

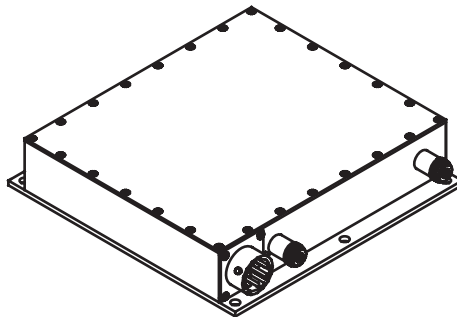
Custom RF High Power Amplifiers

In addition to Emhiser Research, Inc.'s line of miniature RF power amplifiers, Emhiser's acquisition of the military RF power amplifier product line from the former Chesapeake Microwave Corporation allows us to better serve the RF amplifier needs of our present and future customers.

Custom amplifiers may be designed in a wide variety of rack-mounted and airborne packages, power levels, gains, frequency bands, supply voltage requirements, communications, and control. Transistor technologies utilized include SiBJT, HBT, MOSFET, LDMOSFET, MESFET, and PHEMT.

Emhiser's custom RF high power amplifiers are designed to customer's specifications and / or source control drawings. Listed below are a few of our present products. Please call us to discuss your requirements.

- 50 W, Pulsed, Airborne, 3.1 to 3.5 GHz High Power Amplifier
- 250 W, Pulsed, Airborne, 3.1 to 3.5 GHz High Power Amplifier
- 125 W, CW, Airborne, 225 to 400 MHz, Serial Communications High Power Amplifier



EMHISER RESEARCH, INC.

2705 Old Highway 40 West
P.O. Box 189
Verdi, Nevada 89439-0189

Phone: (775) 345-2705

Fax: (775) 345-2484

E-mail: info@emhiser.com

Web: www.emhiser.com

RF Power Amplifiers

Emhiser Research, Inc.'s miniature RF power amplifiers utilize the same technologies as our current line of airborne telemetry transmitters that have been qualified for a variety of military and space programs. All Emhiser amplifiers are designed for harsh military environments.

Innovative design efforts have resulted in an ultra high efficiency (UHE) line of power amplifiers with previously unattainable DC-RF conversion efficiency. For a required output power, our UHE technology decreases current draw and dissipated power requiring fewer, smaller, and lighter batteries and heat sinks. UHE power amplifiers are available in miniature airborne packages with a variety of power levels, frequency bands, and supply voltage requirements.

Listed below are some of our more common products. If these products do not meet your specifications, please call us to discuss your requirements.

- 1.3 Cubic Inches, L- or S-Band, 150 mW to 2 W, Class AB, +12 Vdc
- 3.3 Cubic Inches, L- or S-Band, 2 W to 5 W, Class AB, +28 Vdc
- 9 Cubic Inches, L- or S-Band, 2 W to 20 W (UHE Optional), Class AB, +28 Vdc
- 11 Cubic Inches, L- or S-Band, UHE, 2 W to 20 W, Class AB, +28 Vdc
- 36 Cubic Inches, L- or S-Band, UHE, 40 W to 100 W, Class AB, +28 Vdc



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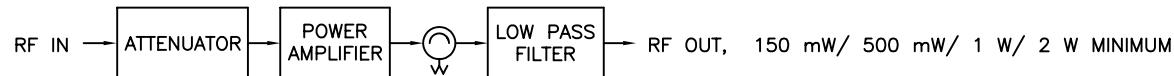
Phone: (775) 345-2705
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E-mail: info@emhiser.com
Web: www.emhiser.com

RF Power Amplifier Model EP-01DE Series

1.3 Cubic Inches 150 mW, 500 mW, 1 Watt, or 2 Watts

Class AB 12 VDC

Protected by One or More of the following Patents:
 US: 5,091,706, 5,097,230, 5,311,152, 5,497,509, 5,802,462, 6,404,292, 6,411,237,
 6,417,738, 6,650,180, 6,683,499, 6,690,238, 6,747,517, and 6,771,133.
 Canadian: 2,033,861, 2,033,878, 2,080,013, 2,097,042, 2,235,091, and 2,308,209.
 Other US and Canadian Patents Pending.



