European countries, for example USA, Canada, Germany, France, Australia and India etc.



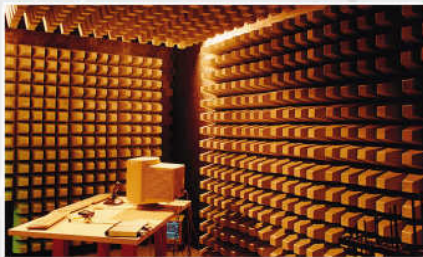
# MAJOR APPLICATIONS



RFLIGHT COMMUNICATION ELECTRONIC CO., LTD.

## Great variety of applications:

### Telecommunications



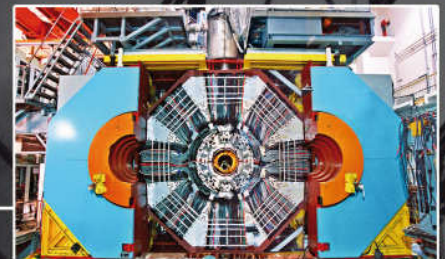
### Electromagnetic compatibility (EMC)

### Military



### Space Research

### High-energy physics research



### Advanced medical

# STRONG PRODUCTION AND TEST CAPABILITY



RFLIGHT COMMUNICATION ELECTRONIC CO.,LTD.

Over **5000** square meters of factory floor space and hundreds of test and calibration equipment.



## ISO9001 Certificate



## CE Certificate



## CE Certificate



## FCC Certificate



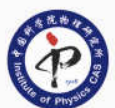
## Keysight Technologies Solutions Partner Certificate



# CUSTOMER BASE



RFLIGHT COMMUNICATION ELECTRONIC CO.,LTD.



中国科学院物理研究所  
INSTITUTE OF PHYSICS CHINESE ACADEMY OF SCIENCES



北京航空航天大学  
BEIHANG UNIVERSITY

(Remarks: No particular ranking order for above namelist)



### NTAMP Series

High Power Narrowband Power Amplifier



### NTSWPPA Series

High Power Wideband Solid State CW&Pulsed Power Amplifier



### NTSPPA Series

High Power Narrowband Solidstate CW&Pulsed Power Amplifier



### NTWPA Series

Wideband Solid State Power Amplifier



### NTPPA Series

High Power Narrowband Pulsed Power Amplifier



### NTWPPA Series

High Power Wideband Solid State Pulsed Power Amplifier



### NTSWPA Series

High Power Wideband Solid State Power Amplifier Module



### NTSPA Series

Solid State Power Amplifier Module



### NTPIM-E Series

Portable PIM Test System



### NTPIM-D Series

Desktop PIM Test System



### NTPIM Series

PIM Test System



### NTGWPPA Series

Power Tolerance Test System

## HIGH POWER WIDEBAND SOLID STATE PULSED POWER AMPLIFIER



**Name** High Power Wideband Solid State Pulsed Power Amplifier

**Part No.** NTWPPA-XXXXX

**Features** NTWPPA-XXXX series high power wideband solid state pulsed power amplifier is capable to provide wideband pulsed wave power (Remarks: PEP: 400us-1000us time cycle adjustable, 0.1-10% duty cycle adjustable, power 100W-10KW, frequency: 10KHz-6GHz) , ideal for passive component power tolerance test, EMC system, national lab test, radar simulation system, wireless interference system and advanced medical equipment.

Model	Frequency (GHz)	Gain Min(dB)	Peak Power Min(dBm)	Gain Flatness Max(± dB)	VSWR	Size (mm)
NTWPPA-0710800	0.728~0.960	60	59	1.5	1.5	448x600x225
NTWPPA-0810800	0.824~0.960	60	59	1.5	1.5	448x600x225
NTWPPA-1822800	1.805~2.170	60	59	1.5	1.5	448x600x225
NTWPPA-2327800	2.3~2.7	60	59	1.5	1.5	448x600x225
NTWPPA-07101500	0.728~0.960	62	61.7	1.5	1.5	448x600x360
NTWPPA-08101500	0.824~0.960	62	61.7	1.5	1.5	448x600x360
NTWPPA-18221500	1.805~2.170	62	61.7	1.5	1.5	448x600x360
NTWPPA-23271500	2.3~2.7	62	61.7	1.5	1.5	448x600x360
NTWPPA-07103000	0.728~0.960	65	65	1.5	1.5	448x600x450
NTWPPA-08103000	0.824~0.960	65	65	1.5	1.5	448x600x450
NTWPPA-18223000	1.805~2.170	65	65	1.5	1.5	448x600x450
NTWPPA-23273000	2.3~2.7	65	65	1.5	1.5	448x600x450

**Remark:** Rflight is capable to offer various customized design based on different frequency, power and special technical requirements

## HIGH POWER WIDEBAND SOLID STATE CW&PULSED POWER AMPLIFIER



**Name** High Power Wideband Solid State CW&Pulsed Power Amplifier

**Part No.** NTSWPPA-XXXX

**Features** NTSWPPA-XXXX series high power wideband solid state CW& pulsed power amplifier is capable to provide wideband pulsed wave power (Remarks: PEP: 400us-1000us time cycle adjustable, 0.1-1% duty cycle adjustable, power 100W-10KW, frequency: 10KHz-6GHz) , an ideal for passive component power tolerance test, EMC system, national lab test, radar simulation system, wireless interference system and advanced medical equipment.

Model	Frequency (GHz)	AVG. Power Min(dBm)	Gain Min(dB)	Peak Power Min(dBm)	Gain Flatness Max(± dB)	VSWR	Size (mm)
NTSWPPA-07102000300	0.728~0.960	55	63	63	1.5	1.5	448x600x450
NTSWPPA-08102000300	0.824~0.960	55	63	63	1.5	1.5	448x600x450
NTSWPPA-18222000300	1.805~2.170	55	63	63	1.5	1.5	600x600x720
NTSWPPA-23272000300	2.3~2.7	55	63	63	1.5	1.5	600x600x720
NTSWPPA-07103000500	0.728~0.960	57	65	65	1.5	1.5	600x600x900
NTSWPPA-08103000500	0.824~0.960	57	65	65	1.5	1.5	600x600x900
NTSWPPA-18223000500	1.805~2.170	57	65	65	1.5	1.5	600x600x900
NTSWPPA-23273000500	2.3~2.7	57	65	65	1.5	1.5	600x600x900
NTSWPPA-07105000700	0.728~0.960	58.5	67	67	1.5	1.5	600x600x900
NTSWPPA-08105000700	0.824~0.960	58.5	67	67	1.5	1.5	600x600x900
NTSWPPA-18225000700	1.805~2.170	58.5	67	67	1.5	1.5	600x600x900
NTSWPPA-23275000700	2.3~2.7	58.5	67	67	1.5	1.5	600x600x900

**Remark:** Rflight is capable to offer various customized design based on different frequency, power and special technical requirements



## HIGH POWER NARROWBAND PULSED POWER AMPLIFIER



**Name** High Power Narrowband Pulsed Power Amplifier

**Part No.** NTPPA-XXXXX

**Features** NTPPA-XXXX series high-power narrowband pulsed power amplifier is capable to provide narrowband pulsed wave power (Remarks: PEP: 8us-800us, 1% duty cycle, maximum power 10KW, frequency 100KHz-4GHz) , customized for passive component multi carrier wave power shock test. Ideal for passive component power tolerance test, EMC system, national lab test, radar simulation system, wireless interference system and advanced medical equipment.

