

# AG 1014

## LF AMPLIFIER/GENERATOR

**Up to 550 Watts RF Power From 20 kHz to 2 MHz For Industrial, Laboratory And Medical Application.**

### **FEATURING:**

- **20 kHz to 2 MHz up to 550 W**
- **Low distortion Output @ 500W,  $h_3 \leq -20$  dBc. Better than  $-25$  dBc for other harmonics**
- **Digital Meter, measures forward, reflected and load power simultaneously**
- **Front Panel Control of Amplifier and Generator functions**
- **Data acquisition: Status Monitoring & Power Measurement at Analog Port**
- **RS232 communication: Full Control Of Amplifier & Generator Functions**
- **AGC or Power Leveling: Gain Control to better than  $\pm 0.5$  dB**
- **Pulse and Sweep of Internal RF oscillator**



Model AG 1014 Amplifier/Generator is a robust source of RF power for ultrasonic, laser modulation, RFI/EMI, plasma generation, general laboratory and industrial applications.

Featuring leading edge solid state design in all RF amplifier stages and a built-in DDS signal source, it provides everything for a complete and reliable, finely controlled RF power delivery system. It reflects the T&C ongoing commitment to provide RF power products of the highest quality, incorporating the current requirements for complete remote control and data acquisition features.

### **OPERATION**

The AG 1014 produces up to 500W of RF Power over a frequency range from lower than 20 kHz to higher than 2 MHz, with low harmonic distortion. It operates without band switching or other adjustments. Extended range to over 2 MHz is possible with reduced output power or in AGC mode. Gain is rated at 57 dB with a typical gain flatness of  $\pm 1.5$  dB.

Front Panel offers a LCD display of Forward, Reflected and Load Power readings, RF Status, MGC/AGC setups and operating frequency in Generator Mode.

Power meters are calibrated into a 50 Ohm Load and are

accurate when unit operates into matched load. Outside of matched condition, the model AG 1014's power measurement system provides an accurate reading of VSWR. When used as amplifier, the AG 1014 is compatible with most signal and function generators, computer synthesizer cards and it accurately reproduces all waveforms within its output and bandwidth limits.

The Forced-air cooling system and the internal power supply are designed to permit operation over a wide range of temperature and global AC line conditions.

The AG 1014 is built to withstand a +5 dBm (1.1Vp-p) Input signal. The unit amplifies the inputs of AM, FM, SSB and pulse modulations with low harmonic distortion and output power stability.

### **OUTPUT PROTECTION**

AG 1014 is protected by its internal monitoring system for greater than 550 Watts Forward Power, 80 Watts of Reflected Power and limits Output Power Amplifier current for High VSWRs below 50 Ohms. This is intended to protect the amplifier output stage from accidental overdrive at the input and an extreme mismatch at the Output.

### **GENERAL**

T&C's products are designed to be reliable, compact and light in weight. The use of conservatively rated components ensures high reliability and eliminates the need for periodic retuning.



# AG 1014 Specifications



## Class Of Operation

Class "B"

## Frequency Of Operation

20 kHz to 2 MHz

## RF Power Output

### 50 Ohm load:

Up to 400W for 20 kHz to 2 MHz  
Up to 500W for 50 kHz to 1.75 MHz  
Up to 550 W for 80 kHz to 1.2 MHz  
Pulse and low duty cycle!

### Any load:

Up to 250W , continues operation.

## Mismatch Power Output

**Continues Load Power** at 20C:

2:1 VSWR (25 Ohm) 210W minimum  
3:1 VSWR (15 Ohm) 145W minimum  
Limited by heat protection circuit!

Burst and Pulse mode Load Power:

3:1 VSWR, 300W minimum

Limited by Reverse Power Limiter!

