

## Infrared Driver

### Description

The U426B is an IR-driver IC for IR data communication. The circuit contains a programmable constant current source (DRV) to drive the IRED. The current is programmed by an external resistor ( $R_S$ ). With the internal

comparator (COMP) an external voltage can be monitored. The low-power standby mode, controlled by means of the WAKE input, makes the circuit well suited for battery-powered systems.

### Features

- Programmable constant current 200 mA to 1.2 A
- Signal frequency up to 500 kHz
- Low-power standby mode
- Internal voltage comparator
- Wide voltage range 2.4 V to 12 V

### Applications

- Keyless entry systems
- Remote control
- Wireless data communication

### Ordering Information

Extended Type Number	Package	Remarks
U426B-FP	SO8	

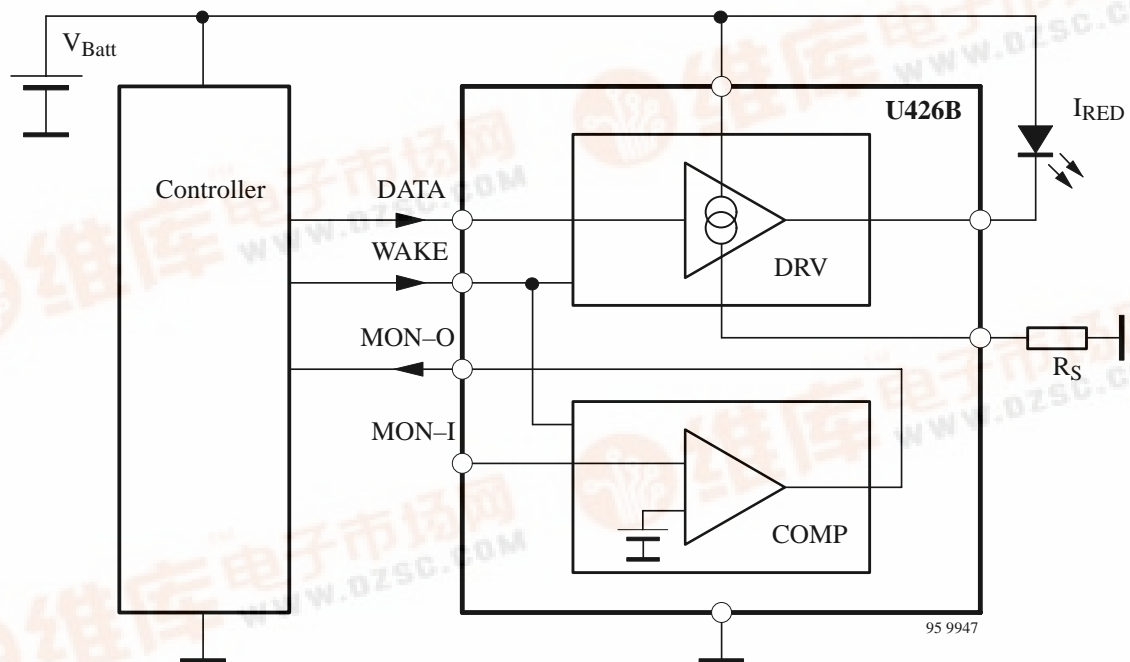


Figure 1. Block diagram for an IR transmitter

## Pin Description

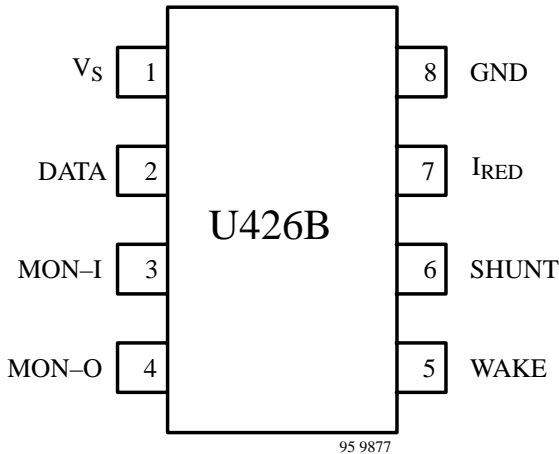
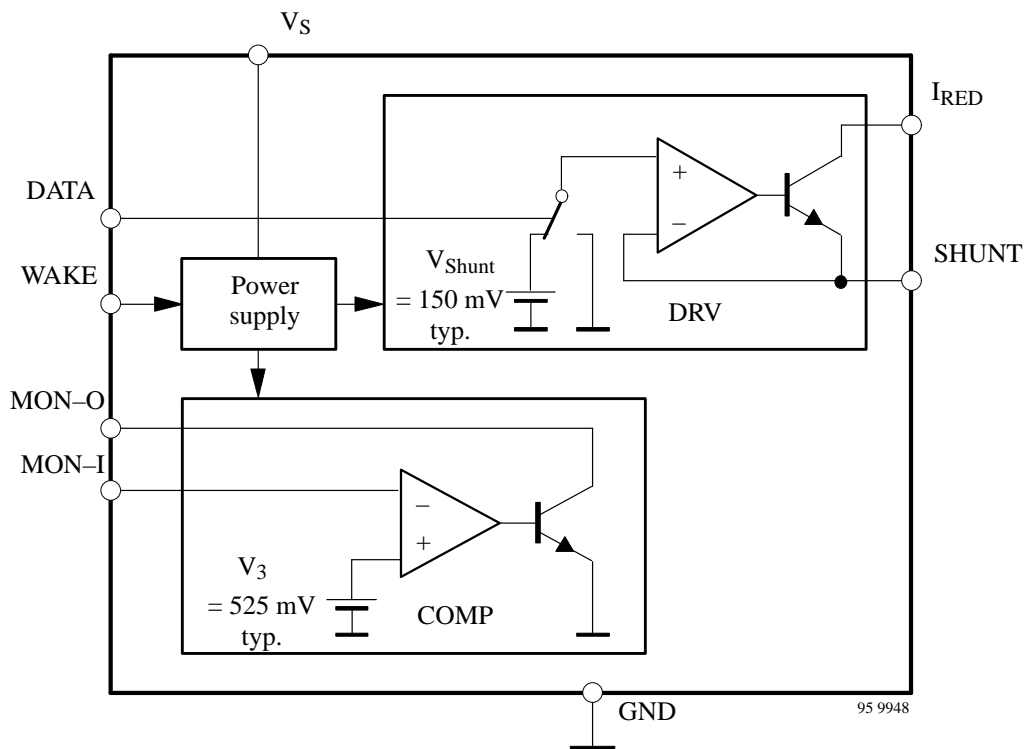


Figure 2. Pinning

Pin	Symbol	Function
1	$V_S$	Supply voltage
8	GND	Circuit ground
2	DATA	Data input for switching the IRED output current on and off
7	IRED	IR-LED output; when the data input is high, this output supplies the IR LED with the constant current
6	SHUNT	The resistor at this pin adjusts the IRED output current
3	MON-I	Voltage monitor input of the internal comparator
4	MON-O	Voltage monitor output. This open collector output is active when the voltage at MON-I is below the internal reference $V_3 = 525 \text{ mV typ.}$
