Standard Products
ACT4485 Dual RS485 Interface Transceiver
Radiation Tolerant

www.aeroflex.com/RadHard
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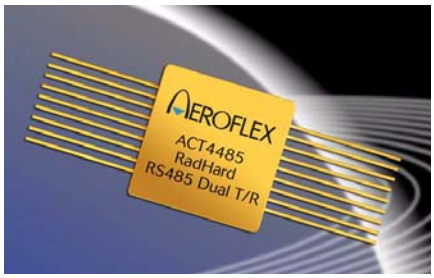


FEATURES

- Radiation Performance
  - Total dose ≥ 100 krad (Si)
- Designed for RS485 Interface Applications
- Single +5V supply
- +5V to -7V Bus common mode range source output
- Driver maintains high impedance in three-state or with the power off
- Combined Impedance of a driver output and receiver allows up to 32 transceivers on the bus
- 200 mV typical input hysteresis
- Voltage source output
- Receiver output Hi for Vin Diff = 0V
- < 5ns skew between BUS and BUSN complementary outputs
- 0.63"sq. x 0.125"ht, 18 lead, hermetic flat package
- Monolithic construction
- Designed for commercial, industrial and aerospace applications
- Plainview is a Class H & K MIL-PRF-38534 manufacturer

Note: Aeroflex Plainview does not currently have a DSCC certified Radiation Hardened Assurance Program.

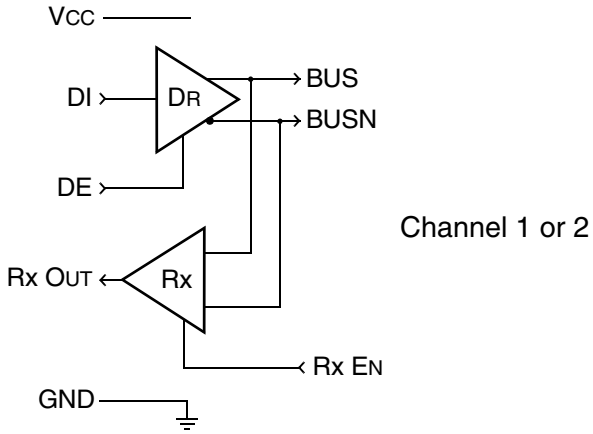


FIGURE 1 – SCHEMATIC

GENERAL DESCRIPTION

The Aeroflex-Plainview ACT4485 is a monolithic dual bus/line transceiver designed for multipoint data transmission standard RS485 applicatons. The ACT4485 meets TIA/EIA -485 requirements. The receiver has a fail-safe feature which guarantees a high output state when the BUS is open or shorted.

ABSOLUTE MAXIMUM RATINGS

Operating Case Temperature	-55°C to +125°C
Storage Case Temperature	-65°C to +150°C
Power Supply Voltages (V_{CC})	+12V_{DC}
Control Input Voltage	-0.5 V_{DC} to Vcc + 0.5V_{DC}
Driver Input Voltage	-0.5 V_{DC} to Vcc + 0.5V_{DC}
Driver Output Voltage	±5V
Receiver Input Voltage	±5V
Receiver Output Voltages	-0.5 V_{DC} to Vcc + 0.5V_{DC}

ELECTRICAL CHARACTERISTICS 1/ 2/

Parameter	Condition	Symbol	Min	Typ	Max	Unit
Differential driver output voltage (unloaded)	$I_O = 0$	V_{OD1}	2.5	-	5	Vp-p
Differential driver output voltage (with load)	See Figure 2	V_{OD2}	2.5	-	5	Vp-p
Change in magnitude of driver differential output Voltage for complementary states		ΔV_{OD}	-	-	0.2	Vp-p
Driver common mode output voltage		V_{OC}	-	2.55	3	V
Change in magnitude of driver common-mode output Voltage for complementary states		$\Delta\lvert V_{OC}\rvert$	-	-	0.2	V
Input high voltage	DE, DI, $\overline{RE}$	V_{IH}	2.4	-	-	V
Input low voltage		V_{IL}		-	0.8	V
Input current		I_{IN}		±1	±2	µA
Differential input threshold voltage for receiver	-6.5V ≤ V_{CM} ≤ +5V	V_{TH}	-0.5		-0.1	V
Receiver input hysteresis	$V_{CM} = 0$	ΔV_{TH}	-	160	400	mV
Receiver output high voltage	$I_O = 4mA$	V_{OH}	4.0	-	-	V
Receiver output low voltage	$I_O = -4mA$	V_{OL}	-	-	0.5	V
Receiver threshold	-	R_X THLD	-500	-400	-100	mVp
Receiver input differential resistance	-	RIN_{DIFF}	30K	-	-	Ω
Receiver input common-mode resistance	-	RIN_{CM}	8K	-	-	Ω
Driver short-circuit current	-	I_{OS}	70	100	140	mA
Receiver short-circuit current	V_{OH} to GND or V_{OL} to Vcc	I_{OSR}	7	22	85	mA

