# LPA Concepts

| LINEAR POWER AMPLIFIER | LPA-AH1-020AA-0760M-0960M-28-00 |
|---|---|
| **P2990** | |

## FEATURES

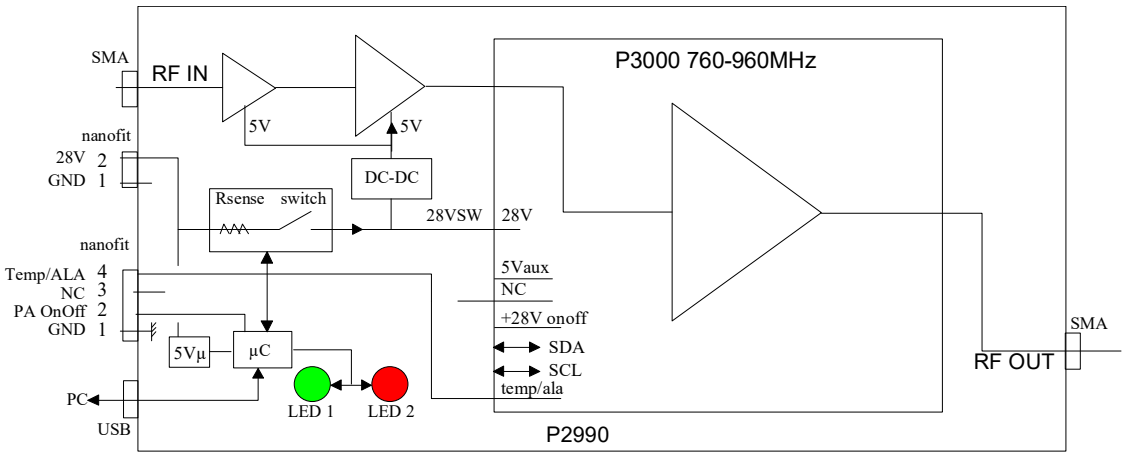
- 760-960MHz
- Gain : 46 dB
- Class A / OIP3 = +55 dBm
- 28V / 2.3A
- Temperature compensated gain
- Protection over/under voltage, current and temperature
- Visual status with LEDs
- USB monitoring & controls
- RoHS compliant

## PACKAGE


## APPLICATIONS

- Instrumentation

## BLOCK DIAGRAM



## Electrical characteristics: 50 ohms; +28V; -25°C to +80°C (1, 2)

| Ref | Parameter | Conditions | Note | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|---|
| 1 | Bandwidth | | | 760 | | 960 | MHz |
| 2 | Gain small signal | 860 MHz; 50°C | | | 46 | | dB |
| 3 | Gain variation vs frequency | 760 MHz - 960 MHz | | | | 1 | dBpp |
| 4 | Gain variation vs temperature | -25°C to +80°C | 2 | | 0.5 | | dB |
| 5 | Input return loss | 50 ohms | | | | -15 | dB |
| 6 | Output return loss | 50 ohms | | | | -15 | dB |
| 7 | Peak envelope power | IMD3 = -30 dBc, f=860 MHz | 3 | | 40 | | W |
| 8 | OIP3 | IMD3 = -60 dBc, f=860 MHz | 4 | 54 | 55 | | dBm |
| 9 | OIP3 Flatness | 760 MHz - 960 MHz | | | | 3 | dBmpp |
| 10 | Output Noise | 760 MHz - 960 MHz | | | -121 | | dBm/Hz |
| 11 | Current consumption | 28V ; <30dBm | | | 2.3 | | A |

1. Unless otherwise specified
2. Housing temperature
3. 2 CW tones 10W each, f1=855 MHz, f2=865MHz
4. 2 CW tones +25dBm each, f1=855 MHz, f2=865MHz

## Maximum ratings

| Ref | Parameter | Conditions | Note | Min | Nom | Max | Units |
|---|---|---|---|---|---|---|---|
| 1 | Operating temperature | Flange temperature | | -40°C | | +90 | °C |
| 2 | Supply voltage | | | 26 | 28 | 30 | V |
| 3 | Voltage on Alarm pin | | | | | 10 | V |
| 4 | Input CW power | | 5 | | | -3 | dBm |
| 5 | Load VSWR | at 20W output | 5 | | | 10:1 | |

5. This amplifier is intended to work in a linear mode. Although its peak power capability is 40W, its output power is limited to 20W CW.

