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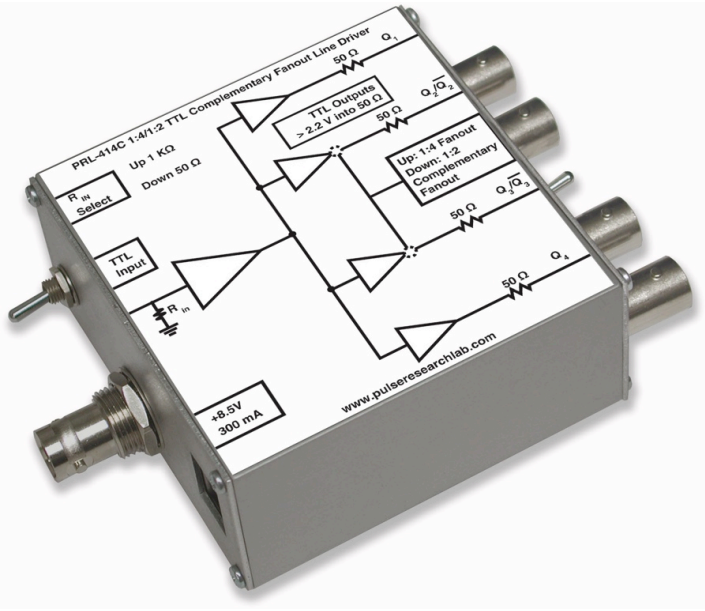
PRL-414C, 1:4 FANOUT/1:2 COMPLEMENTARY FANOUT 50 Ω TTL/CMOS LINE DRIVER FOR 1PPS SIGNAL DISTRIBUTION

APPLICATIONS

- 1 PPS Signal Distribution
- TTL/CMOS Clock Distribution
- 1:4 Fanout or 1:2 Complementary Fanout Line Driver
- High Speed Digital Communications System Testing
- Mini Modular Instrument™

FEATURES

- f_{max} > 110 MHz, typical in 1:4 fanout mode
- f_{max} > 70MHz in 1:2 complementary Fanout mode
- Drives 100 ft of cable @ 80 MHz typical in 1:4 fanout mode; @ 50MHz in 1:2 complementary Fanout mode
- 1.8 ns Typical Output Rise & Fall Times
- TTL Compatible 50 Ω or 1 kΩ Input
- 300 ps typical channel-to-channel skew in 1:4 fanout Mode; 700ps typical in 1:2 Complementary Fanout Mode
- BNC or SMA I/O Connectors
- DC Coupled I/Os
- Self-contained 1.3 x 2.9 x 2.9-in. unit includes AC/DC Adapter



PRL-414C 1:4 TTL Fanout or 1:2 Complementary Fanout Line Driver

DESCRIPTION

The PRL-414C is a fanout 50 Ω TTL Line Driver with two selectable output modes—1:4 fanout or a 1:2 complementary fanout. When the output mode toggle switch is switched Up, the PRL-414C outputs 4 identical outputs. When the output switch is Down, the inner two outputs are inverted, producing 2 pairs of complementary TTL signals.

It is intended for distribution of high-speed clock and logic signals to multiple loads via long lines. The 50 Ω back-terminated outputs can drive long lines with or without 50 Ω load terminations. With 50 Ω load terminations, however, all outputs of the PRL-414C can drive 100 ft of 50 Ω cables at clock rates greater than 80 MHz in the 1:4 fanout mode and 50MHz in the 1:2 complementary fanout mode.

The input resistance of the PRL-414C can be selected to be either 50 Ω or 1 k by a switch. The 1 k input is desirable when interfacing with low power circuits. All I/Os are DC coupled and have BNC or SMA connectors.

The PRL-414C is an important tool for distributing a precision clock signal to a number of test stations in the lab and also for distributing the 1PPS signal in the satellite ground station. The 1:2 complementary fanout mode facilitates distribution of the 1PPS signal over long distances using CAT5 twisted pair data cables, via the PRL-RJ45-SMA adapter assembly.

The PRL-414C is housed in a 1.3 x 2.9 x 2.9-in. extruded aluminum enclosure and is supplied with a ±8.5 V/±1.4 a AC/DC Adapter, but requires only a single 7.5V-12V supply to operate. A maximum of four units can share a single PRL-760B AC/DC adapter using the PRL-730 or PRL-736 voltage distribution modules, or a single 4-output PRL-760C AC Adapter. If mounting is desired, a pair of the # 35001420 mounting brackets can accommodate any two PRL modules of the same length. Please see www.pulseresearchlab.com/accessories for more detail.

