

Standard Products

DRS4485 Dual RS485 Interface Transceiver

Radiation Tolerant

www.aeroflex.com/RadHard

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A passion for performance.

FEATURES

- Radiation Performance
 - Total dose ≥ 100 krad (Si)
- Designed for RS485 and RS422 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
- Serial data rate 500KHz maximum
- Voltage source output
- Receiver output Hi for V_{IN} 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
- Aeroflex Plainview's Radiation Hardness Assurance Plan is Certified by DLA Land and Maritime.

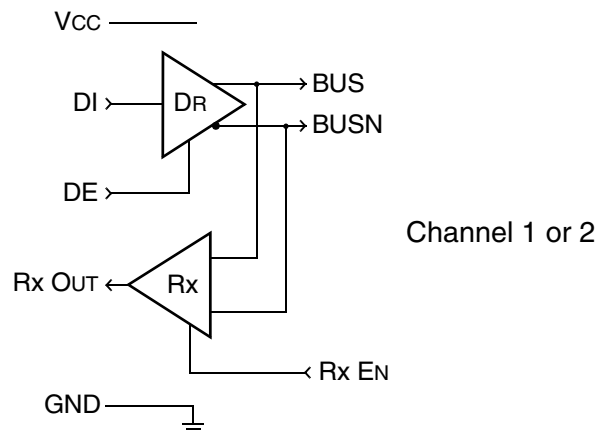


FIGURE 1 – SCHEMATIC

GENERAL DESCRIPTION

The Aeroflex-Plainview DRS4485 is a monolithic dual bus/line transceiver designed for multipoint data transmission standard RS485 applications. The DRS4485 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 (VCC)	+12VDC
Control Input Voltage	-0.5 VDC to Vcc + 0.5VDC
Driver Input Voltage	-0.5 VDC to Vcc + 0.5VDC
Driver Output Voltage	±5V
Receiver Input Voltage	±5V
Receiver Output Voltages	-0.5 VDC to Vcc + 0.5VDC

ELECTRICAL CHARACTERISTICS 1/ 2/

Parameter	Condition	Symbol	Min	Typ	Max	Unit
Differential driver output voltage (unloaded)	$I_O = 0$	V_{OD1}	2.5	3.0	5	Vp-p
Differential driver output voltage (with load)	See Figure 2	V_{OD2}	2.5	3.0	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		ΔV_{OC}	-	-	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	$-6.5V \leq V_{CM} \leq +5V$	V_{TH}	-0.5	-0.2	-0.1	V
Receiver input hysteresis 3/	$V_{CM} = 0$	ΔV_{TH}	-	160	400	mV
Receiver output high voltage	$I_O = -0.4mA$	V_{OH}	4.0	-	-	V
Receiver output low voltage	$I_O = 0.4mA$	V_{OL}	-	-	0.5	V
Receiver input differential resistance 3/	-	R_{IN_DIFF}	30K	-	-	Ω
Receiver input common-mode resistance 3/	-	R_{IN_CM}	8K	-	-	Ω
Driver short-circuit current	-	I_{OS}	50	80	140	mA
Receiver short-circuit current	V_{OH} to GND or V_{OL} to Vcc	I_{OSR}	7	50	85	mA

STATIC DC POWER SUPPLY CURRENTS

Input Conditions			Driver Output Conditions		Sym	Min	Typ	Max	Unit	Channel Conditions			
DE	DI	RE	Output State	Output Load						Channel 1		Channel 2	
										Driver	Receiver	Driver	Receiver
0V	X	5V	HiZ	X	I_{CC1}	-	10	16	mA	Disabled	Disabled	Disabled	Disabled
5V	X	0V	LoZ	NL	I_{CC2}	-	29	40	mA	Enabled	Enabled	Disabled	Disabled
5V	X	0V	LoZ	60 Ω	I_{CC3}	-	50	65	mA	Enabled	Enabled	Disabled	Disabled

