



ELECTRONIC TUBE REFERENCE

# F6825

Specialized - Traveling Wave electronic tube

CONSOLIDATED TECHNICAL DATA

**1 SECTION**

CONSTRUCTION

**TRAVELINGWAVE**

High-power pulsed 2-4 GHz traveling-wave amplifier producing approximately 2 kW peak RF output at 3 GHz with about 30 dB gain.

## GENERAL CHARACTERISTICS

|                     |                   |                      |               |
|---------------------|-------------------|----------------------|---------------|
| BASE DESIGNATION    | —                 | BASE PINS            | —             |
| NOMINAL HEATER      | — / —             | PARALLEL HEATER      | — / —         |
| HEATING             | Indirect          | SERIES OPERATION     | Not specified |
| CATHODE ARRANGEMENT | Separate cathodes | SECTION CONSTRUCTION | Similar       |

## SECTION RATINGS

### SECTION 1 TravelingWave

*No fixed ratings recorded.*

*Published maximum ratings and characteristics audited; remaining numeric data retained densely in parameter table.*

The F6825 is a one-kilowatt pulsed traveling-wave amplifier using a helix slow-wave structure for broadband microwave power amplification.

## SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 1962 ITT

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1962 ITT

## Section 1 · TravelingWave

| OTHER                                |                 |                                                                                   |
|--------------------------------------|-----------------|-----------------------------------------------------------------------------------|
| PARAMETER                            | PUBLISHED VALUE | CONDITION / NOTE                                                                  |
| The F [1]                            | 6825            | The F-6825 is a 1 kilowatt pulse traveling wave amplifier tube having 30 db gain  |
| The F [2]                            | 1               | The F-6825 is a 1 kilowatt pulse traveling wave amplifier tube having 30 db gain  |
| The F [3]                            | 30              | The F-6825 is a 1 kilowatt pulse traveling wave amplifier tube having 30 db gain  |
| and [1]                              | 2000 MHz        | and 2000 to 4000 mc frequency range. It is constructed in a rugged metal envelope |
| and [2]                              | 4000 MHz        | and 2000 to 4000 mc frequency range. It is constructed in a rugged metal envelope |
| Published value [1]                  | 5               | . 005 and pulse widths up to 15 microseconds can be used.                         |
| Published value [2]                  | 15              | . 005 and pulse widths up to 15 microseconds can be used.                         |
| Heater Voltage [1]                   | 6.3 V           | Heater Voltage 6.3 (±10%) volts                                                   |
| Heater Voltage [2]                   | 10 V            | Heater Voltage 6.3 (±10%) volts                                                   |
| Heater Current                       | 5 A             | Heater Current : 5.0 amperes                                                      |
| Maximum Anode Voltage (Note [1])     | 1 V             | Maximum Anode Voltage (Note 1) 8500 wvolts peak                                   |
| Maximum Anode Voltage (Note [2])     | 8500 V          | Maximum Anode Voltage (Note 1) 8500 wvolts peak                                   |
| Maximum Shell Current (Note [1])     | 2 A             | Maximum Shell Current (Note 2) 0.5 ampere peak                                    |
| Maximum Shell Current (Note [2])     | 500 mA          | Maximum Shell Current (Note 2) 0.5 ampere peak                                    |
| Maximum Collector Voltage (Note [1]) | 3 V             | Maximum Collector Voltage (Note 3) 9000 volts peak                                |

