

Display Subsystem Solutions using QuickLogic's ArcticLink II VX Platforms

ARCTICLINK II

The ArcticLink® VX Solution Platform family integrates QuickLogic's 2nd generation Visual Enhancement Engine (VEE), Display Power Optimizer (DPO), MIPI, LVDS, MDDI, Framebuffer and Programmable Fabric. This highly integrated, yet flexible architecture enables the platform family to be deployed as Customer Specific Standard Product (CSSP) solutions in the display subsystems of Smartphones, Tablets, and Smartbooks.



VEE Technology – Delivers Superior Viewing Experience

QuickLogic's VEE technology, based on the iridix® algorithm from Apical Limited, greatly enhances the viewability of displays under challenging viewing conditions such as bright ambient light, while dynamically optimizing video characteristics on a pixel-by-pixel basis to provide a superior viewing experience to the user, regardless of ambient lighting.

- TV-quality visual experience in mobile devices through dynamic range control.

Tablet



DPO Technology – Extends Battery Life Up To 36%

Used in conjunction with the VEE technology, QuickLogic's DPO technology enables significantly longer battery life and the use of smaller, more cost-effective batteries by lowering display backlight power without compromising the viewing experience.

Smartphone

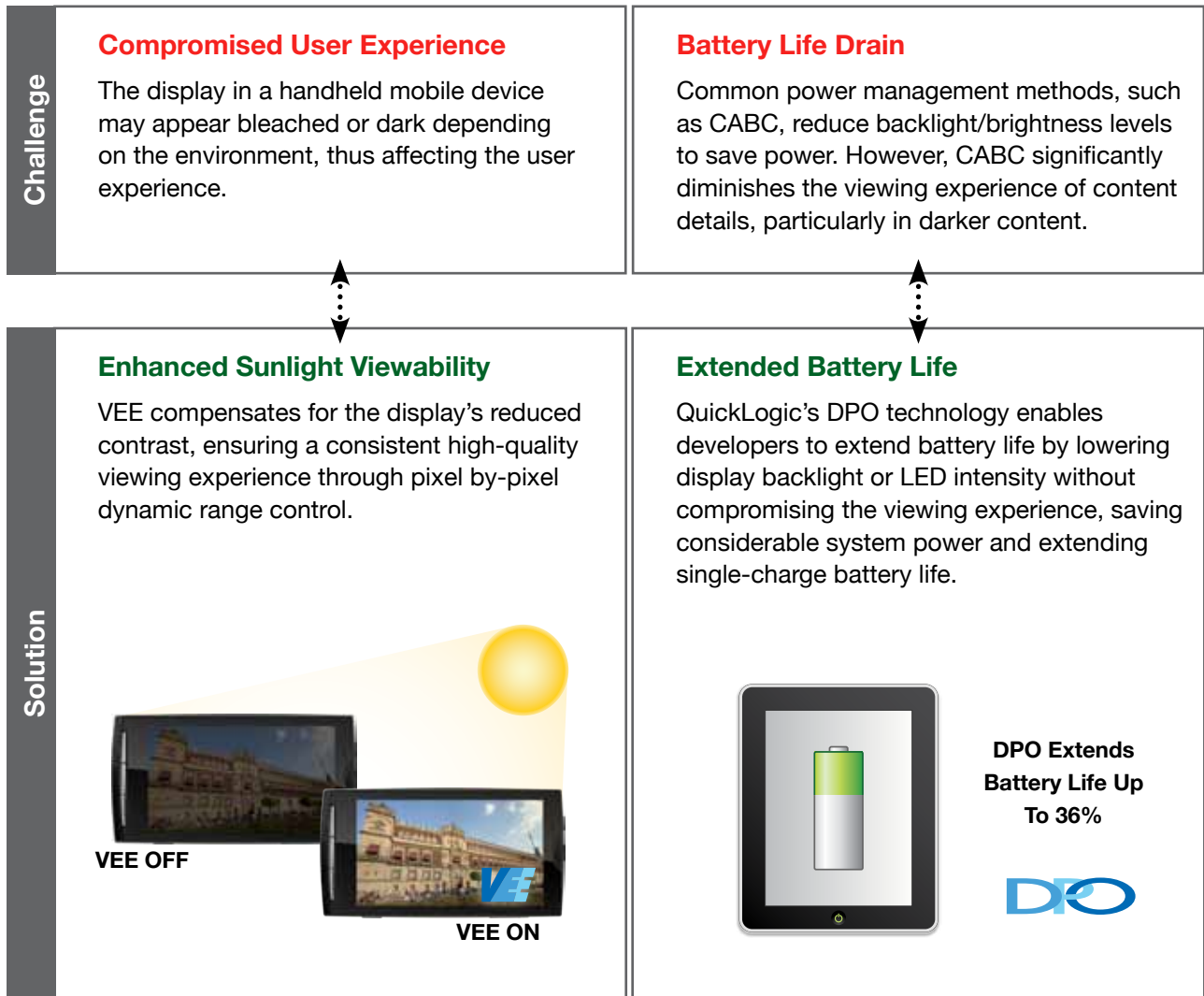


- DPO includes Pulse Width Modulation (PWM) technology to drive the display backlight for active backlight power management.

