



Advanced Test Equipment Corp.

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A photograph of the Earth's horizon from space, showing a blue sky and white clouds, is partially obscured by large, overlapping, curved shapes in shades of blue and grey that sweep across the page.

Instrumentation  
product Amplifiers  
summary

**TMD**

*...the power in microwaves!*

# Instrumentation Amplifiers (TWTAs)

## For Laboratory Applications (including EMC Testing, PIM Testing, Scientific and Medical)

Our instrumentation amplifiers are closely related to our rugged amplifiers.

They are based on the same switched mode power supply technology as the rugged amplifiers - with all the advantages of performance and reliability, but have been neatly re-packaged for less demanding physical environments into compact, lightweight and affordable rack-mountable units, typically at 4U or 3U high.

A set of standard amplifiers covers the range between 1-40 GHz in both pulsed and CW modes. In addition, special products can be designed to customers' specific requirements.

Over the past 20 years TMD has proved itself to be a world leader in TWTA design innovation, offering particularly unusual products for a variety of markets and applications, many of which have proven to be unobtainable elsewhere. We have particular strength in the area of high power pulsed TWTAs (up to 40 kW) for EMC HIRF testing.

Recently we have developed a new range of Ultra High Power HIRF amplifiers achieving over 10 kW.

EMC test laboratories using TMD's range of Ultra High Power amplifiers have generated 14,000 V/m, easily complying with the latest most demanding test requirement - RTCA/DO-160G and L.

For many years TMD has been providing amplifiers for scientific establishments such as CERN. Projects we have been involved with have included: Driver Amplifiers for Anti-matter Experimentation (CERN in collaboration with Riken Laboratory, Japan), Amplifiers for the CERN CLIC Test Facility CTF3 and Kicker Amplifiers for Oxford University.

The following table shows a selection of generic products in this range – but don't worry if you can't see exactly what you are looking for – bespoke solutions are available, although the impossible may take a little longer! Our Business Development Team is always eager to discuss the ways in which TMD can contribute to new technology areas.

For more details of TMD's products and capabilities, please go to [www.tmd.co.uk](http://www.tmd.co.uk), or request a copy of our capability brochure.

We also offer a comprehensive repairs service for our microwave products; contact us at [wecare@tmd.co.uk](mailto:wecare@tmd.co.uk) for an evaluation.

We provide excellent after sales support.

**TMD is approved to the rigorous Quality Standard BS EN ISO9001:2008 – quality is at the heart of everything we do.**



“Special products can be designed to customers’ specific requirements.”

To find out more or ask for a quotation

email us at [wecare@tmd.co.uk](mailto:wecare@tmd.co.uk) or visit

[www.tmd.co.uk](http://www.tmd.co.uk)

## Standard Broadband Amplifiers

CW 1 - 18.0 GHz (also CW/pulsed options available)

Type Number	Frequency Range (GHz)	Output Power (W Min)	Output Power (W Typ)	Height	Length (mm)	Typical Weight (kg)
<b>Lower Power</b>						
PTC6341	0.8 - 2.8	250	300	4U	700	30
PTC6342	2.0 - 4.0	250	300	4U	700	30
PTC6492	2.0 - 6.0	250	250	4U	700	30
PTC6343	2.5 - 8.0	250	300	4U	700	30
PTC6344	4.0 - 8.0	250	300	4U	700	30
PTC6581	6.5 - 18.0	200	220	4U	700	30
PTC6322	6.0 - 18.0	300	320	4U	700	30
PTC6348	7.5 - 18.0	250	300	4U	700	30
<b>Medium Power</b>						
PTC6440	0.8 - 2.5	500	560	4U	800	37
PTC6441	2.5 - 7.5	500	560	4U	700	35
PTC6522	6.0 - 18.0	550	570	8U	700	48
PTC6442	7.5 - 18.0	500	560	8U	700	48
<b>High Power</b>						
PTC7440	1.0 - 2.5	1000	1000	12U	700	110
PTC7441	2.5 - 7.5	1000	1000	12U	700	110
PTC7442	7.5 - 18.0	1000	1000	19U	700	130

Both pictures are EMC testing of vehicles at SP in Sweden - in the low frequency microwave range (photos courtesy of SP).