DE=Driver En, DI=Driver In, RE=Receiver En X=HiLo. 0V=GND. 5V= V_{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}	-	4	15	nS
Driver rise or fall time		t _r , t _f	-	100	150	nS
Driver Output enable delay		t _{ZH}	-	160	250	nS
Driver Output disable delay		t _{LZ}	-	220	350	nS
Receiver input to output delay	I _O = 0 See test ckt Figure 2 C _L = 15pF	t _{PLH}	-	80	150	nS
Receiver input to output delay		t _{PHL}	-	90	150	nS
Receiver rise or fall time		t _r , t _f	-	26	50	nS
Receiver enable delay		t _{ZL}	-	90	150	nS
Receiver disable delay		t _{ZH}	-	120	150	nS

Notes:

1. Min/Max values are for VCC = +5V ±5%, TC = -55°C to +125°C. Typical values are measured at VCC = +5V and TC = +25°C.
2. Current measurements are for both channels.
3. Not tested, guaranteed by design to the specified limits.

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
X	H/OPEN	H
OPEN	X	H
SHORT	X	H

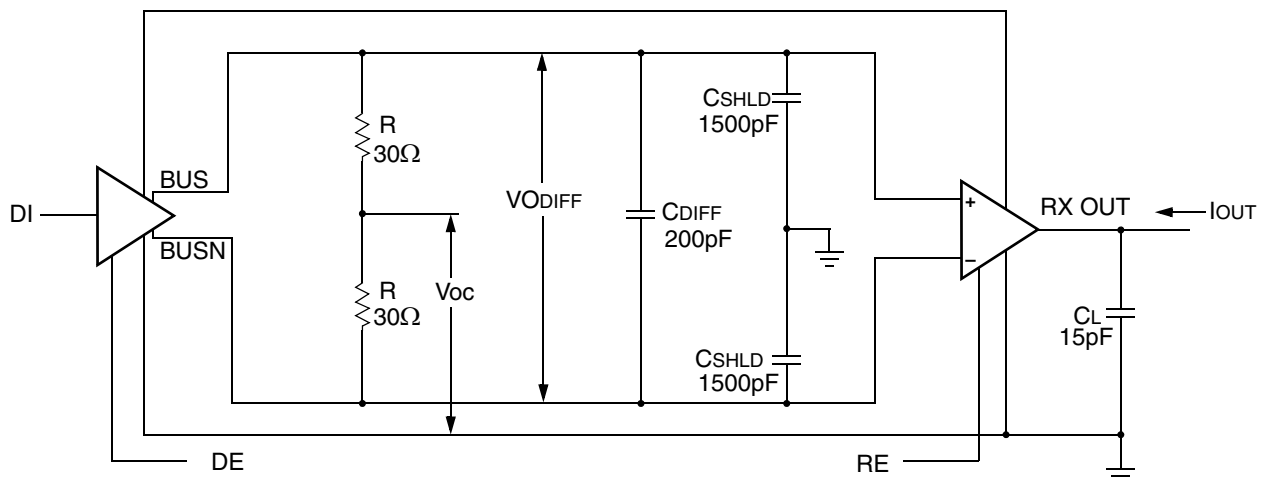


FIGURE 2 – DRIVER/RECEIVER TIMING TEST CIRCUIT (Channel 1 or 2)