## Protections

| Ref | Parameter | Description | Remarks |
|---|---|---|---|
| 1 | Overvoltage | Shut down if supply > 30 V | |
| 2 | Under voltage | Shut down if supply < 26 V | |
| 3 | Overcurrent | Shut down if current > 3.7 A | Output power > +44dBm CW |
| 4 | Temperature | Shut down if temp > 80°C | Auto recovery (at 75°C) |

## Analog monitoring & controls

| Ref | Characteristic | Description | Remarks |
|---|---|---|---|
| 1 | Temperature | Analog output | -40°C to +100°C (TMP20) |
| 2 | Alarm | Open drain (0V on alarm) | Multiplexed with analog temp |
| 3 | PA On/Off | <Amplifier Off when PAOO > 3V | 48V switches off |
| 4 | | | |

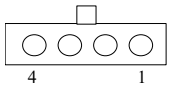
## USB Monitoring & controls (6)

| Ref | Characteristic | Description | Remarks |
|---|---|---|---|
| 1 | Temperature | Temperature of amplifier module | Digital sensor |
| 2 | Supply voltage | Voltage applied by user | |
| 3 | Current | Through sense resistor | Rsense=11.65 mohms |
| 4 | ON/OFF | Shut down amplifier | |
| 5 | Alarm | Provide state of amplifier | |

6. Use Interface program PRSI25001V0.2.

Specifications and information are subject to change without notice

### Communication DC Connector Molex NanoFit 105313-1104

| Pin description | | | PINOUT |
|---|---|---|---|
| Pin 1 : GND | | Mate with 105313-1104 |   |
| Pin 2 : PA ONOff | | | |
| Pin 3 : NC | | | |
| Pin 4 : Temperature /ALA | Open drain | | |

### Communication USB

| Pin description | | | PINOUT |
|---|---|---|---|
| Pin 1 : GND | | Mini USB b |   |
| Pin 2 : Data- | | | |
| Pin 3 : Data+ | | | |
| Pin 4 : Vbus | | | |

### Power Supply DC Connector Molex NanoFit 105313-1102

| Pin description | | | PINOUT |
|---|---|---|---|
| Pin 2 : Supply +28V | | Mate with 105307-1202 with 105300-2100 inserts and AWG20-22 wires |   |
| Pin 1 : Gnd | | | |
| | | | |
| | | | |

