12-Channel Automotive Pixel Rear LED Driver

Features

- AEC-Q100 qualified
  - Device ambient temperature: -40°C ≤ T_A ≤ 125°C
  - Device junction temperature: -40°C ≤ T_J ≤ 150°C
- Operating voltage 4.5 V to 20 V
- Up to 100 mA channel current set by resistor
- High current accuracy: < ±5% at 5 mA to 100 mA, < ±10% at 1 mA
- Low dropout voltage 450 mV at 45 mA
- 8-bit DC current: 2-bit global, 6-bit individual
- 12-bit PWM dimming each channel, programmable frequency up to 20 kHz
- PWM dimming method: Linear and exponential
- UART control interface with frequency up to 1 MHz, CAN physical layer compatible
- Maximum 16 devices can be cascaded on one UART bus
- 5 V LDO output to supply CAN transceiver
- Diagnostic and protection:
  - LED short / open detection
  - Single-LED short-circuit diagnostic
  - Programmable low-supply detection
  - UART communication loss detection
  - Overtemperature protection
- Internal 8-bit ADC for voltage and temperature measurement
- Open-drain FAULT for fault indication
- Programmable fail-safe state, allowing “ One Fail All Fail ” or “ One Fail Others On ” options

Package Information

Part Number	Package	Body Size
DIA82920	EP-TSSOP24	7.80 mm × 4.40 mm

Applications

- Automotive rear light
- Automotive headlight with animated function
- Automotive interior lighting functions for ambient lighting and illumination

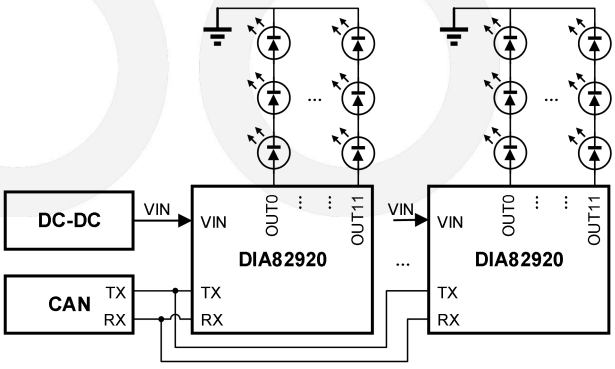
Description

The DIA82920 is a 12 channel linear LED driver with integrated and protected output stages. In order to achieve complex animation function, each output can be controlled independently and supports 8 bit analog dimming and 12 bit PWM dimming. The maximum current of each channel is up to 100 mA.

With integrated UART interface, the device can achieve CAN communication easily by adding an external CAN transceiver. The high-speed, differential CAN interface can greatly improve the EMC performance when it is used in long distance off-board communication compared with the traditional single-end interface.

The device integrates full diagnostic and protection, including LED short / open, single LED short detection and supply voltage, temperature protection. The integrated programmable watchdog will make the device enter fail-safe mode once the UART communication is lost, and the output configuration can be flexibly programmed by internal EEPROM.

Simplified Schematic



Ordering Information

Ordering Part No.	Top Marking	MSL	RoHS	T_A	Package	
DIA82920AXT24	DIAHB9B	3	Green	-40 to 125°C	EP-TSSOP24	Tape & Reel, 2500
DIA82920BXT24	DIAHB9B	3	Green	-40 to 125°C	EP-TSSOP24	Tape & Reel, 2500
DIA82920CXT24	DIAHB9B	3	Green	-40 to 125°C	EP-TSSOP24	Tape & Reel, 2500
DIA82920DXT24	DIAHB9B	3	Green	-40 to 125°C	EP-TSSOP24	Tape & Reel, 2500

Part No.		DIA82920A	DIA82920B	DIA82920C	DIA82920D
EEPROM function		Enable	Enable	Disable	Disable
C6h	EEPM6	00h	08h	00h	08h
CFh	EEPM15	51h	EBh	51h	EBh

If you encounter any issue in the process of using the device, please contact our customer service at marketing@dioo.com or phone us at (+86)-21-62116882. If you have any improvement suggestions regarding the datasheet, we encourage you to contact our technical writing team at docs@dioo.com. Your feedback is invaluable for us to provide a better user experience.

