

CT1469-2

MIL-STD-1397 Type E 10MHz Transceiver

Features

- Low Level $\pm 0.65V$ 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

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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.

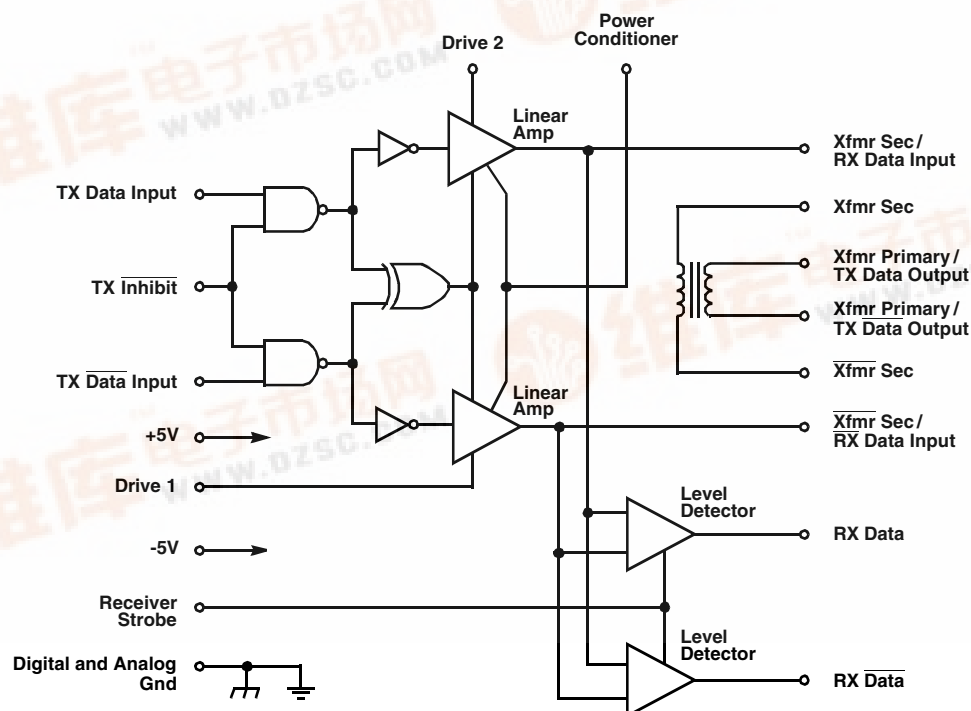


Figure 1 – Block Diagram

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		
V _{CC}	+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)

(VCC = 5V ±10%, VEE = -5V ±10%, TC = -55 °C to +100°C, unless otherwise specified)

SYMBOL	PARAMETER	LIMIT
RECEIVER STROBE (21) <u>1/</u>		
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

(VCC = 5V ±10%, VEE = -5V ±10%, TC = -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 1 ST 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)

(VCC = 5V $\pm$ 10%, VEE = -5V $\pm$ 10%, TC = -55 °C to +100°C, See Figure 2 and 3, unless otherwise specified)

Symbol	Parameter / Condition	Min	Max	Unit
Vs	Voltage overshoot	-	100	mV
VUS	Voltage undershoot	-	100	mV
TOS	Offset Voltage – 2T after last zero crossing	-	30	mV
TDTX	Delay from data input to transformer secondary	-	50	nsec
VN	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

(VCC = 5V $\pm$ 10%, VEE = -5V $\pm$ 10%, TC = -55 °C to +100°C, See Figure 4, unless otherwise specified)

Symbol	Parameter / Condition	Min	Max	Unit
VIN	Input signal to receiver	± 0.22	± 0.88	VPK
VCM	Common Mode Rejection DC to 1.0MHz 2.0MHZ to 20MHz	- -	20 5	VPK-TO-PK VPK-TO-PK
VT	Signal rejection No response to single ended signals	- -	10^{-9} ± 0.13	Volts-Seconds VPK
TD1	Delay from 50% point of positive input signal to 50% point of data output	-	30	nsec
TD2	Delay from 50% point of negative input signal to 50% point of data output	-	30	nsec
Vo	Output signal Complementary TTL drive capability of 2 TTL Loads	2.4 -	- 0.4	V V
TRSU	To input data, setup time Receiver Strobe Enable	5	-	nsec
TRSH	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