## Pulsed 1 - 18.0 GHz

Type Number	Frequency Range (GHz)	Output Power (W Min)	Output Power (W Typ)	Duty Cycle (Max %)	Pulse Length (us)	Height	Length (mm)	Typical Weight (kg)
<b>Lower Power</b>								
PTC6352	2.0 - 4.0	1700	2000	6	0.2 - 100	4U	700	30
PTC6353	2.5 - 8.0	1700	2100	6	0.2 - 100	4U	700	30
PTC6354	4.0 - 8.0	1700	2100	6	0.2 - 100	4U	700	30
PTC6338	5.0 - 11.0	1600	2200	5	0.2 - 100	4U	700	30
PTC6358	7.5 - 18.0	1500	2000	6	0.2 - 100	4U	700	30
<b>Medium Power</b>								
PTC7351	1.0 - 2.5	2000	2500	6	0.2 - 100	4U	800	30
PTC7353	2.0 - 8.0	1900	2100	6	0.2 - 100	4U	700	30
PTC6356	8.0 - 12.4	1700	2500	6	0.2 - 20	4U	700	30
PTC6658	8.0 - 18.0	2000	2200	4	0.2 - 20	4U	700	30
<b>High Power (for HIRF testing)</b>								
PTC6704	1.0 - 1.5	10000	11000	1	0.2 - 50	4U	900	40
PTC7359	1.0 - 2.0	3800	4000	4	0.1 - 50	4U	800	35
PTC7030	1.1 - 1.5	30000	40000	1	0.2 - 20	8U	1200	100
PTC6706	1.5 - 2.0	7000	8000	1	0.2 - 20	4U	880	30
PTC7352	2.0 - 4.0	5000	5500	6	0.2 - 20	4U	880	35
PTC6303	2.9 - 4.0	9000	11000	4	0.2 - 50	4U	780	30
PTC7354	4.0 - 8.0	4000	5000	6	0.2 - 20	6U	780	35
PTC6326	8.0 - 12.4	4000	5000	6	0.2 - 20	4U	780	35
PTC6357	8.0 - 11.0	5900	7500	5	0.2 - 20	4U	700	30
PTC6568	8.5 - 10.5	6800	8000	5	0.2 - 100	IFA	5	30
PTC7716	8.7 - 10.0	5000	6500	7	0.2 - 50	4U	700	30
PTC6447	10.5 - 12.5	9000	10000	2	0.1 - 20	4U	700	30
PTC6382	12.4 - 18.0	3500	4000	6	0.2 - 20	4U	780	35
<b>Ultra High Power (for HIRF Testing)</b>								
PTC9612	1.0 - 1.5	8000	10000	4	0.2 - 50	8U	880	40
PTC6708	1.0 - 1.5	10000	11000	2	0.2 - 50	8U	880	40
PTC7375	1.5 - 2.0	7000	8000	2	0.2 - 20	8U	880	40
PTC9613	1.5 - 2.0	8000	10000	4	0.2 - 50	8U	880	40
PTC7371	1.5 - 2.0	15000	20000	1	0.2 - 20	12U	880	100
PTC6709	1.5 - 2.0	15000	16000	2	0.2 - 20	12U	880	100
PTC7373	1.0 - 2.0	6000	6500	4	0.2 - 20	10U	800	100
PTC7360	1.0 - 2.0	12000	12500	4	0.2 - 20	20U	880	175
PTC7370	2.0 - 4.0	9000	11000	6	0.2 - 50	12U	880	100
PTC7361	2.0 - 4.0	12000	18000	6	0.2 - 20	20U	880	175
PTC7369	4.0 - 8.0	7000	10000	6	0.2 - 50	16U	880	100
PTC7368	8.0 - 12.4	8000	9000	5	0.2 - 50	12U	800	100
PTC7362	8.0 - 11.0	12000	12600	5	0.2 - 20	12U	880	110
PTC7372	12.4 - 18.0	6000	8000	6	0.2 - 50	12U	880	100
PTC7363	12.4 - 18.0	12000	14000	6	0.2 - 20	20U	880	175

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A suite of TMD amplifiers in a HIRF testing facility at TRW Conekt (photo (c) TRW Limited).



## CW Millimetric (also CW/pulsed options)

Type Number	Frequency Range (GHz)	Output Power (W Min)	Output Power (W Typ)	Height	Length (mm)	Typical Weight (kg)
PTC6479S	17.5 - 21.5	210	280	4U	700	30
PTC6329	18.0 - 28.0	45	70	4U	700	27
PTC6479	18.0 - 23.0	210	311	4U	780	27
PTC6337	18.0 - 40.0	40	80	4U	700	27
PTC6333	26.5 - 40.0	40	70	4U	700	27
PTC7732	27.0 - 31.0	112	125	4U	780	30
PTC7732S	31.6 - 32.5	230	260	4U	700	27

All units are Integral Forced Air cooled except PTC7030 which is IFA plus internal liquid cooled.

