AU301-DP

Product Name

GR03490

Manufacturer's Part Number

Technical Specification Summary

Frequency Range	470-862MHz	Typ. Gain	56 dB	
P1dB	1900 W	Typ. Efficiency	> 40%	At 1dBcp
Analogue TV	1400 Wps	Temperature Range	-5 to + 45 ºC	
DVB	430 Wrms	Max VSWR	3:1	
DTV	560 Wrms	Working Class	AB	
Two tone	1600 Wpep	Supply Voltage	43,0 V	

Key Features and Functions

Full LDMOS Power Amplifier
1400 W ps Out
430 Wrms Out DVB-T
DTV (8 VSB): 560Wrms
BroadBand (470-862 MHz)
No internal cabling
Easy maintenance without special tools
RS232-RS485 interface
Control software included
Extremely strong mechanical structure
Requires external PSU (see PS200-D series from Res-Ingenium)

General Description

AU301-DP is a full LDMOS Broadcast Power Amplifier specifically designed for digital applications. The unit is the state of the art in terms of easy assembly, reliability and performances. The complete unit is compliant to all relevant international standards.

Actual Power Amplifier Picture

Electrical Specifications

Parameter	Min.	Typ.	Max	Units	Notes
Frequency	470		862	MHz	Full coverage without tuning
P1dB		1900		W	In CW mode
Power		1600		W PEP	2 tones, 1 kHz spacing (-30 dBc)
IMD3		-33		dBc	2 tones, 1 kHz spacing (1,6 kW PEP)
Power Input			7	dBm	Max value in CW mode @ 1dBcp
Gain		56		dB	At 1600 W PEP / 430 W rms DVB-T
V Supply		43		Vdc	By External Power Supply
Drain Current			80	Adc	For 1600 W PEP
Drain Current			63	Adc	For 430 Watt rms with DVB-T signal
Input return loss	-14	-16		dB	
Phase Variation		± 10		°	Unit to unit
Gain Variation			± 2,0	dB	Fine ADJ available
F2 Second Harmonic		-35	-25	dBc	
F3 Third Harmonic		-45	-30	dBc	
Baseplate Temp.	-10		+75	ºC	

Video Parameter	Min.	Typ.	Max	Units	Notes
Analog Power			1400,0	W ps	Common amplification
IMD		-55,0	-50,0	dBc	At 1400 Wps, inside the Channel [#]
Differential Gain		3,5	6,0	%	Error at 1400 Wps [#]
Lum. Non Lin.		4,5	7,0	%	Error at 1400 Wps [#]
Differential Phase		2,0	4,0	Deg.	Error at 1400 Wps [#]
ICPM (peak to peak)		2,5	5,0	Deg.	Error at 1400 Wps [#]
Digital Power (DTV)		560,0		W rms	
Digital Power (DVB-T)			430,0	W rms	
M.E.R. (DVB-T)		30,0		dB	
Shoulders (DVB-T)	-33,0	-35,0		dBc	At ± 4.2 MHz / 360 W rms
Shoulders (DVB-T)	-30,0	-33,0		dBc	At ± 4.2 MHz / 430 W rms

[#] Analog TV signal, dual sound (-13, -20 dBc) RED field, without Precorrection

All Specifications are valid for load impedance 50 Ohm, Vdc=43.0Vdc, Idrain=78A max

ABSOLUTE Maximum Ratings

Parameter	Value	Units	Notes
Output Power	1500	W	in CW mode
Input Power	7,0	dBm	in CW mode
Operating Voltage	50	Vdc	
Stable operations	43	Vdc	
Bias Current	10,0	A	Quiescent current for four LDU661 pallets
Drain Current	90	A	with Tj @ 175 ºC (see the Device data)
VSWR	2:1		All phase angle / High Mismatch Protection set @ 2:1
Storage Temp.	-20 + 80	ºC	
Base Plate temp.	75	ºC	Heatsink Temperature

Electrical Interfaces

RF input	N female on Rear Panel
RF output	7/16 DIN female on Rear Panel
RF Monitor	SMA connector on Rear Panel
RS232	Dsub 9 Pin on front and rear panel
RS485	Dsub 9 Pin on rear panel
Local Enable	Switch front panel
Local Enable	Two-pole connector on the rear panel

