AS "ALFA RPAR
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572PA1
H572PA1
K(KR)572PA1

10-bit multiplying digital-to-analog converter

PECULIARITIES
- Power consumption (max.)30 mW
- ±22.5V – max reference voltage range
- Output current settling time (max.)5 µs
- Supply voltage U_{SS}= 15V ± 10%

DESCRIPTION
   572PA1- 10-bit CMOS multiplying DAC with parallel input interface and current output. It is designed to convert a 10-bit direct binary code at the digital inputs into a current at the analog output, which is proportional to the code values   and (or) the reference voltage. The DAC includes: a precision resistive matrix of the R-2R type, amplifiers - inverters for controlling current keys, current two-position keys made on   CMOS transistors.

   To operate in the voltage output mode, external reference voltage and op amps with a negative feedback circuit are connected to the 572PA1 type DAC IC.

   To achieve stability of the main conversion parameters under the influence of external factors, the feedback resistor R_{FB} placed on the IC crystal. DAC (N)572PA1 of increased reliability are additionally marked with the OSM index.
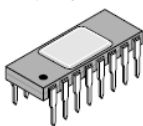
FUNCTIONAL DIAGRAM
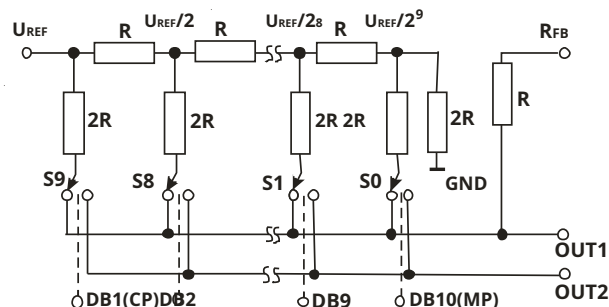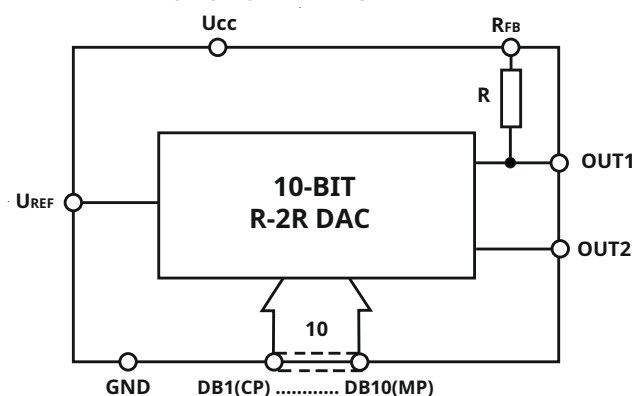
DAC circuit with keys and R-2R matrix

| Product type	TU number	Case type
572PA1A,B	bK0.347.182 TU 1	201.16-15, 201.16-8
H572PA1 A,B	bK0.347.182 TU1	H04.16-1B
B572PA1A-4,B-4	bK0.347.232 TU	b/k (on a common plate)
K 572PA1A,B	bK0.348.432 -01TU	201.16-8
KR572PA1A,B	bK0.348.432 -01TU	238.16-1

Pin assignment table

572PA1 A,B;
K572PA1 A,B
201.16-15, 201.16-8
CDIP-16
7.4×19 mm

H572PA1 A,B
H04.16-1B
LLCC-16 (2x6)
7.4×7.8 mm
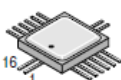
KR572PA1 A,B
238.16-8
PDIP-16
6.6×21 mm
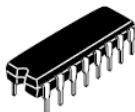
Designated nie	Output number			Purpose of the output
	201.16-15, 201.16-8	H04.16-1B	238.16-8	
OUT1	1	6	1	Analog output 1
OUT2	2	7	2	Analog output 2
GND	3	8	3	General
DB1(CP)	4	9	4	Digital input 1
DB2	5	10	5	Digital input 2
DB3	6	11	6	Digital input 3
DB4	7	12	7	Digital input 4
DB5	8	13	8	Digital input 5
DB6	9	14	9	Digital input 6
DB7	10	15	10	Digital input 7
DB8	11	16	11	Digital input 8
DB9	12	1	12	Digital input 9
DB10(MP)	13	2	13	Digital input 10
U_{CC}	14	3	14	Power U_{CC}(plus)
U_{REF}	15	4	15	Support voltage U_{REF}
R_{FB}	16	5	16	Resistor terminal feedback

Notes
   1 The overall drawings of the housings used are given below.
   2 When marking the designation of the type rating of the K572PA1 and KR572PA1 microcircuits, it is permissible to replace the final letter A, B with a color code (dots): A - one dot, B - two dots.
   The color of the dots for K572PA1 is black, for KR572PA1 - white.

