

Dynamic Depressed Collector (DDC) Technology

Now you can have it all: SuperLinear® HPA cost savings in C-Band WITH full CW power.



SuperLinear TWT A

+



CW TWT A

=



NEW DDC TWT A!

More than a decade ago, CPI introduced a simple yet revolutionary product: the SuperLinear® high power amplifier (HPA). As the only fully vertically integrated HPA manufacturer in the world, we were able to optimize the pairing of a CPI-manufactured traveling wave tube (TWT) and the CPI manufactured HPA power supply. This created significant power efficiency improvements, which in turn led to advancements in the amplifier's size, weight and reliability and cooling structure.

For many full-time operators, this technology has led to prime power cost reductions of thousands of dollars per year per amplifier. HVAC costs and UPS requirements have also been reduced. For other operators, the smaller footprint of the HPAs has allowed for more efficient and compact earth station designs. CPI SuperLinear TWTAs are a very popular choice for:

- Fixed earth stations with high energy costs
- Mobile uplinks for commercial and military where size and weight are a premium; and
- Systems driven by generators which consume valuable fossil fuels.

The SuperLinear® TWT A is regularly chosen over both GaN SSPAs and klystron amplifiers by many operators because it simply makes good technical and business sense to do so.

However, not all system operators have been in a position to reap the efficiency benefits that SuperLinear® TWTAs offer. Since SuperLinear® HPA technology sacrifices the ability to run at peak power (P_{sat}) so that maximum efficiency can be achieved in the linear operating performance range, those who require occasional full peak output power have had to rely on traditional HPAs. But with CPI's new DDC technology, that has changed: no longer must you choose between high efficiency and high power.

INTRODUCING DDC TECHNOLOGY

With the patented Dynamic Depressed Collector (DDC) technology from CPI, you can alternate between highest efficiency and CW modes on the same amplifier at the touch of a button. For more autonomous systems, the HPA can automatically select the best mode of operation based on your requirements. As with SuperLinear HPAs, cost savings are quite dramatic versus traditional TWTAs when operating at linear power (see table on page 2), but when breakthrough power is needed, the DDC HPA delivers that as well.



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DDC amplifiers are very appropriate for applications that require occasional operation at high output power levels, such as:

- TT&C and IOT users who need max power regardless of linearity
- Uplinkers on the edge of a beam or in rain fade conditions who rely on full power to make their links reliable
- Single carrier users who want to push higher than 3 dB backoff

The technology is currently available on the CPI C-band 2.25 kW rack-mount TWTA, with more frequency and power options to follow in 2016.

CPI is the world’s largest and oldest HPA manufacturer, providing a full range of satellite uplink amplifiers for all major commercial frequency ranges, including SSPAs, TWTAs, and KPAs. Contact CPI today to see how you can benefit from CPI’s products, experience, and reliability.

Line Voltage (264 VAC)	C-Band Power Consumed, CW Mode (kVA)	C-band Power Consumed, SL Mode (kVA)	RF Output Power (W)	Annual Savings, Prime Power (W)	Yearly Cost Savings at \$0.25 per kWh	10 Year Savings
No RF	3.260	2.852	0	408	\$894	\$8,935
45 dBm	3.351	2.770	32	581	\$1,272	\$12,724
48 dBm	3.398	2.742	63	656	\$1,437	\$14,366
51 dBm	3.407	2.755	126	652	\$1,428	\$14,279
54 dBm	3.464	2.929	251	535	\$1,172	\$11,717
57 dBm	3.967	3.482	501	485	\$1,062	\$10,622
60 dBm	4.600	4.245	1000	355	\$777	\$7,774
61 dBm	4.972	N/A	1259	N/A	N/A	N/A
62 dBm	5.355	N/A	1585	N/A	N/A	N/A
63 dBm	6.072	N/A	1995	N/A	N/A	N/A

Typical cost savings, DDC in SuperLinear mode vs. CW 2.25 kW C-Band HPA

Patent Information

Dynamic Depressed Collector (DDC) technology is patented under U.S. patent number 7,368,874 B2, dated May 6, 2008