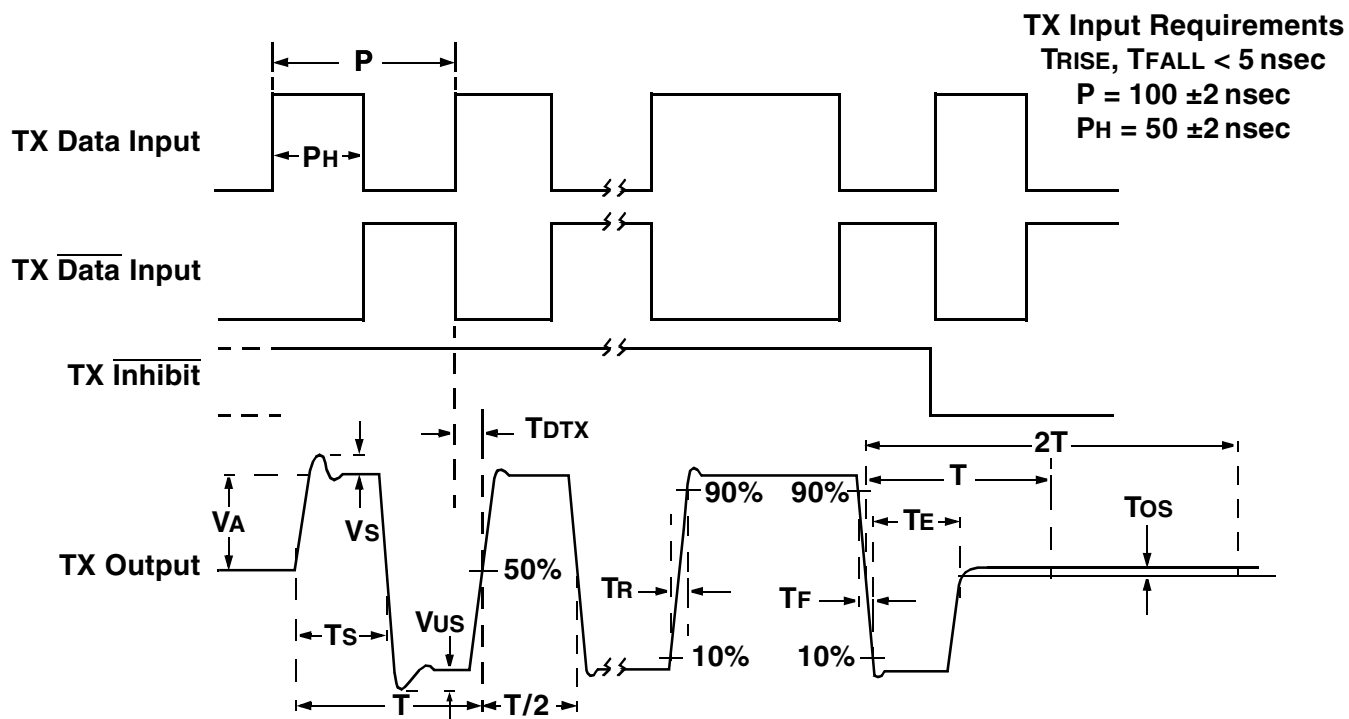


Figure 2 – Transmitter Logic Waveforms

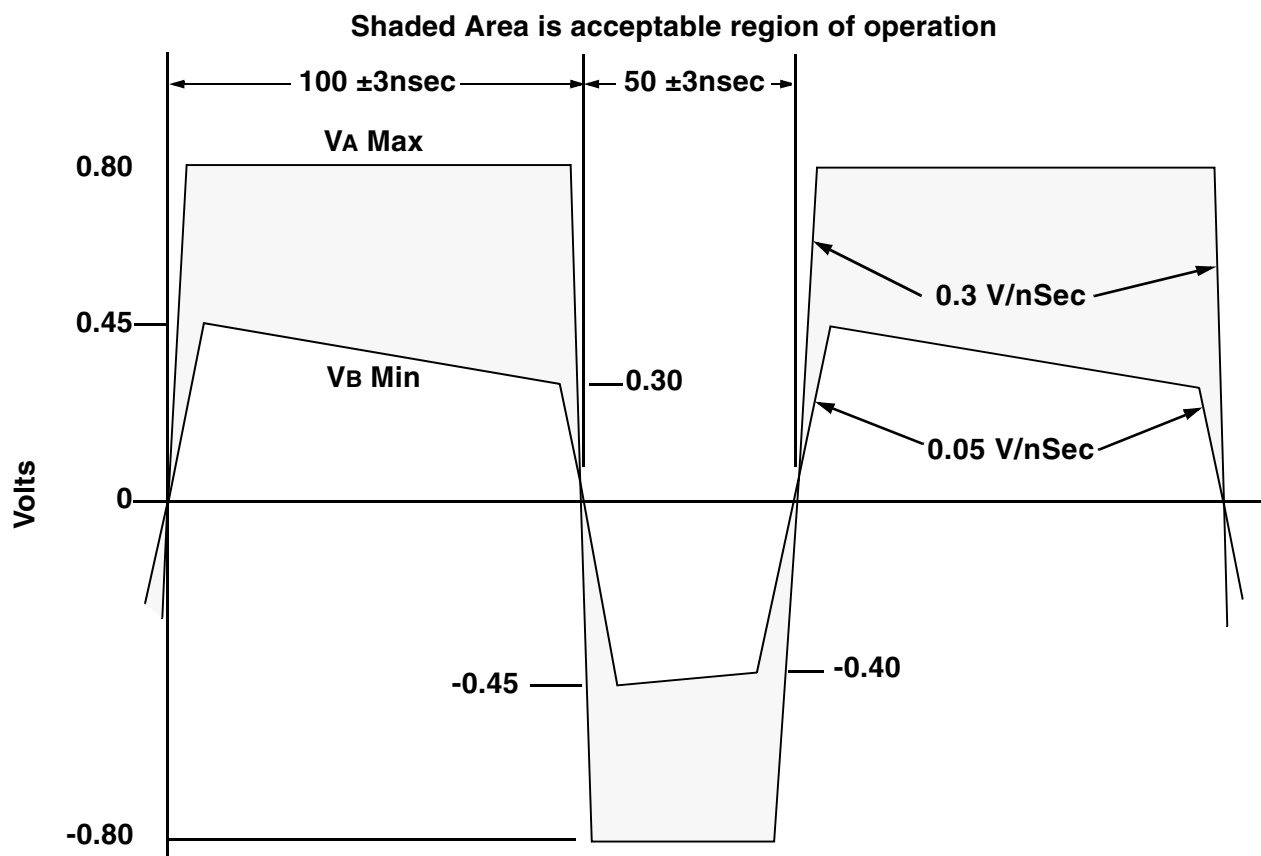


Figure 3 – Transmitter Waveshape Envelope

