



Pentode Type PT15

(RF AMPLIFIER)

General. The PT 15 is a radio-frequency transmitting pentode with an oxide-coated dull emitter filament.

The valve is suitable for use as an oscillator, radio-frequency amplifier or frequency multiplier, and for telephony.

Modulation may be applied to the control grid, suppressor grid, or to the anode and screen grids.

APPROXIMATE DATA

V_f	6.3	V
I_f	1.3	A
g_m	2.8	mA/V
} taken at V_a 1,000 V, V_{g2} 300 V, p_a 30 W		
g_m (taken at $\frac{1}{2} I_e$ (pk))	7.0	mA/V*
I_e (pk)	0.7	A*
C_{a-g1}	0.035	pF
C_{1n}	22.0	pF
C_{out}	14.5	pF

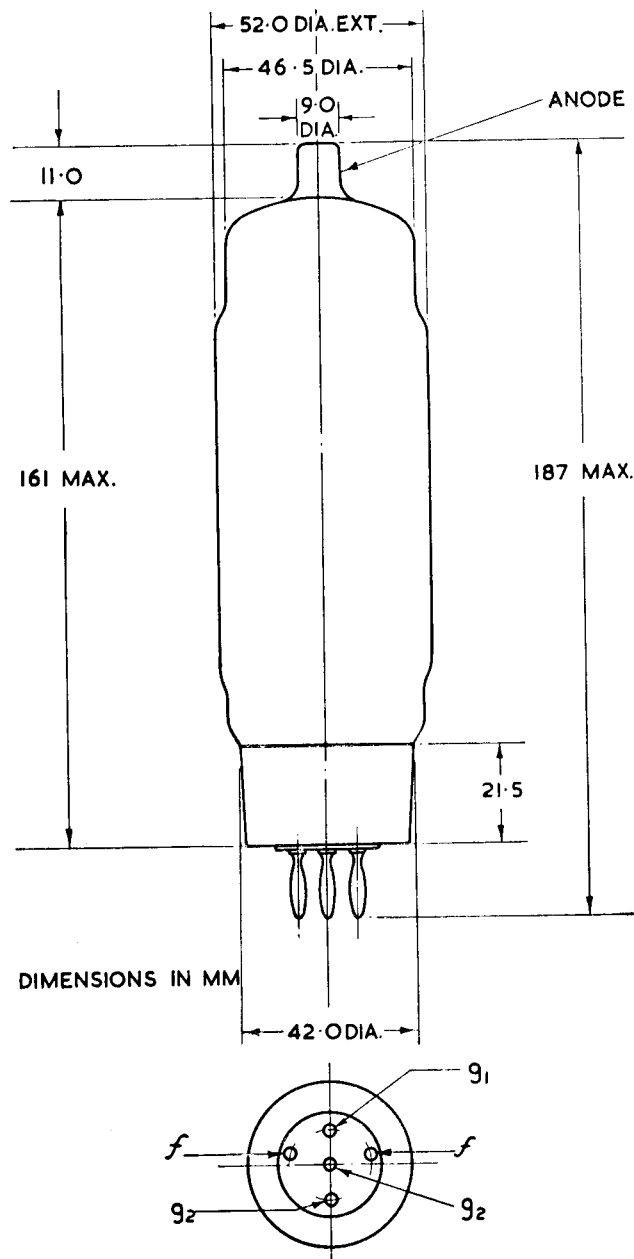
*No attempt must be made to measure this figure statically.

(1) HF POWER AMPLIFIER AND OSCILLATOR. CLASS C TELEGRAPHY

(Unmodulated, one valve, key down conditions.)

Maximum permissible ratings

V_a	1,250	V	
I_a	100	mA	
P_{1n}	($V_{g3} + 40$ V)	115	W
	(V_{g3} 0 V)	90	W
V_{g1}	-200	V	
I_{g1}	10	mA	
V_{g2}	300	V	
P_{g2}	10	W	
P_a	30	W	



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Typical Operation						
V _a	1,250	1,000	750	1,250	1,000	V
I _a	90	100	95	70	70	mA
V _{g2}	290	290	290	290	290	V
I _{g2}	25	30	30	18	25	V
P _{g2}	7.3	8.7	8.7	5.2	7.3	W
V _{g3}	+40	+40	+40	0	0	V
V _{g1}	-90	-90	-90	-90	-90	V
I _{g1} (a)	7.0	7.5	7.0	4.6	5.0	mA
R _{g1}	12,500	12,500	12,500	20,000	20,000	Ω
v _{g1(pk)}	140	150	148	129	132	V
P _{dr} (a)	1.0	1.2	1.1	0.6	0.65	W
Z _a	6,600	4,500	3,600	7,600	5,600	Ω
p _a	30	30	21.4	29.5	28	W
P _{out}	82.5	70	50	58	42	W
η _a	73.5	70	70	66	60	%

(2) HF POWER AMPLIFIER. CLASS C

(Anode modulated, one valve, carrier conditions, permissible modulation 100%.)

