LPA Concepts

LINEAR POWER AMPLIFIER	LPA-AH1-020AA-0380M-0480M-28-00
P2870	

FEATURES

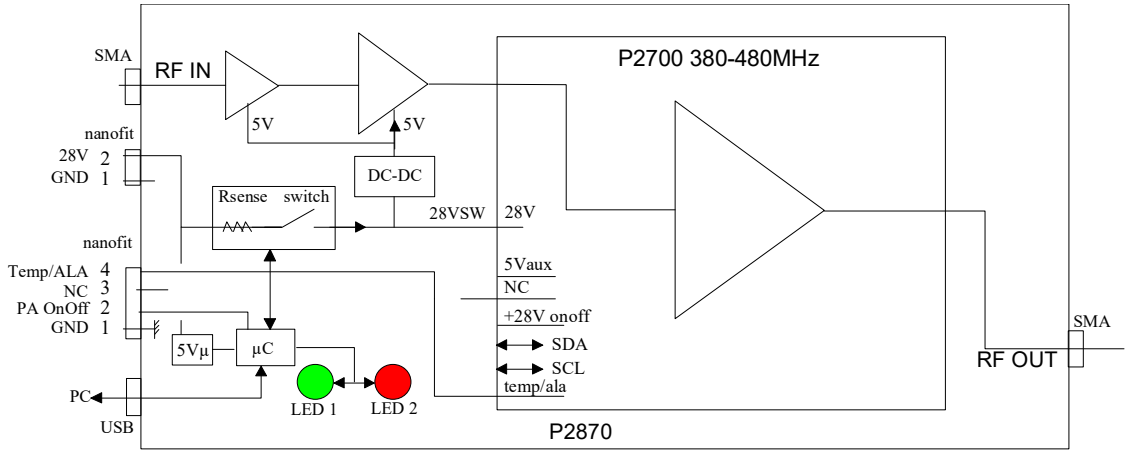
- ♦ 380-480MHz
- ♦ Gain : 52 dB
- ♦ Class A / OIP3 = +55 dBm
- ♦ 28V / 2.3A
- ♦ Temperature compensated gain
- ♦ Protection over/under voltage, current and temperature
- ♦ Visual status with LEDs
- ♦ USB monitoring & controls
- ♦ RoHS compliant

PACKAGE

APPLICATIONS

- ♦ Instrumentation

BLOCK DIAGRAM



Specifications and information are subject to change without notice

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

Ref	Parameter	Conditions	Note	Min	Typ	Max	Units
1	Bandwidth			380		480	MHz
2	Gain small signal	430 MHz; 50°C			52		dB
3	Gain variation vs frequency	380 MHz - 480 MHz				1.0	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=430 MHz	3		40		W
8	OIP3	IMD3 = -60 dBc, f=430 MHz	4	54	55		dBm
9	OIP3 Flatness	380 MHz - 480 MHz				3	dBmpp
10	Harmonic rejection	430MHz +34dBm			-43		dBc
11	Output Noise	380 MHz - 480 MHz			-121		dBm/Hz
12	Current consumption	28V ; <30dBm			2.3		A

1. Unless otherwise specified
2. Housing temperature
3. 2 CW tones 10W each, f1=429 MHz, f2=431MHz
4. 2 CW tones +25dBm each, f1=429 MHz, f2=431MHz

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			-9	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 > 3.6 A	
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

USB Monitoring & controls (6, 7)

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=13.2 mohms
4	ON/OFF	Shut down amplifier	
5	Alarm	Provide state of amplifier	

6. For more details see programmer's guide
7. Driver needed for communication

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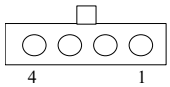
Communication DC Connector Molex NanoFit 105313-1104