RF OUTPUT

CARRIER FREQUENCY: 1435 to 1540; 1710 to 1850; 2200 to 2300;
 2300 to 2400 MHz (Specify)
 POWER: 150 mW /500 mW /1 W /2 W Minimum
 VSWR: 1.5:1 Maximum
 IMPEDANCE: 50 Ohms Nominal
 LOADING: Normal Operation into any Load VSWR and Phase Angle
 OPEN/SHORT PROTECTION: Internal Isolator
 HARMONIC FILTER: 5 Pole Chebychev

RF INPUT

POWER: 10 Milliwatts Minimum, 1 Watt Maximum (Specify)
 INPUT TOLERANCE: ± 1.5 dB
 VSWR: 1.5:1 Maximum
 IMPEDANCE: 50 Ohms Nominal

POWER REQUIREMENTS

INPUT VOLTAGE: +12 +4.5/-1.5 VDC: Reverse Polarity Protected
 INPUT CURRENT (MAXIMUM):

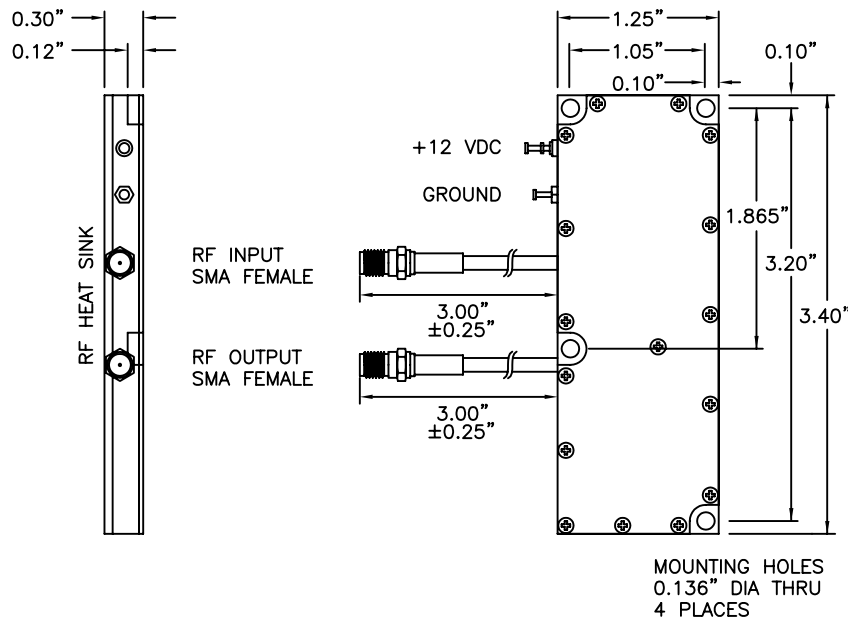
Power	Current
150 Milliwatts	200 Milliamps
500 Milliwatts	400 Milliamps
1 Watt	650 Milliamps
2 Watts	1.0 Amp

ENVIRONMENTAL SPECIFICATIONS

TEMPERATURE: Operating: -20°C to +70°C; Storage: -55°C to +100°C
 VIBRATION: 14 G's, Random, Standard Haystack, 20 Hz to 2 KHz, 3 Axes
 SHOCK: 1/2 Sine, 100 G's Pk, 11 ms, 3 Axes
 ACCELERATION: 100 G's, 3 Axes
 ALTITUDE: Unlimited
 HUMIDITY: To 95% at any Temperature forming Frost or Condensation

