

# Driving Towards Innovation: Illuminating the Automotive Market with Dynamic LED Lighting

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# Lighting Creates Awe and Influences Perception



# Gaming Enthusiasts



# Automotive In Cabin Lighting

## After Market



# Automotive In Cabin Lighting

## Automotive Trim

### Levels



[www.motortrend.com/features/best-ambient-lighting](http://www.motortrend.com/features/best-ambient-lighting)

**MOTORTREND**

2020 Mercedes Benz A-Class interior ambient lighting



[www.motortrend.com/features/best-ambient-lighting](http://www.motortrend.com/features/best-ambient-lighting)

**MOTORTREND**

Rolls Royce starlight headliner



# RGB LED Cabin Lighting

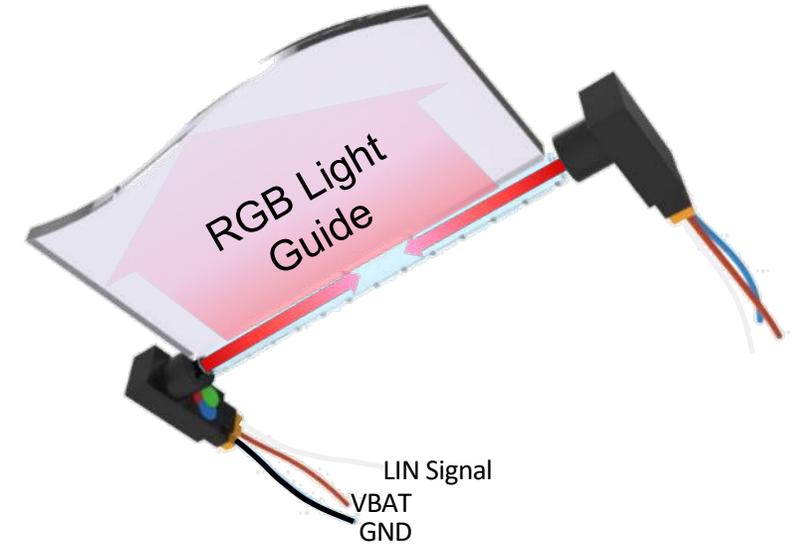
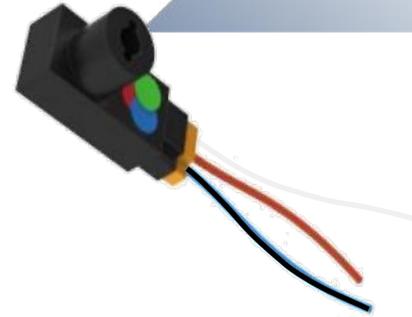
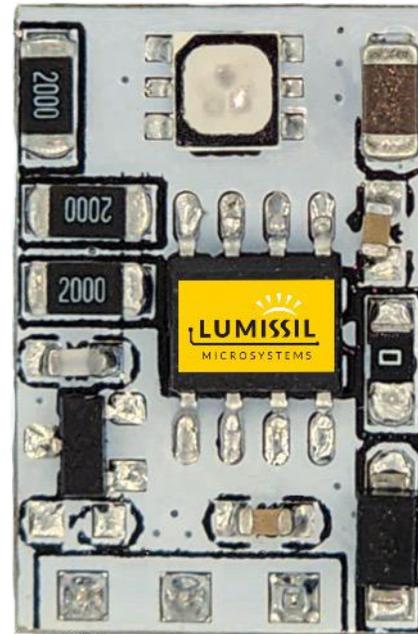
LIN RGB+W  
**LED Driver**  
IS32LT3183A



