

**Sundance Multiprocessor Technology Limited**  
**SMT399- F Clock Distribution**  
**Module User Manual**

Form : QCF42  
Date : 6 July 2006

<b>Unit / Module Description:</b>	
<b>Unit / Module Number:</b>	SMT399- F
<b>Document Issue Number:</b>	1.1
<b>Issue Date:</b>	6/9/2006
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# **SMT399- F Clock Distribution Module User Manual**

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Certificate Number FM 55022

# Revision History

Issue	Changes Made	Date	Initials
1.0	First draft	12/7/06	GKP
1.1	Added phase diagram	6/9/06	GKP

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## 1 Introduction

The SMT399- F is a single width TIM designed to distribute a clock signal to four devices.

It can produce a local clock using an OCXO, or receive an external clock on an MMBX or MMCX style connector.

The clock signal is split into 4 via a power splitter.

## 2 Related Documents

[TIM- 40 Specification.](#)

[OCXO Datasheet](#)

[PSC Datasheet](#)

## 3 Acronyms and Abbreviations

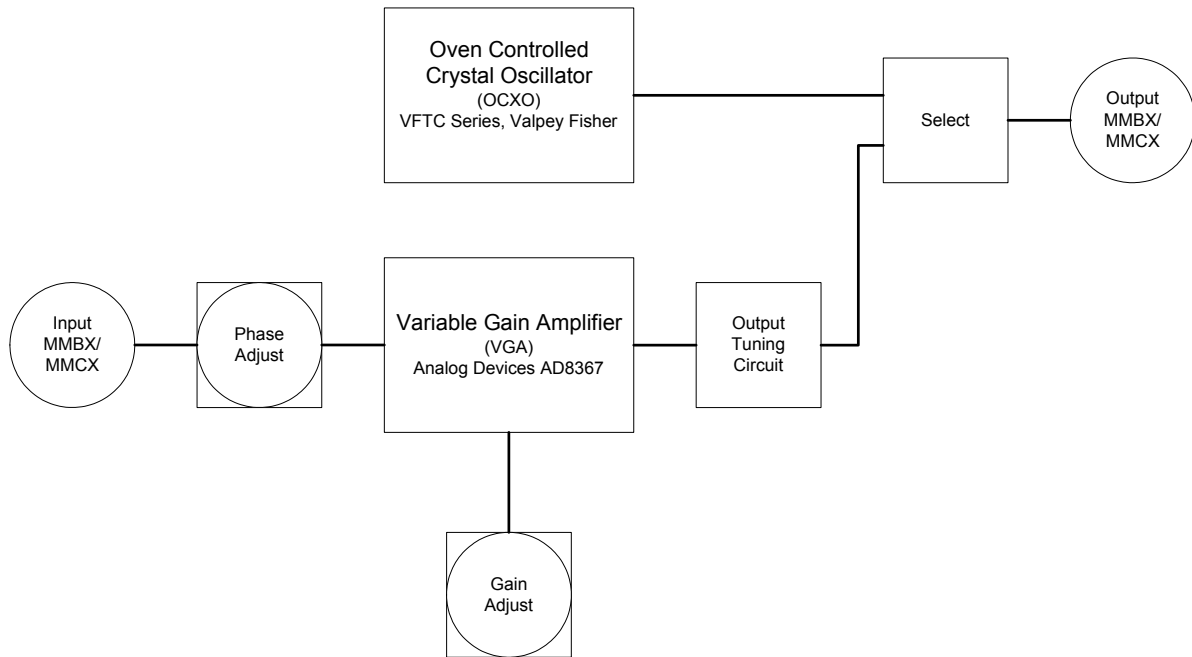
OCXO	Oven controlled Crystal Oscillator
TIM	Texas Instruments Module
LED	Light Emitting Diode

## 4 Functional Description

The output of the OCXO is a +7dBm sinewave. This is split via a 4-way power splitter and feeds the four outputs.

A minimum input voltage of 0.4Vp-p is required if the external clock is to be used.

