

**INDEPENDENT CUSTOMER EVALUATION OF MIL-STD-1553 TRANSFORMERS 1553-45
MANUFACTURED BY COMPUPOWER LTD. INDIA**

Subject: CP Transformer Evaluation

I have evaluated 3ea. of the 1553-45 transformers along side the Pulse 1553-45 transformer and here are the results.

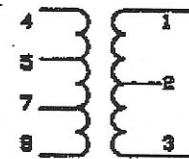
OPEN CIRCUIT IMPEDANCE

The following tests were conducted using an HP4192A IMPEDANCE ANALYZER

MANUFACTURER	FREQUENCY	PINS 5 & 7	PINS 4 & 8
CP-1553-45 #1	100KHZ 1MHZ	13KΩ∠+61Deg 7.2KΩ∠-77Deg	24.4KΩ∠+62Deg 14.15KΩ∠-76.5Deg
CP-1553-45 #2	100KHZ 1MHZ	13.1KΩ∠+54.9Deg 6.8KΩ∠-76.4Deg	24.2KΩ∠+56.5Deg 12.99KΩ∠-76.2Deg
CP-1553-45 #3	100KHZ 1MHZ	12.85KΩ∠+60.96Deg 7.8KΩ∠-76Deg	24.2KΩ∠+61Deg 14.7KΩ∠-75.7Deg
PULSE 1553-45	100KHZ 1MHZ	6.7KΩ∠+60.7Deg 6.6KΩ∠-70.7Deg	13.2KΩ∠+61.4Deg 13.03KΩ∠-70.6Deg

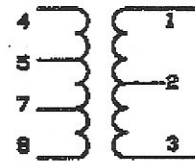
LEAKAGE TESTS

The following tests were conducted using an HP4192A IMPEDANCE ANALYZER Serial # 2150J01138



Measured PINS 1-2 with 5-7 shorted

FREQ	CP-1	CP-2	CP-3	PULSE
1KHZ	.5 uH	.5 uH	.5 uH	.7uH
100KHZ	.185 uH	.175 uH	.173 uH	.196uH
1MHZ	.180 uH	.169 uH	.167 uH	.175uH



Measured PINS 2-3 with 5-7 shorted

FREQ	CP-1	CP-2	CP-3	PULSE
1KHZ	.5 uH	.5 uH	.5 uH	.7uH
100KHZ	.175 uH	.175 uH	.172 uH	.170uH
1MHZ	.171 uH	.169 uH	.166 uH	.152uH

Measured PINS 1-3 with 5-7 shorted

FREQ	CP-1	CP-2	CP-3	PULSE
1KHZ	1.8 uH	1.5 uH	1.5 uH	3.8 uH
100KHZ	.423 uH	.380 uH	.389 uH	.625 uH
1MHZ	.413 uH	.370 uH	.379 uH	.603 uH
2MHZ	.401 uH	.358 uH	.368 uH	.575 uH

Measured PINS 1-2 with 4-8 shorted

FREQ	CP-1	CP-2	CP-3	PULSE
1KHZ	.4 uH	.5 uH	.4 uH	.4uH
100KHZ	.182 uH	.177 uH	.173 uH	.180uH
1MHZ	.177 uH	.171 uH	.168uH	.167uH
2MHZ	Data not taken	Data not taken	Data not taken	Data not taken

Measured PINS 2-3 with 4-8 shorted

FREQ	CP-1	CP-2	CP-3	PULSE
1KHZ	.4 uH	.5 uH	.4 uH	.5uh
100KHZ	.172 uH	.177 uH	.172 uH	.208uh
1MHZ	.167 uH	.171 uH	.167uH	.194uh
2MHZ	Data not taken	Data not taken	Data not taken	Data not taken

Measured PINS 1-3 with 4-8 shorted

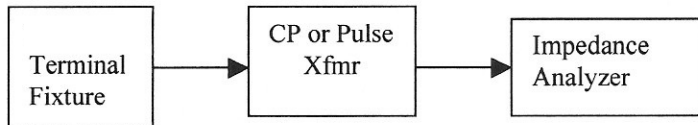
FREQ	CP-1	CP-2	CP-3	PULSE
1KHZ	1.2 uH	1.6 uH	1.1 uH	2.3 uH
100KHZ	.411 uH	.390 uH	.389 uH	.439 uH
1MHZ	.402 uH	.380 uH	.380uH	.426uH
2MHZ	.392	.370	.370	.410 uH

DC RESISTANCE TEST(OHMS)

