1.0   INTRODUCTION

This report contains all the required data for certification of Thomcast's model SDA1250C frequency agile digital transmitter system. The data presented was taken from tests performed on a production transmitter system tuned to operate on ITFS channel C-4 (2584-2590 MHz) designed to transmit any one of 31 ITFS/MMDS television channels, in the MDS and ITFS bands. Other information required for Certification, such as circuit diagrams and descriptions, photographs, tune-up and maintenance procedures, and the technical manual are attached.

2.0   TEST EQUIPMENT
FCC Section 2.947 (d)

The following is a list of major test equipment, which was used in testing the transmitter for this report:

1.	Spectrum Analyzer	HP Model 8564E & 8593E
2.	Power Meter	HP Model 436A
3.	Frequency Counter	HP Model 5350B
4.	Digital Multimeter	Fluke Model 87
5.	Vector Signal Analyzer	HP 89441A
6.	Digital Transmission Analyzer	HP 3784A

3.0   MEASUREMENTS
FCC Section 2.1033 (c)(14)

➤ RF POWER OUTPUT
FCC Section 2.1046 (a) (c)

Output Power:

12.5 watts average QAM modulation; 10 watts average QAM modulation with three equally spaced 2 MHz carriers

Method of Measurement:

Per FCC 2.1046 (b)

The transmitter was operated into a dummy load of substantially zero reactance with a resistance equal to the transmission line characteristic impedance. Average power was directly measured using an HP 436A microwave power meter. The transmitter's % power meter was found to be within 2% of the indications provided by the external average power meter with output variations of 80% to 110% of the transmitter's rated output.