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			

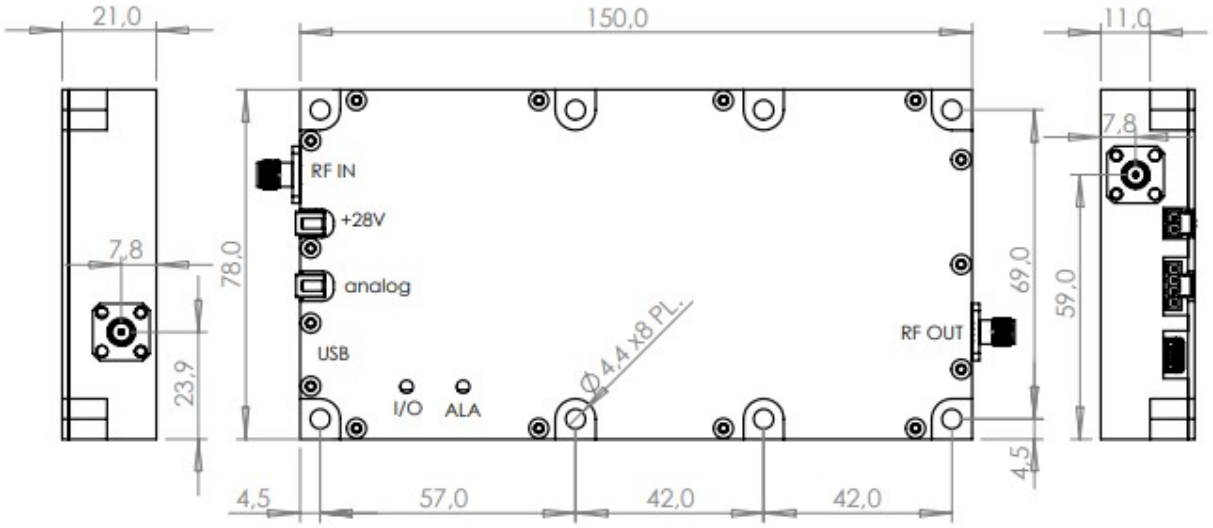
LED significations

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-0380M-0480M-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

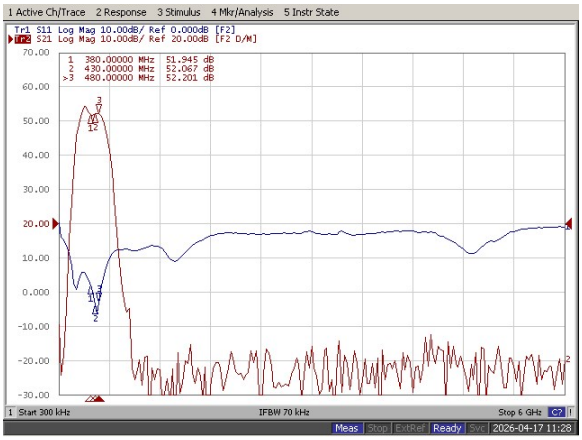
Other options

Support material:

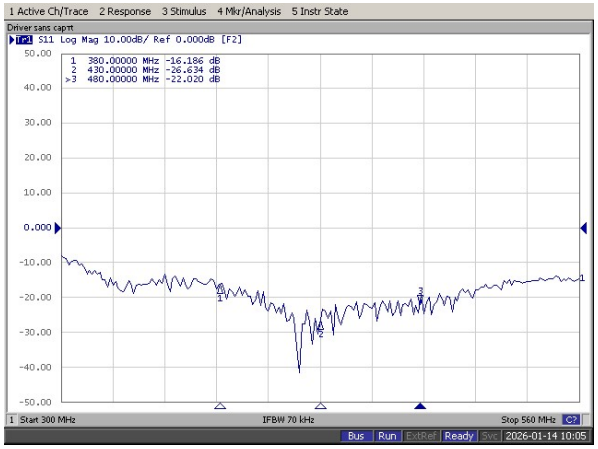
Ref	Document type	Document number	Title	Date
1	USB Cable		USB to mini USB B	
2	Interface program	PRSI25001 V0.2.		2025

