CT1469-2
MIL-STD-1397 Type E 10MHz Transceiver

AEROFLEX
CIRCUIT TECHNOLOGY
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Features

- **Low Level ±0.65V output**
- **Optional transformer isolation**
- **Internally set threshold**
- **Operates with ±5 volt supply**
- **Matched to 50 ohms system impedance power on or off**
- **Bipolar construction for radiation resistance**
- **Power management**
- **Interfaces directly to the CT1496-2 (Manchester Encoder) and CT1508-2 (Manchester Decoder)**
- **MIL-PRF-38534 compliant devices available**

AEROFLEX LABS INC. ISO 9001 CERTIFIED

General Description

CT1469-2 is a hybrid microcircuit which incorporates a MIL-STD 1397 Type E 10MHz transceiver in a single package. The transmitter section accepts 10MHZ serial Manchester encoded TTL NRZ data from the encoder and transformer couples a bipolar ±0.65 volt (nominal) signal level to a 50 ohm triaxial cable for transmission up to 1000 ft. The CT1469-2 receiver accepts a bipolar signal level and outputs an NRZ TTL serial data or SIS / SOS signal to the decoder (CT1508-2). Aeroflex Circuit Technology is a 80,000 square foot MIL-PRF-38534 certified facility in Plainview, N.Y.

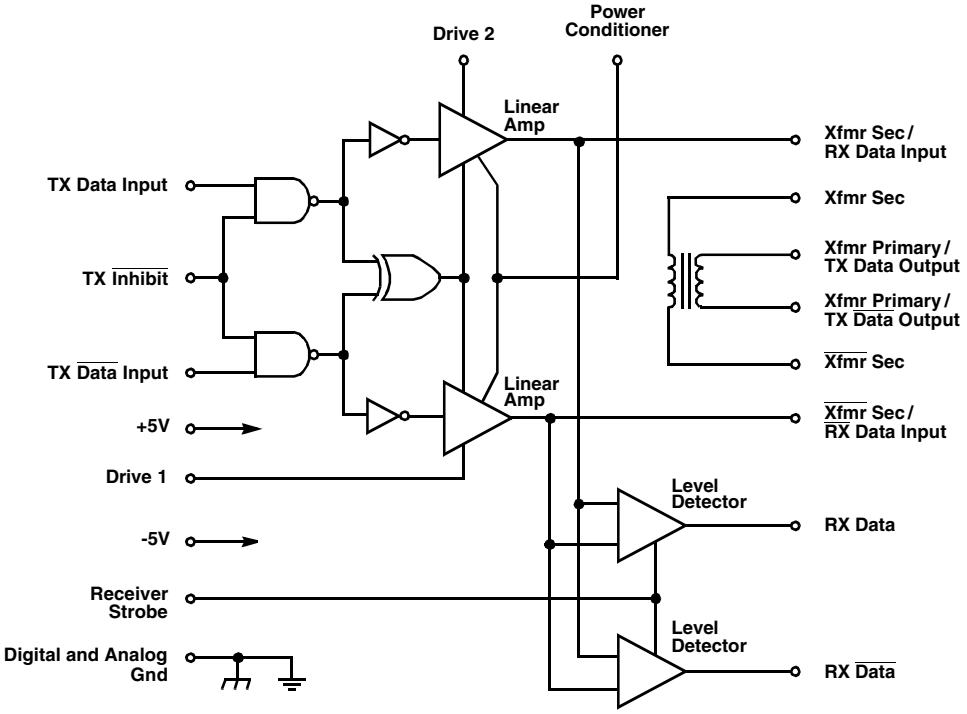


Figure 1 – Block Diagram

Introduction

The specification detailed herein encompasses a hybrid transceiver designed to meet the requirements of STANAG 4153 and Type E requirements of MIL-STD-1397. The transceiver is transformer coupled to the specified triaxial cable and is available compliant to MIL-PRF 38534.

Electrical Requirements

See Figure 1 for block diagram. All input and output signals are manchester encoded. The transformer is internal to the package with its use being optional.