## Special Amplifiers (in order of starting frequency)

Size: Almost all units are 19" wide S= standard 700mm long, 4U high (all dimensions given in mm) \* Optional pulse modulation capacity: 0.2 - ∞ us pulse

Type Number	Frequency Range (GHz)	Output Power (W Min)	Duty Cycle (Max %)	Pulse Length (us)	Cooling	Size (see notes above)	Typical Weight (kg)
PTC6331	0.8 - 2.8	200	100	-*	IFA	S	30
PTC6468	1.2 - 1.4	20,000	1	0.2 - 50	IFA plus Integral Liquid Cooling	1025 L 8U H	110
PTC6443	3.6 - 4.2	4000	0.5	0.2 - 20	IFA	S	35
PTC6310	5.4 - 5.9	10,000	5	0.2 - 20	IFA or Integral Liquid Cooled	S	30
PTC6568	8.5 - 10.5	8000	5	0.2 - 100	IFA	S	30
PTC6445	9.0 - 10.5	8000	5	0.2 - 20	IFA	S	27
PTC6313	12.0 - 14.5	350	100	-*	IFA	S	30
PTC6553	15.0 - 17.0	3500	2	0.2 - 20	IFA	S	30
PTC6437	18.0 - 23.0	200	100	CW	IFA	S	30
PTC6315	20.2 - 21.2	350	100	CW	IFA	S	30
PTC6317	27.5 - 31.0	130	100	CW	IFA	S	30
PTC7728	27.5 - 30.0	100	100	CW	IFA	S	30
PTC7729	27.5 - 30.0	150	100	CW	IFA	S	30
PTC6429	34.5 - 35.5	100	35	CW	IFA	S	30
PTC7727	43.5 - 45.5	100	100	CW	IFA	S	27
<b>Dual Band</b>							
PTC6493	2.83 - 2.93 & 5.49 - 5.59	1000	4	0.2 - 20	IFA	600 L	30
PTC6498	9.360 - 9.460 & 16.650 - 16.750	1000	4	0.2 - 20	IFA	600 L	30
<b>Solid State</b>							
PTC7364	1.0 - 2.0	200	-	-	IFA	630 L	28
PTC7365	2.7 - 3.1	200	10	0.5 - 20	IFA	350 L	20
PTS6801	2.975 - 3.025	300	1	0.5 - 20	IFA	478 W 425 L 134 H	11



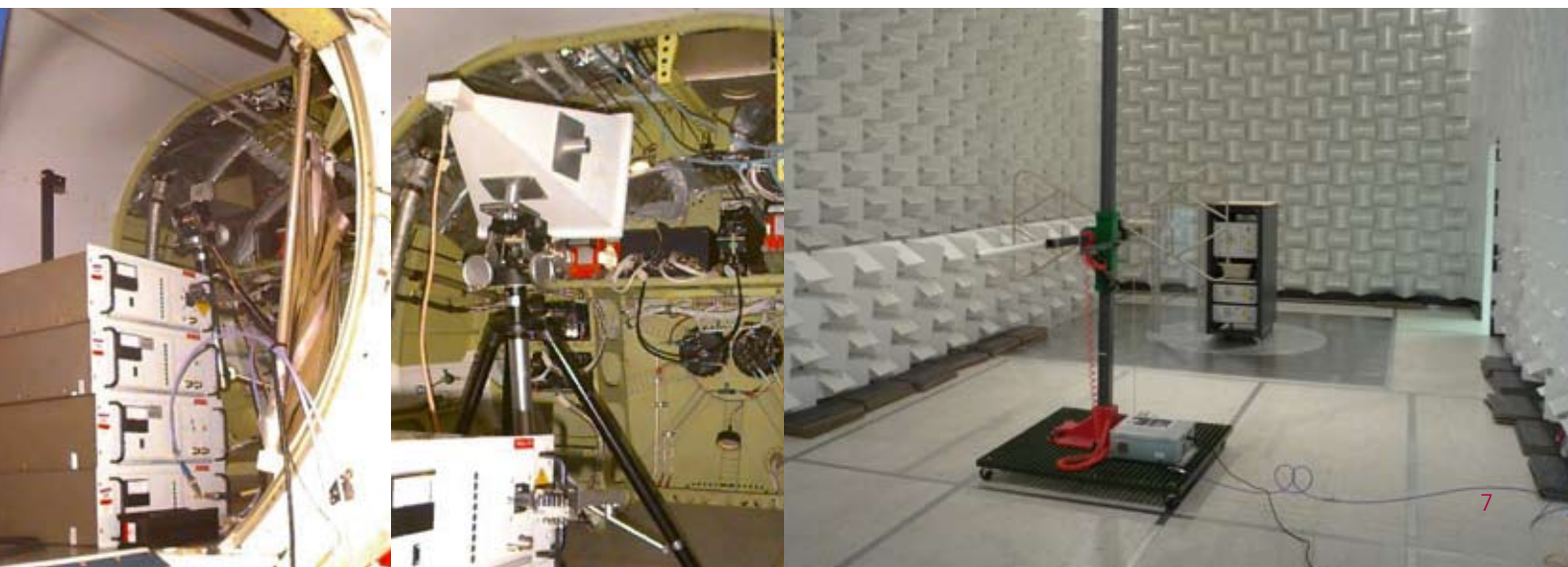


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“TMD is a market leader in amplifiers for HIRF testing; offering excellent after sales support.”

Photos courtesy TRaC Global (second from left), QinetiQ (third & fourth from left) and Thales Group (far right). Assembly of amplifiers at TMD – far left.



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