Battery Life: QuickLogic Averaged Measured Results

Note: Actual power savings are system dependent.

Mobile Device Challenges & QuickLogic Solutions



Customizable “Mobile Device Display Optimizer” Android Application - Enables Mobile Product Differentiation

MDDO (Mobile Device Display Optimizer) gives the system designer complete control over VEE and DPO parameters while providing information on ambient light levels, current display backlight, and recommended display backlight based upon the system's Auto Backlight settings. MDDO can be implemented at the user-level as a replacement for the standard Android Auto Brightness menu, allowing the consumer to directly adjust VEE processing and display brightness.

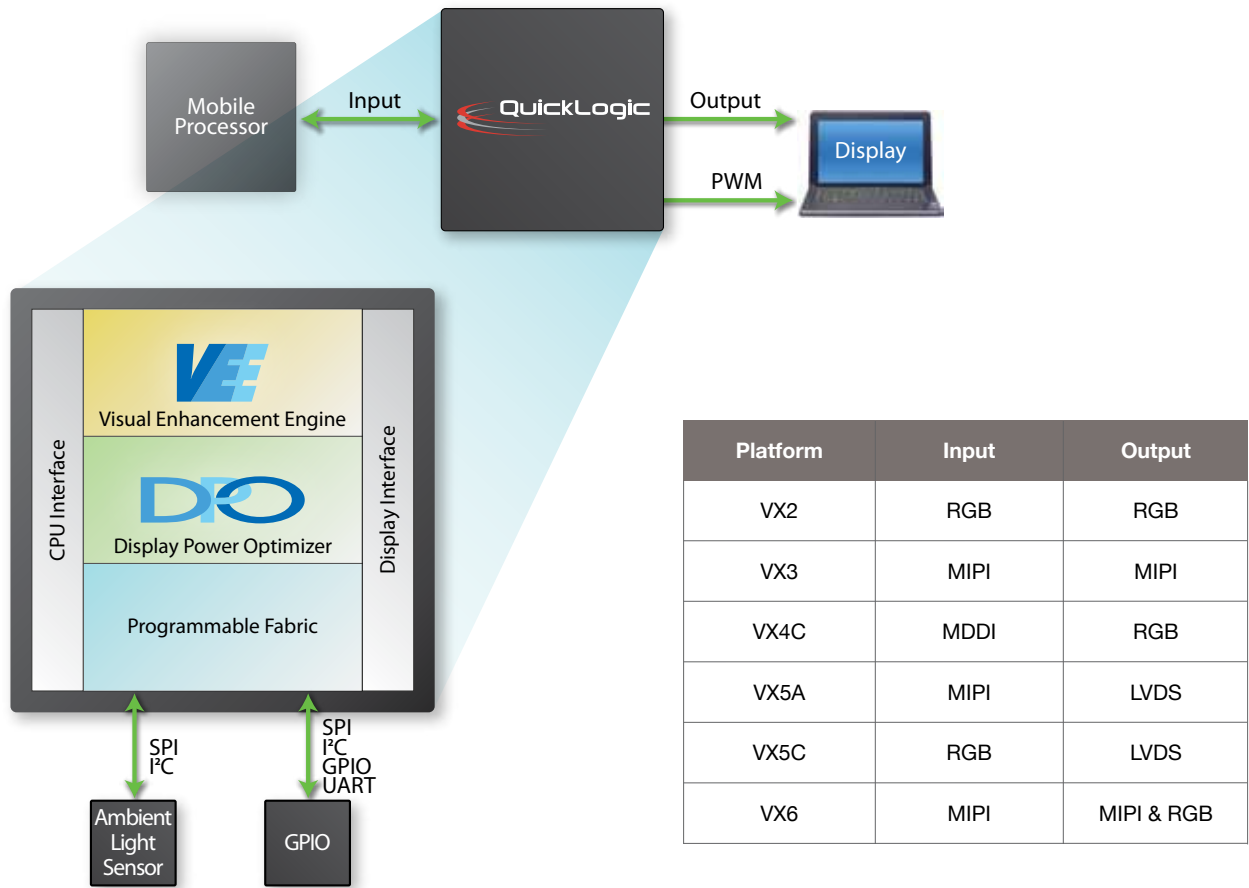


MDDO Screenshot

- Speeds time-to-market by providing a standard software platform that substantially improves the native Auto Backlight controls in Android™



