

# Amperex

# NL347

Air Cooled UHF Power Tetrode

The NL347 is a metal-ceramic, forced-air cooled, coaxial power tetrode. The tube features high gain and high linearity and is primarily intended for use as a linear broadband amplifier in band IV/V TV transmitters and transposers.

- **Output power:**
  - 1.1 kW peak-of-sync in common amplification of the vision and sound carriers.
  - 1.2kW in sound-carrier amplification.
- **Operating frequency up to 1000 MHz.**
- **Excellent linearity**
- **Anode dissipation up to 4.5 kW, with forced-air cooling.**
- **Typical gain: 15.5 dB**

#### Quick Reference Data

#### Electrical

Type of Cathode	Thoriated Tungsten		
Heating	Direct, dc or single phase		
Heater voltage	6.0± 2%	V	
Heating current, approx.	34	A	
Heating surge current	max. 85	A	
Amplification factor, G1-G2, average	7		
Transconductance			
I <sub>a</sub> =1.5A, V <sub>g2</sub> =400V	40	mA/V	

#### Mechanical

Operating position	Vertical		
Weight, approx	2.3	kG	
Dimensions	see outline drawing		

#### Anode Cooling

Type	Forced Air		
Minimum air flow on the anode	2	m <sup>3</sup> /min <sup>Note 1</sup>	
Corresponding pressure drop	2	mbar	
Maximum air inlet temperature	50	°C	
Maximum air outlet temperature	100	°C	

For direction of air flow see outline drawing. The air should be ducted so that sufficient air is directed to the seals to keep the seal temperature below the limit.

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## Capacitances, grounded-grid

Input	$C_{in}$	40	pF
Output	$C_{out}$	8.2	pF
Anode to filament	$C_{af}$	0.1	pF

## Temperature Limits

Absolute maximum envelope temperature	$T_{env}$	250	°C
Recommended envelope temperature	$T_{env}$	200	°C
Recommended seal temperature	$T_s$	180	°C

## R.F. Class-AB Amplifier for Television Transposer Service

### Limiting Values

Unless otherwise stated, the voltages are given with respect to the cathode.

Frequency	$f$		up to 1000	MHz
Anode voltage	$V_a$	max.	5	kV
Grid 2 voltage	$V_{g2}$	max.	650	V
Grid 1 voltage	$-V_{g1}$	max.	200	V
Anode current	$I_a$	max.	2	A
Anode dissipation	$W_a$	max.	4.5	kW
Grid 2 dissipation	$W_{g2}$	max.	25	W
Grid 1 dissipation	$W_{g1}$	max.	5	W
Peak cathode current	$I_{kp}$	max.	6	A

### Operating Conditions

Negative modulation, positive synchronization, combined sound and vision.  
(CCIR standard G)

Frequency of vision carrier	$f$		470 to 860	MHz
Bandwidth (-1dB)	$B$	10	8	MHz <sup>Note 2</sup>
Anode voltage	$V_a$	4	4	kV
Grid 2 voltage	$V_{g2}$	400	400	V
Grid 1 voltage	$V_{g1}$	50	50	V <sup>Note 3</sup>
Anode current, zero signal	$I_{a0}$	0.5	0.5	A
Anode current (black + sound)	$I_a$	0.8	0.75	A
G2 current (black + sound)	$I_{g2}$	7	7	mA
Output power in load, sync.	$W_l$ (sync)	1100	1100	W
Power gain	$G$	15.5	16	dB
Intermodulation products	$d$	-54	-54	dB <sup>Note 4</sup>

Notes:

1. For an air inlet temperature of 30°C, an anode dissipation of 2 kW and at sea level.
2. With double-tuned circuit.
3. To be adjusted for the stated zero signal anode current.
4. Three-tone test method (vision carrier -8 dB, sound carrier -10 dB, sideband signal -16 dB with respect to peak sync = 0 dB)