Model	Frequency (GHz)	Gain Min(dB)	Peak Power Min(dBm)	Gain Flatness Max(± dB)	VSWR	Size (mm)
NTPPA-040800	0.40~0.47	60	59	0.50	1.5	448x600x177
NTPPA-070800	0.72~0.78	60	59	0.50	1.5	448x600x177
NTPPA-080800	0.869~0.894	60	59	0.50	1.5	448x600x177
NTPPA-090800	0.925~0.96	60	59	0.50	1.5	448x600x177
NTPPA-150800	1.4~1.6	60	59	0.50	1.5	448x600x177
NTPPA-180800	1.8~1.88	60	59	0.50	1.5	448x600x177
NTPPA-190800	1.92~1.99	60	59	0.50	1.5	448x600x177
NTPPA-210800	2.11~2.17	60	59	0.50	1.5	448x600x177
NTPPA-230800	2.3~2.4	60	59	0.50	1.5	448x600x177
NTPPA-260800	2.5~2.7	60	59	0.50	1.5	448x600x177
NTPPA-350800	3.4~3.6	60	59	0.50	1.5	448x600x225

Model	Frequency (GHz)	Gain Min(dB)	Peak Power Min(dBm)	Gain Flatness Max(± dB)	VSWR	Size (mm)
NTPPA-041500	0.40~0.47	62	61.7	0.50	1.5	448x600x225
NTPPA-071500	0.72~0.78	62	61.7	0.50	1.5	448x600x225
NTPPA-081500	0.869~0.894	62	61.7	0.50	1.5	448x600x225
NTPPA-091500	0.925~0.96	62	61.7	0.50	1.5	448x600x225
NTPPA-151500	1.4~1.6	62	61.7	0.50	1.5	448x600x225
NTPPA-181500	1.8~1.88	62	61.7	0.50	1.5	448x600x225
NTPPA-191500	1.92~1.99	62	61.7	0.50	1.5	448x600x225
NTPPA-211500	2.11~2.17	62	61.7	0.50	1.5	448x600x225
NTPPA-231500	2.3~2.4	62	61.7	0.50	1.5	448x600x225
NTPPA-261500	2.5~2.7	62	61.7	0.50	1.5	448x600x225
NTPPA-351500	3.4~3.6	62	61.7	0.50	1.5	448x600x270
NTPPA-043000	0.40~0.47	65	65	0.50	1.5	448x600x270
NTPPA-073000	0.72~0.78	65	65	0.50	1.5	448x600x270
NTPPA-083000	0.869~0.894	65	65	0.50	1.5	448x600x270
NTPPA-093000	0.925~0.96	65	65	0.50	1.5	448x600x270
NTPPA-183000	1.8~1.88	65	65	0.50	1.5	448x600x270
NTPPA-193000	1.92~1.99	65	65	0.50	1.5	448x600x270
NTPPA-213000	2.11~2.17	65	65	0.50	1.5	448x600x270
NTPPA-233000	2.3~2.4	65	65	0.50	1.5	448x600x270
NTPPA-263000	2.5~2.7	65	65	0.50	1.5	448x600x270

**Remark:** Rflight is capable to offer various customized design based on different frequency, power and special technical requirements

## HIGH POWER NARROWBAND POWER AMPLIFIER



**Name** High Power Narrowband Power Amplifier

**Part No.** NTAMP-XXXXX

**Features** NTAMP-XXXX series high-power narrow-band power amplifier is capable to provide narrow-band wave power (Remarks: PEP: 8us-800us, 1% duty cycle, maximum power 10KW, frequency: 100KHz-4GHz), customized for passive component multi carrier wave power shock test. Ideal for passive component power tolerance test, EMC system, national lab test, radar simulation system, wireless interference system and advanced medical equipment.

Model	Frequency (GHz)	Gain Min(dB)	AVG. Power Min(dBm)	Gain Flatness Max(± dB)	VSWR	Size (mm)
NTAMP-005200	0.030~0.088	53	53	0.50	1.5	448x600x177
NTAMP-03200	0.35~0.40	53	53	0.50	1.5	448x600x177
NTAMP-04200	0.40~0.47	53	53	0.50	1.5	448x600x177
NTAMP-05200	0.44~0.52	53	53	0.50	1.5	448x600x177
NTAMP-08200	0.869~0.894	53	53	0.50	1.5	448x600x177
NTAMP-09200	0.925~0.96	53	53	0.50	1.5	448x600x177
NTAMP-13200	1.2~1.4	53	53	0.50	1.5	448x600x177
NTAMP-15200	1.4~1.6	53	53	0.50	1.5	448x600x177
NTAMP-18200	1.8~1.88	53	53	0.50	1.5	448x600x177
NTAMP-19200	1.92~1.99	53	53	0.50	1.5	448x600x177
NTAMP-21200	2.11~2.17	53	53	0.50	1.5	448x600x177
NTAMP-23200	2.3~2.4	53	53	0.50	1.5	448x600x177
NTAMP-26200	2.5~2.7	53	53	0.50	1.5	448x600x177
NTAMP-28200	2.7~3.1	53	53	0.50	1.5	448x600x225
NTAMP-33200	3.1~3.5	53	53	0.50	1.5	448x600x225
NTAMP-35200	3.4~3.6	53	53	0.50	1.5	448x600x225
NTAMP-40200	3.7~4.2	53	53	0.50	1.5	448x600x225
NTAMP-50200	5.3~5.9	53	53	0.50	1.5	448x600x225

