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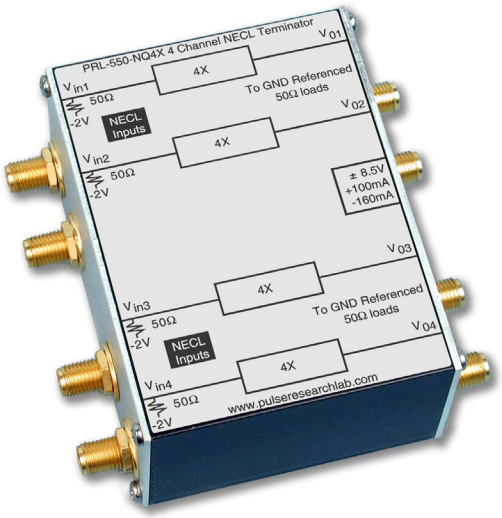
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# PRL-550NQ4X/PRL-550PQ4X FOUR CHANNEL NECL/PECL TERMINATORS

## APPLICATIONS

- Allow direct connection of NECL/PECL signals to 50Ω input instruments
- Provide standard 50Ω/$V_{TT}$ terminations for NECL/PECL signals and Ground Referenced Outputs
- Testing and monitoring GHz NECL/PECL signals in digital and wireless communication applications




**PRL-550NQ4X**

## FEATURES

- 43 ps Typical Rise Time (8 GHz bandwidth)
- 50Ω/-2V Input Termination for NECL and 50Ω/3V for PECL
- Ground Referenced Outputs protect sensitive instruments
- SMA I/O connectors
- 4X attenuation
- Self-contained 1.3 x 2.9 x 2.2-in. unit includes a ±8.5V AC/DC Adapter

## INTRODUCTION

NECL/PECL logic levels are offset from ground. Without proper level shifting, these logic signals can not be connected to ground referenced 50Ω input instruments, such as sampling 'scopes, network analyzers, scanners and counters, etc. Otherwise, either the NECL/PECL equipment outputs or the measurement instrument inputs may be made inoperative or damaged.

When driving a length of 50 Ω coaxial cable, an NECL/PECL output must be terminated into a 50 Ω load that is connected to a terminating voltage $V_{TT} = V_{CC}$ -2V. For NECL circuits operating with a supply voltage of either -5.2V or -4.5V, $V_{CC}$ is 0 V, and $V_{TT}$ is equal to -2V. For PECL circuits, where the supply voltage $V_{CC}$ is +5V, $V_{TT}$ is +3V.

NECL/PECL Terminators are level translators which convert NECL/PECL signals into signals that can be connected to ground referenced 50Ω input instruments and, at the same time, provide standard 50Ω/$V_{TT}$ teriminations required by NECL/PECL signals.

## DESCRIPTION

The PRL-550NQ4X and PRL-550PQ4X are, respectively, Four Channel NECL and PECL Terminators. The PRL-550NQ4X is designed to interface with NECL circuits operating with a -5.2V or -4.5V supply. Each input has an equivalent 50 Ω resistor terminated to a voltage $V_{TT}$ = -2V. The PRL-550PQ4X is designed to interface with PECL circuits operating with a +5V supply. Each input has an equivalent 50 Ω resistor terminated to a voltage $V_{TT}$ = +3V. The outputs of these Terminators are designed for direct connection to ground referenced 50 Ω input instruments as shown in Figs. 1 and 2, respectively. These near ground level output signals* protect sensitive instruments and enhence measurement accuracy when these instruments are used.

Once an NECL or PECL signal is translated through a proper Terminator, it can be routed through 50Ω scanners and other high frequency measuring instruments for processing. Each PRL-550NQ4X and PRL-550PQ4X Terminator is housed in an attractive 1.3 x 2.9 x 2.2-in. extruded aluminum enclosure and is supplied with a ±8.5V AC/DC Adapter.

