



Electron Device
Business

Instrumentation Amplifiers

For EMC/Test & Measurement

PULSED
INSTRUMENTATION AMPLIFIERS
L-, S-, C-, X-, Ku-, K- and Ka-Bands

CONTINUOUS WAVE (CW)
INSTRUMENTATION AMPLIFIERS
L-, S-, C-, X-, Ku-, K- and Ka-Bands

High-power radio frequency (RF)
and microwave amplifiers, offered
in both TWTA and solid state

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TWTAs

For EMC testing, radar, electronic warfare (EW), RF component testing, communications, scientific and medical applications



CPI Electron Device Business offers innovative modulars featuring enhanced user interface and ultra-reliable design

CPI EDB offers standard amplifiers covering the range between 10 KHz and 50 GHz in both pulsed and continuous waves (CW) modes. In addition, special products can be designed to customers' specific requirements.

CPI EDB's traveling wave tube amplifier (TWTA) product line features high-power pulsed TWTAs (up to 40 kW) for electromagnetic compatibility (EMC) high-intensity radiated field (HIRF) testing. Recently, CPI EDB has added ultra-high-power HIRF amplifiers achieving more than 10 kW to its product range. CPI EDB also offers a full range of solid state amplifiers; these amplifiers have been developed for use at frequencies below 18 GHz.

EMC TWT CW & Pulsed Transmitters

- Rack-mount and turnkey configurations
- Compact and ultra-wide band
- L-Band, S-Band, C-Band, X-Band, Ku-Band, K-Band and Ka-Band

S-Band TWT Compact, Pulsed Amplifiers

- Single phase AC power
- Local or remote control
- Wide RF bandwidth
- General purpose interface bus (GPIB) remote

X-Band TWT Compact, Pulsed Amplifiers

- Mobile
- Touchscreen
- Waveguide output
- GPIB remote


CPI EDB is a proven leader in TWTA design and innovation, offering products for a variety of markets and applications.

Features



Photo courtesy of RI.SE

The intelligence behind CPI EDB's Modular Commercial Amplifier (MCA) range is provided by a state-of-the-art advanced "System-on-Chip" (SOC) microcircuit, which not only controls and synchronizes all of the power conversion circuitry in real time, but also provides the intelligence for all of the monitoring, control, data-logging and user interface functionality.

CPI TMD Technologies Tools 

Power Standby **Operate** Time to heater warmup

Trip Code

Information

Parameter	Value	Units
R.F. Power Rev	low	dBm
Pulse Width	5.0	us
P.R.F.	10.0	kHz
Duty Cycle	5.0	%
T.W.T. Temp	60	Celsius
Power Supply Temp	35	Celsius
Heater Voltage	5.70	Volts
Grid OFF Voltage	302	Negative Volts
Grid ON Voltage	132	Volts
Cathode Voltage	14.3	Negative kV
Fan Speed	2210	R.P.M.
Standby Accumulated	130	Hours
Operate Accumulated	72	Hours
GPIO Address	20	Range 1 to 31

Standard features of an MCA:

- Rugged, ultra-reliable design
- High-power dual TWT in 12U chassis
- Advanced self-diagnostics
- Ethernet interface
- Remote management and diagnostics via an embedded web server
- Graphical user interface to run on any PC or laptop with a standard browser, with operational parameters updated in real time
- Voltage standing wave ratio (VSWR) reflected power protection
- RF forward sample port
- Plug-and-play field-replaceable power supplies
- Front panel RF input and output
- 110–240 volts alternating current (VAC) single phase*
- Soft start for millimetric TWTs as standard

*110 VAC minimum only on some models

Benefits

User interface, monitoring and control

The main interface standard is Ethernet (although almost all interface standards are available), which enables the amplifier to be connected to a standard PC or laptop web browser, either point-to-point, on a LAN or from the other side of the world!

Auto logging

The amplifier will log operational hours and any tripped states with a date stamp throughout its life. This greatly aids diagnostics; For instance, CPI EDB can assess with customer approval whether a TWT is near end of life and arrange a replacement TWT so the amplifier is available when you need it.

Reliability and thermal management

The amplifier architecture is based on CPI EDB's ultra-reliable military power supplies, which have been proven over years in the field.

CPI EDB employs a state-of-the-art cooling system, incorporating heat pipe technology. This has the effect of spreading the heat dissipated by the TWT over a large area, reducing peak temperatures and significantly improving mean time between failures. Smart Fan speed control is provided to reduce ambient noise.