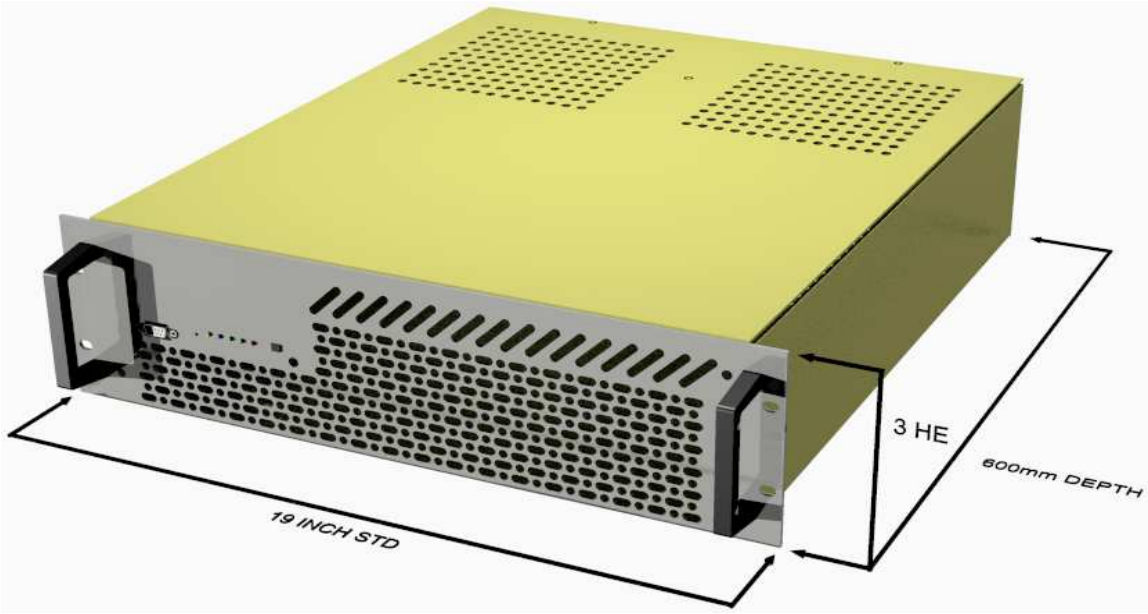
Remote control ENABLE RF Enable / Disable (On / Stand By)

Note: An output on the rear panel can manage the external Power Supply ON/OFF.
The external PS will be switched OFF in case of alarm

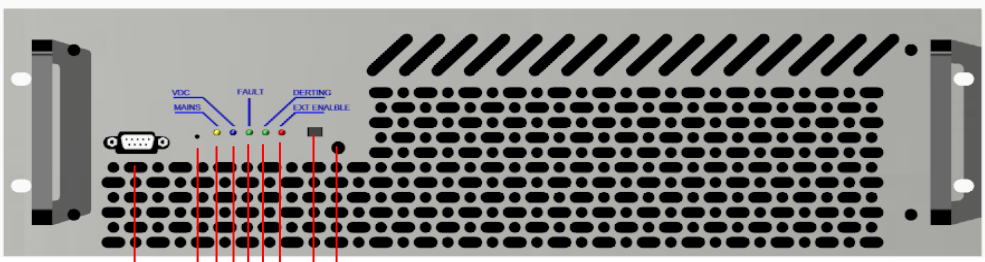
Mechanical specifications

AU301-DP General data and layout Dimensions.

Physical Dimensions	19 Inch x 3 Units x 600mm (23,62") depth
Weight	25 kg. / 55.0 Pounds
Air flow	500 cubic meters per hour at max fan speed.



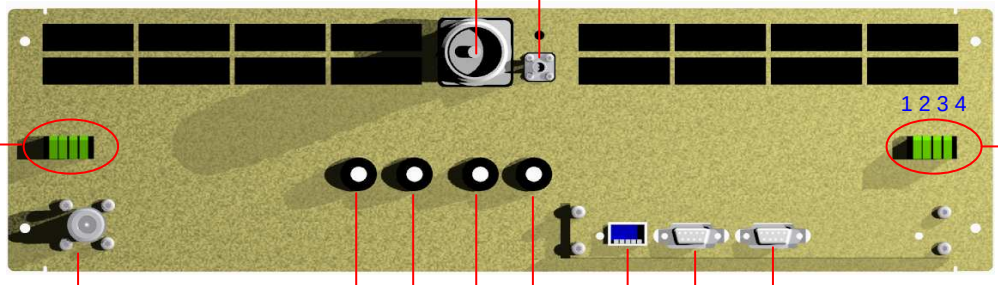
Front Panel Functions



RS232
RESET
Mains
Vdc

Gain Adjustment
ENABLE Switch
External Enable
Derating
Fault

Rear Panel Connections



RF Out
RF Monitor

External Senses
RF Input

-VDC Poles
GND

+VDC Poles
+43 Volt

Impedance Selector

RS485

RS232

1 EXT. ENABLE
2 GND
3 P.Supply Enable
4 +5Vdc

READABLE DATA BY REMOTE COMPUTER OR CONTROL LOGIC UNIT (via RS232 / RS485)