ANDROID



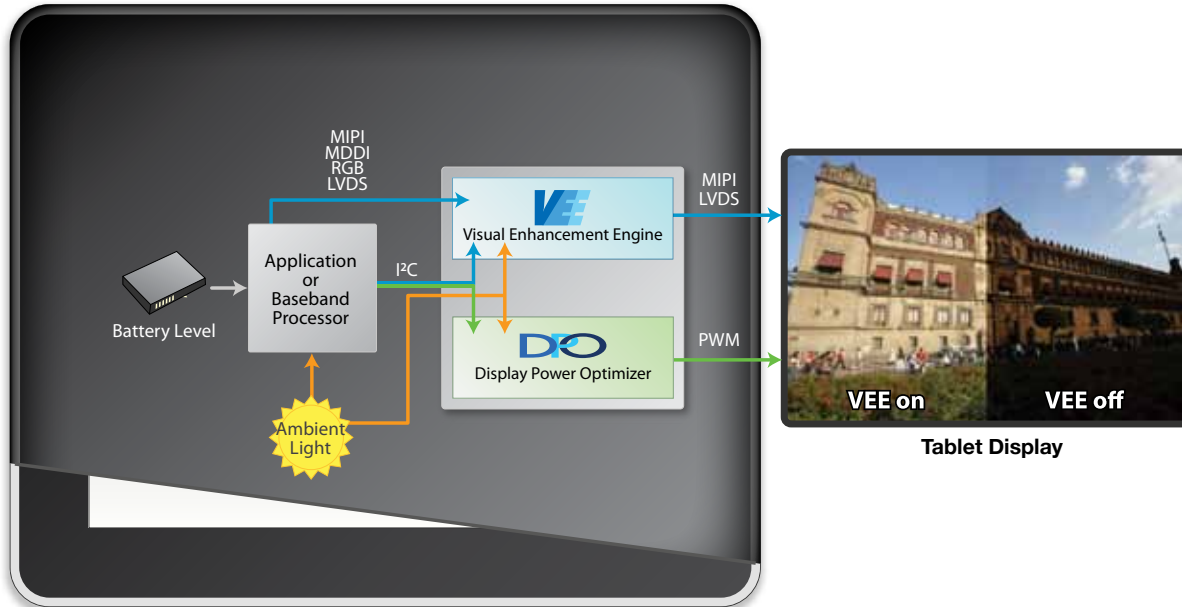
ArcticLink II Solution Platform Block Diagram

VEE and DPO Background

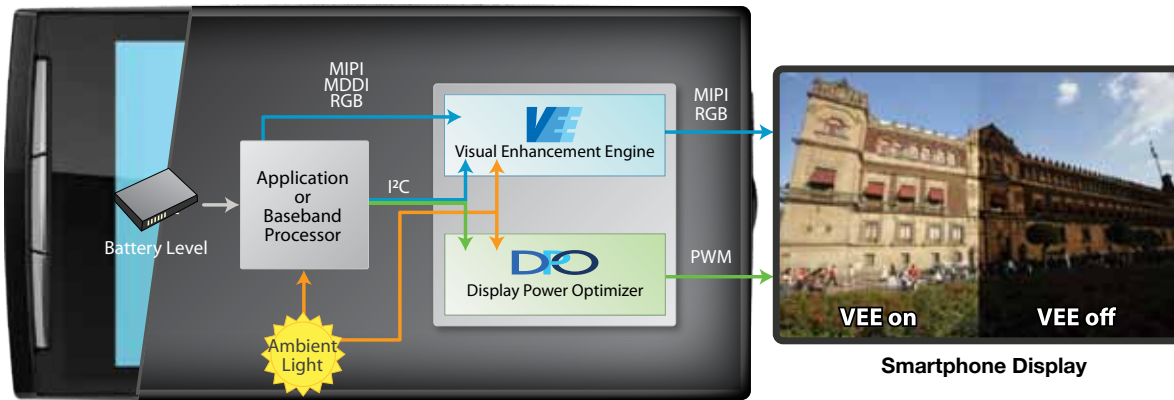
VEE uses a Dynamic Range Compression (DRC) technology, which differs from conventional methods such as gamma correction in that it applies different tonal and color transformations to every pixel in an image. These algorithms implement a model of human perception resulting in a displayed image that retains detail, color and vitality even under difficult viewing conditions. VEE technology specifically addresses the problem of the low contrast ratio of mobile displays to bring a more television-like viewing experience to mobile devices.

While VEE uses statistical information gathered pixel-by-pixel, frame-by-frame to adjust the value of individual pixels, QuickLogic's Display Power Optimizer (DPO) uses that same information to adjust the backlight. The ability to provide a unique tone curve for each pixel, as well as have tight control over the display backlight, gives greater flexibility than the global adjustments of alternative implementations. This approach results in greater power savings and the entirely new capability of adapting to a bright environment.

VEE and DPO are hardware based technologies, integrated into consumer devices via a CSSP (Customer Specific Standard Product) chip from QuickLogic. The CSSP is placed in the display path, between the CPU/Applications Processor and the display.



Tablet



Smartphone

Application Examples



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