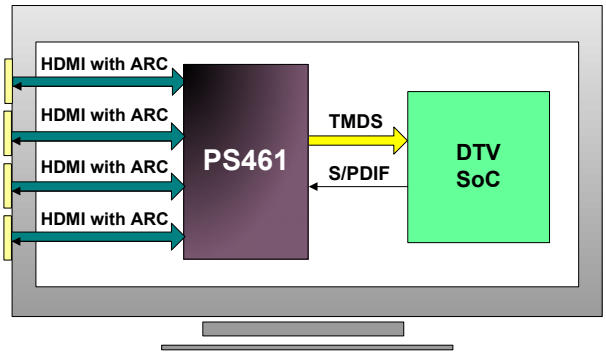
HDMI 4:1 Switch with QuickPort® Switching and Adaptive Equalizer

Product Brief

PS461

KEY FEATURES

- HDMI 1.4a compliant, up to 225 MHz TMDS clock rate
- Fast HDMI port switching enabled through QuickPort® Switching with HDCP pre-authentication
- Supports up to WUXGA / 1080p with 8/10/12 bits per color component depth - supports deep color
- Automatic compensation for signal loss from long HDMI cables through adaptive receiver equalization
- ARC (Audio Return Channel) supported on all HDMI inputs from single S/PDIF source within the display
- HDMI and VGA input EDIDs supported by integrated non-volatile memory, saving system BOM cost
- Optional on-chip EDID shadow for HDMI EDID
- Zero standby power easily meets ENERGY STAR sleep mode power consumption criteria
- Automatic device power down and output squelch modes provide power management and fail-safe
- Active port and source connection detection enables better end customer experience and flexible system management
- Integrated 50 ohm active input termination
- Built-in side-band signals with 5V DDC pin tolerance
- Local I2C interface provides flexible host control
- Integrated bidirectional CEC buffer
- Single 3.3V operation enabled by integrated switching regulator
- Less than 800mW power consumption
- 100-pin TQFP Halogen free RoHS package
- 0°C to 70°C operating temperature range
- ESD: Human Body Model at 8 kV, Machine Model at 300 V, and Charged Device Model at 2kV



APPLICATIONS

- Digital TV Receivers and Displays
- Digital Signage Displays

GENERAL DESCRIPTION

PS461 is a 4-to-1 HDMI switch with Parade's innovative QuickPort® Switching that reduces switching time between HDMI inputs to less than one second. The device includes the HDMI Audio Return Channel (ARC) for transmitting digital audio from the DTV to any selected HDMI input.

The fast switching performance is accomplished through the use of four TMDS Receivers and one TMDS Transmitter. An integrated HDCP cipher engine, with integrated HDCP keys, provides simultaneous support for up to 4 HDCP-encrypted HDMI and/or DVI inputs. The selected HDMI input is provided to the DTV SoC through the unencrypted TMDS output.

PS461 includes on-chip, non-volatile memory for HDMI EDID and VGA EDID. This non-volatile memory uses a multiple-time programmable (MTP) ROM to reduce system BOM cost; it eliminates four external HDMI port EDID EEPROMs and one VGA port EDID EEPROM. EDID programmed can be accomplished through the control I2C bus or Port 1 DDC channel. EDID shadow RAM configuration is optional for HDMI EDID access.

Each HDMI input includes an adaptive equalizer which will automatically compensate for signal loss from long cables or other signal impairments.

PS461 features Zero Standby Power which allows easy compliance to the ENERGY STAR sleep mode power consumption criteria. When the display or TV is powered off, the PS461 will draw its 5V supply from HDMI source devices enabling EDID access.

PS461 also provides flexible power management: automatic power down which will shut down the main power when there are no sources plugged in the input ports; squelch which will disable TMDS outputs when no active input signal is detected on the selected port.

A bidirectional CEC buffer is also included with an on-chip pull-up resistor. The CEC buffer isolates line capacitance and is fully compliant to the CEC power-off line degradation leakage spec.

