



Mil-Std-1553/1760 Products

NHI-15123 Series

+5V Monolithic Dual Transceivers

Features:

- **Smallest Available, Fully Compliant, Mil-Std-1553A/B & Mil-Std-1760 Transceivers.**
- **Single +5V Supply !!**
- **1.5 Watts Maximum Power Dissipation @ 100% Duty Cycle !!**
- **Output Driver Withstands Short Circuit Fault**
- **Proprietary Monolithic Design Provides Superior Reliability, with outstanding Thermal Impedance Characteristics !!**
- **Superior Noise Performance Characteristics**

Description:

The NHI-15123 series of Mil-Std-1553/1760 monolithic dual transceivers are available in 1.000" x .300" ceramic dual in-line and flatpack packages.

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 current source 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.

To reduce the pin count and package size, the transmitter outputs are connected to the receiver inputs internal to the device for each channel. This results in only two connections BUS & BUS_L to the coupling transformer per channel.

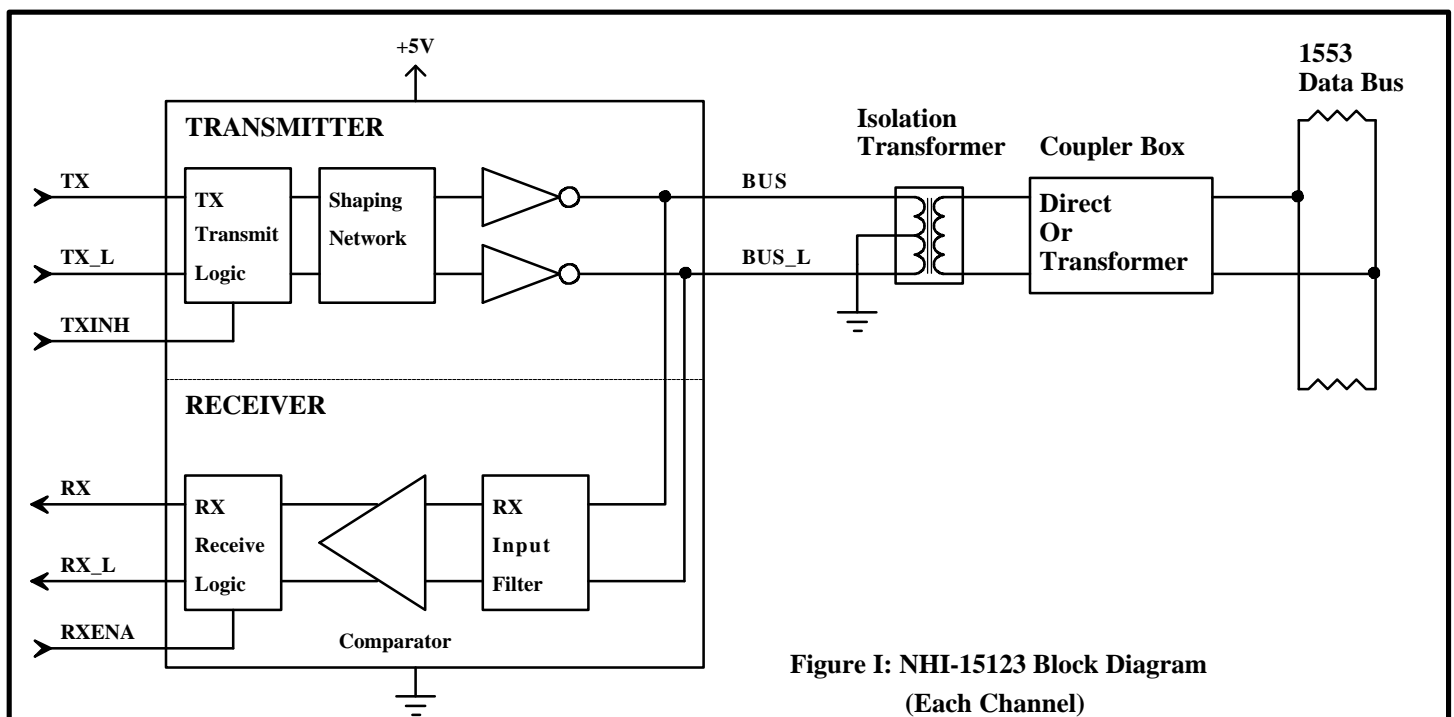


Figure I: NHI-15123 Block Diagram
(Each Channel)

