

### 36-Channel RGB LED Drivers with I<sup>2</sup>C Control

#### Features

- Drives up to 36 LEDs (12 RGBs)
- Multiplexed LED Current Driver Outputs
  - ▶ Only 12 PCB Traces to the LEDs
  - ▶ 23kHz MUX Frequency Prevents Audio Noise
- 14 Million Colors
  - ▶ LED Current: 125µA to 24mA in 125µA Steps
  - ▶ Night-Mode: 8µA to 1.5mA in 8µA Steps
  - ▶ 5% Max. Current Accuracy & Matching
- 36 Independent Exponential Fade-Engines
  - ▶ Ultra-Smooth 3072-Step Fade Resolution
  - ▶ 3-bit Programmable Fade Rate
  - ▶ Dramatically Reduces Software Complexity
- Patented<sup>1</sup> BrightExtend™ Technology
  - ▶ Maintains Color-Accuracy and PSRR for Battery-Powered Applications with Low Vin
- Proprietary CoolExtend™ Technology
  - ▶ 2-bit Programmable Max. Die-Temp Regulation
- 0.4µA Automatic Shutdown (Standby) Current
- 1MHz I<sup>2</sup>C Interface with Multiple Slave Addresses
- 2.5V to 5.5V Operating Supply Voltage Range
- -40°C to 85°C Operating Temperature Range
- 20 pin UQFN 3x3mm (0.4mm pitch)
- RoHS and Green Compliant

#### Applications

- AI Smart Speakers, Bluetooth / WiFi Loudspeakers
- Automotive Panel, Accent and Mood Lighting
- IoT, Gaming PC/Keyboards/Controllers/VR, Robots

#### Brief Description

The KTD2061/58/59/60 are fully programmable current regulators for up to 12 RGB LED modules (36 LEDs total). The devices are ideally powered from a supply rail in the 3V to 5V nominal range. Three 4-wire buses are multiplexed to reduce the pin-count and PCB traces to the LEDs.

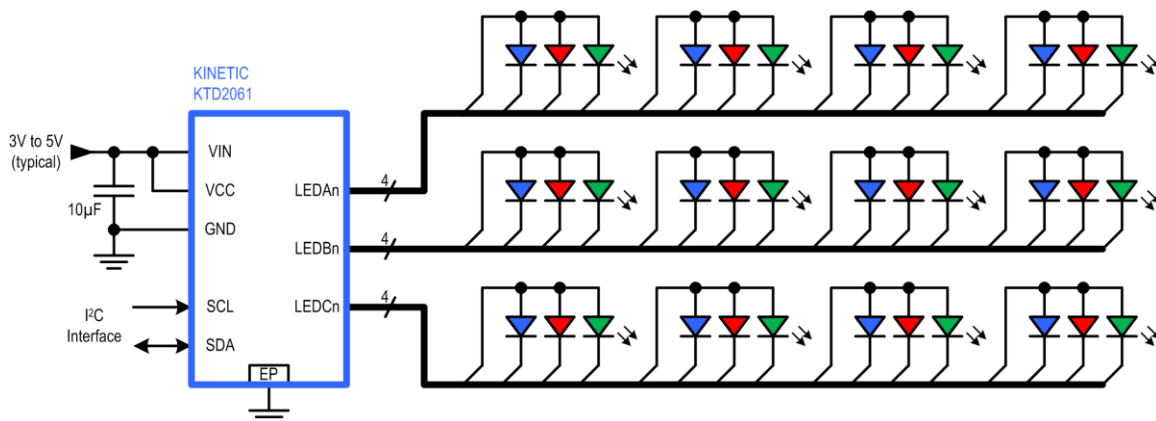
The I<sup>2</sup>C control interface is used to set the LED color palette and then dynamically select the on/off status and color of each RGB module. For applications requiring more RGBs on one I<sup>2</sup>C bus, the KTD2061/58/59/60 have different slave addresses.

36 independent fade-up/down engines are integrated for independent ramping of each LED's current during on/off, brightness, and color transitions without software burden. The exponential current ramps provide visually pleasing fades with eight I<sup>2</sup>C programmable fade-rate settings. 3072-step fade resolution ensures ultra-smooth visual effects.

BrightExtend™ optionally reduces dropout when the input voltage is too low for the forward voltage of the LEDs, enabling battery-powered applications. Programmable CoolExtend™ prevents excessive heat by regulating die temperature when the input voltage, current settings, and/or ambient temperature are high.

The KTD2061/58/59/60 are packaged in RoHS and Green compliant 3mm x 3mm UQFN packages with 0.60mm maximum height.

#### Typical Application



1. US Patent 8,482,216 B1

## Ordering Information

Part Number	I <sup>2</sup> C Slave Address	Marking <sup>2</sup>	Operating Temperature	Package
KTD2061EUAC-TR	0x68 default	NCYWZ	-40°C to +85°C	UQFN33-20
KTD2060EUAC-TR	0x6B alternate	OCYWZ	-40°C to +85°C	UQFN33-20
KTD2059EUAC-TR	0x6A alternate	OFYWZ	-40°C to +85°C	UQFN33-20
KTD2058EUAC-TR	0x69 alternate	OEYWZ	-40°C to +85°C	UQFN33-20

Part Number	Description	Package
KTD2061EUAC-EV1	KTD2061 EVAL Kit	UQFN33-20

2. YW = Date Code, Z = Serial Number.

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