VDAP1000 – True Single-Chip Solution for TFT LCD Panels

POWER MANAGEMENT | ANALOG & RF | INTERFACE & CONNECTIVITY | CLOCKS & TIMING | MEMORY & LOGIC | TOUCH & USER INTERFACE | **VIDEO & DISPLAY** | AUDIO

FEATURES

- **Integrated LVDS / mini-LVDS Timing Controller**
  - Support input frequency range from 25MHz to 85.5MHz
  - Support 1-port mini-LVDS transmitter at a maximum clock rate up to 250 MHz (3 or 6 pair)
  - Support 8-bit input and 6-bit output with FRC mode (16.7M colors)
  - Built-in aging and test pattern generator
  - IDT LED Dimming control
  - Support Failsafe
  - Support input SSC 5% down-spread
  - Support dual-gate(COG/GIP mode) panel design
  - Support Pre-Charge /Non Pre-charge mode for dual Gate GIP
  - Support 1 line or 1+2 line inversion mode for Traditional mode.
  - Support 2 lines or 2+4 lines inversion mode for dual Gate mode.
  - Support Z, and Z+ type for Display Scan function
  - Support output Even/Odd Frame selection signal
  - Support all Refresh Rate switching techniques
  - Support serial bus programming
  - Support up to WXGA (1366x768) resolution
- **Integrated power management**
  - Input voltage range of 2.7V to 5.5V
  - 2A high efficiency boost regulator with integrated switch for AVDD and built-in soft start
  - 2.5V, LDO
  - Built-in high speed VCOM buffer
  - Positive regulator for VGH
  - Negative regulator for VGL
  - Support Slicer function
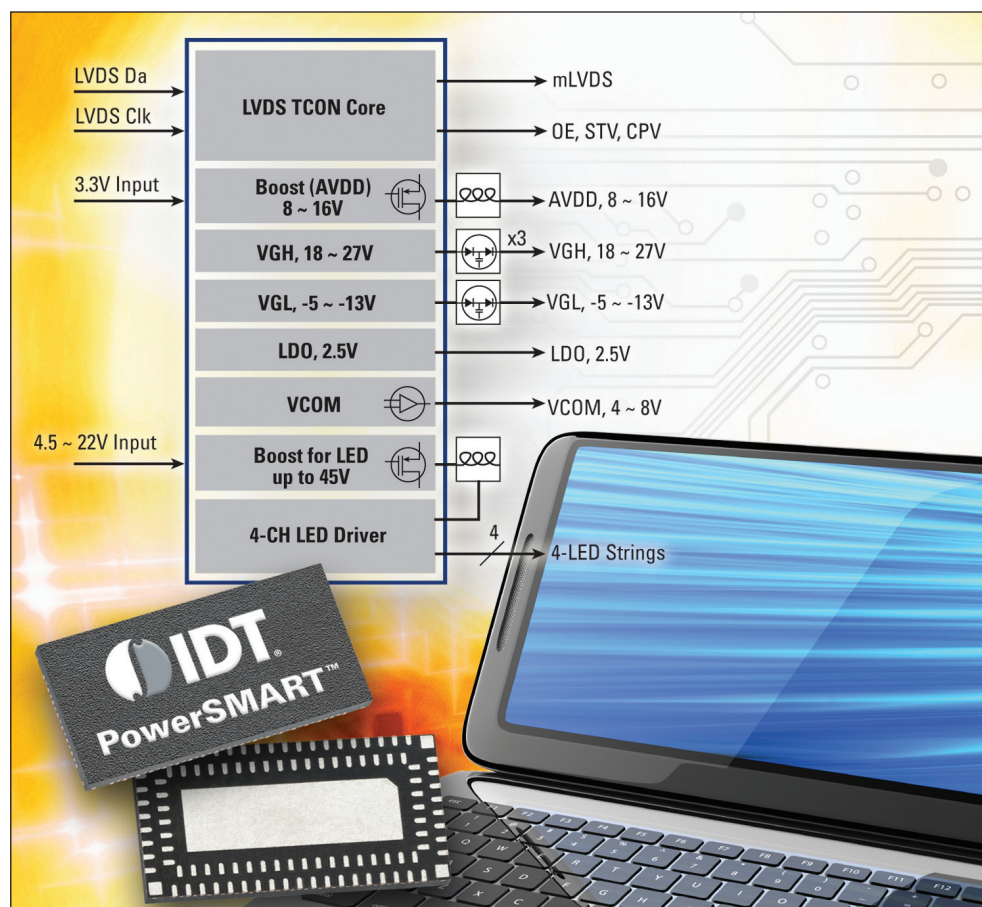- **4 or 2 channel LED driver**
  - PWM input (LED) frequency from 0.1kHz to 20kHz
  - Adjustable LED current up to 25mA per string
  - LED input voltage range of 4.5V to 22V
  - 45V Power N-channel MOSFET for LED
- **Over-current, over-voltage and over-temperature protection**
- **104-MLF Dual Row QFN, 5.5 x 11 x 0.85mm**

TARGET APPLICATIONS

- TFT-LCD panels for Netbook and Notebook application
- Portable displays

Device Overview

The VDAP1000 is a true single-chip solution for Netbook TFT-LCD panels. It features a full function LVDS timing controller (TCON), fully integrated power management, and a 4/2 channel LED driver.

The integrated TCON is embedded with a single pixel LVDS receiver and a 6-pair mini-LVDS transmitter. The low voltage swing of the mini-LVDS transmitter minimizes EMI and power consumption, while offering a 6-bit output and a barrage of key features. The integrated TCON supports WXGA resolution (1366x768) and other resolutions with EEPROM.

The integrated power management blocks support all the required panel voltages. It features a boost regulator for the source driver, a charge pump regulator for VGL, a charge pump for VGH, an LDO for the TCON core, and an amplifier to drive the VCOM plane.

The integrated 4-channel white LED driver includes a 45V power MOSFET and supports up to 48 LEDs (with VF=3.6V max). The string current is adjustable up to 25 mA per channel. Dimming is controlled by SMBus or directly by PWM.

This device is offered in a 104-Id 5.5 x 11 x 0.85mm MLF (QFN) package, and tested over the temperature range of 0°C to +70°C.

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