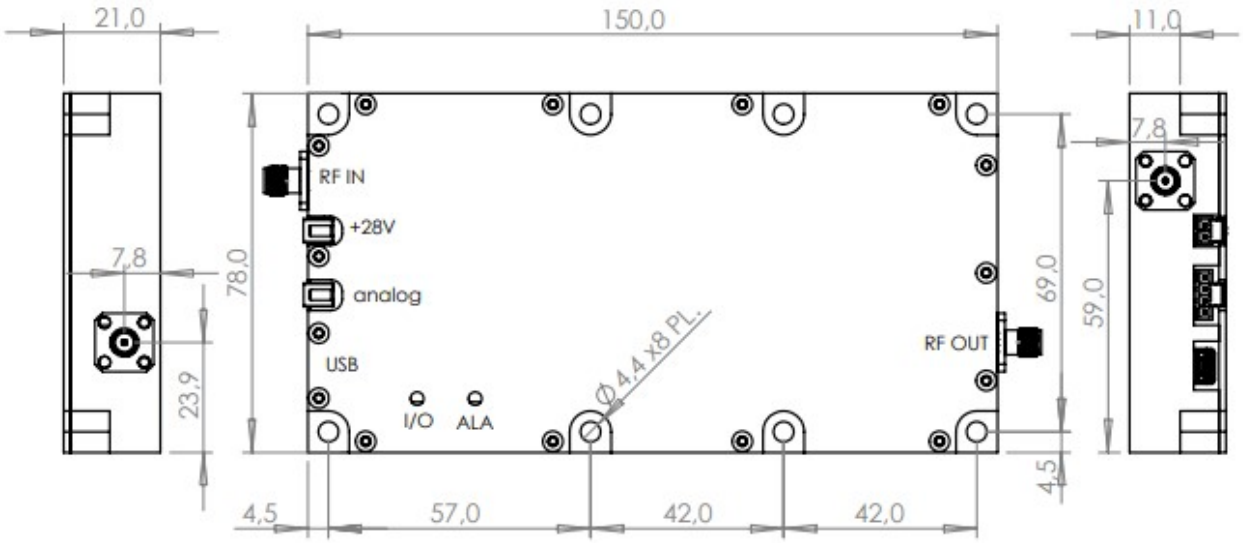
### LED significations

| LED 1 (green) | LED 2 (red/orange) | Signification |
|---|---|---|
| OFF | OFF | Power supply not applied |
| ON | OFF | Amplifier ON |
| Blinking | OFF | Amplifier Muted by operator |
| ON | Orange | Temperature warning, amplifier ON |
| OFF | Red | Amplifier OFF (Under voltage, over voltage, over temp….) |

### Mechanical characteristics

| Ref | characteristic | description | remarks |
|---|---|---|---|
| 1 | Housing dimensions | 150mm x 78mm x 21mm | |
| 2 | Housing cover finish | Electroless nickel | |
| 3 | Mounting | 8 M4 screws | |
| 4 | Input/output RF connectors | SMA | |
| 5 | DC supply connector | Molex 105313-1102 | Male type |
| 6 | DC controls connector | Molex 105313-1104 | Male type |
| 7 | USB connectors | Mini USB B | |
| 8 | Weight | 460 grams | |

**Package outline:**




Part numbering:

**LPA-AH1-020AA-0760M-0960M-28-00**

Housing

Peak power (W)

| Class of operation | |
|---|---|
| AA | Class A |
| AB | Class AB |
| DO | Doherty |

Frequency band lower edge

Frequency band upper edge

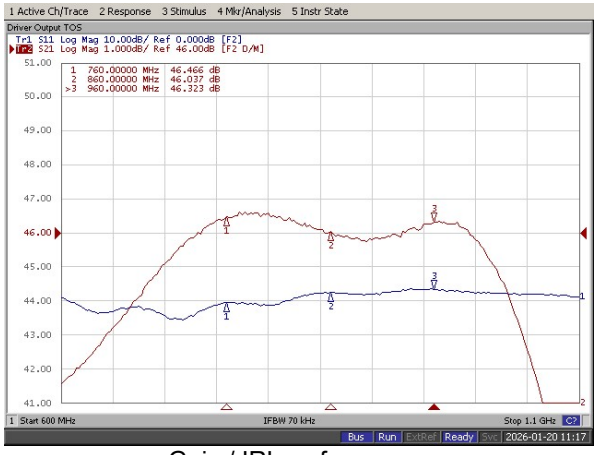
| Supply Voltage | |
|---|---|
| 28 | 28V Supply |
| 48 | 48V Supply |
| | |

Other options

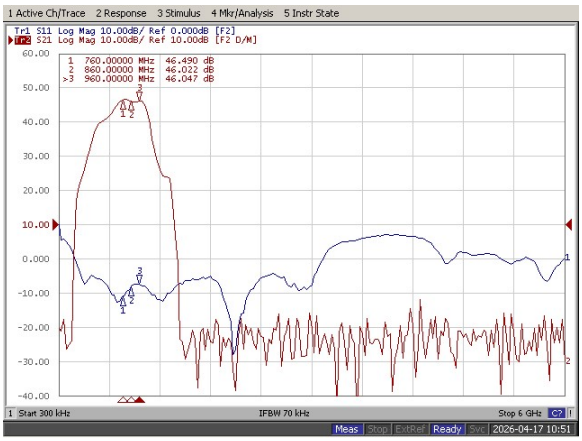
Support material:

| Ref | Document type | Document number | Title | Date |
|---|---|---|---|---|
| 1 | USB Cable | | USB to mini USB B | |
| 2 | Interface program | PRSI25001 V0.2. | | 2025 |
| | | | | |
| | | | | |