Maximum permissible ratings

V _a		1,000	V
I _a		80	mA
P _{in}	(V _{g3} +40 V)	80	W
	(V _{g3} 0 V)	60	W
I _{g1}		10	mA
V _{g2}		300	V
P _{g2}		7.5	W
P _a		20	W

Typical Operation

V _a	1,000	750	1,000	750	V
I _a	80	80	60	60	mA
V _{g2}	300	300	300	270	V
I _{g2}	23	22.5	23	24	mA
R _{g2}	30,000	20,000	30,000	20,000	Ω
P _{g2}	6.9	6.75	6.9	6.5	W
V _{g3}	+40	+40	0	0	V
V _{g1}	-70	-70	-70	-70	V
I _{g1} (a)	6.0	6.0	4.5	5.0	mA
v _{g1(pk)}	115	120	108	110	V

P _{dr} (a)	0.7	0.75	0.5	0.6	W
P _{audio mod} (c)	40	30	30	22.5	W
Z _{to mod}	9,900	7,300	12,000	9,000	Ω
Z _a	6,300	4,700	7,600	5,600	Ω
p _a	20	15	19	15	W
P _{out}	60	45	41	30	W
η _a	75	75	68	66	%

(3) HF POWER AMPLIFIER. CLASS C

(Grid modulated, one valve, carrier conditions, permissible modulation 100%.)

Maximum permissible ratings

V _a		1,250	V
I _a		60	mA
P _{in}	(V _{g3} +40 V)	48	W
	(V _{g3} 0 V)	45	W
I _{g1}		10	mA
V _{g2}		300	V
P _{g2}		10	W
P _a		30	W

Typical Operation

V _a	1,250	1,000	1,250	1,000	V
I _a	37	46	36	36	mA
V _{g2}	300	300	300	300	V
I _{g2}	5.5	6.0	5.0	5.0	mA
P _{g2}	1.7	1.8	1.5	1.5	W
V _{g3}	+40	+40	0	0	V
V _{g1}	-62	-63	-65	-65	V
I _{g1} (a)	0.25	0.75	0	0	mA
v _{g1(pk)}	66	73	65	65	V
P _{dr} (a) (b)	0.4	0.4	0.4	0.4	W
v _{mod(pk)} (c)	25	26	28	28	V
P _{audio mod} (c)	0.06	0.08	0.08	0.08	W
Z _{to mod}	5,600	4,400	5,400	5,400	Ω
Z _a	8,300	5,200	8,000	5,900	Ω
p _a	29.8	30	30	25	W
P _{out}	16.5	16	15	11	W
η _a	36	35	33	31	%

(4) HF POWER AMPLIFIER

(Suppressor modulated, one valve, carrier conditions, permissible modulation 100%.)

Maximum permissible ratings

V_a	1,250	V
I_a	50	mA
P_{1n}	45	W
I_{g1}	10	mA
V_{g2}	300	V
P_{g2}	10	W
P_a	30	W

Typical Operation

V_a	1,250	V
I_a	35	mA
V_{g2}	275	V
R_{g2}	50,000	Ω
I_{g2}	19.5	mA
P_{g2}	5.4	W
V_{g3}	-78	V
V_{g1}	-90	V
I_{g1} (a)	4.5	mA
R_{g1}	20,000	Ω
$V_{g1(pk)}$	135	V
P_{dr} (a)	0.7	W
$v_{mod(pk)}$ (c)	78	V
$P_{audio mod}$ (c)	Negligible	
Z_a	7,600	Ω
P_a	30	W
P_{out}	14	W
η_a	32	%

(5) HF POWER AMPLIFIER.**CLASS B TELEPHONY**

(One valve, carrier conditions, permissible modulation 100%.)

Maximum permissible ratings

V_a	1,250	V
I_a	60	mA
P_{1n} (V_{g3} 0 and +40 V)	45	W
I_{g1}	10	mA
V_{g2}	300	V
P_{g2}	10	W
P_a	30	W

Typical Operation

V_a	1,250	1,000	750	1,250	1,000	V
I_a	35	45	56	35	42	mA
V_{g2}	300	300	300	300	300	V
I_{g2}	3	6	7	3	6	mA
P_{g2}	0.9	1.8	2.1	0.9	1.8	W
V_{g3}	+40	+40	+40	0	0	V
V_{g1}	-35	-35	-33	-35	-35	V
I_{g1} (a)	—	—	0.25	—	—	mA
$v_{g1(pk)}$	27	28	35	27	29	V
$P_{dr(a)(b)}$	0.2	0.25	0.5	0.2	0.3	W
Z_a	9,800	6,000	3,600	9,200	5,500	Ω
P_a	29	30	28	30	30	W
P_{out}	15	15	14	14	12	W
η_a	34	33	33	32	29	%

The figures quoted for maximum permissible ratings apply only to operation at wavelengths down to 20 m. (15 Mc/s).

At shorter wavelengths the anode voltage must be reduced and curves are given showing the maximum permissible anode voltages against wavelength.

As the efficiency falls with decrease of wavelength the input must be reduced in order to avoid exceeding the permissible anode dissipation.

NOTES

- (a) Subject to wide variation. The figures are approximate only.
 (b) At crest of audio cycle with 100% modulation.
 (c) 100% modulation.

