

FORWARD WAVE AMPLIFIER

LA9-3

Application: Broadband low power amplifier.

Frequency: 'X' band.

Construction: Unpackaged.

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS—MICROWAVE DEVICES: INTRODUCTION and FORWARD WAVE AMPLIFIERS which precede this section of the handbook.

CHARACTERISTICS

| | Min. | to | Max. | |
|--|------|----|------|------|
| Frequency band | 7.0 | | 11.5 | Gc/s |
| Gain (low power level)—over frequency band | 20 | | — | dB |
| *Noise factor | — | | 25 | dB |
| Saturation power output | 4.0 | | — | mW |
| Attenuation (at $I_k = 0\text{mA}$) | 40 | | — | dB |
| Input match in recommended mount —broadband (v.s.w.r.) | — | | 3.5 | |
| Output match in recommended mount —broadband (v.s.w.r.) | — | | 3.5 | |

CATHODE

Indirectly heated

| | | |
|-------------|-----|-----|
| V_h | 6.3 | V |
| I_h | 500 | mA |
| τ_{hk} | 5.0 | min |

TYPICAL OPERATION

As an input amplifier using a periodic permanent magnet system of approved design.

| | | |
|--|-----|---------------|
| f | 9.0 | Gc/s |
| $V_{\text{collector}}$ | 1.4 | kV |
| V_{helix} | 1.3 | kV |
| V_{g3} | 135 | V |
| V_{g2} | 155 | V |
| V_{g1} | -85 | V |
| $I_{\text{collector}}$ | 550 | μA |
| Gain | 30 | dB |
| *Noise factor | 20 | dB |
| Power output | 50 | μW |
| Input match in recommended mount (v.s.w.r.) | 3.0 | |
| Output match in recommended mount (v.s.w.r.) | 3.0 | |

*Using a solenoid of approved design, up to 5dB improvement in noise factor can be obtained.

ABSOLUTE MAXIMUM RATINGS

| | | |
|------------------------------|------|---------------|
| $V_{\text{collector max.}}$ | 1.55 | kV |
| $I_{\text{collector max.}}$ | 600 | μA |
| $P_{\text{collector max.}}$ | 900 | mW |
| $V_{\text{helix max.}}$ | 1.45 | kV |
| $I_{\text{helix max.}}$ | 50 | μA |
| $V_{g3 \text{ max.}}$ | 400 | V |
| $I_{g3 \text{ max.}}$ | 10 | μA |
| $V_{g2 \text{ max.}}$ | 200 | V |
| $I_{g2 \text{ max.}}$ | 10 | μA |
| $-V_{g1 \text{ max.}}$ | 100 | V |
| $I_{g1 \text{ max.}}$ | 10 | μA |
| $P_{\text{in(signal) max.}}$ | 500 | mW |
| $V_{h-k \text{ max.}}$ | 50 | V |

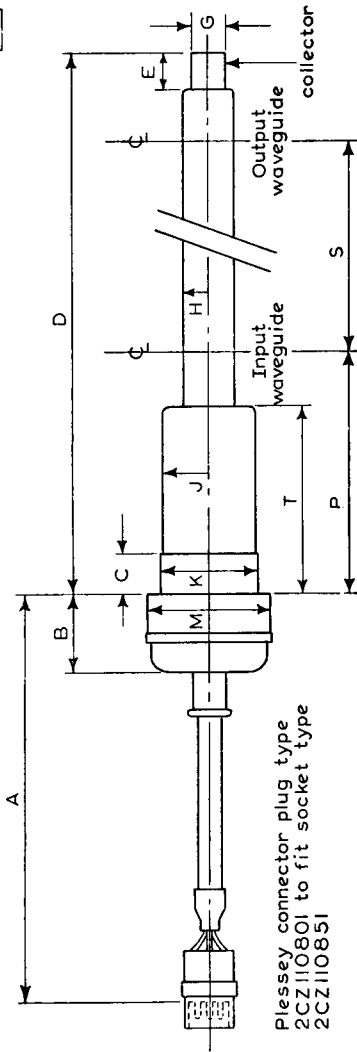
MOUNTING POSITION

Any

ACCESSORIES

| | | |
|-------|------------------|-------|
| Mount | Permanent magnet | P9L-1 |
| | Solenoid | S9L-1 |