NHI-15123 Series

TABLE I: Electrical Specifications

| Parameter | Condition | Symbol | Min | Typ | Max | Units |
|--|--|---------------------------------|-----|-----|------|-------|
| POWER SUPPLY REQUIREMENT | | Vcc | 4.7 | | 5.5 | V |
| TOTAL SUPPLY CURRENT | Vcc=5.0V, Not Transmitting | Icc1 | | 70 | 80 | mA |
| | Vcc=5.0V, Transmit one channel @ 50% duty cycle | Icc2 | | 320 | 340 | mA |
| | Vcc=5.0V, Transmit one channel @ 100% duty cycle | Icc3 | | 570 | 615 | mA |
| POWER DISSIPATION | Vcc=5.0V, Not Transmitting | Pd1 | | | 0.4 | W |
| | Vcc=5.0V, Transmit one channel @ 100% duty cycle | Pd2 | | | 1.5 | W |
| OPERATING TEMPERATURE | Junction | Tj | -55 | | 165 | °C |
| | Case | Tc | -55 | | 125 | °C |
| | Storage | Ts | -55 | | 165 | °C |
| THERMAL IMPEDANCE | Junction to Case | θjc | | | 4 | °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 | | | -0.4 | mA |
| | Vcc= 4.7v, Vih= 2.7V | Iih | | | 20 | uA |
| RXA, RXA_L, RXB, RXB_L | Vcc= 5.5V, Iol= -4mA | Vol | | | 0.4 | V |
| | Vcc= 4.7v, Ioh= 400 uA | Voh | 2.7 | | | V |
| RECEIVER | | | | | | |
| Input Resistance | Differential | Rin | 20 | | | 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 140 Ω load | V _{out} | 29 | | 36 | Vpp |
| Rise/Fall Time | 10% to 90% of peak to peak output | t _r , t _f | 100 | 150 | 300 | nS |
| Output DynamicOffset Voltage | Across 35 Ω load | Vdyn | -90 | | 90 | mV |
| Output Noise | Differential | Vnpp | | | 10 | mVpp |
| Output Resistance | Differential, not transmitting | Rout | 10 | | | kΩ |

Note: Typical receiver threshold is 0.9v pk-pk, reference to the bus.

NHI-15123 Series

Table II: Pin Functions

| Pin# | Function | Pin# | Function |
|------|----------|------|----------|
| 1 | +5V_A | 20 | TXA_L |
| 2 | BUS_A | 19 | TXA |
| 3 | BUS_A_L | 18 | TXINH_A |
| 4 | RXENA_A | 17 | RXA |
| 5 | GND_A | 16 | RXA_L |
| 6 | +5V_B | 15 | TXB_L |
| 7 | BUS_B | 14 | TX_B |
| 8 | BUS_B_L | 13 | TXINH_B |
| 9 | RXENA_B | 12 | RXB |
| 10 | GND_B | 11 | RXB_L |

Transformer Requirements:

The NHI-15123 series requires a transformer with a turns ratio of 1:2.5 for Direct Coupling, and a turns ratio of 1:1.79 for Transformer Coupling to the Mil-Std-1553 Bus. Technitrol part number Q1553-45 or equivalent is recommended. The center tap on the transceiver side of the isolation transformer must be grounded.