| PARAMETER                                 | PUBLISHED VALUE | CONDITION / NOTE                                         |
|-------------------------------------------|-----------------|----------------------------------------------------------|
| Maximum Collector Voltage (Note [2])      | <b>9000 V</b>   | Maximum Collector Voltage (Note 3) 9000 volts peak       |
| Maximum Collector Dissipation {Note [1]}  | <b>4 W</b>      | Maximum Collector Dissipation {Note 4) 150 watts average |
| Maximum Collector Dissipation {Note [2]}  | <b>150 W</b>    | Maximum Collector Dissipation {Note 4) 150 watts average |
| Maximum R-F Input Power                   | <b>10 W</b>     | Maximum R-F Input Power 10 watts average                 |
| Maximum R-F Output Power                  | <b>20 W</b>     | Maximum R-F Output Power 20 watts average                |
| Maximum Pulse Width (Beam)                | <b>15</b>       | Maximum Pulse Width (Beam) 15 microseconds               |
| Maximum Cathode Current                   | <b>25 A</b>     | Maximum Cathode Current 2,5 amperes peak                 |
| Maximum Frequency (Note [1])              | <b>5 MHz</b>    | Maximum Frequency (Note 5) 4000 mc                       |
| Maximum Frequency (Note [2])              | <b>4000 MHz</b> | Maximum Frequency (Note 5) 4000 mc                       |
| Minimum Frequency (Note [1])              | <b>5 MHz</b>    | Minimum Frequency (Note 5) 2000 mc                       |
| Minimum Frequency (Note [2])              | <b>2000 MHz</b> | Minimum Frequency (Note 5) 2000 mc                       |
| Air Flow on Collector Radiator {Note [1]} | <b>4</b>        | Air Flow on Collector Radiator {Note 4) 30 cfm           |
| Air Flow on Collector Radiator {Note [2]} | <b>30</b>       | Air Flow on Collector Radiator {Note 4) 30 cfm           |
| Glass Temperature                         | <b>160</b>      | Glass Temperature 160°C max.                             |
| Center Frequency                          | <b>3000 MHz</b> | Center Frequency 3000 mc                                 |
| Anode Voltage (Note [1])                  | <b>1 V</b>      | Anode Voltage (Note 1) 8000 volts peak                   |
| Anode Voltage (Note [2])                  | <b>8000 V</b>   | Anode Voltage (Note 1) 8000 volts peak                   |
| Cathode Current                           | <b>1.8 A</b>    | Cathode Current 1.8 amperes peak                         |
| Collector Voltage (tied to Shell)         | <b>8000 V</b>   | Collector Voltage (tied to Shell) 8000 volts peak        |
| Collector Current                         | <b>1.5 A</b>    | Collector Current 1.5 amperes peak                       |
| Power Output (at center frequency)        | <b>2 kW</b>     | Power Output (at center frequency) 2 kw peak             |
| Bandwidth to [1]                          | <b>3 MHz</b>    | Bandwidth to 3 db power points 2,0-4.0 kmc               |
| Bandwidth to [2]                          | <b>20 MHz</b>   | Bandwidth to 3 db power points 2,0-4.0 kmc               |
| Bandwidth to [3]                          | <b>-4 MHz</b>   | Bandwidth to 3 db power points 2,0-4.0 kmc               |
| Gain (Note [1])                           | <b>6</b>        | Gain (Note 6) 30 db                                      |
| Gain (Note [2])                           | <b>30</b>       | Gain (Note 6) 30 db                                      |
| Pulse Width                               | <b>2</b>        | Pulse Width 2   seconds                                  |
|                                           |                 |                                                          |

| PARAMETER                                                 | PUBLISHED VALUE | CONDITION / NOTE                                                                     |
|-----------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------|
| Note                                                      | <b>1 V</b>      | Note 1: All voltages shown are with respect to cathode. Anode and helix are con-     |
| Note                                                      | <b>2 A</b>      | Note 2: The shell current is the difference between cathode current and collector    |
| Note                                                      | <b>3</b>        | Note 3: The tube may be operated with the collector tied to the shell {(anode and    |
| difference between collector and shell must be limited to | <b>500</b>      | difference between collector and shell must be limited to 500 volts maximum.         |
| Note [1]                                                  | <b>4 W</b>      | Note 4: Forced air cooling is required for average collector power in excess of 10   |
| Note [2]                                                  | <b>10 W</b>     | Note 4: Forced air cooling is required for average collector power in excess of 10   |
| At the maximum collector power of [1]                     | <b>150 W</b>    | At the maximum collector power of 150 watts, a minimum air flow of 20 cfm            |
| At the maximum collector power of [2]                     | <b>20 W</b>     | At the maximum collector power of 150 watts, a minimum air flow of 20 cfm            |
| Note [1]                                                  | <b>5 MHz</b>    | Note 5: Useful gain and power output exists below 2000 mc and above 4000 mc and      |
| Note [2]                                                  | <b>2000 MHz</b> | Note 5: Useful gain and power output exists below 2000 mc and above 4000 mc and      |
| Note [3]                                                  | <b>4000 MHz</b> | Note 5: Useful gain and power output exists below 2000 mc and above 4000 mc and      |
| Note [1]                                                  | <b>6 MHz</b>    | Note 6: This gain is obtained over the 2. 0 to 4. 0 kmc bandwidth at the power level |
| Note [2]                                                  | <b>2 MHz</b>    | Note 6: This gain is obtained over the 2. 0 to 4. 0 kmc bandwidth at the power level |
| Note [3]                                                  | <b>0 MHz</b>    | Note 6: This gain is obtained over the 2. 0 to 4. 0 kmc bandwidth at the power level |
| Note [4]                                                  | <b>4 MHz</b>    | Note 6: This gain is obtained over the 2. 0 to 4. 0 kmc bandwidth at the power level |
| Note [5]                                                  | <b>0 MHz</b>    | Note 6: This gain is obtained over the 2. 0 to 4. 0 kmc bandwidth at the power level |
| ( [1]                                                     | <b>1 V</b>      | (1) Heater warm up of 2 minutes before applying high voltage is recommended.         |
| ( [2]                                                     | <b>2 V</b>      | (1) Heater warm up of 2 minutes before applying high voltage is recommended.         |
| /                                                         | <b>1</b>        | / 1 watt input                                                                       |

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