5	WAKE	WAKE input. When being LOW, the circuit is in standby mode. A high level activates the circuit

## Block Diagram



COMP Monitoring comparator  
 DRV IRED constant current driver

Figure 3. Block diagram

**Constant Current Driver (DRV)**

The constant current driver converts the incoming data pulses into adequate constant current pulses. A high level applied to the data input causes a constant current flow through the IR diode connected to the IRED output. This current can be programmed via the external resistor ( $R_S$ ). To calculate the output current, use the following formula:

$$I_{RED} = 150 \frac{mV}{R_S}$$

**Power Supply**

The power-supply circuit generates the internal supply voltage from an external voltage ( $V_S = 2.4 V$  to  $12 V$ ). The Pin  $V_S$  is protected by an internal suppressor diode

against voltages above 13 V. The internal supply voltage can be switched on/off with a high/low level at the WAKE input. Setting WAKE to low level switches the circuit from busy to standby mode which results in a very low current consumption ( $2 \mu A$ ). Every change between busy and standby mode needs a latency of up to 1 ms. Data transmission and voltage monitoring only takes place while WAKE remains high.

**Monitoring Comparator (COMP)**

The monitoring comparator compares the voltage at Pin MON-I to an internal reference voltage of  $V_3 = 525 mV$  typ. The open collector output transistor is active if the voltage at Pin MON-I falls below the internal threshold voltage. The comparator can be used to monitor the power-supply battery.

