RF POWER TRIODE

Triode in metal-ceramic construction intended for use as industrial oscillator. The YD1342 has an integral water cooler.

QUICK REFERENCE DATA

Oscillator output power ($W_o - W_{feedb}$)	W_{osc}		530 kW
Frequency for full ratings	f.	max.	30 MHz

To be read in conjunction with "General Operational Recommendations"

RF CLASS C OSCILLATOR FOR INDUSTRIAL USE

OPERATING CONDITIONS

Frequency	f	30	30	30 MHz
Oscillator output power ($W_o - W_{feedb}$)	W_{osc}	355	440	530 kW
Anode voltage	V_a	12	14	16 kV
Anode current	I_a	39,1	41	43,5 A
Anode input power	W_{ia}	470	574	696 kW
Anode dissipation	W_a	106	125	156 kW
Anode output power	W_o	364	449	540 kW
Anode efficiency	η_a	77,4	78,2	77,6 %
Oscillator efficiency	η_{osc}	75,5	76,6	76,1 %
Feedback ratio	V_{gp}/V_{ap}	10	9,5	9,3 %
Grid resistor	R_g	65	79	97 Ω
Grid current, on load	I_g	8,4	8,2	7,7 A
Grid voltage, negative	$-V_g$	550	650	750 V
Grid dissipation	W_g	3,8	3,8	3,8 kW
Grid resistor dissipation	W_{Rg}	4,6	5,3	5,8 kW

LIMITING VALUES

(Absolute maximum rating system)

Frequency for full ratings	f	up to 30	MHz
Anode voltage	V_a	max. 18	kV
Anode current	I_a	max. 45	A
Anode input power	W_{ia}	max. 750	kW
Anode dissipation	W_a	max. 240	kW
Grid voltage	$-V_g$	max. 2,5	kV
Grid current, on load	I_g	max. 9	A
Grid current, off load	I_g	max. 11	A
Grid dissipation	W_g	max. 6	kW
Grid circuit resistance	R_g	max. 10	kΩ
Cathode current, mean	I_k	max. 55	A
Cathode current, peak	I_{kp}	max. 250	A
Envelope temperature	T_{env}	max. 240	°C
HEATING; direct; thoriated tungsten filament, mesh construction			
Filament voltage	V_f	14	V
Filament current	I_f	555	A
Peak filament starting current	I_{fp}	max. 3500	A
Cold filament resistance	R_{fo}	2,6	mΩ

The filament is designed to accept temporary fluctuations of + 5% and − 10%.

It is extremely important that the filament be properly decoupled. This should be done so that the resonance of the circuit formed by the filament and the decoupling elements remain below the fundamental oscillator frequency. In grounde-grid circuits this resonance should be below the grid-cathode resonance. For further information please see Application Book "Tubes for RF heating" or contact the manufacturer.

CAPACITANCES

Anode to filament	C_{af}	4,5 pF
Grid to filament	C_{gf}	250 pF
Anode to grid	C_{ag}	70 pF

CHARACTERISTICS

Measured at V_a = 16 kV, I_a = 18 A

Transconductance	S	230 mA/V
Amplification factor	μ	35

COOLING

To obtain optimum life, the temperature of the seals and of the envelope should, under normal operating conditions, be kept below 200 °C.

At low frequencies the seals are sufficiently cooled if the filament connectors are water-cooled by a flow of about 1 l/min. At high frequencies, however, an additional air flow of about 6 m^3/min must be led along the seals from a 60 mm diameter nozzle positioned at a distance of 300 mm from the tube header.

Table 1 Water cooling characteristics

anode + grid dissipation $W_a + W_g$ kW	inlet temperature T_i °C	rate of flow q_{min} l/min	pressure drop ΔP kPa*	outlet temperature T_o °C
240	20	120	100	50
	50	180	180	70
200	20	95	65	52
	50	144	120	71
160	20	72	42	54
	50	110	75	72
110	20	47	23	56
	50	73	44	73

Absolute max. water inlet temperature	T_i	max. 50 °C
Absolute max. water pressure	P	max. 600 kPa

ACCESSORIES

Filament connector with cable	type 40695A
Filament/cathode connector with cable	type 40696A
Grid connector	
$f \leqslant 4$ MHz	type 40694
$f > 4$ MHz	type 40737