# IS32LT3183A

Fully Integrated  
LIN Compliant  
LED Driver in an  
SOIC-8

LIN RGB+W  
**LED Driver**  
IS32LT3183A



# Integrates:

LIN Transceiver & SW Stack

4 Configurable HV GPIOs

- 60mA LED Current Sinks

- 12-bit ADC, I2C or SPI Bus

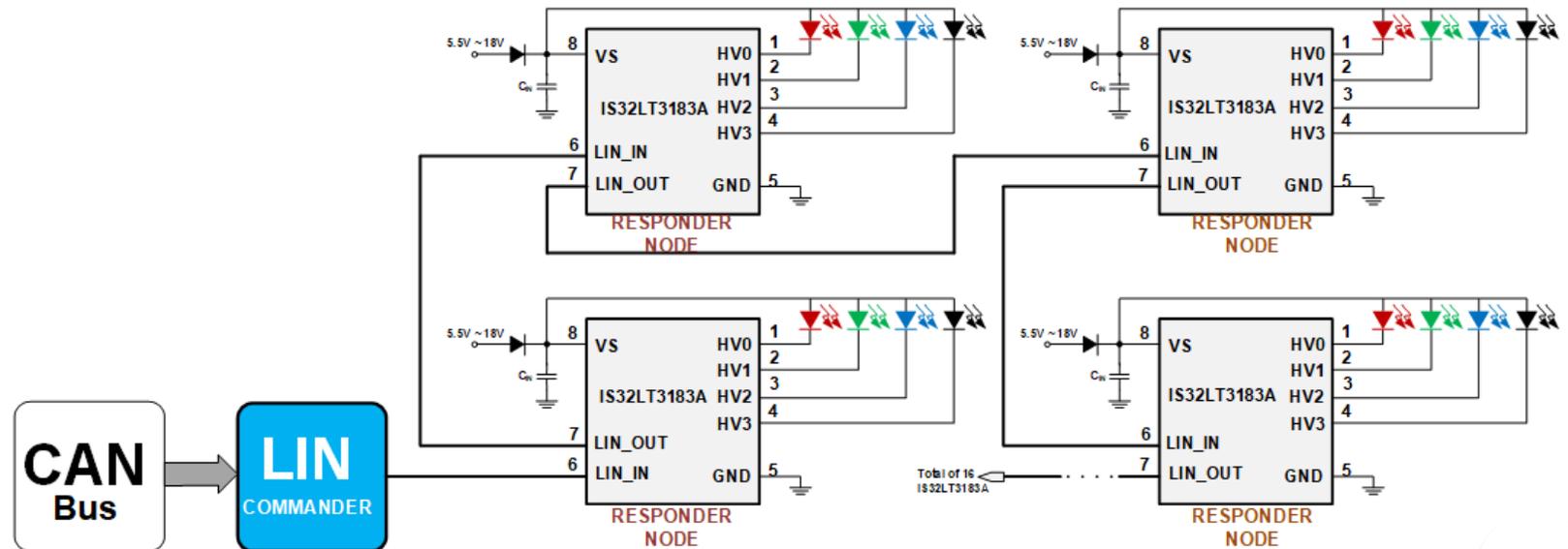
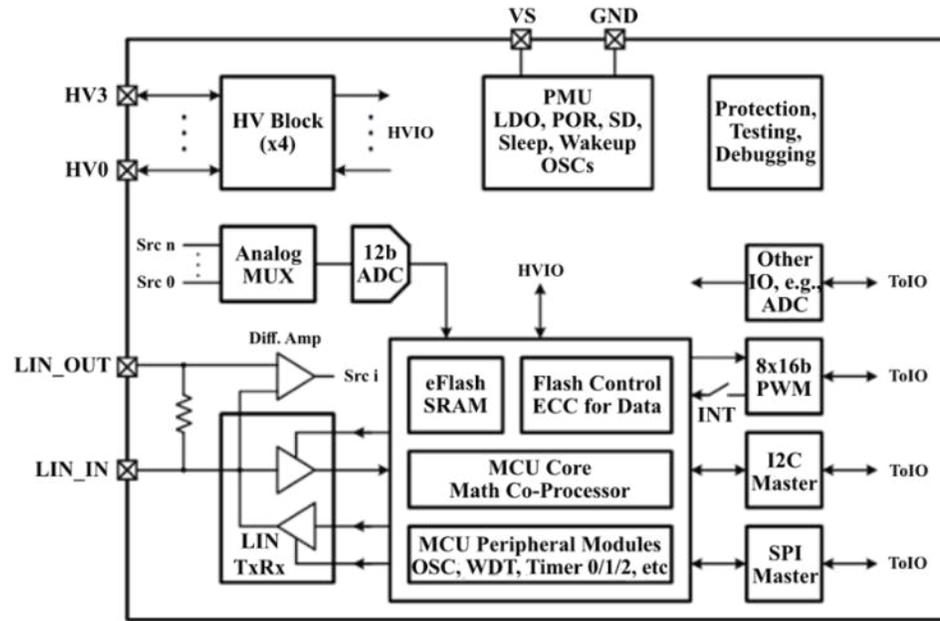
32kB ECC Protected Flash

