NATIONAL HYBRID, INC.
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Mil-Std-1553 Products
NHI-1529 Series
+5V Hybrid Dual Transceivers

Features:

- **Compliant to Mil-Std-1553A & B**
- **Single +5V +/- 10% Supply**
- **Very Low Standby Power**
- **Short Circuit Proof**
- **Superior Noise Performance**

Description:

The NHI-1529 series of Mil-Std-1553 hybrid dual transceivers are available in 1.900" x .780", 36 pin plug-in and flatpack packages. It operates off of a single +5V power supply with very low standby power dissipation.

Each receiver converts the 1553 bus bi-phase data to complementary RX and RX_L TTL digital outputs for use by the manchester decoder. The device provides independent receiver enables for each channel.

The transmitters will output bi-phase manchester to the coupling transformer when the TX and TX_L inputs are driven by complementary TTL digital data. The device provides an independent transmitter inhibit TXINH for each channel.

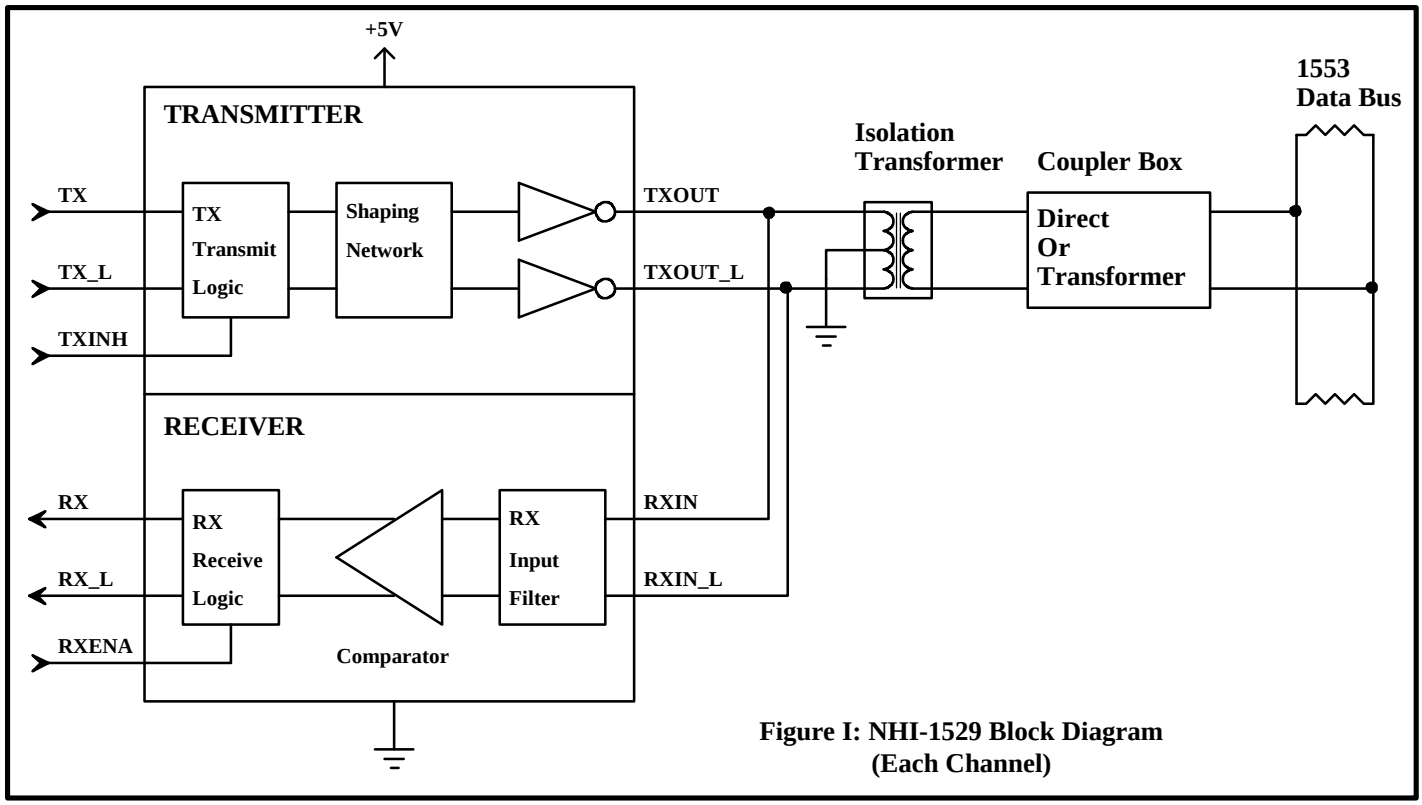


Figure I: NHI-1529 Block Diagram (Each Channel)

