RHIC
197MHz BUCKET COUNTER

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Rev. 1

1.0 OVERVIEW

The purpose of the 197MHz bucket counter is to provide information to the DSP for phase alignment of the yellow and blue RHIC collider rings.The board is an 2 in.by 5 in. VSB/VME mother board plug in.

The 197MHz Rf signal (0dBm) is used to clock a synchronous 12-bit counter at 197MHz. The counter is started by the RHIC Blue ring REV TICK signal, and stopped by the RHIC Yellow ring REV TICK signal. The value in the counter represents the number of 197MHz cycles the blue and yellow ring are offset. This value is then read as an unsigned 32-bit word via the VSB/VME mother board.

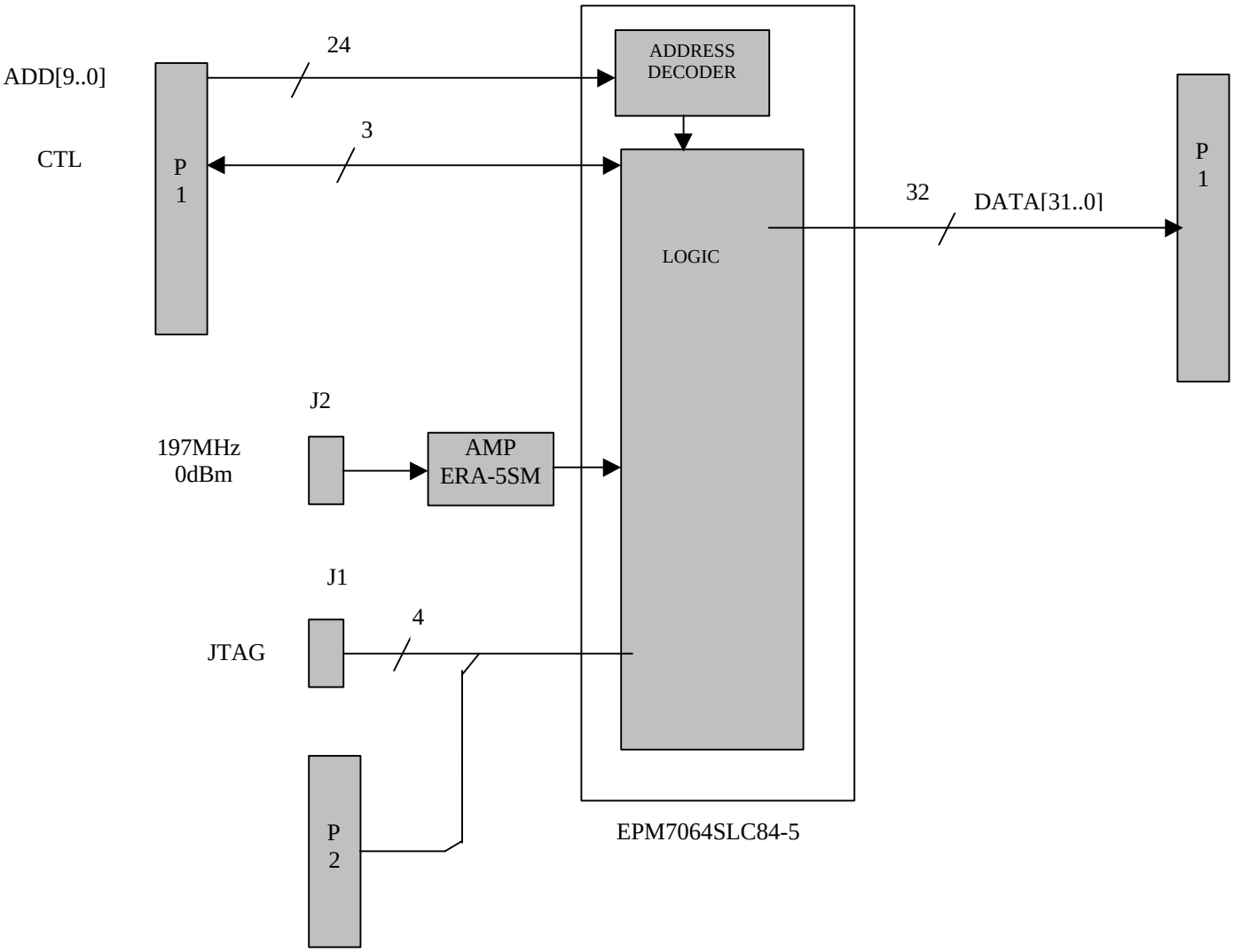
2.0 BOARD MEMORY MAP

Table 1 defines the on-board addressing of the RHIC 197MHz Bucket Counter.

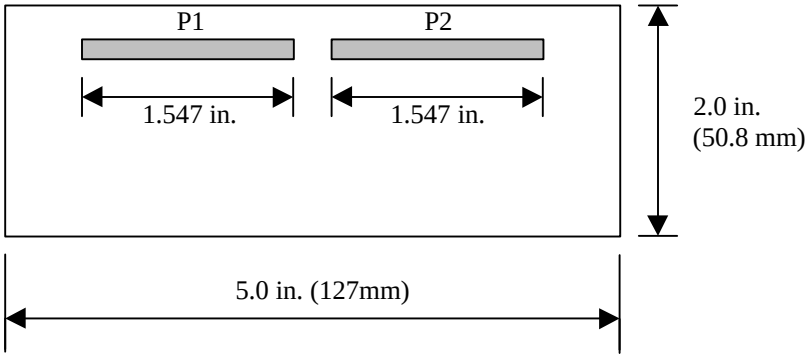
PARAMETER	ADDRESS RANGE
READ DATA	Mother board base + 0x100
WRITE DATA	N/A

Table 1

3.0 BLOCK DIAGRAM (RHIC 197MHz BUCKET COUNTER)



4.0 MECHANICAL OUTLINE



5.0 INTERCONNECTIONS

This module will plug into the VSB mother board via two 69 pin connectors (P1,P2). An on board JTAG header (J1) has been included for independent development. System JTAG will be performed by a single JTAG port on the front panel of the VSB mother board in which this module plugs into. The JTAG lines will connected to the mother board via the P2 connector.