TYPICAL PERFORMANCE

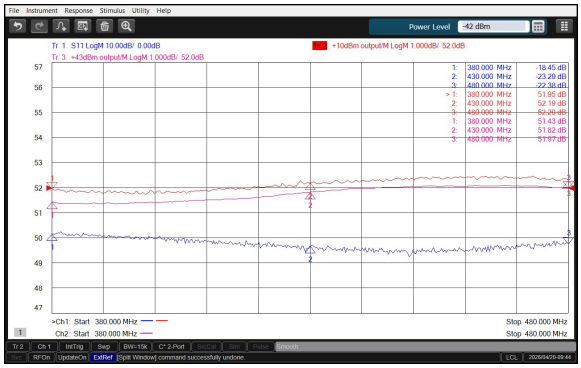
Gain / IRL vs frequency



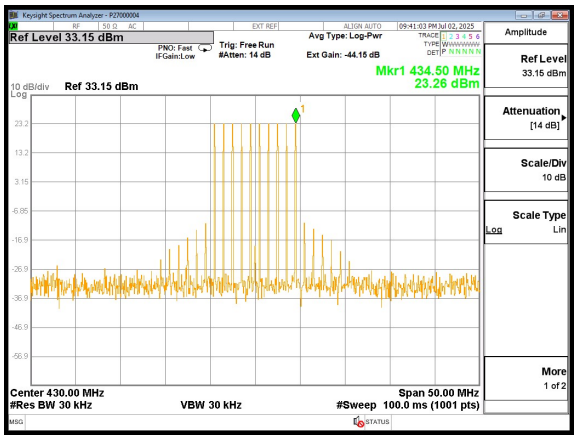
Wideband response



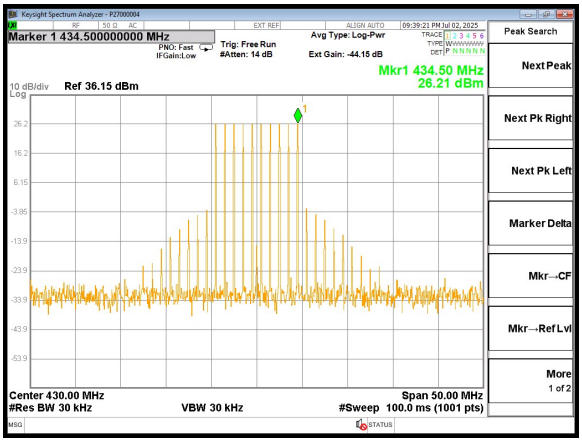
Output return loss vs frequency



Gain compression at 20W output



10 tones, 20 W peak, f=430MHz, peaked phases



10 tones, 40 W peak, f=430 MHz, peaked phases

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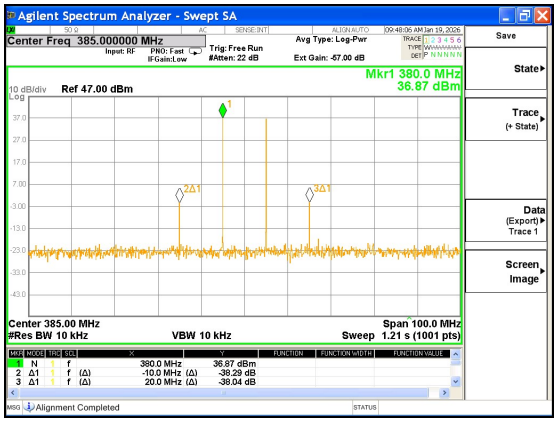