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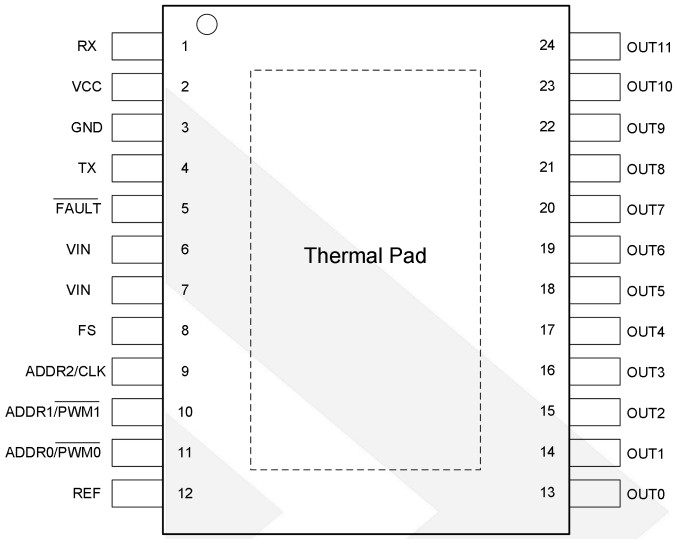


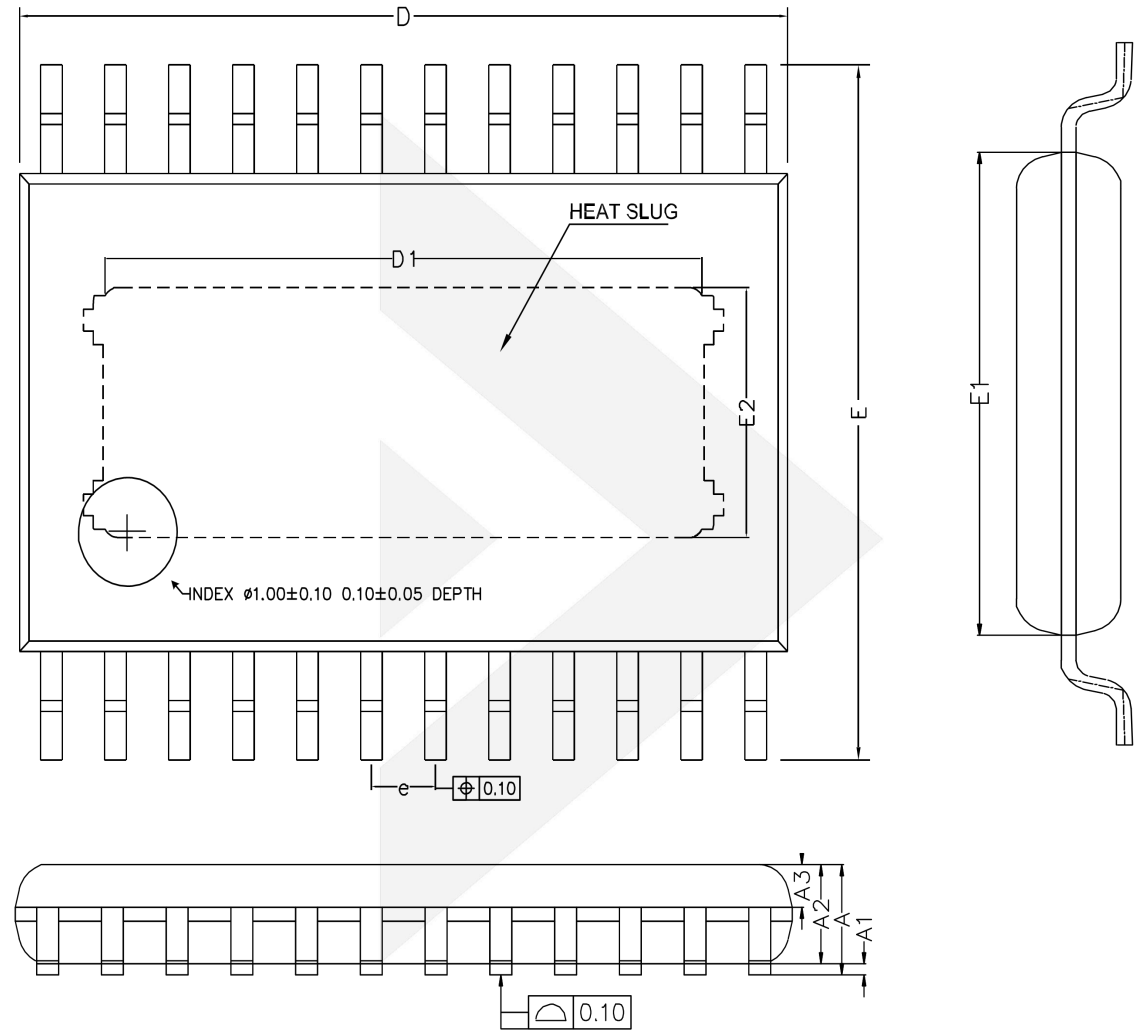
Figure 1. EP-TSSOP24 (Top view)