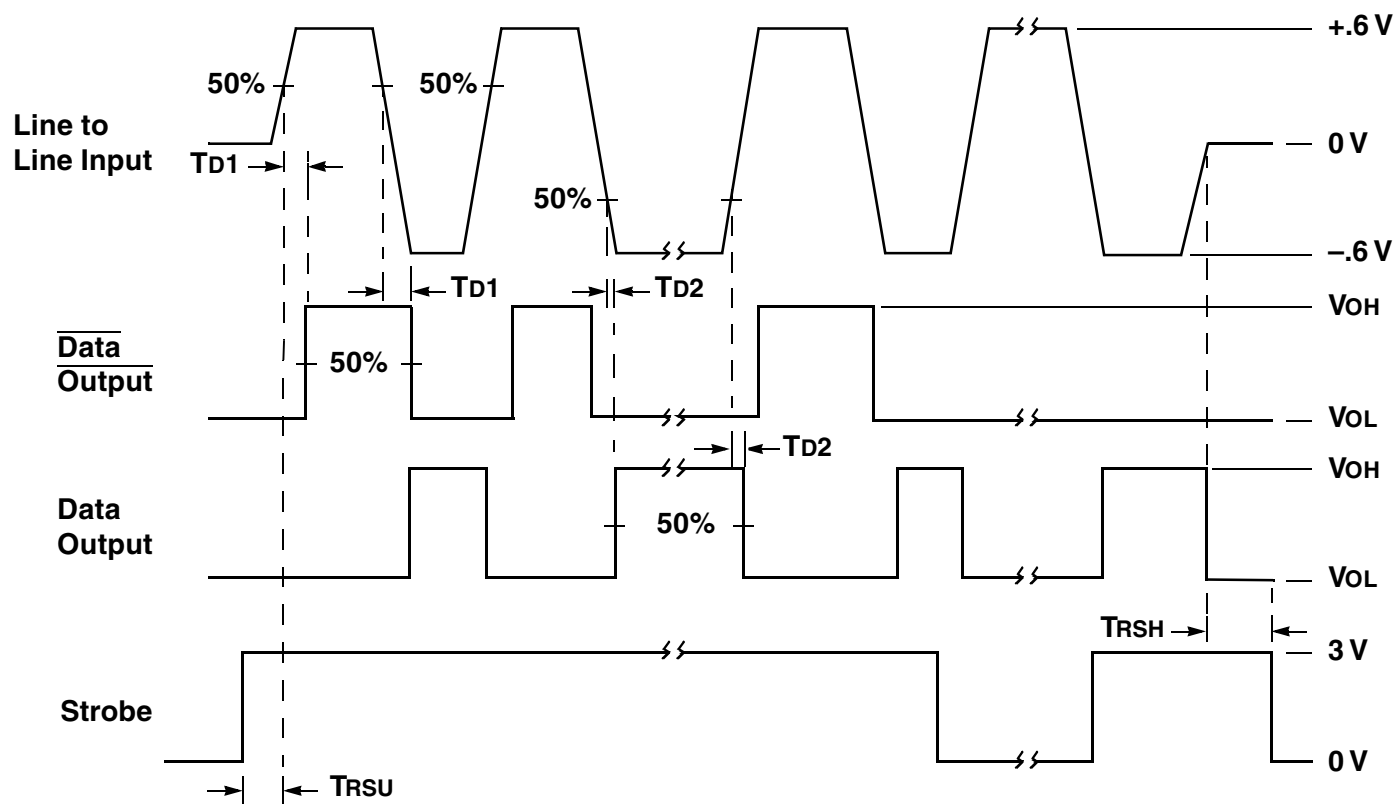


Figure 4 – Receiver Logic Waveforms

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

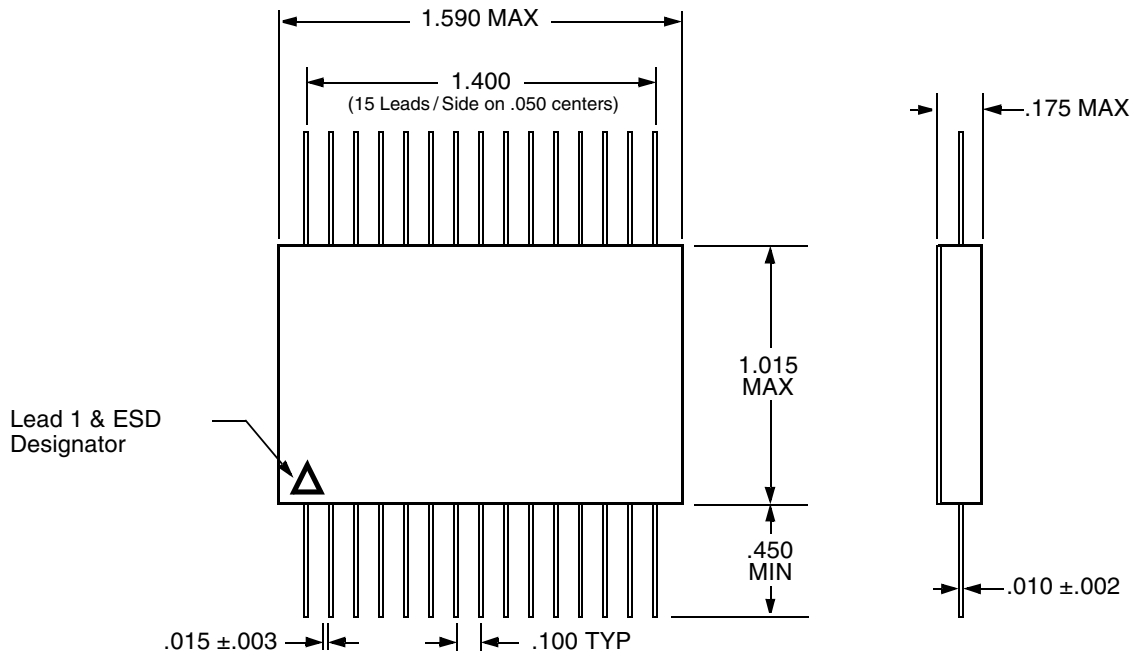
NC = No Connection



Ordering Information

Model Number	Package
CT1469-2	Flat Package

Flat Package Outline



Specifications subject to change without notice.

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