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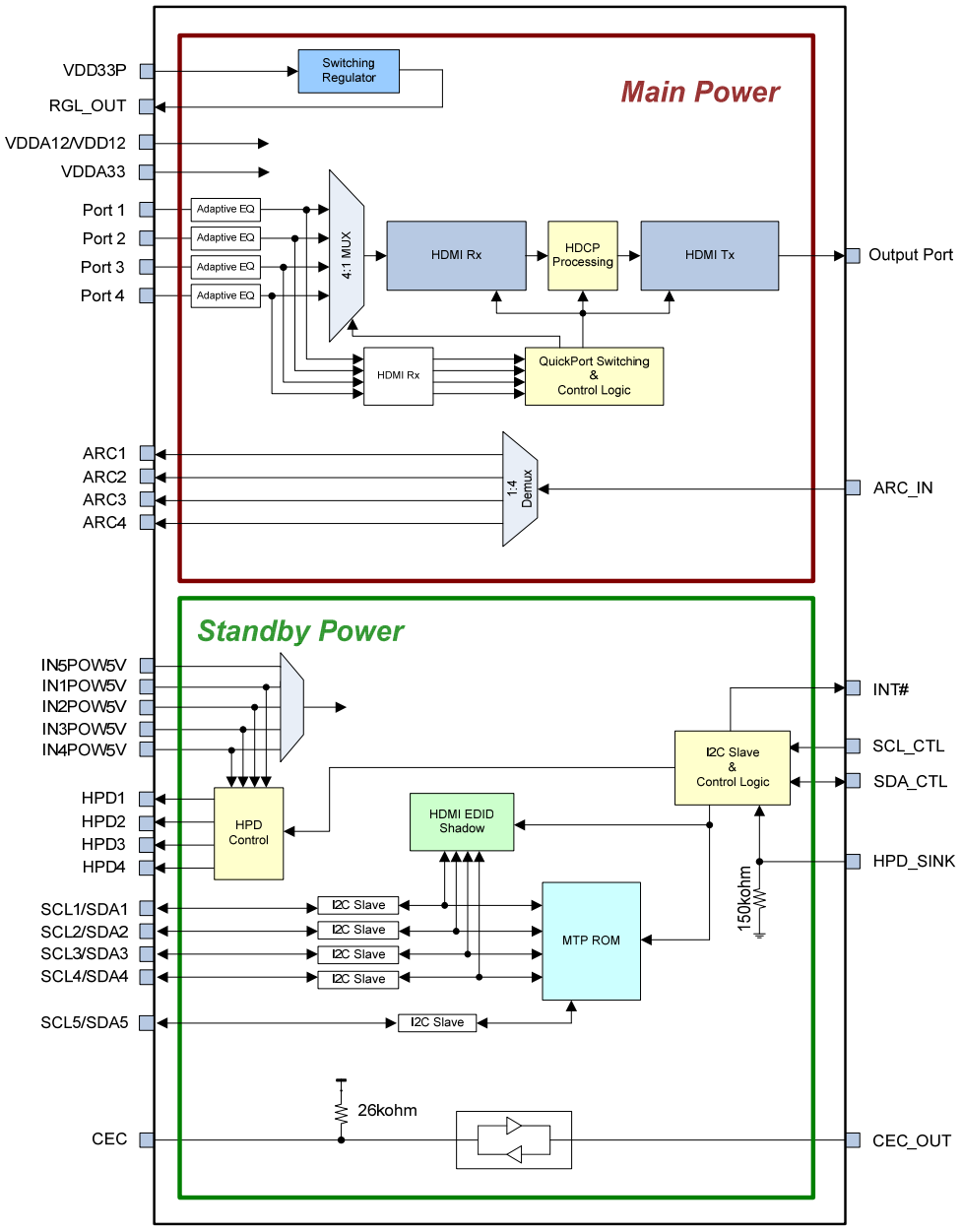
To minimize power consumption and simplify system configuration, the PS461 includes an on-chip switching regulator. This enables the device to use a single 3.3V supply and generate 1.2V for the low-power core logic. Total device power consumption is less than 800mW under maximum device utilization.

FUNCTIONAL BLOCK DIAGRAM



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