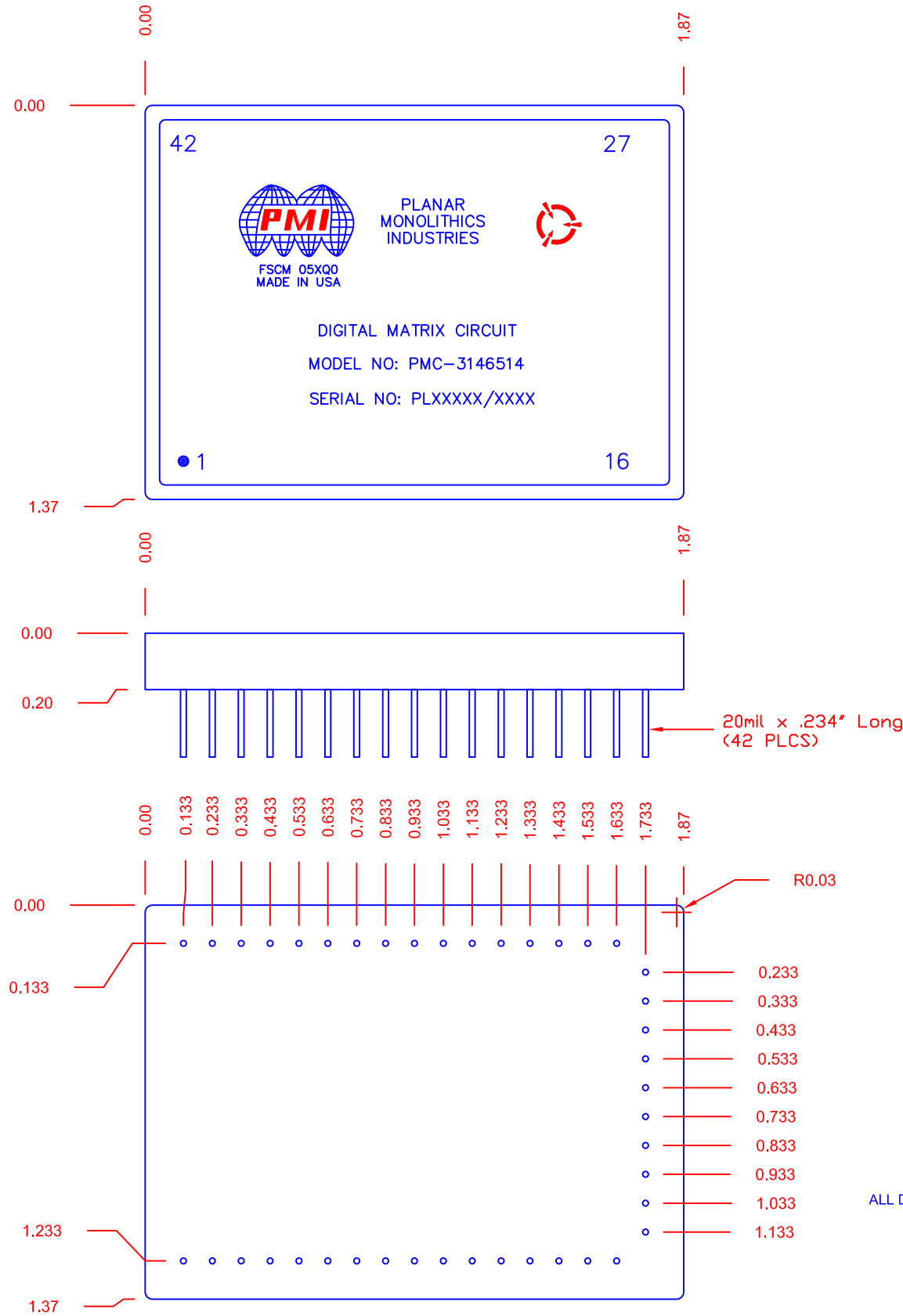


DESCRIPTION

PMI MODEL PMC-3146514 IS A FPGA BASED MATRIX CIRCUIT MEETING THE SPECIFICATIONS AS LISTED.

