U6795B-D

LED Driver

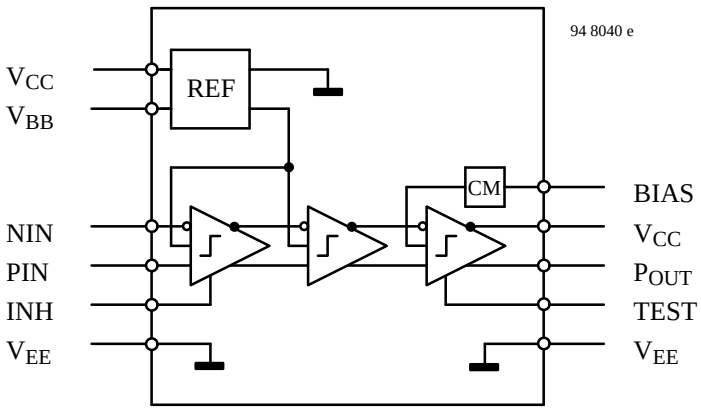
Description

U6795B-D is an LED driver optimized for high-speed-data transmission applications up to 220 MB/s. The maximum output current is 100 mA. Output current can be set from 25 to 100 mA by an external resistor at the BIAS pin. An INH pin is available for gating of the output signal.

Features

- Data rates up to 220 MB/s
- 1 ns rise and fall time
- High current (50 mA) source capability (100 mA with additional cooling)
- 100-ps rise and fall time match
- ECL inputs
- Programmable output current allows compatibility with most LEDs
- Single supply operation
- Output inhibit control
- Available in SO16 package or in chip form

Block Diagram



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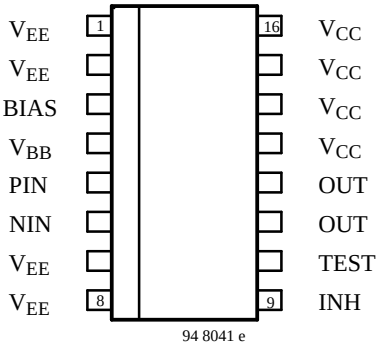
Pin Description

Pin	Symbol	Function
1, 2	V_{EE}	Negative supply voltage
3	BIAS	LED current programming pin
4	V_{BB}	Reference voltage for asymmetric input signals
5, 6	PIN, NIN	Differential ECL input
7, 8	V_{EE}	Negative supply voltage
9	INH	Disables the output when hold high
10	TEST	Indirect testing of the output signal
11, 12	OUT	Output
13, 16	V_{CC}	Positive supply voltage, normally grounded



Absolute Maximum Ratings

Parameters		Symbol	Value	Unit
Supply voltage	Pins 1, 2, 7 and 8	V_{EE}	6.0	V
Input voltage	Pins 3, 5, 6 and 9	V_i	V_{EE} to GND	V
Junction temperature		T_j	125	°C
Storage temperature range		T_{stg}	–40 to +125	°C

Operating Range

Parameters	Symbol	Value	Unit
Ambient temperature range	T_{amb}	–40 to +70	°C

Thermal Resistance

Parameters		Symbol	Value	Unit
Junction ambient	SO16	R_{thJA}	typ. 120	K/W

DC Electrical Characteristics

Operating conditions: T_{amb} = 0 to 70°C, V_{EE} = –5.2 V ± 10%

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	Pins 1, 2, 7 and 8	V_{EE}	4.5		5.7	V
Supply current	I_{LED} = 50 mA	I_{EE}	–100	–91		mA
LED output current *	R_{BIAS} = 820 Ω	I_{OH}			50	mA
Low level output current		I_{OL}			1	mA
High level input current	(PIN, NIN, INH)	I_{IH}			250	µA
Low level input current	(PIN, NIN, INH)	I_{IL}			100	µA
High level input voltage		V_{IH}	–0.98		–0.7	V
Low level input voltage		V_{IL}	–1.82		–1.62	V

* For $I_{LED} \geq 50$ mA an additional heatsink is required.

AC Electrical Characteristics

Operating conditions: T_{amb} = 0 to 70°C, V_{EE} = –5.2 V ± 10%

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
Output rise time	R_L = 10 Ω at OUT	t_r	0.6		1.2	ns
Output fall time	R_L = 10 Ω at OUT	t_f	0.6		1.2	ns
Propagation delay time		t_{pd}	2		4	ns
Bandwidth		BW	200			MHz

Functional Description

U6795B-D transforms an ECL level digital input into a signal which is optimal for driving LEDs. It contains a proprietary high-speed driver and a high-current switch.

