



Mil-Std-1553/1760/MacAir Products

NHi-1559 & NHi-1563

+5V Monolithic Dual Transceivers

Features:

- Compliant to Mil-Std-1553A & B, Mil-Std-1760
- 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-1559, 1563 Mil-Std-1553/1760 monolithic 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.

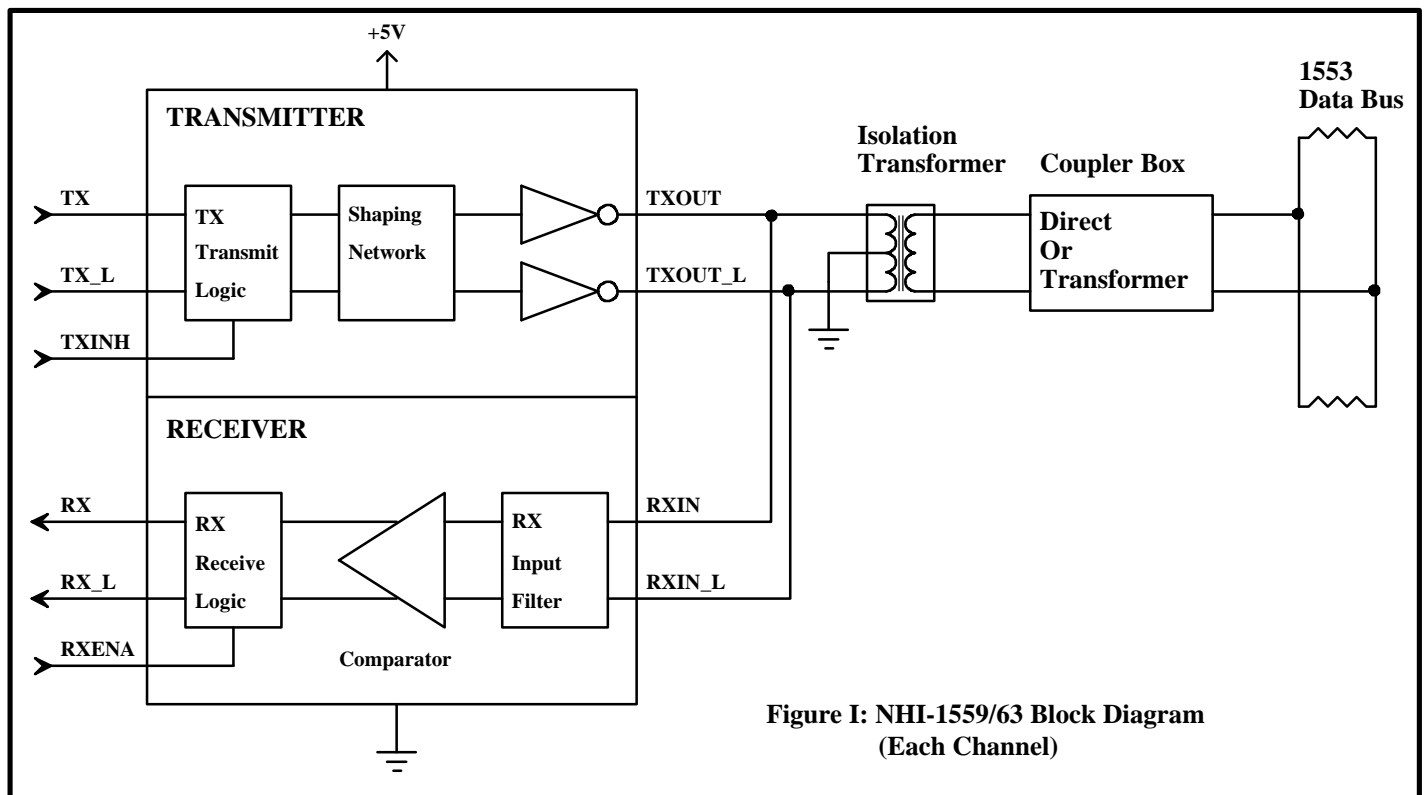


Figure I: NHI-1559/63 Block Diagram (Each Channel)