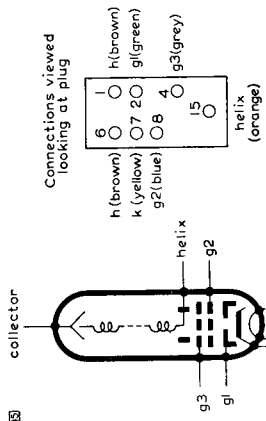
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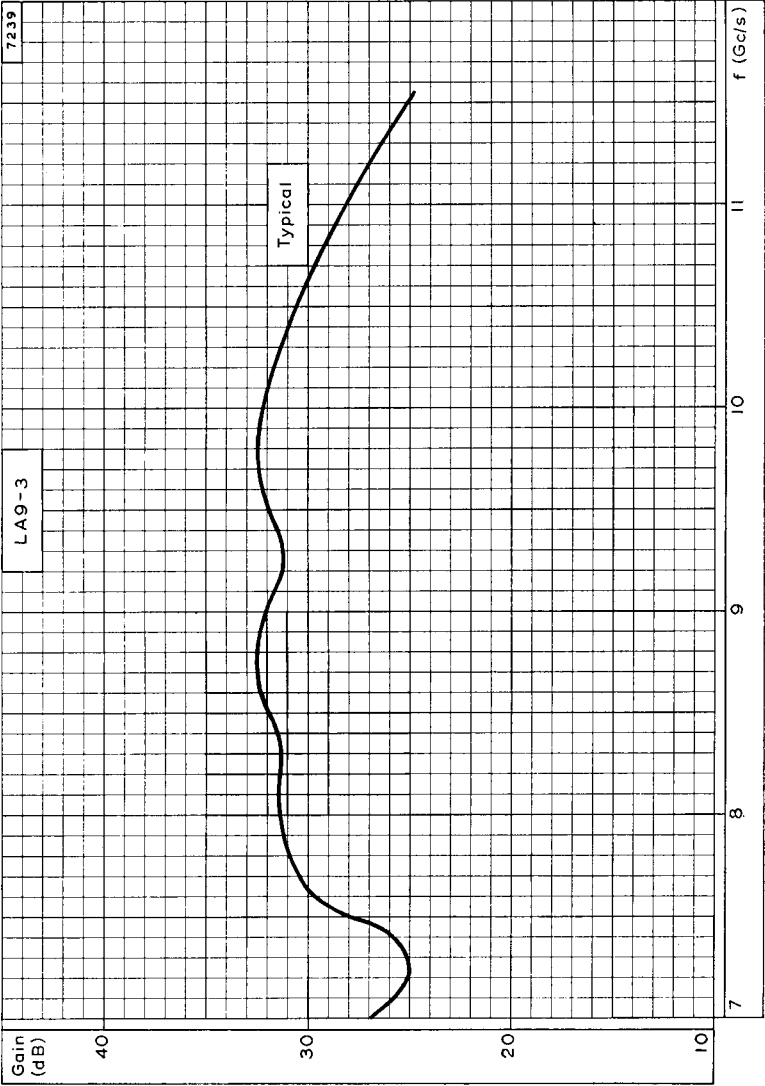
Plessey connector plug type
2CZ110801 to fit socket type
2CZ110851

Waveguide dimensions 0.900×0.079 inches, 22.86×2.00 millimetres

| | Inches | Millimetres |
|---|-------------------|----------------|
| A | 4.331 | 110 |
| B | 1.299 | 33 |
| C | 0.650 | 16.5 |
| D | 12.638 | 316 |
| E | 0.394 | 10 |
| G | 0.167 ± 0.002 | 5.0 ± 0.05 |
| H | 0.125 | 3.17 |
| J | 0.472 | 12 |
| K | 1.063 | 27 |
| M | 1.260 | 32 |
| P | 2.835 ± 0.008 | 72 ± 0.2 |
| S | 8.150 ± 0.004 | 207 ± 0.1 |
| T | 2.126 | 54 |

