1. DESCRIPTION

MT3321 is a high integration optical sensor incorporating ambient light sensing (ALS), color (RGB) sensing, and proximity sensing (PS). It includes five concurrent channels—Red, Green, Blue, Clear, and Wideband—for accurate ambient light measurement, precise illuminance and color temperature calculations, optimizing display management.

The proximity sensing function synchronizes infrared (IR) emission and detection to accurately sense nearby objects. The sensor's consists of four independent advanced emitter drivers, a self-maximizing dynamic range receiver, ambient light subtraction, advanced crosstalk cancellation, and interrupt-driven detector. Sensitivity, power consumption, and noise levels are all optimized.

MT3321 synchronizes ALS and PS with an OLED display using a VSYNC signal, operating within 0.7Hz to 1000Hz. The proximity function can be set for either automatic synchronization detection or manual operation. Synchronization status flags reflects when the VSYNC frequency is within the target range. When it changes, or whether the measurement times out.

Additionally, MT3321 supports flicker detection through off-chip calculations, provided that ALS data is appropriately sampled, buffered in the FIFO, and retrieved by an external host for flicker frequency analysis.
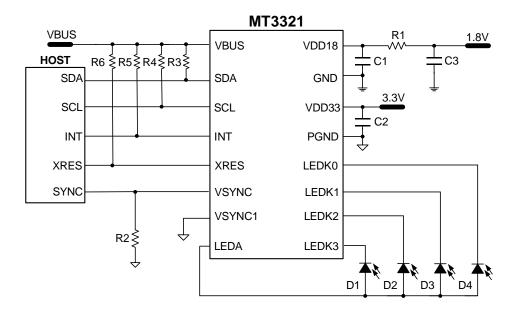
2. FEATURES

- 32-bit resolution for ALS and 16-bit resolution for PS
  - PS supports both classical and common modes
  - ALS supports 3 SUM channels
- ALS and PS functions synchronized with display
  - Supports 2 VSYNC signals
  - VSYNC synchronous monitoring
- Red/Green/Blue/Clear/Wideband 5 channels for ALS detection
- Programmable gain and integration time
- Built-in emitter drivers with flexible settings
  - Quantity of VCSEL
  - VCSEL pulse width and count selection
  - VCSEL current: 2mA ~ 30mA
- High ambient light suppression and low noise design
- Crosstalk and ambient light cancellation
  - Supports FFT sample mode
- Supports V_{BUS} 1.8V/1.2V I²C interface
- Low power consumption
  - Configurable sleep mode
  - VDD supply voltage: 1.7V ~ 2.0V
- Lead-free OLGA package (RoHS compliant)

3. APPLICATIONS

- Brightness management for displays
- Color management for displays
- Proximity detection for mobile phones
- Flicker-immune camera operation

4. TYPICAL APPLICATION CIRCUIT