TRANSFORMER	1-2	2-3	1-3	4-8
CP-1	.248	.278	.482	2.45
CP-2	.252	.240	.464	2.89
CP-3	.244	.228	.442	2.24
PULSE	.431	.396	.620	2.75

STANDBY INPUT IMPEDANCE TEST

The transformers are installed into a device under test fixture as shown:



The impedance is measured with the power off and then on:

CP TRANSFORMER

Channel A

OFF = 2.55K Ω \angle -80deg

ON = 2.9K Ω \angle -78.6deg

Channel B

OFF = 2.45K Ω \angle -78.3deg

ON = 2.78K Ω \angle -76.3deg

PULSE TRANSFORMER

Channel A

OFF = 2.15K Ω \angle -82.6deg

ON = 2.7K Ω \angle -80.11deg

Channel B

OFF = 1.99K Ω \angle -83.9deg

ON = 2.53K Ω \angle -80.84deg

TRANSFORMER INTEGRITY TEST

The measurements are taken between the .5K resistor and the transformer to simulate a current driver.

The Equipment was setup as per Figure 1 and using a Tektronics AFG3101 Function generator, The responses of the transformer are shown along with the pulse transformer for comparison.

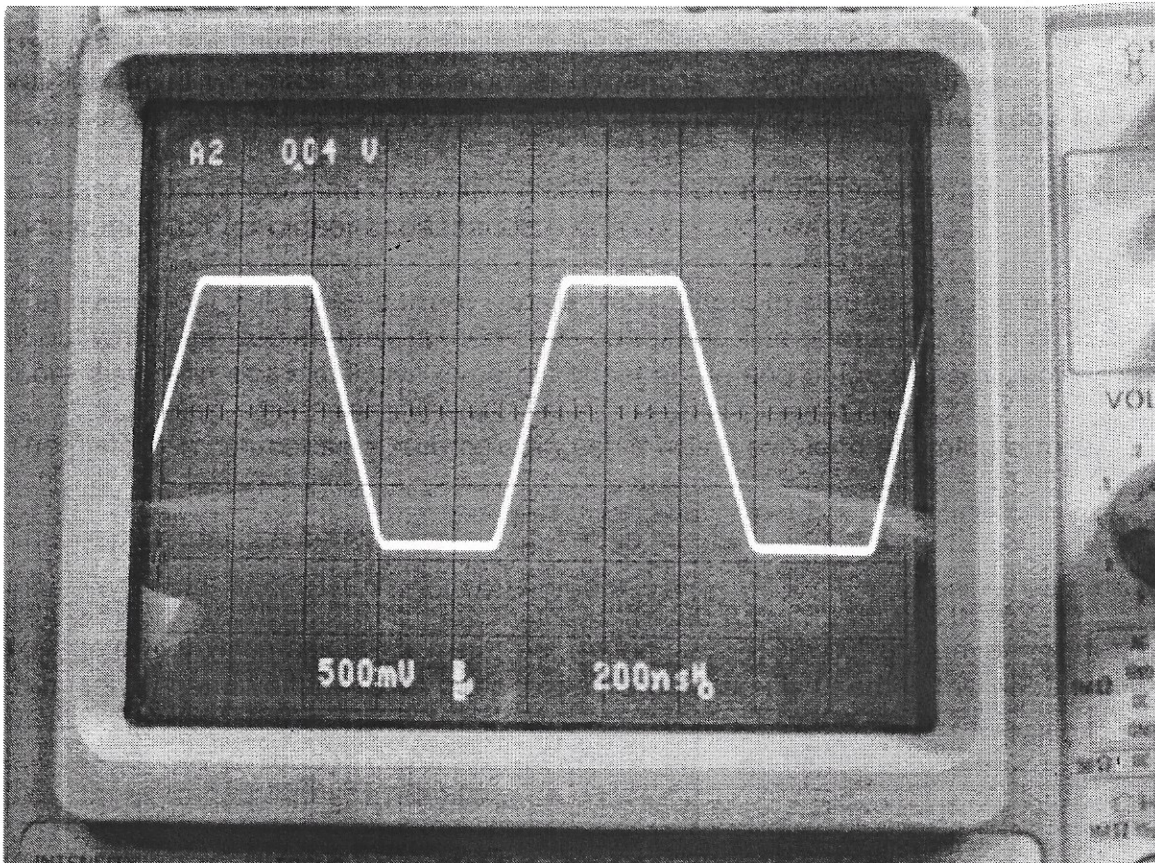
The input signal is a square wave with 150ns rise/fall time.