Absolute Maximum Ratings

Parameter	Rating	Units
Supply Voltage		
Vcc	+0.5 to +7.0	V
V_{EE}	-0.5 to -7.0	V
Input Voltage		
Digital $V_{IN(D)}$	-0.5 to +5.5	V
Receiver $V_{IN(R)}$	±2	V
Power Dissipation P_D	2.0	W
Storage Temperature Range T_{STG}	-60 to +150	°C
Operating Case Temperature Range T_C	-55 to +100	°C

DC Electrical Characteristics

(V_{CC} = 5V ±10%, V_{EE} = -5V ±10%, T_C = -55 °C to +100°C, unless otherwise specified)

SYMBOL	PARAMETER	LIMIT
RX DATA (7), RX $\overline{\text{DATA}}$ (8)		
V_{OH}	Logic High Output Voltage	2.4V min @ I_{OH} = -80µA, V_{CC} = +4.5V, V_{EE} = -4.5V
V_{OL}	Logic Low Output Voltage	0.4V max @ I_{OL} = 3.2mA, V_{CC} = +4.5V, V_{EE} = -4.5V
TX DATA INPUT (22), TX $\overline{\text{DATA}}$ INPUT (24) 1/		
I_{IH}	Logic High Input Current	50µA max @ V_{IH} = 2.4V, V_{CC} = +5.5V, V_{EE} = -5.5V
I_{IL}	Logic Low Input Current	-2mA max @ V_{IL} = 0.4V, V_{CC} = +5.5V, V_{EE} = -5.5V
TX $\overline{\text{INHIBIT}}$ INPUT (23) 1/		
I_{IH}	Logic High Input Current	100µA max @ V_{IH} = 2.4V, V_{CC} = +5.5V, V_{EE} = -5.5V
I_{IL}	Logic Low Input Current	-4mA max @ V_{IL} = 0.4V, V_{CC} = +5.5V, V_{EE} = -5.5V

DC Electrical Characteristics (con't)

(V_{CC} = 5V ±10%, V_{EE} = -5V ±10%, T_C = -55 °C to +100°C, unless otherwise specified)

SYMBOL	PARAMETER	LIMIT
RECEIVER STROBE (21) 1/		
I_{IH}	Logic High Input Current	40µA max @ V_{IH} = 2.4V, V_{CC} = +5.5V, V_{EE} = -5.5V
I_{IL}	Logic Low Input Current	-3mA max @ V_{IL} = 0.4V, V_{CC} = +5.5V, V_{EE} = -5.5V
Power Supply Currents		
STANDBY		
I_{CC}	V_{CC} = +5.5V, V_{EE} = -5.5V, V_{23} = GND, V_{26} = -V_{EE}	90mA max
I_{EE}		70mA max
100% Transmission		
I_{CC}	V_{CC} = +5.5V, V_{EE} = -5.5V, V_{23} = 2.4V min, f_{IN} = 10MHz	150mA max
I_{EE}		125mA max

Notes:
1/ Maximum total capacitance loads allowable on these pins are:

DATA, $\overline{\text{DATA}}$	10 pF max
TX $\overline{\text{INHIBIT}}$	15 pF max
RX STROBE	45 pF max

Transmitter Timing Characteristics

(V_{CC} = 5V ±10%, V_{EE} = -5V ±10%, T_C = -55 °C to +100°C, See Figure 2 and 3, unless otherwise specified)

Symbol	Parameter / Condition	Min	Max	Unit
V_A	Output amplitude [1]	0.45	0.8	V
T	Pulse period	97	103	nsec
T_S	Width of 1ST positive half bit	45	65	nsec
T_E	Width of last half bit	47	65	nsec
T/2	Half pulse period	47	53	nsec
T_R	Pulse rise time	0.05	0.3	V/nsec
T_F	Pulse fall time	0.05	0.3	V/nsec

Transmitter Timing Characteristics (con't)

(V_{CC} = 5V ±10%, V_{EE} = -5V ±10%, T_C = -55 °C to +100°C, See Figure 2 and 3, unless otherwise specified)