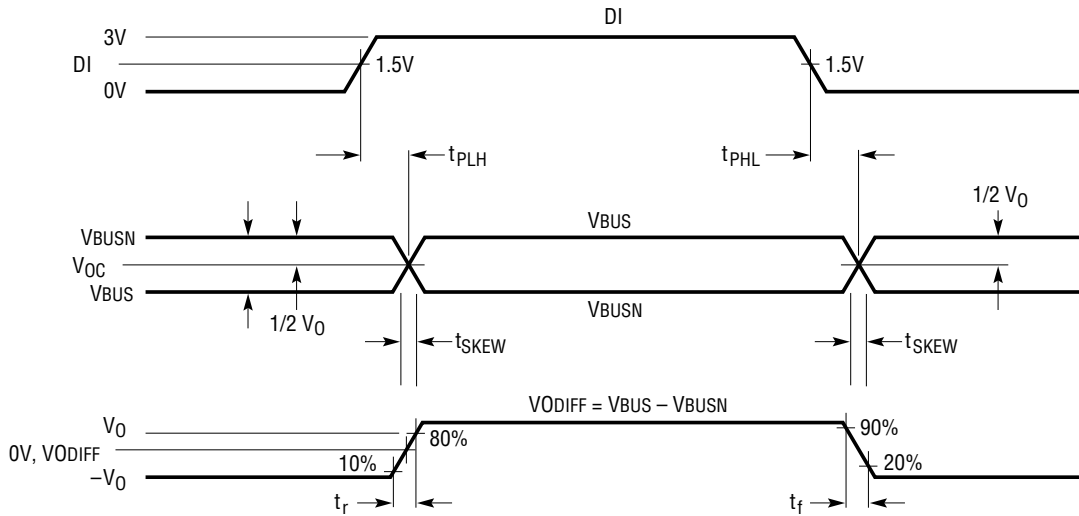


FIGURE 3 – DRIVER SWITCHING WAVEFORMS

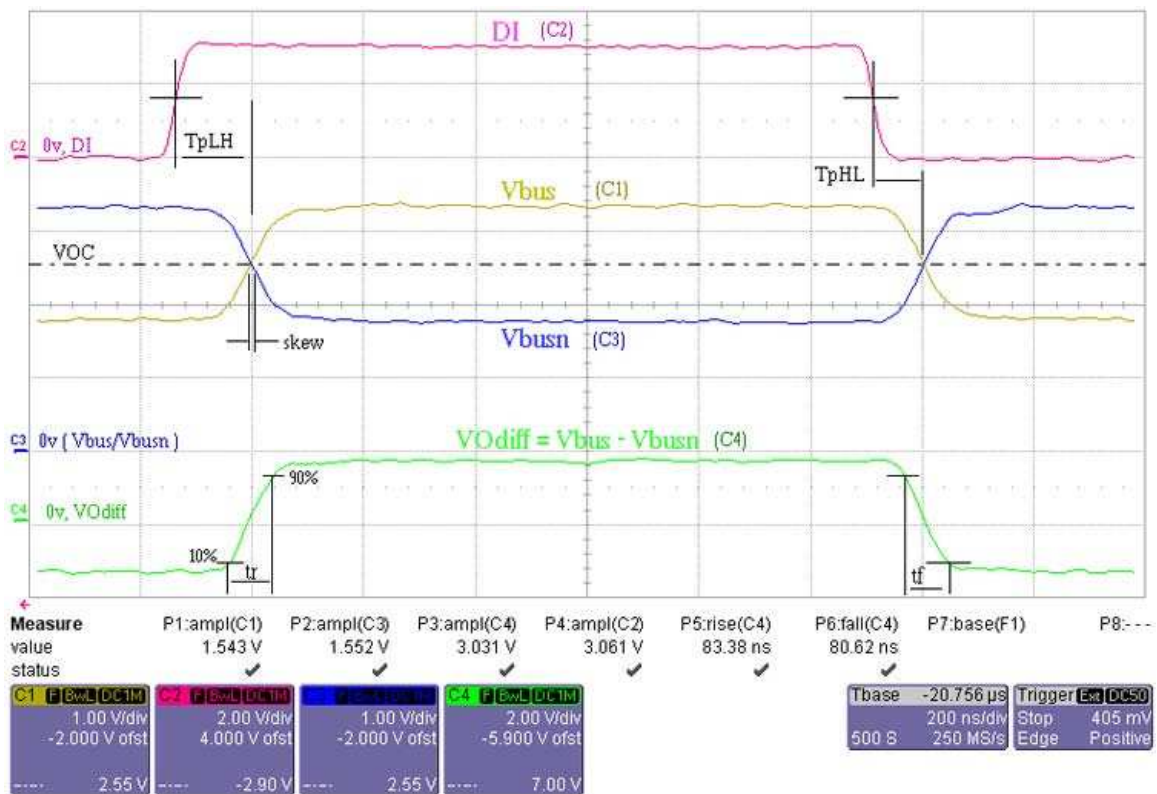


FIGURE 3A – TYPICAL DRIVER OUTPUTS

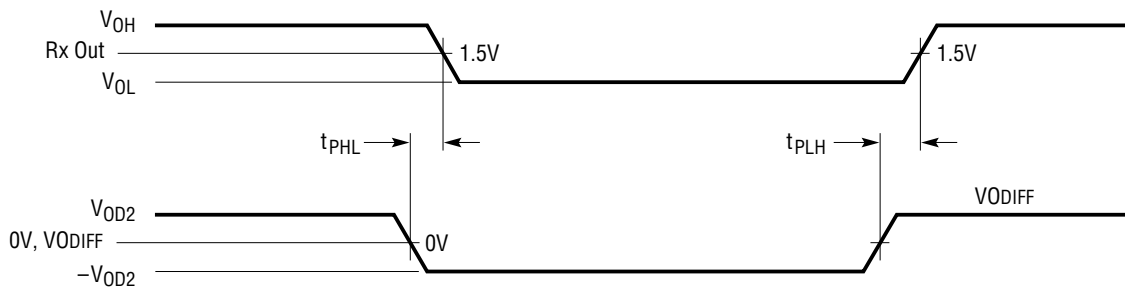


FIGURE 4 – RECEIVER SWITCHING WAVEFORMS

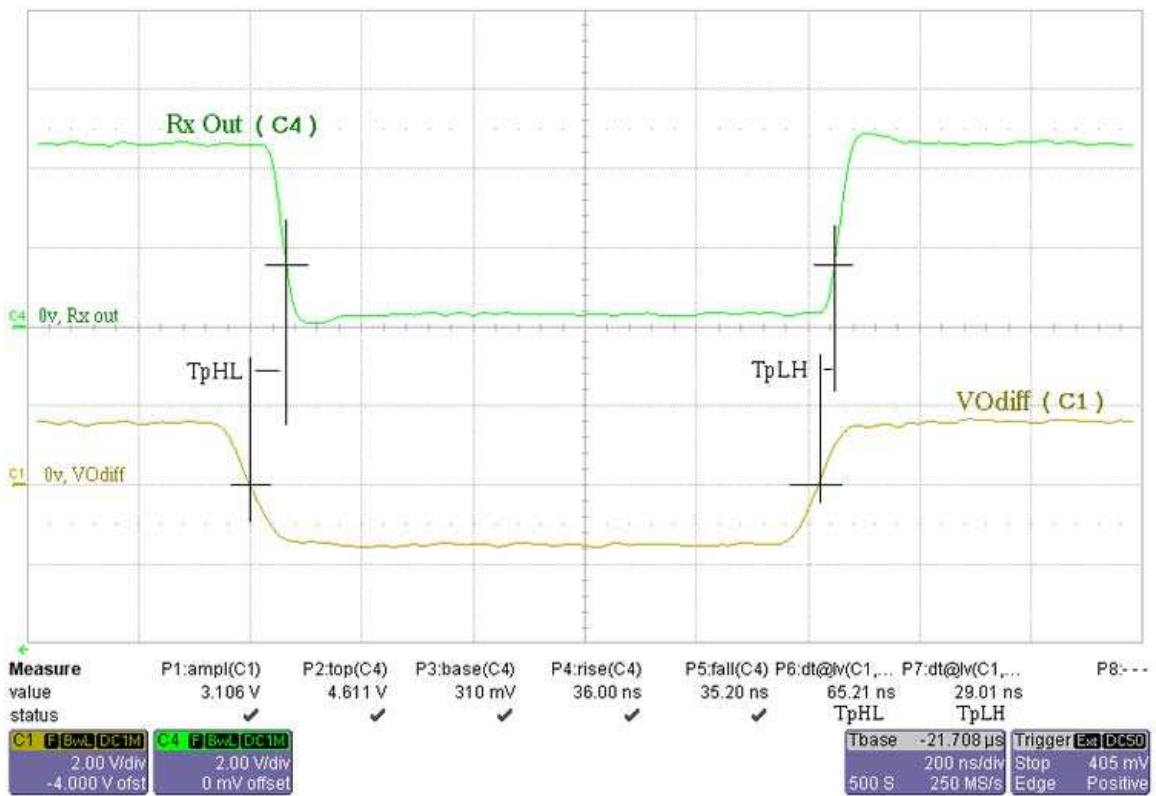
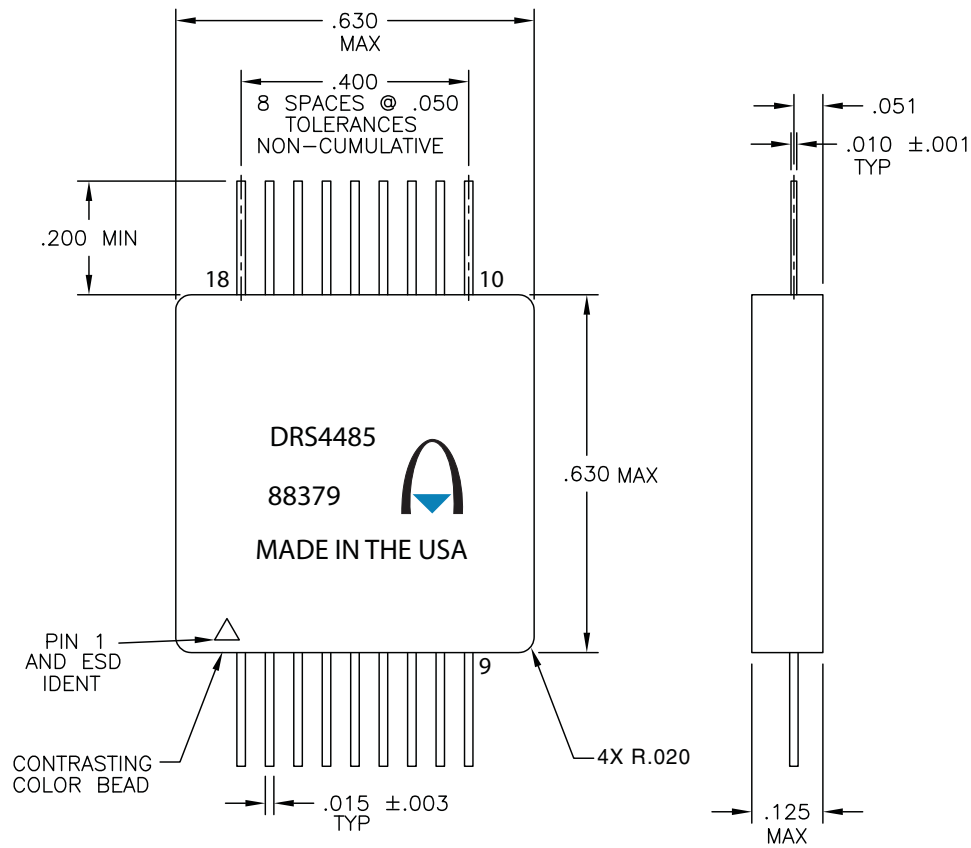


FIGURE 4A – TYPICAL RECEIVER OUTPUTS



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	CASE_GND	13	BUSN 2
5	DRIVER IN 1	14	DRIVER IN 2
6	BUSN 1	15	NC_GND
7	BUS 1	16	RECEIVER OUT 2
8	GROUND	17	RECEIVER ENABLE 2
9	VCC	18	DRIVER ENABLE 2

PIN # vs FUNCTION TABLE

ORDERING INFORMATION

Model	DSCC SMD #	Screening	Case
DRS4485-7		Commercial Flow, +25°C testing only	Flat Pack
DRS4485-S	-	Military Temperature, -55°C to +125°C Screened in accordance with the individual Test Methods of MIL-STD-883 for Space Applications	
DRS4485-201-1S DRS4485-201-2S	5962-0922601KXC 5962-0922601KXA	In accordance with DSCC SMD	

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