Parameter	Alarms / Status
Enable	ON / STAND BY
RF Faults	ACTIVE if Gain < 6dB referred to nominal
℃ max	ACTIVE when RF Thermal Protection is ON
Pin max	ACTIVE when RF Overdrive Protection is ON
VSWR max	ACTIVE if VSWR max Protection is ON
Max Current (I max)	ACTIVE when Current is too high
Parameter	Alarms / Status

Measurements

RF Power Input	Input level expressed in [micro Watt]
RF Power Output	Output level expressed in [Watt]
RF Power Driver	Driver level expressed in [Watt]
RF Temperature	RF Heatsink Temperature expressed in ℃ (half section)
RF Temperature 2	RF Heatsink Temperature expressed in ℃ (half section)
VDC	Main Power Supply / Input Voltage
IDC Final 1	Supply Current of half section (two LDU661) expressed in Ampere
IDC Final 2	Supply Current of half section (two LDU661) expressed in Ampere
IDC Driver	Supply Current of Predriver and Driver expressed in Ampere

Self Protection

Thermal Protection	High Temperture protection
Overdrive	Pin max must be set on the working channel with the used DVB-T signal
High Output Mismatch	VSWR max must be set on the working channel with the used DVB-T signal
Max Current	High Current protection

External High Power Supply Technical Specifications

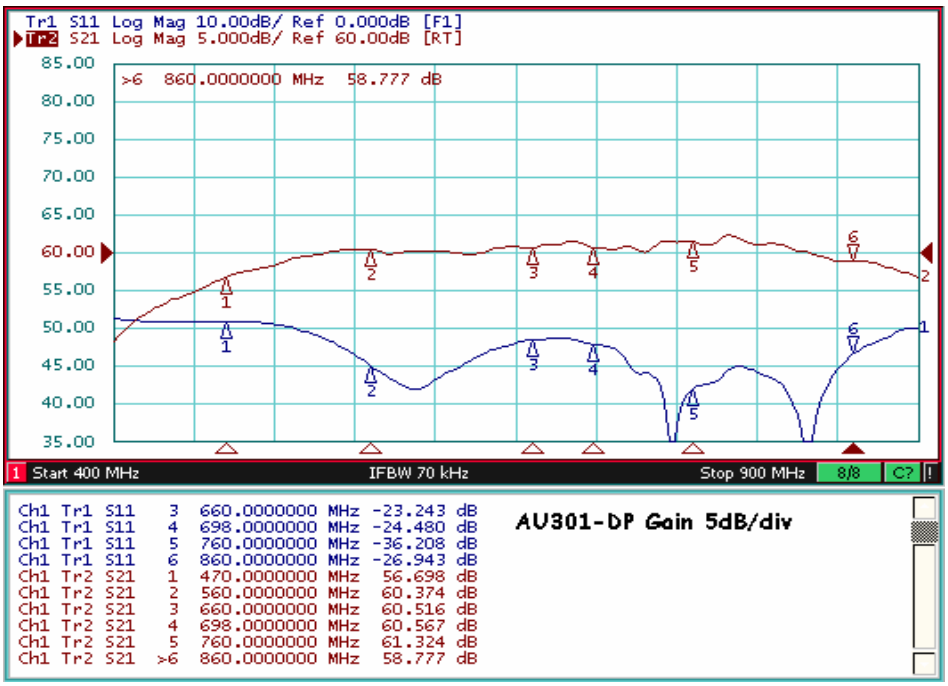
V out	43 Volt DC
I out	2 x 30 A or 1x 60 A with DVB-T signal 3 x 30 A or 1 x 90 A with Analog TV signal
Load Regulation	± 0.5% from 10% up to 100% dynamic load change
Output Ripple	400mV max
Sense	External Sense for both sections (if double). Sense Impedance 6.8 KΩ each positive/GND wire
Enable	AU301-D provides a signal 0/5V (0 = disable; 5 = enable). Open collector with internal pull-up. This signal must be used to enable the power supply.

