Integrated Components for Automated Test Equipment

Integrated Pin Electronics
Integrated DUT Power Supplies
Integrated V/I and PPMU
High Current Pin Drivers
Table of Contents

Elevate Products Dramatically Reduce the Cost of Test .......................................................... 3

Integrated Digital Pin Electronics ........................................................................................... 4
  SOC Dual Channel 800MBPS Pin Electronics/DAC/PMU .................................................. 6
  ISL55164 (Venus) ............................................................................................................... 7
  ISL55162 (Venus3) ......................................................................................................... 8
  ISL55161 (Venus4) ...................................................................................................... 9
  ISL55163 (Venus4 Lite) .............................................................................................. 10
  Hallasan ......................................................................................................................... 11
  ISL55169 (Mercury) .................................................................................................... 12
  ISL55188 (Saturn) ..................................................................................................... 13
  Kilimanjaro .................................................................................................................... 14

Integrated PMU, DPS, and V/I Products ................................................................................ 15
  SOC 8-Channel DPS .................................................................................................... 16
  ISL55187 (Neptune) ................................................................................................... 17
  Pluto2 ............................................................................................................................ 18
  ISL55185 (Triton) ..................................................................................................... 19
  Jupiter ............................................................................................................................ 20
  ISL55180 (Europa) .................................................................................................... 21
  Vesuvius ......................................................................................................................... 22
Elevate Products Dramatically Reduce the Cost of Test

Elevate Semiconductor (Formerly Intersil ATE Product Line) is dedicated to the support and design of Integrated solutions for Automated Test Equipment and Instrumentation. The members of Elevate are ATE industry veterans who are familiar with the high level of focused support and long term commitment required to successfully service the ATE market and our customers.

Elevate is a leading supplier of innovative, lower power, high density components for the design of next generation Automated Test Equipment (ATE). With a proven track record of consistently delivering the highest density, lowest power solutions available, systems designed around Elevate products have a competitive advantage in the ATE market space and are able to adapt successfully to emerging trends and challenges while providing ever increasing end user value.

Our extensive portfolio of integrated solutions for ATE system design includes core integrated building blocks for Pin Electronics with AC performance up to 800Mbps and wide voltage products covering up to 32V. We also offer integrated solutions for DUT power supply (DPS) and PMU/VI Instruments with best in class density as high as 8 channels per chip and voltage up to 26V. Our manufacturing partner, Intersil, also offers an extensive line of power supply solutions along with high performance precision op-amps and voltage reference products, analog switches/muxes, precision data converters, high speed op-amps and high speed data converters to complete the design of most ATE systems.
Integrated Digital Pin Electronics

Elevate is the market leader in low power, high density integrated pin electronics. Developed in a pure CMOS technology, our products enable customers to develop next generation high density instruments with increased parallelism for reduced cost of test and improved system reliability. Integrated timing delay, or “Deskew”, circuitry comes standard on our integrated pin electronics products and enables flexible timing control and edge placement in a system without the need for an expensive ASIC. Packed with system level features, these products greatly simplify the design of ATE systems for improved time to market.

Pin Electronics Product Selection Table

<table>
<thead>
<tr>
<th>Product</th>
<th>ISL55164 (Venus)</th>
<th>ISL55162 (Venus3)</th>
<th>ISL55161 (Venus4)</th>
<th>ISL55163 (Venus4 Lite)</th>
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<tr>
<td><strong>Description</strong></td>
<td>P/E + PMU + DAC + Deskew</td>
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<td>P/E + PMU + Load + DAC + Deskew</td>
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<td>10x10 TQFP w/exposed slug up</td>
<td>10x10 TQFP w/exposed slug up 9x9 QFN (Top Exposed Paddle)</td>
<td>10x10 TQFP w/exposed slug up 9x9 QFN (Top Exposed Paddle)</td>
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<td>1W/Channel</td>
<td>600mW/Channel</td>
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<tr>
<td><strong>Fmax</strong></td>
<td>133MHz</td>
<td>300MHz</td>
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<tr>
<td><strong>Driver</strong></td>
<td>3 Level/8V</td>
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<tr>
<td><strong>Comparator</strong></td>
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<td>On-Chip</td>
<td>On-Chip</td>
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<tr>
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<td>1/Channel</td>
<td>1/Channel</td>
<td>1/Channel</td>
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<td><strong>DC Levels</strong></td>
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<td><strong>Resolution</strong></td>
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<td>ISL55161CNEZ ISL55161CRSZ</td>
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continued next page
## Pin Electronics Product Selection Table (continued)