STATIC DC POWER SUPPLY CURRENTS

Parameter	Conditions	Sym	Min	Typ	Max	Unit
Supply current	See Below Table	I_{CC1}	-	8.2	-	mA
		I_{CC2}	-	21.3	-	mA
		I_{CC3}	-	43	-	mA

Channel 2 (1) Outputs	Channel 1 (2) Outputs					Note
	DE	DI	RE	DRVout	Load	
All disabled	0V	X	0V	HiZ	X	Icc1
	5V	X	0V	LoZ	NL	Icc2
	5V	X	0V	LoZ	60Ω	Icc3

X = Hi/Lo, 0V = GND, 5V = 5V_{DC}, HiZ = high impedance, LoZ = low impedance, NL = No Load

SWITCHING CHARACTERISTICS 1/ 2/

Parameter	Condition	Symbol	Min	Typ	Max	Unit
Driver input to output delay	R_{DIFF} = 60Ω See test ckt Figure 2	t_{PLH}	-	125	200	nS
Driver input to output delay		t_{PHL}	-	80	150	nS
Driver output to output delay		t_{SKEW}	-	1	5	nS
Driver rise or fall time		t_r, t_f	-	80	150	nS
Driver Output enable delay		t_{ZH}	-	200	250	nS
Driver Output disable delay		t_{LZ}	-	230	300	nS
Receiver input to output delay	I_O = 0 See test ckt Figure 2	t_{PLH}	-	40	100	nS
		t_{PHL}	-	60	100	nS
Receiver rise or fall time		t_r, t_f	-	36	50	nS
Receiver enable delay		t_{ZL}	-	100	150	nS
Receiver disable delay		t_{ZH}	-	50	150	nS

Notes:
1. Min/Max values are for V_{CC} = +5V ±5%, T_C = -55°C to +125°C. Typical values are measured at V_{CC} = +5V and T_C = +25°C.
2. Current measurements are for both channels.

DRIVER FUNCTION TABLE

Inputs		Outputs	
DI	DE	BUS	BUSN
H	H/OPEN	H	L
L	H/OPEN	L	H
X	L	OFF HiZ	OFF HiZ

RECEIVER FUNCTION TABLE

DIFF Input	RE	Output
> -100mV	L	H
< -500mV	L	L
-500mV < V_{ID} < -100mV	L	H
X	H/OPEN	H
OPEN	X	H
SHORT	X	H

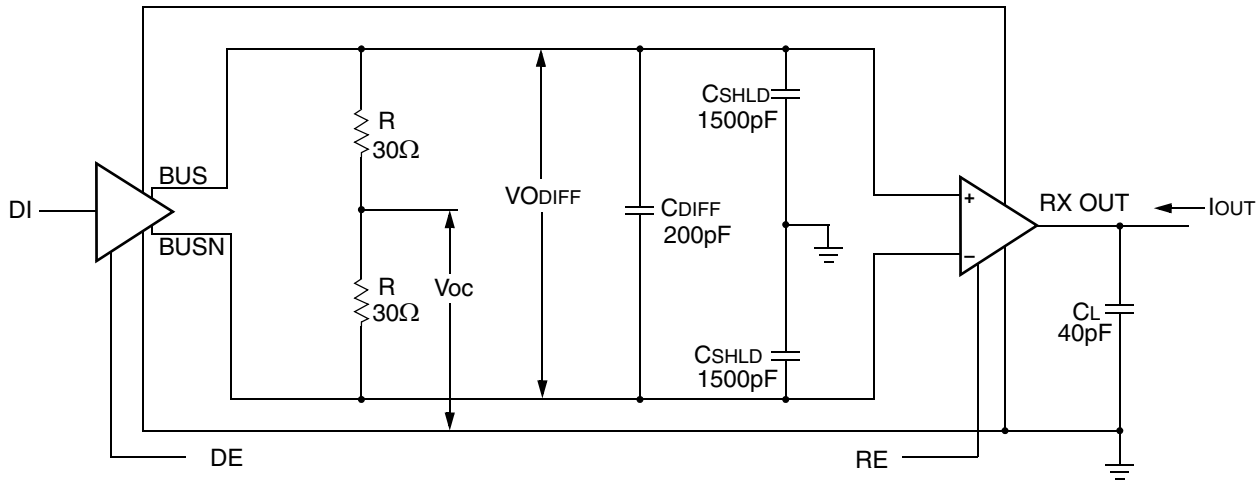


FIGURE 2 – DRIVER/RECEIVER TIMING TEST CIRCUIT (Channel 1 or 2)

