

Display Drivers

IT-52-13-07

U 123 P • Photo pulse amplifier

**Features:**

- Integrated operational amplifier and photo detector on one chip
- External controlled photo sensitivity through  $R_{2-3}$
- Quiescent current  $I_{SB} = 11 \text{ mA}$
- For  $R_{2-3} \geq 50 \text{ k}\Omega$  internal frequency compensations
- No influence of primary illumination up to  $E \leq 15 \text{ klx}$ ,  $f \leq 100 \text{ Hz}$  (fluorescent lamps)
- Radiant sensitive area  $A = 1 \text{ mm}^2$

**Case:**  
Special case, clear plastic DIP 6  
Dimensions see page 63 Fig. 103

U 143 M • Driver circuit for LED digits in TV program displays

Supply voltage range	$-V_{DD}$	10.8...13.2 V
Control level Pin 2...6	$-V_{IL}$	4.0...13.2 V
	$V_{IH}$	-0.3... 1.0 V

**Features:**

- Display numbers from 1 to 16
- Direct control of LED-digits with  $I_o \geq 10 \text{ mA}$
- Input code BCD
- Display BCD + 1
- Pull-up input resistor 50 k $\Omega$
- Separate input for dark switching  $I_{DS}$

**Case:**  
DIP 16  
Dimensions see page 63 Fig. 105

**Displays:**  
e.g. TDSR 5110, TDSR 5150

U 175 M • U 176 M • Pulse generator for flasher circuits

Supply voltage range	$V_S$	4.75...13.2 V	
Frequency	$V_S = 5 \text{ V}$	U 175 M $f_o$	1.3...5.2 Hz
		U 176 M $f_o$	0.3...1.3 Hz
	$V_S = 12 \text{ V}$	U 175 M $f_o$	5 Hz
		U 176 M $f_o$	1.25 Hz
Frequency deviation	$V_S = 5...12 \text{ V}$	U 175 M $\Delta f$	0.3 Hz/V
		U 176 M $\Delta f$	0.075 Hz/V

**Features:**

- Small dimensions
- $P_V = 150 \text{ mW}$  at  $T_{amb} = 75 \text{ }^\circ\text{C}$

**Case:** TO 92 • Dimensions see page 64 Fig. 110

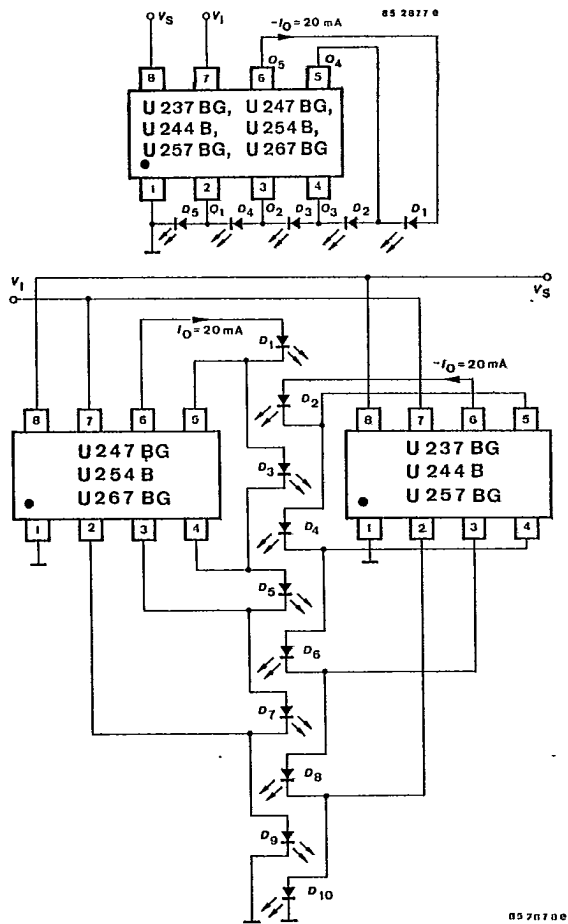
**LED:** e.g. TLUR 5400

Display Drivers

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U 237 BG · U 244 B · U 247 BG · U 254 B · U 257 BG · U 267 BG · Driver for LED displays with 5 or 10 diodes