NHi-1559 & NHi-1563

TABLE I: Electrical Specifications

Parameter	Condition	Symbol	Min	Typ	Max	Units
POWER SUPPLY REQUIREMENT		V _{cc}	4.7		5.5	V
TOTAL SUPPLY CURRENT	V _{cc} =5.0V, Not Transmitting	I _{cc1}		70	80	mA
	V _{cc} =5.0V, Transmit one channel @ 50% duty cycle	I _{cc2}		320	340	mA
	V _{cc} =5.0V, Transmit one channel @ 100% duty cycle	I _{cc3}		570	615	mA
POWER DISSIPATION	V _{cc} =5.0V, Not Transmitting	P _{d1}			0.4	W
	V _{cc} =5.0V, Transmit one channel @ 100% duty cycle	P _{d2}			1.5	W
OPERATING TEMPERATURE	Junction	T _j	-55		165	°C
	Case	T _c	-55		125	°C
	Storage	T _s	-55		165	°C
THERMAL IMPEDANCE	Junction to Case	θ _{jc}			4	°C/W
LOGIC I/O						
RXENA_A, TXA, TXA_L, TXINH_A, RXENA_B, TXB, TXB_L, TXINH_B	V _{cc} = 5.5V, Vil= 0.0V	I _{il}			-0.4	mA
	V _{cc} = 4.7V, Vih= 2.7V	I _{ih}			20	uA
RXA, RXA_L, RXB, RXB_L	V _{cc} = 5.5V, Iol= -4mA	V _{ol}			0.4	V
	V _{cc} = 4.7V, Ioh= 400 uA	V _{oh}	2.7			V
RECEIVER						
Input Resistance	Differential	R _{in}	20			k Ω
Input Capacitance	Differential	C _{in}			5	pF
Common Mode Rejection Ratio		CMRR	40			dB
Input Level	Differential	V _{in}			40	V _{pp}
TRANSMITTER						
Output Voltage	Across 140 Ω load	V _{out}	29		36	V _{pp}
Rise/Fall Time	10% to 90% of peak to peak output	t _r , t _f	*		*	ns
Output Dynamic Offset Voltage	Across 35 Ω load	V _{dyn}	-90		90	mV
Output Noise	Differential	V _{npp}			10	mV _{pp}
Output Resistance	Differential, not transmitting	R _{out}	10			kΩ

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

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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-1559/1563 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. Please contact Beta Transformer (www.bttc-beta.com) for a recommended transformer. The center tap on the transceiver side of the isolation transformer must be be grounded.