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A1	ORIGINAL RELEASE	11/05/13	

MECHANICAL OUTLINE



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APPROVALS		DATE		TITLE	
DRAWN <i>ANG</i>		11/05/13		PRODUCT FEATURE PMC-3146514	
CHECKED		SIZE	FSCM NO.	DWG NO.	REV.
		A	05XQ0	27007972	A1
ISSUED		SCALE N: S		SHEET 1 OF 5	

DESCRIPTION

PMI MODEL PMC-3146514 IS A FPGA BASED MATRIX CIRCUIT MEETING THE SPECIFICATIONS AS LISTED.

REVISIONS				
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PARAMETER	TEST CONDITION 1/	SYMBOL	LIMITS		UNITS
			MIN.	MAX.	
HIGH LEVEL INPUT CURRENT (CLOCK INPUT)	$V_{CC}=5.5V, V_{IH}=2.4V, S2=OPEN,$ TEST AT PIN 34	$I_{IH}(CK)$	-	160	μA
LOW LEVEL INPUT CURRENT (CLOCK INPUT)	$V_{CC}=5.5V, V_{IL}=0.8V, S2=OPEN,$ TEST AT PIN 34	$I_{IL}(CK)$	-	-6.4	mA
LOW LEVEL INPUT CURRENT (SELECTOR INPUTS)	$V_{CC}=5.5V, V_{IL}=0.8V, S2=OPEN,$ TEST AT PINS 15,16,17,18,19,20, 21, 22	$I_{IL}(DS)$	-3.9	-7.5	mA
HIGH LEVEL OUTPUT CURRENT (COUNTER OUTPUTS)	$V_{CC}=4.5V,$ CLOSE V_{H7} SWITCH, APPLY CLEAR PULSE, $V_{OH}=5.5V,$ TEST AT PINS 3,4,5,6,8,9	$I_{OH}(CT)$	-	250	μA
LOW LEVEL OUTPUT VOLTAGE (COUNTER OUTPUTS)	$V_{CC}=4.5V,$ CLOSE V_{H0} SWITCH, APPLY CLEAR PULSE, $I_{OL}=12mA,$ TEST AT PINS 3,4,5,6,8,9	$V_{OL}(CT)$	-	0.4	V
LOW LEVEL OUTPUT VOLTAGE (DECODER OUTPUTS)	$V_{CC}=4.5V,$ CLOSE V_{H0} SWITCH TO TEST PIN 37, V_{H1} TO TEST PIN 39, ETC., APPLY CLEAR PULSE, $I_{OL}=8mA,$ TEST AT PINS 2,36,37, 38, 39, 40, 41, 42	$V_{OL}(DCR)$	-	0.4	V
HIGH LEVEL OUTPUT VOLTAGES ("STOP" AND "Δ" OUTPUTS)	$V_{CC}=4.5V,$ CLOSE V_{H0} SWITCH, $I_{OH}=-560\mu A$ (PIN 10) OR $-400\mu A$ (PIN 33) TEST PINS 10 AND 33	$V_{OH}(STOP)$	2.4	-	V
		$V_{OH}(\Delta)$	2.4	-	V
LOW LEVEL OUTPUT VOLTAGES ("STOP" AND "Δ" OUTPUTS)	$V_{CC}=4.5V,$ CLOSE V_{H0} SWITCH $I_{OL}=5mA$ (PIN 10) OR $16mA$ (PIN 33) TEST PINS 10 AND 33	$V_{OL}(STOP)$	-	0.4	V
		$V_{OL}(\Delta)$	-	0.4	V

