U 427 B · U 428 B-FP

TELEFUNKEN ELECTRONIC

T-52-13-07

DRIVER FOR IR TRANSMITTER DIODES (CURRENT SINK)

Technology: Bipolar

Features:

- Constant current
  U 427 B $I_c \geq 1.3$ A
  U 428 B-FP $I_c \geq 0.75$ A
- Saturation voltage
  U 427 B $V_{CEsat} = 1.2$ V
  U 428 B-FP $V_{CEsat} = 1.0$ V
- Current stabilisation starts at $V_7 = 1.2$ V
- Control voltage $V_I = 3 \ldots 10$ V
- Control current $I_I \leq 0.1$ mA
- Additional switching transistor $I_C = 20$ mA

Case: DIP 8, SO 8

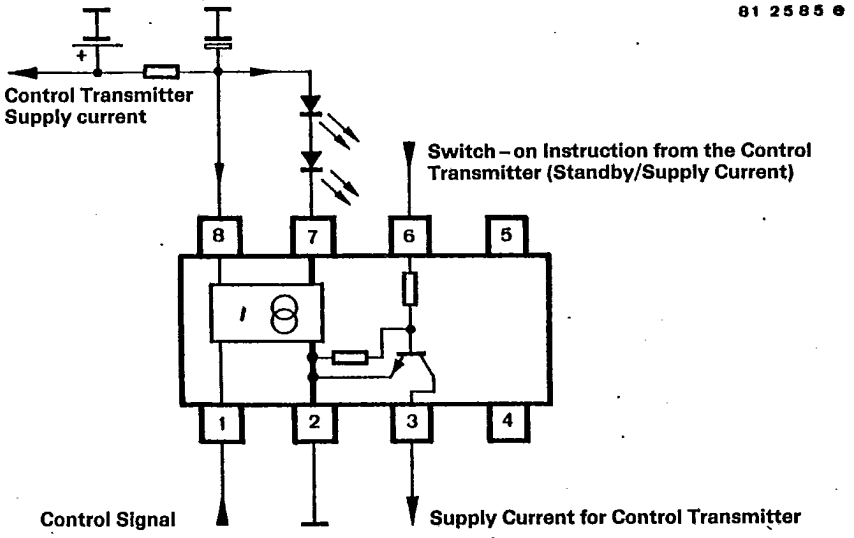

Fig. 1 Block diagram

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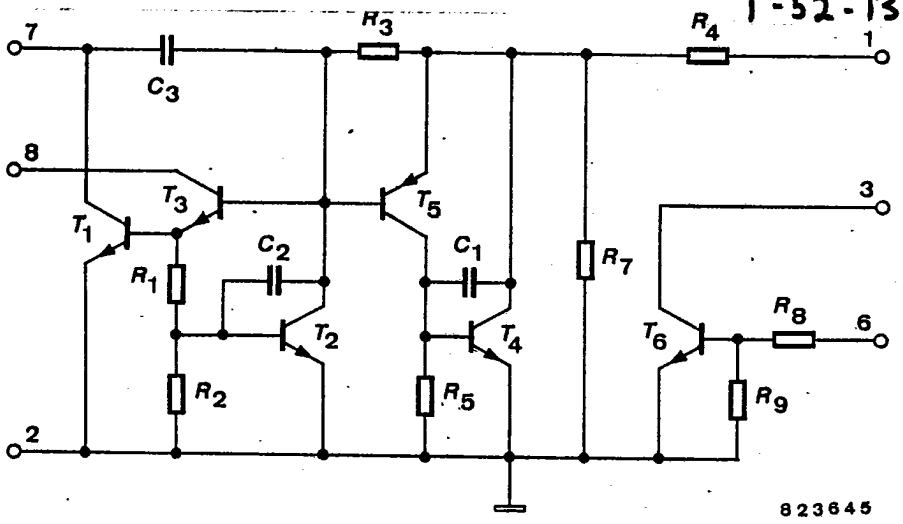

Fig. 2 Circuit diagram

Absolute maximum ratings

Reference point Pin 2

Supply voltage		Pin 7, 8	$V_{7,8}$	10	V
Input voltages		Pin 1, 3, 6	V_I	≦10	V
Controlled output current					
$\frac{1}{T}\int_0^T t_p \leqq 0.013, t_p \leqq 10\ \mu s$	U 427 B	Pin 7	I_c	2.2	A
	U 428 B-FP	Pin 7	I_c	1.0	A
Collector current		Pin 3	I_C	25	mA
Power dissipation					
$T_{amb} = 85$ °C	DIP 8		P_{tot}	250	mW
	SO 8		P_{tot}	150	mW
Junction temperature			T_j	125	°C
Ambient temperature range			T_{amb}	0...+85	°C
Storage temperature range			T_{stg}	−25...+125	°C