Math Co-Processor

# Auto-Addressing

# Bus Shunt Method (BSM)

LIN RGB+W  
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Up to 16 devices per chain

# Color Accuracy

- 16-Bit PWM Color Accuracy
- Color Calibration
- Temperature Compensated
- Linear or Logarithmic Intensity

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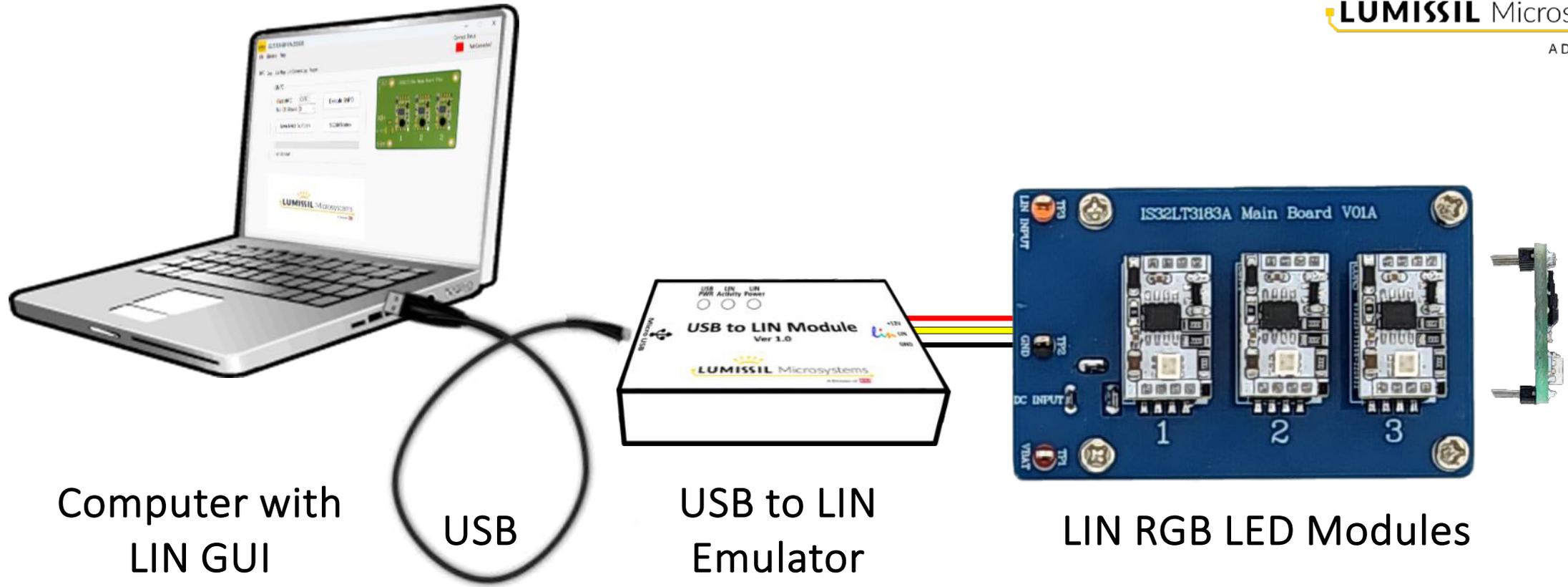
# Reliability

- ECC Protected Memory
- On-Chip Temp Sensor
- 40V Load Dump
- PWM Spread Spectrum
- LIN 2.2A & SAE J2602