* 100 kPa ≈ 1 at

MECHANICAL DATA

Dimensions in mm

Mounting position vertical with anode up or down

Net mass approx. 30 kg

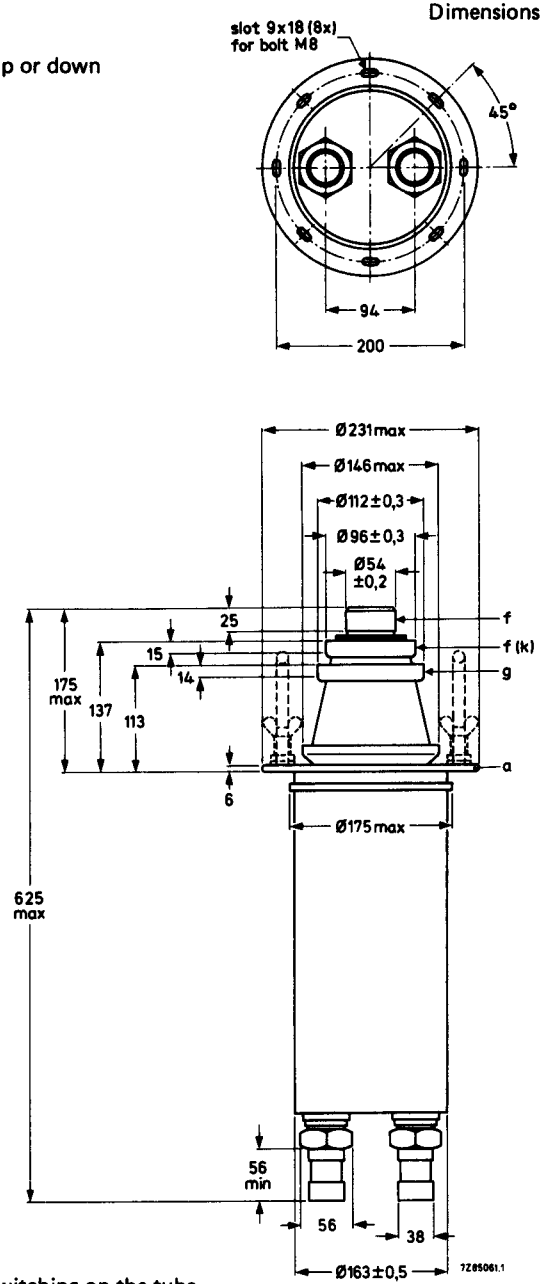

Fig. 1 Mechanical outline.

The handles should be removed before switching on the tube.

When using the tube in the anode up position the input and output water connections should be reversed.

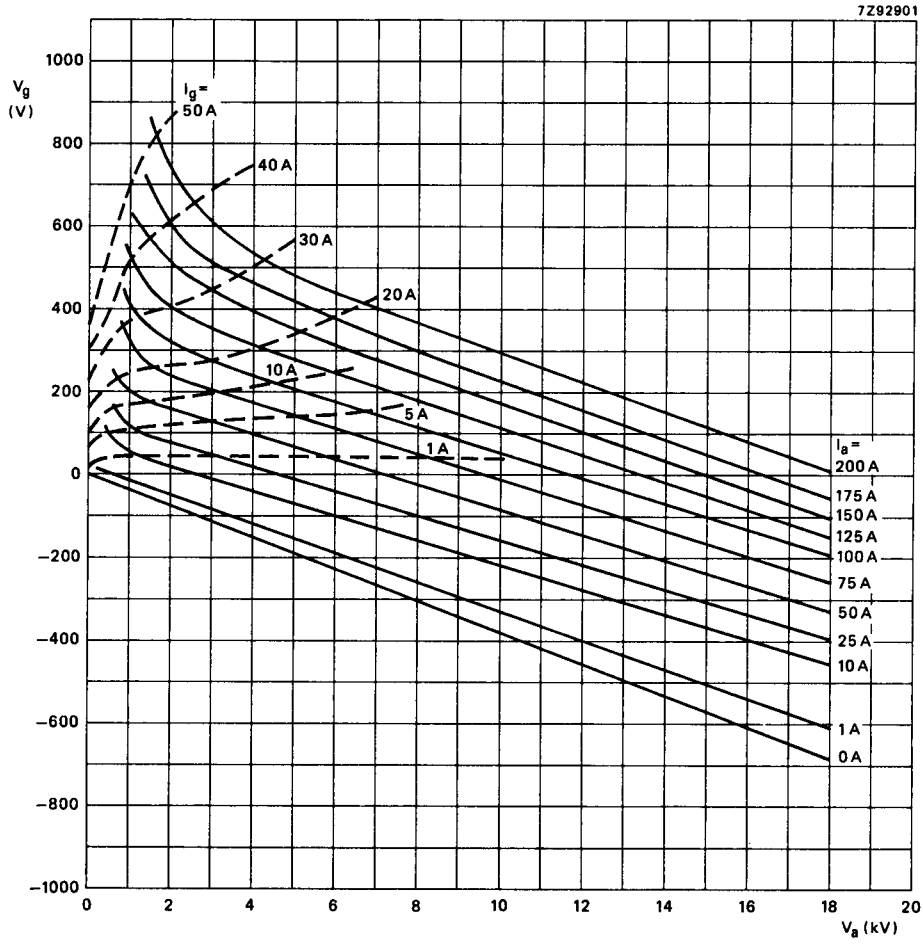

Fig. 2 Constant current characteristics.

PHILIPS

Data handbook

Electronic components and materials

YD1342

page	sheet	date
1	287	1986.11
2	288	1988.02
3	289	1988.02
4	290	1988.02
5	291	1988.02
6	FP	2000.09.09