Model	Frequency (GHz)	Gain Min(dB)	AVG. Power Min(dBm)	Gain Flatness Max(± dB)	VSWR	Size (mm)
NTAMP-005500	0.030~0.088	57	57	1.5	1.5	448x600x225
NTAMP-03500	0.35~0.40	57	57	0.50	1.5	448x600x225
NTAMP-04500	0.40~0.47	57	57	0.50	1.5	448x600x225
NTAMP-05500	0.44~0.52	57	57	0.50	1.5	448x600x225
NTAMP-08500	0.869~0.894	57	57	0.50	1.5	448x600x270
NTAMP-09500	0.925~0.96	57	57	0.50	1.5	448x600x270
NTAMP-13500	1.2~1.4	57	57	0.50	1.5	448x600x270
NTAMP-15500	1.4~1.6	57	57	0.50	1.5	448x600x270
NTAMP-18500	1.8~1.88	57	57	0.50	1.5	448x600x270
NTAMP-19500	1.92~1.99	57	57	0.50	1.5	448x600x270
NTAMP-21500	2.11~2.17	57	57	0.50	1.5	448x600x270
NTAMP-23500	2.3~2.4	57	57	0.50	1.5	448x600x270
NTAMP-26500	2.5~2.7	57	57	0.50	1.5	448x600x270
NTAMP-33500	3.1~3.5	57	57	0.50	1.5	448x600x360
NTAMP-35500	3.4~3.6	57	57	0.50	1.5	448x600x360
NTAMP-0051000	0.030~0.088	60	60	1.5	1.5	448x600x360
NTAMP-041000	0.40~0.47	60	60	0.50	1.5	448x600x360
NTAMP-051000	0.44~0.52	60	60	0.50	1.5	448x600x360
NTAMP-081000	0.869~0.894	60	60	0.50	1.5	448x600x450
NTAMP-091000	0.925~0.96	60	60	0.50	1.5	448x600x450
NTAMP-181000	1.8~1.88	60	60	0.50	1.5	600x600x720
NTAMP-191000	1.92~1.99	60	60	0.50	1.5	600x600x720
NTAMP-211000	2.11~2.17	60	60	0.50	1.5	600x600x720
NTAMP-231000	2.3~2.4	60	60	0.50	1.5	600x600x720
NTAMP-261000	2.5~2.7	60	60	0.50	1.5	600x600x720

**Remarks:** Rflight is capable to offer various customized design based on different frequency, power and special technical requirements

## HIGH POWER WIDEBAND SOLID STATE POWER AMPLIFIER



**Name** High Power Wideband Power Amplifier

**Part No.** NTWPA-XXXX

**Features** NTWPA-XXXX series high power wideband solid state power amplifier is capable to provide wideband CW wave power from 1W to 1KW, frequency 10KHz to 6 GHz. Ideal for passive component power tolerance test, EMC system, national lab test, radar simulation system, wireless interference system and advanced medical equipment.

Model	Frequency (GHz)	Gain Min(dB)	AVG. Power Min(dBm)	Gain Flatness Max(± dB)	VSWR	Size (mm)
NTWPA-00000104100	0.00001~0.4	50	50	5.0	2.0	448x600x177
NTWPA-0000010011000	0.00001~0.01	60	60	5.0	2.0	600x600x720
NTWPA-0000010013000	0.00001~0.01	65	65	5.0	2.0	600x600x900
NTWPA-0000010015000	0.00001~0.01	67	67	5.0	2.0	600x600x1400
NTWPA-001011000	0.01~0.1	60	60	4.0	2.0	600x600x720
NTWPA-001013000	0.01~0.1	65	65	4.0	2.0	600x600x900
NTWPA-001015000	0.01~0.1	67	67	4.0	2.0	600x600x1400
NTWPA-008031000	0.08~0.3	60	60	2.5	2.0	600x600x720
NTWPA-008032000	0.08~0.3	63	63	2.5	2.0	600x600x720
NTWPA-0310700	0.3~1.0	58	58	2.0	2.0	600x600x720
NTWPA-03101000	0.3~1.0	60	60	2.0	2.0	600x600x720
NTWPA-00305100	0.03~0.512	50	50	2.0	2.0	448x600x177
NTWPA-00305200	0.03~0.512	53	53	2.0	2.0	448x600x270
NTWPA-000110100	0.001~1.0	50	50	3.0	2.0	448x600x225
NTWPA-00810100	0.08~1.0	50	50	3.0	2.0	448x600x225
NTWPA-00810200	0.08~1.0	53	53	3.0	2.0	448x600x270

Model	Frequency (GHz)	Gain Min(dB)	AVG. Power Min(dBm)	Gain Flatness Max(± dB)	VSWR	Size (mm)
NTWPA-0510100	0.5~1.0	50	50	1.0	2.0	448x600x177
NTWPA-0510200	0.5~1.0	53	53	1.0	2.0	448x600x177
NTWPA-0510500	0.5~1.0	57	57	1.0	2.0	448x600x450
NTWPA-05101000	0.5~1.0	60	60	1.5	2.0	600x600x720
NTWPA-0710100	0.7~1.0	50	50	1.0	1.5	448x600x177
NTWPA-0710200	0.7~1.0	53	53	1.0	1.5	448x600x225
NTWPA-0710500	0.7~1.0	57	57	1.0	1.5	448x600x450
NTWPA-1822100	1.8~2.2	50	50	1.0	1.5	448x600x177
NTWPA-1822200	1.8~2.2	53	53	1.0	1.5	448x600x225
NTWPA-1822500	1.8~2.2	57	57	1.0	1.5	448x600x450
NTWPA-2327100	2.3~2.7	50	50	1.5	1.5	448x600x177
NTWPA-2327200	2.3~2.7	53	53	1.5	1.5	448x600x225
NTWPA-2327500	2.3~2.7	57	57	1.5	1.5	448x600x450
NTWPA-0822100	0.8~2.2	50	50	4.0	2.0	448x600x177
NTWPA-0822200	0.8~2.2	53	53	4.0	2.0	448x600x270
NTWPA-0822500	0.8~2.2	57	57	4.0	2.0	600x600x720
NTWPA-0727100	0.7~2.7	50	50	4.0	2.0	448x600x270
NTWPA-0727200	0.7~2.7	53	53	4.0	2.0	448x600x450
NTWPA-2560100	2.5~6.0	50	50	4.0	2.0	448x600x270
NTWPA-2560200	2.5~6.0	53	53	4.0	2.0	448x600x450
NTWPA-2060100	2.0~6.0	50	50	4.0	2.0	448x600x270

**Remarks:** Rflight is capable to offer various customized design based on different frequency, power and special technical requirements

## HIGH POWER WIDEBAND TWT POWER AMPLIFIER



**Name** High Power Wideband TWT Power Amplifier

**Part No.** NTTWPA-XXXX

**Features** NTTWPA-XXXX series high power wideband TWT power amplifier is capable to provide wideband CW power: 1W-200W, frequency: 1-40GHz, ideal for EMC system, radar simulation system, wireless telecom. interference system and antenna test system.

