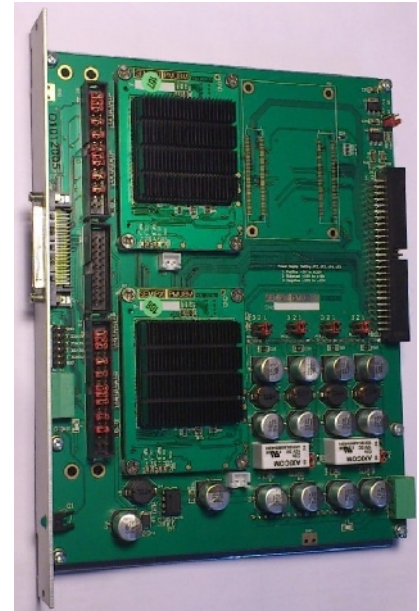


## 16 Channel PPMU Card for PXI Platform

- 16 independent Per-pin Parametric Measurement Unit (PPMU) channels
- FV, FI, FN (high-Z), MV, MI functions
- Voltage Range:  $\pm 11.25$  V
- 5 Current Ranges:  $\pm 5$   $\mu$ A,  $\pm 20$   $\mu$ A,  $\pm 200$   $\mu$ A,  $\pm 2$  mA and  $\pm 80$  mA
- FI voltage clamps and FV current clamps
- 16-bit resolution for programmable levels and measurement
- Per-channel voltage sense and DUT ground
- 16 relay driver outputs for control of external relays
- Works with National Instruments PXI-3U FlexRIO FPGA Card
- LabVIEW 2009 VI driver and DLL functional driver
- Debug Tools



## Description

Orchid-16 offers the most performance and features on the 3U PXI platform for semiconductor device DC measurements. Its per-pin architecture makes it ideal for parallel DC parametric testing.

Orchid-16 has 4 quadrant capability with support for  $\pm 11.25$  V voltage range and 5 programmable current ranges from  $\pm 5$   $\mu$ A to  $\pm 80$  mA. Each of the 16 channels can independently FV/MV, FV/MI, FI/MI, FI/MV, MV, MI or high-Z.

Orchid-16 works with National Instruments PXI-3U FlexRIO FPGA Card to provide 16 PPMU channels. 2 Orchid-16 can share 1 single FlexRIO FPGA Card to provide 32 independent PPMU channels.

## Features

### Independent Pin Resources

Orchid-16's pin resources are independent on a per channel basis. Each of the 16 channels can independently perform any combination of FV, FI, MV, MI and High-Z. This makes Orchid-16 highly suitable for parallel DC characterization of DUTs. 1 single-slot National Instruments FlexRIO FPGA card can link 2 Orchid-16 cards to provide a total of 32 channels of PPMU to further reduce per-pin cost. If more channels are required, simply slot in extra FlexRIO cards in the PXI chassis and link more Orchid-16.

## Relay Driver Outputs

Orchid-16 provides 16 relay driver outputs for control up to 16 external relays on the DUT board. Relay driver output capability is 12VDC and 100mA per channel. Designing relays into the DUT board makes it possible to share PMU resources for high pin-count devices under test. Relays can also be used to switch device pins from PMU DC measurement pins to other digital instrument pins

## Software

Orchid-16 is supplied with LabVIEW 2009 VI functional driver, which provides powerful graphical programming tools.

In addition, 32-bit DLL driver is provided for programming languages such as C/C++ and Visual Basic.