Using a current driver, the dynamics of the transformer can be evaluated. A voltage driver will mask the transformer dynamics. Both current drive transceivers and voltage drive transceivers are presently used on the 1553 bus.

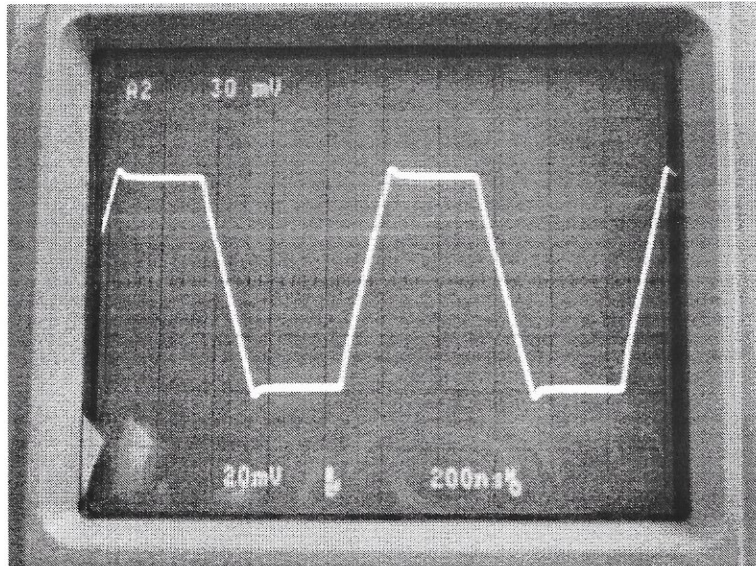
Excessive overshoot and distortion, seems to indicate higher leakage inductance and/or higher capacitance.

The over shoot will cause current source transmitters to saturate on the over shoot which causes an unbalanced drive condition. The unbalance then causes more distortion and excessive dynamic offset at the end of the transmission.

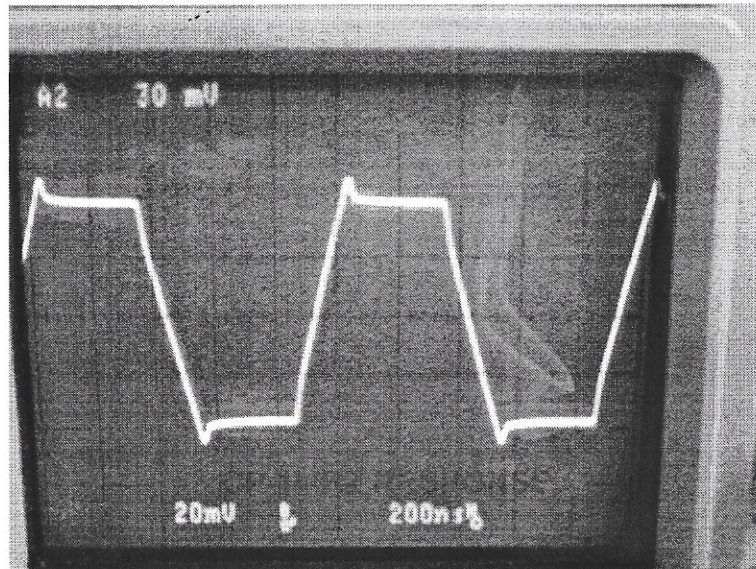
The distortion can cause a zero crossing shift which can lead to timing errors.