PARAMETER	TEST CONDITION 1/	SYMBOL	LIMITS		UNITS
			MIN.	MAX.	
FUNCTIONAL TESTS					
A. CLOCK PULSE	OBSERVE OUTPUT AT PIN 26. IT SHALL BE A SQUARE WAVE WITH DUTY CYCLE= 45% TO 65%, $V_{LO}=0.4V$ MAX, $V_{HI}=2.4V$ MIN, $f=220$ KHZ TO 390 KHZ				
B. COUNTER OUTPUTS	OBSERVE OUTPUTS AT PINS SHOWN BELOW. WAVEFORMS SHALL BE AS SHOWN ABOVE WITH FREQUENCY AS FOLLOWS: PIN NO: 8 9 5 6 4 3 FREQ: CP CP CP CP CP CP 4 8 16 32 64 128				
C. MATRIX DECODING	ALTERNATELY CLOSE SWITCHES V_{H0} THRU V_{H7} WITH LED'S CONNECTED TO PINS 8,9,5,6,4 AND 3. THE DEVICE SHALL COUNT FROM ZERO TO BINARY 64 AS INDICATED BY LED'S. THUS $V_{H0}=0=$ ALL LED'S ON; $V_{H1}=1=$ ALL EXCEPT L1 ON; ETC.				
PROPAGATION DELAY TIME, LOW TO HIGH LEVEL (CP TO CT1 THRU CT6)	$V_{CC}=5.0V,$ WAVEFORMS PER FIG 2, LOAD CIRCUIT PER FIG. 3, MEASURE FROM PIN 34 TO PINS 5,8 AND 9	$t_{PLH}(CT)$ $t_{PLH}(CT)$	-	110 60	nS nS
PROPAGATION DELAY TIME, HIGH TO LOW LEVEL (CP TO CT1 THRU CT6)	MEASURE FROM PIN 34 TO PINS 5, 8 AND 9 MEASURE FROM PIN 34 TO PINS 3, 4 AND 6	$t_{PHL}(CT)$	-	105	nS
		$t_{PHL}(CT)$	-	70	nS

PARAMETER	TEST CONDITION 1/	SYMBOL	LIMITS		UNITS
			MIN.	MAX.	
PROPAGATION DELAY TIME, LOW TO HIGH LEVEL (CP TO V_0 THRU V_7)	MEASURE FROM PIN 34 TO PINS 2, 36, 37, 38, 39, 40, 41, 42	$t_{PLH}(V)$	-	140	nS
PROPAGATION DELAY TIME, HIGH TO LOW LEVEL (CP TO V_0 THRU V_7)	MEASURE FROM PIN 34 TO PINS 2, 36, 37, 38, 39, 40, 41, 42	$t_{PHL}(V)$	-	100	nS
PROPAGATION DELAY TIME, LOW TO HIGH LEVEL ("STOP" TO "Δ")	SEE FIGURE 3	$t_{PLH}(S\Delta)$	-	30	nS
PROPAGATION DELAY TIME, HIGH TO LOW LEVEL ("Δ" TO "STOP")	SEE FIGURE 3	$t_{PHL}(CL\Delta)$	-	80	nS
"Δ" TO "STOP" DELAY TIME (ANTI-BOUNCE TIME)	SEE FIGURE 4 AND 2/BELOW TEST AT PINS 15, 16, 17, 18, 19, 20, 21, 22.	$t_{\Delta-STOP}$	7.5	17.5	mS
SUPPLY CURRENT	TEST IN CIRCUIT SHOWN IN FIGURE 1, ALL COUNTER, DECODER, AND DATA SELECTOR INPUTS OPEN, $V_{CC+}=5.5V, V_{CC-}=-5.5V$	I_{CC+}	-	380	mA
		I_{CC-}	-	-15	mA

ENVIRONMENTAL RATINGS

- TEMPERATURE: ————— -0°C TO + 75°C (OPERATING)
-55°C TO +125°C (STORAGE)
- HUMIDITY: ————— MIL-STD-202F, METHOD 103B COND. B
- SHOCK: ————— MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: ————— MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: ————— MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: ————— MIL-STD-202F, METHOD 107D COND. A