CONNECTOR	PIN NUMBER	SIGNAL NAME	CHARACTERISTICS
P1	1	A0	TTL
P1	2	D0	TTL
P1	3	A1	TTL
P1	4	D1	TTL
P1	5	A2	TTL
P1	6	D2	TTL
P1	7	A3	TTL
P1	8	D3	TTL
P1	9	A4	TTL
P1	10	D4	TTL
P1	11	A5	TTL
P1	12	D5	TTL
P1	13	A6	TTL
P1	14	D6	TTL
P1	15	A7	TTL
P1	16	D7	TTL
P1	17	A8	TTL
P1	18	D8	TTL
P1	19	A9	TTL
P1	20	D9	TTL
P1	21	A10	TTL
P1	22	D10	TTL
P1	23	A11	TTL
P1	24	D11	TTL
P1	25	A12	TTL
P1	26	D12	TTL

P1	27	A13	TTL
P1	28	D13	TTL
P1	29	A14	TTL
P1	30	D14	TTL
P1	31	A15	TTL
P1	32	D15	TTL
P1	33	A16	TTL
P1	34	D16	TTL
P1	35	A17	TTL
P1	36	D17	TTL
P1	37	A18	TTL
P1	38	D18	TTL
P1	39	A19	TTL
P1	40	D19	TTL
P1	41	A20	TTL
P1	42	D20	TTL
P1	43	A21	TTL
P1	44	D21	TTL
P1	45	A22	TTL
P1	46	D22	TTL
P1	47	A23	TTL
P1	48	D23	TTL
P1	49	GND	TTL
P1	50	D24	TTL
P1	51	CHIPSEL~	TTL
P1	52	D25	TTL
P1	53	GND	GND
P1	54	D26	TTL
P1	55	R/W~	TTL
P1	56	D27	TTL
P1	57	GND	GND
P1	58	D28	TTL
P1	59	DSTB~	TTL
P1	60	D29	TTL
P1	61	GND	GND
P1	62	D30	TTL
P1	63	ACK~	TTL
P1	64	D31	TTL
P1	65	DATA +	RS485
P1	66	GND	GND
P1	67	EXT CLK	TTL
P1	68	DATA -	RS485
P1	69	GND	GND
P2	1	GND	GND
P2	2	IRQ~	TTL
P2	3	NC	N/A
P2	4	GND	GND
P2	5	GND	GND
P2	6	+12VDC	+12VDC
P2	7	-12VDC	-12VDC

P2	8	GND	GND
P2	9	GND	GND
P2	10	+5VDC	+5VDC
P2	11	+5VDC	+5VDC
P2	12	+5VDC	+5VDC
P2	13	+5VDC	+5VDC
P2	14	NC	TTL
P2	15	NC6	TTL
P2	16	NIM_DATA+	RS485
P2	17	NIM_DATA-	RS485
P2	18	SPARE I/O 1	N/A
P2	19	SPARE I/O 2	N/A
P2	20	SPARE I/O 3	N/A
P2	21	SPARE I/O 4	N/A
P2	22	A0	N/A
P2	23	A1	N/A
P2	24	A2	N/A
P2	25	A3	N/A
P2	26	A4	N/A
P2	27	A5	N/A
P2	28	A6	N/A
P2	29	A7	N/A
P2	30	A8	N/A
P2	31	TCK	TTL
P2	32	GND	GND
P2	33	TDO	TTL
P2	34	+5V	+5V
P2	35	TMS	TTL
P2	36	N/C	N/A
P2	37	N/C	N/A
P2	38	N/C	N/A
P2	39	TDI	TTL
P2	40	GND	GND
P2	41	A9	N/A
P2	42	NU	TTL
P2	43	NU	TTL
P2	44	GND	GND
P2	45	+5V	+5V
P2	46	NU	TTL
P2	47	GND	GND
P2	48	B0	N/A
P2	49	B1	N/A
P2	50	B2	N/A
P2	51	B3	N/A
P2	52	B4	N/A
P2	53	B5	N/A
P2	54	B6	N/A
P2	55	B7	N/A
P2	56	B8	N/A
P2	57	B9	N/A
P2	58	B10	N/A

P2	59	B11	N/A
P2	60	B12	N/A
P2	61	B13	N/A
P2	62	B14	N/A
P2	63	B15	N/A
P2	64	A10	N/A
P2	65	A11	N/A
P2	66	A12	N/A
P2	67	A13	N/A
P2	68	A14	N/A
P2	69	A15	N/A
J1	1	TCK	TTL
J1	2	GND	GND
J1	3	TDO	TTL
J1	4	+5V	+5V
J1	5	TMS	TTL
J1	6	N/C	N/A
J1	7	N/C	N/A
J1	8	N/C	N/A
J1	9	TDI	TTL
J1	10	GND	GND
J2	SMC	197 MHz	+10 dBm
J3	SMC	ANALOG IN	+- 2.5V (max)
J4	SMC	ANALOG OUT A	+- 1V (50 ohms)
J5	SMC	ANALOG OUT B	+- 1V (50 ohms)