NHI-1529 Series

TABLE I: Electrical Specifications

Parameter	Condition	Symbol	Min	Typ	Max	Units
POWER SUPPLY REQUIREMENT		Vcc	4.5		5.5	V
TOTAL SUPPLY CURRENT	Vcc=5.0V, Not Transmitting	Icc1		30	40	mA
	Vcc=5.0V, Transmit one channel @ 50% duty cycle	Icc2		285	330	mA
	Vcc=5.0V, Transmit one channel @ 100% duty cycle	Icc3		535	600	mA
POWER DISSIPATION	Vcc=5.0V, Not Transmitting	Pd1			0.5	W
	Vcc=5.0V, Transmit one channel @ 100% duty cycle	Pd2			0.95	W
OPERATING TEMPERATURE	Junction	Tj	-55		175	°C
	Case	Tc	-55		125	°C
	Storage	Ts	-55		165	°C
THERMAL IMPEDANCE	Junction to Case (Hottest Die)	θ_{jc}			38.6	°C/W
LOGIC I/O						
RXENA_A, TXA, TXA_L, TXINH_A, RXENA_B, TXB, TXB_L, TXINH_B	Vcc= 5.5V, Vil= 0.0V	Iil			-0.8	mA
	Vcc= 4.5V, Vih= 2.7V	Iih			40	uA
RXA, RXA_L, RXB, RXB_L	Vcc= 5.5V, Iol= -4mA	Vol			0.4	V
	Vcc= 4.5V, Ioh= 400 uA	Voh	2.4			V
RECEIVER						
Input Resistance	Differential	Rin	10			k Ω
Input Capacitance	Differential	Cin			5	pF
Common Mode Rejection Ratio		CMRR	40			dB
Input Level	Differential	Vin			40	Vpp
TRANSMITTER						
Output Voltage	Across 35 Ω load	V_{out}	6	7.5	9	Vpp
Rise/Fall Time	10% to 90% of peak to peak output	t_r , t_f	100	150	300	nS
Output Dynamic Offset Voltage	Across 35 Ω load	Vdyn	-90		90	mV
Output Noise	Differential	Vnpp			10	mVpp
Output Resistance	Differential, not transmitting	Rout	10			kΩ

NHI-1529 Series

Table II: Pin Functions

Pin#	Function	Pin#	Function
1	TXOUT_A	36	TXA_L
2	TXOUT_A_L	35	TXA
3	GND_A	34	TXINH_A
4	NC	33	+5V_A
5	RXA	32	NC
6	RXENA_A	31	GND_A
7	GND_A	30	RXIN_A_L
8	RXA_L	29	RXIN_A
9	NC	28	NC
10	TXOUT_B	27	TXB_L
11	TXOUT_B_L	26	TXB
12	GND_B	25	TXINH_B
13	NC	24	+5V_B
14	RXB	23	NC
15	RXENA_B	22	GND_B
16	GND_B	21	RXIN_B_L
17	RXB_L	20	RXIN_B
18	NC	19	NC

Transformer Requirements:

The NHI-1529 series requires a transformer with a turns ratio of 1:2.12 for Direct Coupling, and a turns ratio of 1:1.5 for Transformer Coupling to the Mil-Std-1553 Bus. Technitrol part number Q1553-5 or equivalent is recommended. The center tap on the transceiver side of the isolation transformer must be grounded.

