1 T837 General Information

This section provides a brief description of the T837 paging exciter, 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 T837 is a synthesised, microprocessor controlled, DFSK low speed paging exciter designed for single or multichannel[1] operation in the 148 to 174MHz frequency range[2]. With a standard power output of only 800mW, the exciter is designed for use with the T839 100W power amplifier. The RF section of the exciter comprises a frequency synthesiser which provides 170mW of frequency modulated RF drive to a two stage, wide band output amplifier. The synthesiser frequency is programmed via the serial communications port.

The low speed paging modulator section provides DFSK modulation. It incorporates a TCXO frequency reference and uses two point modulation to achieve modulation of data rates from 2400bps down to DC.

All components except those of the VCO 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 circuit board is obtained by removing each of the chassis lids. There is provision within the chassis to mount small option PCBs.

The front panel has two indicator LEDs to show when the transmit carrier is on (red) and when the DC supply is connected (green). The T837 is 60mm wide and occupies a single space in a Tait rack frame, which has the ability to accommodate up to seven standard modules.

1. Although you can program the microcontroller with up to 128 channels, you must carry out the modulation adjustment procedure if you change frequency (see Section 3.5).
2. Although capable of operating over the 148-174MHz frequency range, the T837 has an 8MHz VCO switching range (see Section 1.2.3 and Section 3.1).

1.2 Specifications

1.2.1 Introduction

The performance figures given are minimum figures, unless otherwise indicated, for equipment tuned with the maximum switching range and 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 EIA and ETS specifications. However, there are several parameters for which performance according to the Chinese specification GB/T 15938 is given. Refer to Section 1.2.6 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

Number Of Channels		.. 128 (standard)[1]
Supply Voltage:		
Operating Voltage		.. 10.8 to 16V DC
Standard Test Voltage		.. 13.8V DC
Polarity		.. negative earth only
Polarity Protection		.. crowbar diode
Line Keying Supply (if required)		.. -50V DC
Supply Current:		
Transmit		.. <650mA
Standby	- T837-2X-1020	.. <150mA
	- T837-2X-1021	.. <200mA
Operating Temperature Range		.. -30°C to +60°C
Dimensions:		
Height		.. 183mm
Width		.. 60mm
Length		.. 320mm
Weight		.. 2.1kg
Time-Out Timer (optional)		.. 0 to 5 minutes[2] adjustable in 10 second steps

1. Additional channels may be factory programmed. Contact your nearest Tait Dealer or Customer Service Organisation.
2. Adjustable from 0 to 10 minutes in PGM800Win version 2.12 and later.

Tail Timer	..	0 to 5 seconds adjustable in 100ms[1] steps
Transmit Key Time:		
T837-20-102X	..	<100ms
T837-26-102X	..	<30ms
Transmit Lockout Timer	..	0 to 1 minute adjustable in 10 second steps

1.2.3 RF Section

Frequency Range	..	148-174MHz
Modulation Type	..	DFSK
Frequency Increment:		
T837-20-102X	..	5 or 6.25kHz
T837-26-102X	..	2.5 or 3.125kHz
VCO Switching Range	..	8MHz
Load Impedance	..	50 ohms
Frequency Stability:		
T837-2X-1020	..	±1.0ppm, -20°C to +70°C ±2.0ppm, -30°C to +70°C
T837-2X-1021	..	±1.5ppm, -30°C to +70°C
External Reference Frequency (T837-2X-1021)	..	100kHz to 25.6MHz in 100kHz steps
External Reference Amplitude	..	0 to +10dBm into 50Ω
Adjacent Channel Power (4.5kHz deviation)	..	-75dBc (ETS) -70dBc (GB/T 15938)
Transmitter Side Band Noise: (no modulation, 15kHz bandwidth)		
At ±25kHz	..	-95dBc
At ±1MHz	..	-105dBc
Radiated Spurious Emissions:		
Transmit	..	-36dBm to 1GHz -30dBm to 4GHz
Standby	..	-57dBm to 1GHz -47dBm to 4GHz

1. Adjustable in 20ms steps in PGM800Win version 2.12 and later.

Power Output	.. 800mW ±200mW
Transmit Keying Noise	.. -70dBc (GB/T 15938)

1.2.4 Low Speed Paging Modulator

Accepted Protocols/Speeds:

T837-20-102X	.. POCSAG 512/1200 and FLEX 1600
T837-26-102X	.. POCSAG 512/1200/2400 and FLEX 1600
Input Data Levels	.. TTL

Data Rise Time (10% - 90%):

T837-20-102X	.. <150µs (GB/T 15938)
T837-26-102X	.. <115µs

1.2.5 Microcontroller

Auxiliary Ports:

Open Drain Type	.. capable of sinking 2.25mA via 2k2Ω
V_{ds} max.	.. 5V

1.2.6 Test Standards

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

1.2.6.1 European Telecommunication Standard

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.

1.2.6.2 Telecommunications Industry Association

ANSI/TIA/EIA-603-1992

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

1.2.6.3 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:

T83X-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-**X**X-XXXX '2' for 148-174MHz

The second digit in the Type group indicates the channel spacing:

T83X-X**X**-XXXX
'0' for wide bandwidth (25kHz) - standard
'6' for wide bandwidth (25kHz) - USA

Options

T83X-XX-**XXXX** 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.

1.4 T837 Paging Product Range

The following table lists the range of T837 paging product types available at the time this manual was published. Consult your nearest Tait Dealer or Customer Service Organisation for more information.

Frequency Range (MHz)		148-174			
Deviation (kHz)		5			
Baud Rate (bps)		1200	1200	2400	2400
Frequency Increments (kHz)		5/6.25	5/6.25	2.5/3.125	2.5/3.125
TCXO	±1.0ppm -20°C to +70°C ±2.0ppm -30°C to +70°C	•		•	
	±1.5ppm -20°C to +70°C		•		•
Exciter Type: T837-		20-1020	20-1021	26-1020	26-1021

You can identify the exciter type by checking the product code printed on a label on the rear of the chassis (Figure 1.1 in Part A shows typical labels). You can further verify the exciter type by checking the placement of an SMD resistor in the table that is screen printed onto the PCB (refer to Section 6.1 for more details).

