



U 427B · U 428B-FP

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 $V_f = 1.2$ V
- Control voltage $V_f = 3 \dots 10$ V
- Control current $I_f \leq 0.1$ mA
- Additional switching transistor $I_c = 20$ mA

Case: DIP 8, SO 8

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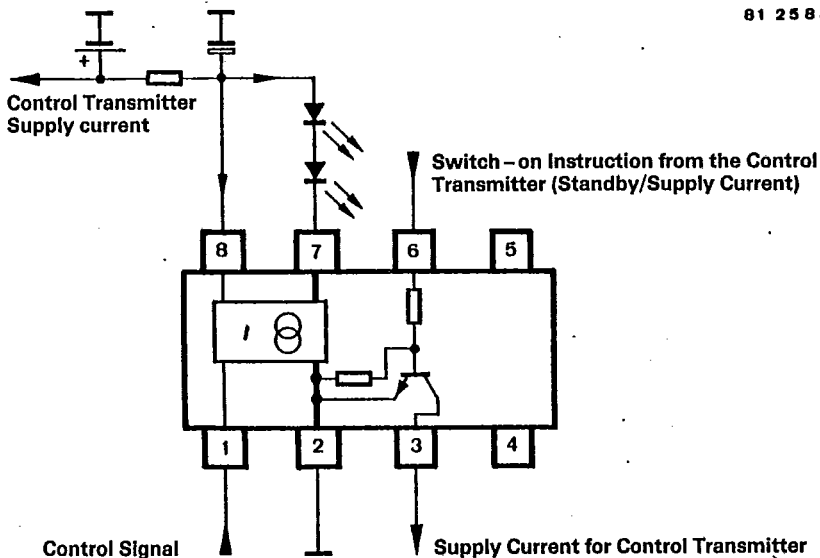
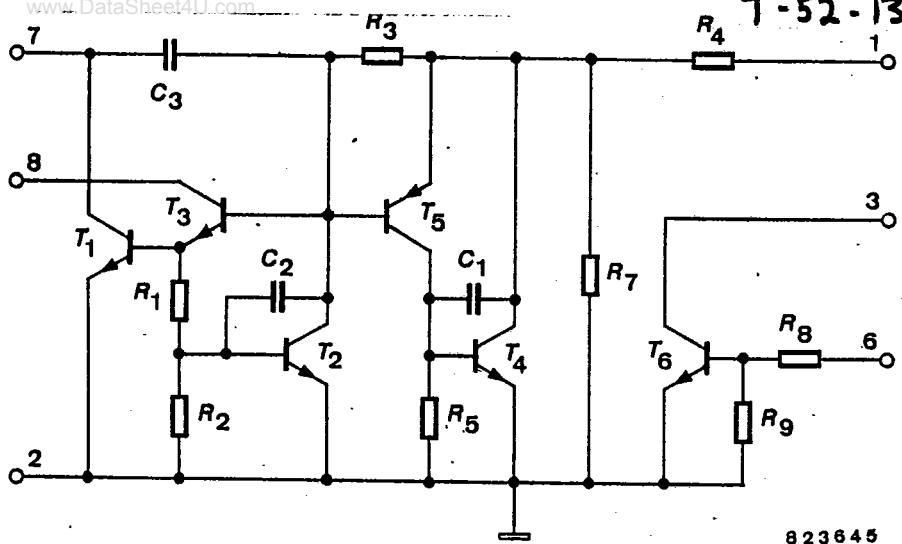


Fig. 1 Block diagram

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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	$^\circ C$



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Electrical characteristics

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

Supply voltage range

Fig. 2

	Min.	Typ.	Max.
Pin 8 V_B	5	10	V
Pin 7 V_7	1.2	10	V
Pin 7 V_7	1.2	10	V

 $I_C = 1.3\text{ A}$

U 427 B

 $I_C = 0.5\text{ A}$

U 428 B-FP

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

	Min.	Typ.	Max.
Pin 7 I_C	1300	1550	1800
Pin 7 I_C	610	725	845
Pin 7 I_C	1350	1600	1900
Pin 7 I_C	630	750	870