Figure 1: Constant Current Characteristics

Vg2 = 400 V

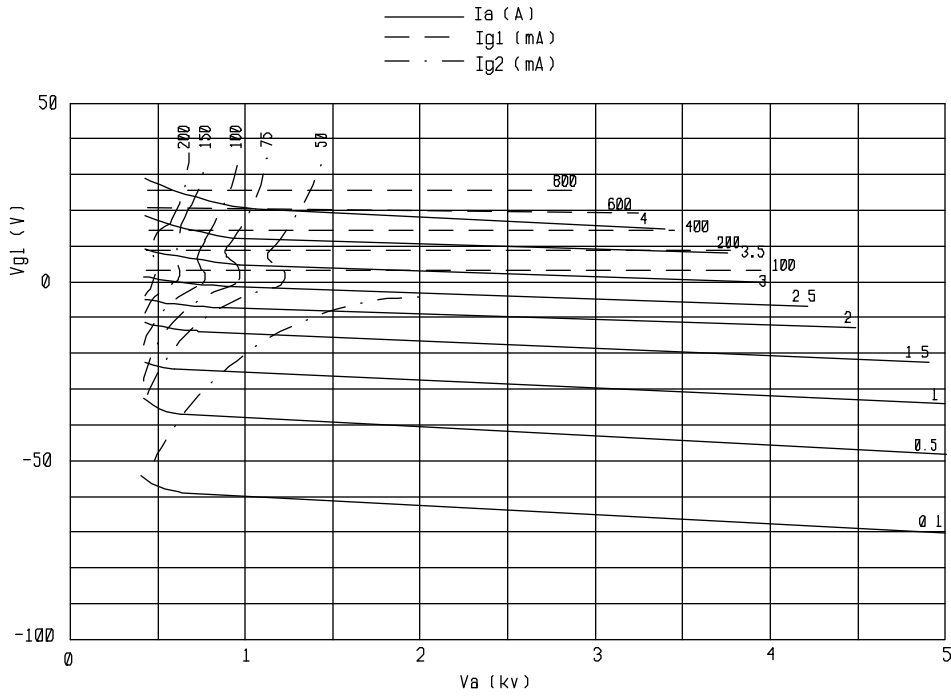
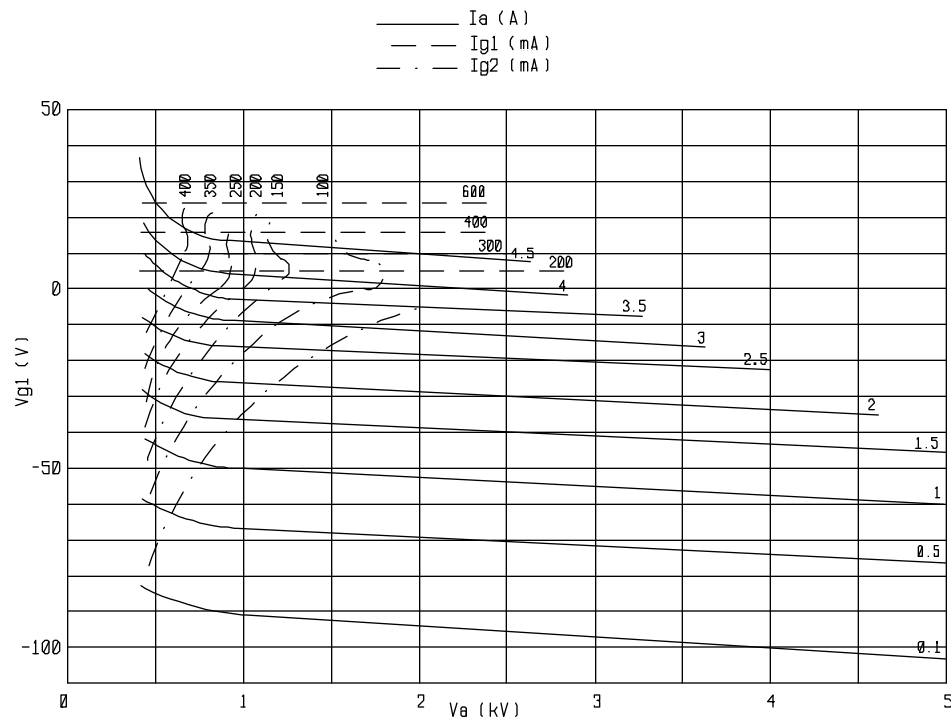


