PHILIPS ECC 86

DOUBLE TRIODE for use as R.F. amplifier and self-oscillating mixer in carradio sets. The tube can be directly operated from a storage battery

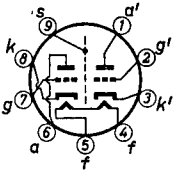
DOUBLE TRIODE pour l'utilisation comme amplificatrice H.F. et tube mélangeur auto-oscillateur dans récepteurs auto-radio. Le tube peut fonctionner directement d'un accumulateur

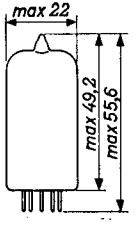
DOPPELTRIODE zur Verwendung als HF-Verstärker und selbstschwingende Mischröhre in Autoempfängern. Die Röhre kann direkt von einer Batterie betrieben werden

Heating : indirect by A.C. or D.C.; parallel supply
Chauffage: indirect par C.A. ou C.C.; alimentation parallèle
Heizung : indirekt durch Wechsel- oder Gleichstrom; Parallelspeisung

V_f = 6,3 V
I_f = 330 mA

Dimensions in mm
Dimensions en mm
Abmessungen in mm





Base, culot, Sockel: NOVAL

Capacitances
Capacités
Kapazitäten

C_a	= 1,8 pF	$C_{a'}$	= 1,8 pF
C_g	= 3 pF	$C_{g'}$	= 3 pF
C_{ag}	= 1,3 pF	$C_{a'g'}$	= 1,3 pF
		$C_{aa'}$	< 0,05 pF
		$C_{gg'}$	< 0,005 pF
		$C_{ag'}$	< 0,005 pF
		$C_{a'g}$	< 0,005 pF

Typical characteristics (each section)
Caractéristiques types (chaque système)
Kenndaten (jedes System)

V_a	=	6,3 V
V_g	=	-0,4 V
I_a	=	0,9 mA
S	=	2,6 mA/V
μ	=	14

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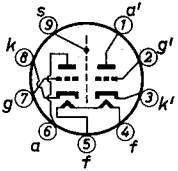
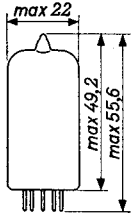
V_f = 6,3 V
I_f = 330 mA

Dimensions in mm
Dimensions en mm
Abmessungen in mm





Base, culot, Sockel: NOVAL

Capacitances
Capacités
Kapazitäten

C_a	= 1,8 pF	$C_{a'}$	= 1,8 pF
C_g	= 3 pF	$C_{g'}$	= 3 pF
C_{ag}	= 1,3 pF	$C_{a'g'}$	= 1,3 pF
	$C_{aa'}$	< 0,05 pF	
	$C_{gg'}$	< 0,005 pF	
	$C_{ag'}$	< 0,005 pF	
	$C_{a'g}$	< 0,005 pF	

Typical characteristics (each section)
Caractéristiques types (chaque système)
Kenndaten (jedes System)

V_a	=	6,3 V
V_g	=	-0,4 V
I_a	=	0,9 mA
S	=	2,6 mA/V
μ	=	14

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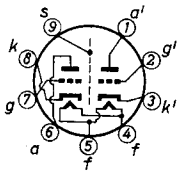
DOUBLE TRIODE for use as R.F. amplifier and self-oscillating mixer in carradio sets. The tube can be directly operated from a storage battery

HEATING

Indirect by A.C. or D.C.; parallel supply

Heater voltage	V_f = 6.3 V
Heater current	I_f = 330 mA

Dimensions in mm



Base: NOVAL

CAPACITANCES

Grid to all other elements except anode	$C_g = C_{g'}$ = 3.0 pF
Anode to all other elements except grid	$C_a = C_{a'}$ = 1.8 pF
Anode to grid	$C_{ag} = C_{a'g'}$ = 1.3 pF
Anode to anode of other section	$C_{aa'}$ < 0.05 pF
Grid to grid of other section	$C_{gg'}$ < 0.005 pF
Anode to grid of other section	$C_{ag'}$ < 0.005 pF $C_{a'g}$ < 0.005 pF

TYPICAL CHARACTERISTICS (each triode)