Model	Frequency (GHz)	Gain Min(dB)	Output Power Min(dBm)	Gain Flatness Max(± dB)	VSWR	Size (mm)
NTTWPA-60180050	6.0~18.0	47	47	1.5	2.0	448x600x135
NTTWPA-60180100	6.0~18.0	50	50	1.5	2.0	448x600x177
NTTWPA-60180200	6.0~18.0	53	53	1.5	2.0	448x600x177
NTTWPA-180265020	18.0~26.5	43	43	1.5	2.0	448x600x135
NTTWPA-180265050	18.0~26.5	47	47	1.5	2.0	448x600x135
NTTWPA-180265100	18.0~26.5	50	50	1.5	2.0	448x600x177
NTTWPA-265400020	26.5~40.0	43	43	1.5	2.0	448x600x177
NTTWPA-265400040	26.5~40.0	46	46	1.5	2.0	448x600x177

**Remark:** Rflight is capable to offer various customized design based on different frequency, power and special technical requirements

## HIGH POWER WIDEBAND TWT PULSED POWER AMPLIFIER



**Name** High Power Wideband TWT Pulsed Power Amplifier

**Part No.** NTTWPPA-XXXX

**Features** NTTWPPA-XXXX series high power wideband TWT power amplifier is capable to provide wideband pulsed wave power, pulsed wave width 0.1-100Us, time cycle adjustable, duty cycle 1%, power 1W-3KW, frequency 1-18GHz, ideal for EMC system, radar simulation system, wireless telecom. interference system and antenna test system.

Model	Frequency (GHz)	Gain Min(dB)	Output Power Min(dBm)	Gain Flatness Max(± dB)	VSWR	Size (mm)
NTTWPPA-10201000	1.0~2.0	60	60	2.0	2.5	448x600x450
NTTWPPA-10202000	1.0~2.0	63	63	2.0	2.5	448x600x450
NTTWPPA-20401000	2.0~4.0	60	60	2.0	2.5	448x600x450
NTTWPPA-20402000	2.0~4.0	63	63	2.0	2.5	448x600x450
NTTWPPA-40801000	4.0~8.0	60	60	2.0	2.5	448x600x450
NTTWPPA-40802000	4.0~8.0	63	63	2.0	2.5	448x600x450
NTTWPPA-801801000	8.0~18.0	60	60	2.0	2.5	448x600x450
NTTWPPA-801802000	8.0~18.0	63	63	2.0	2.5	448x600x450

**Remark:** Rflight is capable to offer various customized design based on different frequency, power and special technical requirements



## NTPIMS-XXXX S parameter & PIM parameter auto switching test system

This S parameter & PIM parameter auto switching test system is based on Rflight leading product PIM test system, in cooperation with Keysight utilized its new generation of vector network analyzer E5072A along with Rflight active, passive equipments and low intermodulation RF switch matrix through software automatic control to realize single port testing of S parameter & PIM parameters. This is a total solution to use one single test system without cable changing to achieve various parameters testing through software auto switching which greatly improved the testing efficiency of the manufacturers, it's a breaking through to the S parameter & PIM parameters seamless testing market in China. The test system characterized with logical design, convenient operation, easy to upgrade, high reliability. This test system is a customized design (in cooperation with Keysight design) based on our long term cooperation with antenna manufacturing customer for their automatic antenna production requirements.

This innovative test system design gives better performance with lower cost for PIM & S parameters in compare with the conventional design, the features of this test system including: flexible configuration, fast test speed, excellent accuracy, its an ideal replacement for current PIM test system.

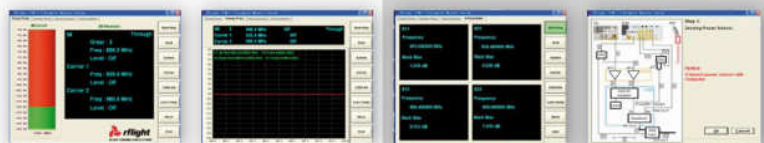
Nowadays passive components PIM testing, it will take long time for connecting and disconnecting which is much longer than testing itself. This test system which opens up the some of the test ports of internal receiver and signal source, these ports are located at the front panel. During PIM & S parameters testing, it's not required to change DUT physical connection which means only one time DUT connection and disconnection we can achieve both PIM & S parameters testing which greatly improved the manufacturing efficiency. This test system has outstanding RF performance, suitable for high speed sweep, especially it's frequency sweep function which do not need extra time to control other equipment's operation, it's greatly saved the time for PIM sweep test.

This test system featured with accurate power calibration function to compensate power amplifier's output power changes

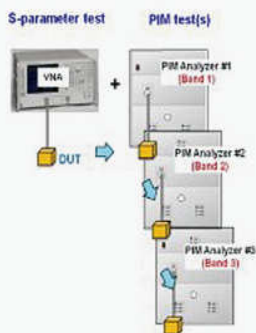


- Freq Coverage: DD800, CDMA800, EGSM900, DCS1800, PCS1900, WCDMA2100, LTE2600
- System self IMD3 less than -165dBc, meeting the test requirements for dual ports base station antenna
- Test port power rate: 2 channel carrier wave signal, min. +33dBm to max. +43dBm
- Multi protections and inspection functions
- Flexible combinations, to achieve multi freq. band automatic test through switch matrix
- Capable for test of IMD3, 5, 7, 9, 11
- Automatic testing of S parameter through RF switch matrix
- Periodic calibration through software to ensure testing 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:



## Old Design



## New Design

### PIM & S-parameter test



## NTPIMS-0810 S parameter & PIM parameter auto switching test system, equipment required:

Name	Model	Quantity
Vector Network Analyzer	E5072A	1
Signal Source	N5181A	1
Power Meter	U2001A	1
Power Amplifier	NTPIM-0810	2
Passive Test Module	NTPIMD-800	1
Passive Test Module	NTPIMD-900	1
RF Switch Matrix	NTDPDT-4X10	1
Network Port Switch		1

### NTPIMS-0810 Key Technical Data:

- **Testing signal:**  
CDMA800/EGSM900 IMD3,5 transmission signal  
S parameter test  
Input signals:  
Keysight MXG N518A & vector network analyzer E5072A CW signals  
Test port power rate: 2 channel carrier wave signal, min. +33dBm to max. +43dBm  
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 vector network analyzer for IMD3,5 intermodulation signal analysis and S parameter test  
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: ≤168dBc typical (reflect mode) (2x43dBm)  
≤160dBc typical (transmit mode) (2x43dBm)  
Capable to test S parameter of 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:** 440mmX600mmX8Umm (Active Module)  
440mmX600mmX3Umm (Passive Module)
- **Power supply:** 100-240VAC, 50/60 Hz
- **Working Temperature:** +5-+30C
- **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

## NTSPPA-XXXX2800750S Power Tolerance Test System

With the expansion of the telecom. network capacity, passive components have called more and more attentions as a key factor in the telecom. network. In multi channels wireless transmission systems because of insufficient power rate withstand capacity (especially to the peak power rate) of the components it happens that products over-heat, early aging, deformed, electric arcing which lead to noise floor rising and system interference.