### 4.1 Block Diagram



## 4.2 Module Options

Although the module is fully assembled, there are several surface mount selector pads that are user adjustable.

The selector pads are labelled S1 thru S9, and consist of 3 pads in an 'L' shape. The pad spacing allows for surface mount 0805 packaged devices to be fitted; typically zero- Ohm resistors.

The following table details all of the selector pad functions;

Selector	Position	Function
S1	1	Enable VGA. Leaves OCXO powered down.
	2	Enable OCXO. Leaves VGA powered down.
S2	1	Enable J1 output, MMBX.
	2	Enable J2 output, MMCX.
S3	1	Enable J3 output, MMBX.
	2	Enable J4 output, MMCX.
S4	1	VFTCR thru- hole OCXO. Factory fitted, do not alter.
	2	VFTCS surface mount OCXO. Factory fitted, do not alter.
S5	1	Enable OCXO. Can fit capacitor for AC coupling.
	2	Enable VGA.
S6	1	Enable J5 output, MMBX.
	2	Enable J6 output, MMCX.
S7	1	Enable J7 output, MMBX.
	2	Enable J8 output, MMCX.
S8	1	Enable J9 clock input, MMCX.
	2	Enable J10 clock input, MMBX.
S9	1	Routes VGA output to J11, SMA. Used for output LC filter adjustment.
	2	Normal operation.

### 4.3 Module Adjustments

Several trimmer capacitors and multi-turn potentiometers are provided. The following table describes their use;

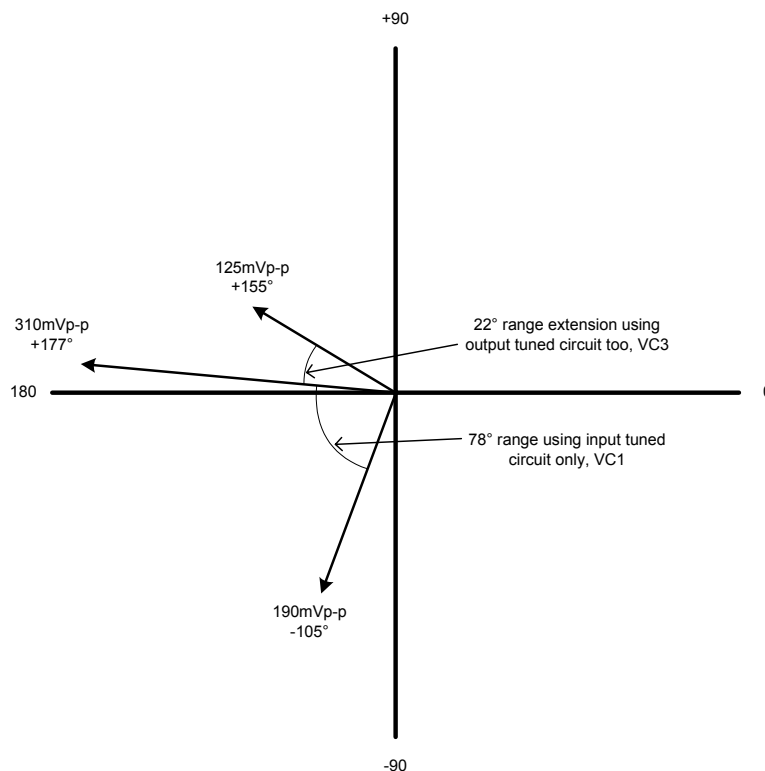
Adjustment	Function
VC1	Phase adjust COARSE.
VC2	Phase adjust FINE.
VC3	Output tuning COARSE.
VC4	Output tuning FINE.
R13	VGA gain adjust.
R4	OCCO frequency trim.

#### 4.3.1 Phase Adjustment

When using an external clock input, the phase relationship between the input and output can be adjusted. This is implemented using the LC tuned circuit consisting of L1 and VC1&2.

Set VC1 and VC2 to their centre positions. Whilst monitoring the input and an output on an oscilloscope, adjust VC1 for the correct phase delay. VC2 may be used to make fine adjustments.

