

# FORWARD WAVE AMPLIFIER

# LAI6-2

Application: Low power amplifier, broadband.

Frequency: 'J' 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. | Max. |      |
|--------------------------------------------|------|------|------|
| Frequency band                             | 11.5 | 18   | Gc/s |
| Gain (low power level)—over frequency band | 20   | —    | dB   |
| *Noise factor                              | —    | 28   | dB   |
| Saturation power output                    | 1.0  | —    | mW   |
| Attenuation (at $I_k = 0\text{mA}$ )       | 40   | —    | dB   |

## CATHODE

Indirectly heated

|       |     |    |
|-------|-----|----|
| $V_h$ | 8.5 | V  |
| $I_h$ | 400 | mA |

## TYPICAL OPERATION

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

|                        |      |               |
|------------------------|------|---------------|
| $f$                    | 15   | Gc/s          |
| $V_{\text{collector}}$ | 1.7  | kV            |
| $V_{\text{helix}}$     | 1.6  | kV            |
| $V_{g3}$               | 150  | V             |
| $V_{g2}$               | 350  | V             |
| $V_{g1}$               | -120 | V             |
| $I_{\text{collector}}$ | 450  | $\mu\text{A}$ |
| Gain                   | 32   | dB            |
| *Noise factor          | 23   | dB            |
| Power output           | 10   | $\mu\text{W}$ |

\*Using a solenoid of approved design, up to 6dB improvement in noise factor can be obtained.

### ABSOLUTE MAXIMUM RATINGS

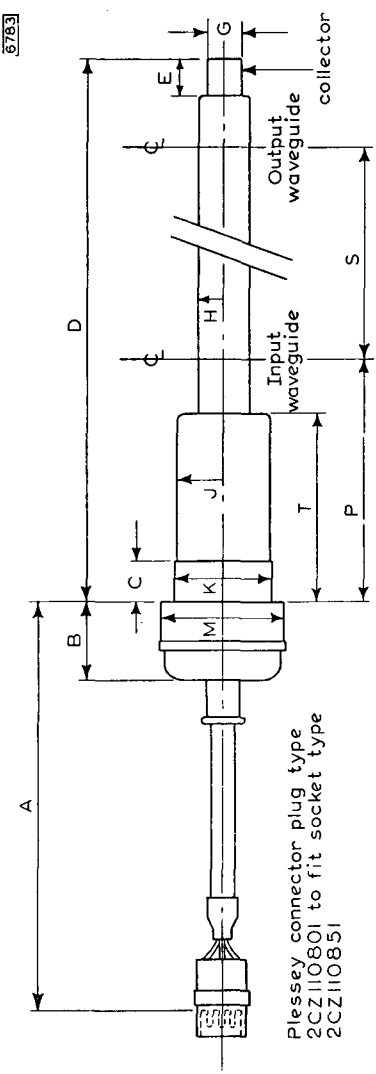
|                               |      |               |
|-------------------------------|------|---------------|
| $V_{\text{collector}}$ max.   | 1.85 | kV            |
| $I_{\text{collector}}$ max.   | 500  | $\mu\text{A}$ |
| $P_{\text{collector}}$ max.   | 800  | mW            |
| $V_{\text{helix}}$ max.       | 1.75 | kV            |
| $I_{\text{helix}}$ max.       | 60   | $\mu\text{A}$ |
| $V_{g3}$ max.                 | 200  | V             |
| $I_{g3}$ max.                 | 20   | $\mu\text{A}$ |
| $V_{g2}$ max.                 | 450  | V             |
| $I_{g2}$ max.                 | 20   | $\mu\text{A}$ |
| $-V_{g1}$ max.                | 150  | V             |
| $I_{g1}$ max.                 | 10   | $\mu\text{A}$ |
| $P_{\text{in (signal)}}$ max. | 300  | mW            |
| $V_{h-k}$ max.                | 50   | V             |