<table>
<thead>
<tr>
<th>Product</th>
<th>Hallasan</th>
<th>ISL55169 (Mercury)</th>
<th>ISL55188 (Saturn)</th>
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<tr>
<td>Description</td>
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<td>P/E + PMU + DAC + Deskew</td>
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<td>On-Chip</td>
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<td>On-Chip</td>
<td>On-Chip</td>
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<td>1/Channel</td>
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<td>±25% of Delay</td>
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<td>ISL55169CNEZ-SYS</td>
<td>ISL55188CNEZ-SYS</td>
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</tbody>
</table>
SOC Dual Channel 800MBPS
Pin Electronics/DAC/PMU

Key Features

- **Pin Electronics Driver/Comparator**
  - 3 Level Driver (DVH/DVL/VTT)
  - 8V Driver Output Swings
  - Extremely Low HiZ Leakage over 16V Range
  - Differential Driver and Comparator Modes
  - 16V Comparator Input Compliance Range

- **Load**
  - 24mA Imax
  - 16V Input Compliance Range
  - Extremely Low HiZ Leakage over 16V Range
  - Independent Power-down Option

- **Deskew**
  - Propagation Delay Adjustment
  - Falling Edge Adjustment

- **PMU**
  - FV, FI, MV, MI
  - FI Voltage Clamps
  - 8 Current ranges (32mA, 8mA, 2mA, 512µA, 128µA, 32µA, 8µA, 2µA)
  - Resistive Load (8 selectable resistor values)
  - Remote Sense Option

- **On-Chip DC Levels**
  - 13 Levels/Channel
  - Gain and Offset Correction/Level
  - DUT Ground Sensing and Correction

- **Flexible High Speed Digital Inputs and Outputs**
  - Selectable On-chip Terminations for Inputs
  - Read Back Internal States

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ISL55161 is the Lowest 800Mbps ATE Digital Pin Available

**ElevATE Pin Electronics are the ONLY “Off the Shelf” Solutions with Digital Timing Delay**

**Highly Integrated System-on-a-Chip Solutions with 9mm x 9mm Footprint**
The ISL55164 is a highly integrated System-on-a-Chip (SOC) pin electronics solution aimed at incorporating every analog function, along with some digital support functionality, required on a per channel basis for Automated Test Equipment. The interface, control and I/O of the chip are all digital; all analog circuitry is inside the chip. Two complete tester channels are integrated into each ISL55164.

The ISL55164 is pin and functionally compatible with Venus.

**Features**

- **133MHz**
- **3.75ns Minimum Pulse Width**
- **Pin Electronics Driver/Comparator**
  - 3 Level Driver (DVH/DVL/VTT)
  - 8V Driver Output Swings
  - 16V Comparator Input Voltage Range
  - Extremely Low HiZ Leakage over 16V Range
- **Per Pin PMU**
  - FV, FI, MV, MI
  - 8 Current Ranges (32mA, 8mA, 2mA, 512μA, 128μA, 32μA, 8μA, 2μA)
  - +12V Super Voltage Capability
  - Resistive Load (8 selectable resistor values)
- **Deskew**
  - Propagation Delay Adjustment (up to 12.8ns range)
  - Falling Edge Adjustment (up to ±3.2ns range)
  - Auto Calibration via PLL
- **On-Chip DC Levels**
  - 11 Levels/Pin
  - Gain and Offset/Level
  - DUT Ground Sensing/Pin
- **3-Bit Serial CPU Port**
  - Load Internal Registers and Memory
  - Read Back Internal States
- **Flexible High Speed Digital Inputs and Outputs**
  - Selectable On-Chip Terminations for High Speed Inputs
  - 50Ω Series Terminated High Speed for Comparator Outputs
- **Package/Power Dissipation**
  - 64-Lead, 10mm x 10mm TQFP with Top Exposed Heat Slug
  - $P_{dq} \leq 1.10W/Channel; \ P_{dq} \leq 2.2W/Chip$

**Applications**

- Automated Test Equipment
- Instrumentation
- ASIC Verifiers
The ISL55162 is a highly integrated System-on-a-Chip (SOC) pin electronics solution aimed at incorporating every analog function, along with some digital support circuitry, required on a per channel basis for Automated Test Equipment. The interface, control and I/O of the chip are all digital; all analog circuitry is inside the chip. Two complete tester channels are integrated into each chip.

ISL55162 is pin and functionally compatible with Venus, Venus Plus and Venus 2.