External Service Power Supply Technical Specifications

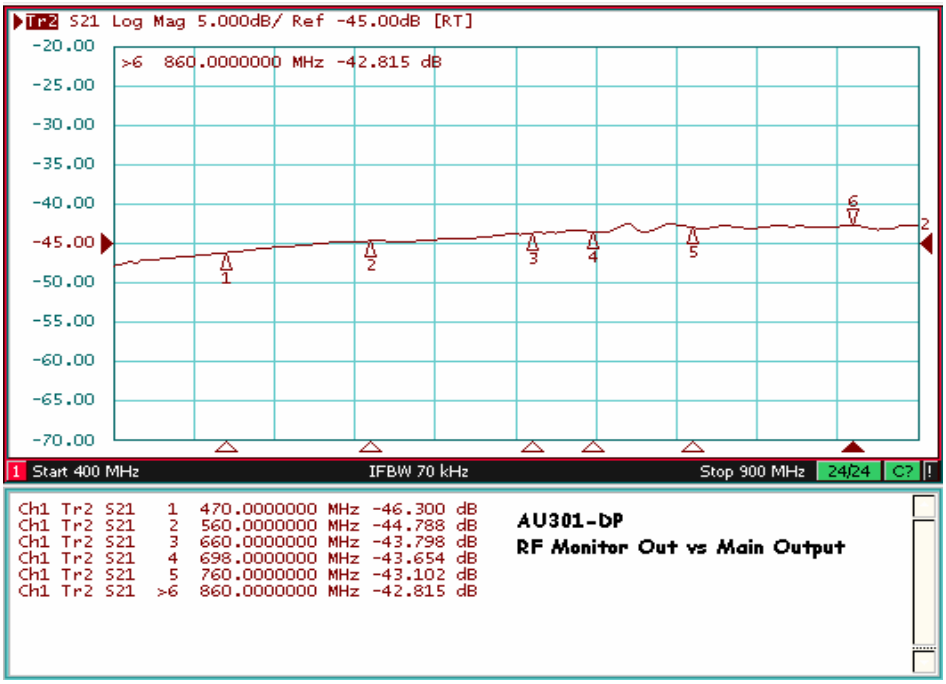
V out	5 Volt DC
I out	0,5 A
Load Regulation	± 0.5% from 10% up to 100% dynamic load change
Output Ripple	50mV max
Enable	This voltage must be present anytime to power the logic control unit.

Graphs and Charts

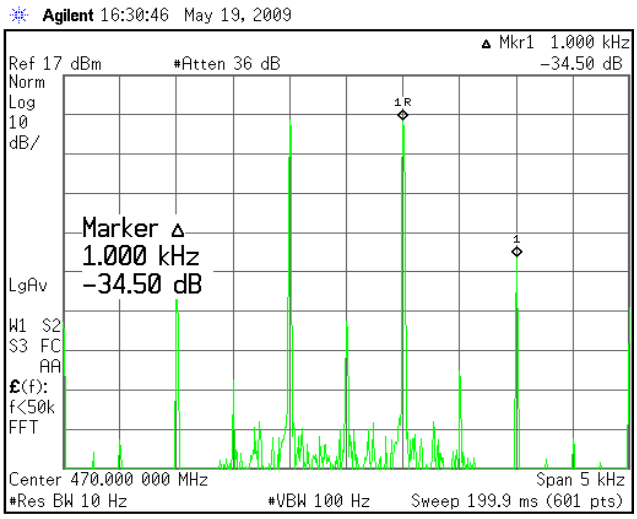
Plot 1. Typ S21 small signal Gain, and S11 Input Return Loss