PHYSICAL CHARACTERISTICS

DIMENSIONS: Per Outline Drawing
 WEIGHT: 2 oz. Maximum



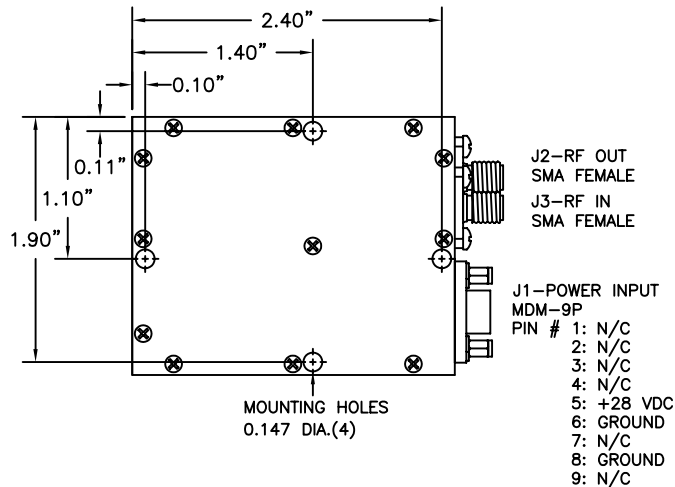
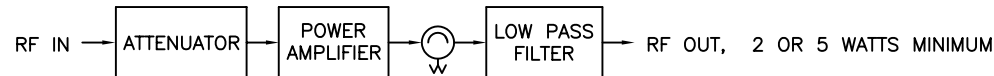
DATE	06 02 17	 EMHISER RESEARCH, INC. 2705 OLD HIGHWAY 40 WEST TEL: 775-345-2705 P.O. BOX 189 VERDI, NEVADA FAX: 775-345-2484 89439-0189 U.S.A. EMAIL: INFO@EMHISER.COM	
DWN	L3		
APVD	RF POWER AMPLIFIER, 150mW/500mW/1W/2W CLASS AB 1435 TO 2400 MHZ (4 BANDS)		
QC			
CAGE CODE IDENT NO.	60666	MODEL NO. EP-01DE SERIES	

RF Power Amplifier Model EP-S3DE Series

3.3 Cubic Inches 2 or 5 Watts

Class AB 28 VDC

Protected by One or More of the following Patents:
 US: 5,091,706, 5,097,230, 5,311,152, 5,497,509, 5,802,462, 6,404,292, 6,411,237,
 6,417,738, 6,650,180, 6,683,499, 6,690,238, 6,747,517, and 6,771,133.
 Canadian: 2,033,861, 2,033,878, 2,080,013, 2,097,042, 2,235,091, and 2,308,209.
 Other US and Canadian Patents Pending.



RF OUTPUT

CARRIER FREQUENCY:

1435 to 1540; 1710 to 1850; 2200 to 2300;
 2300 to 2400 MHz (Specify)

POWER:

2 or 5 Watts Minimum (Specify)

VSWR:

1.5:1 Maximum

IMPEDANCE:

50 Ohms Nominal

LOADING:

Normal Operation into any Load VSWR and Phase Angle

OPEN/SHORT PROTECTION:

Internal Isolator

HARMONIC FILTER:

7 Pole Chebychev

RF INPUT

POWER:

10 Milliwatts Minimum, 1 Watt Maximum (Specify)

INPUT TOLERANCE:

±1.5 dB

VSWR:

1.5:1 Maximum

IMPEDANCE:

50 Ohms Nominal

POWER REQUIREMENTS

INPUT VOLTAGE:

+28 ±4 VDC: Reverse Polarity Protected

INPUT CURRENT (MAXIMUM):

Power	Current
2 Watts	650 Milliamps
5 Watts	1.2 amps

ENVIRONMENTAL SPECIFICATIONS

TEMPERATURE:

Operating: -20°C to +70°C; Storage: -54°C to +125°C

VIBRATION:

14 G's, Random, Standard Haystack, 20 Hz to 2 KHz, 3 Axes

SHOCK:

1/2 Sine, 100 G's Pk, 11 ms, 3 Axes

ACCELERATION:

100 G's, 3 Axes

ALTITUDE:

Unlimited

HUMIDITY:

To 95% at any Temperature forming Frost or Condensation

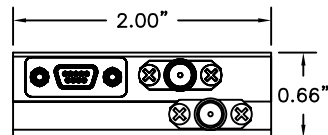
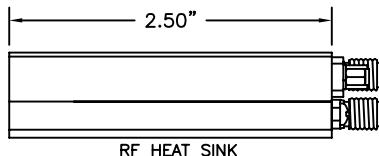
PHYSICAL CHARACTERISTICS

DIMENSIONS:

Per Outline Drawing

WEIGHT:

3.6 oz. Maximum



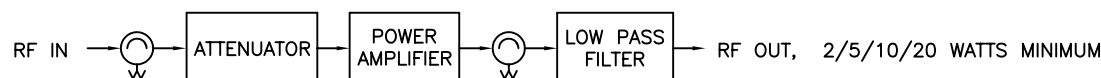
DATE	06 02 17	 EMHISER RESEARCH, INC. 2705 OLD HIGHWAY 40 WEST TEL: 775-345-2705 P.O. BOX 189 VERDI, NEVADA FAX: 775-345-2484 89439-0189 U.S.A. EMAIL: INFO@EMHISER.COM
DWN	L3	
APVD		
QC		
CAGE CODE IDENT NO. 60666		RF POWER AMPLIFIER, 2 OR 5 WATTS CLASS AB 1435 TO 2400 MHZ (4 BANDS) MODEL NO. EP-S3DE SERIES

RF Power Amplifier Model EP-09DE Series

Standard or Ultra High Efficiency 9 Cubic Inches 2/5/10/20 Watts

Class AB 28 VDC

Protected by One or More of the following Patents:
 US: 5,091,706, 5,097,230, 5,311,152, 5,497,509, 5,802,462, 6,404,292, 6,411,237, 6,417,738, 6,650,180, 6,683,499, 6,690,238, 6,747,517, and 6,771,133.
 Canadian: 2,033,861, 2,033,878, 2,080,013, 2,097,042, 2,235,091, and 2,308,209.
 Other US and Canadian Patents Pending.



RF OUTPUT

CARRIER FREQUENCY: 1435 to 1540; 1710 to 1850; 2200 to 2300; 2300 to 2400 MHz (Specify)
 POWER: 2/5/10/20 Watts Minimum (Specify)
 VSWR: 1.5:1 Maximum
 IMPEDANCE: 50 Ohms Nominal
 LOADING: Normal Operation into any Load VSWR and Phase Angle
 OPEN/SHORT PROTECTION: Internal Isolator
 HARMONIC FILTER: 7 Pole Chebychev

RF INPUT

POWER: 10 Milliwatts Minimum, 1 Watt Maximum (Specify)
 INPUT TOLERANCE: ± 1.5 dB
 VSWR: 1.5:1 Maximum
 IMPEDANCE: 50 Ohms Nominal

POWER REQUIREMENTS

INPUT VOLTAGE: +28 ± 4 VDC: Reverse Polarity Protected
 INPUT CURRENT (MAXIMUM):

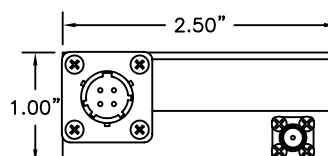
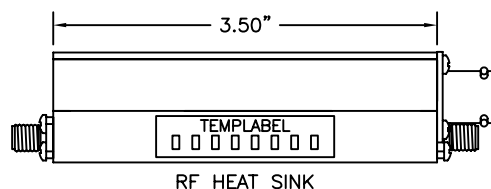
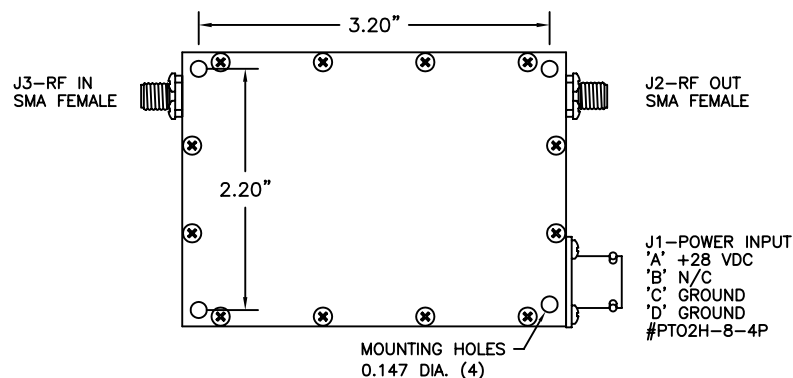
Power	Current
2 Watts	650 Milliamps
5 Watts	750 Milliamps (Ultra High Efficiency)
5 Watts	1.2 Amps
10 Watts	2.0 Amps
20 Watts	4.0 Amps

ENVIRONMENTAL SPECIFICATIONS

TEMPERATURE: Operating: -20°C to +70°C; Storage: -54°C to +125°C
 VIBRATION: 14 G's, Random, Standard Haystack, 20 Hz to 2 KHz, 3 Axes
 SHOCK: 1/2 Sine, 100 G's Pk, 11 ms, 3 Axes
 ACCELERATION: 100 G's, 3 Axes
 ALTITUDE: Unlimited
 HUMIDITY: To 95% at any Temperature forming Frost or Condensation

PHYSICAL CHARACTERISTICS

DIMENSIONS: Per Outline Drawing
 WEIGHT: 12 oz. Maximum



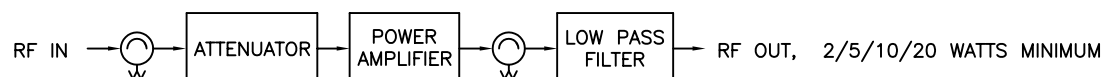
DATE	06 02 17	 EMHISER RESEARCH, INC. 2705 OLD HIGHWAY 40 WEST TEL: 775-345-2705 P.O. BOX 189 VERDI, NEVADA FAX: 775-345-2484 89439-0189 U.S.A. EMAIL: INFO@EMHISER.COM
DWN	L3	
APVD		
QC		
CAGE CODE IDENT NO. 60666		RF POWER AMPLIFIER, 2/5-10/20 WATTS CLASS AB 1435 TO 2400 MHZ (4 BANDS) MODEL NO. EP-09DE-SERIES

RF Power Amplifier Model EP-11DE Series

Standard or Ultra High Efficiency 11 Cubic Inches 2/5/10/20 Watts

Class AB 28 VDC

Protected by One or More of the following Patents:
 US: 5,091,706, 5,097,230, 5,311,152, 5,497,509, 5,802,462, 6,404,292, 6,411,237,
 6,417,738, 6,650,180, 6,683,499, 6,690,238, 6,747,517, and 6,771,133.
 Canadian: 2,033,861, 2,033,878, 2,080,013, 2,097,042, 2,235,091, and 2,308,209.
 Other US and Canadian Patents Pending.



RF OUTPUT

CARRIER FREQUENCY:

1435 to 1540; 1710 to 1850; 2200 to 2300;
 2300 to 2400 MHz (Specify)

POWER:

2/5/10/20 Watts Minimum (Specify)

VSWR:

1.5:1 Maximum

IMPEDANCE:

50 Ohms Nominal

LOADING:

Normal Operation into any Load VSWR and Phase Angle

OPEN/SHORT PROTECTION:

Internal Isolator

HARMONIC FILTER:

7 Pole Chebychev

RF INPUT

POWER:

10 Milliwatts Minimum, 1 Watt Maximum (Specify)

INPUT TOLERANCE:

±1.5 dB

VSWR:

1.5:1 Maximum

IMPEDANCE:

50 Ohms Nominal

POWER REQUIREMENTS

INPUT VOLTAGE:

+28 ±4 VDC: Reverse Polarity Protected

INPUT CURRENT (MAXIMUM):

Power	Current
2 Watts	650 Milliamps
5 Watts	750 Milliamps (Ultra High Efficiency)
5 Watts	1.2 Amps
10 Watts	2.0 Amps
20 Watts	4.0 Amps

ENVIRONMENTAL SPECIFICATIONS

TEMPERATURE:

Operating: -20°C to +70°C; Storage: -54°C to +125°C

VIBRATION:

14 G's, Random, Standard Haystack, 20 Hz to 2 KHz, 3 Axes

SHOCK:

1/2 Sine, 100 G's Pk, 11 ms, 3 Axes

ACCELERATION:

100 G's, 3 Axes

ALTITUDE:

Unlimited

HUMIDITY:

To 95% at any Temperature forming Frost or Condensation

PHYSICAL CHARACTERISTICS

RF CONNECTORS:

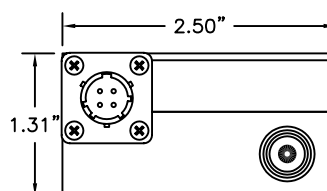
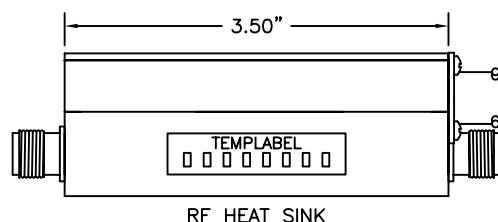
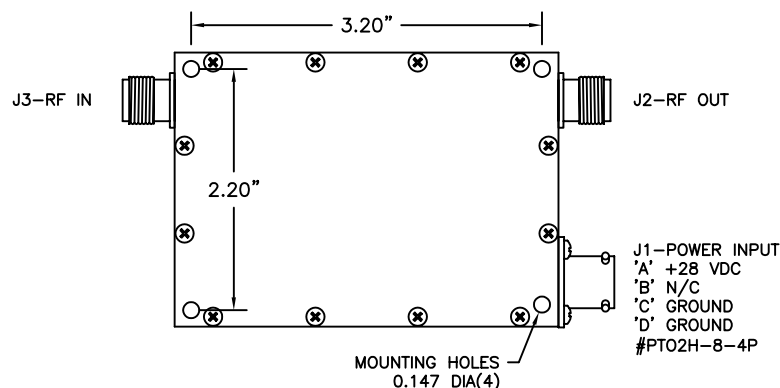
SMA-F, BNC-F, TNC-F, or N-F in any Combination (Specify)

DIMENSIONS:

Per Outline Drawing

WEIGHT:

14 oz. Maximum



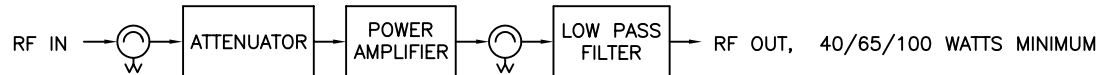
DATE	06 02 17	 EMHISER RESEARCH, INC. 2705 OLD HIGHWAY 40 WEST TEL: 775-345-2705 P.O. BOX 189 VERDI, NEVADA FAX: 775-345-2484 89439-0189 U.S.A. EMAIL: INFO@EMHISER.COM
DWN	L3	
APVD		
QC		
CAGE CODE IDENT NO. 60666		RF POWER AMPLIFIER, 2/5-UHE/5/10/20 WATTS CLASS AB 1435 TO 2400 MHZ (4 BANDS)
MODEL NO. EP-11DE-SERIES		

RF Power Amplifier Model EP-36DE Series

36 Cubic Inches 40/65/100 Watts

Class AB 28 VDC

Protected by One or More of the following Patents:
 US: 5,091,706, 5,097,230, 5,311,152, 5,497,509, 5,802,462, 6,404,292, 6,411,237,
 6,417,738, 6,650,180, 6,683,499, 6,690,238, 6,747,517, and 6,771,133.
 Canadian: 2,033,861, 2,033,878, 2,080,013, 2,097,042, 2,235,091, and 2,308,209.
 Other US and Canadian Patents Pending.



RF OUTPUT

CARRIER FREQUENCY: 1435 to 1540; 1710 to 1850; 2200 to 2300;
 2300 to 2400 MHz (Specify)
 POWER: 40/65/100 Watts Minimum (Specify)
 VSWR: 1.5:1 Maximum
 IMPEDANCE: 50 Ohms Nominal
 LOADING: Normal Operation into any Load VSWR and Phase Angle
 OPEN/SHORT PROTECTION: Internal Isolator
 HARMONIC FILTER: 7 Pole Chebychev

RF INPUT

POWER: 10 Milliwatts Minimum, 10 Watts Maximum (Specify)
 INPUT TOLERANCE: ± 1.5 dB
 VSWR: 1.5:1 Maximum
 IMPEDANCE: 50 Ohms Nominal

POWER REQUIREMENTS

INPUT VOLTAGE: +28 ± 4 VDC: Reverse Polarity Protected
 INPUT CURRENT (MAXIMUM):

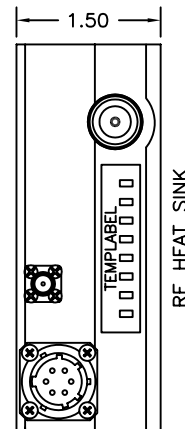
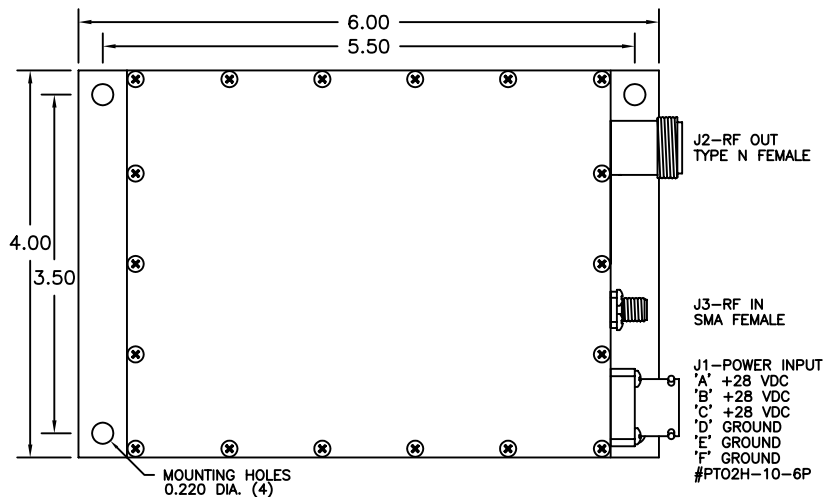
Band	40 W	65 W	100 W
1435 to 1540 MHz	7.0 A	10 A	16 A
1710 to 1850 MHz	7.5 A	11 A	18 A
2200 to 2300 MHz	8.0 A	12 A	20 A
2300 to 2400 MHz	8.0 A	12 A	20 A

ENVIRONMENTAL SPECIFICATIONS

TEMPERATURE: Operating: -20°C to $+70^{\circ}\text{C}$; Storage: -54°C to $+125^{\circ}\text{C}$
 VIBRATION: 14 G's, Random, Standard Haystack, 20 Hz to 2 KHz, 3 Axes
 SHOCK: 1/2 Sine, 100 G's Pk, 11 ms, 3 Axes
 ACCELERATION: 100 G's, 3 Axes
 ALTITUDE: Unlimited
 HUMIDITY: To 95% at any Temperature forming Frost or Condensation

PHYSICAL CHARACTERISTICS

DIMENSIONS: Per Outline Drawing
 WEIGHT: 48 oz. Maximum

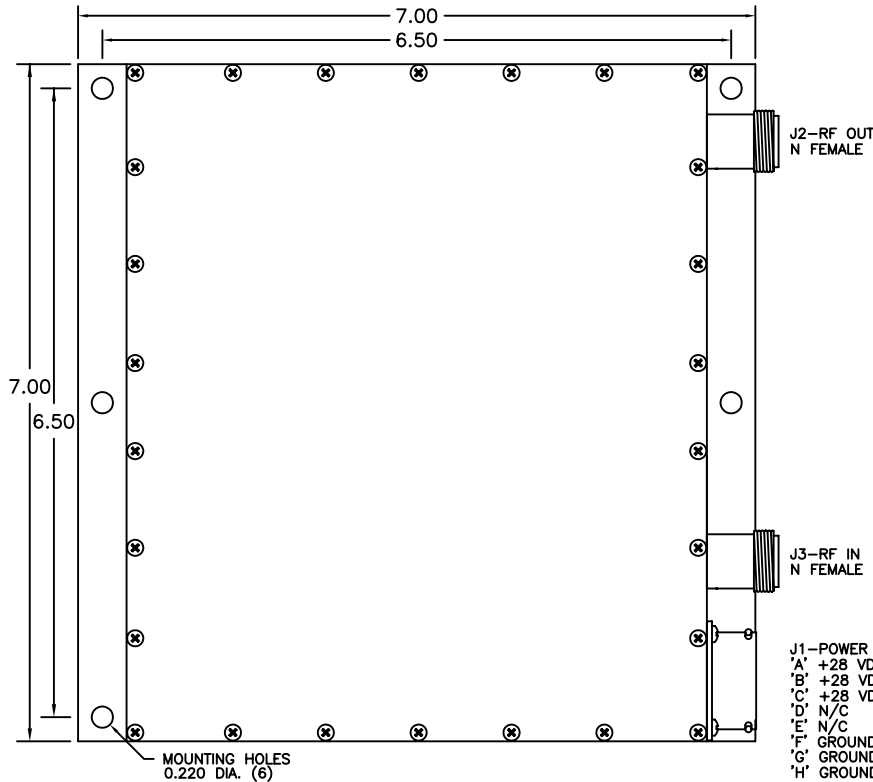
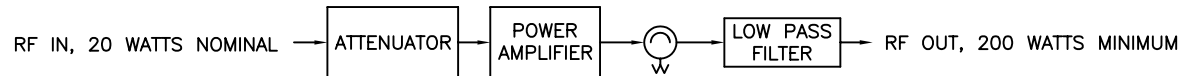


DATE	06 02 17	 EMHISER RESEARCH, INC. 2705 OLD HIGHWAY 40 WEST TEL: 775-345-2705 P.O. BOX 189 VERDI, NEVADA FAX: 775-345-2484 89439-0189 U.S.A. EMAIL: INFO@EMHISER.COM
DWN	L3	
APVD		
QC		
CAGE CODE IDENT NO.	60666	RF POWER AMPLIFIER, 40/65/100 WATTS CLASS AB 1435 TO 2400 MHz (4 BANDS)
		MODEL NO. EP-36DE-SERIES 

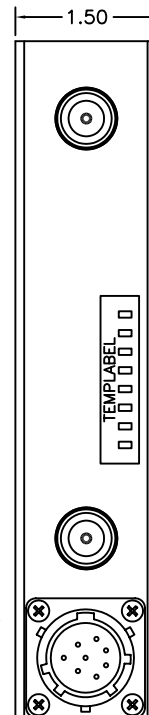
RF Power Amplifier Model EP-73B2203204-44

73 Cubic Inches 20 Watts Input 200 Watts Output

Class C 28 VDC



CONNECTOR TYPE = PT02H-16-8P



RF OUTPUT

FREQUENCY RANGE:

POWER:

VSUR:

IMPEDANCE:

LOADING:

OPEN/SHORT PROTECTION:

HARMONIC FILTER:

400 to 450 MHz

200 Watts Minimum

1.5:1 Maximum

50 Ohms Nominal

Normal Operation into any Load VSWR and Phase Angle

Internal Isolator

7 Pole Chebyshev

RF INPUT

POWER:

VSUR:

IMPEDANCE:

20 Watts ± 0.75 dB

1.5:1 Maximum

50 Ohms Nominal

POWER REQUIREMENTS

INPUT VOLTAGE:

INPUT CURRENT:

+28 ± 4 VDC: Reverse Polarity Protected

25 Amps Maximum

ENVIRONMENTAL SPECIFICATIONS

TEMPERATURE:

VIBRATION:

SHOCK:

ACCELERATION:

ALTITUDE:

HUMIDITY:

Operating: -54°C to $+55^{\circ}\text{C}$; Storage: -54°C to $+125^{\circ}\text{C}$

14 G's, Random, Standard Haystack, 20 Hz to 2 KHz, 3 Axes

1/2 Sine, 100 G's Pk, 11 ms, 3 Axes

100 G's, 3 Axes

Unlimited

To 95% at any Temperature forming Frost or Condensation

PHYSICAL CHARACTERISTICS

DIMENSIONS:

WEIGHT:

Per Outline Drawing

72 oz. Maximum

DATE	05 08 08	 EMHISER RESEARCH, INC. 2705 OLD HIGHWAY 40 WEST TEL: 775-345-2705 P.O. BOX 189 VERDI, NEVADA FAX: 775-345-2484 89439-0189 U.S.A. EMAIL: INFO@EMHISER.COM
DWN	L3	
APVD		
QC		
CAGE CODE IDENT NO.	60666	RF POWER AMPLIFIER 20 WATTS IN 200 WATTS OUT 400 TO 450 MHz MODEL NO. EP-73B2203204-44