

DRIVER FOR IR TRANSMITTER DIODES (CURRENT SINK)

T-52-13-07

Technology: Bipolar

Features:

- Constant current
 - U 427B $i_c \geq 1.3$ A
 - U 428B-FP $i_c \geq 0.75$ A
- Saturation voltage
 - U 427B $V_{CEsat} = 1.2$ V
 - U 428B-FP $V_{CEsat} = 1.0$ V
- Current stabilisation starts at $V_7 = 1.2$ V
- Control voltage $V_1 = 3 \dots 10$ V
- Control current $I_1 \leq 0.1$ mA
- Additional switching transistor $I_c = 20$ mA

Case: DIP 8, SO 8

81 2585 ●

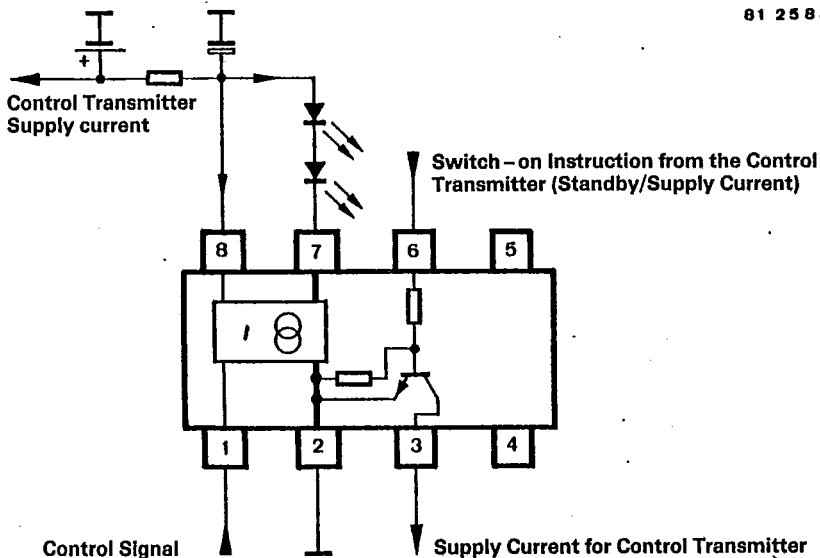
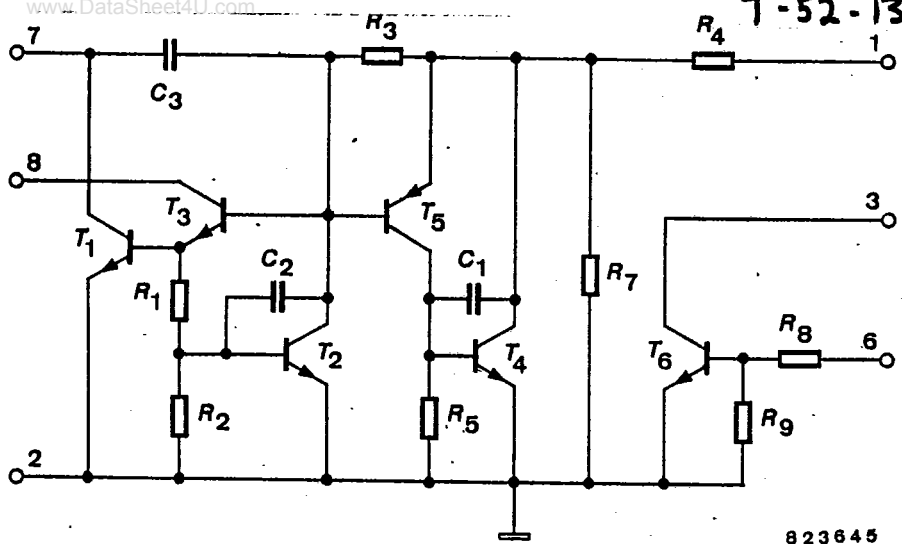


Fig. 1 Block diagram

U 427B · U 428B-FP

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8 2 3 6 4 5

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					
1 T					
$\Sigma t_p \leq 0.013, t_p \leq 10 \mu s$	U 427B	Pin 7	I_C	2.2	A
T 0	U 428B-FP	Pin 7	I_C	1.0	A
Collector current	Pin 3	I_C	25	mA	
Power dissipation					
$T_{amb} = 85^\circ C$	DIP 8	P_{tot}	250	mW	
	SO 8	P_{tot}	150	mW	
Junction temperature		T_J	125	$^\circ C$	
Ambient temperature range		T_{amb}		$^\circ C$	
Storage temperature range		T_{stg}	-25 ... +125	$^\circ C$	



T-52-13-07

Electrical characteristics

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

Min.	Typ.	Max.
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Supply voltage range

Fig. 2

Pin 8	V_8	5	10	V
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 $I_C = 1.3\text{ A}$

U 427 B

Pin 7	V_7	1.2	10	V
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 $I_C = 0.5\text{ A}$

U 428 B-FP

Pin 7	V_7	1.2	10	V
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Controlled output current pulse

 $V_7 = 4$, $t_p = 10\text{ }\mu\text{s}$, $t_m = 5\text{ }\mu\text{s}$ $V_1 = 5\text{ V}$, Fig. 4

U 427 B

Pin 7	I_C	1300	1550	1800	mA
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U 428 B-FP

Pin 7	I_C	610	725	845	mA
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 $V_1 = 8\text{ V}$, Fig. 5

U 427 B

Pin 7	I_C	1350	1600	1900	mA
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U 428 B-FP

Pin 7	I_C	630	750	870	mA
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Temperature coefficient

 $T_{\text{amb}} = 0 \dots 85\text{ °C}$

U 427 B

Pin 7	TC	6.5	8	mA/K
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U 428 B-FP