Supply voltage range	Pin 8	$V_S$	12...25	V
Output current (in series)	Pin 6	$I_O$	20	mA
Input threshold distance	Pin 7	$\Delta V_I$	$\leq \pm 30$	mV



Features:

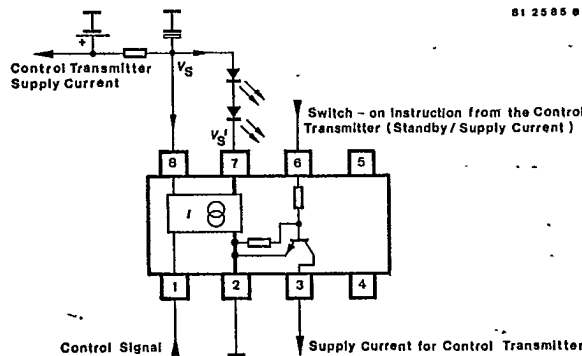
- Wide supply voltage range
- High LED current
- Low power dissipation due to series connection of LED's
- Different colour LED's can be connected arbitrary
- No peripheral components are necessary
- High input resistance
- Eligible between:
  - 5 LED's line with linear scale division with U 237 BG or U 247 BG
  - 5 LED's line having linear scale division with U 244 B or U 254 B of flowing transition
  - 5 LED's line with logarithmic scale division with U 257 BG or U 276 BG
  - 10 LED's line with linear scale division with U 237 BG and U 247 BG
  - 10 LED's line having linear scale division with U 244 B and U 254 B of flowing transition
  - 10 LED's line with logarithmic scale division with U 257 BG and U 267 BG

Case:

DIP 8  
 Dimensions see page 63  
 Fig. 104  
 LEDs: e.g. TLSH 5100

U 427 B · U 428 B-FP · Driver for IR transmitter diodes

Supply voltage range	$V_S$	5...10	V	
Control range	$V_I$	3...10	V	
Control current $\frac{t_p}{T} \leq 0.013$	$I_i$	< 0.1	mA	
Controlled output current pulse	U 427 B U 428 B-FP	$I_C$ $I_C$	1.3 0.75	A A



Features:

- Current stabilisation starts at 1.2 V
- Additional switching transistor  $I_C = 20$  mA
- Automatic current control

Case:

DIP 8 (U 427 B)  
 Dimensions see page 63  
 Fig. 104  
 or  
 SO 8 (U 428 B-FP)  
 Dimensions see page 64  
 Fig. 111

IREDS: e.g. TSIP 5200



Display Drivers

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U 429 B-FP · U 430 B-FP · Driver for IR transmitter diodes

Supply voltage range	$V_{S1}$	2.8...13.2	V
Control range	$V_i$	2.5...13.2	V
Control current	$I_i$	0.25	mA
Controlled output current pulse	$I_{O(IR)}$	320	mA

Features:

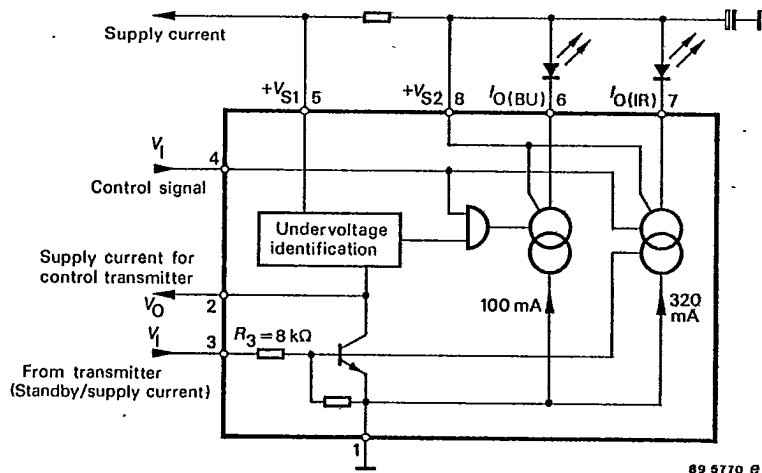
- Constant current for IR signal 320 mA
- Undervoltage control with indicator driver
- Constant current output for control LED 100 mA
- Current stabilisation starts at  $V_{CE} = 1V$
- Control voltage  $V_4 = 2...13.2V$
- Minimum driver current  $I_4 = 0.4A$
- Additional switching transistor  $I_C = 20mA$

Case:

SO 8  
Dimensions see page 64  
Fig. 111

LED: e.g. TLUR 4400

IREd: e.g. TSIP 5200



89 5770 8

U 1096 B · U 2097 B · Driver for 30-element flying spot LED displays

Supply voltage range	Pin 10	$V_S$	8...16	V
Input voltage range	Pin 16	$V_i$	0...( $V_S-1$ )	V
Difference of input threshold voltages	Pin 16	$\Delta V_i$	100...500	mV

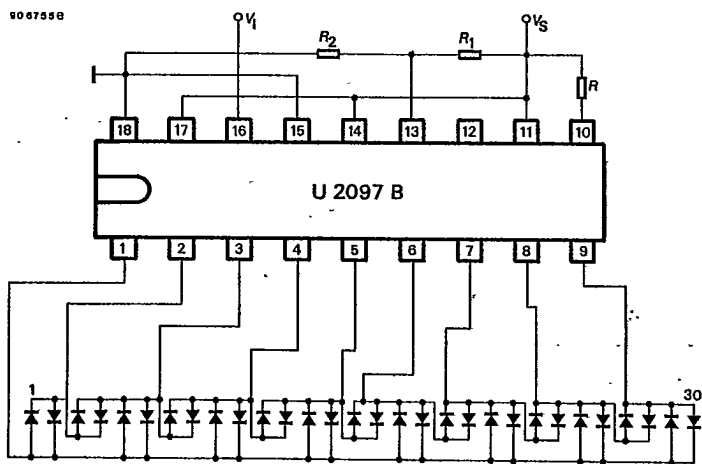
Features:

- Only 9 address lines for 30 LED's "TELEPAREL"
- Up to 150 LED's can be driven by arranging several IC's in a series
- LED's of various colours can be incorporated in displays
- 15 mA current source (U 1096 B)
- External adjustable LED current up to 30 mA (U 2097 B)
- Analogue voltage input
- Regulated indicating range
- Simple voltage ratio indication

Case:

DIP 18  
Dimensions see page 63  
Fig. 106

LEDs: e.g. TLSH 5100



Display Drivers

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U 2066 B · U 2067 B · Low cost stereo LED scale controller for radio, amplifier or cassette recorder

Supply voltage range	Pin 16	$V_S$	7...18	V
Total supply current	Pin 16	$I_S$	35	mA
LED current source		$I_o$	15	mA

Features:

- Wide supply voltage range
- Constant LED current
- Low power dissipation due to series connection of LEDs
- Different colour LEDs can be mixed easily
- One operational amplifier per channel
- Logarithmic scale division
- Threshold intervals:  
5 dB - 5 dB - 3 dB - 3 dB (U 2066 B)  
2 dB - 2 dB - 2 dB - 2 dB (U 2067 B)

Case:

DIP 16  
Dimensions see page 63  
Number 105

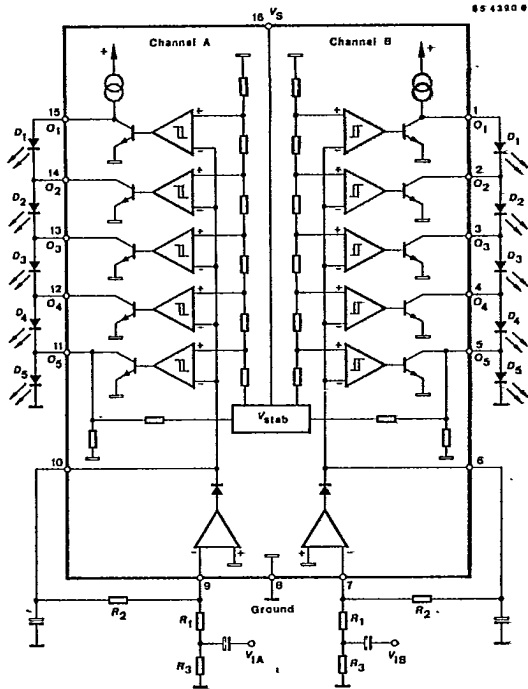
LEDs: e.g. TLS. 5100

Channel B

- 1 LED-Output  $O_1$
- 2 LED-Output  $O_2$
- 3 LED-Output  $O_3$
- 4 LED-Output  $O_4$
- 5 LED-Output  $O_5$
- 6 Rectifier output
- 7 OP AMP "negative"-Input
- 8 Ground (GND)

Channel A

- 9 OP AMP "negative"-Input
- 10 Rectifier output
- 11 LED-Output  $O_5$
- 12 LED-Output  $O_4$
- 13 LED-Output  $O_3$
- 14 LED-Output  $O_2$
- 15 LED-Output  $O_1$
- 16 Supply voltage  $V_S$



Block diagram and pin connections

U 2068 B · Stereo volume indicator for 2 x 5 LEDs and two headphone amplifiers for radio and cassette recorder

Supply voltage range	Pin 20	$V_S$	7...18	V
Total supply current	Pin 20	$I_S$	40	mA
LED current source		$I_o$	15	mA

Features:

- Large supply voltage range
- Constant LED current
- Low power dissipation due to series connection of LEDs
- Different colour LEDs can be mixed easily
- One independent connectable operational amplifier per channel
- Logarithmic scale division with intervals:  
6 dB - 6 dB - 3 dB - 3 dB

Case:

DIP 20  
Dimensions see page 63  
Fig. 107

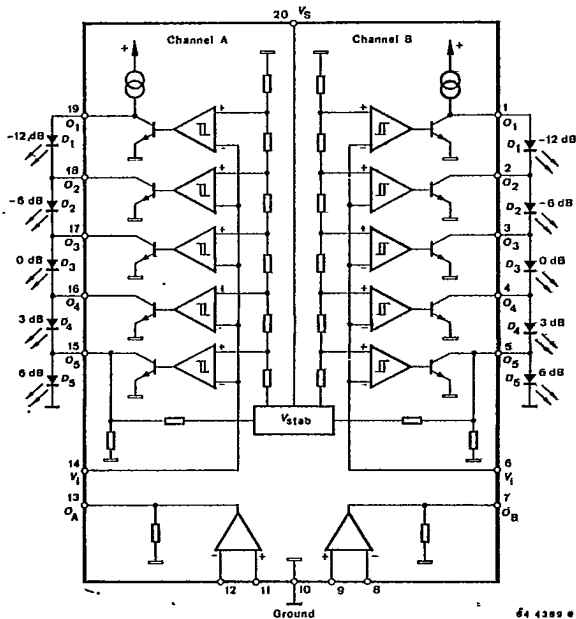
LEDs: e.g. TLS. 5100

Channel B

- 1 LED-Output  $O_1$
- 2 LED-Output  $O_2$
- 3 LED-Output  $O_3$
- 4 LED-Output  $O_4$
- 5 LED-Output  $O_5$
- 6 Comparator input  $V_1$
- 7 OP AMP-Output OUT
- 8 OP AMP "negative"-Input
- 9 OP AMP "positive"-Input
- 10 Ground (GND)

