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Data Sheet RS 242

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Description



RS 242 was designed by **Telefunken** as a space saving transmitter tube for portable applications, and for amateur radio. It's good sound, made it a popular audio tube amongst Japanese collectors. The combination of gain=17, and $R_p=5k$, and exceptional linearity of the tube curves, allows interesting audio applications.

The EML RS 242 is a replacement for the famous Telefunken RS 242. All dynamic parameters are identical. Heater current of the EML tube was chosen higher. ([See also notes](#)).

Tube microphonics is generally increased by the glass surface, and it decreased by the weight of the glass per square centimeter. This is why we have chosen for this very small glass bottle, made of thicker glass. ([See notes](#))

Socket: RS 242 has the European B4 Socket.

[High Resolution picture of RS242](#)

Nothing was officially published by Telefunken, because RS242 was a second world war military product. After the war, any military production in Germany was not allowed, and RS242 was not produced any more. It went under, without documentation. All what remains today, is a little data sheet which was with the tubes, at packaging. It gives only data for use as a transmitter tube, and specific tube curves for use as transmitter tube. And of course what we have, is NOS tubes. From those we extracted all data, and tube curves, as needed for audio. We have to credit the Japanese Audio Scene, for discovering the excellent audio properties of RS242. Something Telefunken never intended. From the tube curves, we extracted the dynamic parameters, and they were identical as on that small TFK sheet, with the tubes. From such mint quality NOS tubes, we took the tube curves, and build our RS242 to fit exactly to those curves. Those curves are so nicely linear, considering the gain of this tube is still a factor 17. I think we can say RS242 was a masterpiece of design, by Telefunken. Though we found the higher heater current we choose at EML works out positive on all tube properties.

For modern design simulation, we also supply the S-parameters.

Guarantee program for first owner.

The first owner can register the tube within 4 weeks after receival, at the Emission Labs website, to participate in the 5 years guarantee program, which is additional to the legal obligations of the seller.

[Our Guarantee conditions](#)

[Register here for the 5years guarantee](#)

Features

- Gold Plated Grid ([See Notes](#))
- *New* Soft rubber suspended tube base
- Hard metal Construction ([See Notes](#))

Empty

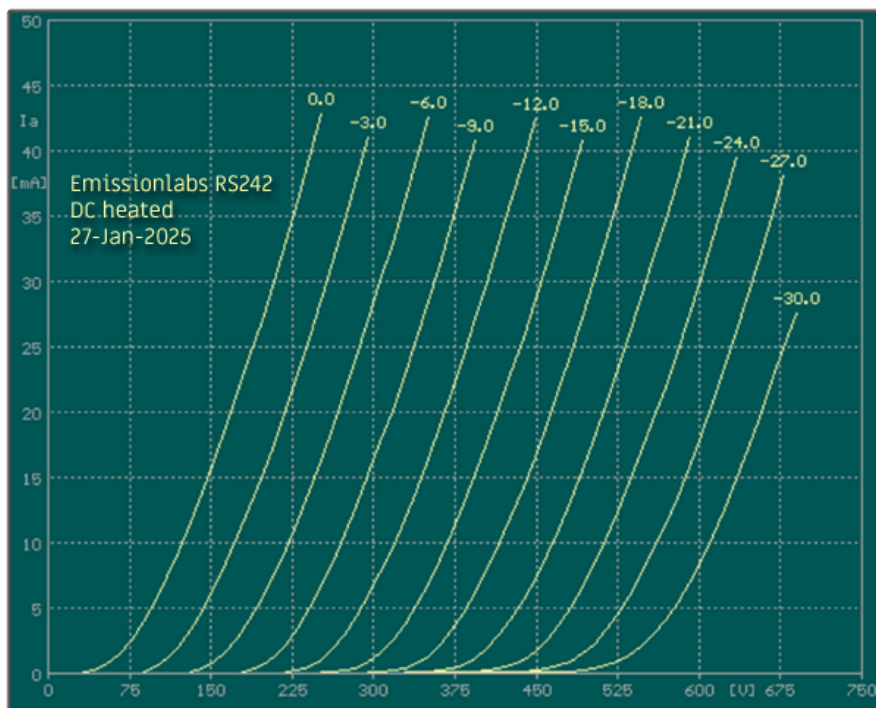
- Extra large getters
- Heavy glass bottle
- Anti-microphonic Anode- and grid suspension
- These tubes are shipped in a [high quality dual box](#)
- Tube printing with 24k gold, and red color burned into the glass
- Machined, solid tube base pins for highest contact precision.
- Gold Plated, ceramic socket

EML RS 242 Filament Ratings	
Filament Voltage Important: See notes at page bottom	3.8...4.1 Volt DC
Electronic heater modules:	Only voltage source
Filament Current	0.9 Ampere

EML RS 242 Maximum Conditions (not possible simultaneously)	
Anode Voltage	500Volt
Anode Current	70mA
Anode Dissipation Continuous	17Watt
Highest possible Grid to ground resistor, Single Ended.	250kOhm
Highest possible Grid to ground resistor, Push-Pull.	50kOhm

EML RS 242 Factory Test condition	
Anode Voltage	400V
Anode Current	30mA

EML RS 242 Average Resulting Data	
Control Grid Voltage (V)	-10.9
Transconductance (mA/V)	4.6
Amplification Factor	17
Anode Impedance	4k7



EML RS 242. DC heated tube curves. See Notes

These curves are made with the Sofia Curve tracer.