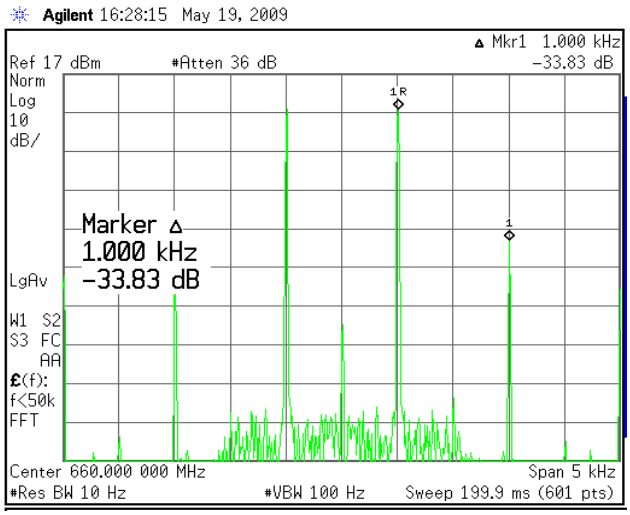


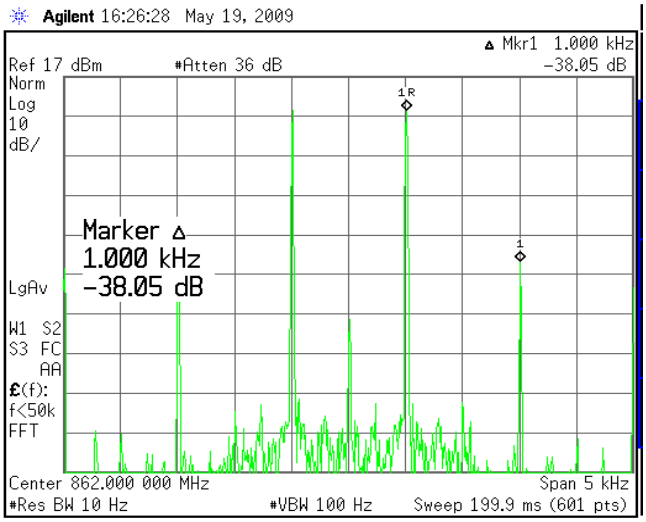
Plot 2. Typ S21 RF Monitor vs Main Output



Plot 3,4,5. Typ. Two Tone Test @ 1600 Watt PEP. 400 Watt CW each Carrier, 1 kHz spacing



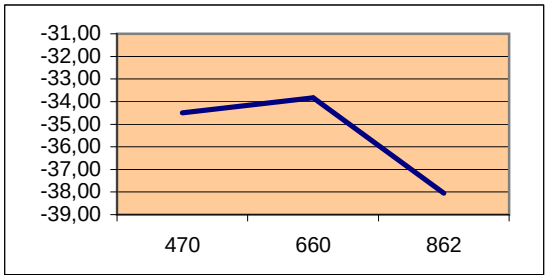




Test condition: VDC=43 Volt

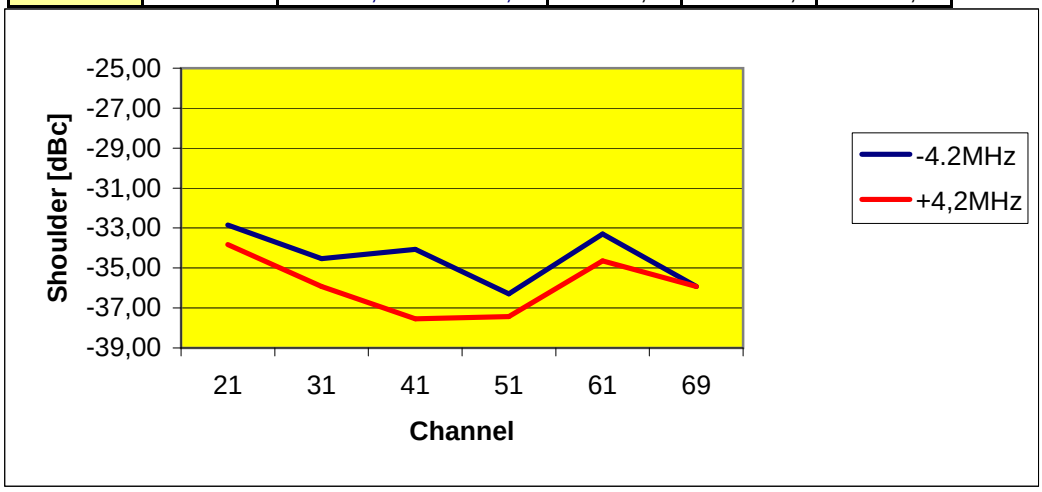
3rd order IMD measurements

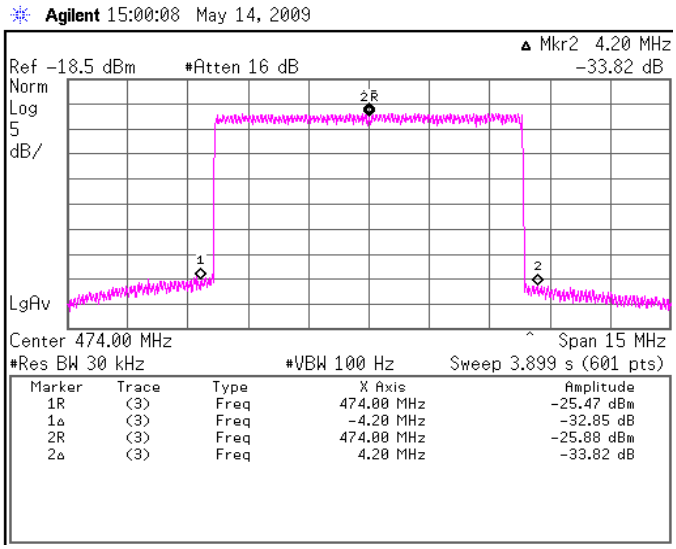
Freq. [MHz]	Pout PEP [Watt]	3rd order [dBc]	I total [A]
470	1600	-34,50	72,0
660	1600	-33,83	77,0
862	1600	-38,05	78,0