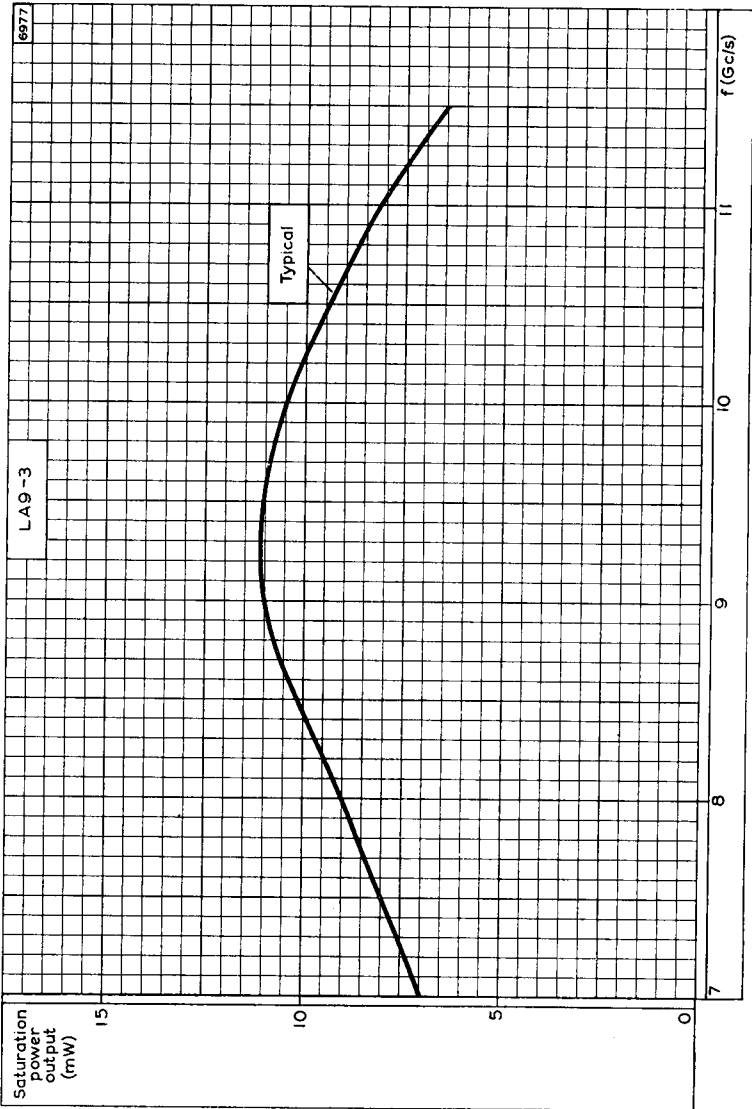


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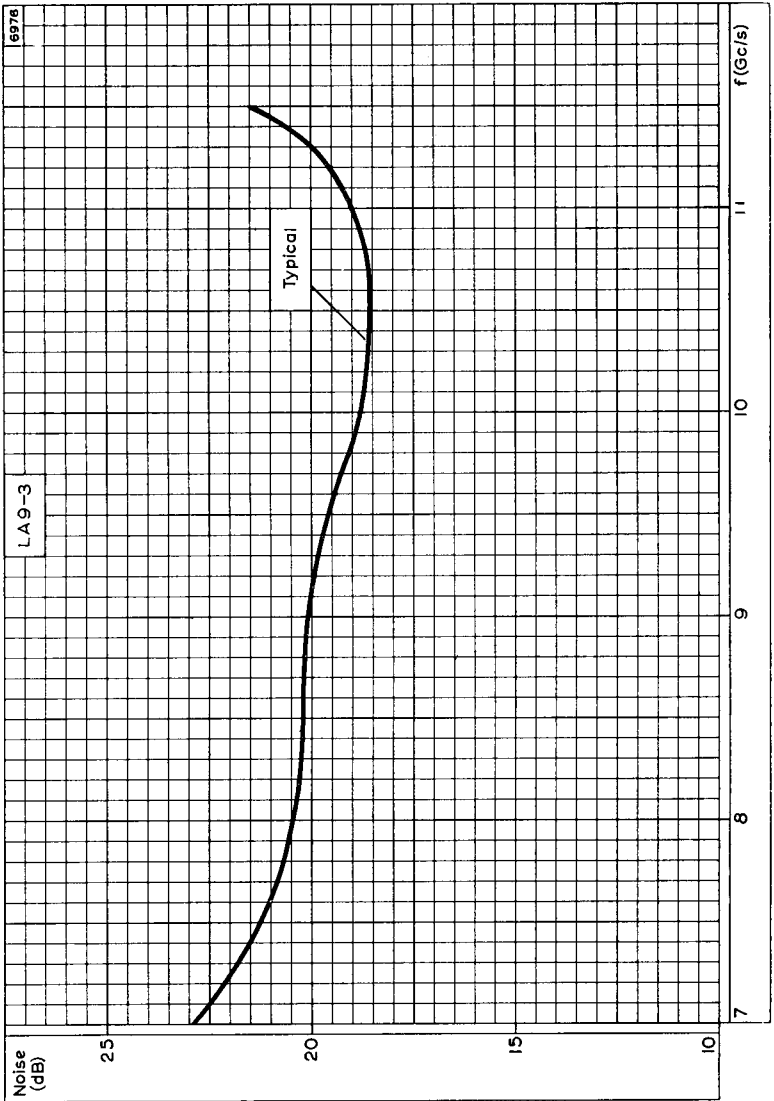


TYPICAL GAIN PLOTTED AGAINST FREQUENCY





SATURATION POWER OUTPUT PLOTTED AGAINST FREQUENCY



TYPICAL NOISE FACTOR PLOTTED AGAINST FREQUENCY USING A PERMANENT-MAGNET MOUNT