Channel A

- 11 OP AMP "positive"-Input
- 12 OP AMP "negative"-Input
- 13 OP AMP-Output OUT
- 14 Comparator input  $V_1$
- 15 LED-Output  $O_5$
- 16 LED-Output  $O_4$
- 17 LED-Output  $O_3$
- 18 LED-Output  $O_2$
- 19 LED-Output  $O_1$
- 20 Supply voltage  $V_S$



Block diagram and pin connections



Display Drivers

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Survey – Display drivers

U 3088 M U 3088 M-FP U 3089 M	U 3081 M U 3081 M-FP	U 3082 M	U 3084 M U 3084 M-FP U 3085 M	U 3079 M
Uncoded serial data input				
8 outputs open drain	15 outputs open drain	19 outputs open drain	19 outputs open drain	34 outputs curr. sink
Clear input				Brightness CTR. input
Cascadable				
Wired OR				
U 3089 M: Masc option with pull-up resistors			U 3085 M: Masc option with pull-up resistors	
NCMOS		NMOS	NCMOS	

U 3088 M · U 3088 M-FP · U 3089 M · Microcomputer controlled display drivers with 8 outputs

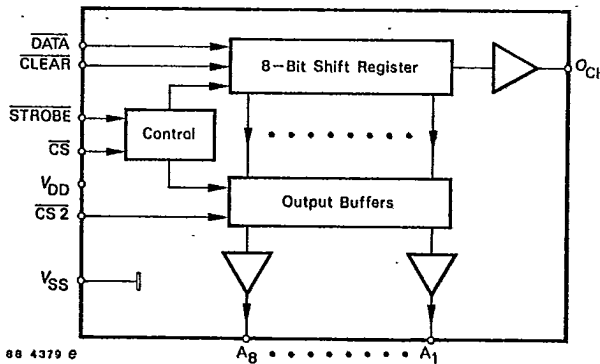
Supply voltage range	$V_S$	4.5...5.5	V
Quiescent supply current	$I_S$	100	$\mu A$
Output voltage ( $A_1 \dots A_8$ ) $I_{OL} = 15 \text{ mA}$	$V_{OL}$	$\leq 1$	V

Features:

- 8 buffered uncoded outputs, open drain, 15 mA each
- Cascadable through separate shifting register output
- Static drive of LEDs with common anode
- Serial data interface for microcomputer control
- Pull-up resistor at the inputs as a mask option (U 3089 M)

Case:

DIP 16 (U 3088 M, U 3089 M)  
Dimensions see page 63  
Fig. 105  
or  
SO 16 (U 3088 M-FP)  
Dimensions see page 65  
Fig. 112



88 4379 0

U 3081 M · U 3081 M-FP · Microcomputer controlled display drivers with 15 outputs

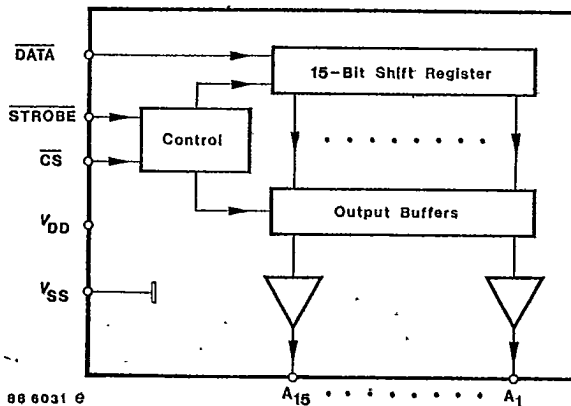
Supply voltage range	$V_S$	4.5...5.5	V
Quiescent supply current	$I_S$	200	$\mu A$
Output voltage ( $A_1 \dots A_{15}$ ) $I_{OL} = 15 \text{ mA}$	$V_{OL}$	$\leq 1$	V