**Features**

- **Pin Electronics Driver/Comparator**
  - 3 Level Driver (DVH/DVL/VTT)
  - 8V Driver Output Swings
  - 16V Comparator Input Voltage Range
  - Extremely Low HIz Leakage over 16V Range
- **Per Pin PMU**
  - FV, FI, MV, MI
  - 4 Quadrant Operation
  - 8 Current Ranges (32mA, 8mA, 2mA, 512μA, 128μA, 32μA, 8μA, 2μA)
  - +13V Super Voltage Capability
  - FI Voltage Clamps
  - Resistive Load (8 selectable resistor values)
- **Deskew**
  - Propagation Delay Adjustment
  - Falling Edge Adjustment
  - Delay Range set by PLL Clock
- **On-Chip DC Levels**
  - 11 Levels/Channel
  - Gain and Offset Correction/Level
  - DUT Ground Sensing and Correction
- **3-Bit Serial CPU Port**
  - Flexible High Speed Digital Inputs and Outputs
  - Selectable On-Chip Terminations for Inputs
  - 50Ω Series Termination for Comparator Outputs
- **Lead Free Package**
  - 64-Lead, 10mmx10mm TQFP with Top Exposed Heat Slug
  - Pdq < 1.1W/Channel

**Applications**

- Automated Test Equipment
- Instrumentation
- ASIC Verifiers
The ISL55161 is a highly integrated System-on-a-Chip (SOC) pin electronics solution aimed at incorporating every analog function, along with some digital support functionality, required on a per channel basis for Automated Test Equipment. The interface, control and I/O of the chip are all digital; all analog circuitry is inside the chip. Two complete tester channels are integrated into each ISL55161.

The ISL55161 is pin and functionally compatible with Venus4.

Features

- Pin Electronics Driver/Comparator
  - 3-level Driver (DVH/DVL/VTT)
  - 8V Driver Output Swings
  - Extremely Low HiZ Leakage over 16V Range
  - Differential Driver and Comparator Modes
  - 16V Comparator Input Compliance Range
- Load
  - 24mA Imax
  - 16V Input Compliance Range
  - Extremely Low HiZ Leakage over 16V Range
  - Independent Power-down Option
- Deskew
  - Propagation Delay Adjustment
  - Falling Edge Adjustment
- PMU
  - FV, FI, MV, MI
  - FI Voltage Clamps
  - Eight current Ranges (32mA, 8mA, 2mA, 512µA, 128µA, 32µA, 8µA, 2µA)
  - Resistive Load (eight selectable resistor values)
  - Remote Sense Option
- On-chip DC Levels
  - 13 Levels/Channel
  - Gain and Offset Correction/Level
  - DUT Ground Sensing and Correction
- Flexible High Speed Digital Inputs and Outputs
  - Selectable On-chip Terminations for Inputs
  - Read-back Internal States
- Package/Power Dissipation
  - 64-Lead, 10mm x 10mm TQFP with Top Exposed Heat Slug
  - 64-Lead, 9mmx9mm QFN with Top Exposed Heat Slug
  - Pqd ≤ 500mW/Channel @ 11V Operation

Applications

- Automated Test Equipment
- Instrumentation
- ASIC Verifiers
Integrated Digital Pin Electronics

**ISL55163 (Venus4 Lite)**

**SOC Dual Channel 400MHz Pin Electronics/DAC/PMU**

The ISL55163 is a highly integrated System-on-a-Chip (SOC) pin electronics solution aimed at incorporating every analog function, along with some digital support functionality, required on a per channel basis for Automated Test Equipment. The interface, control and I/O of the chip are all digital; all analog circuitry is inside the chip. Two complete tester channels are integrated into each ISL55163.

The ISL55163 is pin compatible with Venus4.

**Features**

- **Pin Electronics Driver/Comparator**
  - 3-level Driver (DVH/DVL/VTT)
  - 8V Driver Output Swings
  - Extremely Low HiZ Leakage over 16V Range
  - Differential Driver and Comparator Modes
  - 16V Comparator Input Compliance Range

- **Load**
  - 24mA Imax
  - 16V Input Compliance Range
  - Extremely Low HiZ Leakage over 16V Range
  - Independent Power-down Option

- **PMU**
  - FV, FI, MV, MI
  - FI Voltage Clamps
  - Eight current Ranges (32mA, 8mA, 2mA, 512µA, 128µA, 32µA, 8µA, 2µA)
  - Resistive Load (eight selectable resistor values)
  - Remote Sense Option

- **On-chip DC Levels**
  - 13 Levels/Channel
  - Gain and Offset Correction/Level
  - DUT Ground Sensing and Correction

- **Flexible High Speed Digital Inputs and Outputs**
  - Selectable On-chip Terminations for Inputs
  - Read-back Internal States

- **Package/Power Dissipation**
  - 64-Lead, 10mm x 10mm TQFP with Top Exposed Heat Slug
  - 64-Lead, 9mmx9mm QFN with Top Exposed Heat Slug
  - Pdq ≤ 500mW/Channel @ 11V Operation

**Applications**

- Automated Test Equipment
- Instrumentation
- ASIC Verifiers

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**Diagram**

Diagram showing the pin connections and functional blocks of the ISL55163.
The Hallasan is a highly integrated, low cost pin electronics solution aimed at incorporating every analog function, along with some digital support functionality, required on a per-channel basis for Automated Test Equipment. The interface, control and I/O of the chip are all digital; all analog circuitry is inside the chip. Two complete tester channels are integrated into each Hallasan.