NOTE: SPECIFICATIONS WILL VARY OVER OPERATING TEMPERATURE
NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

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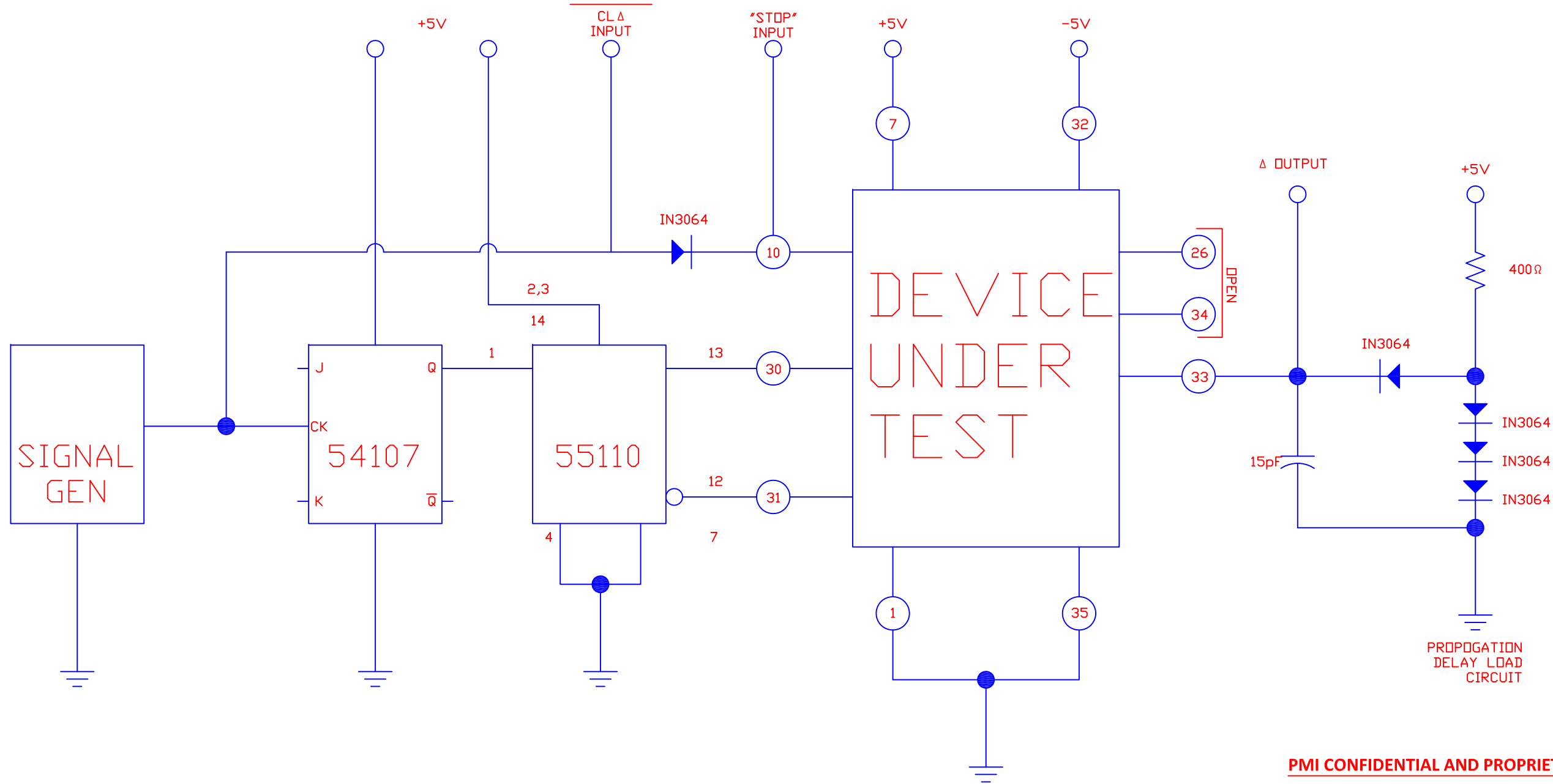


APPROVALS		DATE	TITLE			
DRAWN <i>AVG</i>		11/05/13	PRODUCT FEATURE PMC-3146514			
CHECKED			SIZE	FSCM NO.	DWG NO.	REV.
ISSUED			A	05XQ0	27007972	A1
			SCALE N: S	SHEET 2 OF 5		