## Gain

57 dB @ 500W / 0.45 MHz  
±1 dB 50 kHz to 2 MHz

## RF Input Drive for AGC

Recommended -5 dBm to 0 dBm for  
±0.5 dB gain flatness

## Input Drive Source

Signal or function generator, analog  
computer input capable of up to 1 Vp-p  
@ 50 Ohm

Input range: -30 to 0 dBm typical,  
+5 dBm maximum

## Internal RF Source

DDS oscillator: 20 kHz to 2 MHz,  
1 kHz resolution

## Input and Output Impedance

50 Ohm

2:1 max INPUT VSWR

3:1 max OUTPUT VSWR

## Output VSWR Protection

80 W max reflected power limit for  
Load Impedance > 50 Ohm. Current  
level protection for Load Impedance <  
50 Ohm.

## Harmonic Level @ 500W

Better then - 20 dBc for 3-d harmonic,  
any other better then -20 dBc  
NOTE! See chart for details.

## Spurious Output

- 26 dBm equivalent noise level  
generated by internal circuits

## Output Settings & Control

- Front Panel EDITOR and function  
switches for manual control,  
- RS232 port for GUI or other  
computer communication. Rear  
Panel.

- SubD 25 Analog and Digital I/O .  
Port power scale 1V=100W. Rear  
Panel

## BURST operation

Pulse range: 1 to 500 usec  
Period: 1 to 50 milliseconds  
User settings via GUI and RS232

## BURST - external

DC to > 200 kHz. User defined  
BURST scheme via SubD-25.  
See analog port description for more  
details.

## SWEEP operation

0.02 to 2 MHz. Min time 10 ms, max  
10s. Settings and activation from GUI  
only.

## Output Blanking

For pulsed applications, T&C  
amplifiers and generators offer  
blanking of the output signal for  
minimum noise RF spectrum

## RF Connectors

BNC Female: Back Panel

## AC Power Source

200 - 240 VAC, +/- 10%, 47 - 63 Hz,  
no adjustment required

## AC Power Connection

IEC Standard Power Entry followed  
by RFI filter.

Filter range 0.1 to 30 MHz minimum

## AC Input Current (RMS)

**RF Out nominal 400W:**

I ≤ 5.5A @ 220V

**RF Out max 550W:**

I ≤ 6.5A @ 220V

**Maximum: 11.5 A**

## Cooling

Forced air, temperature controlled,  
heatsink temperature monitored via  
RS232 GUI interface.

## Acoustic level:

45dBa @ Max Fan Speed @ temp.

## Case

Designed to meet EMI and RFI  
shielding requirements AL chassis,  
yellow conductive finish.  
Front Panel: T&C off-white.  
Cover: T&C black.

## Dimensions

135mm x 254 mm x 385 mm  
( H 5.25" x W 10" x L 15" )

## Weight:

12 kg, 26 lbs.

## Mounting

Table top, stand alone unit.  
Optional: Rack Mount Kit.

## Environmental conditions

**Temp.:** 10° to 30° C ambient

**Humidity:** 80%

Equipment intended for ISM applica-  
tions in laboratory and light industrial  
environment.