Environmental

Operating temperature 0°C to +40°C

Storage temperature -10°C to + 50°C

Vibration military standard 810G - transportation

Mechanical

Single unit: 19" front panel, 6U height, 800 mm long, weight 47 kg typ. Dual unit: 19" front panel, 12U height, 800 mm long, weight 110 kg typ. Fan noise: < 80 dBa @ 1 m distance

Safety & EMC

CE and UK CA marked, UL approved, certified to comply with EN61010-1:2010 and EN 61000.

"The units, delivered a decade ago are still the most reliable we've ever used."

– Major U.S. EMC Facility



Standard Broadband Amplifiers

CW 1 – 40.0 GHz (also CW and pulsed options available)

Model Number	Frequency Range (GHz)	Output Power (W Typ)	Output Power (W Typ)	Duty Cycle (%)	Pulse Length (µs)	Height (rack unit)	Weight Typical (kg)	Output
Low Power								
PTCM1002	2.0 - 6.5	365	470	100	N/A	6U	45	SC
PTCM1005	2.5 - 8.0	400	475	100	N/A	6U	45	SC
PTCM1008	6.0 - 18.0	280	320	100	N/A	6U	44	WRD650
PTCM1010	7.5 - 18.0	280	300	100	N/A	6U	44	WRD750
PTCM1011	8.0 - 18.0	300	390	100	N/A	6U	44	WRD750
Medium Power								
PTCM1013	2.5 - 7.5	500	650	100	N/A	6U	47	SC
PTCM2008	6.0 - 18.0	480	570	100	N/A	12U	87	WRD650
PTCM2010	7.5 - 18.0	500	600	100	N/A	12U	87	WRD750
PTCM2011	8.0 - 18.0	520	600	100	N/A	12U	87	WRD750
High Power								
PTCM2013	2.5 - 7.5	850	1350	100	N/A	12U	90	WRD250
PTCM4013	2.5 - 7.5	1500	2200	100	N/A	36U		WRD250
PTCM4008	6.0 - 18.0	850	1000	100	N/A	36U		WRD650
PTCM4010	7.5 - 18.0	900	1000	100	N/A	36U		WRD750
PTCM4011	8.0 - 18.0	1000	1250	100	N/A	36U		WRD750
Millimetric Power								
PTCM1016	18.0 - 26.5	100	120	100	N/A	6U	45	WR42
PTCM2016	18.0 - 26.5	160	180	100	N/A	12U	90	WR42
PTCM4016	18.0 - 26.5	330	360	100	N/A	36U		WR42
PTCM1018	18.0 - 40.0	50*	60	100	N/A	6U	45	WRD180
PTCM1027	26.5 - 40.0	120*	145	100	N/A	6U	45	WR28
PTCM2027	26.5 - 40.0	180	200	100	N/A	12U	90	WR28
PTCM4027	26.5 - 40.0	350	400	100	N/A	36U		WR28
PTCM1028	40.0 - 50.0	Call Factory		100	N/A	6U	45	



Naval EW application (courtesy Brazilian navy)

* Over majority of the bandwidth

Standard Broadband Amplifiers

Pulsed 1 – 18.0 GHz

Model Number	Frequency Range (GHz)	Output Power (W Typ)	Output Power (W Typ)	Duty Cycle (%)	Pulse Length (µs)	Height (rack-unit)	Weight Typical (kg)	Output
Low Power								
PTCM1207	2.0 - 8.0	1900	2200	6	0.2-100	6U	47	SC
PTCM1204	6.5 - 18.0	1200	2000	5	0.2-100	6U	47	WRD650
PTCM1205	7.5 - 18.0	1500	2000	6	0.2-100	6U	44	WRD750
PTCM1209	8.0 - 18.0	1900	2500	4	0.2-100	6U	45	WRD750
PTCM2204	6.5 - 18.0	2200	3800	5	0.2-100	6U	95	WRD650
PTCM2205	7.5 - 18.0	2800	3800	6	0.2-100	6U	95	WRD750
Medium Power								
PTCM1210	2.0 - 4.0	4000	4500	6	0.2-100	6U	51	7/16
PTCM1211	2.0 - 4.0	4500	6000	6	0.2-100	6U	51	7/16
PTCM1212	2.7 - 4.0	9000	11000	4	0.2-50	6U	47	SC
PTCM1219	4.0 - 8.0	4000	5000	6	0.2-100	6U	53	WRD350
PTCM1213	8.0 - 12.4	4000	5000	6	0.2-100	6U	47	WR90
PTCM1214	8.0 - 11.0	5900	7500	5	0.2-100	6U	46	WR90
PTCM1220	8.5 - 10.0	8000	8350	5	0.2-100	6U	46	WR90
PTCM1216	8.0 - 12.0	4500	5000	6	0.2-100	6U	47	WR90
PTCM1218	12.0 - 18.0	3100	4500	6	0.2-50	6U	47	WR62
High Power (for HIRF Testing) - Dual Unit								
PTCM2211	2.0 - 4.0	9000	11000	6	0.2-50	12U	105	7/16
PTCM2219	4.0 - 8.0	8000	9000	6	0.2-50	12U	96	WRD350
PTCM2213	8.0 - 12.4	7200	9000	6	0.2-100	12U	90	WR90
PTCM2214	8.0 - 11.0	11700	14400	5	0.2-100	12U	95	WR90
PTCM2216	8.0 - 12.0	8000	9000	6	0.2-100	12U	95	WR90
PTCM2220	8.5 - 10.0	15000	16000	5	0.2-50	12U	95	WR90
PTCM2218	12.0 - 18.0	5500	7000	6	0.2-100	12U	94	WR62
Ultra High Power (for HIRF Testing) - Quad Unit								
PTCM4211	2.0 - 4.0	15000	17800	6	0.2-50	32U		WRD200
PTCM4212	2.7 - 4.0	30000	36900	4	0.2-50	32U		WRD200
PTCM4213	8.0 - 12.4	14000	22000	6	0.2-100	32U		WR90
PTCM4216	8.0 - 12.0	15000	22000	6	0.2-100	32U		WR90
PTCM4218	12.0 - 18.0	11000	13500	6	0.2-100	32U		WR62