The diagram below shows a typical input-output phase relationship.



**SMT399-F**  
**Input to Output phase delay.**  
**Input: 100MHz, +7dBm**

#### 4.4 Module Component Selection

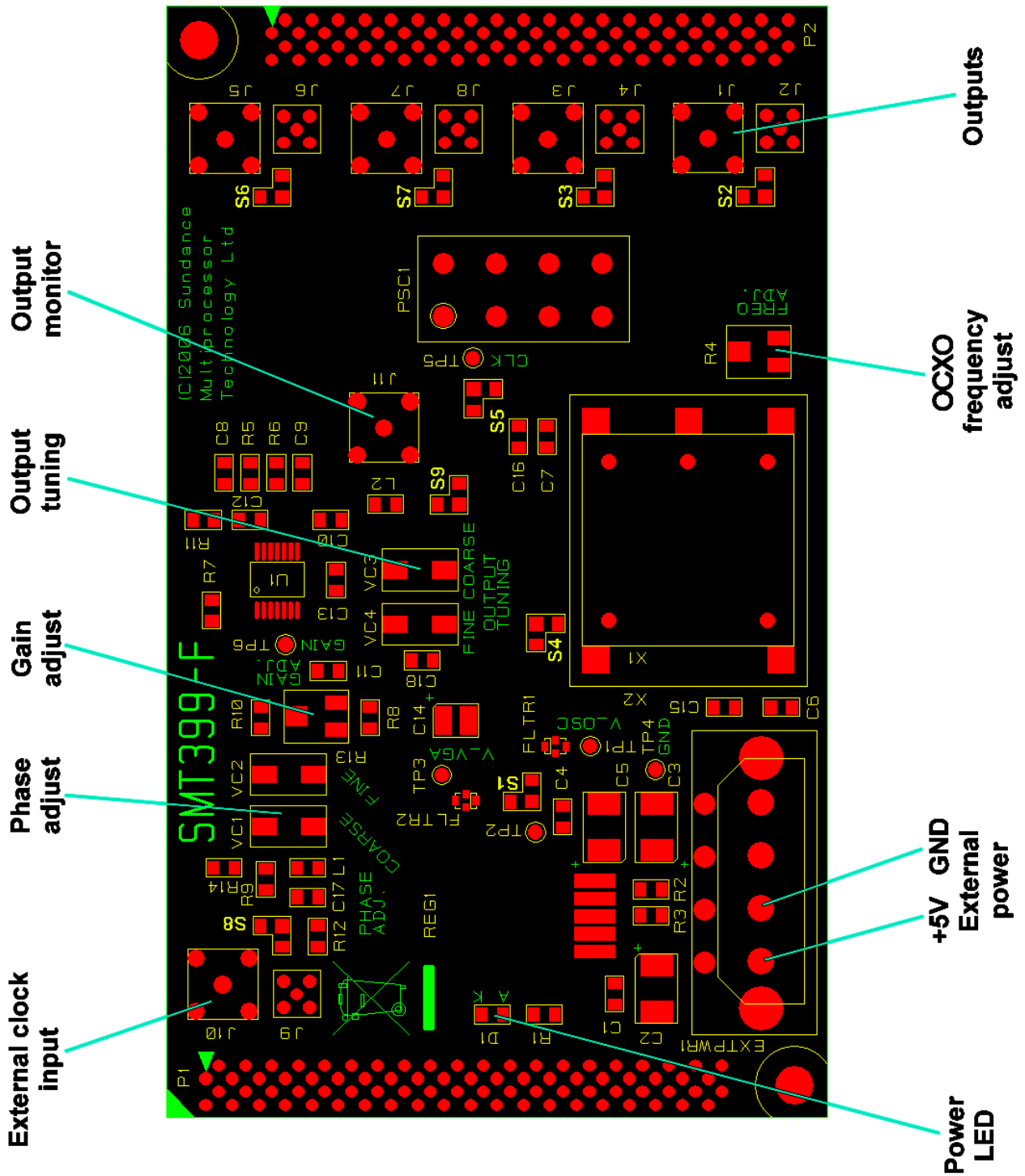
Some component values may be replaced if different operating frequencies are required. The following table lists these components;

Component	Function
L1	Input phase adjustment. 100nH fitted for frequencies of 100MHz.
L2	Output tuning. 100nH fitted for frequencies of 100MHz.

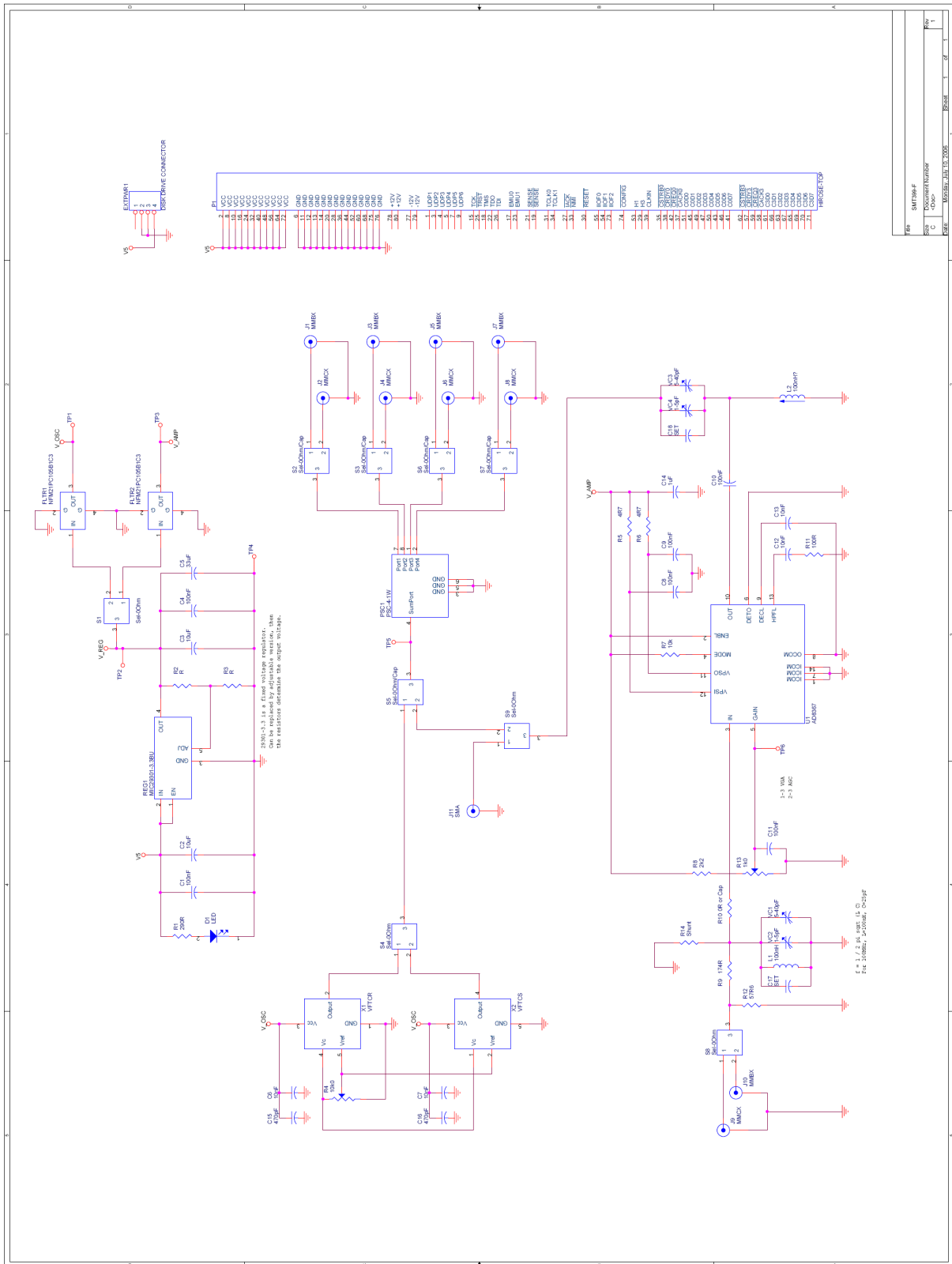


# 5 Footprint

## 5.1 Top View



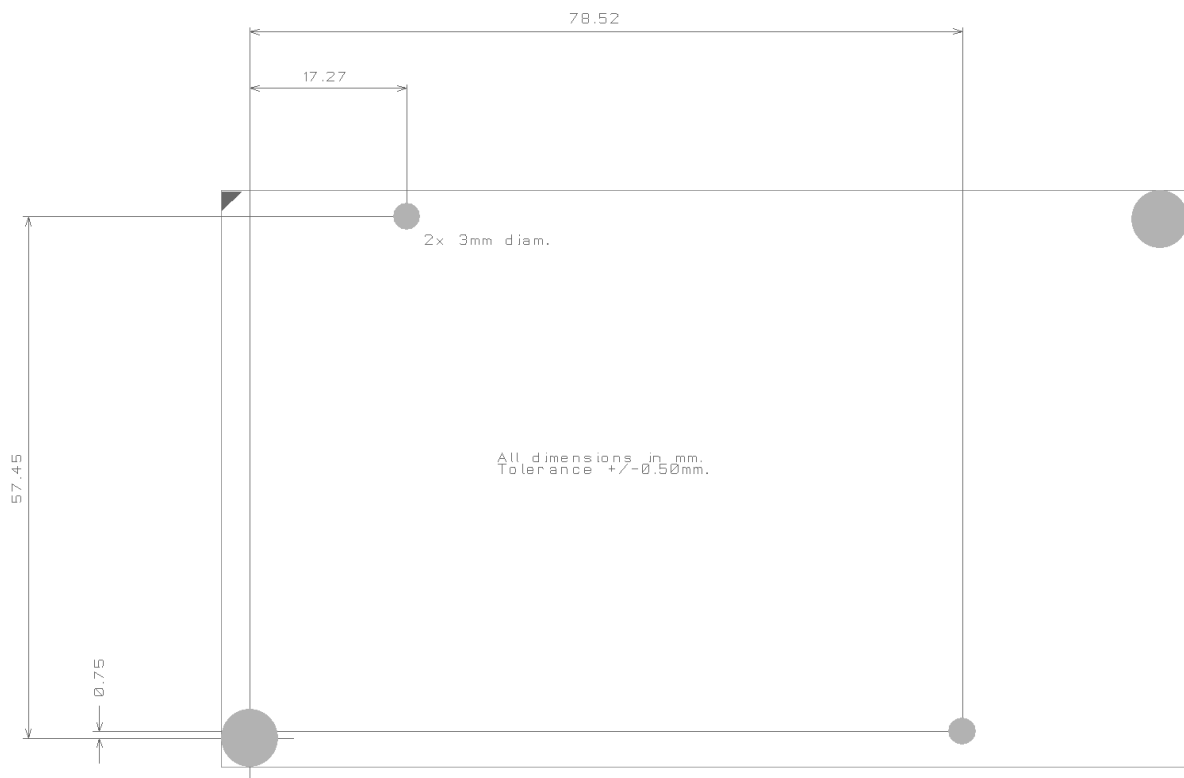
# 6 Circuit Diagram



Rev	SMT399-F
Doc	Document Number
Size	0
Part	0
Print	1
Date	2018/08/10 10:00

## 7 Physical Properties

Dimensions	4.2" x 2.5"
Weight	
Supply Current	+5V @ 1.1A
MTBF	



## 8 Safety

This module presents no hazard to the user when in normal use.

## 9 EMC

This module is designed to operate from within an enclosed host system, which is built to provide EMC shielding. Operation within the EU EMC guidelines is not guaranteed unless it is installed within an adequate host system.

This module is protected from damage by fast voltage transients originating from outside the host system which may be introduced through the output cables.

Short circuiting any output to ground does not cause the host system to lock up or reboot.