# Compliant

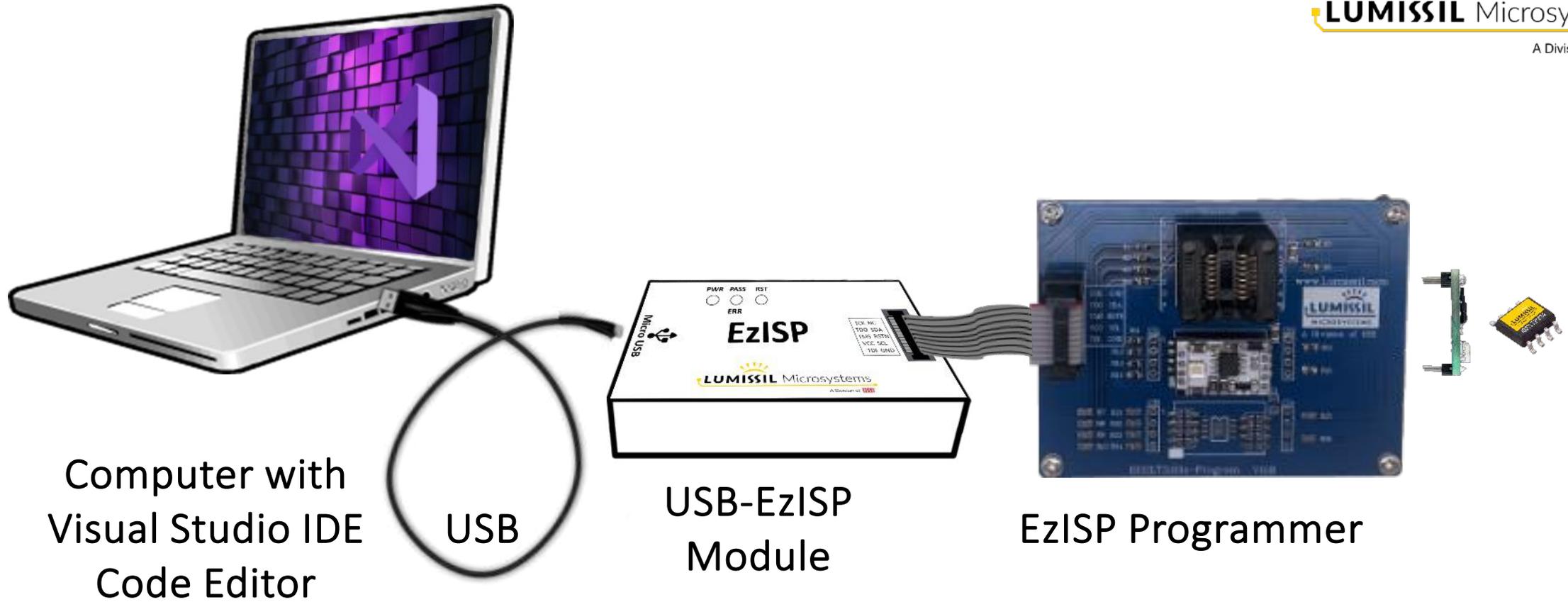
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LIN RGB+W  
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# Evaluation – GUI, USB-LIN Adapter LIN Eval Board



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# Programmer – Visual Studio, USB-EzISP Module, Programmer Board

# IS32FL3202

CAN with UART Protocol  
State Machine Driven

3 Channels for RGB LED

- 63mA LED Current Sinks
- Temperature Compensated
- 16-bit PWM Color Accuracy
- Calibration Data Stored OTP