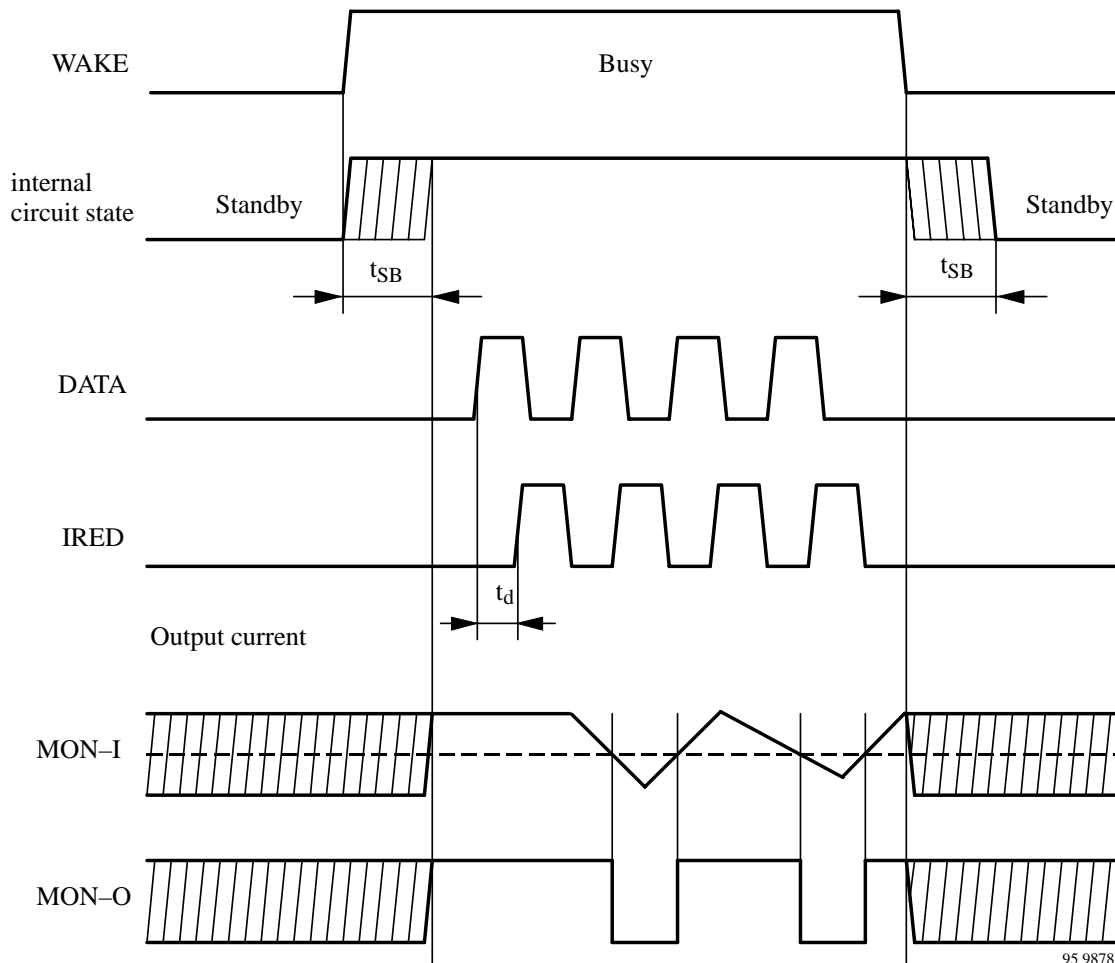


Figure 4. Timing diagram

## Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
Supply voltage Pin 1	$V_S$	13.4	V
Supply current $t < 10 \mu s$	$I_S$ $i_s$	40 150	mA mA
Input voltages Pins 2, 3 and 5 Pin 6	$V_I$	$V_S$ 1	V V
Input currents Pins 2, 3 and 5	$I_I$	1	mA
Output voltage Pin 7 Pin 4	$V_7$ $V_4$	13.4 $V_S$	V V
Output current $t < 100 \mu s$ Pin 7 Pin 4	$I_7$ $I_4$	1.5 5	A mA
Power dissipation $T_{amb} = 85^\circ C$ SO8: on PC board on ceramic on ceramic with silicon grease	$P_{tot}$ $P_{tot}$ $P_{tot}$	150 250 430	mW mW mW
Junction temperature	$T_j$	125	$^\circ C$
Ambient temperature range	$T_{amb}$	-40 to 85	$^\circ C$
Storage temperature range	$T_{stg}$	-40 to 150	$^\circ C$

## Thermal Resistance

Parameters	Symbol	Value	Unit
Junction ambient SO8: on PC board	$R_{thJA}$	220	K/W
on ceramic	$R_{thJA}$	140	K/W
on ceramic with silicon grease	$R_{thJA}$	80	K/W

## Electrical Characteristics

$V_S = 6 V$ ,  $T_{amb} = 25^\circ C$ , reference point Pin 8, unless otherwise specified

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
<b>Supply current</b>						
<b>Pin 1</b>						
Supply voltage	Pin 1	$V_S$	2.4		12	V
Standby current		$I_I$			2	$\mu A$
Wake-up current	Without pulse	$I_I$			1.5	mA
Overvoltage protection	$I_I = 20 mA$	$V_S$		13		V
<b>DATA</b>						
<b>Pin 2</b>						
Input signal	High Low	$V_2$ $V_2$	3 1.6	3.6 2.1	4.2 2.6	V V
Common-mode input			0		$V_S$	V
Rise time		$t_r$			500	ns
Fall time		$t_f$			500	ns
Signal frequency		f			500	kHz
Input current		$I_2$			100	$\mu A$
<b>MON-I</b>						
<b>Pin 3</b>						
Reverse current	$V_3 = 0 V$	$I_r$			0.8	$\mu A$
Input voltage HIGH	MON-I on	$V_3$	485	525	555	mV
Input voltage LOW	MON-O off	$V_3$	515	545	580	mV
Hysteresis				4		%
Temperature coefficient		TC		100		$\mu A/K$
Input current	$V_3 = 6 V$	$I_3$			0.3	$\mu A$