FIGURE # 3 : WAVEFORMS

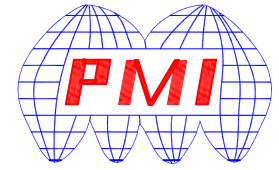
TEST CIRCUIT AND WAVEFORMS FOR MEASURING "Δ" PROPAGATION DELAY TIMES

REVISIONS				
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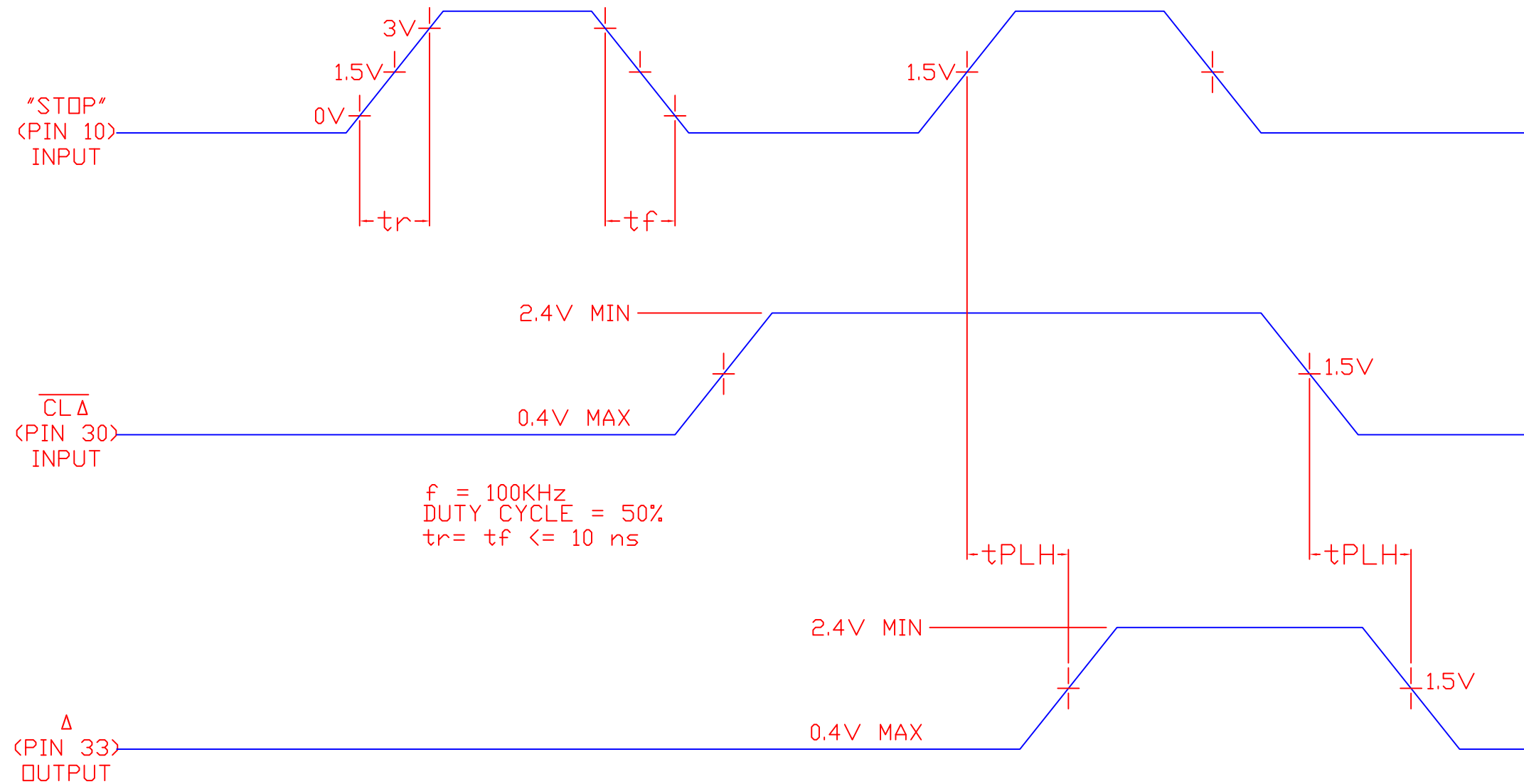


APPROVALS		DATE	TITLE			
DRAWN		11/05/13	PRODUCT FEATURE			
CHECKED			PMC-3146514			
ISSUED			SIZE	FSCM NO.	DWG NO.	REV.
			A	05XQ0	27007972	A1
			SCALE	N: S	SHEET	3 OF 5