Symbol	Parameter / Condition	Min	Max	Unit
V_S	Voltage overshoot	-	100	mV
V_{US}	Voltage undershoot	-	100	mV
T_{OS}	Offset Voltage – 2T after last zero crossing	-	30	mV
T_{DTX}	Delay from data input to transformer secondary	-	50	nsec
V_N	Transmitter noise output with transmitter inhibited	-	35	mV
Zo	Output impedance	45	55	Ω
Inhibit	External-TTL low inhibits outputs Internal-Equal input signals inhibit output			

1. Pins 25 and 27 are not used for MIL-STD-1397 Type E nominal output signal levels.

Receiver Timing Characteristics

(V_{CC} = 5V ±10%, V_{EE} = -5V ±10%, T_C = -55 °C to +100°C, See Figure 4, unless otherwise specified)

Symbol	Parameter / Condition		Min	Max	Unit
V_{IN}	Input signal to receiver		±0.22	±0.88	V_{PK}
V_{CM}	Common Mode Rejection DC to 1.0MHz 2.0MHZ to 20MHz		 - -	 20 5	 $V_{PK\text{-}TO\text{-}PK}$ $V_{PK\text{-}TO\text{-}PK}$
V_T	Signal rejection No response to single ended signals		- -	10^{-9} ±0.13	Volts-Seconds V_{PK}
T_{D1}	Delay from 50% point of positive input signal to 50% point of data output		-	30	nsec
T_{D2}	Delay from 50% point of negative input signal to 50% point of data output		-	30	nsec
V_O	Output signal Complementary TTL drive capability of 2 TTL Loads	 High Low	 2.4 -	 - 0.4	 V V
T_{RSU}	To input data, setup time Receiver Strobe Enable		5	-	nsec
T_{RSH}	Receiver Strobe hold time		20	-	nsec
Strobe	Strobe – Forces outputs low, logic low inhibits reception				

Output Function Table

D	$\overline{D}$	TX INH	OUTPUT
D = $\overline{D}$	$\overline{D}$ = D	X	Inactive
X	X	0	Inactive
Active	Active	1	Active

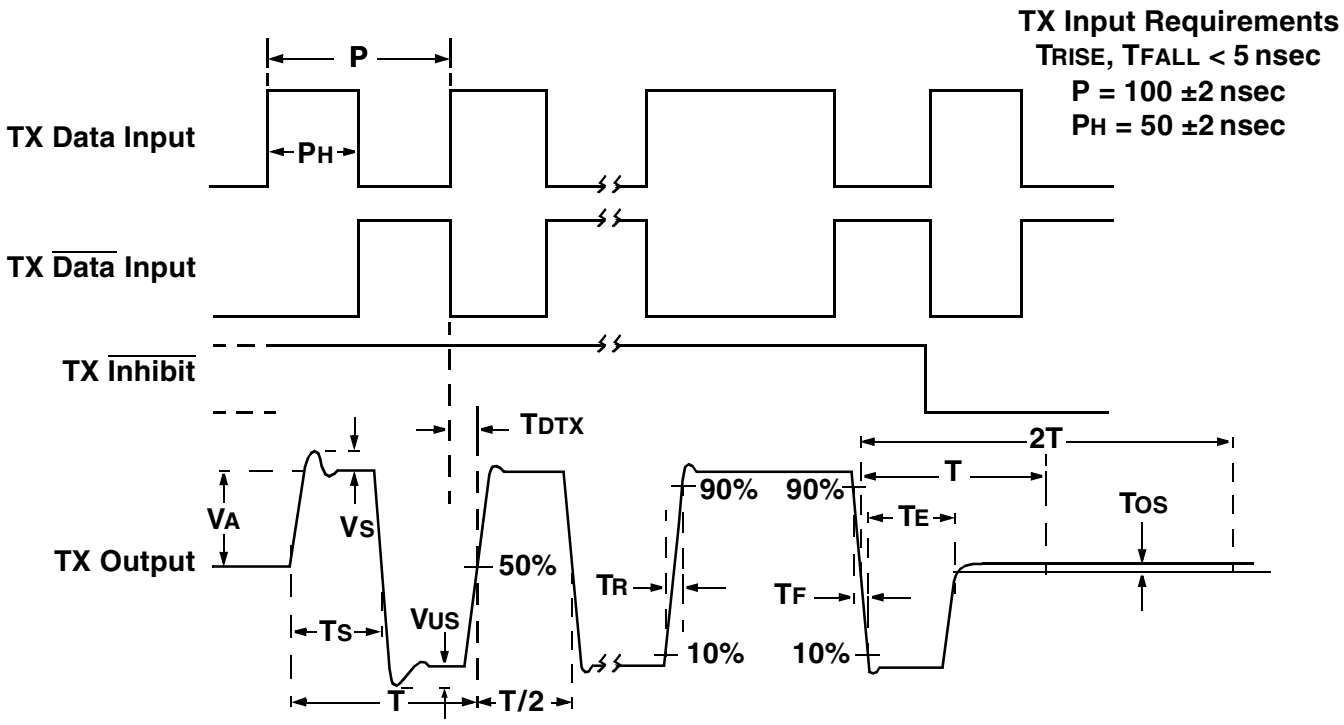


Figure 2 – Transmitter Logic Waveforms

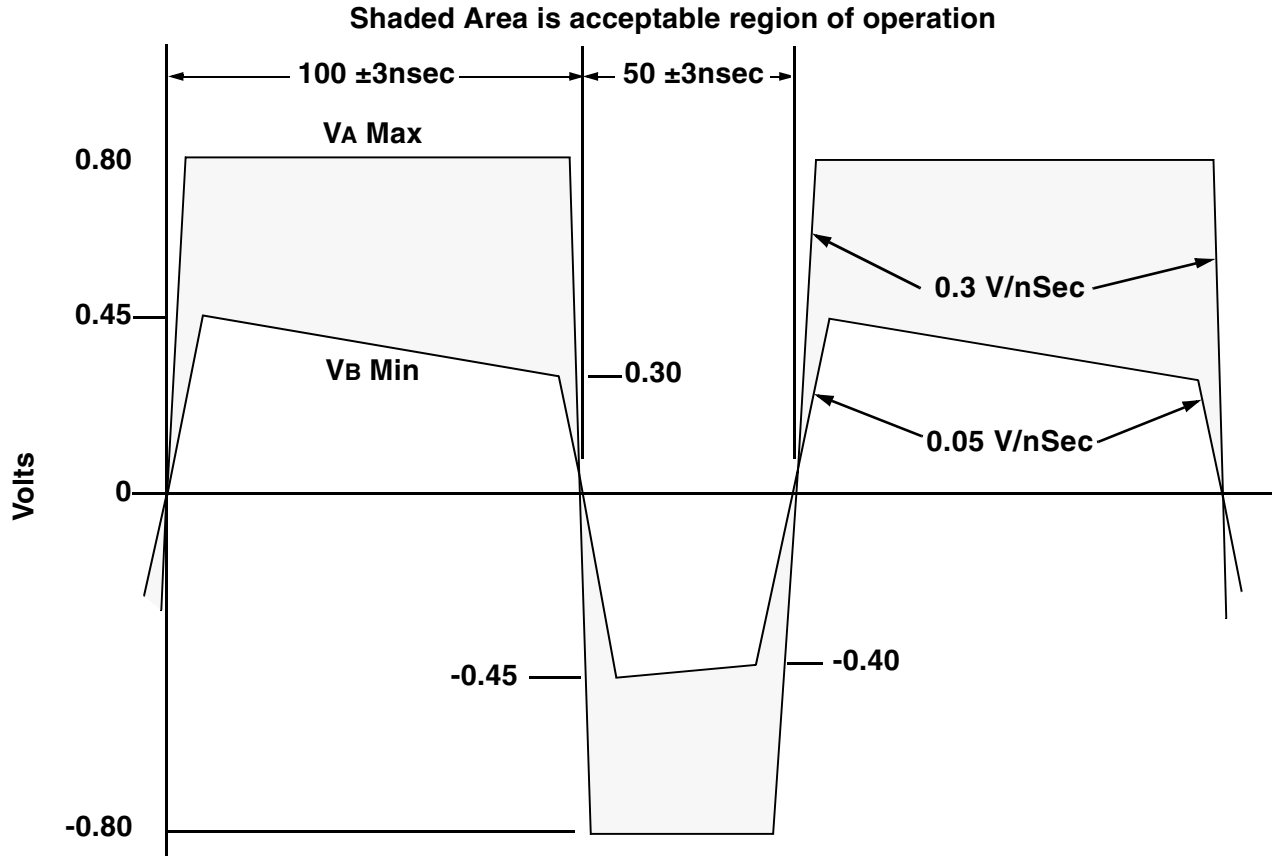


Figure 3 – Transmitter Waveshape Envelope

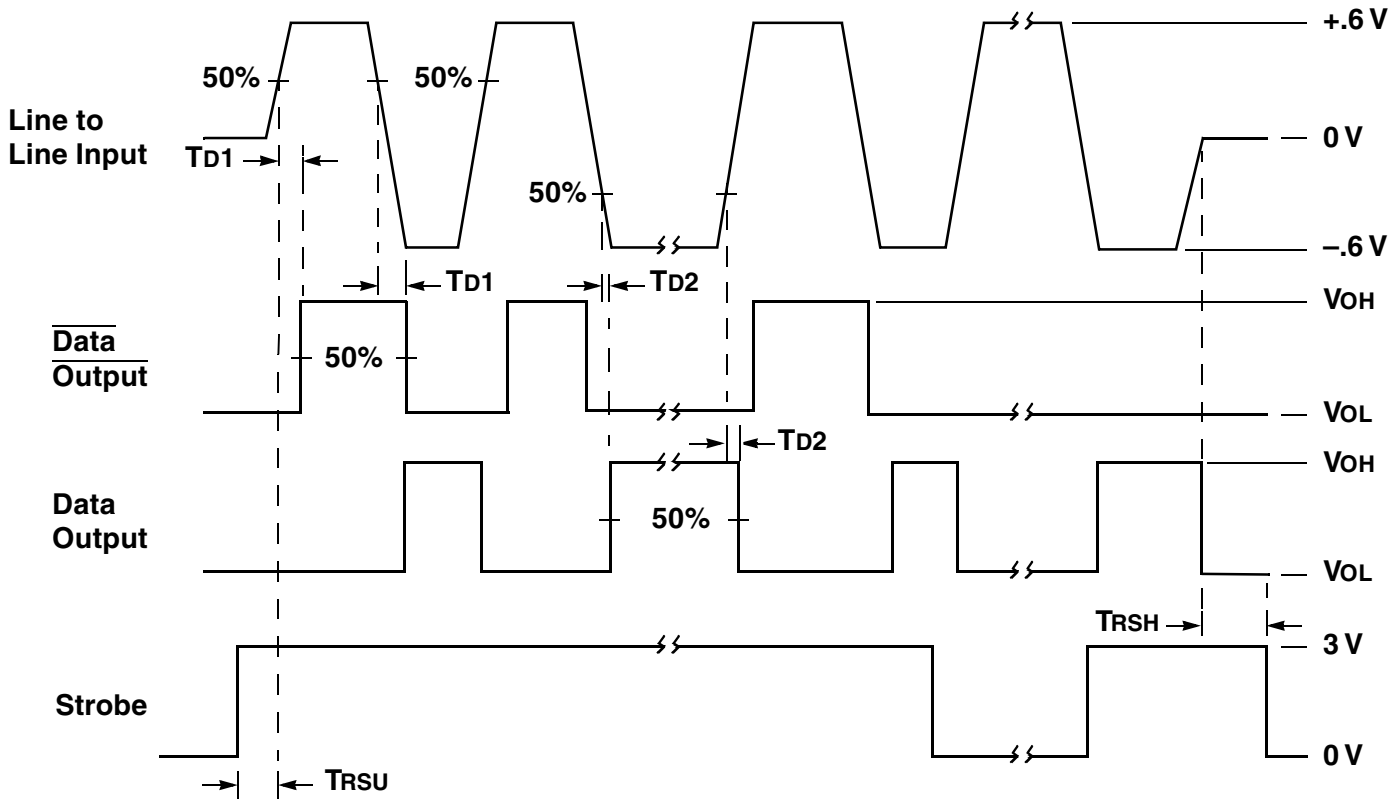


Figure 4 – Receiver Logic Waveforms

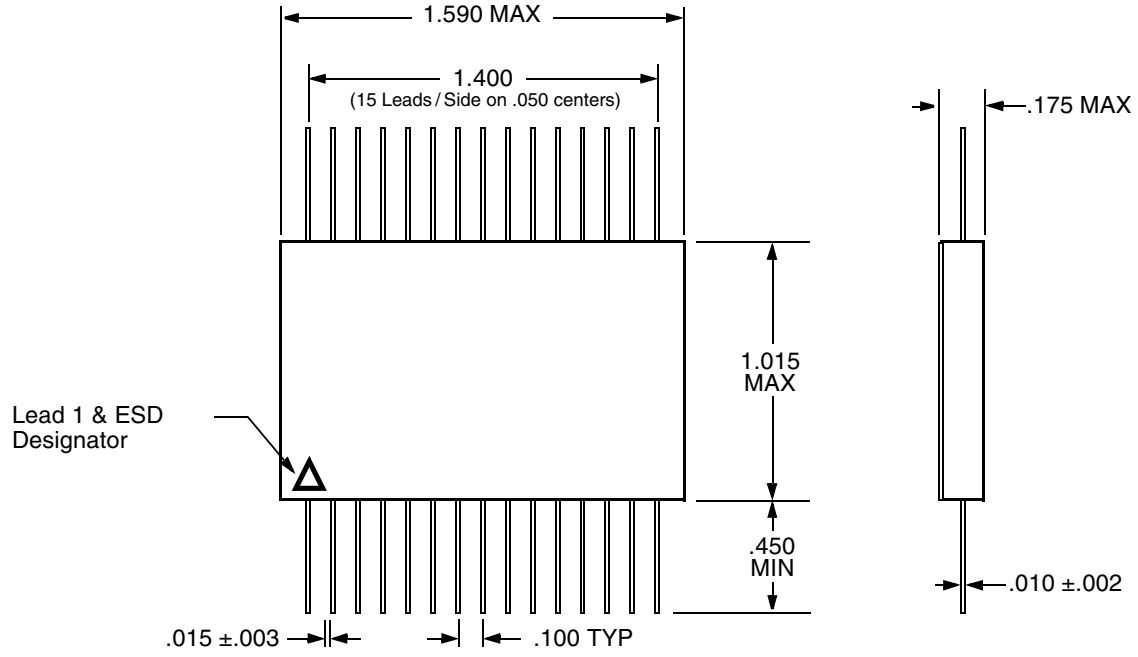
Pin #'s	Functions	Pin #'s	Functions
1	Vee (-5V)	16	XFMR PRIMARY / TX DATA OUTPUT
2	NC	17	XFMR SEC
3	NC	18	XFMR SEC / RX DATA INPUT
4	NC	19	NC
5	DIGITAL GND	20	NC
6	Vcc (+5V)	21	RECEIVER STROBE
7	RX DATA OUTPUT	22	TX DATA INPUT
8	RX $\overline{\text{DATA}}$ OUTPUT	23	TX $\overline{\text{INHIBIT}}$
9	NC	24	TX $\overline{\text{DATA}}$ INPUT
10	NC	25	DRIVE 2
11	NC	26	POWER CONDITIONER
12	CASE GND (ANALOG)	27	DRIVE 1
13	$\overline{\text{XFMR}}$ SEC / $\overline{\text{RX}}$ DATA INPUT	28	NC
14	$\overline{\text{XFMR}}$ SEC	29	NC
15	XFMR PRIMARY / TX $\overline{\text{DATA}}$ OUTPUT	30	NC

NC = No Connection

Ordering Information

Model Number	Package
CT1469-2	Flat Package

Flat Package Outline



Specifications subject to change without notice.

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