## T&C Power Conversion, Inc.

110 Halstead Street, Suite 7

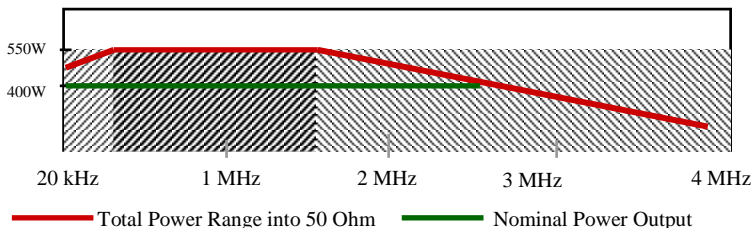
Rochester, NY 14610, USA

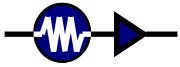
Tel: 585-482-5551

Fax: 585-482-8487

<http://www.TCPowerconversion.com>

## AG 1014 Performance Chart

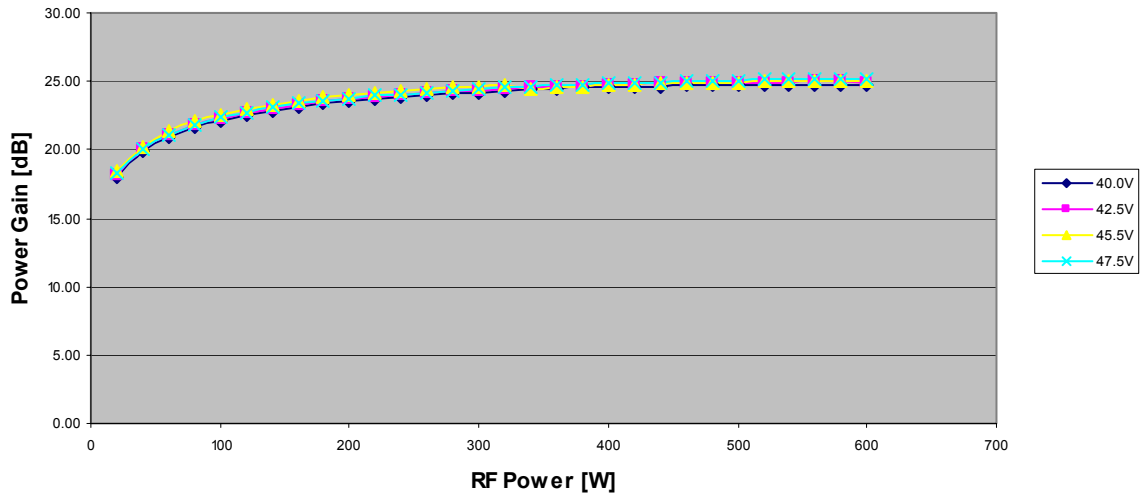




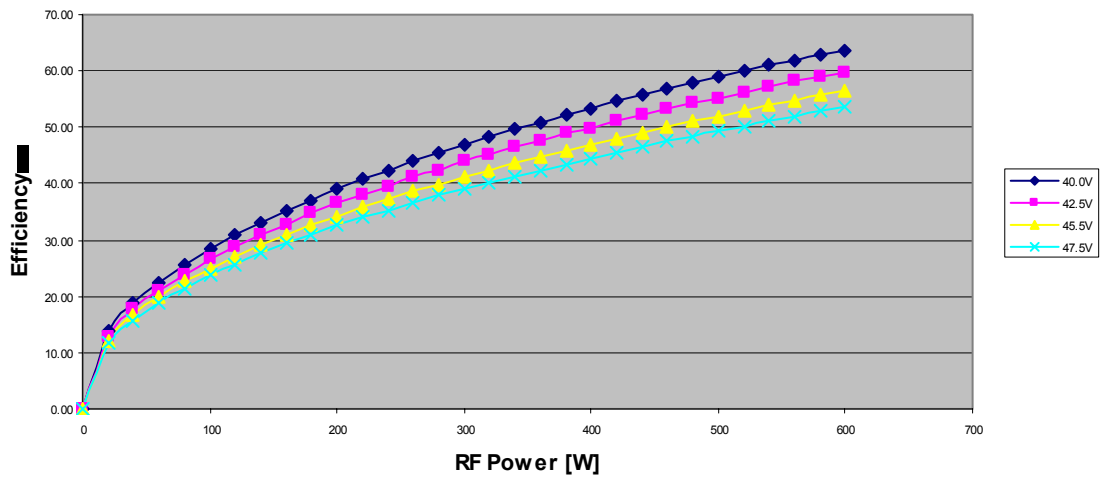
# AG 1014 PEP, $\eta$ and Harmonics



PEP LF 600W module at different supply voltages @ 500 kHz



Efficiency LF 600 W module at different supply voltages @ 500 kHz



AG 1014 third harmonic [h3] performance at different supply voltages / 500 kHz

