PRL-350ECL DUAL CHANNEL COMPARATOR, ECL OUTPUT
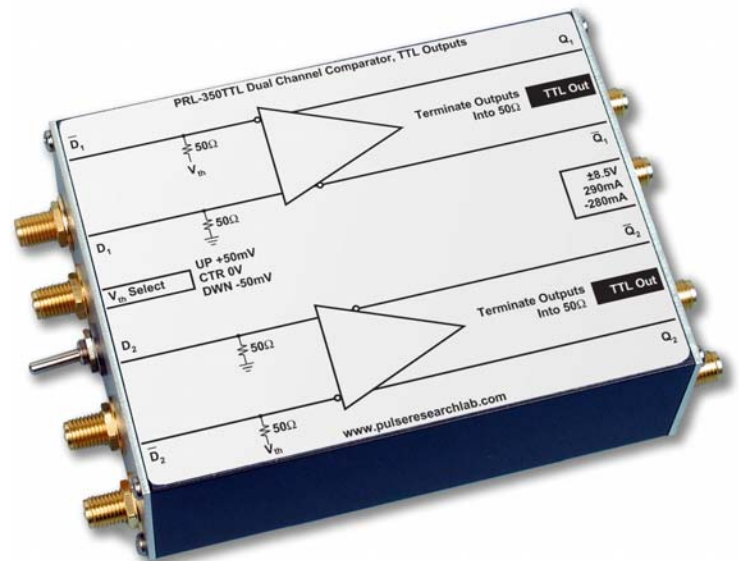# PRL-350TTL DUAL CHANNEL COMPARATOR, TTL OUTPUT
PRL-350TTL-NIM DUAL CHANNEL NIM-INPUT COMPARATOR, TTL OUTPUT

APPLICATIONS

- Window Comparators
- High Speed Timing
- Line Receivers
- Threshold Detection
- Peak Detection
- NIM translation

FEATURES

- f_{MAX} >1000/250 MHz for PRL-350ECL[*]/PRL-350TTL
- 750 ps/1.1 ns Typical t_r for PRL-350ECL/PRL-350TTL
- +50 mV, 0 V or -50 mV Preset Input Threshold Voltage
- +400 mV, 0V or -400 mV for models with –NIM suffix
- -2.0 V to +3.0 V Input Common Mode Range
- 10 mV_{P-P} Minimum Input @ 250 MHz for PRL-350ECL and @ 150 MHz for PRL-350TTL
- DC Coupled 50 Ω Inputs
- Complementary ECL/TTL Outputs
- SMA I/O Connectors
- Self-contained 1.3 x 2.9 x 3.9-in. modules include AC/DC Adapters

PRL-350TTL
Dual Channel Comparator, TTL Outputs

DESCRIPTION

The PRL-350ECL and PRL-350TTL are ready-to-use, high-speed dual-channel comparator modules. The PRL-350ECL has a typical maximum clock frequency in excess of 2 GHz[*] and has complementary ECL outputs designed for driving 50 Ω transmission lines terminated to 50 Ω/-2 V. The PRL-350TTL has a typical maximum clock frequency in excess of 250 MHz and has complementary TTL outputs designed for driving 50 Ω transmission lines with or without 50 Ω load terminations.

Both models have DC coupled 50 Ω inputs and outputs. Input threshold voltage can be selected either from a set of preset values of +50 mV, 0 V or –50 mV using a common three-position switch, or varied independently in each channel by applying a DC voltage to one of the two inputs. Input Common Mode Range is –2.0 V to +3.0 V. Models with -NIM suffix, such as PRL-350TTL-NIM, have ±400 mV or 0 V preset input threshold voltage. The -400 mV threshold setting is intended for NIM input signals. The 0V threshold setting is intended for signals with zero crossings, such as a sinewave or AC-coupled square wave, etc.

These high-speed comparators are Mini Modular Instruments™ that can be used as peak detectors, threshold detectors, sinewave-to-square wave converters, window comparators or differential line receivers, etc. Typical minimum input voltage of 10 mV_{P-P} into 50 Ω is required for up to 250 MHz for the ECL output and 150 MHz for the TTL output. It is recommended that the non-driven input be terminated into 50 Ω when the input frequency is near f_{MAX} and its amplitude is less than 20 mV_{P-P}.

Each unit is supplied with a ±8.5 V AC/DC Adapter and housed in a 1.3 x 2.9 x 3.9-in. extruded aluminum enclosure.

[*] Although the PRL-350ECL typically operates up to 2 GHz, the internal device is specified at 1 GHz by the device manufacturer; therefore the guaranteed f_{MAX} is 1 GHz.