Output Power Calibration

See technical manual, document #
DOC16-0057

➤ MODULATION CHARACTERISTICS
FCC Section 2.1047

The digital modulation format is Quadrature Amplitude Modulation with a 64 or 256 point signal constellation (64 QAM and 256 QAM) with the QAM symbol rate and occupied bandwidth optimized for a 6 MHz channel plan. Forward Error Correction (FEC) uses a concatenated coding approach that produces high coding gain at moderate complexity and overhead. The system FEC is optimized for quasi-error free operation at a threshold output error event rate of one error per 15 minutes.
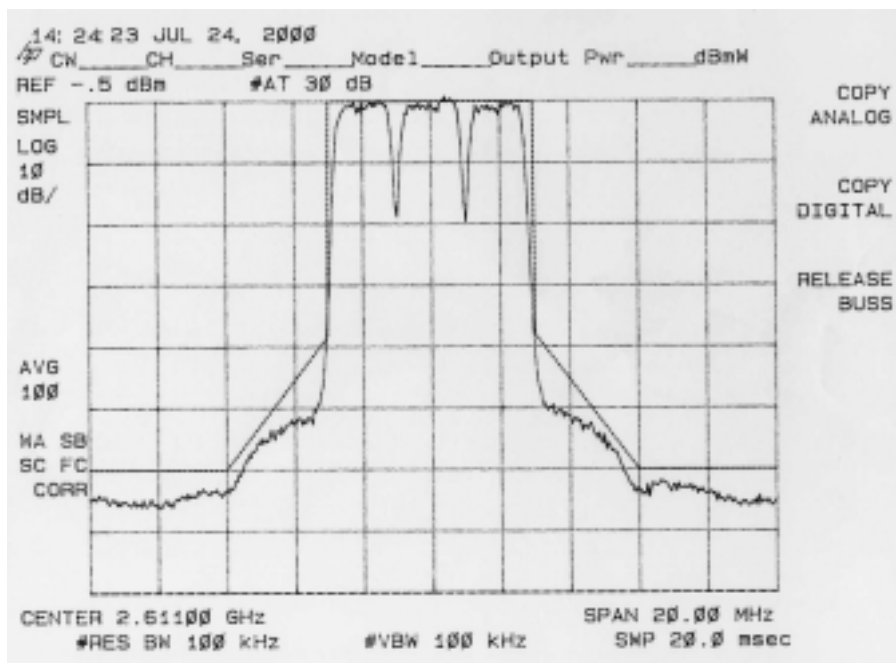
To achieve the appropriate level of error protection required for transmission of digital data, an FEC based on Reed-Solomon coding is used. Protection against burst errors is achieved by use of byte interleaving.
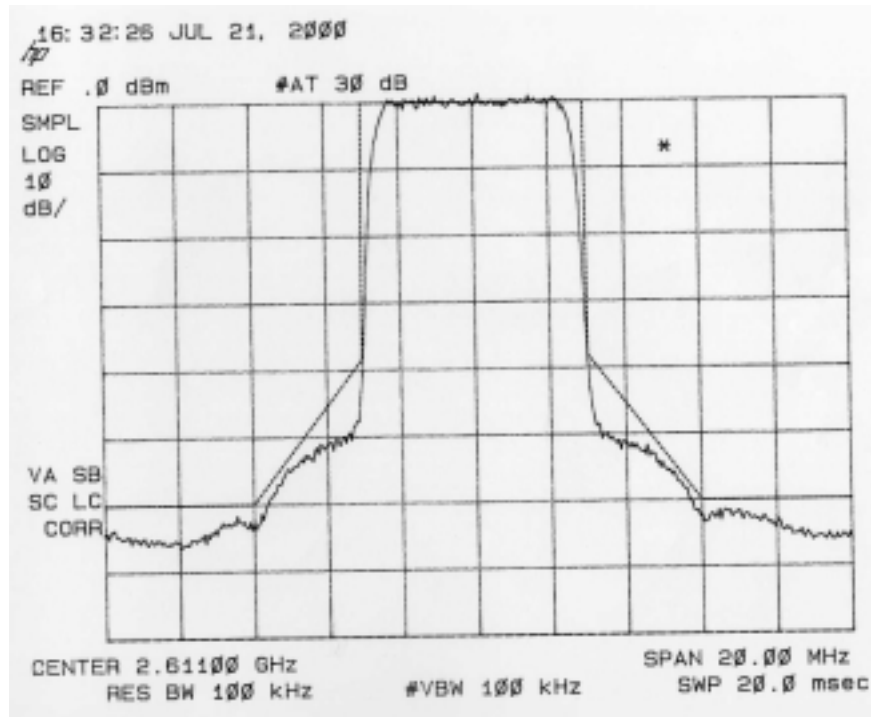
PLOT 1: Occupied bandwidth of the 64 QAM transmitter.
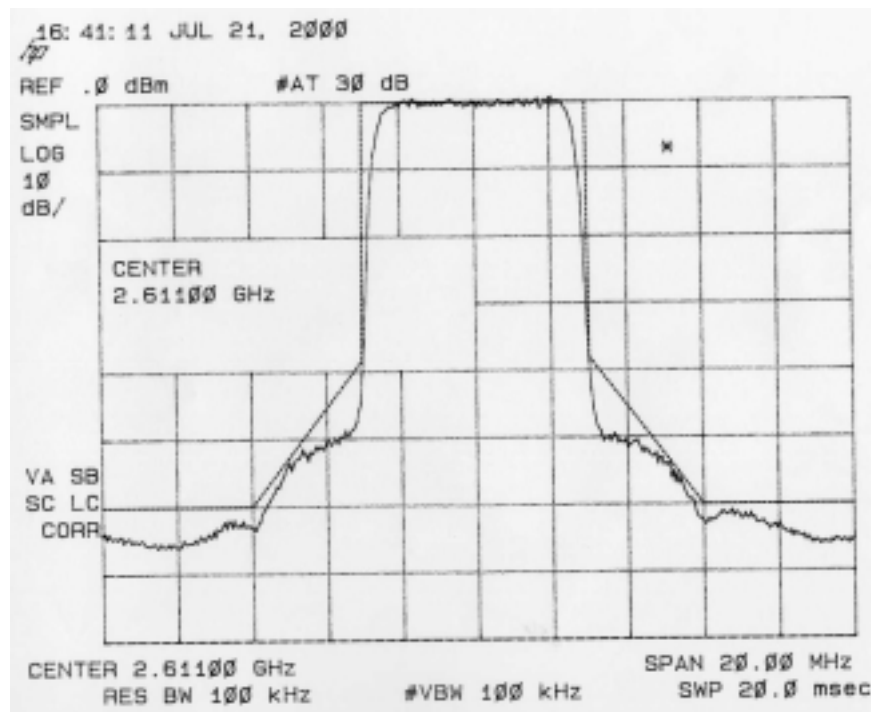
PLOT 2: Occupied bandwidth of the 256 QAM transmitter.

PLOT 3: Occupied bandwidth of the QAM modulation with three equally spaced 2MHz carriers[1].

❖ <u>SPURIOUS EMISSIONS AT ANTENNA TERMINALS</u>
FCC Section 2.1051/2.1057/21.908 (b)/74.936

Average Output Power:	12.5 watts average QAM modulation; 10 watts average QAM modulation with three equally spaced 2 MHz carriers
Type Modulation:	64/256 QAM
Spectrum Analyzer Setting:	The Spectrum Analyzer setting used in conducting the spurious emissions test at the equipment output terminals was as follows

Frequency Span:	2 MHz per Division
Center Frequency:	Adjusted continuously for 10 MHz to 27 GHz
Resolution Bandwidth:	100 KHz
Video Filter:	Out
Input Attenuator Setting:	Input level was set for a full-scale calibration of the average digital power. All other frequencies were referenced to this point.
Spurious Emissions:	See chart

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[1] Test was performed using a spectral shaping assembly and a channel combiner. The agile is routed to the correct filtering system by the spectral shaping assembly.