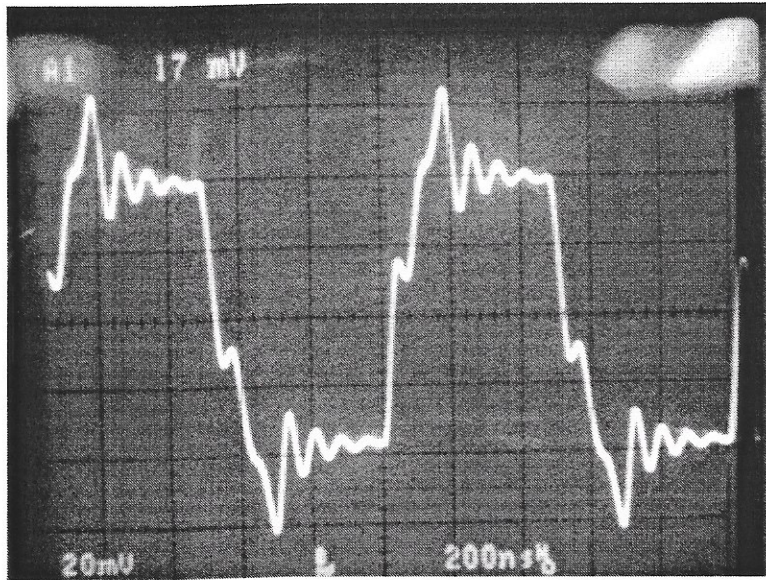
INPUT SIGNAL



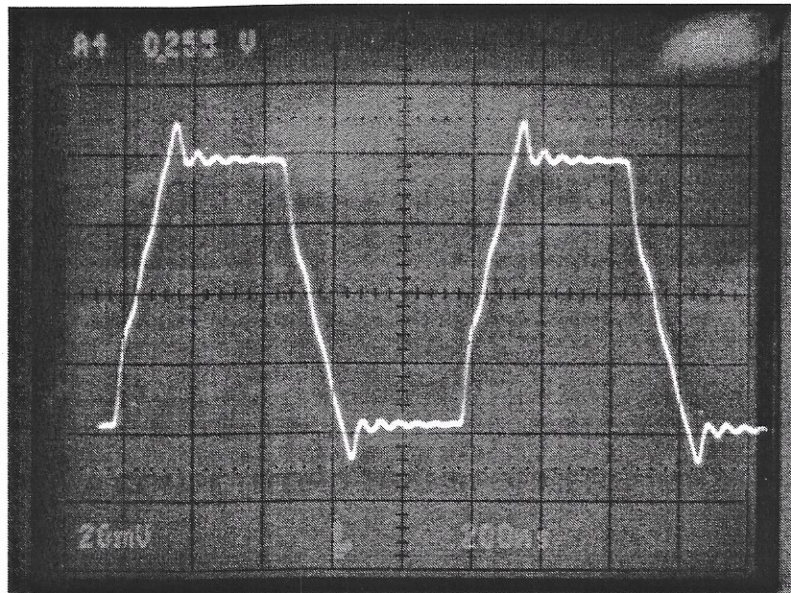
CP-1MHZ RESPONSE



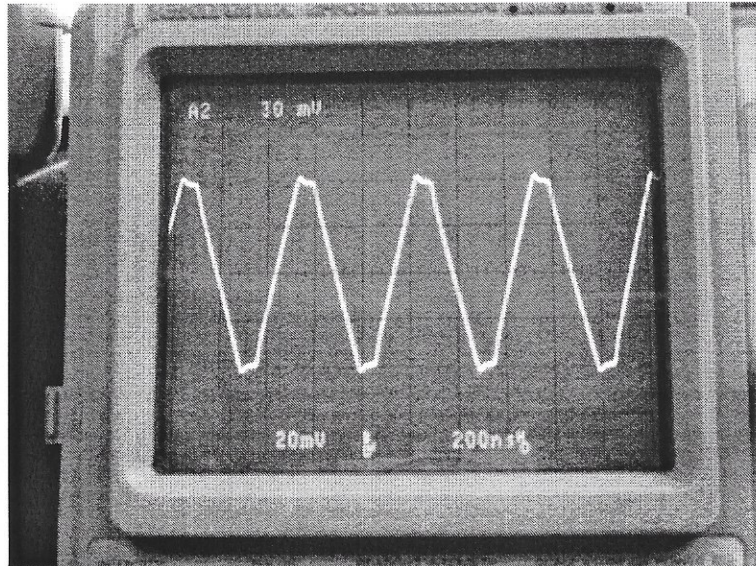
PULSE-1MHZ RESPONSE



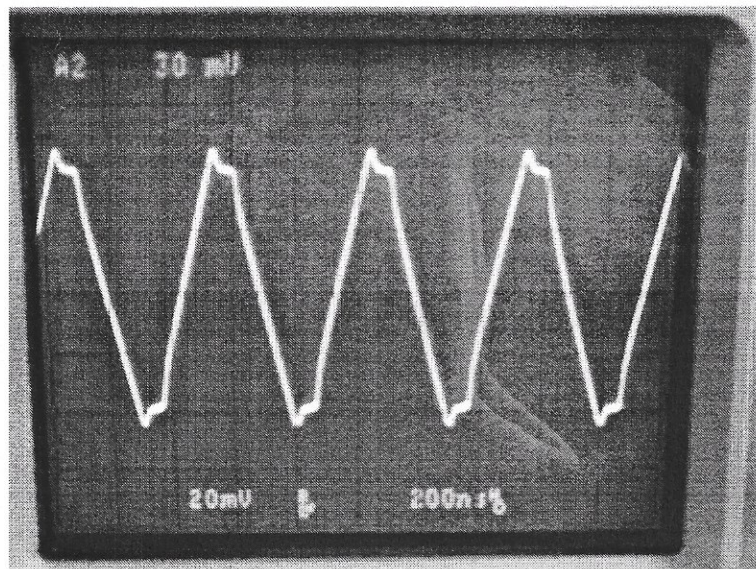