## Applications

- Automated test equipment (ATE)
- Per-pin parametric measurement unit (PPMU)
- Characterization and Validation
- Open/Short Tester
- Leakage Current Measurement
- Continuity Measurement
- Multi-Channel Voltmeter
- I-V Curve Measurement
- Device power supply
- Source measure unit (SMU)

## Specifications

### Force Voltage

Range	Resolution	Accuracy / Offset Error
-11.25 V to +11.25 V	16-bit DAC	5mV

### Force Current

Range	Resolution	Accuracy / Offset Error
$\pm 5 \mu\text{A}$	16-bit DAC	10nA
$\pm 20 \mu\text{A}$	16-bit DAC	50nA
$\pm 200 \mu\text{A}$	16-bit DAC	100nA
$\pm 2 \text{ mA}$	16-bit DAC	200nA
$\pm 80 \text{ mA}$	16-bit DAC	5uA

### Measure Voltage

Range	Resolution	Accuracy / Offset Error
-11.25 V to +11.25 V	16-bit ADC	5mV

### Measure Current

Range	Resolution	Accuracy / Offset Error
$\pm 5 \mu\text{A}$	16-bit ADC	10nA
$\pm 20 \mu\text{A}$	16-bit ADC	50nA
$\pm 200 \mu\text{A}$	16-bit ADC	500nA
$\pm 2 \text{ mA}$	16-bit ADC	5uA
$\pm 80 \text{ mA}$	16-bit ADC	50uA

### Voltage Clamps

Range between Clamp Low and Clamp High	Resolution	Accuracy
500 mV to 11.25 V	16-bit DAC	$\pm 155\text{mV}$

### Current Clamps

Range between Clamp Low and Clamp High	Resolution	Accuracy
5-100% of current range	16-bit DAC	0-10% of programmed clamp value

# Orchid-16



## Settling Time

Range	Force Voltage	Measure Current	Force Current	Measure Voltage
±80 mA Range	22-40 μs	22-40 μs	24-55 μs	24-55 μs
±2 mA Range	24-40 μs	24-40 μs	24-60 μs	24-60 μs
±200 μA Range	40-80 μs	60-100 μs	50-120 μs	50-120 μs
±20 μA Range	300 μs	462 μs	450 μs	450 μs
±5 μA Range	1400 μs	1902 μs	2700 μs	2700 μs

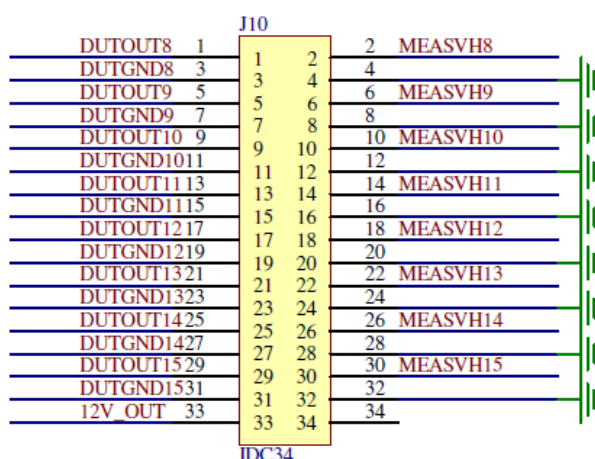
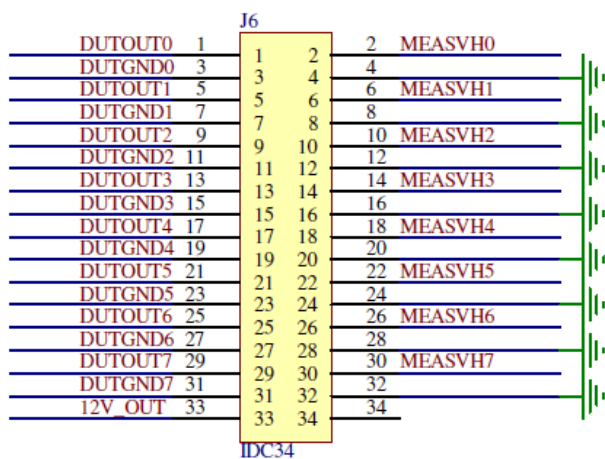
## Relay Driver Output