ADC for LED Temp

Measure

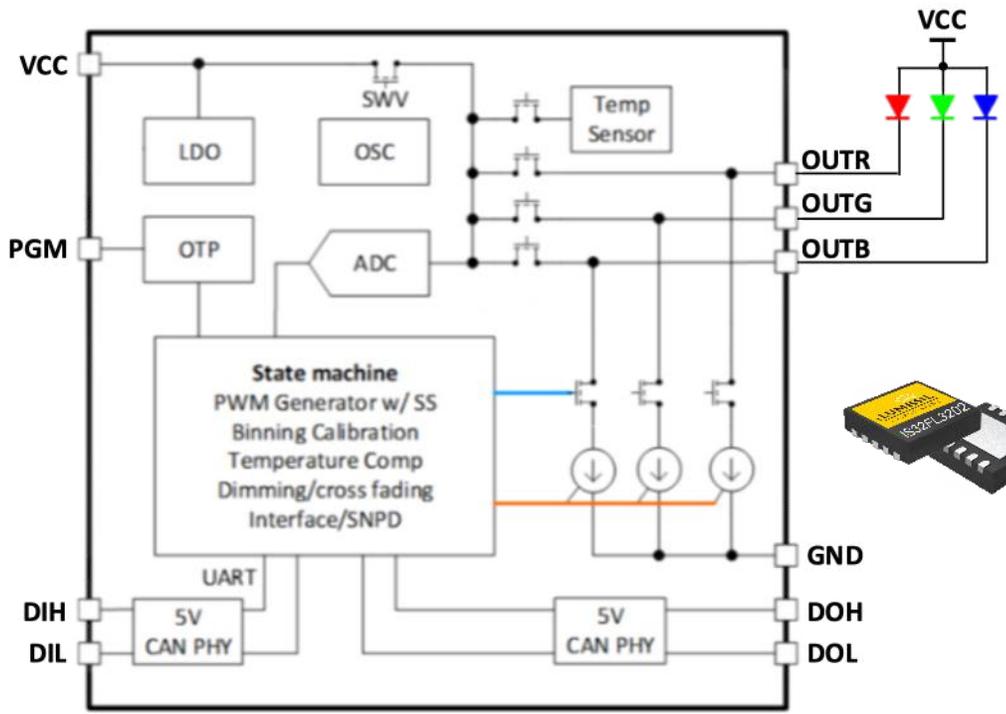
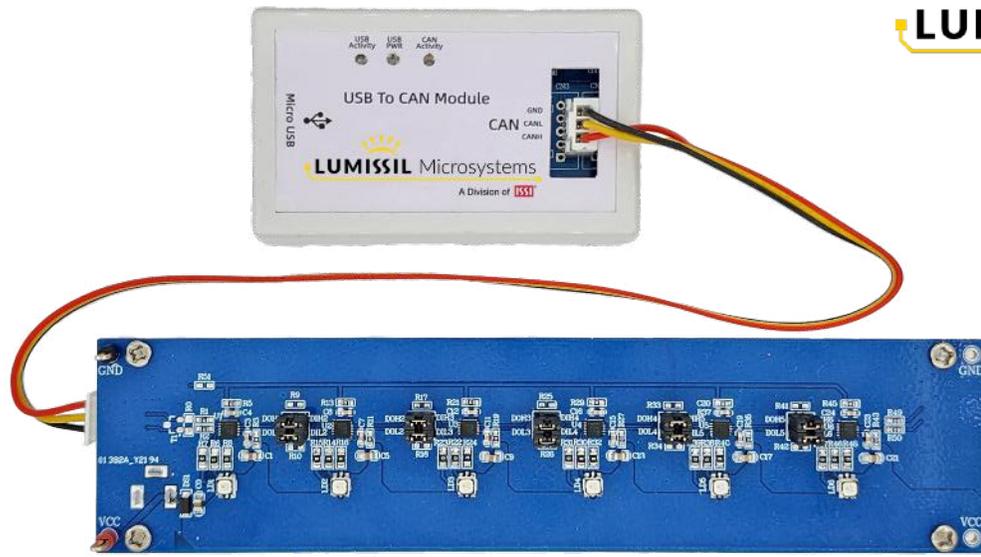
Location Address Assign

(LAA)