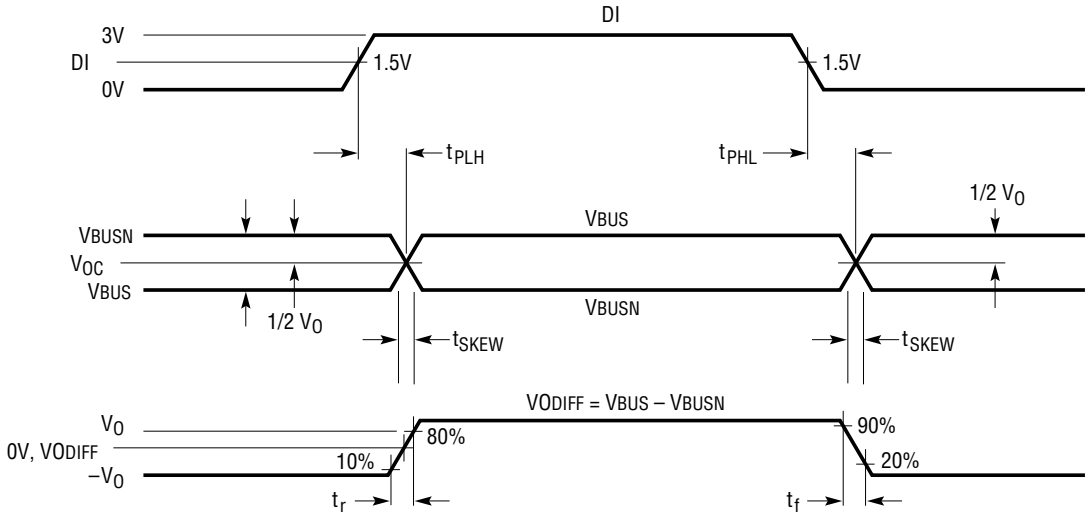


FIGURE 3 – DRIVER SWITCHING WAVEFORMS

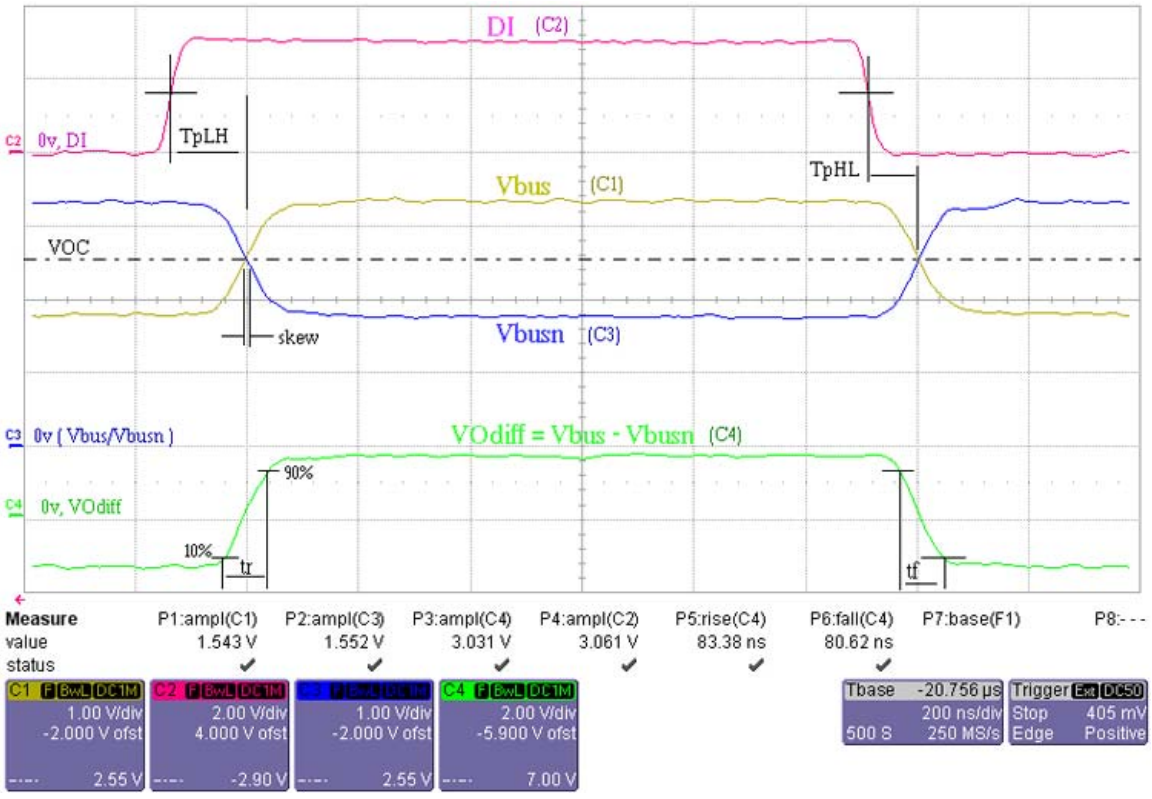


FIGURE 3A – TYPICAL DRIVER OUTPUTS

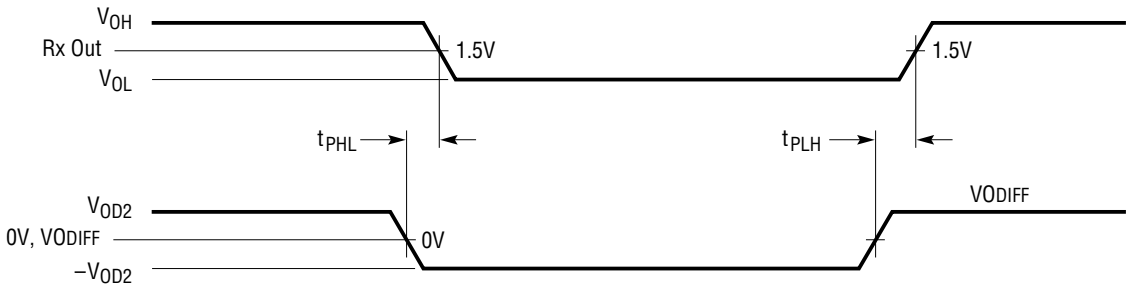


FIGURE 4 – RECEIVER SWITCHING WAVEFORMS

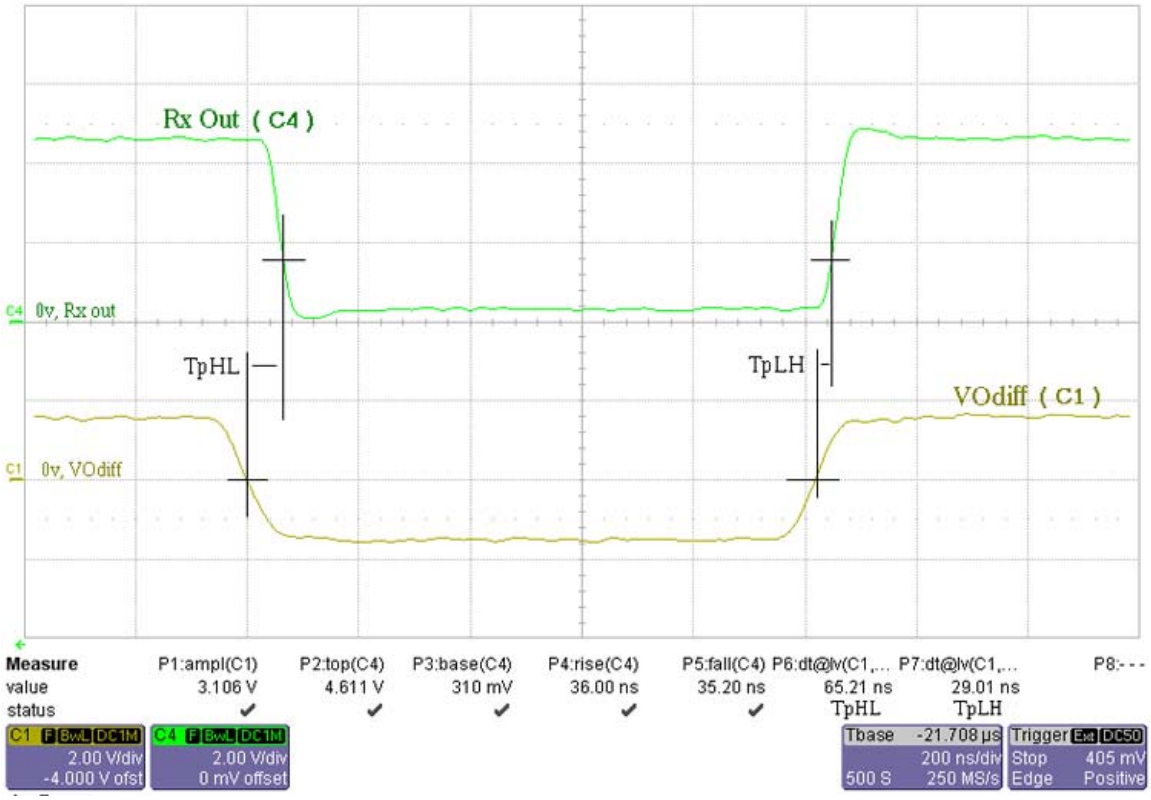
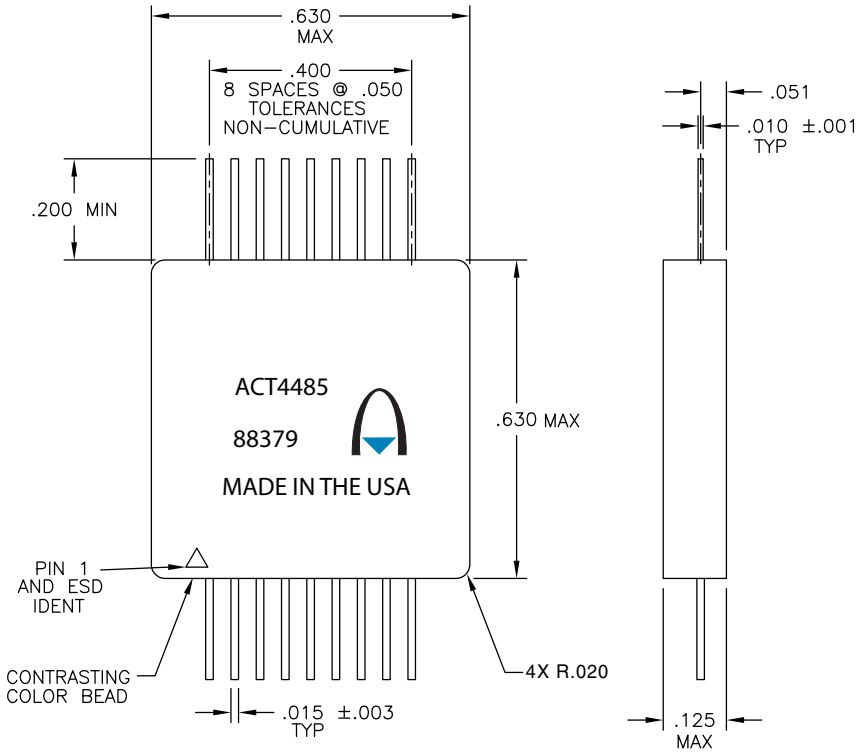


FIGURE 4A – TYPICAL RECEIVER OUTPUTS



PACKAGE CONFIGURATION OUTLINE

Pin #	Function	Pin #	Function
1	DRIVER ENABLE 1	10	VCC
2	RECEIVER ENABLE 1	11	GROUND
3	RECEIVER OUT 1	12	BUS 2
4	NC	13	BUSN 2
5	DRIVER IN 1	14	DRIVER IN 2
6	BUSN 1	15	NC
7	BUS 1	16	RECEIVER OUT 2
8	GROUND	17	RECEIVER ENABLE 2
9	VCC	18	DRIVER ENABLE 2

PIN # vs FUNCTION TABLE

CONFIGURATIONS AND ORDERING INFORMATION

Model No.	Specifications	Case
ACT4485-S	Military Temperature, -55°C to +125°C Screened in accordance with MIL-PRF-38534, Class K	Flat Pack
ACT4485-7	Commercial Flow, +25°C testing only	

EXPORT CONTROL:

This product is controlled for export under the International Traffic in Arms Regulations (ITAR). A license from the U.S. Department of State is required prior to the export of this product from the United States.

EXPORT WARNING:

Aeroflex's military and space products are controlled for export under the International Traffic in Arms Regulations (ITAR) and may not be sold or proposed or offered for sale to certain countries. (See ITAR 126.1 for complete information.)

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