Power tolerance test system is to verify the components under the condition of peak power input signal i.e. the components maximum tolerance to withstand the heat and not to lead to component aging, deform and arcing. It's an important inspection technical method to inspect the design and manufacturing of the passive components. The system is capable to verify the component peak power performance by detecting RF signal VSWR which is going through from power amplifier to DUT

Rflight NTSPPA-XXXX2800750S Power Tolerance Test System is based on Keysight I/Olib platform, compatible with Keysight E series (for example E4438/E4445A etc.) N series ( for example N5182A/N9020A etc.) general signal sources and spectrum analyzers. The system test port output average power rate is 750w, peak power rate is 2800w (remark: allowed to improve to output average 1000w & peak power 5000w at customer request). The system is featured with multiple protect functions. With intergraded software, the system is capable to detect VSWR changes through Keysight E4417A dual channel power meter. The system is characterized with extreme stability, low power consumption, easy to operate, flexible for combination and upgrade. It's a great solution to telecom components suppliers' passive-devices testing requirements which including antenna, duplexer, combiner, cable etc.

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: DD800, CDMA800, EGSM900, DCS1800, PCS1900, UMTS2100, LTE2600
- Test port power: detected through E4417 dual channel power meter
- Average power: Min. +40dBm to Max. +58.7dBm (750w)
- Peak power: Min+40dBm to Max. +64.5dBm (2800w)
- Through spectrum analyzer detection, using avg. power 750w & peak power 2800w to ensure minimum 50w of 4 channel carrier modulation signals of different protocols. Each power module working freq. range is allowed to send to 2 different freq. full-time slot modulated carrier, also the power rate is with sufficient redundancy design.
- Through detecting VSWR deterioration to verify peak power withstanding features of the device-under-test.

### Software Operation Interface:



## NTSPPA-XXXX2800750S Power Tolerance Test System, equipment required:

Name	Model	Unit	Quantity	Remarks
Narrow Band Solid State Pulsed Amplifier	NTSPPA-092800750	Piece(s)	1	925-960MHz, Pulsed power 2800w, Avg. power 750w
Narrow Band Solid State Pulsed Amplifier	NTSPPA-092800750	Piece(s)	1	925-960MHz, Pulsed power 2800w, Avg. power 750w
Narrow Band Solid State Pulsed Amplifier	NTSPPA-182800750	Piece(s)	1	1805-1880MHz, Pulsed power 2800w, Avg. power 750w
Narrow Band Solid State Pulsed Amplifier	NTSPPA-182800750	Piece(s)	1	1805-1880MHz, Pulsed power 2800w, Avg. power 750w
Dual channel power meter main unit	E4417A	Piece(s)	1	Power meter - EPM-P series,dual channel
Dual channel power meter probe	E9323A	Piece(s)	2	Peak and Average Power Sensor,50 MHz to 6 GHz bandwidth
Multi function signal/power control unit	NTDPDT-1	Piece(s)	1	
Switching Unit		Piece(s)	1	
IPC		Piece(s)	1	
Cabinet		Piece(s)	3	1.6 Cabinet
Test System Application Software		Set(s)	1	
Hardware/Software Integration		Set(s)	1	

## NTSPPA-XXXX2800750S Power Tolerance Test System, Key Technical Data:

- **Product Model:** NTSPPA-XXXX2800750S
- **Band utilization:** Use 925-960MHz for transmission working freq.  
Use 1805-1880MHz for transmission working freq.
- **Test port power:** Average power: Min. +40dBm to Max. +58dBm (750w)  
Peak power: Min+40dBm to Max. +64.5dBm (2800w)  
Support GSM900 & DCS1800 carrier modulation signal, through spectrum analyzer detection, using avg. power 500w & peak power 2000w to ensure minimum 50w of 4 channel carrier modulation signals of different protocols. Each power module working freq. range is allowed to send to 2 different freq. full-time slot modulated carrier, also the power rate is with sufficient redundancy design to guarantee system reliability and life cycle.
- **Output power accuracy:**  $\pm 0.25$ dB typical,  $\pm 0.3$ dB maximum
- **Port types:** impedance 50  $\Omega$ , input and output ports located on front panel, input N-K type, output 7/16-K type, VSWR $\leq 1.5$
- **Reliability:** allow to working 48 hours continuously
- **Stability:** Under test mode when system reflect VSWR is larger than 1.5, the system will turn off automatically, in addition the power amplifier is built with protect function to avoid circuit break-down as well as VSWR display and control function by using external power meter
- **Electromagnetic radiation standards:**
- **The electromagnetic radiation of the power amplifier is comply with National Standards of China**
- **Protection and capability:**
  - 1) The test system will not affected by Interference impact like: high power RF signal, DC current, burst pulse, electronic switch pulse etc.
  - 2) Attention marks on test system, switching unit & interface ports to avoid error operation
  - 3) Extra attention marks between the test system and the device-under-test to avoid equipment damage due to error operation or equipment malfunction.
- **Size:** 600mm (W)x600mm(D)x1600mm(H)
- **Power supply:** Rated AC voltage: 220V $\pm 10\%$ , 50Hz-60Hz
- **Recommend working temperature:** +5-+40 $^{\circ}$ C
- **Testing mode:** continuous wave, pulsed wave
- **Remote control:** LAN

## System Software:

- **Instrumental control:** Allowed to flexibly control test system various software operations through IPC
- **Working parameter setup:** To setup test freq, signal transmit power, power amplitude, system test start and stop as well as test system loss compensation value etc.
- **Working mode selection:** To setup continuous wave or pulsed wave
- **Test power detection:** Software controlled power meter to real time detect & display of output port average power rate, peak power rate and VSWR etc.
- **Warning function:** Support test status display and malfunction warning function. Warning may based on threshold input and prompt with next step emergency operation.
- **Storage function:** Allows test data & test curves to save on hard-disk for easy software accessing, support test data base management.
- **Test report output:** Support automatic test report creation, allows create & save functions using the test system or external PC
- **System calibration:** Test software is capable to execute auto calibration for the system signal loss of all test paths, calibration data is allowed to be used during the test.