The Hallasan is pin compatible with Venus4 and Venus4 Lite.

**Features**

- Pin Electronics Driver/Comparator
  - 3 Level Driver (DVH/DVL/VTT)
  - 8V Driver Output Swings
  - Extremely Low HiZ Leakage over 16V Range
  - Differential Driver and Comparator Modes
  - 16V Comparator Input Compliance Range

- On-Chip DC Levels
  - 5 Levels/Channel
  - Gain and Offset Correction/Level
  - DUT Ground Sensing and Correction

- Flexible High Speed Digital Inputs and Outputs
  - Selectable On-Chip Terminations for Inputs
  - Readback Internal States

- Package/Power Dissipation
  - 64 Lead, 10mm x 10mm TQFP with Exposed Heat Slug
  - \( P_dq \leq 500mW/\text{Channel} @ 11V \) Operation

**Applications**

- Automated Test Equipment
- Instrumentation
- ASIC Verifiers
ISL55169 (Mercury)
SOC 66MHz Octal Pin Electronics w/PMU

ISL55169 is a highly integrated system on a chip (SOC) pin electronics solution aimed at incorporating every analog function (with some digital support functionality) required on a per channel basis for Automated Test Equipment (see figure below.) The interface, the control, and the I/O are digital; all analog circuitry is inside the chip. Eight complete and independent channels are integrated into each chip.

For most tester applications, no additional analog hardware needs to be developed or used on a per pin basis.

### Features

- **66MHz**
- **7.5ns Minimum Pulse Width**
- **Pin Electronics Driver**
  - 2 Level Driver with On-Chip Buffers
  - 8V Driver Output Swings
  - Extremely Low Leakage over a 16V HI-Z Range
- **Pin Electronics Comparator**
  - Extremely Low Leakage over a 16V Input Range
  - 16V Comparator Input Voltage Range
- **Per-Chip PMU**
  - FV, FI, MV, MI
  - 8 Current Ranges (32mA, 8mA, 2mA, 512µA, 128µA, 32µA, 8µA, 2µA)
- **12V Super Voltage Capability**
- **Deskew**
- **Propagation Delay Adjustment**
- **Falling Edge Adjustment (up to ±5ns range)**
- **Auto Calibration via PLL**
- **On-Chip DC Levels**
  - 4 Levels/Channel
  - 8 Levels/Central PMU
  - 16 Bits per Level
  - 16 Bit per Level Offset Correction
  - 16 Bit per Level Gain Correction
- **3 Bit Serial CPU Port**
  - Load Internal Registers and Memory
  - Read Back Internal States
- **Flexible Digital Inputs and Outputs**
  - Adjustable Threshold for High Speed Inputs
  - 50Ω/100Ω Input Termination Options
  - 50Ω Serial Terminated High-Speed Comparator Outputs
- **Package/Power Dissipation**
  - 128 Lead, 14mm x 20mm MQFP with Heat Slug
  - Pdq ≤ 500mW/Channel; Pdq ≤ 4.0W/Chip

### Applications

- **Automated Test Equipment**
- **Instrumentation**
- **ASIC Verifiers**
The ISL55188 is a highly integrated System-on-a-Chip (SOC) pin electronics solution aimed at incorporating every analog function, along with some digital support functionality, required on a per channel basis for Automated Test Equipment. The interface, control and I/O of the chip are all digital; all analog circuitry is inside the chip. Two complete tester channels are integrated into each ISL55188.

Features

- **Pin Electronics Driver**
  - 75 MHz Fmax
  - 2 Level Driver (DVH / DVL)
  - DC Level Generators On Chip
  - 24V Driver Output Swings
  - Adjustable Output Voltage Range (-15V to +24V)
  - Programmable Slew Rates (1 V/ns to .1 V/ns)
  - Iout = 200 mA (DC)
  - Extremely Low Leakage Over the operating Range
- **Pin Electronics Comparator**
  - Threshold Level Generators On Chip
  - Extremely Low Leakage over a 32V Range
  - 32V Comparator Input Compliance Range
  - Differential Comparator
- **Load**
  - 24 mA Source / Sink Capability
  - Split Load Configuration
  - Resistive Load Capability
- **Deskew**
  - Propagation Delay Adjustment
  - Falling Edge Adjustment
  - Delay Range set by PLL Clock
  - PMU
  - 5 Current Ranges (20 µA, 200 µA, 2 mA, 20 mA, 200 mA)
  - FV / MI
  - FI / MV
  - Imax = 200 mA
- **On Chip DC Levels**
  - 10 Levels / Channel; 16-Bit Levels
  - 16-Bit Gain and 16-Bit Offset Correction / Level
  - DUT Ground Sensing and Correction
- **3 Bit Serial CPU Port**
  - 2 Control Bits per Channel (for Ext Relay Support)
- **Flexible Real Time Digital Inputs and Outputs**
  - 50Ω Series Terminations for Comparator Outputs
  - Selectable On-Chip Terminations for Inputs
- **Package**
  - Lead Free
  - 128 Lead, 14 mm X 20 mm, MQFP w/ Heat Slug
  - Pdq < 1.5 Watts / Channel; Pdq < 3.0 Watts / Chip