Figure 2: Constant Current Characteristics

Vg2 = 600 V

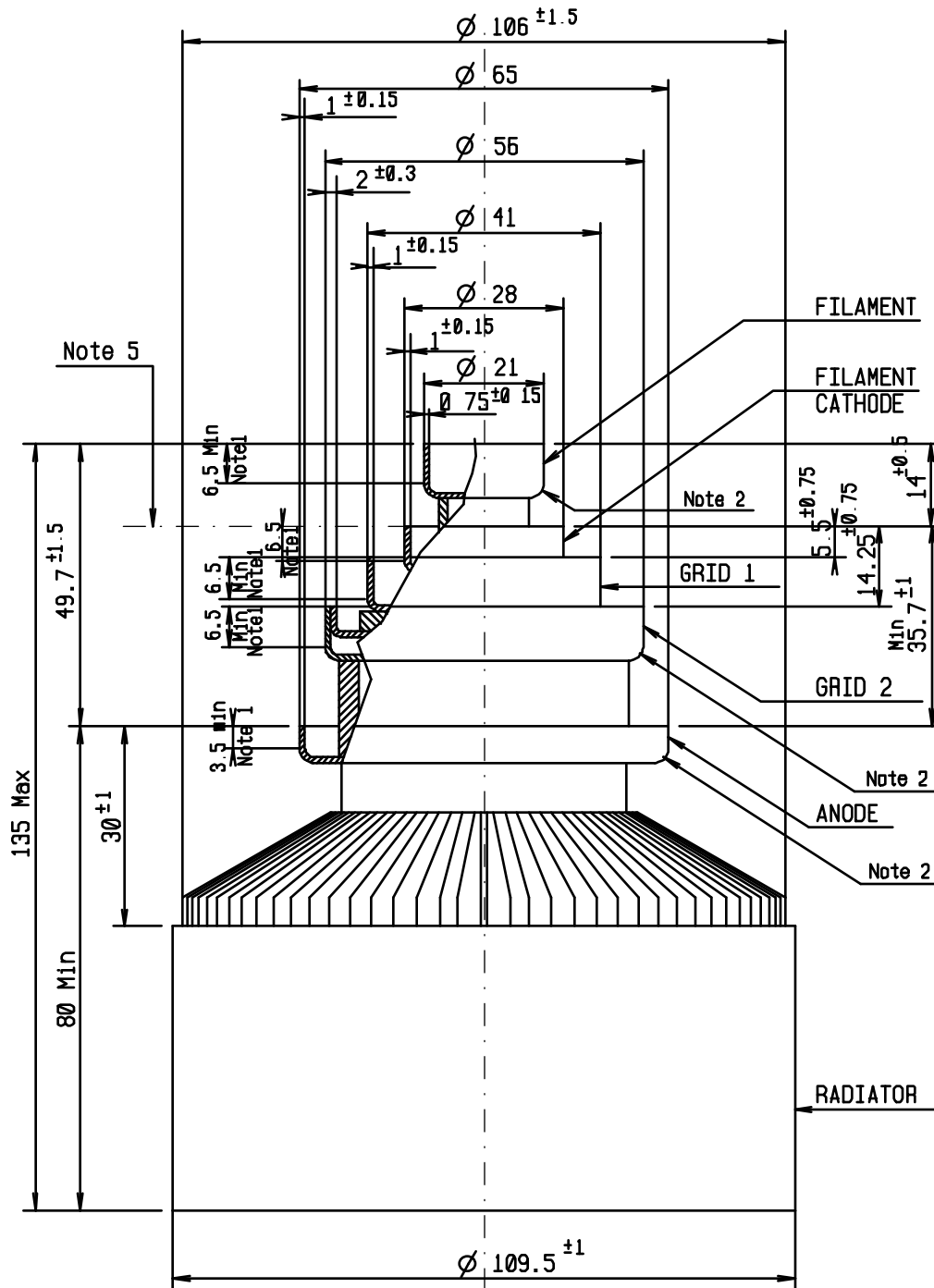


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Figure 3: Mechanical Outline

Dimensions in mm



NOTES:

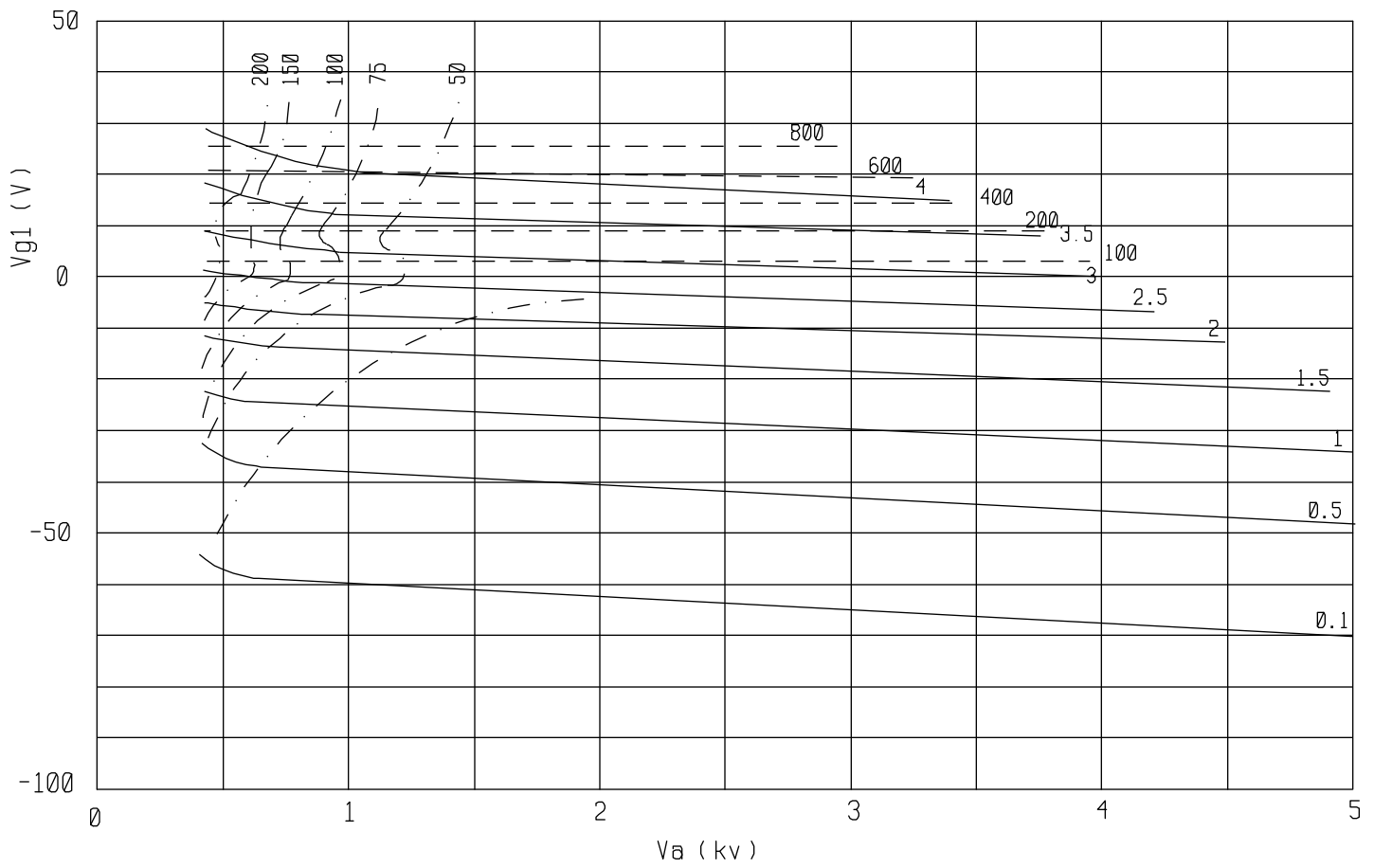
1. Cylindrical area for connection
2. R 2.5 max
3. Tolerance on diameters  $\pm 0.3$  unless specified otherwise
4. Maximum excentricity: 0.3
5. Reference plane

Characteristics and operating values are based upon performance tests. These figures may change without notice as the result of additional data or product refinement. Richardson Electronics, Ltd. should be consulted before using this information for final equipment design.

# CONSTANT-CURRENT CHARACTERISTICS

$V_{g2} = 400 \text{ V}$

—  $I_a$  (A)  
- - -  $I_{g1}$  (mA)  
- · - ·  $I_{g2}$  (mA)



# CONSTANT-CURRENT CHARACTERISTICS

$$V_{g2} = 600 \text{ V}$$

—  $I_a$  (A)  
- - -  $I_{g1}$  (mA)  
· · · ·  $I_{g2}$  (mA)