SPECIFICATIONS (0° C $\leq$ T$_A$ $\leq$ 35° C)

Unless otherwise specified, dynamic measurements are made with all outputs terminated into 50 Ω/V$_{TT}$, where V$_{TT}$ = -2 V for ECL outputs and 0 V for TTL outputs.

| SYMBOL	PARAMETER	PRL-350ECL			PRL-350TTL			UNIT
		Min	Typ	Max	Min	Typ	Max	
R_{in}	Input Resistance	49.5	50	50.5	49.5	50	50.5	Ω
R_{out}	Output Resistance	NPN emitter			49.5	50	50.5	Ω
V_{TH+} NIM+	Preset positive threshold voltage	45 396	0 400	55 404	45 396	50 400	55 404	mV
V_{TH-} NIM-	Preset negative threshold voltage	-55 -404	-50 -400	-45 -396	-55 -404	-50 -400	-45 -396	mV
V_{TH0}	Preset zero threshold voltage[1]	-2	0	2	-2	0	2	mV
V_{OL}	Output Low Level	-2	-1.6	-1.5	-0.5	0	0.5	V
V_{OH}	Output High Level	-1	-0.8	-0.6	2	2.2	2.4	V
I_{DC}	DC Input Current		36/ -136	45/-145		300/-285	325/-300	mA
V_{DC}	DC Input Voltage	$\pm$7.5	$\pm$8.5	$\pm$12	$\pm$7.5	$\pm$8.5	$\pm$12	V
V_{AC}	AC/DC Adapter Input Voltage	103	115	127	103	115	127	V
t_{PLH}	Propagation Delay to output $\uparrow$		1.5			2		ns
t_{PHL}	Propagation Delay to output $\downarrow$		1.5			2		ns
t_r/t_f	Rise/Fall Times[2]		750	850		1100	1250	ps
t_{SKEW}	Skew between any 2 outputs		100	300		200	400	ps
V_{IN} I**	Minimum Input Voltage @ 150MHz[3]	20	10		20	10		mVp-p
V_{IN} II**	Minimum Input Voltage @ 250MHz[3]	20	10		40	20		mVp-p
V_{IN} III	Minimum Input Voltage @ 1GHz	250	100		NA			mVp-p
V_{CM}	Input Common Mode Range		-2.0/+3.0			-2.0/+3.0		V
f_{MAX}	Max Clock Frequency[4]	1000	2000		250	300		MHz
	Size	1.3 x 2.9 x 3.9			1.3 x 2.9 x 3.9			in.
	Weight	7			7			Oz
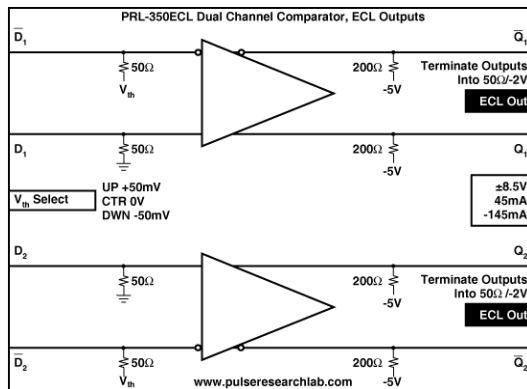
Fig. 1A PRL-350ECL Block Diagram
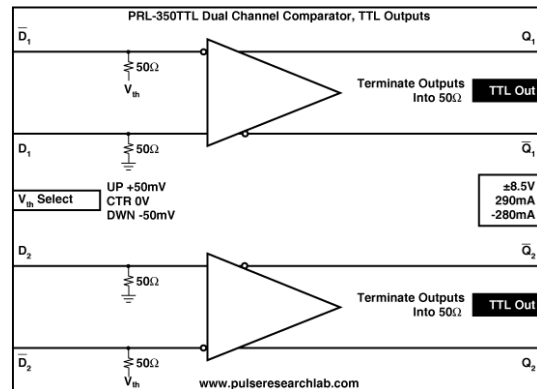
Fig. 1B PRL-350TTL Block Diagram

(1) If the switch is set to the center position (0 V threshold) a non-driven channel will oscillate and induce jitter in the driven channel. Connect any output to any input to stop the oscillation.

(2) 20%-80% for ECL outputs, 10%-90% for TTL outputs. For the PRL-350ECL, an unused complementary output must be either terminated into 50 Ω/V$_{TT}$ or AC coupled into a 50 Ω load; otherwise, output waveform distortion and rise time degradation will occur. Use the PRL-ACT-50, Dual Channel AC-Coupled 50 Ω Termination, for terminating unused complementary outputs. Use the PRL-550NQ/PQ4X, Four Channel NECL/PECL Terminators, respectively, for the 50 Ω/V$_{TT}$ termination and for connection of NECL/PECL signals to 50 Ω input oscilloscopes. If preservation of DC levels is not required, then the PRL-SC-104, 0.1 μf DC block or the PRL-ACX-12dB, 12 dB AC-coupled attenuator may be used to connect the NECL/PECL outputs to 50 Ω input instruments.

For the PRL-350TTL, very slight output waveform distortion and rise time degradation will occur when an unused complementary output is not terminated. For optimum performance, however, all outputs should be terminated.

(3) In order to reduce jitter near f$_{MAX}$, terminate the non-driven input into 50 Ω when the input voltage is less than 20 mV$_{P-P}$.

(4) Although the PRL-350ECL typically operates up to 2 GHz, the internal device is specified at 1 GHz by the device manufacturer; therefore the guaranteed f$_{MAX}$ is 1 GHz.