Applications

- **Automated Test Equipment**
- **Instrumentation**
- **ASIC Verifiers**
# Kilimanjaro

**Low Cost, Dual Channel, 15V Pin Electronics Driver/Window Comparator**

The Kilimanjaro is a dual-channel pin electronics driver and window comparator product fabricated in a wide voltage Bi-CMOS process. It is designed specifically for Test During Burn-In (TDBI) applications and low cost testers, where cost, functional density, and power are all at a premium.

The Kilimanjaro incorporates two channels of programmable drivers and window comparators into a small 5mm x 5mm QFN package. Each channel has per-pin driver levels, data, and high impedance control, along with per-pin high and low window comparator thresholds levels.

The Kilimanjaro was specifically designed to offer a low cost, high density driver and window comparator solution with excellent small swing performance and stable timing characteristics.

A 15V driver output and receiver input range allow the device to interface directly with TTL, ECL, CMOS (3V, 5V, and 7V), LVCMOS, and custom level circuitry, as well as high voltage levels required for many special test modes in Flash Devices and for stressing devices under test.

## Features

- **15V I/O Range**
- **125mA DC Current Capability**
- **Low Output Impedance**
- **100MHz Operation**
- **Driver Short Circuit Protection**
- **Per-Pin Flexibility**
- **Programmable Input Thresholds**
- **LVTTL Compatible I/O**
- **Small Footprint (5mm x 5mm QFN with Exposed Heat Slug**
- **Improved Small Signal Swing and Timing Performance**
- **Low Preshoot/Overshoot/Undershoot**
- **PIN and Functionally Compatible with E7801 and E7802**

## Applications

- **Burn-In ATE**
- **Low Cost ATE**
- **Instrumentation**

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![Kilimanjaro Block Diagram](image-url)
Integrated PMU/DPS and V/I Products

ElevATE is the market leader in integrated PMU, V/I, and DPS products. We have leveraged our knowledge and expertise in system-on-a-chip solutions to offer the widest product portfolio available in this space. As a pioneer in the integrated analog pin space, we have developed products with the most advanced features in the industry. These features include ground-breaking advances in technology like glitch-free current measurement range changing, programmable pole and zero placement, less than 0.5V force amp headroom for improved system efficiency, and “ESP”, a method to double the DPS density of existing systems. With a myriad of fully integrated, scalable, and digitally reconfigurable solutions available, we are confident that you will find a solution for your testing challenges.

ElevATE Solution
- DUT Power Supply
- DACs
- External Force and Sense Switches
- Overcurrent Protection

<table>
<thead>
<tr>
<th>Product</th>
<th>ISL55187 (Neptune)</th>
<th>Pluto2</th>
<th>ISL55185 (Triton)</th>
<th>Jupiter</th>
<th>ISL55180 (Europa)</th>
<th>Vesuvius</th>
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</thead>
<tbody>
<tr>
<td>Description</td>
<td>Integrated PMU + Companion DAC Levels</td>
<td>Integrated PMU + 10MHz Pin Electronics</td>
<td>Integrated V/I</td>
<td>Integrated DPS</td>
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<td>Status</td>
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<td>14x20 TQFP w/ exposed slug up</td>
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<td>10x10 TQFP w/ exposed slug up</td>
<td>14x20 TQFP w/ exposed slug up</td>
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<td>100mW/Channel</td>
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<td>24mA</td>
<td>1A Gangable</td>
<td>256mA Infinitely Gangable</td>
<td>512mA Infinitely Gangable</td>
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<td>ISL55185CNEZ</td>
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<td>Jupiter-SYS</td>
<td>ISL55180CNEZ-SYS</td>
<td>ELE58VE2A-SYS</td>
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</tbody>
</table>
SOC 8-Channel DPS

Key Features

- **Per Channel DPS**
  - FV, FI, MV, MI, HIIZ Capability
  - 16V Measure Voltage Input Compliance Range
  - 2 Force Voltage Ranges (8V, 16V)
  - 3 Measure Voltage Ranges (4V, 8V, 16V)
  - 6 Current Ranges: (256mA, 25.6mA, 2.56mA, 256µA, 25.6µA, 2.56µA)
  - Programmable Current Clamps