FIGURE # 3 : WAVEFORMS

TEST CIRCUIT AND WAVEFORMS FOR MEASURING "Δ" PROPAGATION DELAY TIMES

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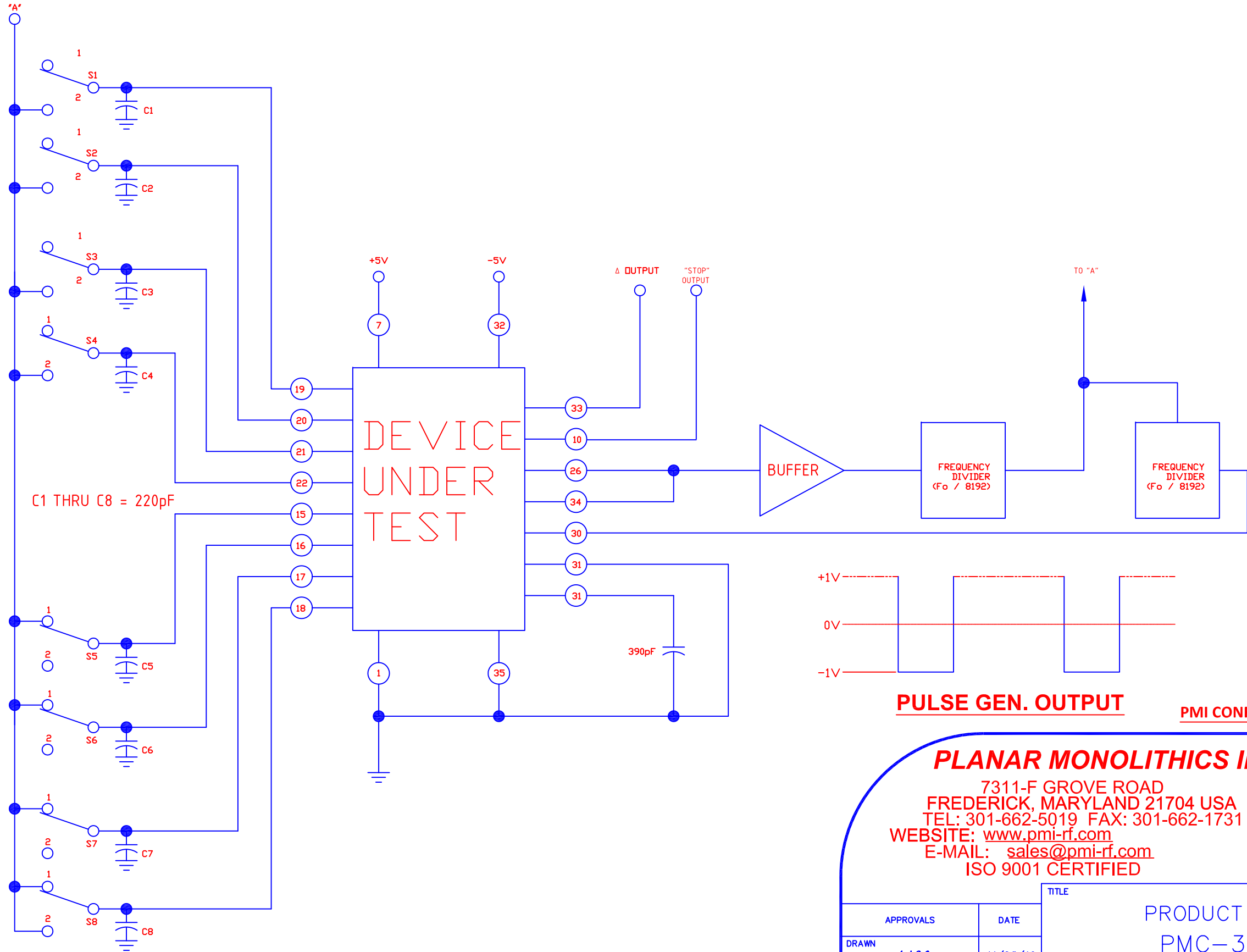


APPROVALS		DATE	TITLE		
DRAWN <i>ANG</i>		11/05/13	PRODUCT FEATURE PMC-3146514		
CHECKED			SIZE A	FSCM NO. 05XQ0	DWG NO. 27007972
ISSUED					REV. A1
SCALE N: S			SHEET		4 OF 5

FIGURE # 4

"Δ" TO "STOP" DELAY TIME TEST CIRCUIT

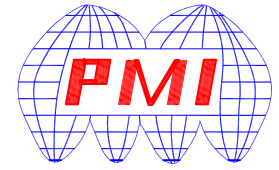
REVISIONS				
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PULSE GEN. OUTPUT

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ISSUED		SCALE N:S			SHEET 5 OF 5		