Anode voltage	V_a = 6.3 V
Anode current	I_a = 0.9 mA
Grid voltage	V_g = -0.4 V
Mutual conductance	S = 2.6 mA/V
Amplification factor	μ = 14

Operating characteristics as R.F. amplifier
Caractéristiques d'utilisation comme amplificateur H.F.
Betriebsdaten als HF-Verstärker

V_a	= 6,3	12,6	V
V_{bg}	= 0	0	V
R_g	= 100	100	kΩ
I_a	= 0,9	2,5	mA
S	= 2,6	4,6	mA/V
R_i	= 5	3,4	kΩ

Operating characteristics as self-oscillating mixer
Caractéristiques d'utilisation comme tube mélangeur auto-oscillateur
Betriebsdaten als selbstschwingende Mischröhre

V_{ba}	= 6,3	12,6	V
R_a	= 500	500	Ω
R_g	= 220	220	kΩ
V_{osc}	= 0,7	1,0	V_{eff}
I_a	= 0,4	1,0	mA
S_c	= 0,8	1,3	mA/V
R_i	= 11	8	kΩ

Limiting values (each section)
Caractéristiques limites (chaque système)
Grenzdaten (jedes System)

V_a	= max.	30	V
W_a	= max.	0,6	W
I_k	= max.	20	mA
R_g	= max.	1	MΩ
V_{kf}	= max.	30	V
R_{kf}	= max.	20	kΩ

Operating characteristics as R.F. amplifier (one triode)
Caractéristiques d'utilisation en amplificatrice H.F. (une triode)
Betriebsdaten als HF-Verstärker (eine Triode)

V_a =	6,3	12,6	25	V
V_{bg} =	0	0	0	V
R_g =	100	100	100	kΩ
I_a =	0,9	2,5	7,5	mA
S =	2,6	4,6	7,8	mA/V
R_i =	5	3,4	2,1	kΩ
R_{eq} =	1	-	-	kΩ

Operating characteristics as self-oscillating mixer (one triode)
Caractéristiques d'utilisation en mélangeuse auto-oscillatrice (une triode)
Betriebsdaten als selbstschwingende Mischstufe (eine Triode)

V_{ba} =	6,3	12,6	25	V
R_a =	500	500	500	Ω
R_g =	220	220	220	kΩ
V_{osc} =	0,7	1,0	1,5	Veff
I_a =	0,4	1,0	2,6	mA
S_c =	0,8	1,3	2,0	mA/V
R_i =	11	8	5,3	kΩ

Limiting values (each system)
Caractéristiques limites (chaque système)
Grenzdaten (jedes System)

V_a	= max.	30	V
W_a	= max.	0,6	W
I_k	= max.	20	mA
V_{kf}	= max.	30	V

Max. circuit values
Valeurs max. des éléments de montage
Max. Werte der Schaltungsteile

R_g	= max.	1	MΩ
R_{kf}	= max.	20	kΩ

OPERATING CHARACTERISTICS for use as R.F. amplifier (each triode)

Anode voltage	V_a	= 6.3	12.6	25	V
Grid supply voltage	V_{bg}	= 0	0	0	V
Grid resistor	R_g	= 100	100	100	kΩ
Anode current	I_a	= 0.9	2.5	7.5	mA
Mutual conductance	S	= 2.6	4.6	7.8	mA/V
Internal resistance	R_i	= 5	3.4	2.1	kΩ
Equivalent noise resistance	R_{eq}	= 1	-	-	kΩ

OPERATING CHARACTERISTICS for use as self-oscillating mixer (each triode)

Anode supply voltage	V_{ba}	= 6.3	12.6	25	V
Anode resistor	R_a	= 500	500	500	Ω
Grid resistor	R_g	= 220	220	220	kΩ
Oscillator voltage	V_{osc}	= 0.7	1.0	1.5	V(RMS)
Anode current	I_a	= 0.4	1.0	2.6	mA
Conversion conductance	S_c	= 0.8	1.3	2.0	mA/V
Internal resistance	R_i	= 11	8	5.3	kΩ

LIMITING VALUES (Design centre limits; each triode)

