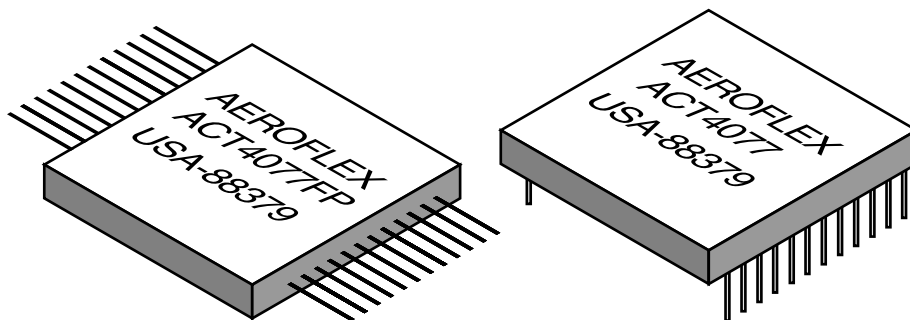


ACT4077 Driver for MACAIR A3818, A5690, A5232, A4905 & MIL-STD-1553

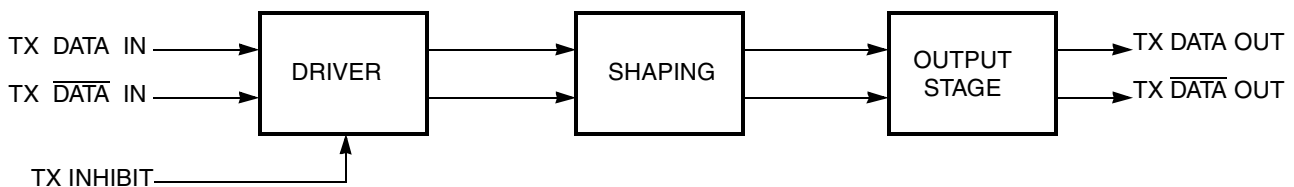


Features

- ACT4077 Driver meets MIL-STD-1553A & B, Macair A3818, A4905, A5232 and A5690 specs
- Bipolar Supply $\pm 15V$ to $\pm 12V$, Logic Supply +5V
- Direct replacement for CT2077 and CT3077
- Voltage source output for higher bus drive power
- Plug-in, flat package or low profile flat package
- Monolithic construction using linear ASICs
- Processed and screened to MIL-STD-883 specs
- MIL-PRF-38534 Compliant Devices Available



ACT4077 Driver



Block Diagram (without Transformer)

General Description

The Aeroflex Laboratories driver ACT4077 are new generation monolithic Drivers which provide full compliance with Macair and MIL-STD-1553 data bus requirements

The ACT4077 performs the front-end analog function of inputting and outputting data through a transformer to a MIL-STD-1553 or Macair data bus. The ACT4077 can be considered a "Universal" Driver in that it is compatible with MIL-STD-1553A, B, Macair A-3818, A-4905, A-5232 and A-5690.

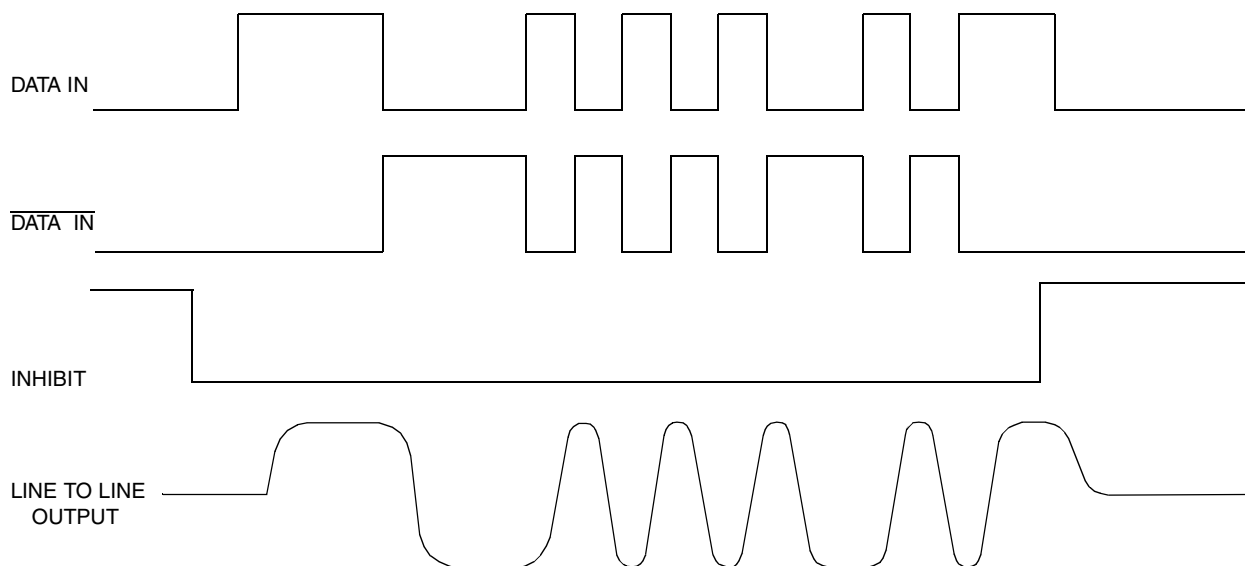
Design of the Driver reflects particular attention to active filter performance. This results in low bit and word error rate with superior waveform purity and minimal zero crossover distortion. The ACT4077 series active filter design has additional high frequency roll-off to provide the required Macair low harmonic distortion waveform without increasing the pulse delay characteristics significantly.