## 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	DD800	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 2050-2060 MHz	1930-1980 MHz 2050-2060 MHz	-173dBc(7rd IM)/43 dBm -173dBc(3rd IM)/43 dBm
NTPIM-2600B	LTE2600	2620-2695 MHz	2545-2580 MHz	2545-2580 MHz	-173dBc(3rd IM)/43 dBm

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

Module Name	Module No	Requirments
Switch Matrix	NTDPDT-4X20E	40channels
Switch Matrix	NTDPDT-4X20E	40channels
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: 440mmX600mmX8Umm (Active Module)

440mmX600mmX3Umm (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

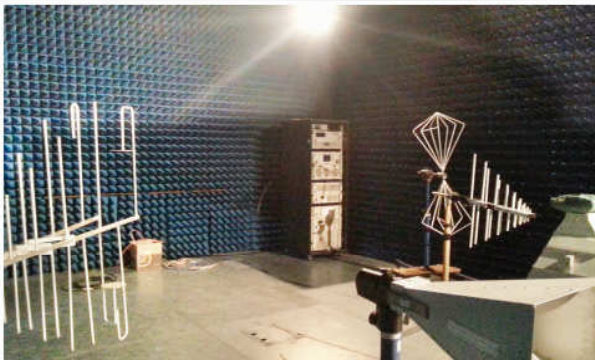
Recommended to use printer with USB port, either black&white or color printer

## POWER AMPLIFIERS FOR EMC (Electromagnetic Compatibility)

In the wake of widely using of electronic products in military and civilian industries, Electromagnetic Compatibility (EMC) has increasingly attracted each country's attention. Modern warfare is based on information, the military electronics equipment is facing unprecedented Complex Electromagnetic Environment (CEME). Therefore, starting from 1990s each country has attached great importance to the R&D and application of Electromagnetic Environmental Effects (E3)

There are two different test methods: Electromagnetic Interference Test & Electromagnetic Sensitivity Test. The key testing items for electromagnetic interference test including: Conducted interference voltage measurement, Conducted interference current measurement, Radio Frequency Interface power measurement, Radio Frequency Interface electric field & magnetic field measurement, Harmonic current measurement, Voltage fluctuations and flicker measurement.

In the field of electromagnetic interference test, our NTWPAS-XXXX series & NTTWPAS-XXXX series wideband power amplifiers technically are in the leading position in the domestic market, meeting National Military Standard GJB-151A/GJB-152A (MIL-STD-461E) 200v/m for Radio Frequency Interface Test. Using our power amplifier to replace the well-know foreign brands, our domestic customers including China Telecommunication Technology Labs (CTTL), State Radio Regulation Committee, CCTL, GRGT, Chengdu Telecommunications Metrology Station, Xi'an Inspection and Testing Center for Radio Communication Products etc.



### Power Amplifier Systems Requirements (10KHz-40GHz 200v/m):

- 10KHz-10MHz CW: 3000W & 10MHz-100MHz CW: 3000W / NTWPAS-0000010013000E
- 80MHz-300MHz CW: 2000W & 300MHz-1000MHz CW: 700W / NTWPAS-0081020000700E
- 800MHz-2500MHz CW: 200W / NTWPAS-0825200
- 2500MHz-6000MHz CW: 200W / NTWPAS-2560200
- 6GHz-18GHz CW: 200W / NTTWPAS-6018200
- 18GHz-26.5GHz CW: 50W / NTTWPAS-1826550
- 26.5GHz-40GHz CW: 40W / NTTWPAS-2654040

### System Schematic:



## POWER AMPLIFIERS FOR ANTENNA TEST

Antenna far-field test system consists of auxiliary transmit antenna & stand, testing turntable, signal source, power amplifier, signal receiver, data collect-processing & control unit, antenna far-field test software and computer. Test system frequency covering 30MHz-40GHz, far-field test ranging from 1-3000meters.

In the field of antenna test, our NTWPAS-XXXX series & NTTWPAS-XXXX series wideband power amplifiers technically are in the leading position in the domestic market, meeting antenna far-field test requirements. Using our power amplifier to replace the well-know foreign brands, our domestic customers including China Telecommunication Technology Labs (CTTL), CETC, CEC etc



### Power Amplifier System Requirements:

- 30MHz-1000MHz CW:100W  
/ NTWPAS-00310100
- 800MHz-2500MHz CW:100W  
/ NTWPAS-0825100
- 2500MHz-6000MHz CW:100W  
/ NTWPAS-2560100
- 6GHz-18GHz CW : 100W  
/ NTTWPAS-6018100
- 18GHz-26.5GHz CW : 50W  
/ NTTWPAS-1826550
- 26.5GHz-40GHz CW : 20W  
/ NTTWPAS-2654020

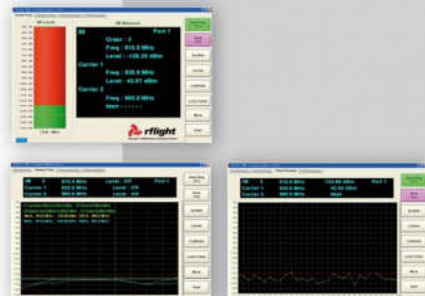


## NTPIM-XXXXE Series Portable Outdoor PIM Test System

In order to meet the telecom. carrier's demand for testing of the passive intermodulation for antennas, Rflight specially designed NTPIM-XXXXE Series Portable Outdoor PIM test system. This portable system is characterized with high reliability, excellent accuracy, low cost, light weight, easy operation, portability etc. It's a perfect solution to telecom carrier's outdoor testing task of the passive intermodulation for antennas, it's also a handy tool for telecom. components manufacturers for production line complete testing, a truly daily necessity toolkit

- Frequency Coverage: CDMA800, GSM900, DCS1800, TD-SCDMA2000, UMTS2100, LTE2600
- System IMD3 test accuracy is min -168dBc, capable to test various passive base station antennas
- Test port power rate: 2 channel carrier wave signal, min. +30dBm to max. +46dBm
- Multi protections and inspection functions
- Capable for test of IMD3, 5, 7 signals
- High accuracy, good repeatability
- Effective heat radiation, high reliability
- Outstanding cost-effectiveness
- High test speed, easy to operate

### Software Operation Interface:



### What's the passive intermodulation?

Passive Intermodulation is the nonlinear distortion of the radio frequency passive components, while 2 or more than 2 signals transmit through the components with nonlinear characters, the combined signals mixed together which will lead to spurious signal—passive intermodulation, once the passive intermodulation goes into receiver's band width, the intermodulation interference will occur.