U 428 B-FP

 $V_1 = 8\text{ V}$, Fig. 5

U 427 B

U 428 B-FP

Temperature coefficient

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

U 427 B

	Min.	Typ.	Max.
Pin 7 TC	6.5	8	mA/K
Pin 7 TC	3.5	4	mA/K

U 428 B-FP

Collector saturation voltage

 $I_C = 1.3\text{ A}$

U 427 B

	Min.	Typ.	Max.
Pin 7 V_{CEsat}		1.2	V
Pin 7 V_{CEsat}		1.0	V
Pin 7 V_{CEsat}		1.0	V
Pin 3 V_{CEsat}		0.3	V

 $I_C = 1\text{ A}$

U 427 B

 $I_C = 0.5\text{ A}$

U 428 B-FP

 $I_C = 10\text{ mA}$

Temperature coefficient

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

U 427 B

	Min.	Typ.	Max.
Pin 7 TC	0.5	1	mV/K
Pin 7 TC	0.5	1	mV/K

 $I_C = 350\text{ mA}$

U 428 B-FP

Collector cut-off current

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

	Min.	Typ.	Max.
Pin 7 I_{CES}		1	μA
Pin 8 I_{CES}		1	μA
Pin 3 I_{CES}		1	μA

Control voltage range

	Min.	Typ.	Max.
Pin 1 V_1	3	10	V

Control current

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

	Min.	Typ.	Max.
Pin 1 I_1	1.4	1.9	mA
Pin 1 I_1	2.9	3.9	mA

Current inflow

	Min.	Typ.	Max.
Pin 1 I_1		0.1	mA

Switching transistor

Input current

 $V_1 = 3\text{ V}$

	Min.	Typ.	Max.
Pin 6 I_1	0.3	0.5	mA
Pin 6 I_1			mA
Pin 6 I_1		0.15	mA

 $V_1 = 9\text{ V}$ $I_C = 10\text{ mA}$

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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

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

0

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

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

Number of single pulses = 85

T

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

0

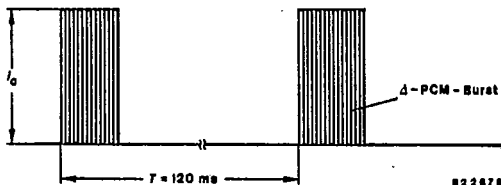
Duty cycle:

T

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

0

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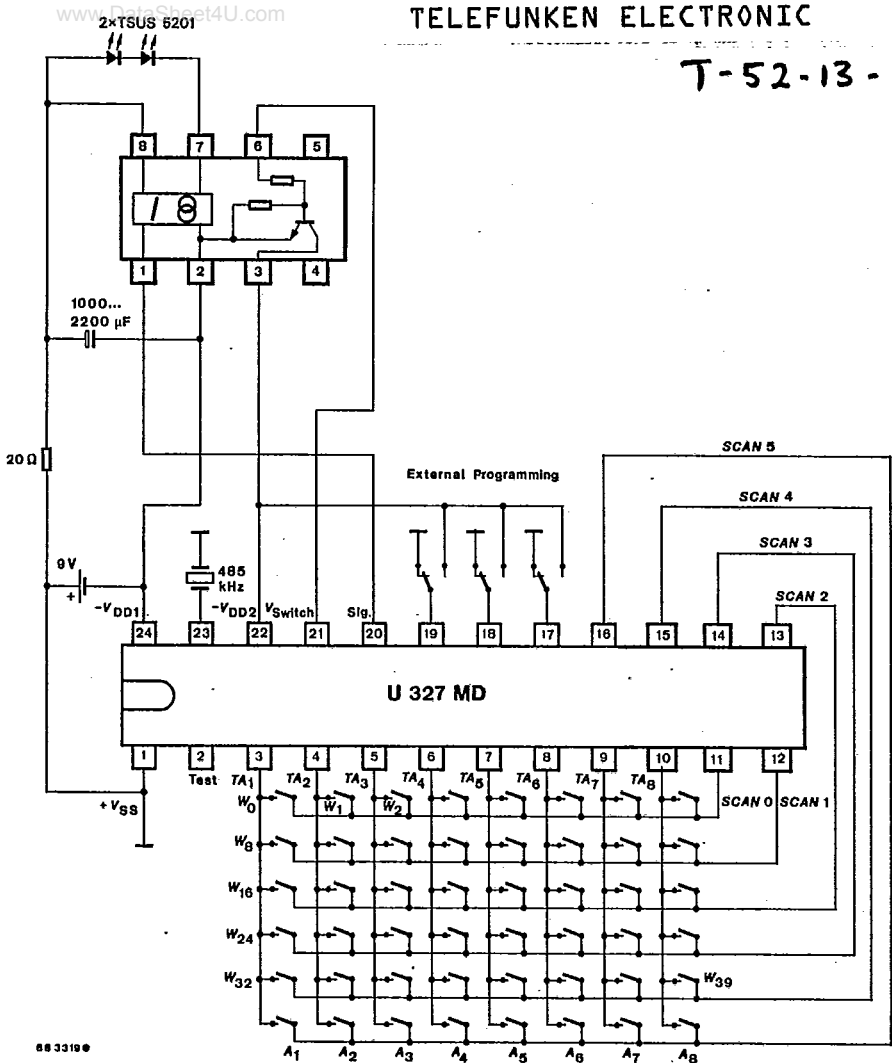
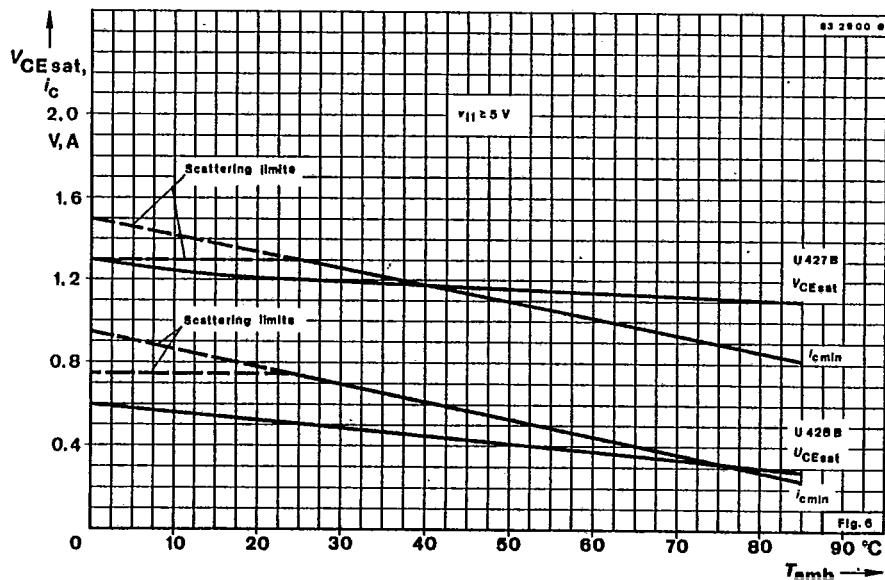
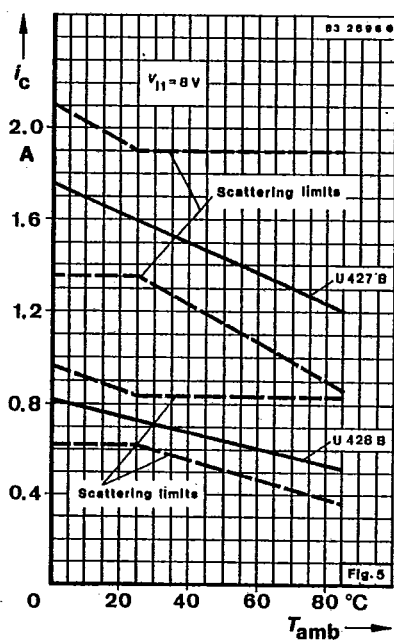
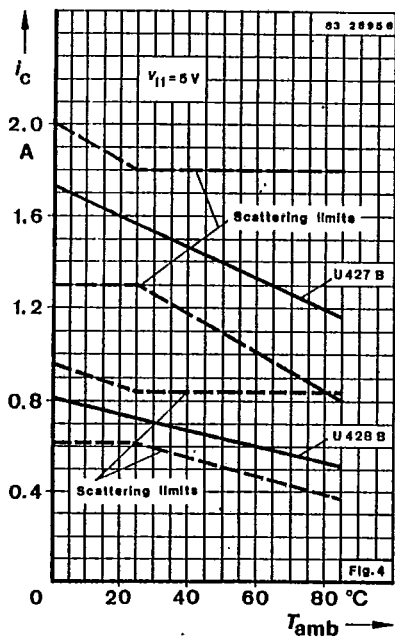
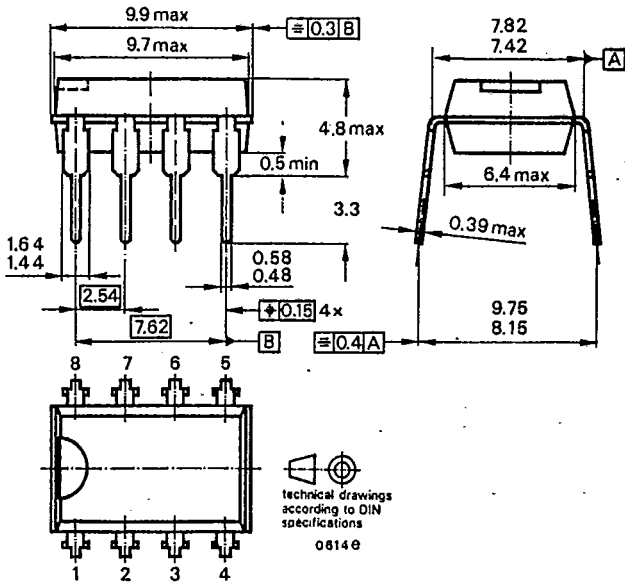