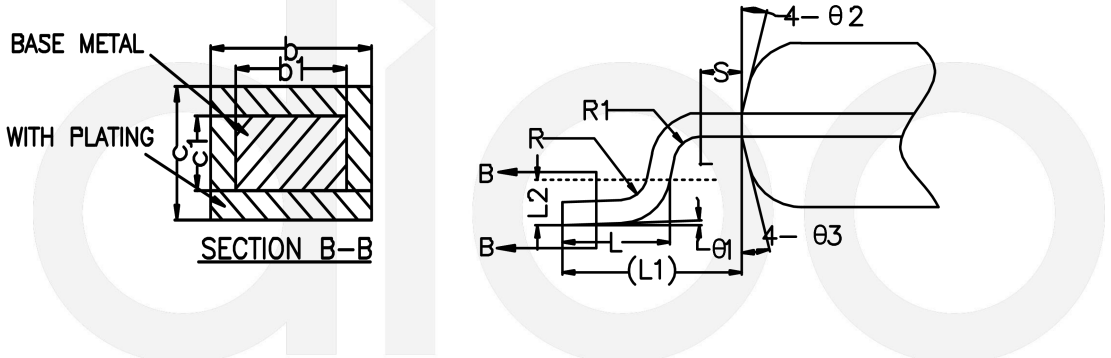
Pin Name	NO.	I/O	Description
RX	1	I	UART-based RX
VCC	2	Power	5 V regulator output
GND	3	GND	Ground
TX	4	O	UART-based TX
$\overline{\text{FAULT}}$	5	I/O	Open drain fault output
VIN	6.7	Power	Power supply
FS	8	ID	Fail safe state selection. 0: Fail safe state 0 1: Fail safe state 1
ADDR2/CLK	9	I	Function as device address 2 in external address mode; Function as PWM clock input internal address mode when EXTCLK is 1
ADDR1/$\overline{\text{PWM1}}$	10	I	Function as device address 1 in external address mode Function as PWM input channel for OUT6-11 in internal address mode
ADDR0/$\overline{\text{PWM0}}$	11	I	Function as device address 0 in external address mode Function as PWM input channel for OUT0-5 in internal address mode
REF	12	I/O	Device reference current setting, EEPROM programming chip-selection input
OUTx (1)	13 to 24	O	Output channel X
Thermal pad			Recommend connecting to ground

Note:

(1) x = 0 to 11.

2. Physical Dimensions: EP-TSSOP24





Common Dimension (Units of measure = Millimeter)			
Symbol	**Min**	**Nom**	**Max**
A	-	-	1.15
A1	0.05	-	0.15
A2	0.80	0.90	1.00
A3	0.34	0.39	0.44
b	0.20	-	0.29
b1	0.19	0.22	0.25
c	0.10	-	0.19
c1	0.10	0.13	0.15
D	7.70	7.80	7.90
D1	5.80	-	6.20
E	6.20	6.40	6.60
E1	4.30	4.40	4.50
E2	2.10	-	2.40
e	0.55	0.65	0.75
L	0.45	0.60	0.75
L1	1.00 REF		
L2	0.25 BSC		
R	0.09	-	-
R1	0.09	-	-
S	0.20	-	-
θ1	0°	-	8°
θ2	12°	14°	16°
θ3	12°	14°	16°

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