A block diagram showing the equivalent input and output circuits of the PRL-414C is shown in Fig. 1.

PULSE RESEARCH•LAB

1234 Francisco Street, Torrance, CA 90502
Tel: 310-515-5330 Fax: 310-515-0068
sales@pulseresearchlab.com
www.pulseresearchlab.com

SPECIFICATIONS* (0° C ≤ T_A ≤ 35°C)

Unless otherwise specified, dynamic measurements are made with the input set to 50 Ω and all outputs terminated into 50 Ω.

SYMBOL	PARAMETER	Min	Typ	Max	UNIT	Comments
$R_{IN\ LO}$	Input Resistance Low Range	49.5	50	50.5	Ω	
$R_{IN\ HI}$	Input Resistance High Range	990	1000	1010	Ω	
R_{OUT}	Output Resistance		50		Ω	
V_{IL}	TTL input Low Level	-0.5	0	0.5	V	
V_{IH}	TTL input High Level	2.0	2.4	5.0	V	
V_{OL}	TTL Output Low Level	0	0.25	0.5	V	R_L = 50 Ω
V_{OH1}	TTL Output High Level	2.2	2.5		V	R_L = 50 Ω @ DC
V_{OH2}	TTL Output High Level	4.4	5		V	R_L = 1 MΩ @ DC
I_{DC1}	DC Input Currents		280	350	mA	f ≤ 100 MHz
I_{DC2}	DC Input Currents		220	250	mA	f =50 MHz square wave(1)
V_{DC}	DC Input Voltages	7.5	8.5	12	V	
V_{AC}	AC/DC Adapter Input Voltage	103	115	127	V	
T_{PLH}	Propagation Delay to output ↑		10	12	ns	
T_{PHL}	Propagation Delay to output ↓		8	12	ns	
t_r/t_f	Rise/Fall Times (10%-90%)		1.8/1.5	3	ns	f =50 MHz square wave
T_{SKEW}	Skew between any 2 outputs		300	750	ps	f =50 MHz square wave, 1:4 fanout
T_{SKEW}	Skew between any 2 outputs		750	1500	ps	f =50 MHz square wave, 1:2 complementary fanout
F_{max1}	Max. Clock Frequency(2) 3ft RG58C/U 50Ω Cable	100 75	110 85		MHz	1:4 fanout 1:2 complementary fanout
F_{max2}	Max. Clock Frequency(3) 100ft RG58C/U 50Ω Cable		80 50			1:4 fanout 1:2 complementary fanout
PWmin	Minimum Pulse Width		4		ns	↑ Input
PWmin	Minimum Pulse Width		6		ns	↓ Input
	Size	1.3 x 2.9 x 2.9			in.	
	Weight	5			Oz	

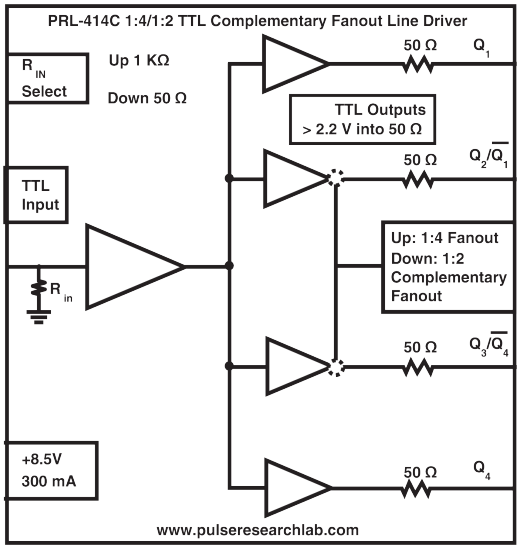


Fig. 1: PRL-414C Functional Block diagram

Notes:
(1). For sharing a single PRL-760C, ±8.5 V, ±1.8 A AC/DC adapter, the total current should not exceed 1.8 A.
(2). f_{MAX} should not exceed 135 MHz; otherwise, damage of the unit due to overheating may result.
(3). f_{MAX2} is measured by connecting a second PRL-414C at the end of the 100 ft cable.

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