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Main electrical parameters at U_{CC}= 15V, U_{REF}=10.24V, Tocr =25оWITH

Parameter name, unit of measurement	Letter designated nie	Norm			
		572PA1A H572PA1A B572PA1A-4		572PA1B H572PA1B B572PA1B-4	
		Not less	Not more	Not less	Not more
Differential nonlinearity, % of full scale	-LD	- 0.1	0,1	- 0.2	0.2
Nonlinearity, % of full scale	-L	- 0.1	0,1	- 0.2	0.2
Absolute error conversion at end point of scale, % of full scale	-FS	- 0.5	0.5	- 3	3
Output current settling time, µs	t_{SI}	-	5	-	5
Current consumption, mA	I_{CC}	-	2	-	2
Output zero offset current, nA	$I_{o.o.}$	-	100	-	100
Number of digits	V	10	-	10	-

Notes 1 Error in the task of maintaining U $_{CC}$ no more than ±1%
       2 Error in the task of maintaining U $_{REF}$ no more than ±0.25%

Main electrical parameters of K572PA1 A,B and KR572PA1 A,B

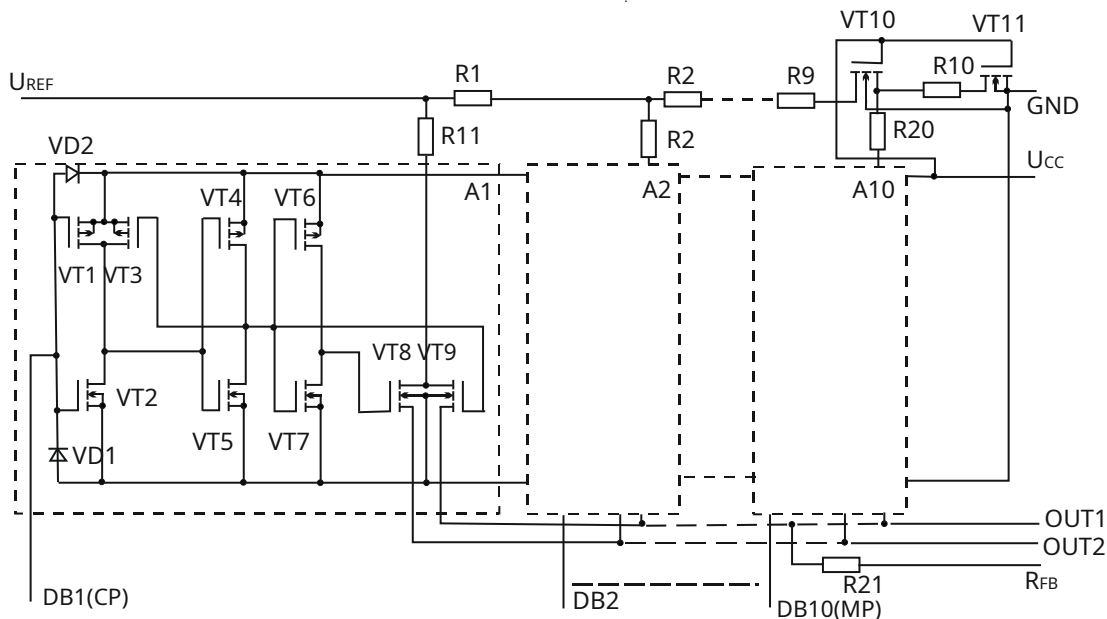| Parameter name, unit of measurement	Letter designated nie	Norm				Tempera-tour, оWITH
		K572PA1A, KR572PA1A		K572PA1B, KR572PA1B		
		Not less	Not more	Not less	Not more	
Current consumption, mA	I_{CC}	-	2	-	2	25
		-	3	-	3	70
		-	3	-	3	- 10
Output current settling time, µs	t_{S1}	-	5	-	5	25
Differential nonlinearity, % of full scale	-LD	- 0.1	0,1	- 0.2	0.2	25
		- 0.2	0.2	- 0.4	0.4	70
		- 0.3	0.3	- 0.5	0.5	- 10
Absolute error conversion at end point of scale, % of full scale	-FS	- 3	3	- 3	3	25
		- 4	4	- 4	4	70
		- 4.5	4.5	- 4.5	4.5	- 10
Number of digits	V	10	-	10	-	25

Maximum permissible operating parameters

| Name parameter, unit measurements	Letter designated nie pair-meters	Norm				Time impacts ultimate regime exploitation
		Maximum permissible mode		The Ultimate mode		
		Not less	Not more	Not less	Not more	
Supply voltage, V	U_{SS}	13.5	16.5	4	17.5*	
Input voltage high level, B	U_{IH}	3.6	U_{CC}	- 0.1	U_{SS}	No more than 2 hours.
Input voltage low level, B	U_{IL}	0	0.8	- 0.1	U_{SS}	
Reference voltage, V	U_{REF}	- 22.5(10.22)	22.5(10.26)	- 25	25	

Notes
 1 *- A short-term (no more than 2 hours during the entire period of operation) increase in supply voltage is allowed up to 17.85 V at condition I_{CC}- 15 mA.
 2 The limit mode for K(KR)572PA1 products is not specified. 3 The
 values   in brackets are given for K(KR)572PA1 products.