Pin 7	TC	3.5	4	mA/K
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Collector saturation voltage

 $I_C = 1.3\text{ A}$

U 427 B

Pin 7	V_{CEsat}	1.2	V
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 $I_C = 1\text{ A}$

U 427 B

Pin 7	V_{CEsat}	1.0	V
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 $I_C = 0.5\text{ A}$

U 428 B-FP

Pin 7	V_{CEsat}	1.0	V
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 $I_C = 10\text{ mA}$

Pin 3	V_{CEsat}	0.3	V
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Temperature coefficient

 $T_{\text{amb}} = 0 \dots 85\text{ °C}$ $I_C = 820\text{ mA}$

U 427 B

Pin 7	TC	0.5	1	mV/K
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 $I_C = 350\text{ mA}$

U 428 B-FP

Pin 7	TC	0.5	1	mV/K
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Collector cut-off current

 $T_{\text{amb}} = 0 \dots 85\text{ °C}$, $V_{I1} = 0\text{ V}$ $V_{I8} = 10\text{ V}$

Pin 7	I_{CES}	1	μA
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Pin 8	I_{CES}	1	μA
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Pin 3	I_{CES}	1	μA
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Control voltage range

Pin 1	V_1	3	10	V
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Control current

 $T_{\text{amb}} = 0 \dots 85\text{ °C}$, $v_1 = 5\text{ V}$ $v_1 = 8\text{ V}$

Pin 1	I_1	1.4	1.9	mA
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Pin 1	I_1	2.9	3.9	mA
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Current inflow

Pin 1	I_1	0.1	mA
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Switching transistor

Input current

 $V_1 = 3\text{ V}$

Pin 6	I_1	0.3	0.5	mA
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 $V_1 = 9\text{ V}$

Pin 6	I_1	0.15	mA
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 $I_C = 10\text{ mA}$

Pin 6	I_1	0.15	mA
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U 427B · 428B-FP



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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

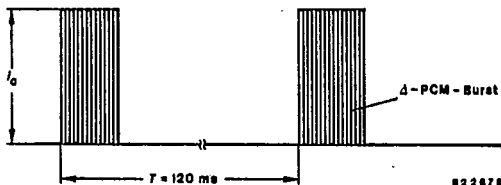
$\sum t_p$ Summarized duration of all single pulses within the period of one word

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

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822678

$$t_p = 4 \mu\text{s}$$

Number of single pulses = 85

T

$$\sum t_p = 4 \mu\text{s} \cdot 85 = 340 \mu\text{s}$$

0

Duty cycle:

T

$$\frac{1}{T} \sum t_p = \frac{340 \mu\text{s}}{120 \text{ ms}} = 0.0028$$

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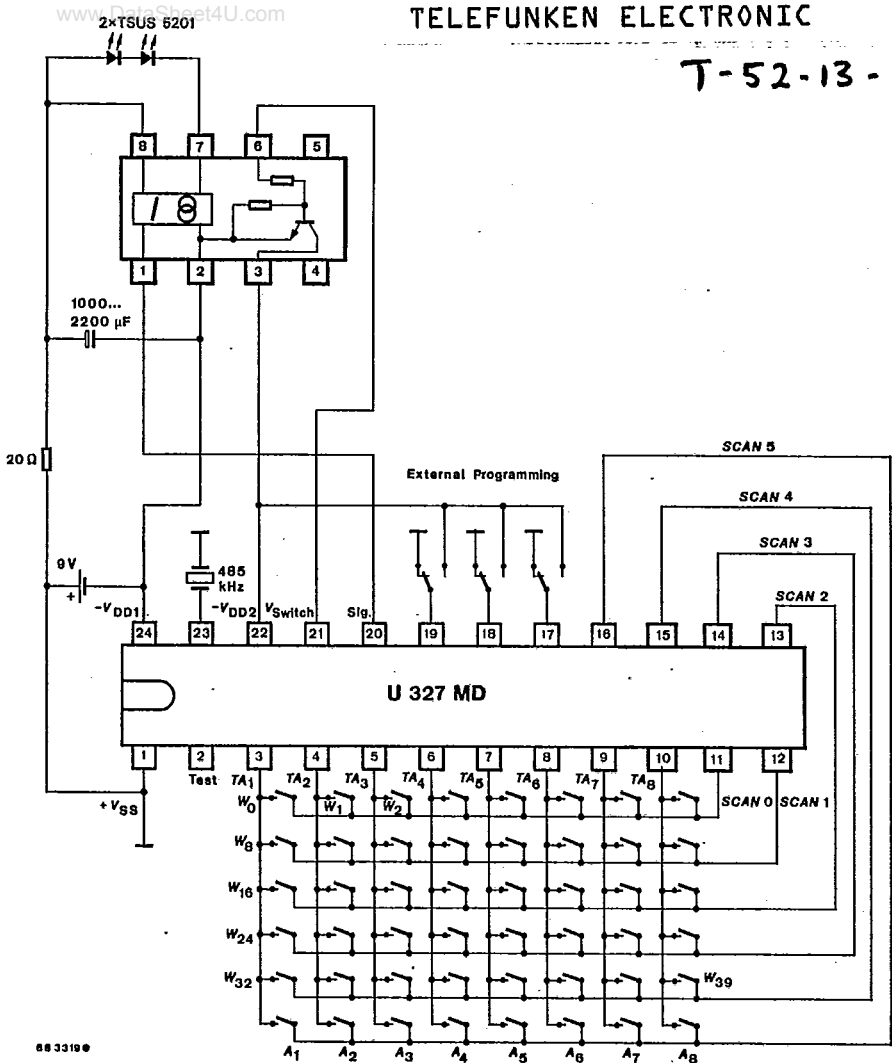


Fig. 3 Application circuit: IR remote control with U 327 MD