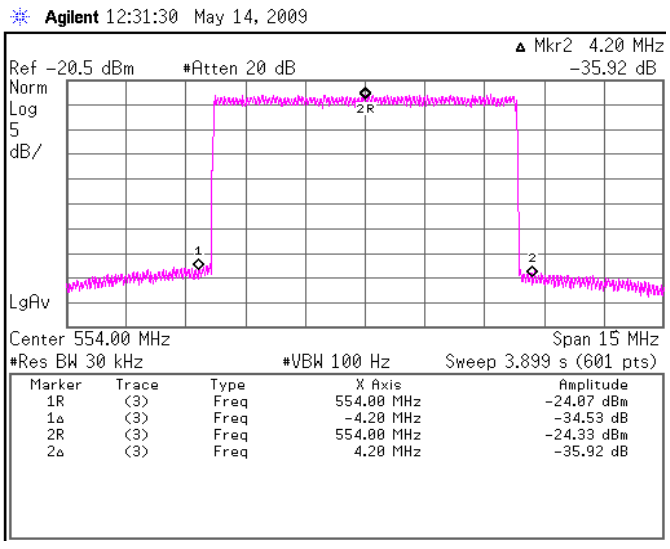


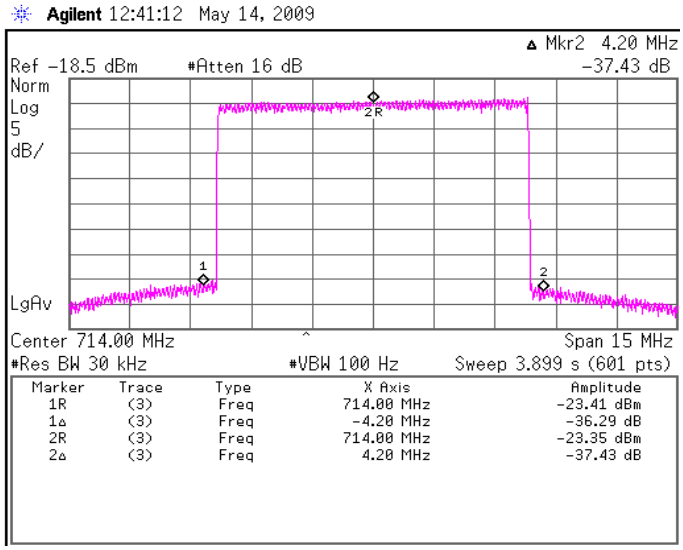
DVB-T Typ. Performances @ 360 Watt rms Output (without precorrection)

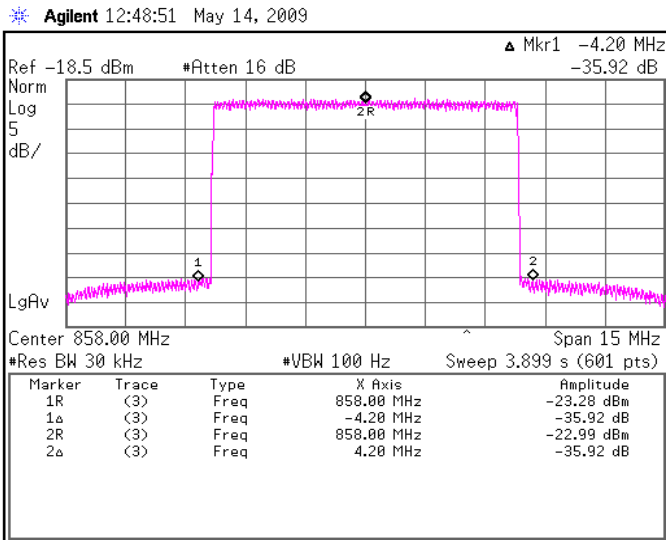
CH	F. [MHz]	Shoulder @ -4,2	Shoulder @ +4,2	I Total [A]	P. coms. [Watt]	Eff. [%]
21	474	-32,85	-33,82	51,40	2210,2	16,29
31	554	-34,53	-35,92	55,20	2373,6	15,17
41	634	-34,06	-37,55	56,50	2429,5	14,82
51	714	-36,29	-37,43	49,80	2141,4	16,81
61	794	-33,29	-34,65	46,90	2016,7	17,85
69	858	-35,92	-35,92	48,90	2102,7	17,12