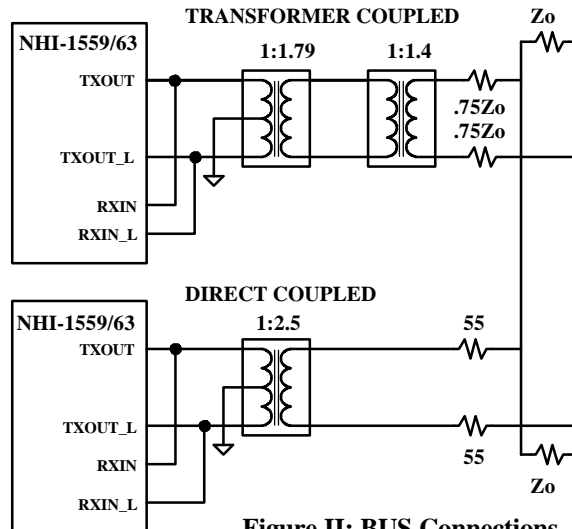


Figure II: BUS Connections

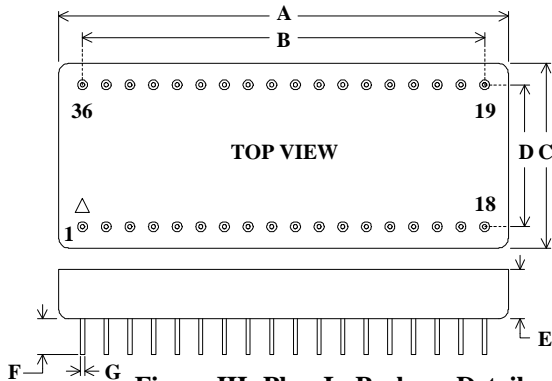


Figure III: Plug-In Package Detail

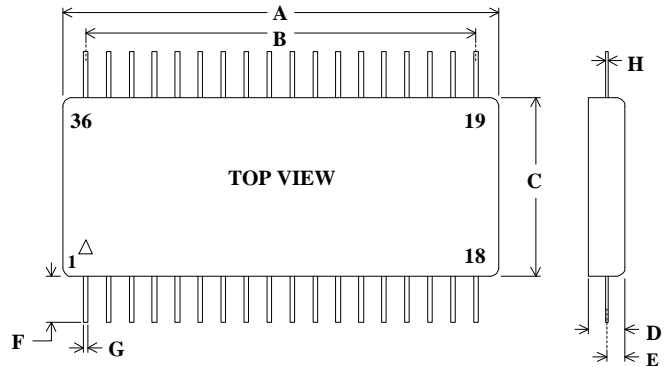


Figure IV: Flatpack Package Detail

Table III: Plug-In Dimensions

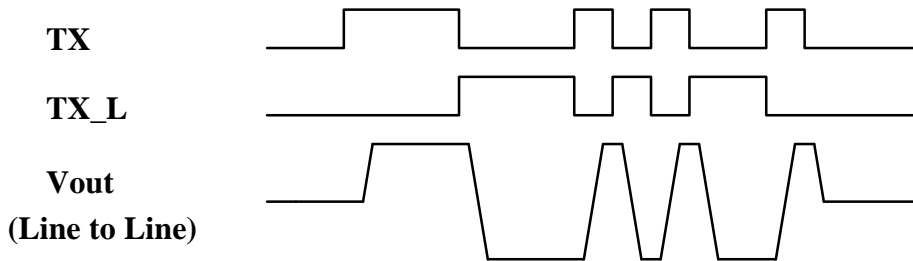
DIM	TYP (inches)	TOL (+/- inches)
A	1.900 "	0.010 "
B	17 EQ SP @	0.100 = 1.700 "
C	0.780 "	0.010 "
D	0.600 "	0.010 "
E	0.185 "	0.010 "
F	0.250 "	MIN
G	0.018 " DIA.	0.002 "

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-1559 & NHi-1563

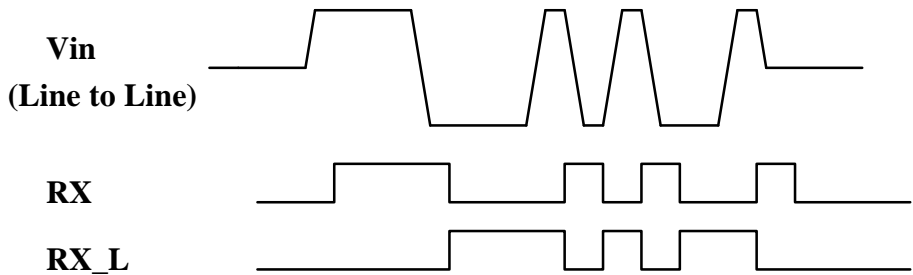
Transmit Waveforms



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.

Ordering Information:

NHI-1559 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

- 1559 = Mil-Std-1553, RX & RX_L, Standby = Logic 0
- 1563 = MacAir, RX & RX_L, Standby = Logic 0
- * 1559 Tx Rise & Fall Time, 100ns min, 300ns max.
- * 1563 Tx Rise & Fall Time, 220ns min, 300ns max.

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



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