Curves Extrapolation

S-PARAMETERS

Applications of RS242

Many Transmitter triodes are good audio amplifiers as well. You will find this for instance directly in the data sheet of the 845 tube, where it is specified in Class C (Radio Transmitter) and in Class A (Single Ended Audio). However, transmitter tubes require often a very high plate voltage, in order to get acceptable Efficiency in Class A or AB. Sure such a tube can be used like this, and users do it, but there are compromises when the voltage is reduced, to what is normal inside HiFi amplifiers.

RS242 however, was intended for portable operation. So for this reason it works at lower power, and lower voltage. This makes it ideal as a driver tube, pre-amp output tube, or pre amplifier tube.

As a driver tube, distortion becomes exceptionally low, even at very high signal. This is remarkable at such high gain. Signal needed, to drive a 300B tube is relatively high, it is 60 Volts RMS, or 170 Volt peak-peak. For best results, a plate choke is recommended. This allows a much lower plate voltage, and reduces distortion at the same time.

Some Applications

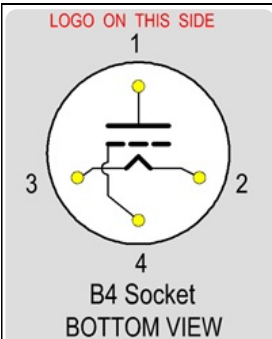
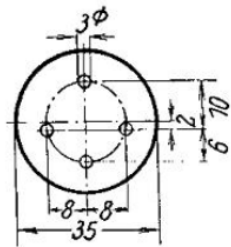
1) RS 242 as driver tube. (DC heated)

Anode Voltage	Grid Voltage	Input	Cathode resistor for Auto Bias	Anode Current (mA)	Circuit Gain	Tube Ri (Ohm)	Lundahl Transformer	Output	Tube Dist. Total
350V See Chart	-10.9V	3.5V RMS	545R	20mA	16.3	4k	LL1668-25mA	60V RMS	0,03%

2) RS 242 as pre amplifier output tube. (DC heated)

Anode Voltage	Grid Voltage	Input	Cathode resistor for Auto Bias	Anode Current (mA)	Circuit Gain	Tube Ri (Ohm)	Lundahl Transformer	Output
350V See Chart	-11.2V	1V RMS	622R	18mA	16.3	4k	LL1689-18mA ALT-Q	1.8V RMS
Input Signal 1V Output Signal 1.8V Tube distortion in this circuit: 0.05% Output resistance: 75 Ohms Low microphonics circuit								

RS 242 Mechanical Data



Size including Socket
(but excluding pins)
105 x 43 mm

Weight of one tube: 140 Gram

Shipment weight for pair in gift
box: 350 Gram

Pin 1: Anode1

Pin 2: Filament

Pin3: Filament

Pin4: Grid

Notes

- Hard-metals** can be used in electron tubes, though these are more difficult to use, and more costly than classic nickel. This results in less distribution of the tube parameters, and better long term stability. Wolfram grids allow the most precise grid wire distance, because wolfram is an extreme hard metal. Best grid geometry ensures uniformity and linearity of the tube curves. Gold plating of the grids has several advantages, such as increased bias stability, some protection against accidental overload, and better linearity of tube curves.
- Heater Current** of original RS242 was chosen by Telefunken company as low as they could get it, to make the batteries of portable equipment last longer. Today, this is no requirement any more, and we chose a higher heater current. This will increase lifetime very much, and eliminates risk of heater breakage in shipment.
- Heater Voltage** is always defined at the tubes pins itself. There may be some voltage drop along the socket contacts. So voltage measured at the tube socket wiring should ideally be 4.1V.
- Do not experiment** with lower filament voltage, to expect better lifetime. We already specify filament voltage for the best lifetime.
- Plate Characteristics** are made with the Sofia Digital Curve tracer. The curves with AC heating are 100% compatible with Telefunken, we made those for the compare. For HiFi use, we publish and recommend DC heating always.
- Individual Test data**, such as: Matching Data, Grid Current, Vacuum, Filament Current, etc., are on the Certificate that is on the outside of the tube box. Each tube is numbered from the inside, with a metal [Tag](#).
- Acoustic Microphonics** and "sensitivity to tap noise" should not be confused with each other. We can reduce the acoustic microphonics considerably by reducing the glass surface, but this will make no difference for "tap noise" effects. Even so, tapping on a working tube, ALWAYS leads to early wear out of the tube filaments. This will start, or accelerate crystallization, which may lead to heater breakage at a much later moment. Also it may cause chipping of the cathode coating. We always say, just never tap on a working tube, because it can and probably will reduce tube life time. This applies for all Directly Heater Tubes, independent of brand or construction,

