

FEATURES:

- ♦ All Digital Phase Locked Frequency Control
- ♦ Meets Telecordia GR-1244-CORE Stratum 3 Requirements
- ♦ Low Jitter Voltage Controlled Oven Controlled Crystal Oscillator (OCXO) Incorporated
- ♦ Advanced Customizable DSP filtering
- ♦ Adjustable Loop Bandwidth and Damping Factor
- ♦ Advanced Reference Phase Alignment Algorithms
- ♦ Holdover and Free Run Functions
- ♦ Advanced Frequency Based Reference Qualification Algorithms
- ♦ Customizable State Transition Configurations
- ♦ 2" x 2" 18 Pin Package
- ♦ Hitless Switching Between References
- ♦ Dual 8KHz Selectable Reference Inputs

GENERAL DESCRIPTION

The CTM 5100A is manufactured in Champion's ISO 9001 Certified facility located in Franklin Park, Illinois. The CTM 5100A is a Stratum III Synchronization Module that meets Telecordia GR-1244-CORE Stratum 3 requirements. The unit comes with a variety of features that are customizable to customer specific unique applications. A variety of outputs for T1, E1, OC and STM applications are available.

Features include DSP based filtering with customizable loop bandwidth and damping factor, customizable state transition configurations including manual, automatic, revertive and non-revertive; advanced frequency based reference qualification algorithms; superior phase transient performance on any re-arrangement including reference switching, holdover entry/exit; excellent reference pull-in performance; hitless switching and more. The CTM 5100A has excellent holdover performance where it will maintain a ± 0.37 ppm frequency stability over 24 hours. A tuning limit alarm is also available for notification of possible reference problems. The CTM 5100A is available in a 2"x2" 18 pin package. Power consumption is typically less than 750mW at 25°C.

Champion's Engineering Staff can also modify or customize the CTM 5100A for your applications for many features, including a multitude of output frequencies, state machine configurations, loop damping and bandwidth requirements.

PART NUMBERING GUIDE

CTM5100A - Specify Frequency (16.384MHz, 19.440MHz)
CONTACT FACTORY FOR PART NUMBERING OPTIONS

Table 1: Absolute Maximum Ratings

Symbol	Parameter	Minimum	Maximum	Units
V_{CC}	Power Supply Voltage	0.0	+5.5	Volts
V_i	Input Voltage	-0.5	+5.5	Volts
T_S	Storage Temperature	-65	135	$^{\circ}C$

Table 2: Electrical Specifications

Parameter	Specification
Voltage	5V $\pm$ 10%
Current	Typically < 150 mA @ 25 $^{\circ}C$
Oscillator Output Frequencies	16.384MHz, 19.440MHz
Temperature Range	0 $^{\circ}C$ to 70 $^{\circ}C$
Input Reference Frequencies	8KHz
Input Jitter Tolerance	< $\pm$ 40Hz @ 10Hz
Acquisition Time	10 sec
Capture/Pull In Range	$\pm$ 9.2 ppm
Input Logic Type	5.0V CMOS
Output Logic Type	CMOS
Output Duty Cycle	40%/60% @ 50% Level
Output Rise and Fall Times	<10 ns (20% - 80%)
Output Load	30 pF
Alarms	Tuning Limit and LOR
Free Run Accuracy	$\pm$ 4.6 ppm
Jitter @ 19.440MHz	TBD

Table 3: Input and Output Characteristics

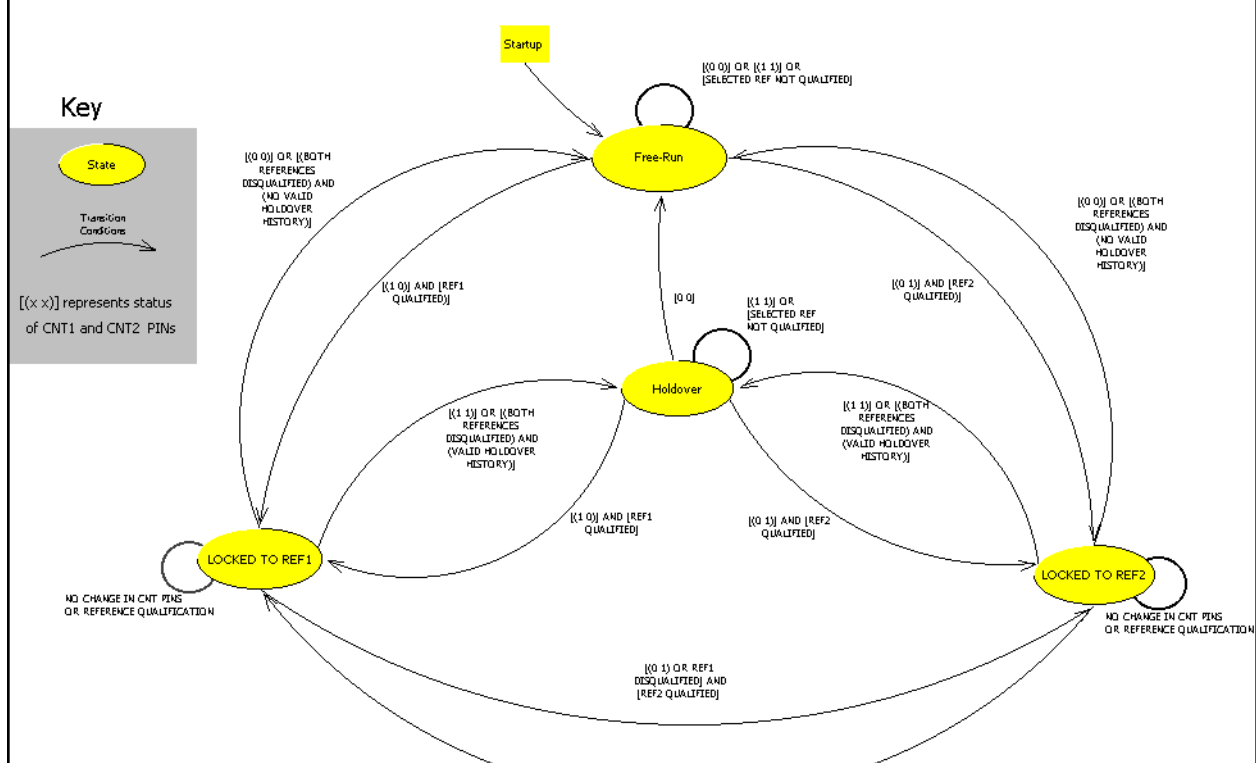
Symbol	Parameter	Minimum	Maximum	Units
V_{IH}	High Level Input Voltage	2.0	5.5	Volts
V_{IL}	Low Level Input Voltage	-0.5	0.8	Volts
T_{IO}	I/O to Output Valid		10	nS
C_O	Output Capacitance		10	pF
V_{HO}	High Level Output Voltage	2.4		Volts
V_{IO}	Low Level Output Voltage		0.4	Volts
T_{IR}	Input Signal Pulse Width	30		nS