- **Power Management**
  - Independent Output Buffer Power Supply (VCCO)
  - Ability to Exceed VCCO in Lower Current Ranges (Patent Pending)

- **Flexible Ganging Capability**
  - No Restrictions on Maximum # DPS

- **Protection**
  - On-Chip Junction Temperature Monitor
  - Over-Temperature Shut-Down per Chip
  - Kelvin Connection Sensing/Alarm per Channel

- **Global External Force/Sense Connectable to any Channel**

- **Monitor**
  - One General Purpose Monitor per Chip
    - Scaling and Shifting Capability
    - HIIZ Capability
  - One Dedicated Measure Current Monitor per Chip
    - HIIZ Capability

- **3-Bit Serial Port**
  - 2 Independent FV Levels/Channel
  - Central Resource Mode w/16 Selectable Levels
  - Independent Source and Sink Clamp Levels/Channel
  - 16 bits/Level
  - On-Chip Offset and Gain Correction per Level

**“ESP” - Elimination of Sense Pin for Double System Density and Lower Cost of Test**

**Digitally Programmable On-Chip Compensation for Ultimate System Flexibility**

**Highest Density DPS Solution Available - 8 Channels in a 14mm x 20mm Package**
The ISL55187 (Neptune) is a highly integrated System-on-a-Chip pin electronics support solution incorporating two independent channels of:

- PMU
- DC Levels for the Pin Electronics
- Resistive Load

The interface, the control, and the I/O are digital. All analog circuitry is inside the chip. Two complete and independent channels are integrated into each chip.

For most tester applications, except for the pin electronics, no additional analog hardware is required on a per pin basis.

**Features**

- **Per Pin PMU**
  - FV, FI, MV, MI
  - 8 Current Ranges (32mA, 8mA, 2mA, 512µA, 128µA, 32µA, 8µA, 2µA)
  - FI Voltage Clamps
  - FV Current Clamps
  - On-Chip Current Ganging
  - Supports 64mA/Channel in FV Mode
- **On-Chip DC Levels**
  - All PMU Levels Generated On-Chip
  - 13 Levels/Channel Brought Off-Chip
  - 16 Bits per Level
  - 16 Bit per Level Offset Correction
  - 16 Bit per Level Gain Corrective
- **Resistive Load**
  - 8 Resistance Options
  - High Speed Real Time Control
  - External Force/Sense Switches On-Chip
  - 3-Bit Serial Port
  - Package/Power Dissipation
    - 56 Ld 8mmx8mm QFN with Exposed Heat Slug
    - Pdq ≤ 343mW/channel; Pdq ≤ 685mW/Chip (No Output Current)
    - Pdmax ≤ 700mW/Channel/ Pdmax ≤1.4W/Chip (Maximum Output Current)

**Applications**

- Automated Test Equipment
- Instrumentation
- ASIC Verifiers

![Diagram of ISL55187 (Neptune) pin electronics support solution](image-url)
Pluto2
SOC Octal DPS/PMU/VI with Ganging 10MHz Pin Electronics

Pluto2 is a highly integrated System on a Chip pin electronics solution incorporating 8 independent channels of:

• DPS / PMU / VI
• Pin Electronics
• Resistive Load

The interface, the control, and the I/O are digital; all analog circuitry is inside the chip. Eight complete and independent channels are integrated into each chip.

For most tester applications, no additional analog hardware needs to be developed or used on a per pin basis.

Features

• Per Pin DPS / PMU
  → FV, FI, MV, MI – 4 Quadrant Operation
    - 64 mA Imax in FV / MI
    - 32 mA Imax in FI / MV
  → 8 Current Ranges (32mA, 8mA, 2mA, 512μA, 128μA, 32μA, 8μA, 2μA)
  → 14V FV Range
  → FI Voltage Clamps
  → FV Current Clamps
  → Per Pin Monitor
  → Central (Per Chip) Monitor
• Pin Electronics Driver and Comparator
  → 2 Level Driver w/ On Chip Buffers
  → 14V Driver Output Swings
  → 10 MHz Driver Operation
  → 16V Comparator Input Voltage Range
  → Extremely Low Input Leakage over a 16V Range
• Ganging Capability
  → High Current Applications
  → No Limit on Ganged Imax
  → Gang Control Circuitry Built In
• 3 Bit Serial CPU Port
• On Chip DAC to Generate DC Levels
  → 10 DC Levels Per Channel (16 Bits / Level)
  → On Chip Offset and Gain Correction
  → Ability to Shift Voltage Ranges Up and Down
• Package / Power Dissipation
  → Lead Free
  → 128 Lead, 14 mm X 20 mm, TQFP w/ Heat Slug
  → Pdq ≤ 125 mW / Channel; Pdq ≤ 1 W / Chip
  → On-Chip Thermal Monitor
**ISL55185 (Triton)**

**SOC Octal Wide Voltage PMU/Load**

The ISL55185 is a highly integrated System-on-a-Chip pin electronics solution incorporating 8 independent channels of:
- **PMU**
- **Active load**
- **External force/external sense**

The interface, the control, and the I/O are digital; all analog circuitry is inside the chip. Eight complete and independent channels are integrated into each chip.

