

# Variable Efficiency Power Amplifier (VEPA-2W)

**COBHAM**

The most important thing we build is trust.

## Applications

- UAV/UGV Transmission
- Wireless Camera
- COFDM Transmission
- FM Transmission
- Mobile and Portable AV Applications
- Electronic News Gathering (ENG)



## Key Features

- Variable Efficiency with local switch or remote logic signal
- High Efficiency Mode – 2 W out for 12 W DC in (Linear)
- High Linearity Mode – 2 W with 25 dB MER
- 9-32 VDC Supply Voltage
- Compact and lightweight
- Protected against excessive input power and load mismatch
- Reversed polarity protected

GMS' Variable Efficiency Power Amplifier (VEPA) Series has the unique ability to adjust its DC power consumption and switch from high linear operation into high efficiency operation mode. These modes are selectable via an external control connector logic signals. Both of these modes can be used for modulation schemes that require linear operation (like COFDM). The High efficiency mode is suitable for COFDM signal with 16 QAM modulation. The high linearity mode can work with COFDM signal up to 64 QAM and provide 2 W of RMS RF output power. This PA can also be used for non-linear signals like FM and can provide up to 3 W of RF output power.

An innovative protection circuit switches off the input signal when it exceeds the value corresponding to about 4 W COFDM output power and it also turns off the input signal when it detects excessive mismatch conditions.

# Variable Efficiency Power Amplifier (VEPA-2W)



## General Specifications:

Parameter		Specification
DC input voltage (Vdc)		9-32
Mechanical Dimension (without heat-sink)		2.1" L x 3" W x 0.6" H 5.3 cm x 7.6 cm x 1.52 cm
Weight	lbs	0.300
	grams	136
Baseplate Temperature		-20 °C to +70 °C
Operating Humidity		95 % Non-condensing
Control Connector 7 pin 1 mm JST	MODE CONTROL	Pin 1
	+5 Vdc	Pin 2:
	N/A	Pin 3:
	+ Vcc	Pin 4:
	+Vcc	Pin 5:
	Vcc RTRN	Pin 6
	Vcc RTRN	Pin 7
RF Connectors		SMA female

### NOTES:

To select High Efficiency MODE (LOW CURRENT) leave Pin 1 open.

To select High Linearity MODE (HIGH MER) connect Pins 1 and 2. Or connect 3-5 Vdc to Pin 1.

Pins 6 and 7 are internally connected to chassis.

# Variable Efficiency Power Amplifier (VEPA-2W)



## Frequency Specific Specifications:

LD Band: 1.4-1.6 GHz	MIN	AVERAGE	MAX
<b>HIGH EFFICIENCY MODE<sup>1</sup>:</b>			
GAIN 1.4-1.6 GHz (dB)	29	30.3	31.7
Flatness (dB)		+/- 1.3	+/- 1.5
Current @ 12 Vdc on 50 ohm load (A)		1.06	1.15
MER (dB) <sup>2</sup>	21.7	28.0	
<b>HIGH LINEARITY MODE<sup>1</sup>:</b>			
GAIN 1.4-1.6 GHz	28.7	30.1	31.8
Flatness (dB)		+/- 1.2	+/- 1.4
Current @ 12 Vdc on 50 ohm load (mA)		1.33	1.44
MER (dB) <sup>2</sup>	27.3	29.9	
Input RL (dB)		-25	-20
Output RL (dB)		-17	-12
Harmonic (dBm / MHz)		-29	-25
Gain Change (dB) (Over Temperature -20 to 70 °C)		+/- 0.25	+/- 0.5
All parameters measured at 25°C unless otherwise specified			

# Variable Efficiency Power Amplifier (VEPA-2W)



L2 Band: 1.7-1.85 GHz	MIN	AVERAGE	MAX
<b>HIGH EFFICIENCY MODE<sup>1</sup>:</b>			
GAIN 1.7-1.85 GHz (dB)	29.8	30.6	31.1
Flatness (dB)		+/- 0.7	+/- 0.8
Current @ 12 Vdc on 50 ohm load (A)		0.96	1.04
MER (dB) <sup>2</sup>	25.3	26.9	
<b>HIGH LINEARITY MODE<sup>1</sup>:</b>			
GAIN 1.7-1.85 GHz	29.4	30.6	31.6
Flatness (dB)		+/- 0.6	+/- 0.7
Current @ 12 Vdc on 50 ohm load (mA)		1.18	1.28
MER (dB) <sup>2</sup>	29.1	30.5	
Input RL (dB)		-20	-14
Output RL (dB)		-17	-12
Harmonic (dBm / MHz)		-35	-29
Gain Change (dB) (Over Temperature -20 to 70 °C)		+/- 0.25	+/- 0.5
All parameters measured at 25 °C unless otherwise specified			

