

1 T855 General Information

This section provides a brief description of the T855 receiver, along with detailed specifications and a list of types available.

The following topics are covered in this section.

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1.1 Introduction

The T855 is a high performance FM base station receiver designed for single or multichannel operation in the 400 to 530MHz frequency range.

The receiver is a dual conversion superhet with a synthesised local oscillator. The first IF is 45MHz, allowing exceptionally high spurious signal rejection to be achieved in the receiver front end. The second IF section (455kHz) combines amplitude limiting, detection and audio pre-amplification within a single integrated circuit. It also drives carrier and noise level detectors for signal strength indication and gating the audio output.

The audio section output can be adjusted to deliver $>+10\text{dBm}$ to a 600 ohm balanced output, and 1W to a local monitor speaker. A flat or de-emphasised audio response is link selectable.

The synthesiser frequency is programmed via an EPROM which is attached to a separate plug-in memory board. A DIP switch on the memory PCB allows fast single channel selection from a multichannel programmed EPROM, but for true multichannel capability the EPROM must be addressed separately via an additional D-range plug at the rear of the set.

All components except those on the VCO and memory boards are mounted on a single PCB. This is secured to a die-cast chassis which is divided into compartments to individually shield each section of circuitry. Access to both sides of the main PCB is obtained by removing each of the two chassis lids. There is provision within the chassis to mount small option PCBs.

The front panel controls include gate sensitivity, line level, monitor volume and a mute disable switch. This switch disables the mute (squelch) signal to the monitor amplifier as an aid to servicing.

1.2 Specifications

1.2.1 Introduction

The performance figures given are minimum figures, unless otherwise indicated, for equipment tuned with the maximum switching band and operating at standard room temperature (+22°C to +28°C).

Where applicable, the test methods used to obtain the following performance figures are those described in the EIA specification. However, there are several parameters for which performance according to the CEPT specification is given.

Details of test methods and the conditions which apply for Type Approval testing in all countries can be obtained from Tait Electronics Ltd.

1.2.2 General

| | |
|-----------------------------|------------------------------------|
| Frequency Range | .. 400-530MHz |
| Type | .. dual conversion superheterodyne |
| Frequency Increment | .. 6.25 or 12.5kHz |
| Switching Range | .. 5MHz |
| Number Of Channels: | |
| Standard | .. 1 |
| Optional . | .. 8 |
| Internally Selectable | .. 128 |
| Supply Voltage: | |
| Operating Voltage | .. 10.8 to 16V DC |
| Standard Test Voltage | .. 13.8V DC |
| Polarity | .. negative earth only |
| Polarity Protection | .. crowbar diode |
| Supply Current: | |
| Standby | .. 300mA |
| Full Audio | .. 700mA |
| Input Impedance | .. 50 ohms |
| Operating Temperature Range | .. -30°C to +60°C |
| Frequency Stability: | |
| Standard Version | .. ±2.5ppm, -30°C to +60°C |
| High Stability Version | .. ±2ppm, -10°C to +60°C |
| Very High Stability Option | .. ±1ppm, 0°C to +60°C |

Received Signal Strength Indicator(RSSI) .. -115dBm to -70dBm, 0 to 5V at
(optional) 10dB/V

Dimensions:

Height .. 191mm
Width .. 60mm
Length .. 322mm

Weight .. 2.2kg

1.2.3 RF Section

IF Amplifiers:

Frequencies .. 45MHz and 455kHz
Bandwidths-
Narrow Band (NB) .. 7.5kHz
Wide Band (WB) .. 15kHz
Ultra-Wide Band (UWB) .. 30kHz

Sensitivity:

Single Channel (NB & WB) .. -117dBm
Single Channel(UWB) .. -114dBm
Bandsread (12dB Sinad) (NB & WB) .. -115dBm
Bandsread (12dB Sinad) (UWB) .. -112dBm

Signal+Noise To Noise Ratio:

RF Level -107dBm .. 30dB
RF Level -83dBm (NB) .. 50dB CEPT (typical)
RF Level -57dBm (WB) .. 55dB EIA (typical)

Selectivity:

Narrow Band (± 12.5 kHz) .. 85dB CEPT (typical)
Wide Band (± 25 kHz) .. 90dB

Offset Selectivity (Canada only) .. 20dB

Spurious Response Attenuation .. 100dB

Intermodulation Response Attenuation:

Narrow Band .. 80dB CEPT (typical)
Wide Band .. 85dB EIA

Blocking .. 100dB

Co-channel Rejection .. 6dB

Amplitude Characteristic .. 3dB

Spurious Emissions:

| | |
|-----------|-------------------------------------|
| Conducted | .. -90dBm to 4GHz |
| Radiated | .. -57dBm to 1GHz -47dBm to 4GHz |

1.2.4 Audio Section

Outputs Available .. line and monitor

Frequency Response .. flat or de-emphasised (link selectable)

Flat Response (15kHz IF BW):

| | |
|-----------|---|
| Bandwidth | .. 67 to 3400Hz |
| Response | .. within +1, -2dB of output level at 1kHz |

De-emphasised Response:

| | |
|---------------------------------------|--|
| CTCSS Band- Bandwidth Response | .. 67 to 260Hz .. within +1, -2dB of output level at 100Hz |
| Speech Band- Bandwidth Response | .. 300 to 3400Hz .. within +1, -3dB of a 6dB/octave de-emphasis characteristic (ref. 1kHz) |

Line Output:

| | |
|---|--------------------------|
| Power | .. adjustable to >+10dBm |
| Load Impedance | .. 600 ohms |
| Distortion- (@ -70dBm signal level, links set to de-emphasis) | |
| WB and NB | .. ≤2% |
| (@ -70dBm signal level, links set to flat) | |
| WB | .. ≤2% |
| NB | .. ≤4% |

Monitor Output:

| | |
|--|-------------|
| Power | .. 1W |
| Speaker Impedance | .. 3.5 ohms |
| Distortion- (@ -70dBm signal level, links set to de-emphasis) | .. ≤3% |

Mute Operation (Gate)

Systems Available .. noise mute and RSSI mute

Noise Mute:

Operating Range .. 6-20dB sinad
Hysteresis .. 1.5 to 6dB
Threshold .. adjustable to -105dBm
Opening Time .. 20ms
Closing Time .. 50ms

RSSI Mute (Optional):

Operating Range .. -115 to -70dBm
Hysteresis .. 2 to 10dB
Opening Time .. 5ms
Closing Time .. 50ms

1.3 Product Codes

| Frequency Range (MHz) | | 400-440 | | | | | | | |
|-----------------------|--|---------|----|----|----|----|----|----|--|
| IF Bandwidth (kHz) | | 7.5 | | 12 | | 15 | | 30 | |
| TCXO | $\pm 2.5\text{ppm}$ -30°C to $+60^{\circ}\text{C}$ | | | • | • | | | • | |
| | $\pm 2\text{ppm}$ -10°C to $+60^{\circ}\text{C}$ | • | | | | | | | |
| | $\pm 1\text{ppm}$ 0°C to $+60^{\circ}\text{C}$ | | • | | | | • | | |
| Receiver Type: T855- | | 15 | 17 | 13 | 10 | 12 | 14 | | |

| Frequency Range (MHz) | | 440-480 | | | | | | | |
|-----------------------|--|---------|----|----|----|----|----|----|--|
| IF Bandwidth (kHz) | | 7.5 | | 12 | | 15 | | 30 | |
| TCXO | $\pm 2.5\text{ppm}$ -30°C to $+60^{\circ}\text{C}$ | | | • | • | | | • | |
| | $\pm 2\text{ppm}$ -10°C to $+60^{\circ}\text{C}$ | • | | | | | | | |
| | $\pm 1\text{ppm}$ 0°C to $+60^{\circ}\text{C}$ | | • | | | | • | | |
| Receiver Type: T855- | | 25 | 27 | 23 | 20 | 22 | 24 | | |

| Frequency Range (MHz) | | 480-530 | | | | | | | |
|-----------------------|--|---------|----|----|----|----|---|--|--|
| IF Bandwidth (kHz) | | 7.5 | | 15 | | 30 | | | |
| TCXO | $\pm 2.5\text{ppm}$ -30°C to $+60^{\circ}\text{C}$ | | | • | | | • | | |
| | $\pm 2\text{ppm}$ -10°C to $+60^{\circ}\text{C}$ | • | | | | | | | |
| | $\pm 1\text{ppm}$ 0°C to $+60^{\circ}\text{C}$ | | • | | | • | | | |
| Receiver Type: T855- | | 35 | 37 | 30 | 32 | 34 | | | |