Anode voltage	V_a	= max.	30	V
Anode dissipation	W_a	= max.	0.6	W
Grid circuit resistance	R_g	= max.	1	MΩ
Cathode current	I_k	= max.	20	mA
Voltage between heater and cathode	V_{kf}	= max.	30	V
Circuit resistance between heater and cathode	R_{kf}	= max.	20	kΩ

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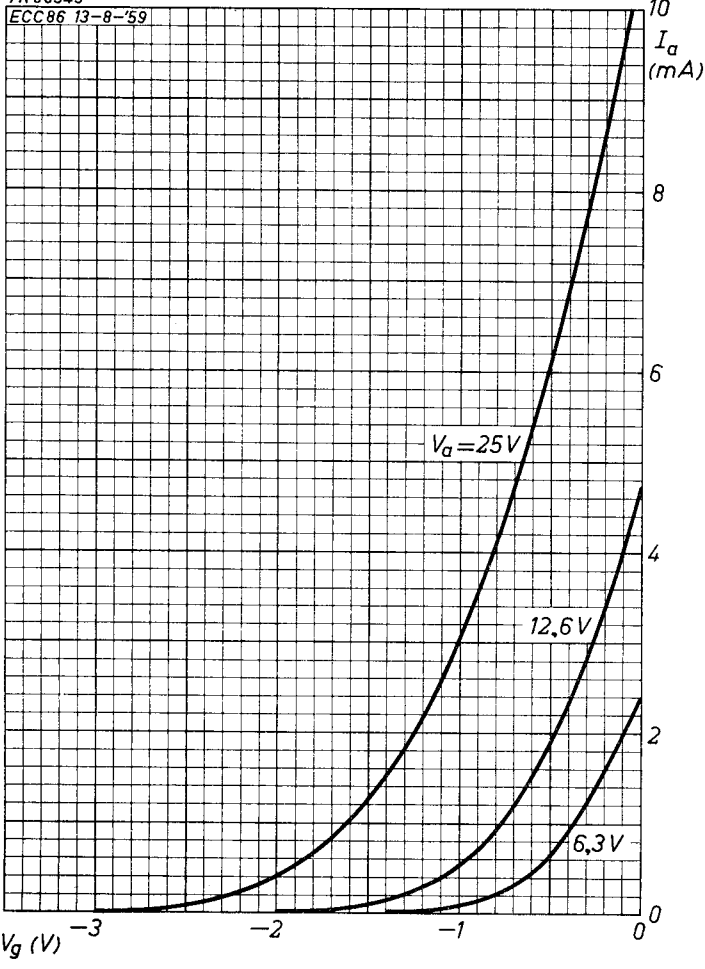

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A

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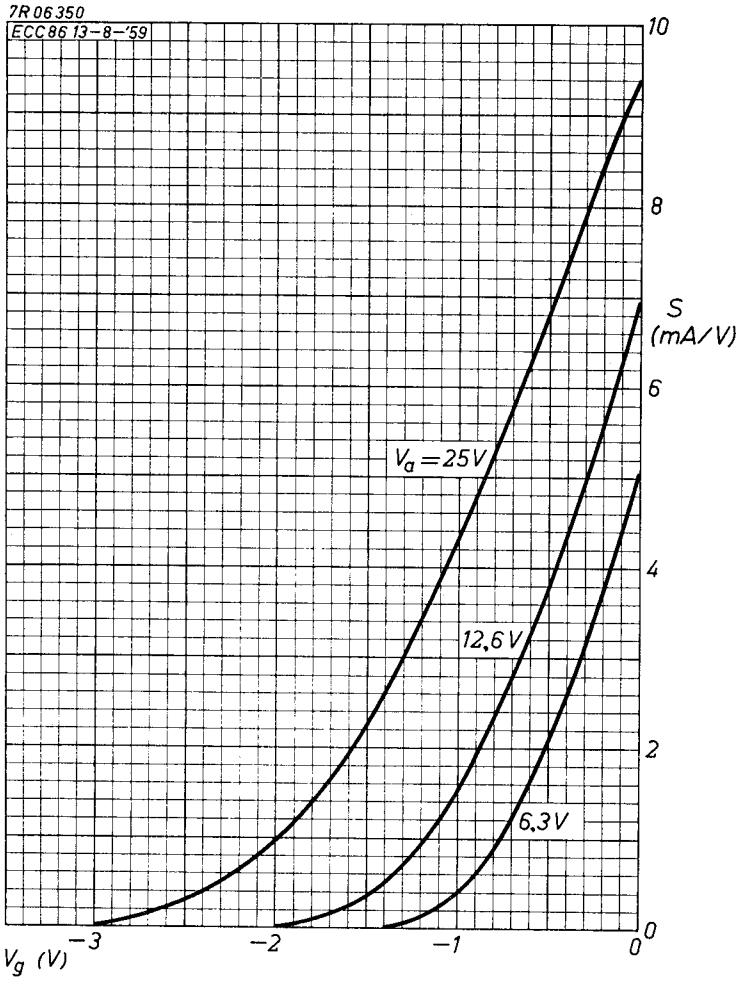