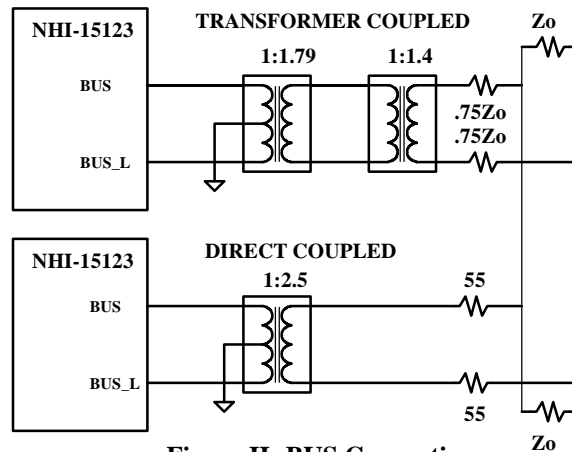


Figure II: BUS Connections

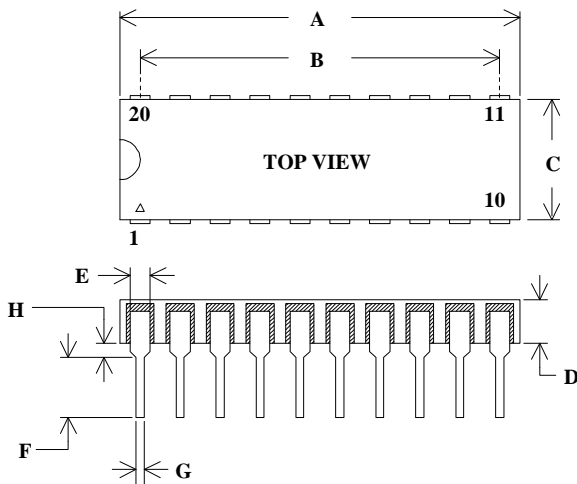


Figure III: Plug-In Package Detail

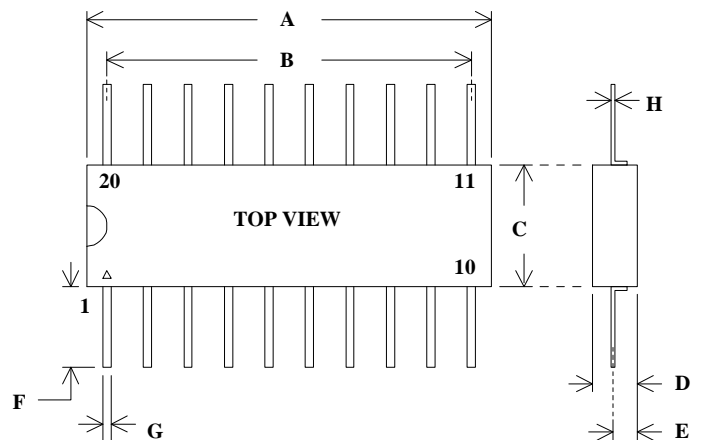


Figure IV: Flatpack Package Detail

Table III: Plug-In Dimensions

| DIM | TYP (inches) | TOL (+/- inches) |
|-----|-----------------|---------------------|
| A | 1.000 " | 0.010 " |
| B | 9 EQ SP @ | 0.100 = 0.900 " |
| C | 0.300 " | 0.010 " |
| D | 0.110 " | 0.012 " |
| E | 0.050 " | TYP |
| F | 0.150 " | MIN |
| G | 0.018 " | 0.002 " |
| H | 0.035 " | 0.010 " |