### Where's the passive intermodulation?

The passive intermodulation is widely spreading through the fields of RF passive components: mobile communication base station antennas, RF coaxial cables, filters, duplexers, couplers, lightning arresters etc.

### What's the cause of passive intermodulation?

1. Product designing, manufacturing flaws
2. Product containing magnetic substances (for example: Fe, Ni, Cr etc.)
3. Products connected with different dielectric metals
4. Poor soldering during the production
5. The contact surface is not smooth, clean or erode while connecting the products

### What's the harmfulness of the passive intermodulation?

If the passive intermodulation goes into uplink band it will interfere with mobile communication makes system Signal Noise Rate deteriorate, occupies channel resources, severely affecting communication capacity and quality, to end user the immediate impact is frequent drop calls, noise & crosstalk

## NTPIM-XXXXE Series Portable Outdoor PIM Test System Specifications

Model	Telecom standards	Signal Source Freq. Accuracy(PPM)	Transmit band (MHz)	Receive band (MHz)	Reflect IMD test (+43dBm)(dBc)
NTPIM-800E	NADC/AMPS	±2	869-894	824-849	-165
NTPIM-900E	GSM900	±2	925-960	880-915	-165
NTPIM-1800E	DCS1800	±2	1805-1880	1710-1785	-165
NTPIM-1900E	PCS1900	±2	1930-1990	1850-1910	-165
NTPIM-2100E	UMTS2100	±2	2110-2170	1920-1980 2050-2060	-165* -165

Remarks: \* indicate IMD7, rest are IMD3

### Key Technical Data:

- **Test objective signal:** IMD3, 5, 7 reflective transmission signal
- **Testing signal:**
  - Freq: Achieving the compatibility of AMPS800, EGSM900, DCS1800, PCS1900, UMTS2100
  - Freq accuracy: ±2ppm (typical) , ±5ppm (max)
  - Test port power rate: 2 channel carrier wave signal, min. +33dBm to max. +43dBm
  - Display: System front panel
  - Data Access: test result can be saved through dedicated port
- **Receiver:**
  - Average Noise Floor: ≤-135dBm (typical)
  - Dynamic Range: 75 dB (typical)
  - Receiver accuracy: ±0.5dB@ (-55~ -120dBm)
  - Max effective input power: -55dBm (transmit & receive freq. mix)
  - Reflect power protection 43dBm (20w)
  - Over VSWR protection (VSWR≥3)
  - Over heat protection (≥+60°C)
  - Self intermodulation (reflect): ≤-165dBc (typical) (2 x 43dBm)
- **Pre-heat:** 3 minutes
- **Power supply:** 110-240V AC, 50/60Hz. DC,AC dual power supply, exterior power supply supported
- **Working temperature:** Max. working temperature: -10°C-+45°C  
recommended working temperature: +15°C-+25°C
- **Measuring modes:** Point freq test, Time domain test, Sweep freq test
- **Remote Control:** RS232, USB, LAN (TCP/IP) (optional)
- **Print:** recommended to use printer with USB port, either black&white or color printer
- **Dimensions:** 570mmx416mmx282mm

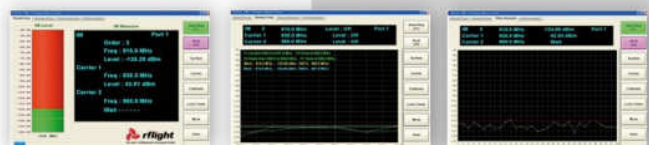
## NTPIM-XXXXD Series Desktop PIM Test Systems

In order to meet the market demand for testing of the intermodulation for passive devices, Rflight specially designed NTPIM-XXXXD Series Desktop PIM test system. It's one of the leading products of our company, at present the Chinese market is dominated by SUMMITEK(USA), Rflight is the first Chinese company to produce PIM test systems—NTPIM which is capable of multi function test including Intermodulation distortion test, power tolerance impact test, spurious test and with various protections. The max. system output power is over 46dBm (customized is allowed to improve to max.50dBm), 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) and The Research Institute of China Mobile, with our own design we developed the TD-SCDMA intermodulation test modules which is the only approved for both CTTL and The Research Institute of China Mobile, it has been widely adopted by China Mobile, Huawei, Comba and Yutong etc. This desktop system is characterized with logical design, excellent accuracy, effective heat radiation, convenient operation, high reliability.



- Freq Coverage: 700BAND, CDMA800, EGSM900, GSM900, DCS1800, TD-SCDMA1800, PCS1900, TD-SCDMA2000, WCDMA2100, LTE2600
- System IMD3 distortion accuracy is over -168dBc, capable to test various passive components
- Test port power rate: 2 channel carrier wave signal, min. +30dBm to max. +46dBm (remarks: allowed to improve to +50dBm at customer request)
- Multi protections and inspection functions
- Flexible combinations, to achieve single freq. band for full freq. band test at lowest cost
- Capable for test of IMD3, 5, 7, 9
- Low Self Intermodulation and high 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
- Outstanding cost-effectiveness

### Software Operation Interface:



## NTPIM-XXXXD Series Desktop PIM Test Systems Specifications

### 1. NTPIM-XXXXD Series Narrow Band Desktop PIM Test Equipment & Telecom Standards:

Model	Telecom Standards	Signal Source Freq. Accuracy(PPM)	Transmit band (MHz)	Receive band (MHz)	Reflect IMD test (+43dBm)(dBc)
NTPIM-700D	700BAND	±2	728-757	L:710-716 U:776-786	-168
NTPIM-800D	NADC/AMPS	±2	869-894	824-849	-168
NTPIM-900D	EGSM(GSM)	±2	925-960	880-915	-168
NTPIM-1800D	DCS1800	±2	1805-1880	1710-1785	-168
NTPIM-1900D	PCS1900	±2	1930-1990	1850-1910	-168
NTPIM-2100D	UMTS2100	±2	2110-2170	1920-1980 2050-2060	-168* -168
NTPIM-2600D	LTE2600	±2	2620-2695	2545-2580	-168

### 2. Wideband Active Equipment and Telecom Standards:

Model	Telecom Standards	Transmit band (MHz)	Signal Source Freq. Accuracy(PPM)	Linear Output Power (dBm)
NTPIM-0710D	700BAND/NADC/AMPS/GSM/EGSM	728-960	±2	+30-+46 (adjustable)
NTPIM-1822D	DCS 1800/PCS 1900/ UMTS-FDD/TD-SCDMA AorB	1805-2170	±2	+30-+46 (adjustable)
NTPIM-2327D	TD-SCDMA C/WLAN/LTE2600	2300-2700	±2	+30-+46 (adjustable)