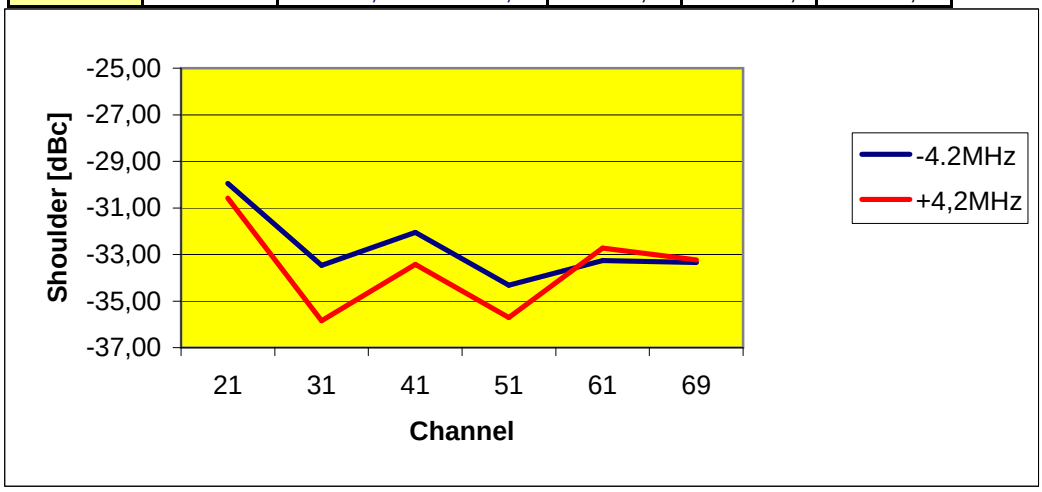


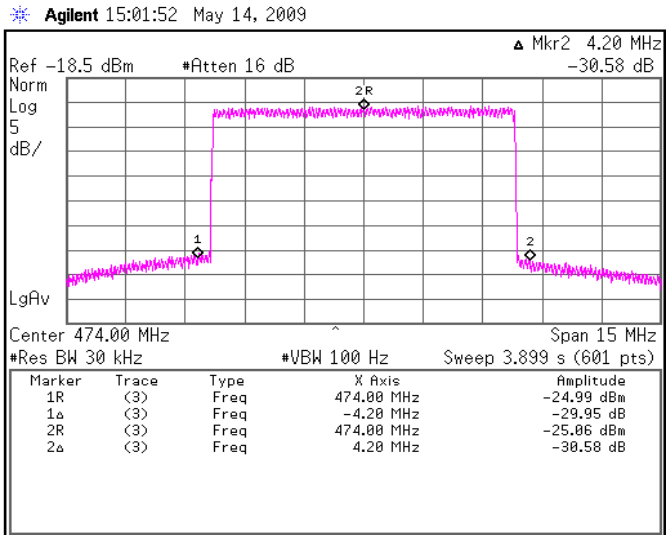


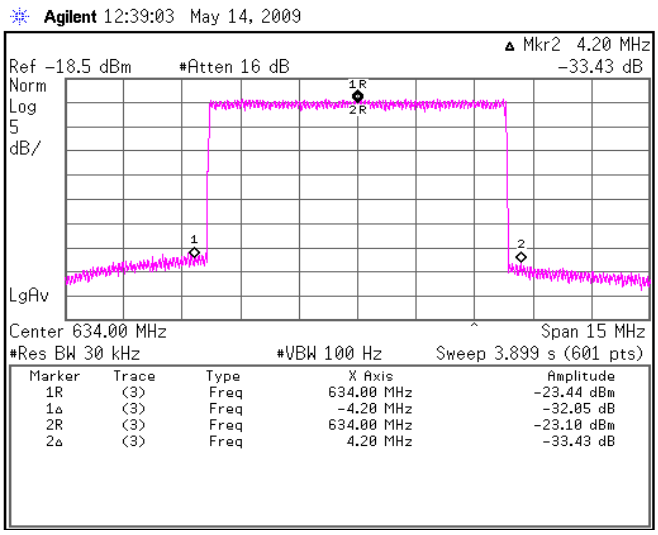


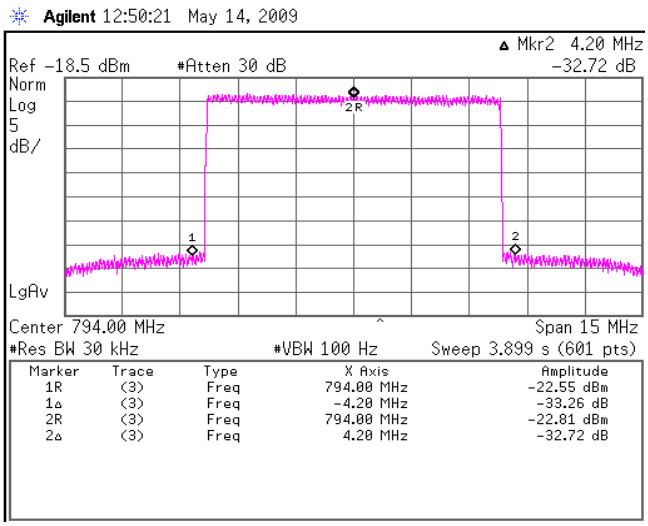
DVB-T Typ. Performances @ 430 Watt rms Output (without precorrection)