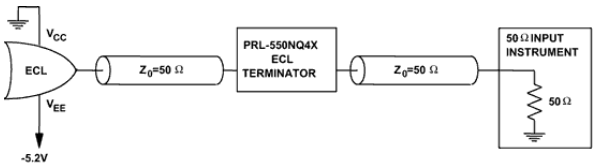



**Fig. 1 NECL driving a 50 Ω input instrument using the PRL-550NQ4X**

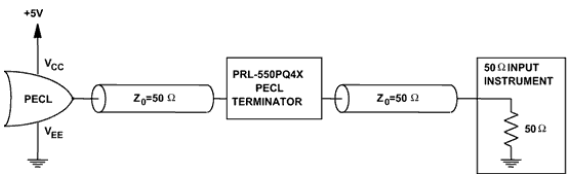
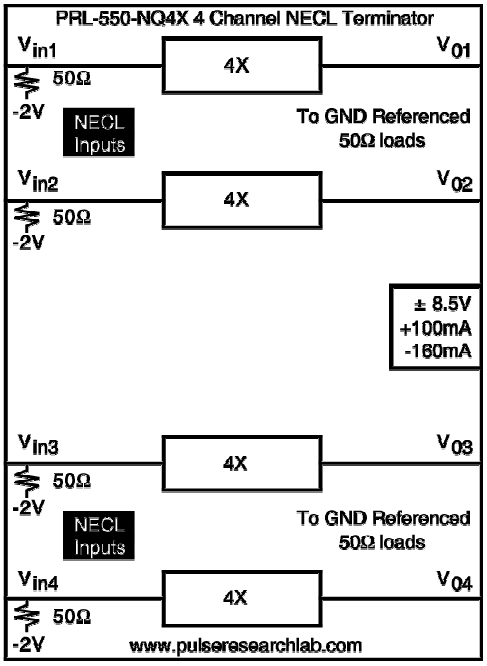



**Fig. 2 PECL driving a 50 Ω input instrument using the PRL-550PQ4X**

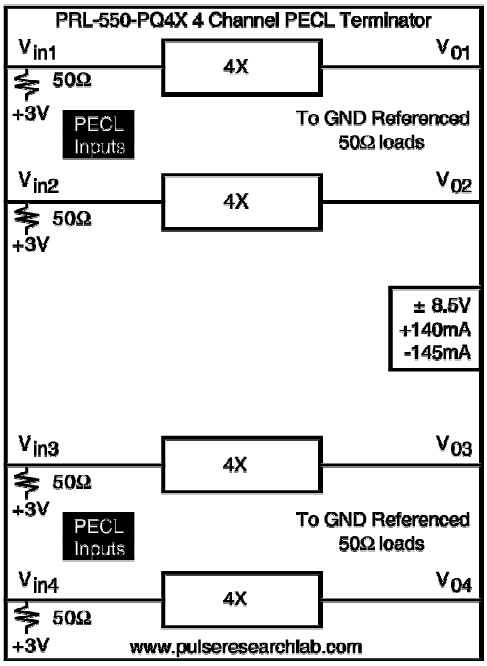

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## SPECIFICATIONS ($0^o$ C ≤ $T_A$ ≤ $35^o$C)

| Symbol | Parameter | PRL-550NQ4X | | | PRL-550PQ4X | | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | Min | Typ | Max | Min | Typ | Max | |
| $R_{in}$ | Input Resistance | 49.5 | 50 | 50.5 | 49.5 | 50 | 50.5 | Ω |
| $V_{TT}$ | Input Termination Voltage | -2.2 | -2 | -1.8 | 2.7 | 3 | 3.3 | V |
| $V_{OS}$ | Output Offset Voltage* | -20 | 0 | 20 | -20 | 0 | 20 | mV |
| | Signal Attenuation | 11.8 | 12 (4X) | 12.2 | 11.8 | 12 (4X) | 12.2 | dB |
| $I_{DC}$ | DC Input Current | | +60, -125 | +85, -150 | | +80, -125 | +120, -150 | mA |
| $V_{DC}$ | DC Input Voltage | ±7.5 | ±8.5 | ±12 | ±7.5 | ±8.5 | ±12 | V |
| $V_{AC}$ | AC/DC Adaptor Input Voltage | 103 | 115 | 127 | 103 | 115 | 127 | V |
| $t_{PLH}$ | Propagation Delay to output ↑ | | 475 | 575 | | 475 | 575 | ps |
| $t_{PHL}$ | Propagation Delay to output ↓ | | 475 | 575 | | 475 | 575 | ps |
| $t_r/t_f$ | Rise/Fall Times | | 43 | 61 | | 43 | 61 | ps |
| BW | Equivalent bandwidth | 5.7 | 8 | | 5.7 | 8 | | GHz |
| $t_{SKEW}$ | Skew between outputs | | 20 | 50 | | 20 | 50 | ps |
| | Cross Talk ↔ chs @ 1.4 GHz | 34 | 40 | | 34 | 40 | | dB |
| | Size | 1.3 x 2.9 x 2.2 | | | 1.3 x 2.9 x 2.2 | | | in. |
| | Weight | 5 | | | 5 | | | Oz |




**PRL-550NQ4X Block Diagram**




**PRL-550PQ4X Block Diagram**

*The output offset and input termination voltages are factory set to 0 V and $V_{TT} = V_{CC}$-2 V, respectively, before the input is connected to an NECL/PECL device. When connected to an NECL/PECL device, the output low level will be slightly offset from ground depending on the low level output voltage of the connected device, which is typically Vcc-1.8 V. When its input is connected to an NECL or PECL device, the Terminator output Low level is typically +50 mV.


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