Features:

- 15 buffered uncoded outputs, open drain 15 mA
- Static drive of LEDs with common anode
- Serial data interface for microcomputer control

Case:

DIP 20 (U 3081 M)  
Dimensions see page 63  
Fig. 107  
or  
SO 20 (U 3081 M-FP)  
Dimensions see page 65  
Fig. 113



88 6031 0

## Display Drivers

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## U 3082 M · Microcomputer controlled display drivers with 19 outputs

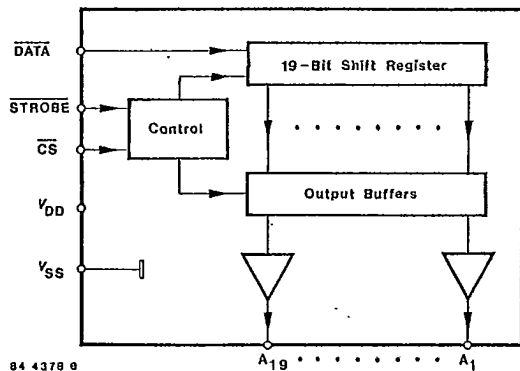
Supply voltage range	$V_S$	10.8...13.2	V
Quiescent supply current	$I_S$	6	mA
Output voltage ( $A_1 \dots A_{19}$ ) $I_{OL} = 15$ mA	$V_{OL}$	$\leq 1$	V

## Features:

- 19 buffered uncoded outputs, open drain 15 mA each
- Static drive of LED indicators with common anode
- Serial data interface for microcomputer control

## Case:

DIP 24  
Dimensions see page 64  
Fig. 108



## U 3084 M · U 3084 M-FP · U 3085 M · Microcomputer controlled display drivers with 19 outputs

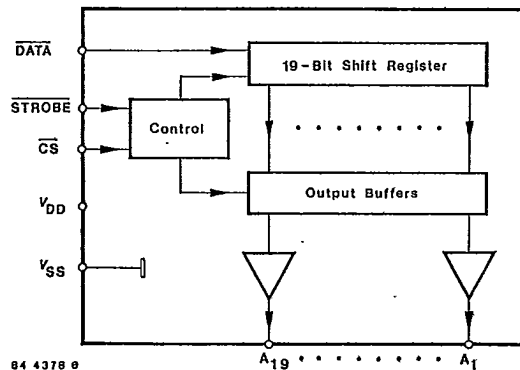
Supply voltage range	$V_S$	4.5...5.5	V
Quiescent supply current	$I_S$	200	$\mu$ A
Output voltage ( $A_1 \dots A_{19}$ ) $I_{OL} = 15$ mA	$V_{OL}$	$\leq 1$	V

## Features:

- 19 buffered uncoded outputs, open drain 15 mA each
- Static drive of LEDs with common anode
- Serial data interface for microcomputer control
- Pull-up resistor at the inputs as a mask option (U 3085 M)
- C-MOS version of U 3082 M

## Case:

DIP 24 (U 3084 M, U 3085 M)  
Dimensions see page 64  
Fig. 108  
or  
SO 24 (U 3084 M-FP)  
Dimensions see page 65  
Fig. 114



## U 3079 M · T 3079 M · Microcomputer controlled display drivers with 34 outputs

Supply voltage range	$V_S$	4.5...5.5	V
Quiescent supply current	$I_S$	2.5	mA

## Features:

- 34 buffered, uncoded outputs
- Current generator outputs, typ. 8 mA sink each
- Static drive of LED-displays with common anode
- Serial data-interface for software-controlled matching to microcomputers
- Continuous brightness control
- Data enable

## Case:

DIP 40 (U 3079 M)  
Dimensions see page 64  
Fig. 109  
or  
Chip for hybrid construction (T 3079 M)

