FEATURES:

- All Digital Phase Locked Frequency Control
- Low Jitter Voltage Controlled Oscillator Incorporated
- +5.0 Volt Power Supply
- Alarm Outputs
- Forced Free Run and Holdover Functions
- Automatic Free Run upon LOR Alarm Condition
- Dual 8KHz Selectable Reference Inputs (External Control
  - 2” x 2” 18 Pin Package
- Hit-less Switching Between References
- Output Frequency 20.480MHz

  Applications
  - Stratum III Precision Clocks
  - Solves Long Holdover Needs

GENERAL DESCRIPTION

The CTM 5100R is manufactured in Champion's ISO 9001 Certified facility located in Franklin Park, Illinois. The CTM5100R is a Stratum III Timing Module that can lock to one of two 8KHz reference input frequencies.
Further features include alarms for Loss-Of-Reference (LOR), or Loss-Of-Lock (LOL) conditions. Upon LOR the CTM5100R can be entered into a holdover state that 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 CTM5100R is available in a 2"x2" 18 pin package. Power consumption is typically less than 750mW at 25^{O}C.

Champion's Engineering Staff can also modify or customize the CTM5100R for your applications for optional output frequencies and bandwidth requirements.

PART NUMBERING GUIDE
CTM5100R - 20.480MHz

2553 N. Edgington Street, Franklin Park, IL 60131 • Phone: 847.451.1000 • Fax: 847.451.7585

800-888-1499 or www.champtech.com

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	^oC

Table 2: Electrical Specifications

Parameter	Specification
Voltage	5V ±10%
Current	Typically < 150 mA @ 25^{o}C; <275mA over all Conditions
Oscillator Output Frequencies	20.480MHz
Temperature Range	-40^{o}C to 85^{o}C
Input Reference Frequencies	8KHz
Input Jitter Tolerance	< 245ns @ 10Hz
Acquisition Time	10 sec
Capture/Pull In Range	±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	±4.6 ppm
Jitter @ 20.480MHz	< 9ps RMS

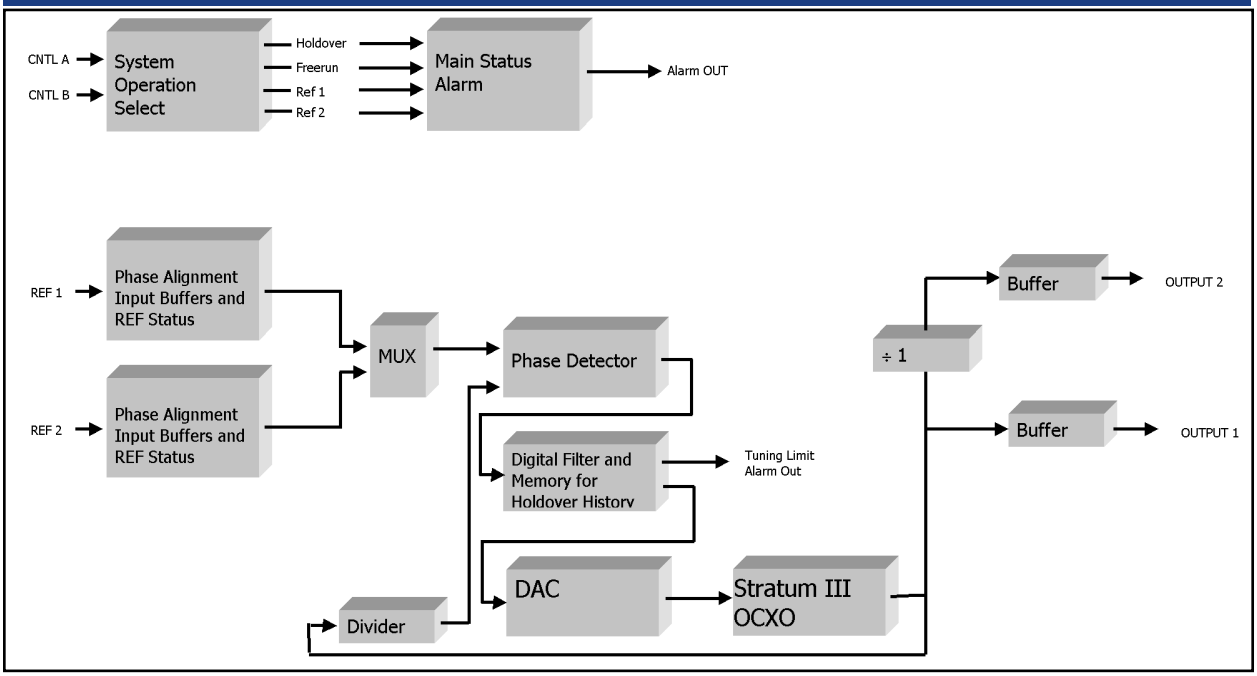
Table 3: Input and Output Characteristics

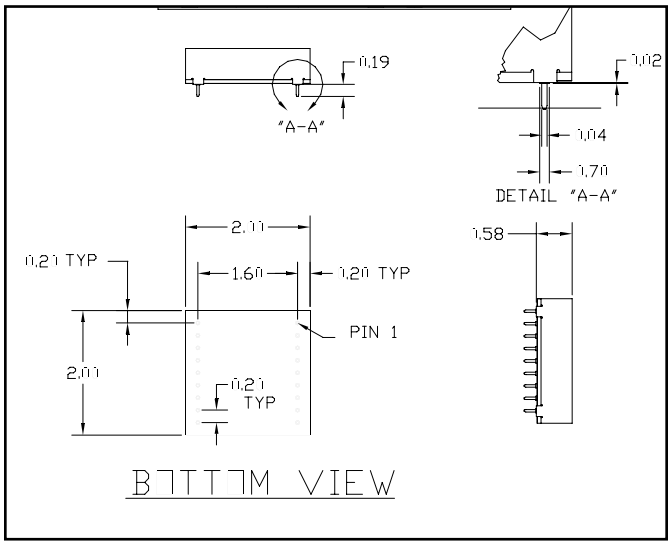
Symbol	Parameter	Minimum	Maximum	Units
V_{IH}	HIgh Level Input Voltage	2.0	5.5	Volts
V_{IL}	Low Level Input Voltage	-0.5	0.8	Volts
T_{IO}	I/O to Output Valid		10	nS
C_O	Output Capacitance		10	pF
V_{HO}	High Level Output Voltage	2.4		Volts
V_{IO}	Low Level Output Voltage		0.4	Volts
T_{IR}	Input Signal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

Table 4: Truth Table

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	0
			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	0
			LOS/LOL	0	1	0	0	0	1
1	1	Holdover		0	0	1	0	0	1

Block Diagram of the CTM5100R





PIN	Function	PIN	Function
1	HOLDOVER	10	GND
2	REF 1	11	OUTPUT 2
3	REF 2	12	GND
4	FREE RUN	13	OUTPUT 1
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-833, 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