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Simplified electrical circuit diagram of the 572PA1 DAC

Basic circuit diagram of the 572PA1 DAC with operational amplifier

D1 - microcircuit;
A1 - operational amplifier
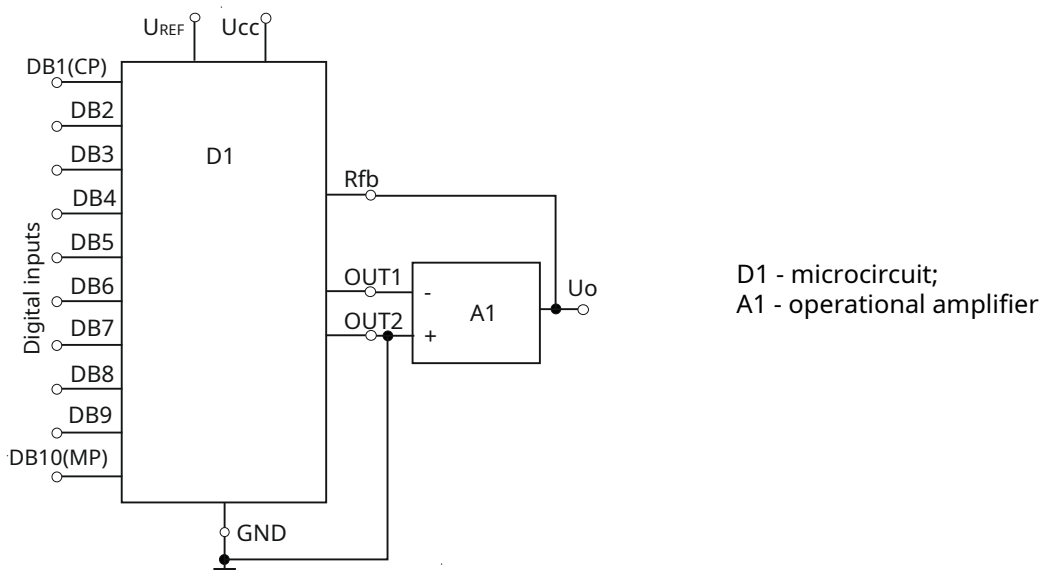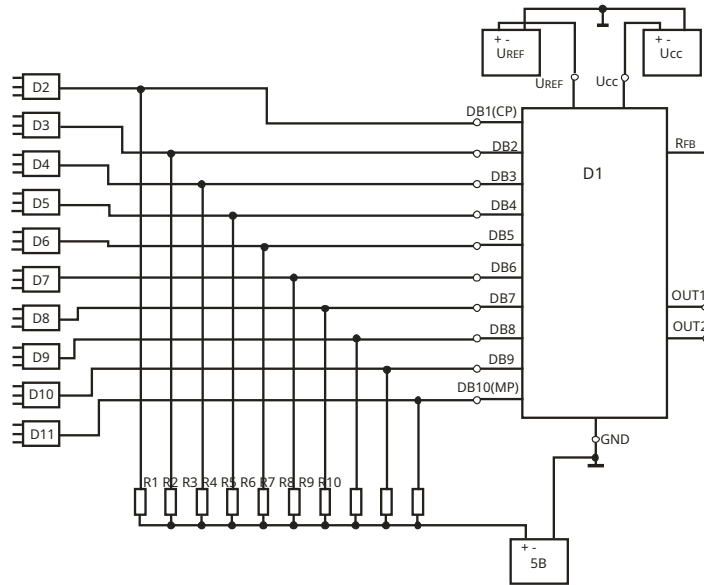
RECOMMENDATIONS FOR USE

1 It is recommended to apply voltage to the microcircuit in the following sequence: ground potential, supply voltage, reference voltage, voltages to the digital inputs.

The order of voltage removal should be reversed. For input voltages $U_{IH} < 5.5$ B the order of supplying modes to the microcircuit is arbitrary.

2 The reference voltage can be set to any polarity and shape.

3 Unused digital inputs must be connected to ground or combined with other inputs. 4 Voltages of less than minus 100 mV or more must not be applied to the OUT1 and OUT2 pins of the microcircuit. U_{SS}. 5 To conclusions microcircuits DB1-DB10, Ucc, GND it is not allowed to supply voltage less than 0 V and more U_{SS}.

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Connection diagram of the DAC type 572PA1 with TTL circuits.

D1 - microcircuit
D2 - D11 - Open Collector TTL Circuits
R1-R10 - matching resistors with a resistance rating of 2-10 kOhm.

Dimensional drawings of the used housings

Buildings 201.16-15, 201.16-8

Building 238.16-1

Housing H04.16-1B

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