Table IV: Flatpack Dimensions

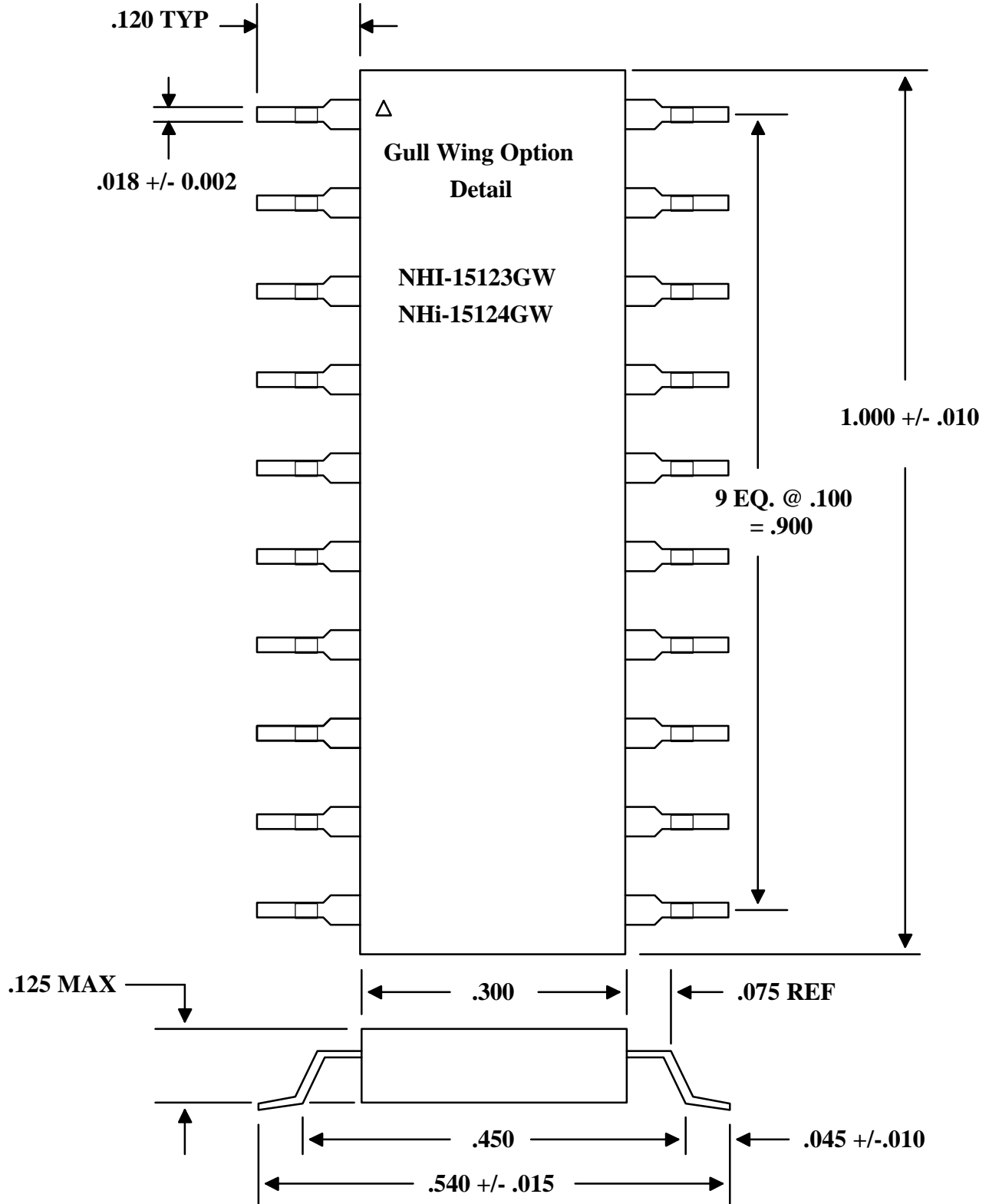
| DIM | TYP (inches) | TOL (+/- inches) |
|-----|-----------------|---------------------|
| A | 1.000 " | 0.010 " |
| B | 9 EQ SP @ | 0.100 = 0.900 " |
| C | 0.300 " | 0.010 " |
| D | 0.110 " | 0.012 " |
| E | 0.060 " | 0.010 " |
| F | 0.400 " | MIN |
| G | 0.018 " | 0.002 " |
| H | 0.010 " | 0.002 " |



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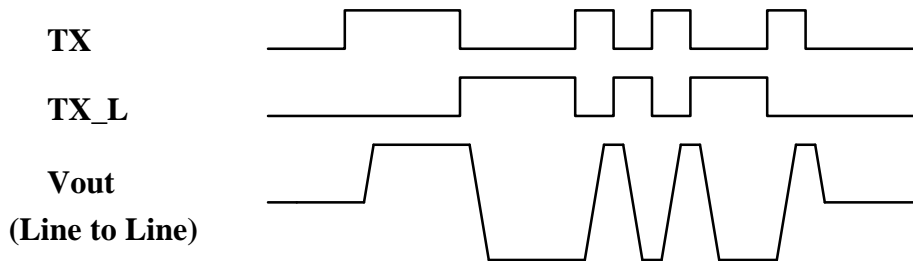
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NHI-15123 Series

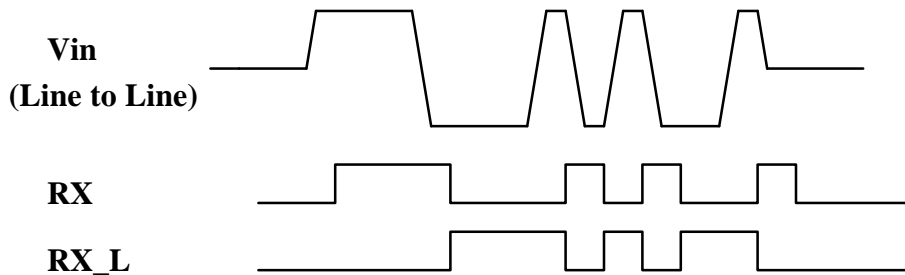
Transmit Waveforms



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.

Receive Waveforms



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-15123 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)

Transceiver Type and Decoder Compatibility

123 = Mil-Std-1553, RX & RX_L, Standby = Logic 0

124 = Mil-Std-1553, RX & RX_L, Standby = Logic 1

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



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