# Variable Efficiency Power Amplifier (VEPA-2W)



W7 Band: 1.7-2.4 GHz	MIN	AVERAGE	MAX
<b>HIGH EFFICIENCY MODE<sup>1</sup>:</b>			
GAIN 1.7-2.4 GHz (dB)	28.5	29.7	30.8
Flatness (dB)		+/- 1.2	+/- 1.4
Current @ 12 Vdc on 50 ohm load (A)		1.1	1.28
MER (dB) <sup>2</sup>	19.3	21.9	
<b>HIGH LINEARITY MODE<sup>1</sup>:</b>			
GAIN 1.7-2.4 GHz	28.7	30.2	31.5
Flatness (dB)		+/- 1.1	+/- 1.2
Current @ 12 Vdc on 50 ohm load (mA)		1.32	1.52
MER (dB) <sup>2</sup>	25.2	26.2	
Input RL (dB)		-14.7	-9.6
Output RL (dB)		-17.3	-9.6
Harmonics (dBm / MHz)		-37	-24
Gain Change (dB) (Over Temperature -20 to 70 °C)		+/- 0.25	+/- 0.5
All parameters measured at 25 °C unless otherwise specified			

# Variable Efficiency Power Amplifier (VEPA-2W)



S2 Band: 1.99-2.5 GHz	MIN	AVERAGE	MAX
<b>HIGH EFFICIENCY MODE<sup>1</sup>:</b>			
GAIN 1.99-2.5 GHz (dB)	29.0	30.2	30.9
Flatness (dB)		+/- 1.0	+/- 1.1
Current @ 12 Vdc on 50 ohm load (A)		1.04	1.17
MER (dB) <sup>2</sup>	21.0	23.0	
<b>HIGH LINEARITY MODE<sup>1</sup>:</b>			
GAIN 1.99-2.5 GHz	29.7	31.0	31.8
Flatness (dB)		+/- 0.8	+/- 0.9
Current @ 12 Vdc on 50 ohm load (mA)		1.25	1.4
MER (dB) <sup>2</sup>	26.0	27.2	
Input RL (dB)		-12.3	-9.6
Output RL (dB)		-15.5	-10
Harmonics (dBm / MHz)		-40	-31
Gain Change (dB) (Over Temperature -20 to 70 °C)		+/- 0.25	+/- 0.5
All parameters measured at 25°C unless otherwise specified			

# Variable Efficiency Power Amplifier (VEPA-2W)



SK Band: 2.2-2.7 GHz	MIN	AVERAGE	MAX
<b>HIGH EFFICIENCY MODE<sup>1</sup>:</b>			
GAIN 2.2-2.7 GHz (dB)	29.2	30.5	31.6
Flatness (dB)		+/- 1.2	+/- 1.3
Current @ 12 Vdc on 50 ohm load (A)		0.97	1.01
MER (dB) <sup>2</sup>	19.7	22.8	
<b>HIGH LINEARITY MODE<sup>1</sup>:</b>			
GAIN 2.2-2.7 GHz	29.2	31	32.5
Flatness (dB)		+/- 1.0	+/- 1.1
Current @ 12 Vdc on 50 ohm load (mA)		1.15	1.22
MER (dB) <sup>2</sup>	24.6	26.7	
Input RL (dB)		-16	-10.5
Output RL (dB)		-15.8	-10
Harmonics (dBm / MHz)		-40	-32
Gain Change (dB) (Over Temperature -20 to 70 °C)		+/- 0.25	+/- 0.5
All parameters measured at 25 °C unless otherwise specified			

Notes:

1. Measurements performed at 2 W output power (33dBm).
2. MER measurements were performed using a Rhode & Schwartz EFA Test RCVR mod 2067 in Stationary mode.