Fig. 3 Application circuit: IR remote control with U 327 MD



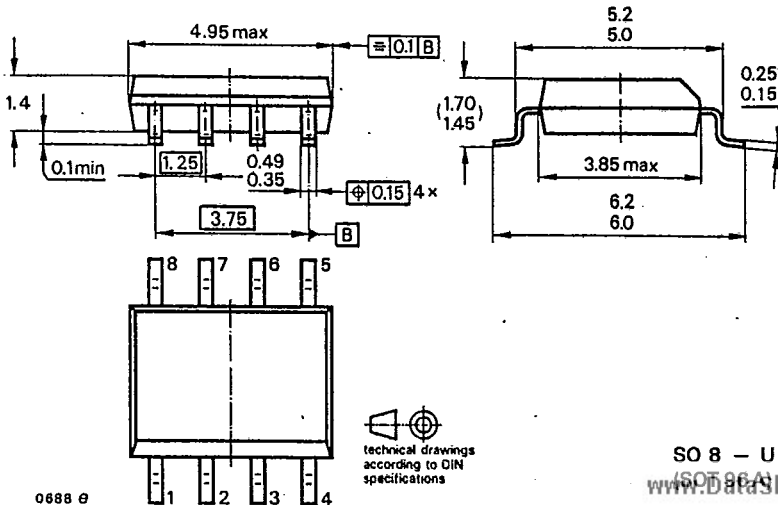
Dimensions in mm

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Case:

DIP 8 - U 427B



SO 8 - U 428B-FP