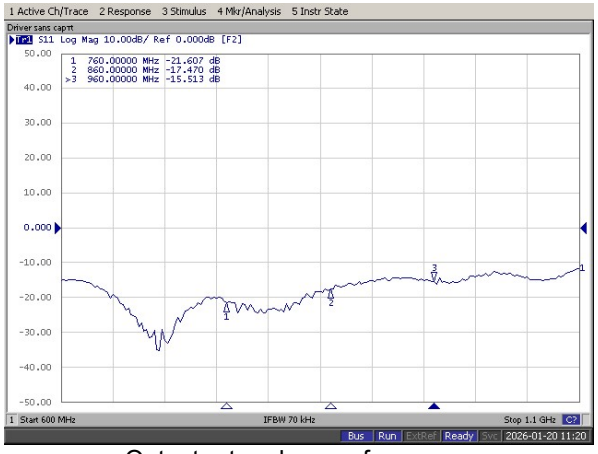
## TYPICAL PERFORMANCE



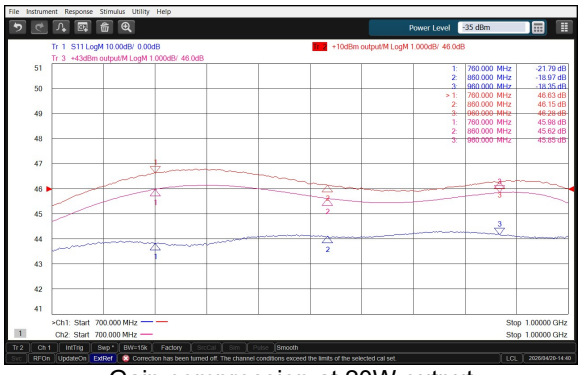

Gain / IRL vs frequency



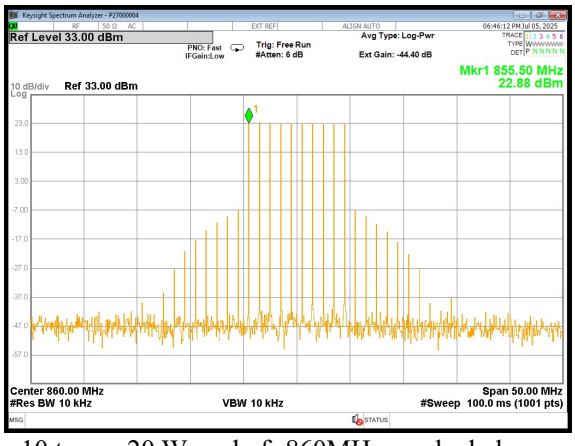

Wideband response



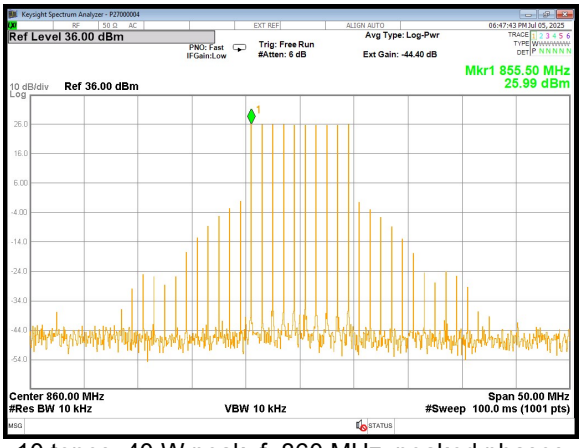

Output return loss vs frequency




Gain compression at 20W output




10 tones, 20 W peak, f=860MHz, peaked phases




10 tones, 40 W peak, f=860 MHz, peaked phases

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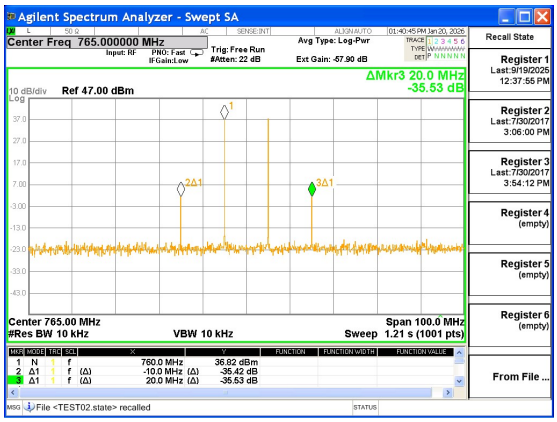