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Electrical characteristics

$V_8 = 9$ V, $T_{amb} = 25$ °C, reference point Pin 2, unless otherwise specified

				Min.	Typ.	Max.	
Supply voltage range							
Fig. 2		Pin 8	V_8	5		10	V
$I_c = 1.3$ A	U 427 B	Pin 7	V_7	1.2		10	V
$I_c = 0.5$ A	U 428 B-FP	Pin 7	V_7	1.2		10	V
Controlled output current pulse							
$V_7 = 4$, $t_p = 10$ µs, $t_m = 5$ µs							
$V_1 = 5$ V, Fig. 4	U 427 B	Pin 7	I_c	1300	1550	1800	mA
	U 428 B-FP	Pin 7	I_c	610	725	845	mA
$V_1 = 8$ V, Fig. 5	U 427 B	Pin 7	I_c	1350	1600	1900	mA
	U 428 B-FP	Pin 7	I_c	630	750	870	mA
Temperature coefficient							
$T_{amb} = 0 \ldots 85$ °C	U 427 B	Pin 7	TC		6.5	8	mA/K
	U 428 B-FP	Pin 7	TC		3.5	4	mA/K
Collector saturation voltage							
$I_c = 1.3$ A	U 427 B	Pin 7	V_{CEsat}			1.2	V
$I_c = 1$ A	U 427 B	Pin 7	V_{CEsat}			1.0	V
$I_c = 0.5$ A	U 428 B-FP	Pin 7	V_{CEsat}			1.0	V
$I_C = 10$ mA		Pin 3	V_{CEsat}			0.3	V
Temperature coefficient							
$T_{amb} = 0 \ldots 85$ °C							
$I_c = 820$ mA	U 427 B	Pin 7	TC	0.5	1		mV/K
$I_c = 350$ mA	U 428 B-FP	Pin 7	TC	0.5	1		mV/K
Collector cut-off current							
$T_{amb} = 0 \ldots 85$ °C, $V_{I1} = 0$ V		Pin 7	I_{CES}			1	µA
$V_{I8} = 10$ V		Pin 8	I_{CES}			1	µA
		Pin 3	I_{CES}			1	µA
Control voltage range		Pin 1	V_I	3		10	V
Control current							
$T_{amb} = 0 \ldots 85$ °C, $v_I = 5$ V		Pin 1	I_I		1.4	1.9	mA
$v_I = 8$ V		Pin 1	I_I		2.9	3.9	mA
Current inflow		Pin 1	I_I			0.1	mA
Switching transistor							
Input current							
$V_I = 3$ V		Pin 6	I_I		0.3	0.5	mA
$V_I = 9$ V		Pin 6	I_I		1	1.6	mA
$I_C = 10$ mA		Pin 6	I_I			0.15	mA

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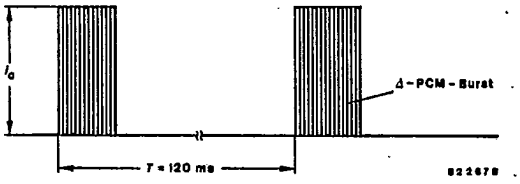
Explanations

$t_m = 0.5\ t_p$	Measuring time
t_p	Duration of a single pulse
T	Period of one word
$\sum_{0}^{T} t_p$	Summarized duration of all single pulses within the period of one word

Example for a rc transmitter built up with U 327 MD,
transmitting the 13-bit-data word 1100101000110 (ΔPCM):