Solid State Amplifiers

Model Number	Frequency Range	Output Power (W Min)	Output Power (W Typ)	Duty Cycle (Max %)	Pulse Length (µs)
PTCS9648	9 kHz – 100 MHz	500	550	100	-
PTCS9649	9 kHz – 100 MHz	600	700	100	-
PTCS9669	9 kHz – 220 MHz	3000	3300	100	-
PTCS9670	9 kHz – 220 MHz	5000	5500	100	-
PTCS9732	9 kHz – 250 MHz	500	550	100	-
PTCS9711	9 kHz – 250 MHz	800	900	100	-
PTCS9717	9 kHz – 400 MHz	400	450	100	-
PTCS9667	20 MHz – 100 MHz	500	550	100	-
PTCS9668	20 MHz – 100 MHz	1000	1100	100	-
PTCS9719	80 MHz – 1 GHz	250	300	100	-
PTCS9729	80 MHz – 1 GHz	400	450	100	-
PTCS9684	80 MHz – 1 GHz	1000	1100	100	-
PTCS6909	80 MHz – 3 GHz	500	550	100	-
PTCS6922	200 MHz – 1 GHz	1000	1100	100	-
PTCS6924	400 MHz – 1 GHz	1200	1300	100	-
PTCS9762	400 MHz – 1 GHz	1500	1600	100	-
PTCS9761	400 MHz – 1 GHz	2000	2100	100	-
PTCS6913	400 MHz – 1 GHz	4000	4200	100	-
PTCS10065	0.4 GHz – 1.0 GHz	4000	4400	10	100
PTCS6932	0.5 GHz – 2.5 GHz	200	220	100	-
PTCS6907	0.5 GHz – 2.5 GHz	250	270	100	-
PTCS10063	0.5 GHz – 2.5 GHz	500	550	100	-

Model Number	Frequency Range (GHz)	Output Power (W Min)	Output Power (W Typ)	Duty Cycle (Max %)	Pulse Length (µs)
PTCS9731	0.5 – 2	500	550	100	-
PTCS10064	0.5 – 2	2000	2200	10	100
PTCS10062	0.7 – 18	30	35	100	-
PTCS6918	0.8 – 3	200	220	100	-
PTS9611	0.8 – 2.5	250	280	100	-
PTCS9655	0.8 – 3	250	280	100	-
PTCS9651	0.8 – 4.2	700	770	100	-
PTCS7364	1 – 2	200	220	100	-
PTCS10052	1 – 2	4000	4400	10	100
PTCS6941	1 – 2	8000	9000	10	100
PTCS6942	1 – 2	11000	12000	10	100
PTCS6923	1 – 2.5	500	550	100	-
PTS9612	1 – 6	50	55	100	-
PTCS9672	1 – 2.5	1000	1100	100	-
PTCS9650	1 – 3	100	110	100	-
PTCS9720	1 – 4	120	130	100	-
PTCS6929	1 – 2.5	1000	1100	6	0.2–50
PTCS6937	1 – 18	10	12	100	-
PTCS9756	1 – 18	50	60	100	-
PTCS9759	2 – 6	100	110	100	-
PTCS9758	2 – 6	200	220	100	-
PTCS9757	2 – 6	500	550	100	-




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