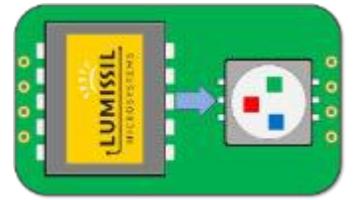
- LAA CAN RGB
- Assigned @ Power Up

LED Driver

IS32FL3202



10 pin package that can be paired with external common Anode RGB LED



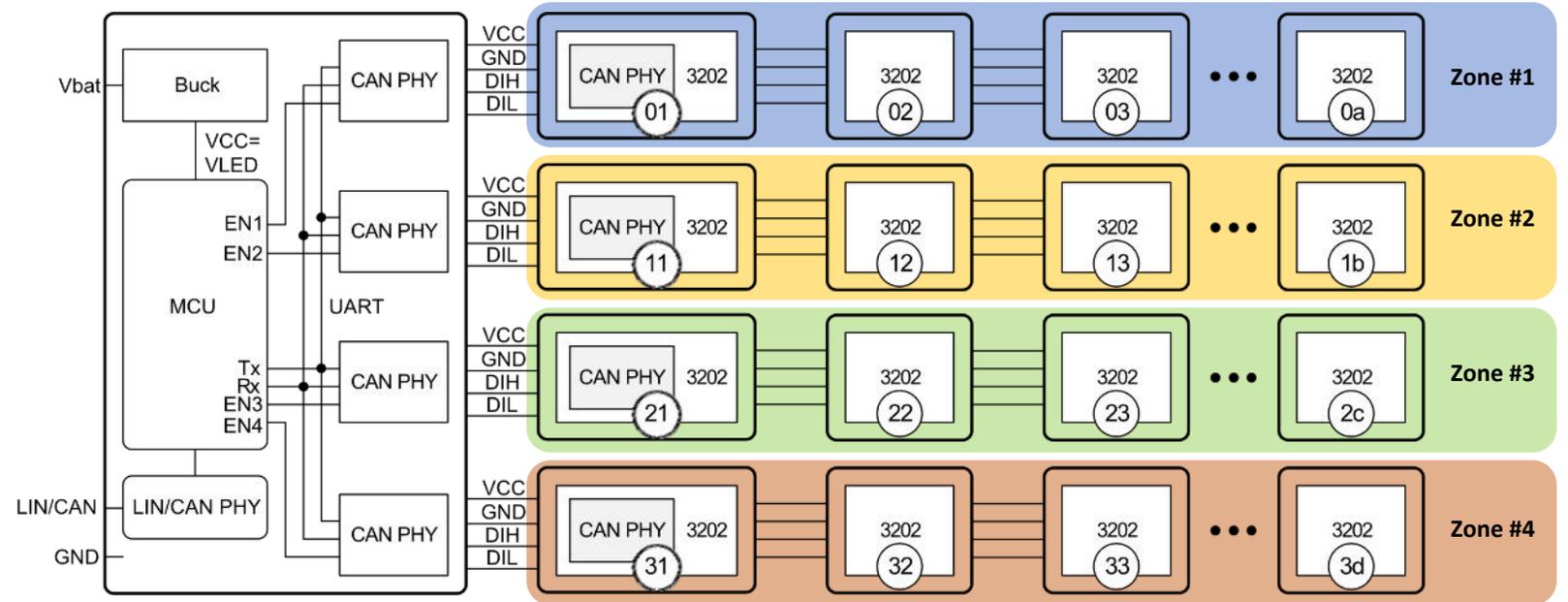
# LumiBus:

Standard CAN PHY @ 5V

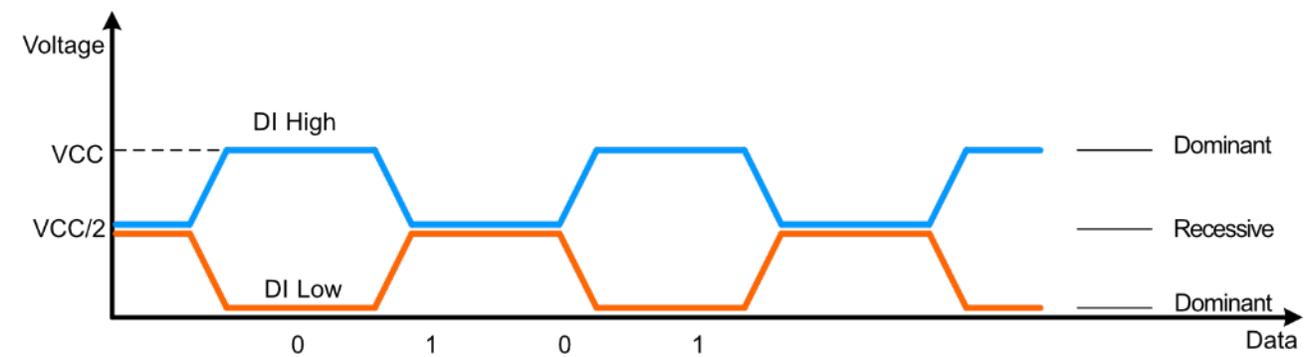
Integrated CAN Repeater

- 2MHz upto 128 Devices
- 1MHz upto 256 Devices

Create Multiple Light Zones



Up to 128 devices per zone @ 2MHz CAN Bus



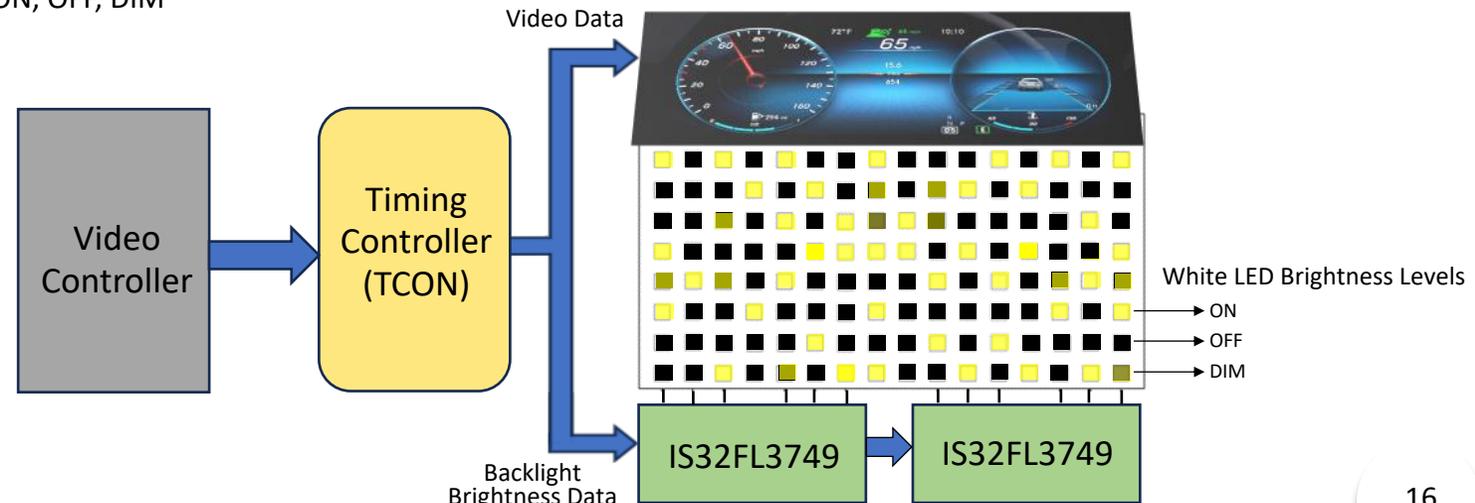
Lumibus: adopted from CAN bus; maximum voltage swing is  $\pm VCC/2$

**CAN RGB**  
**LED Driver**  
IS32FL3202



For Best Display Contrast  
LED ON, OFF, DIM

Mini LED Backlight (car Virtual Instrument Cluster)



White LED Brightness Levels  
 → ON  
 → OFF  
 → DIM

# IS32FL3749

## 24x4 Matrix LED Driver

- 96 LEDs
- Each Dimmed 16-bit PWM
- Enable Local Dimming
- Selectable 33MHz Bus
- Serial-Shift Daisy-Chain
- SPI

## Open/Short LED Detection

# Matrix LED Driver

IS32LT3749

# Automotive Future Trend



# THANK YOU!

Questions or comments? Our contacts are below.



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