$t_p = 4\ \mu s$

Number of single pulses = 85

$$\sum_{0}^{T} t_p = 4\ \mu s \cdot 85 = 340\ \mu s$$

Duty cycle:

$$\frac{1}{T} \sum_{0}^{T} t_p = \frac{340\ \mu s}{120\ ms} = 0.0028$$

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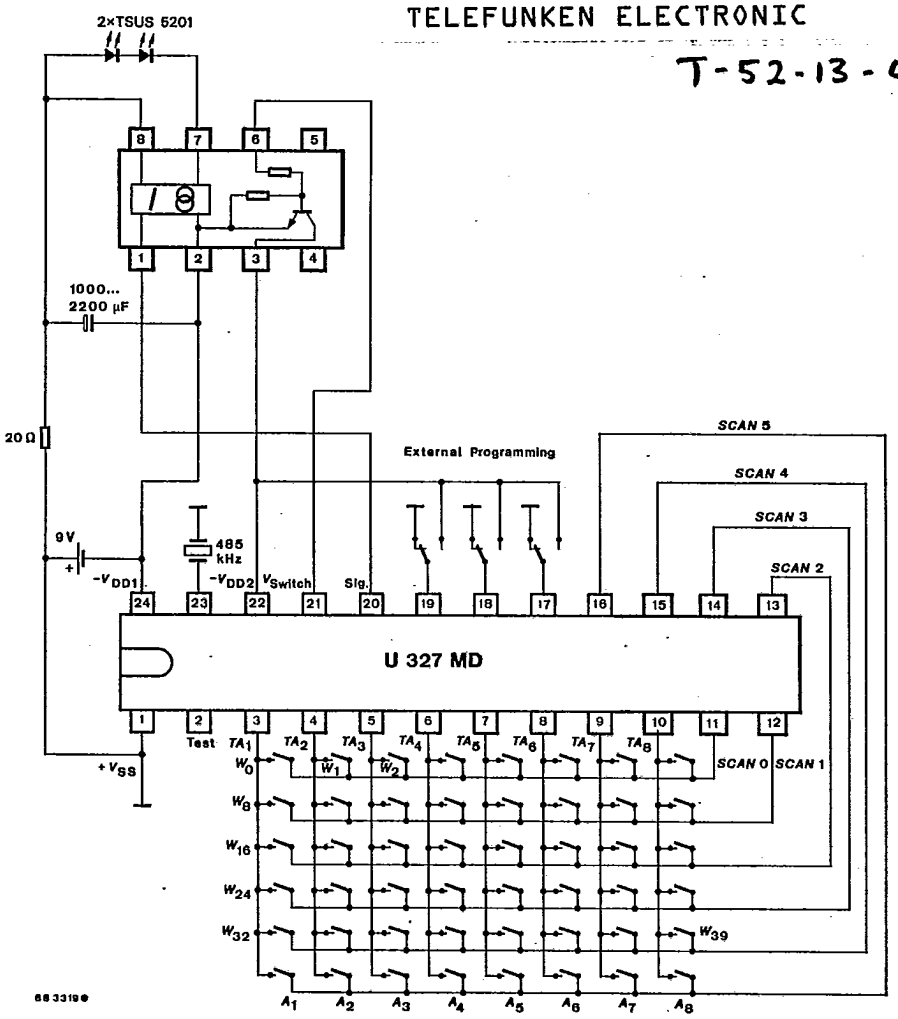

Fig. 3 Application circuit: IR remote control with U 327 MD

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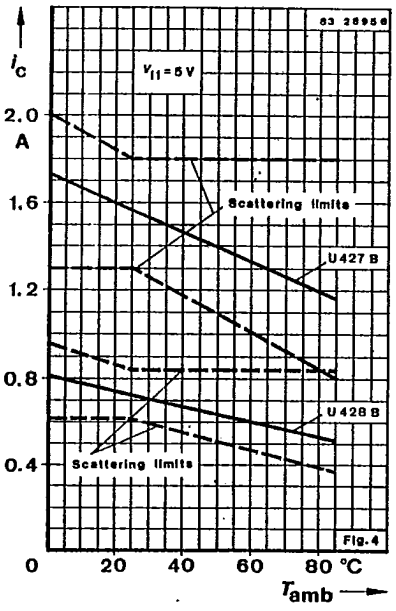