Efficient Driver electrical and thermal design provides low internal power dissipation and heat rise at high and well as low duty cycles.

The Driver section accepts bi-phase TTL data at the input and when coupled to the data bus with a 1:1 transformer, isolated on the data bus side with two 52.5 Ohm fault isolation resistors, and loaded by two 70 Ohm terminations plus additional receivers, the data bus signal produced is 7.0 Volts minimum P-P at A-A'. (See Figure 4.) When both DATA and $\overline{\text{DATA}}$ inputs are held low or high, the Driver output becomes a high impedance and is "removed" from the line. In addition, an overriding "INHIBIT" input provides for the removal of the Driver output from the line. A logic "1" applied to the "INHIBIT" takes priority over the condition of the data inputs and disables the Driver. (See Driver Logic Waveforms, Figure 1)

The Driver utilizes an active filter to suppress harmonics above 1 MHz to meet Macair specifications A-3818, A-4905, A-5232 and A-5690. The Driver may be safely operated for an indefinite period at 100% duty cycle into a data bus short circuit.

Figure 1 - Driver Logic Waveforms



- Notes:
1. Line to line waveforms illustrate Macair signals, MIL-STD-1553 signals are trapezoidal
 2. DATA and $\overline{\text{DATA}}$ inputs must be complementary waveforms or 50% duty cycle average, with no delays between them.
 3. DATA and $\overline{\text{DATA}}$ must be in the same state during off time (both high or low).

Absolute Maximum Ratings

Operating case temperature	-55°C to +125°C	
Storage Case Temperature	-65°C to +150°C	
Power Supply Voltages	±16 V	+7 V
Logic Input Voltage	-0.3 V to +5.5 V	
Receiver Differential Input	±40 V	
Receiver Input Voltage (Common Mode)	±10V	
Driver Peak Output Current	300 mA	
Total Package Power Dissipation over the Full Operating Case Temperature Range	3.6 Watts	
Maximum Junction to Case Temperature	18°C	
Junction-Case, Thermal Resistance	5°C/W	

Electrical Characteristics, Driver Section

Input Characteristics, TX DATA IN or TX DATA IN

Parameter	Condition	Symbol	Min	Typ	Max	Unit
"0" Input Current	$V_{IN} = 0.4 \text{ V}$	I_{ILD}	-	-0.2	-0.4	mA
"1" Input Current	$V_{IN} = 2.7 \text{ V}$	I_{IHD}	-	1.0	40	μA
"0" Input Voltage		V_{IHD}	-	-	0.7	V
"1" Input Voltage		V_{IHD}	2.0	-	-	V

Inhibit Characteristics

"0" Input Current	$V_{IN} = 0.4 \text{ V}$	I_{ILI}	-	-0.2	-0.4	mA
"1" Input Current	$V_{IN} = 2.7 \text{ V}$	I_{IHI}	-	1.0	40	μA
"0" Input Voltage		V_{ILI}	-	-	0.7	V
"1" Input Voltage		V_{IHI}	2	-	-	V
Delay from TX inhibit(0→1) to inhibited output	Note 1	t_{DXOFF}	-	300	450	nS
Delay from TX inhibit, (1→0) to active output	Note 1	t_{DXON}	-	300	450	nS
Differential output noise, inhibit mode		V_{NOI}	-	0.8	10	mVp-p
Differential output impedance (inhibited)	Note 2	Z_{OI}	2K	-	-	Ω