### MOUNTING POSITION

Any

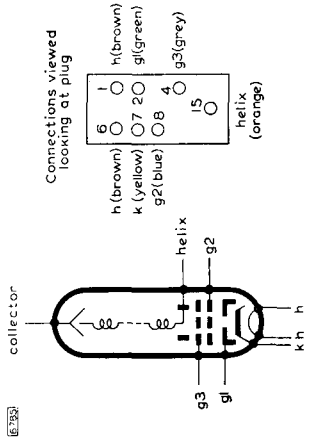
### ACCESSORIES

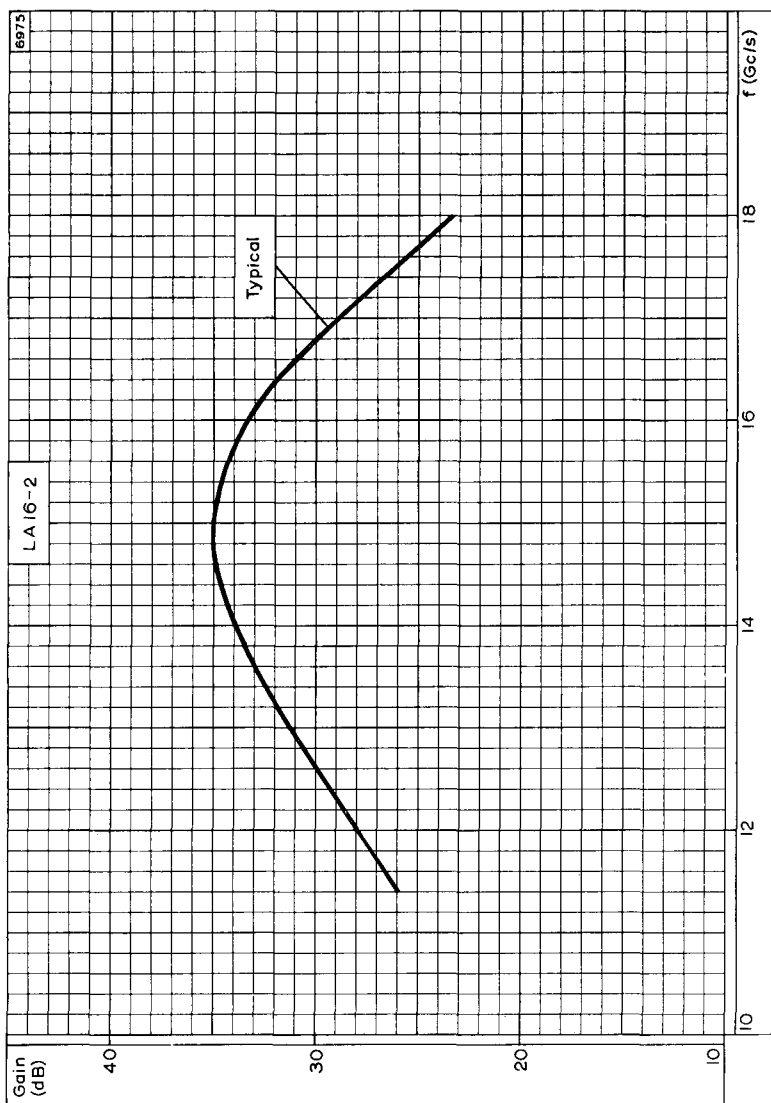
|       |                  |        |
|-------|------------------|--------|
| Mount | Permanent magnet | P16L-1 |
|       | Solenoid         | S16L-1 |



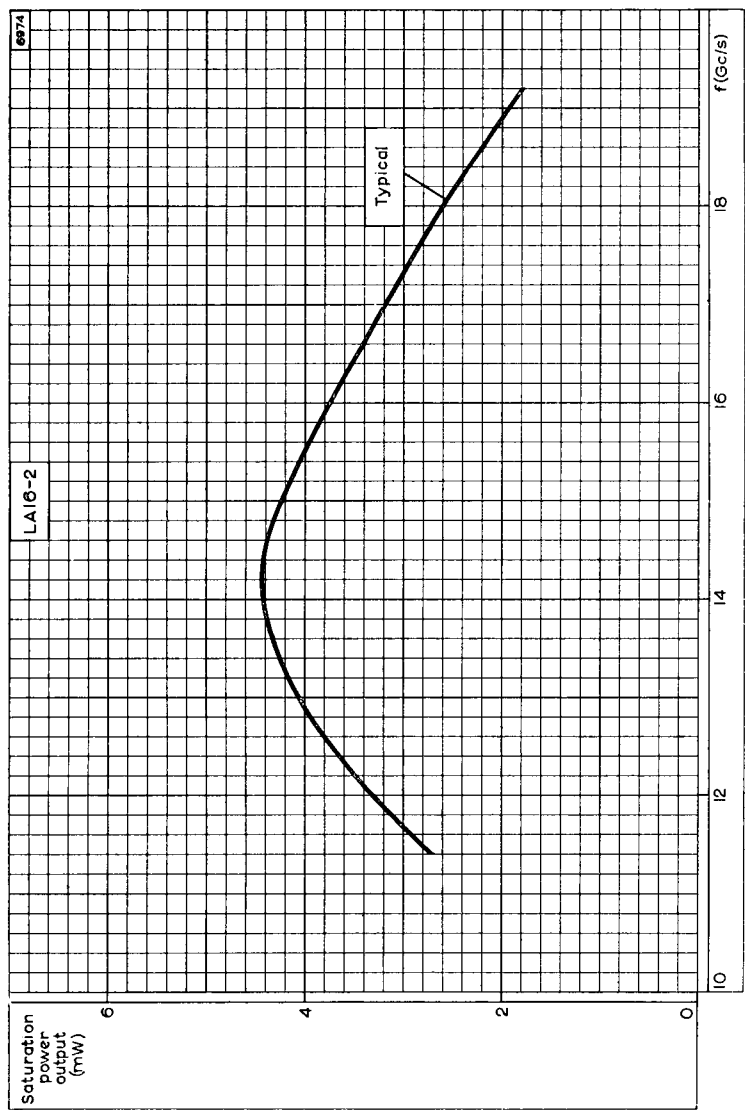
Waveguide dimensions 0.622 x 0.311 in., 15.78 x 7.90 mm.