A COMPETITORS TRANSFORMER@1MHZ



A COMPETITORS TRANSFORMER@1MHZ



CP-2MHZ RESPONSE



PULSE-2MHZ RESPONSE

EVALUATION OF CP- 5 VOLT 1553 TRANSFORMER

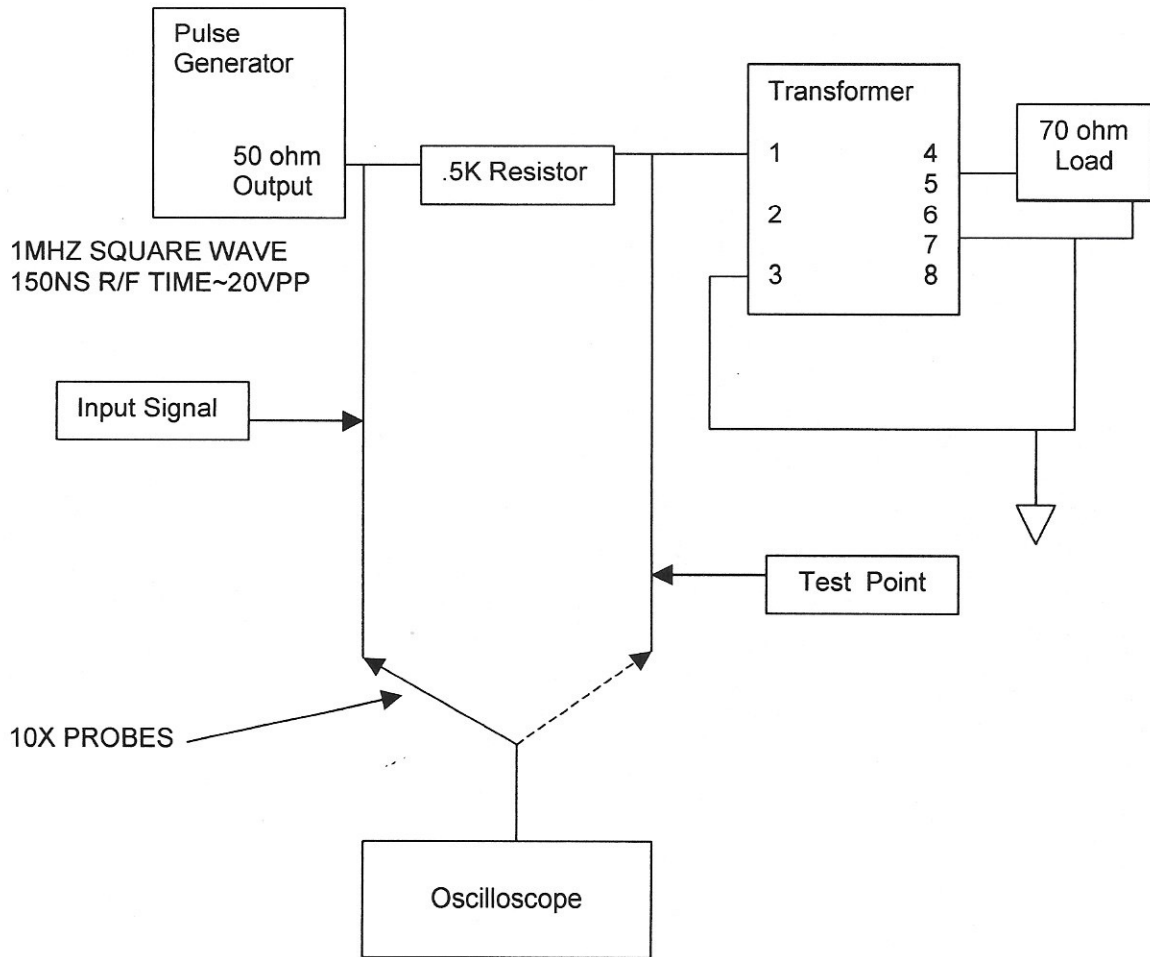


FIGURE 1