### 3. Wide Band Passive Equipment (reflective transmit intermodulation test):

Model	Telecom Standards	Transmit band (MHz)	Receive band (MHz)	Reflect IMD test (+43dBm)(dBc)
NTPIM-700B	700BAND	728-757	L:710-716 U:776-786	-168/-160
NTPIM-800B	NADC/AMPS	869-894	824-849	-168/-160
NTPIM-900B	EGSM(GSM)	925-960	880-915	-168/-160
NTPIM-1800B	DCS1800	1805-1880	1710-1785	-168/-160
NTPIM-1800BT	TD-SCDMA A	1880-1900	1915-1920	-168/-160
NTPIM-1900B	PCS1900	1930-1990	1850-1910	-168/-160
NTPIM-2000B	TD-SCDMA B	2110-2017.5	2025	-168/-160
NTPIM-2100B	UMTS-FDD	2110-2170	1920-1980 2050-2060	-168*/-160* -168/-160
NTPIM-2600B	LTE2600	2620-2695	2545-2580	-168/-160

Remarks: \* indicate IMD7, rest are IMD3

### Key Technical Data:

□ **Test objective signal:** IMD3, 5, 7, 9 reflective transmission signal

□ **Testing signal:**

Freq: Achieving the compatibility of 700BAND, AMPS800, EGSM900, GSM900, DCS1800, PCS1900, TD-SCDMA, UMTS2100, LTE2600

Freq accuracy: +/-2ppm (typical) , +/-5ppm (max)

Test port power rate: 2 channel carrier wave signal, min. +30dBm to max. +46dBm

Display: System panel & PC

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

□ **Receiver:**

Average Ground Noise Floor: ≤-138dBm (max.)

Dynamic Range: 80 dB (typical)

Max effective input power: -60dBm (transmit & receive freq. mix)

Max safe input power: +20dBm (mix power at any freq.)

Reflect power protection 50dBm (100w)

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

Self intermodulation (reflect): ≤-168dBc (typical) (2 x 43dBm)

(transmit): ≤-160dBc (typical) (2 x 43dBm)

Pre-heat: 2-3 minutes

Power supply: 100-240V AC, 50/60Hz

Max. working temperature: -10°C-+45°C recommended working temperature: +15°C-+25°C

Measuring modes: Point freq test, Time domain test, Sweep freq test

Remote Control: RS232, USB, LAN (TCP/IP) (optional)

Print: recommended to use printer with USB port, either black&white or color printer

Dimensions: 480x600x225mm (Active module)

480x600x135mm (Passive module)

## NTSPDT Series High Frequency Multi Ports Switch Matrix

With the development of the testing technology, switch matrix has been introduced for the testing efficiency of the automatic testing system, in order to maximize the testing facility utilization the switch matrix is able to connect DUT and testing equipment in various combinations. Switch matrix is able to auto-route RF microwave signals between testing equipment and UUT (Unit Under Test) of ATE system. It can support consistent signal route, auto test execution, normally including signal adjustment.

The switch matrix can achieve very high testing accuracy and is very popular in engineering practices. Rflight use its very experienced development and delivery knowledge, has designed hundreds of customized switch matrixes. Our skillful system engineers have carefully optimized the switch matrix according to customer specified applications. Supplying the customer applications with the best components specs, manufacturing process and complete tests, so we can guarantee product quality and performance.

NTSPDT series high frequency multi-port switch matrix is used for the physical connection between DUT test ports and Vector Network Analyzer test ports. It's able to expand 2 ports VNA into 9 ports, 12 ports, 18 ports or more ports testing equipment. Through program control it can selectively control test port's logic passage to achieve time division multi-port testing. For example for auto testing of the S parameter for TD-SCDMA multi-port base station antenna, the high frequency switch matrix is the key component to realize multi-port testing and it will eventually decide the accuracy of the test. To ensure the accuracy of the test, calibration is required for the equipment itself and the cable to eliminate the errors.

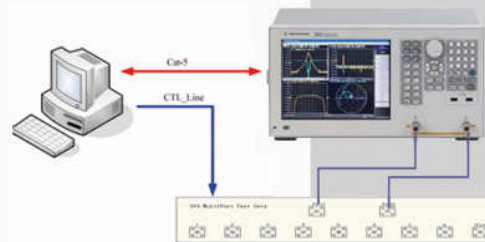


### Key Technical Data:

- Working Freq: DC-4GHz
- Port Isolation: <-90dB
- Return Loss: <-20dB
- Insertion Loss: <1.5dB
- Port to Port Amplitude Imbalance: <0.5dB
- Port to port phase imbalance: <±3°
- Switching Speed: <20ms
- Input Port: 2 pcs
- Output Port: 9pcs; 12pcs, 18pcs etc. (Build-in 50 ohm matching load)
- Test Connector: N-type female
- Control Method: LAN
- Power supply: 220V±10%, 50Hz

### Application Environment:

Input Port1 and Port2 of 2\*9 switch matrix connecting to Port1 and Port2 of the Network Analyzer (Keysight E5062A); Output Port1 to 8 of 2\*9 switch matrix connecting to DUT antenna Port 1 to 8; Port 9 (cal) connecting to cal port of the DUT antenna.



## NTDPDTA Series Low PIM Air-Driven Mechanical Switch Matrix

With the development of the testing technology, switch matrix has been introduced for the testing efficiency improvement of the automatic PIM testing system, this switch matrix is able to achieve multiple bands PIM auto-testing using one single test station, it greatly improved production line manufacturing & testing efficiency. This air-driven switch matrix is characterized with logical design, easy to operate, easy to combine and upgrade, stable performance, outpaced with conventional mechanical switch matrix.



### Key Technical Data:

- Working Freq: 700-2700MHz
- Isolation:  $\leq -30\text{dB}$
- Return loss :  $\leq -20\text{dB}$
- Insertion loss  $\leq 1.5\text{dB}$
- System self intermodulation  $< -165\text{dBc}@2\text{X}+43\text{dBm}$
- Test interface type: 7/16F
- Working method: air driven
- Control method: LAN

### Application Environment:

This equipment can be applied to multiple bands PIM testing & S parameters testing. With switch matrix, the DUT is allowed to be tested using one test port to achieve multiple bands testing of PIM & S parameters. With switch matrix, it also allowed to use one band of PIM test system to connecting to multiple ports device to achieve multiple ports PIM testing with just one single connection.