B

$V_g = 0\,V$
−0,25V
−0,5V
−0,75V
−1V
−1,25V
−1,5V
−1,75V
−2V
V_a (V)
0
5
10
15
20
25
30
35
I_a (mA)
0
2
4
6
8
10
7R06351
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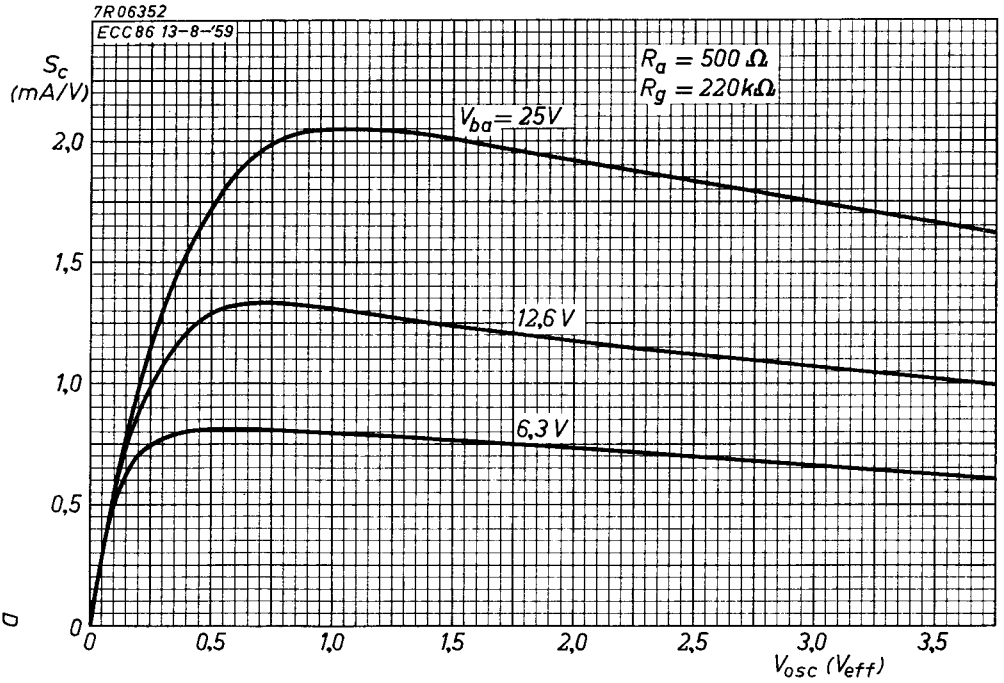
8.8.1959

C


7R06352
ECC86 13-8-'59
S_c (mA/V)
R_a = 500 Ω
R_g = 220kΩ
V_{ba} = 25V
12,6 V
6,3 V
2,0
1,5
1,0
0,5
0
0
0,5
1,0
1,5
2,0
2,5
3,0
3,5
V_{osc} (V_{eff})

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Electronic Tube

HANDBOOK

ECC86

page	sheet	date
1	1	1958.03.03
2	1	1959.08.08
3	1	1962.09.09
4	2	1958.03.03
5	2	1959.08.08
6	2	1962.09.09
7	A	1959.08.08
8	B	1959.08.08
9	C	1959.08.08
10	D	1959.08.08
11	FP	2005.05.06