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150mA Quad Channel LED Driver family with enhanced thermal and fault management for Advanced Automotive Lighting

AMS, the Analog and Mixed-Signal division of ISSI, announces the IS32LT3124 family of quad channel linear LED drivers for the automotive lighting market. The family features dynamic headroom voltage control to maintain a low IC voltage even under high input voltage conditions. The drivers consist of four LED channels, each capable of sourcing up to 150mA with independent Pulse Width Modulation (PWM) making them ideal for animated turn signaling, daytime running lights and photometric corrected taillights.

High current linear controllers such as the IS32LT3124 operate cooler when their input voltage is managed to a low operating voltage (headroom). Because any voltage above the LED forward voltage contributes to an increase in IC thermal energy, the IS32LT3124 family is designed to support an external circuit to actively reduce the IC voltage and shift thermal energy away from the IC. The desired headroom voltage and the operating range is fully programmable and component values can be calculated using the supplied worksheet. For even more flexibility, the external circuit composed of a power PFET and a power resistor can be managed so most of the thermal energy is transferred to the PFET or the power resistor. This unique feature contributes to an effective heat distribution on the PCB and maintains the IS32LT3124 at a low temperature so it can effectively monitor and drive a constant LED brightness.

Differentiating features amongst the six IS32LT3124 family members are dimming method, LED short detection threshold and fault detection response. For example the IS32LT3124A is dimmed by applying a PWM signal to the EN pin, it detects a short when the channel voltage is less than 1.22V and the fault response is one channel fault shuts down the remaining 3 LED channels. While for the IS32LT3124C dimming can be individually applied to each LED channel, a short detection threshold is 4.8V and a single channel fault will not shut down the remaining 3 channels. This level of granularity provides the design engineer unprecedented flexibility in selecting the right LED controller to meet specific fault response requirements.

"The IS32LT3124 family offers the utmost flexibility and performance for designing animated tail and indicator lights a much sought after feature preferred by major Auto manufacturers who are using lighting to differentiate their brands with the highest performance", said Ven Shan, VP of AMS the Analog and Mixed Signal Division of ISSI. "The thermal design and fault protections option afforded by using IS32LT3124 makes this a best in class solution above any other product in this category in the market".

Pricing and availability
The IS32LT3124 family is AEC-Q100 automotive qualified and is available in an eTSSOP-16 package with exposed pad for enhanced thermal dissipation. They come in six options as in table below:

Version	Dimming	Outx Pin Short To GND Threshold V_{SCD}	Support LED String Voltage	Fault Protection Action (See Table 4 For More Details)
IS32LT3124A	PSM dimming or Simultaneous dimming by EN pin	Typ. 1.22V	1 LED(s)	One channel fails all channels off
IS32LT3124B	PSM dimming or Individual dimming by ISET resistors	Typ. 4.8V	> (V_{SCD_MAX}+V_{SCD_HY})	One channel fails all channels off
IS32LT3124C	PSM dimming or Individual dimming by ISET resistors	Typ. 4.8V		One channel fails all channels on
IS32LT3124D	PSM dimming or Simultaneous dimming by EN pin	Typ. 4.8V		One channel fails all channels off
IS32LT3124E	PSM dimming or Individual dimming by ISET resistors	Typ. 1.22V	1 LED(s)	One channel fails all channels off
IS32LT3124F	PSM dimming or Individual dimming by ISET resistors	Typ. 1.22V	1 LED(s)	One channel fails all channels on

For more information on AMS LED products, visit the AMS Analog products website at ams.issi.com/US/product-analog-hbled-driver.shtml

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About AMS
AMS is the analog mixed signal division of ISSI, a fabless semiconductor company that designs and markets high performance integrated circuits for the following key markets: (I) automotive, (ii) communications, (iii) industrial/medical, and (iv) digital consumer. AMS' primary products are LED drivers for low to mid-power RGB color mixing and high power lighting applications. Other products include audio, sensor and micro controller MCU semiconductor ICs. ISSI/AMS is headquartered in Silicon Valley with worldwide offices in Taiwan, Japan, Singapore, China, Europe, Hong Kong, India, and Korea. Visit our web site at http://ams.issi.com/

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