Table 4: Truth Table for MANUAL OPTION

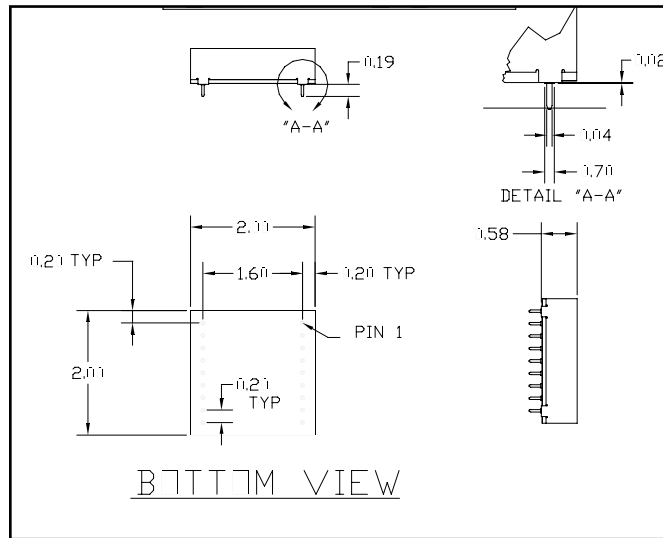
Control Input		Operating Mode		REF 1	REF 2	HOLD OVER	FREE RUN	TLIM ALARM	ALARM OUT
A	B	(SYNC_OUT)	Condition						
0	0	Free Run	Default	0	0	0	1	0	1
1	0	External Reference #1	Normal	1	0	0	0	0	0
			Tune Limit	1	0	0	0	1	1
			LOS/LOL	1	0	0	0	0	1
0	1	External Reference #2	Normal	0	1	0	0	0	0
			Tune Limit	0	1	0	0	1	1
			LOS/LOL	0	1	0	0	0	1
1	1	Holdover		0	0	1	0	0	1

CTM5100A HIGHLIGHTS

CTM5100A Automatic with Manual Override Mode State Transition Diagram



Synchronized Stratum III Timing Module



PIN	Function	PIN	Function
1	HOLDOVER	10	GND
2	REF 1	11	SYNC_OUT
3	REF 2	12	GND
4	FREE RUN	13	F_OUT
5	GND	14	GND
6	ALARM OUT	15	EXT REF 2
7	CNTL A	16	GND
8	CNTL B	17	EXT REF 1
9	TLIM ALARM	18	+5V DC

MECHANICAL AND ENVIRONMENTAL SPECIFICATIONS

TEST METHODS	REFERENCE PROCEDURES	DESCRIPTION
Temperature Cycle	MIL-STD-883, Mtd 1010, Cond. B	-55°C to +125°C; Air-to-Air; 100 cycles; 10 min. dwell
Mechanical Shock	MIL-STD-202, Mtd 213, Cond. D	500 g's
Vibration	MIL-STD 202, Mtd 204, Cond. B	10-2000 Hz; 0.06 inch; 15g; 3 planes
Humidity Steady State	MIL-STD-202, Mtd 103	40°C; 90%-95% R.H.; 56 days
Thermal Shock	MIL-STD-883, Mtd 1011.7 Cond. A	100°C to 0°C; Water-to-Water; 15 cycles
Electrostatic Discharge	MIL-STD-883, Mtd 3015 Class II	2 KV to 4 KV Threshold
Solderability	MIL-STD-883, Mtd 2022.2	Solder dip; Meniscograph Criteria
Hermeticity	MIL-STD-883, Mtd 1014.8, Cond. A1	Mass spectro. 2 x 10 ⁻⁸ atmos. CC/sec He
Resistance to Soldering	MIL-STD-202, Mtd 210A, Cond. C	260°C; 10 seconds: 1 inch/sec.
Lead Integrity	MIL-STD-883, Mtd 2004.5, Cond. A, B1	Lead tension & bend stress
Marking Permanence	MIL-STD-883, Mtd 2015.8	Resistance to solvents
Life Test	MIL-STD-883, Mtd 1005.6	125°C, powered, 1000 hours minimum