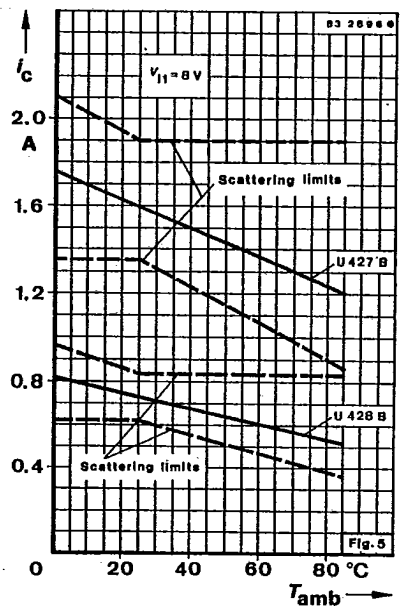

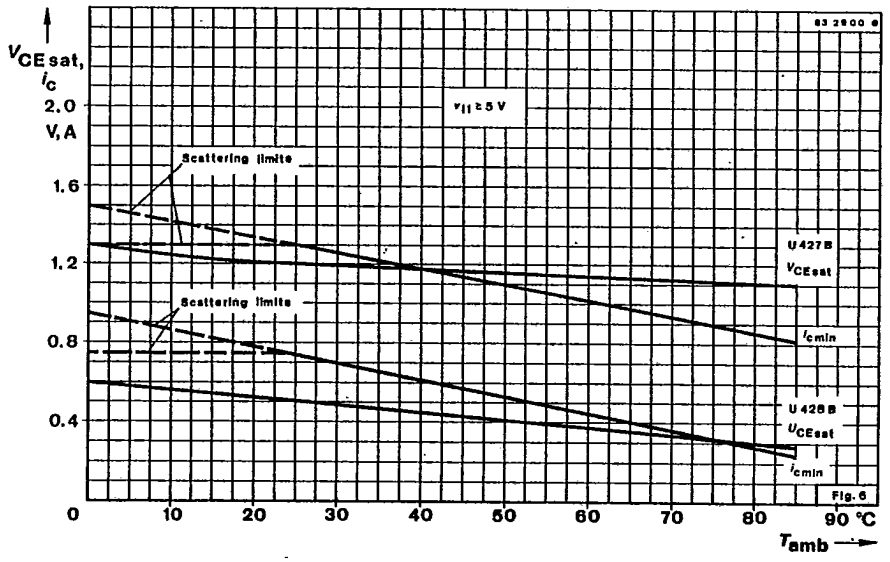

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Dimensions in mm

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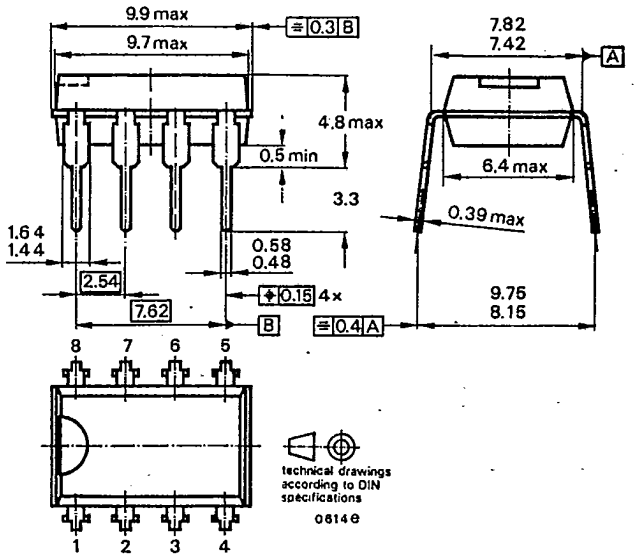
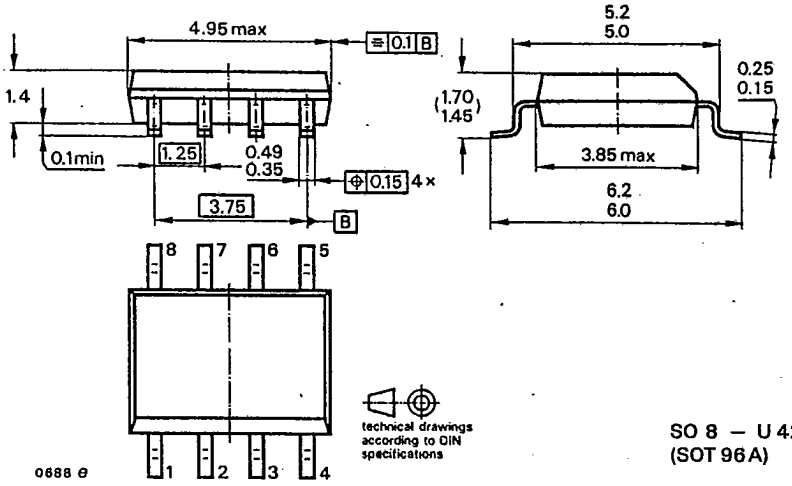


Case:
DIP 8 – U 427 B



SO 8 – U 428 B-FP
(SOT 96 A)