|   | Inches         | Millimetres |
|---|----------------|-------------|
| A | 4.409 ± 0.197  | 112 ± 5     |
| B | 1.299          | 33          |
| C | 0.650          | 16.5        |
| D | 12.756 ± 0.118 | 324 ± 3     |
| E | 0.394          | 10          |
| G | 0.081          | 2.05        |
| H | 0.108          | 2.75        |
| J | 0.5            | 12.7        |
| K | 1.063          | 27          |
| M | 1.259          | 32          |
| P | 2.614 ± 0.008  | 66.5 ± 0.2  |
| S | 8.130 ± 0.004  | 206.5 ± 0.1 |
| T | 2.283          | 58          |

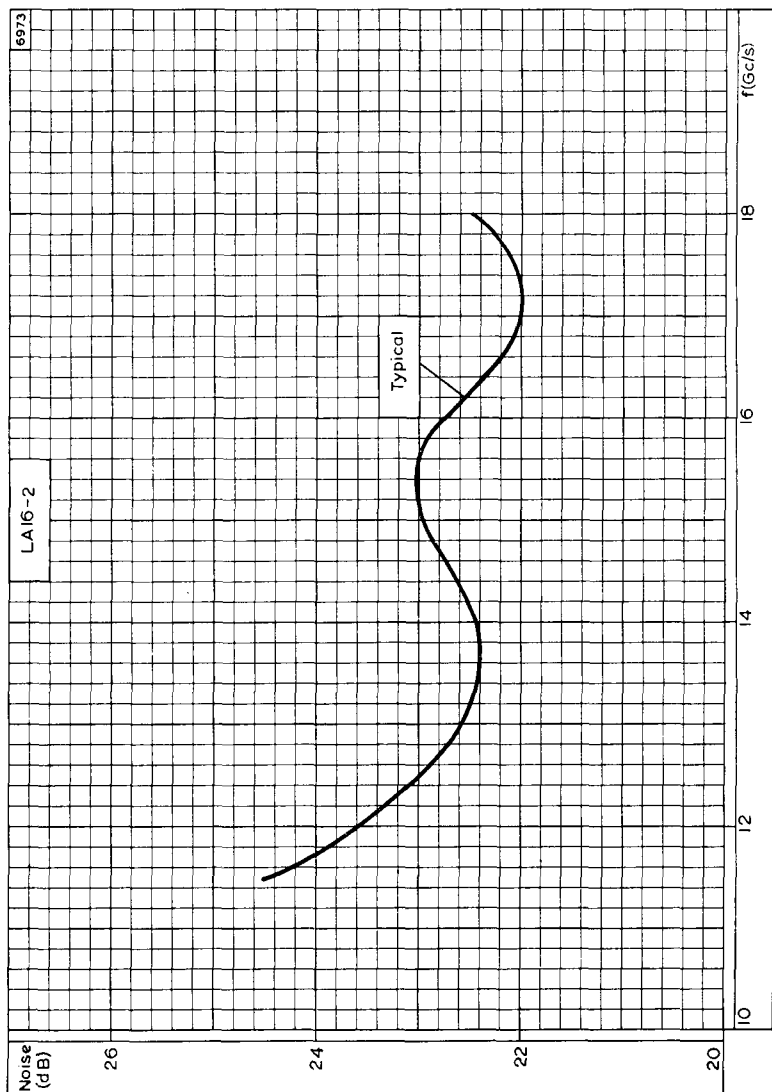




TYPICAL GAIN PLOTTED AGAINST FREQUENCY



SATURATION POWER OUTPUT PLOTTED AGAINST FREQUENCY



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