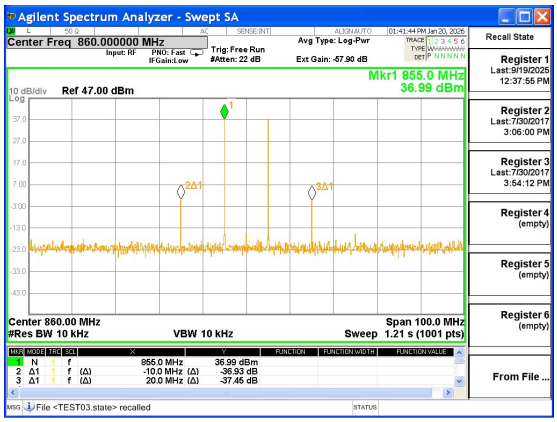
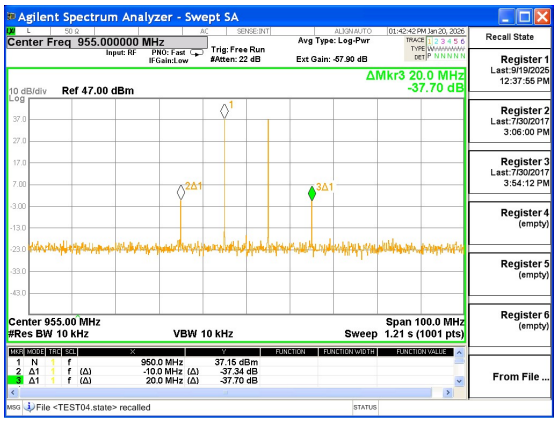
## TYPICAL PERFORMANCE (continued)



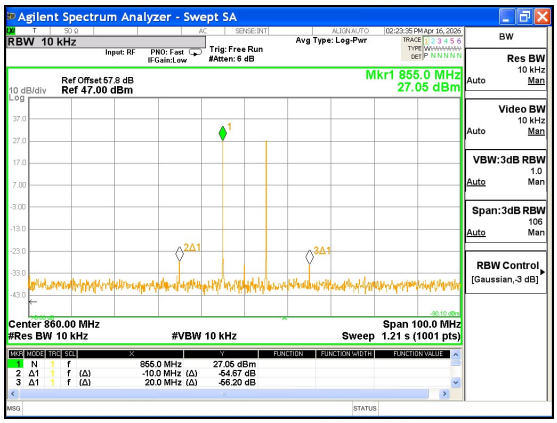

2 tones 760MHz 770MHz +37dBm each



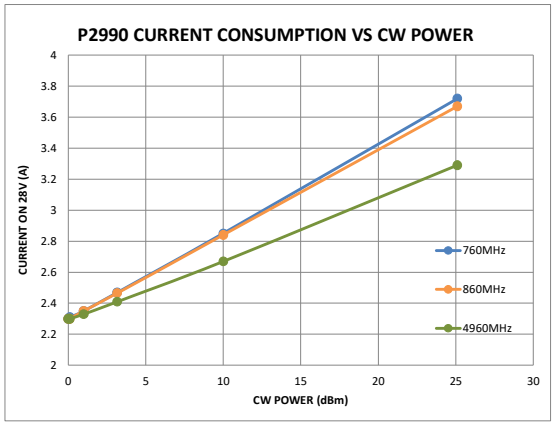

2 tones 855MHz 865MHz +37dBm each

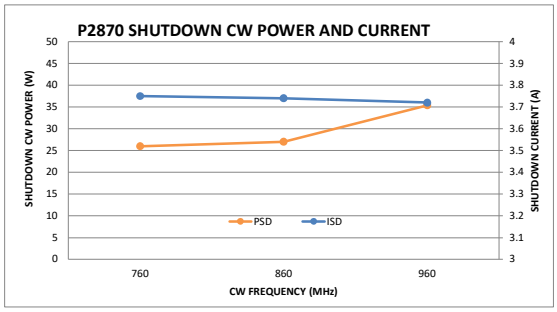



2 tones 955MHz 960MHz +37dBm each




2 tones 855MHz 865MHz +27dBm each



## TYPICAL PERFORMANCE (continued)