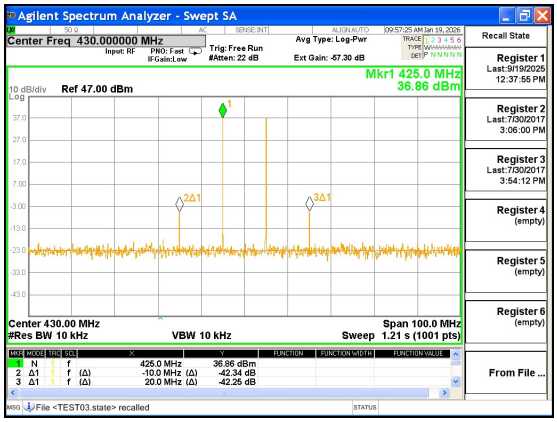
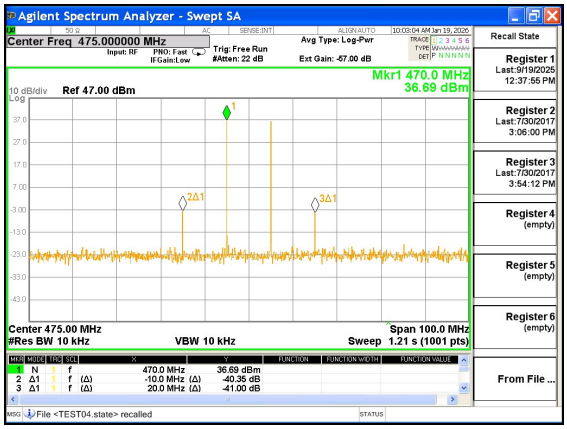
TYPICAL PERFORMANCE (continued)



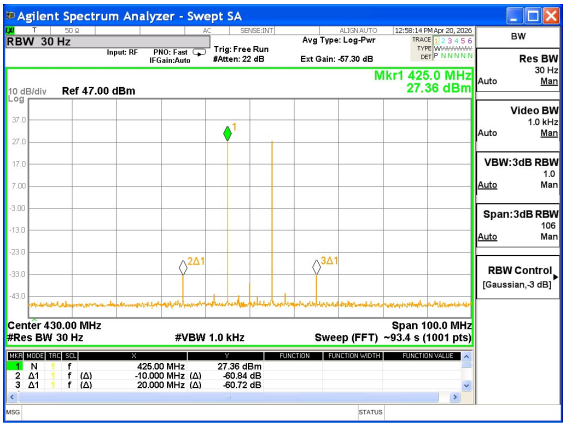
2 tones 380MHz 390MHz +37dBm each



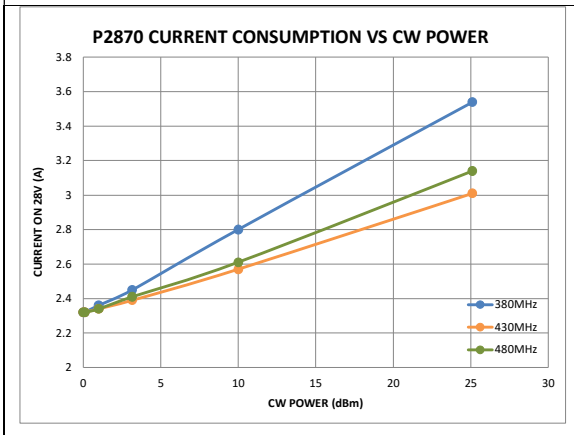
2 tones 425MHz 435MHz +37dBm each

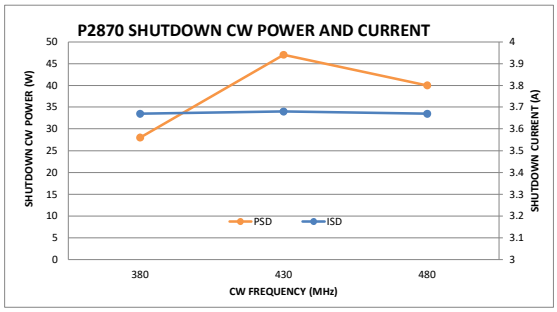


2 tones 470MHz 480MHz +37dBm each



2 tones 425MHz 435MHz +27dBm each





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TYPICAL PERFORMANCE (continued)