PHILIPS "Miniwatt" SPECIAL VALVES

EFF 51

USW PUSH-PULL AMPLIFIER VALVE
FOR METRE- AND DECIMETRE WAVES

CHARACTERISTICS

Heater voltage	V_f	=		6,3	V
Heater current	I_f	=		0,6	A
Anode voltage	V_a	=	250	300	V
Screen-grid voltage	V_{g_2}	=	200	225	V
Grid bias	V_{g_1}	=	-2	-2	V
Anode current*)	I_a	=	6	10	mA
Screen-grid current*)	I_g	=	0,8	1,5	mA
Slope*)	S	=	8	10	mA/V
AC-resistance*)	R_i	=	0,35	0,25	MΩ
Equivalent noise resistance*)	R_{aeq}	=	600	600	Ω
Input damping (λ = 1,5 m)	$R_{g_1g_1'}$	=		750	Ω
Output damping (λ = 1,5 m)	$R_{aa'}$	=		4700	Ω
Input capacity (cold)	$C_{g_1'}$	=	$C_{g_1'}$	= 9,4	pF
Output capacity (cold)	C_a	=	$C_{a'}$	= 5,5	pF
Grid-anode capacity.	C_{ag_1}	=	$C_{a'g_1'}$	< 0,04	pF
Capacity (grid-filament)	C_{g_1f}	=	$C_{g_1'f}$	< 0,1	pF

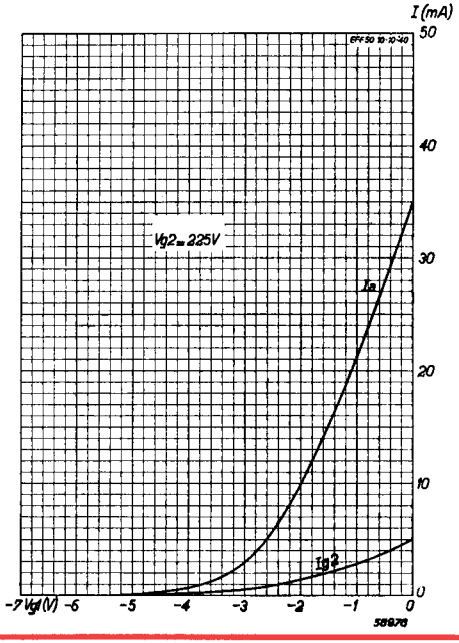
*) per system

SPECIAL ADVANTAGES

1. Slight input- and output damping
2. High slope; consequently high amplification at metre- and decimetre wavelengths
3. Low equivalent noise resistance

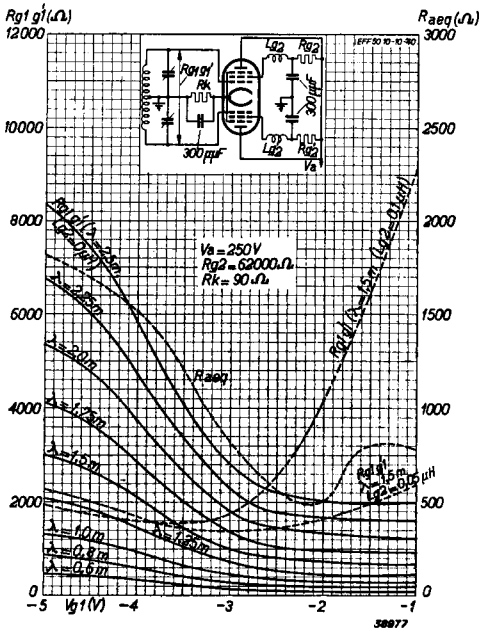
DESCRIPTION

The EFF 51 is a push-pull amplifying valve designed especially for use on ultra-short waves and for wide-band amplifiers, the push-pull principle making amplification possible up to very high frequencies.
Because of its light damping of the input circuit, this valve can also be used successfully as a frequency changer at ultra-short wavelengths; in that case a separate oscillator is required, for instance the EF 51 connected as a triode.



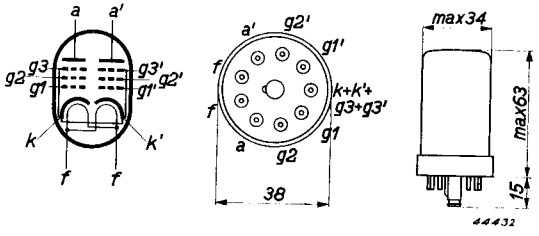
Anode current and screen grid current as functions of the grid bias (Va = 300 V).

Notwithstanding its high slope of 10 mA/V, this valve has, at a wavelength of 1,5 metres, an input resistance of 750 Ω and an output resistance of 4700 Ω; the input-circuit damping can be further reduced by inserting small inductances in the screen-grid leads. With coils of 0,1 μH in each screen-grid lead, input-damping is about 4000 Ω at 1,5 metres. The equivalent noise resistance is 600 Ω for each system; this low value has been reached not only by making the slope steep, but also by keeping the screen-grid current, a prolific cause of noise, at a low level. Thereby the valve's AC resistance becomes slightly lower than that of a normal RF pentode, while its grid-anode capacity is somewhat larger; these modifications, however, have no detrimental effects at the levels of amplification attainable in the ultra-short wave field. Connecting the two systems of the EFF 51 in parallel produces an amplifier with a mutual conductance of 20 mA/V at an anode current of 20 mA; in that case the equivalent noise resistance is only 300 Ω, and the EFF 51 is therefore very suitable for wide-band amplification. Cascade connection of the two systems is not recommended, as mutual couplings would cause self-oscillation.



Input damping and equivalent noise resistance as functions of the grid bias for several wavelengths.

The EFF 51 supersedes the EFF 50, which is identical except for its base; the EFF 51 is fitted with the new 9-pin base.



Electrode arrangement, electrode connections and max. dimensions in mm.