**Electrical Characteristics (continued)**

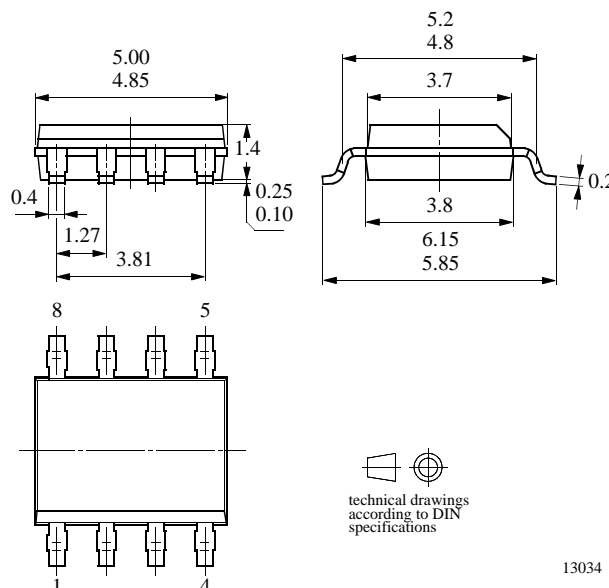
$V_S = 6\text{ V}$ ,  $T_{amb} = 25^\circ\text{C}$ , reference point Pin 8, unless otherwise specified

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
<b>MON-O</b> <span style="float:right"><b>Pin 4</b></span>						
Output current	$V_4 \geq 200\text{ mV}$	$I_4$	1			mA
Output current	$V_4 \geq 400\text{ mV}$	$I_4$	3			mA
Reverse current	$V_4 \leq 6\text{ V}$	$I_r$			0.2	$\mu\text{A}$
Output voltage HIGH					$V_S$	V
Saturation voltage	$I_4 = 1\text{ mA}$	$V_{sat}$			200	mV
<b>WAKE</b> <span style="float:right"><b>Pin 5</b></span>						
Input current	$V_5 = 6\text{ V}$	$I_5$			80	$\mu\text{A}$
	$V_5 = 0\text{ V}$	$I_5$			$\pm 0.2$	$\mu\text{A}$
Input voltage HIGH	Busy	$V_5$	0		$V_S$	V
Input voltage LOW	Standby	$V_5$			0.2	V
<b>SHUNT</b> <span style="float:right"><b>Pin 6</b></span>						
Output current IRED	$V_S = 2.4\text{ V}$ ; $R_S = 0.62\ \Omega$	$I_7$	205		245	mA
	$V_S = 6.0\text{ V}$ ; $R_S = 0.62\ \Omega$	$I_7$	220		265	mA
	$V_S = 12\text{ V}$ ; $R_S = 0.62\ \Omega$	$I_7$	235		275	mA
	$V_S = 6\text{ V}$ ; $R_S = 0.11\ \Omega$	$I_7$	1.25		1.5	A
	$V_S = 12\text{ V}$ ; $R_S = 0.11\ \Omega$	$I_7$	1.3		1.55	A
Shunt voltage	$V_2 = V_S = 6\text{ V}$ ; $R_S = 0.11\ \Omega$	$V_{Shunt}$	140	150	160	mV
Temperature coefficient	$T_{amb} = -40\text{ to }85^\circ\text{C}$	$T_C$		40		$\mu\text{V/K}$
<b>IRED</b> <span style="float:right"><b>Pin 7</b></span>						
Output voltage	$V_2 = V_S = 6\text{ V}$ ; $I_7 = 1\text{ A}$	$V_{out}$			1000	mV
Output voltage	$V_2 = 0\text{ V}$ ; $I_7 = 0$	$V_{out}$		12	13.2	V
Reverse current	$V_2 = 0\text{ V}$ ; $V_7 = 6\text{ V}$	$I_r$			1	$\mu\text{A}$
Rise/fall time		$t_r$			300	ns
Delay time	Pin 2 to Pin 7	$t_d$			1	$\mu\text{s}$
Standby/busy		$t_{SB}$			1	ms
Busy/standby		$t_{BS}$			1	ms

**Package Information**

Package SO8

Dimensions in mm



technical drawings  
according to DIN  
specifications

13034

## Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC Semiconductor 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 Semiconductor GmbH** 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 Semiconductor GmbH** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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