Output Characteristics

Differential output level	$R_L = 35 \text{ } \Omega$	V_O	7	7.5	9	Vp-p
Rise and fall times (10% to 90% of p-p output)		t_R & t_F	200	250	300	nS
Output offset at point A-A' on Fig 5., 2.5 μS after midpoint crossing of the parity bit of the last word of a 660 μS message	$R_L = 35 \text{ } \Omega$	V_{OS}			±90	mVpeak
Delay from 50% point of TX DATA or TX DATA input to zero crossing of differential signal. (Note 1)		t_{DTX}		240	300	nS

Power Data

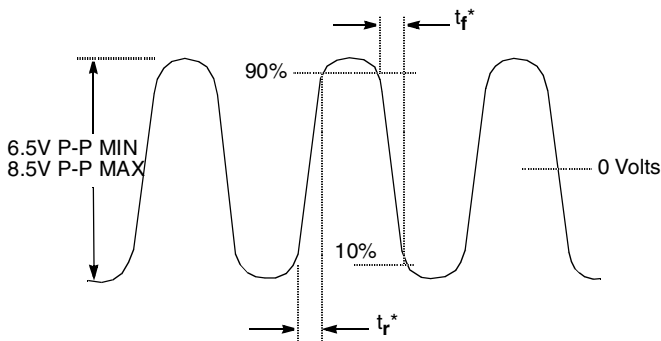
Power Supply Currents (Power Supplies set at +15V, -15V, +5V)

Parameter	Condition	Symbol	Min	Typ	Max	Unit
Driver Standby		I _{CC}		15	30	mA
		I _{EE}		27	50	
		I _L		13	20	
25% duty cycle		I _{CC}		34	50	
		I _{EE}		50	80	
		I _L		14	20	
50% duty cycle		I _{CC}		50	80	
		I _{EE}		70	100	
		I _L		14	20	
100% duty cycle		I _{CC}		110	140	
		I _{EE}		120	150	
		I _L		13	20	

Recommended Power Supply Voltage Range

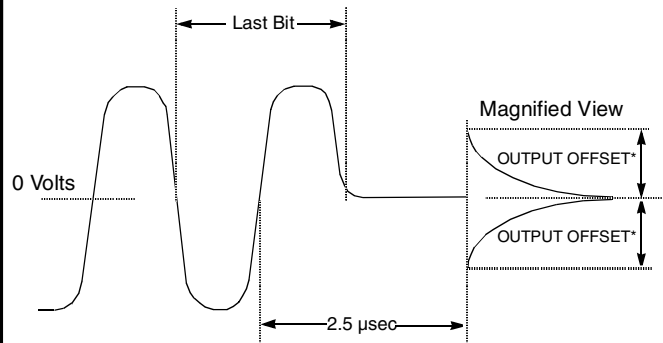
+V	+11.4 Volts to +15.75 Volts
-V	-11.4 Volts to -15.75 Volts
Logic	+4.5 Volts to +5.5 Volts

Figure 2 - Driver (TX) Output Wave form



* Rise and fall times measured at point A-A' in Fig 5

Figure 3 - Driver (TX) Output offset



*Offset measured at point A-A' in Fig 5

Figure 4 - Typical Transformer connection

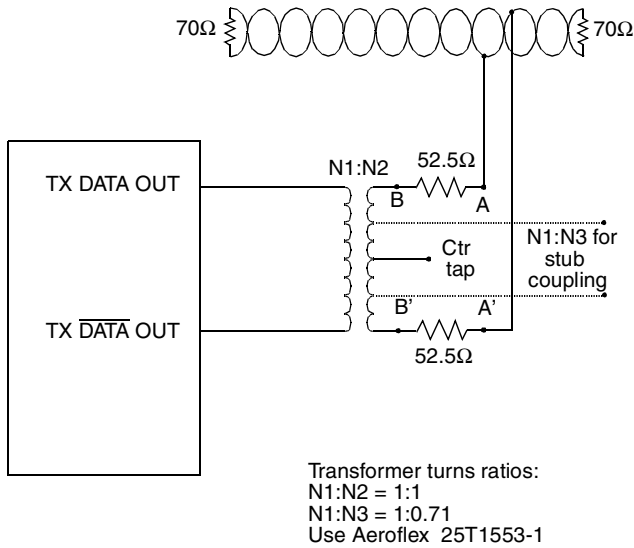
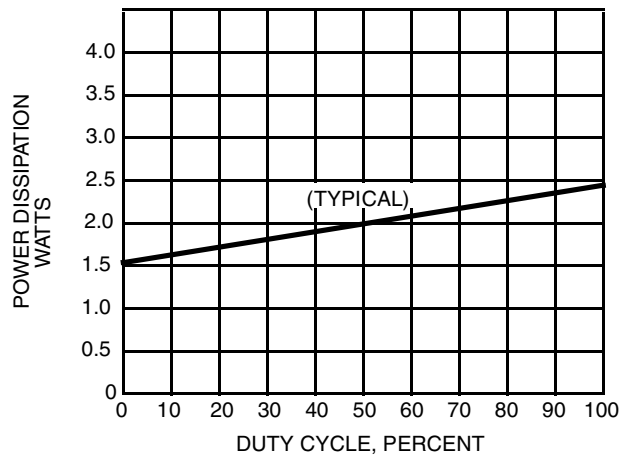


Figure 5 - Power Dissipation vs. Duty Cycle



Notes:

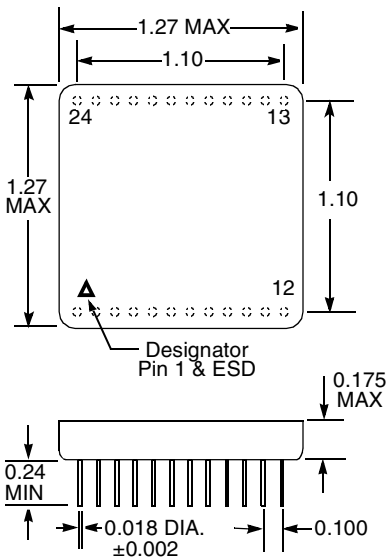
1. Characteristics guaranteed by design, not production tested.
2. Measured from 75KHz to 1MHz at point A-A', power on or off.
3. Specifications apply over the temperature range of -55°C to +125°C (case temperature) unless otherwise noted.
4. All typical values are measured at +25°C

The information contained in this data sheet is believed to be accurate; however, Aeroflex Circuit Technology. assumes no responsibility for its use, and no licence or rights are granted by implication or otherwise in connection therewith.

Ordering Information

Model No.	Case
ACT4077	Plug In
ACT4077-FP	Flat Pack

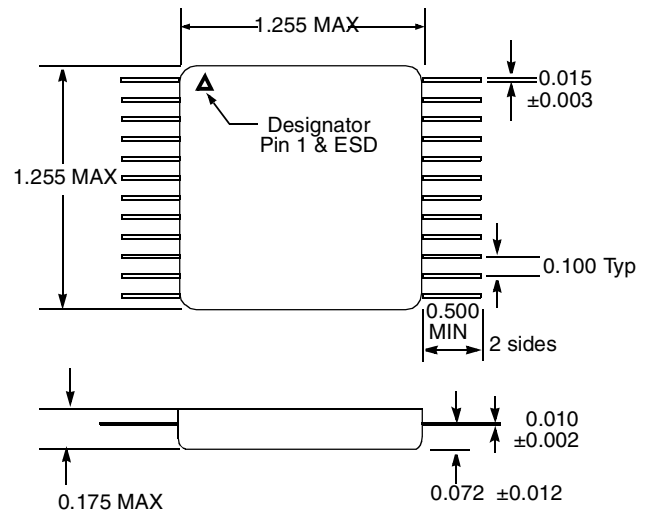
PLUG-IN PACKAGE



Pin #'s & Functions

1	+15V (TX)
2	NC
3	TX DATA IN
4	TX GND (+5V)
5	TX INHIBIT
6	+5V
7	TX DATA IN
8	NC
9	CASE GND
10	GND
11	NC
12	-15V (TX)
13	NC
14	NC
15	NC
16	TX DATA OUT
17	NC
18	NC
19	NC
20	NC
21	TX DATA OUT
22	NC
23	NC
24	NC

FLAT PACKAGE



Notes 1. Dimensions shown are in inches
2. Pins are equally spaced at 0.100±0.002 tolerance non-cumulative each row.

Specifications subject to change without notice

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