For most tester applications, no additional analog hardware needs to be developed or used on a per pin basis.

### Features

- **Per Channel Active Load**
  - 24mA Maximum Current
  - MI capability
  - Independent Source and Sink Current Levels
  - Extremely low HiZ Leakage over a 32V Range
  - 32V Input Compliance/28V Output Forcing Range
  - Extremely Low Input Leakage over a 32V Range

- **Per channel PMU**
  - FV/MI/MV
  - 5 Current Ranges (24mA, 4mA, 400µA, 40µA, 4µA)
  - FV Current Clamps
  - 32V Input Compliance/28V Output Forcing Range
  - Extremely Low Input Leakage over a 32V Range

- **Monitor**
  - Differential Per Channel Monitor with HiZ
  - Differential Central Monitor with HiZ
  - External Force/Sense per Channel
  - 3-bit Serial Port
  - On-chip DAC to Generate DC Levels
  - 4 DC Levels Per Channel (16 bits/level)
  - On-chip Offset and Gain Correction per Level
  - Package/Power Dissipation
    - Pb-free (RoHs Compliant)
    - 128 Lead, 14mm x 20mm LQFP w/Heat Slug
    - \( P_{dq} \leq 250\text{mW/channel}; \ P_{dq} \leq 2\text{W/chip} \)

### Applications

- Automated Test Equipment
- Instrumentation
- ASIC Verifiers
Jupiter

SOC Gangable DPS

Jupiter is a highly integrated system on a chip (SOC) Device Under Test Power Supply (DPS) incorporating all analog and digital functionality required for a single DPS unit for Automatic Test Equipment. The interface, the control, and the I/O are digital; all analog circuitry is inside the chip. One chip constitutes one complete DPS.

Features

• 1A DC Output Drive Capability
  ➔ 6 Current Ranges (1,024 mA, 128 mA, 8 mA, 1 mA, 125 µA, 15.625 µA)
  ➔ Glitchless Current Range Changing
  ➔ HIZ Capability w/ Extremely Low Leakage
• Full Functionality
  ➔ FV, FI, MV, MI
  ➔ 4 Quadrant Operation
  ➔ Bump Function
• Ganging Capability for Higher Current Applications
• Integrated External Force and Sense Switches
• Independent Power Supply for Output Stage
• Operating Voltage
  ➔ 24V Supply Range
  ➔ Adjustable Output Range
  ➔ 4 Voltage Ranges (4V, 8V, 16V, 24V)
• Adjustable Slew Rate
• External Precision DAC Drive Capability
• Programmable Clamps
  ➔ Voltage Clamps
  ➔ Current Clamps
• Ultra Low Noise External DAC Mode
• Programmable Alarms
  ➔ Over Current
  ➔ Over Voltage
  ➔ Over Temperature
  ➔ Kelvin Sense
• Dedicated Real Time DAC for Forcing Level
  ➔ Increment / Decrement Option
  ➔ Linear / Binary Increment / Decrement Option
  ➔ 16 Bit per Level Offset & Gain Correction
• On-Chip DC Support Levels
  ➔ 16 Bits per Level
  ➔ 16 Bit per Level Offset & Gain Correction
• 3 Bit Serial CPU Port
  ➔ Load Internal Registers and Memory
  ➔ Read Back Internal States
• Package/Power Dissipation
  ➔ Lead Free
  ➔ 64 Lead, 10 mm X 10 mm, TQFP w/ Heat Slug
  ➔ Power Dissipation
  ➔ Pdq (No Load) = 700 mW to 1.5 Watt
ISL55180 is a highly integrated System-on-a-Chip (SOC) Device Under Test (DUT) power supply solution incorporating 8 independent DUT Power Supply (DPS) units.

The interface, the control, and the I/O are digital; all analog circuitry is inside the chip. For most tester applications, no additional analog hardware needs to be developed or used on a per channel basis.

All configuration setup and the writing to and reading back of the internal registers are controlled through the 3-bit serial data CPU port. The CPU port is typically used to setup the operating conditions of each channel prior to executing a test, or to change modes during a test.

An internal register chart (Memory Map), listed later in the data sheet, lists all programmable control signals and their addresses.

