

# 1 T838/839 General Information

This section provides a brief description of the T838/839 PA, along with detailed specifications and a list of types available.

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## 1.1 Introduction

The T838 & T839 are FM base station power amplifiers designed for single or multichannel operation in the 148 to 174MHz frequency range. The typical output power capabilities are as follows:

T838 -	10 to 60W
T839 -	20 to 120W.

The T838 PA comprises a single broad band RF power module whose output is filtered before being fed to the output socket.

The T839 PA comprises two broad band RF power modules whose outputs are recombined (using a quadrature hybrid combiner) and filtered before being fed to the output socket. This dual module design enables the transmitter to produce at least one quarter of its rated power if one of the modules fails.

VSWR and thermal protection is incorporated into the basic design, while monitoring and alarm signals are available for both forward and reverse power. The output power is adjustable from the front panel.

The main PCB is mounted directly on a die-cast chassis/heatsink. Extensive use is made of the latest surface mount technology. Effective RF isolation between the PA control circuitry and RF stages is achieved by internal metal shields.

Forced air cooling for the heatsink is provided on the T839 by a fan, which is activated whenever the transmitter is keyed. Thermal sensors will also activate the fan automatically if the internal temperature reaches an unacceptable level.

The T838 has a width of 60mm and occupies a single space in a Tait rack frame, which has the ability to accommodate up to seven standard modules. The T839 has a width of 120mm and occupies a double space.

## 1.2 Specifications

### 1.2.1 Introduction

The performance figures given are minimum figures, unless otherwise indicated, for equipment operating at standard room temperature (+22°C to +28°C) and standard test voltage (13.8V DC).

Where applicable, the test methods used to obtain the following performance figures are those described in the ETS and Chinese GB/T 15938 specifications. Refer to Section 1.2.3 for details of test standards.

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

#### Power Output:

T838	- Rated Power	.. 50W
	- Range Of Adjustment	.. 10 to 60W (typical)
T839	- Rated Power	.. 100W
	- Range Of Adjustment	.. 20 to 120W (typical)

Input Power .. 600mW to 1W

#### Duty Cycle Rating:

T838	.. 50W continuous to +60°C
T839	.. 100W continuous to +60°C

Intermodulation (PA with output isolator) .. -70dBc or -40dBi<sup>1</sup> with 25dB isolation & interfering signal of -30dBc

#### Mismatch Capability:

Ruggedness	.. refer to your nearest Tait Dealer or Customer Service Organisation
Stability	.. 5:1 VSWR (all phase angles)

#### Supply Voltage:

Operating Voltage	.. 10.8 to 16V DC
Standard Test Voltage	.. 13.8V DC
Polarity	.. negative earth only
Polarity Protection	.. crowbar diode

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1. dBi denotes the level of the intermodulation product relative to the interfering signal.

## Supply Current:

Standby		.. 50mA
Transmit	- T838	.. 11A (9A typical @ 156MHz)
	- T839	.. 19A (15A typical @ 156MHz)

## Spurious Emissions:

Conducted	- Transmit	.. -36dBm to 1GHz -30dBm to 4GHz
	- Standby	.. -57dBm to 1GHz -47dBm to 4GHz
Radiated	- Transmit	.. -36dBm to 1GHz -30dBm to 4GHz
	- Standby	.. -57dBm to 1GHz -47dBm to 4GHz

Operating Temperature Range .. -30°C to +60°C

## Dimensions:

Height		.. 183mm
Width	- T838	.. 60mm
	- T839	.. 120mm
Length		.. 340mm

## Weight:

T838	.. 3.2kg
T839	.. 3.4kg

## 1.2.3 Test Standards

Where applicable, this equipment is tested in accordance with the following standards.

### 1.2.3.1 European Telecommunication Standard

#### ETS 300 086 January 1991

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment with an internal or external RF connector intended primarily for analogue speech.

#### ETS 300 113 March 1996

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment intended for the transmission of data (and speech) and having an antenna connector.

#### ETS 300 219 October 1993

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment transmitting signals to initiate a specific response in the receiver.

**ETS 300 279 February 1996**

Radio equipment and systems; electromagnetic compatibility (EMC) standard for private land mobile radio (PMR) and ancillary equipment (speech and/or non-speech).

**1.2.3.2 DTI CEPT Recommendation T/R-24-01****Annex I: 1988**

Technical characteristics and test conditions for radio equipment in the land mobile service intended primarily for analogue speech.

**Annex II: 1988**

Technical characteristics of radio equipment in the land mobile service with regard to quality and stability of transmission.

**1.2.3.3 Telecommunications Industry Association****ANSI/TIA/EIA-603-1992**

Land mobile FM or PM communications equipment measurement and performance standards.

**1.2.3.4 Chinese Radio Regulatory Commission****GB/T 15938 - 1995**

General specification for equipment of radio paging systems.

## 1.3 Product Codes

The three groups of digits in the T830 Series II product code provide information about the model, type and options fitted, according to the conventions described below.

The following explanation of T830 Series II product codes is not intended to suggest that any combination of features is necessarily available in any one product. Consult your nearest Tait Dealer or Customer Service Organisation for more information regarding the availability of specific models, types and options.

### Model

The Model group indicates the basic function of the product, as follows:

<u>T83X</u> -XX-XXXX	T837 exciter
	T838 50W power amplifier
	T839 100W power amplifier

### Type

The Type group uses two digits to indicate the basic RF configuration of the product.

The first digit in the Type group designates the frequency range:

T83X- <u>2</u> -XXXX	'2' for 148-174MHz
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The second digit in the Type group indicates the channel spacing and is not applicable to power amplifiers:

T83X- <u>0</u> -XXXX	'0' for all power amplifiers
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### Options

T83X-XX- <u>XXXX</u>	The Options group uses four digits and/or letters to indicate any options that may be fitted to the product. This includes standard options and special options for specific customers. '0000' indicates a standard Tait product with no options fitted. The large number of options precludes listing them here.
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## 1.4 Paging Product Range

The following table lists the range of T838 and T839 paging product types available at the time this manual was published. Consult your nearest Tait Dealer or Customer Service Organisation for more information.

Output Power (W)	50	100	
Frequency Range (MHz)	148-174	148-174	
PA Type: T838-	20-0000		
PA Type: T839-		20-0000	20-1020 <sup>a</sup>

a. Chinese market only.

You can identify the PA type by checking the product code printed on a label on the rear of the heatsink (Figure 1.1 in Part A shows typical labels). You can further verify the PA type by checking the placement of an SMD resistor in the table that is screen printed onto the PCB (refer to Section 5.1 for more details).