The steady-state forward current flowing through an LED is directly proportional to the light it produces. When the U6795B-D is used in a typical configuration, the steady state forward current in the LED is:

$$I_{LED}/mA = 17 \times \frac{V_{EE}/V - 1.7}{300 + R_{BIAS}/\Omega}$$

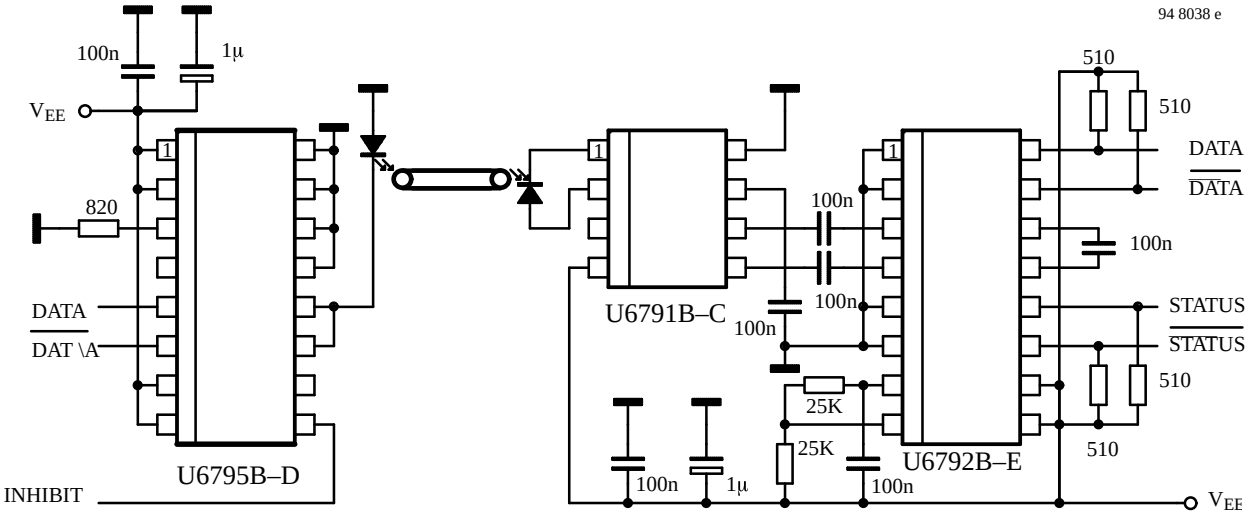
The actual forward current produced is affected by V_{EE}, R_{BIAS}, the temperature of the part and the ±20% tolerance of the internal 300 Ω resistance.

In order to reduce ringing and self-oscillation after turning on the LED, the output current switch incorporates a negative feedback and a damping network. Therefore the inductive load (signal path plus internal inductivity of the LED) may be up to 7 nH.

For asymmetrical input operation VBB has to be connected to NIN.

The LED current can also be controlled via a voltage applied to the bias pin.

Typical Application



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Typical Characteristics (T_{amb} 25°C unless otherwise noted)

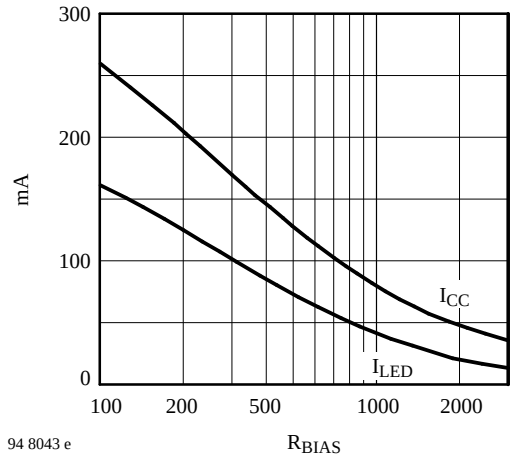


Figure 1. I_{CC} and I_{LED} vs. R_{BIAS}

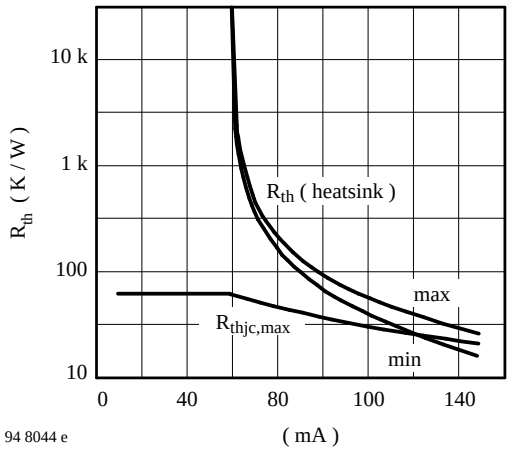
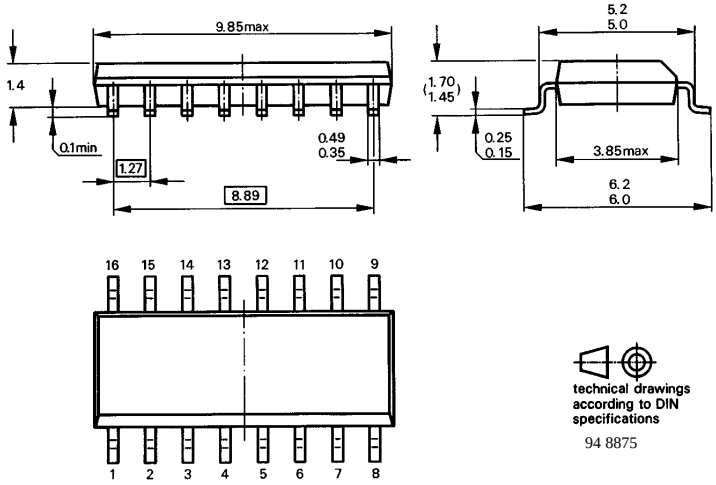


Figure 2. R_{th} vs. I_{LED}

Dimensions in mm

SO16



Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements.

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively

2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA

3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

TEMIC can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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