

## MSL3163 / MSL3164

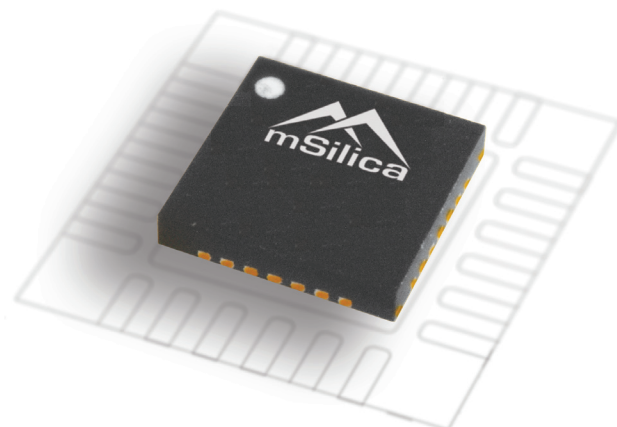
16-String RGB & White LED Drivers with Adaptive Power Control, User E2PROM, and SPI/I2C/SMBus Serial Interface

### Features:

- Drives 16 Parallel LED Strings
- Up to 10 LEDs per String
- Up to 100mA per LED string
- Single Resistor Sets Peak Current for All LED Strings
- $\pm 3\%$  Current Accuracy and Current Balance
- $< 1\mu\text{A}$  LED String Current Sink off Leakage Current
- Individual LED String Intensity (Peak Current and PWM)
- Individual LED String Phase Controls
- Global LED Intensity Control – SPI or I2C Interface
- Programmable String Phase Delays Reduce Motion Blur
- Supports Adaptive, Real-Time 2-D Area Dimming for Highest dynamic Range LCD TVs and Monitors
- Flexible Video Frame (VSYNC) and Line (HSYNC) Synchronization with DLL Multiplier and Dividers
- Sync Loss Detectors Optionally Disable LED Strings
- Adaptive Power Correction Optimize LED String Supplies
- Multiple MSL3163/4s Can Share String Supplies
- MSL3163/4s Automatically Negotiate the Lowest LED Supply Voltage Required by All MSL3163/MSL3164s
- Die Temperature Cutoff Protection
- Open Circuit and Short Circuit Fault Protection
- Individual Fault Detection Enables for Each String
- Fast Serial Interfaces, Supporting up to 16 devices on a Bus
  - MSL3163 1MHz I<sup>2</sup>C
  - MSL3164 20MHz SPI
- Broadcast Mode Simplifies Configuration
- User E2PROM Saves Power-On Default Settings
- -40°C - +85°C Operating Temperature Range

### Ordering Information:

PART	Pin / Package	DESCRIPTION
MSL3163Q	40 Pin, 6 x 6 x 0.75mm TQFN	16 Channel LED Driver with I2C Interface
MSL3164	40 Pin, 6 x 6 x 0.75mm TQFN	16 Channel LED Driver with SPI Interface



### Description:

The MSL3163 and MSL3164 are compact, high power 16-parallel string LED drivers with internal current control MOSFETs sinking up to 100mA per LED string with better than 3% accuracy. Each String can contain 10 white LEDs – 160 LEDs per MSL3163/MSL3164.

The advanced PWM engine is easily synchronized to the video signal and refresh timing using a built-in DLL multiplier and sync dividers. Per-string phase adjustments reduce unwanted LCD artifacts such as motion blur. Up to 16 MSL3164s can share a 20 MHz SPI serial interface or up to 16 MSL3163s can reside on the same 1 MHz I2C serial interface. Both of which are fast enough for frame-by-frame LED string intensity control of 16 MSL3163/4s-2560 white LEDs total.

The MSL 3163/4 adaptively controls the DC-DC converters that power the LED Strings using mSilica's Adaptive Source-Power™ control. These Efficiency Optimizers minimize LED driver power losses while maintaining current accuracy.

Individual LED string current is modulated using a 12-Bit PWM control. Global Brightness fine-tuning is available through an 8-bit global brightness control. One external resistor provides the global reference current for all the LED strings with additional fine tuning available through an 8-bit DAC.

The MSL3163 and MSL3164 feature fault monitoring of open circuit, short circuit and over-temperature conditions with fault status available through I2C (MSL3163) or SPI (MSL3164a) serial interface. Both serial interfaces offer both individual device read/write and also broadcast write commands, allowing multiple MSL3163/4s to be configured simultaneously.

The MSL3163/4 are offered in a 6x6mm 40 pin TQFN package and operates over the -40°C - +85°C temperature Range.

### Applications:

- Flat Panel Television and Desktop Monitors
- Medical and Industrial Instrumentation
- Automotive Audio-Visual Displays
- Channel Signs
- Architecture Lighting

## Typical Application Circuit:

