pinkRF

Turn-key RF-Energy Systems
for cooking, lighting, industrial
and medical applications

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p*RF*iP10000915NXT1

1000W RF out power amplifier module in the 915MHz band

Product summary	
Saturated RF output power (W / dBm)	1000 / 60
Frequency band (MHz)	902 - 928
Typical Gain @ saturated power (dB)	40
DC Voltage (V)	50
Current (A)	≤ 34
ROHS compliant	

Description

The pink*RF* amplifier module **p*RF*iP10000915NXT1** is a robust and easy to use triple stage RF-Energy booster with 1000W output power and typical 40dB of gain in the 902 – 928 MHz ISM band. With such high gain the input level remains low and can be directly retrieved from a small signal generator module.

The usage of the latest generation LDMOS solid state devices guarantees high efficiency, long lifetime, fully controllable and stable output power over temperature and a compact module outline. Although there is no circulator included, the output of the amplifier can withstand 3 : 1 VSWR conditions provided the module is water cooled.

The amplifier module will automatically shut down at excessive temperature.

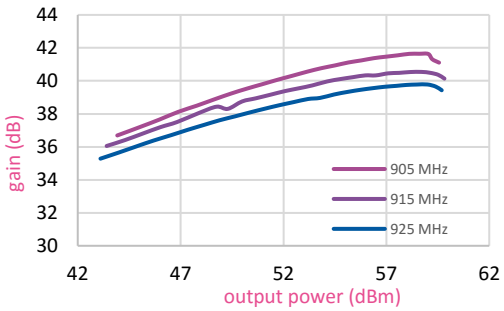
1.1 Initial (20-07-2017)

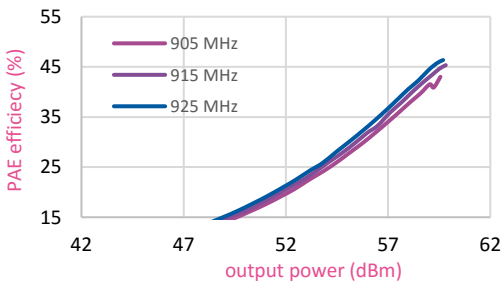
Based on the analog sensing signals ($P_{forward}$, $P_{reflected}$) or the digital I²C sensing signals ($P_{forward}$, $P_{reflected}$, T_{final} and $T_{ambient}$), the external control logic (like that provided in pink*RF*'s small signal generators) can optimize the RF vector (frequency, power, phase, time) depending on the application needs in real time.

Features & Benefits
Good ruggedness
High gain
High efficiency
Hardware enabled excessive temperature shutdown
Built-in coupler and detectors
Analog output voltages for forward and reflected power readings
Analog and digital interfaces
Power supply (5-6V, 1A) for auxiliary circuitry

Applications

This pink*RF* amplifier module **p*RF*iP10000915NXT1** can be used as an adjustment free building block in any single or multi-channel system. Driven by a signal generator module, connected to a DC power supply (50V, 34A), and mounted to a heat sink the module is ready to deliver RF power to an applicator (i.e. a "device" to contain and/or apply the RF energy) like an antenna or a cavity. Such a system can be used for various applications like plasma lighting, plasma torches, industrial heating, solid state cooking, medical treatment or any other high power RF-Energy application.



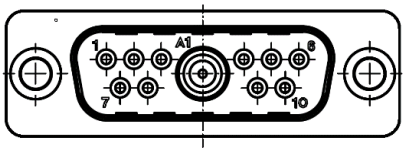


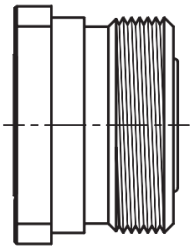
Specifications	
Saturated RF output power (W / dBm)	1000 / 60
Frequency band (MHz)	902 - 928
Typical Gain @ saturated power (dB)	40
Maximum PAE (%)	45
Max. VSWR at output	3 : 1
Input return loss (dB)	>12
Built-in coupler directivity (dB)	16
Harmonics (dBc)	< -20

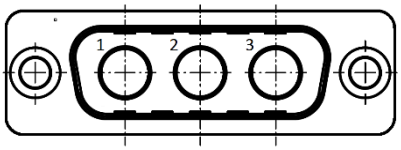
Functionality
RF enable (GPIO)
Temperature compensated bias
Temperature of final transistor (via I²C)
Temperature of ambient (via I²C)
Forward power (both analog output and via I²C)
Reverse power (both analog output and via I²C)

Hardware Connectors

The output power is available on an industry standard 7/16"$_{female}$ connector. The 50Vdc power supply is connected via a robust combo Sub-D connector. All the key connections (e.g. analog and digital interface signals, the RF input signal and a 5-6V adjustable voltage supply (1A)), are combined in one Sub-D connector. This is located at the other end of the module, thus reducing the number of connectors to the bare minimum.



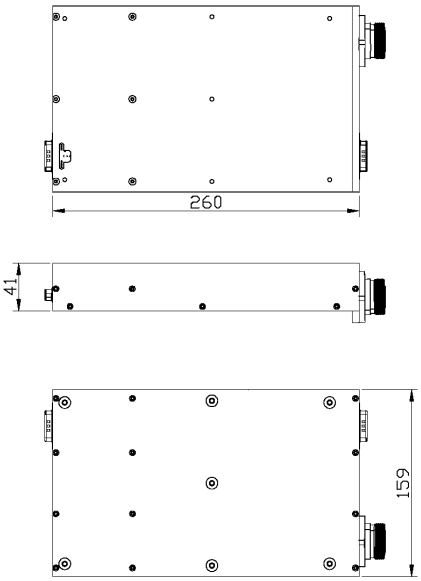




Combined input / control connector: ITT/Cannon DAMP11X1PJK87	
A1	Coaxial analog RF input
1	$P_{forward}$ analog output
2	RFenable input (active high, 3.3V compatible, internal pull-down provided)
3, 8	Not Connected
4, 10	Ground
5	I²C SCL (no pullup provided)
6	+5-6V DC supply output (1A max)
7	$P_{reflected}$ analog output
9	I²C SDA (no pullup provided)

Output connector 7/16"$_{female}$

DC-power supply: ITT/Cannon DAMV3H3PNK87	
1, 2	V_{cc} +50 V_{dc} supply input (34A max)
3	V_{cc} ground



Module p*RF*iP10000915NXT1	
Dimensions (excluding connectors, mm)	260 x 159 x 41
Dimensions (including connectors, mm)	290 x 159 x 51
Weight (kg)	4.0
Full copper baseplate with 8 mounting holes (M4 max)	
Shielded Aluminium casing	
Removable lid in the top cover for I²C sub-address adjustment (dip switch setting, see I²C addressing note)	
ROHS compliant	

Note: I²C addressing:

The I²C accessible 64kB non-volatile memory (NVM) provides manufacturing data and can be made available to store application specific data. The I²C sub address is adjustable by the dip switch setting to enable parallel operation of multiple amplifier modules on the same I²C bus.

	b7	b6	b5	b4	b3	b2	b1	bo
NVM	1	0	1	0	Switch 3 open = "1" closed = "0"	Switch 2 open = "1" closed = "0"	Switch 1 open = "1" closed = "0"	r/$\overline{w}$
ADC	0	1	0	1				r/$\overline{w}$

Ambient	
Temperature range of operation	0 – 50 °C
Humidity	< 90%
Altitude	< 2000 m

Related products
Small signal generators/controllers
Water cooled heatsink
Air cooled heatsink with fans and PWM control
Experimental cavity
Control software

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