Number of Channels	16
Drive Voltage	12V
Drive Current	Up to 100mA per channel

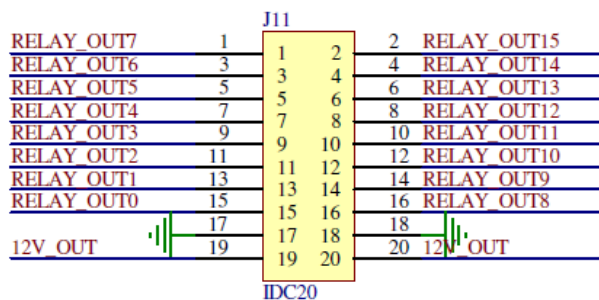
## Onboard Connector Pin-out

### Option A:

0.1" (2.54mm) pitch IDC male, mates with any 0.1" pitch IDC ribbon cable  
 MEASVHx (x from 0-15) are voltage sense pins for Channel 0-15 respectively.

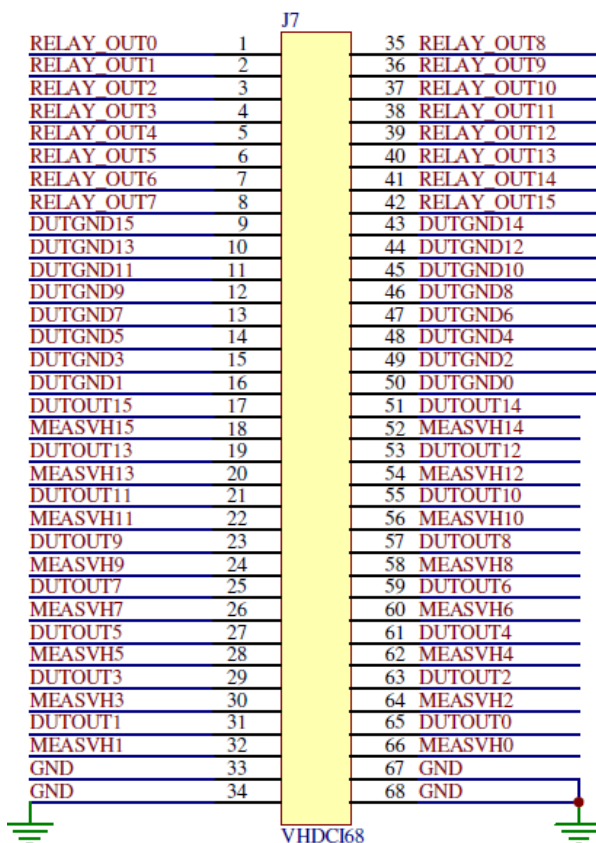


# Orchid-16



## Option B:

68-pin VHDCI, mates with Molex VHDCI cable P/N: 79918-0080 or similar SCSI cable.



# Orchid-16



## Ordering Information

Part Number	Description
SP-337382-01	Orchid-16 PPMU Card Board Only
SP-337382-02	Orchid-16 FlexRIO Adapter Kit (including FlexRIO Adapter + 0.5M 50 Way Interconnect Ribbon Cable)
SP-337383-01	Orchid-16 PPMU Card in Single Box with VHDCI Connector
SP-337383-02	Orchid-16 PPMU Card in Single Box with SMB Connectors
SP-782250-01	Orchid-16 Type-1 Power Supply. Supply 12V power for 1 card. XP Power AEL80US12 fitted with Phoenix Contact connectors
SP-782250-02	Orchid-16 Type-4 Power Supply. Supply 12V power for up to 6 cards. Cooler Master GX-650W fitted with Phoenix Contact connectors.
SP-965585-01	Orchid-16 Card Cage for 19" Rack Width. Fits up to 5 Orchid cards.

SP-337382-02: Orchid-16 FlexRIO Adapter Kit for connecting FlexRIO to Orchid	SP-337383-01: Orchid-16 PPMU Card in Single Box with VHDCI Connector
	