Real time control is accomplished via the central EN and DATA_# pins. Real time observation is accomplished via the central monitor.

Features

- Per Channel DPS
  - FV, FI, MV, MI, HiZ Capability
  - 16V Measure Voltage Input Compliance Range
  - 2 Force Voltage Ranges (8V, 16V)
  - 3 Measure Voltage Ranges (4V, 8V, 16V)
  - 6 Current Ranges: (256mA, 25.6mA, 2.56mA, 256µA, 25.6µA, 2.56µA)
  - Programmable Current Clamps
- Power Management
  - Independent Output Buffer Power Supply (VCCO)
  - Ability to Exceed VCCO in Lower Current Ranges (Patent Pending)
- Flexible Ganging Capability
  - No Restrictions on Maximum # DPS Units

Protection
- On-Chip Junction Temperature Monitor
- Over-Temperature Shut Down per Chip
- Kelvin Connection Sensing/Alarm per Channel
- Over-Current Sensing/Alarm per Channel

Global External Force/Sense Connectable to any Channel

Monitor
- One General Purpose Central Monitor per Chip
  - Scaling and Shifting Capability
  - HiZ Capability
- One Dedicated Measure Current Monitor per Chip
  - HiZ Capability

3-Bit Serial CPU Port

On-Chip DAC to Generate DC Levels
- 2 Independent FV Levels/Channel
- Central Resource Mode w/16 Selectable Levels
- Independent Source and Sink Clamp Levels/Channel
- 16 bits/Level
- On-Chip Offset and Gain Correction per Level

Package/Power Dissipation
- Pb-Free (RoHS Compliant)
- 128 Lead, 14mmx20mm, LQFP w/Exp Heat Slug
- Pdq 100mW/Channel; Pdq 800mW/Chip

Applications

- Automated Test Equipment
- Logic/ASIC Verifiers
- Instrumentation
Vesuvius is a highly integrated System-on-a-Chip (SOC) Device Under Test (DUT) power supply solution incorporating 8 independent DUT Power Supply (DPS) units.

The interface, the control, and the I/O are digital; all analog circuitry is inside the chip. For most tester applications, no additional analog hardware needs to be developed or used on a per channel basis.

All configuration setup and the writing to and reading back of the internal registers are controlled through the 3-bit serial data CPU port. The CPU port is typically used to setup the operating conditions of each channel prior to executing a test, or to change modes during a test.

An internal register chart (Memory Map), listed later in the data sheet, lists all programmable control signals and their addresses. Real time control is accomplished via the EN and DATA_# pins. Real time observation is accomplished via the per-pin or central monitor.

Features

- **Per Channel DPS**
  - FV, FI, MV, MI, HiZ Capability
  - 16V Measure Voltage Input Compliance Range
  - 2 Force Voltage Ranges (8V, 16V)
  - 3 Measure Voltage Ranges (4V, 8V, 16V)
  - 6 Current Ranges: (512mA, 25.6mA, 2.56mA, 256µA, 25.6µA, 2.56µA)
  - Programmable Voltage and Current Clamps
- **Power Management**
  - Independent Output Buffer Power Supply (VCCO)
  - Ability to Exceed VCCO in Lower Current Ranges (Patent Pending)
- **Flexible Ganging Capability**
  - No Restrictions on Maximum # DPS Units

- **Protection**
  - On-Chip Junction Temperature Monitor
  - Over-Temperature Shut Down per Chip
  - Kelvin Connection Sensing/Alarm per Channel
  - Over-Current Sensing/Alarm per Channel
- **Global External Force/Sense Connectable to any Channel**
- **Monitor**
  - Per-pin Monitor for Enhanced Throughput
    - Scaling and Shifting Capability
    - HiZ Capability
  - One General Purpose Central Monitor per Chip
    - Scaling and Shifting
    - HiZ Capability
  - One Dedicated Measure Current Monitor per Chip
    - HiZ Capability
- **3-Bit Serial CPU Port**
- **On-Chip DAC to Generate DC Levels**
  - 2 Independent FV Levels/Channel
  - Central Resource Mode w/16 Selectable Levels
  - Independent Source and Sink Clamp Levels/Channel
  - 16 bits/Level
  - On-Chip Offset and Gain Correction per Level
- **Package/Power Dissipation**
  - Pb-Free (RoHS Compliant)
  - 128 Lead, 14mmx20mm, LQFP w/Exp Heat Slug
  - Pdq 115mW/Channel; Pdq 920mW/Chip

Applications

- Automated Test Equipment
- Logic/ASIC Verifiers
- Instrumentation
ElevATE is Your Total ATE Solution Provider

We offer solution assistance services, design and schematic review services, and personalized local support through all phases of the customer’s product life cycle, from concept through production and beyond.

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