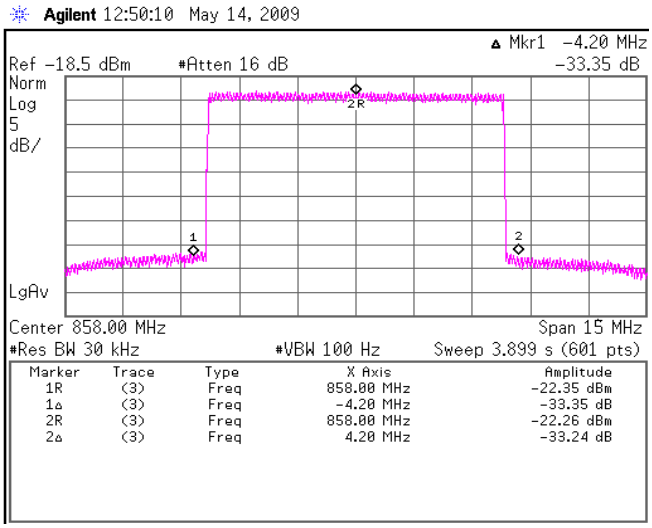
CH	F. [MHz]	Shoulder @ -4,2	Shoulder @ +4,2	I Total [A]	P. coms. [Watt]	Eff. [%]
21	474	-29,95	-30,58	62,20	2674,6	16,08
31	554	-33,47	-35,85	61,90	2661,7	16,16
41	634	-32,05	-33,43	59,90	2575,7	16,69
51	714	-34,32	-35,71	51,40	2210,2	19,46
61	794	-33,26	-32,72	52,70	2266,1	18,98
69	858	-33,35	-33,24	53,40	2296,2	18,73











Integration and important Operating instructions

The AU301-DP is designed for operation up to 430Wrms (DVB signal) with very high linearity, and TV Analog Signal up to 1400 Watt peak synk, in common amplification, dual sound.

This design uses 6th generation family LDMOS devices that are capable of very high peak power as long as the average power does not exceed specified ratings. The devices are protected by an internal circuit, for Overdrive and high Mismatch load.
However is mandatory to handle with care the Input level during the "precorrection operations" due to possible very fast and high spikes coming from the source.

The AU301-DP must allow the nominal voltage before applying RF driver signal or damage can result to the amplifier. For this reason the voltage must be applied before the RF driver signal. Additionally, the input signal, must be removed before powering down to prevent damage to the amplifier. You can accomplish this by removing the RF driver signal and powering down the power amplifier.

The AU301-DP has not the internal Power Supply. It must be supplied by an external Power Supply following the P.S. supply indicated on this document.
RES-Ingenium can provide two kinds of Power Supply:

- PS200 series equipped with 1 kW slots
  - PS200-D3 @ 43 Volt (equipped with 3 Slots) for any Digital Operations
  - PS200-D6 @ 43 Volt (equipped with 6 Slots) for any TV Analog Operations and CW
- Compact 43Volt / 4kW Power Supply (19 Inch, 2 HE) for any operation

In case of installation in a site with no air filter is strongly reccomended to buy the "Air Filter Kit Accessory" coeded as GR04190 easy to install on the front panel.

When the AU301-DP in installed in a 19 Inch std Rack is important to leave a right space on the rear zone to facilitate the exhausted air extraction.

It's suggested to leave one free unit (1 HE) at the top of the Amplifier.

In case of use of more AU301-DP in parallel an appropriate power combiner has to be used. The connection between the Amplifiers and Power Combiner Input Ports is strongly reccomended to use"low Loss Cables" type.

The Amplifier is equipped with an RF Monitor Output available by a SMA connector where is possible to test the performances when the it's on duty. The RF Monitor Output is normally > -40 dB referred to the main output in order to have a right signal managed by std Instrumentation.
Anyway a SMA pad can be put in series to reuduce the RF monitor amplitude.

The Amplifier is delivered in cartoon box packaging. Use all professional caution during unpacking, handling and mounting.

Please consult RES-INGENIUM factory with any integration questions.

Ordering informations

Product Name	Manufacturer's Part n.	Feature Description
AU301-DP	GR03490	Standard version
	GR04190	AIR FILTER KIT

Notices and Warnings

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