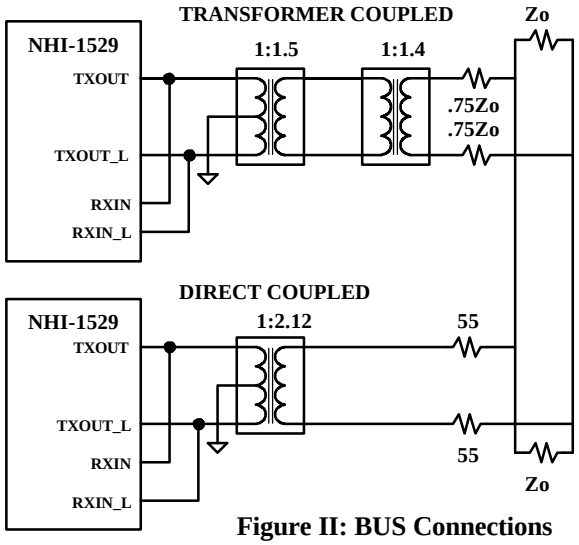


Figure II: BUS Connections

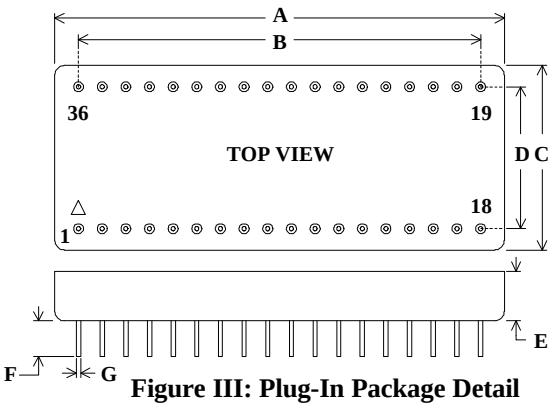


Figure III: Plug-In Package Detail

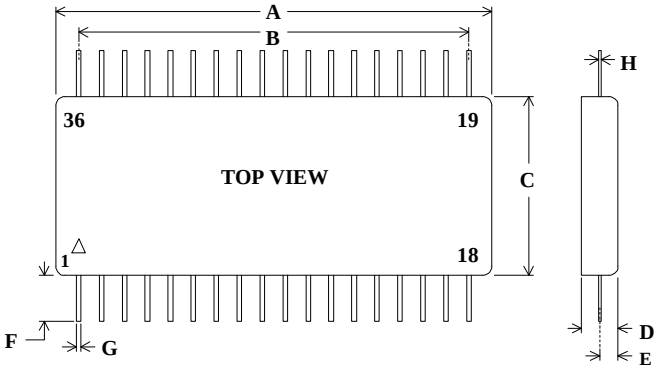


Figure IV: Flatpack Package Detail

Table III: Plug-In Dimensions

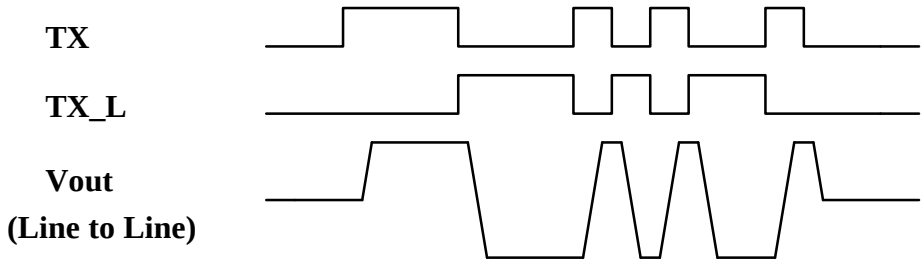
DIM	TYP (inches)	TOL (+/- inches)
A	1.900 "	0.010 "
B	17 EQ SP @	0.100 = 1.700 "
C	0.780 "	0.010 "
D	0.600 "	0.010 "
E	0.185 "	0.010 "
F	0.250 "	MIN
G	0.018 " DIA.	0.002 "

Table IV: Flatpack Dimensions

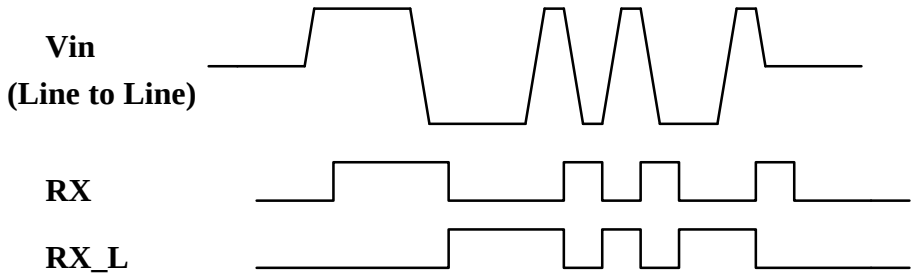
DIM	TYP (inches)	TOL (+/- inches)
A	1.900 "	0.010 "
B	17 EQ SP @	0.100 =1.700 "
C	0.780 "	0.010 "
D	0.185 "	0.012 "
E	0.080 "	0.010 "
F	0.500 "	MIN
G	0.018 "	0.002 "
H	0.010 "	0.002 "

NHI-1529 Series

Transmit Waveforms



Receive Waveforms



Transmitter Operation:

A high level input on TXINH will inhibit the transmitter outputs. If the TX & TX_L transmitter inputs are both high or both low, the transmitter is also inhibited. The output drivers are short circuit protected and the device will "fold back" to decrease power dissipation under this condition until the fault is removed.

Receiver Operation:

A low level input on RXENA will disable the receiver outputs RX & RX_L regardless of bus activity. The receiver output compatibility may be specified as logic 0 or logic 1 when in standby mode.

**** See Ordering Information**

Ordering Information:

NHI-1529 FP / 883

Reliability Grade

883 = Fully Compliant with Mil-Std-883
M = Screened to Mil-Std-883, -55 to +125 °C
Blank = Industrial, -40 to +85 °C

Package Style

Blank = Plug-In (Figure III)
FP = Flatpack (Figure IV)

Decoder Compatibility

29 = RX & RX_L, Standby = Logic 0
30 = RX & RX_L, Standby = Logic 1

**** SMD Listing: DESC Drawing# 5962-89522**

See QML-38534 for NHI's Manufacturer Qualification Under Mil-PRF-38534