

## 9-Bit Odd/Even Parity Generator/Checker

### Features

- Buffered Inputs
- Typical Propagation Delay
  - 10ns at  $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ ,  $C_L = 50pF$
- Exceeds 2kV ESD Protection per MIL-STD-883, Method 3015
- SCR-Latchup-Resistant CMOS Process and Circuit Design
- Speed of Bipolar FAST™/AS/S with Significantly Reduced Power Consumption
- Balanced Propagation Delays
- AC Types Feature 1.5V to 5.5V Operation and Balanced Noise Immunity at 30% of the Supply
- $\pm 24mA$  Output Drive Current
  - Fanout to 15 FAST™ ICs
  - Drives 50 $\Omega$  Transmission Lines

### Description

The 'AC280 and 'ACT280 are 9-bit odd/even parity generator/checkers that utilize Advanced CMOS Logic technology. Both even and odd parity outputs are available for checking or generating parity for words up to nine bits long. Even parity is indicated ( $\Sigma E$  output is HIGH) when an even number of

data inputs is HIGH. Odd parity is indicated ( $\Sigma O$  output is HIGH) when an odd number of data inputs is HIGH. Parity checking for words larger than nine bits can be accomplished by tying the  $\Sigma E$  output to any input of an additional 'AC280, 'ACT280 parity checker.

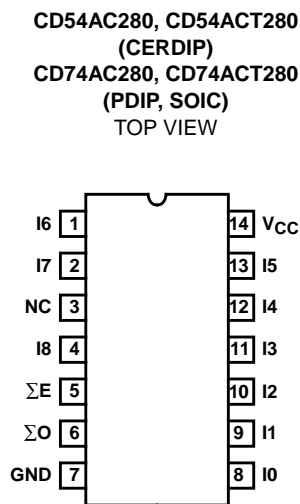
### Ordering Information

PART NUMBER	TEMP. RANGE ( $^\circ C$ )	PACKAGE
CD54AC280F3A	-55 to 125	14 Ld CERDIP
CD74AC280E	0 to 70 $^\circ C$ , -40 to 85, -55 to 125	14 Ld PDIP
CD74AC280M	0 to 70 $^\circ C$ , -40 to 85, -55 to 125	14 Ld SOIC
CD54ACT280F3A	-55 to 125	14 Ld CERDIP
CD74ACT280E	0 to 70 $^\circ C$ , -40 to 85, -55 to 125	14 Ld PDIP
CD74ACT280M	0 to 70 $^\circ C$ , -40 to 85, -55 to 125	14 Ld SOIC

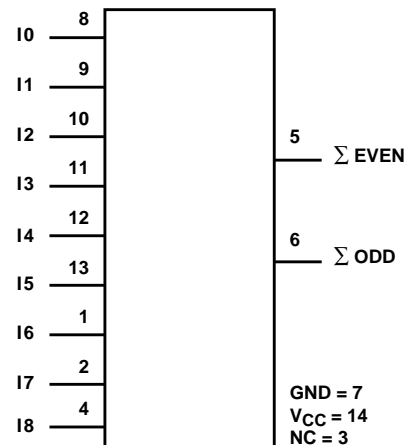
#### NOTES:

1. When ordering, use the entire part number. Add the suffix 96 to obtain the variant in the tape and reel.
2. Wafer and die for this part number is available which meets all electrical specifications. Please contact your local TI sales office or customer service for ordering information.

### Pinout



### Functional Diagram



## CD54/74AC280, CD54/74ACT280

### Absolute Maximum Ratings

DC Supply Voltage, $V_{CC}$ .....	-0.5V to 6V
DC Input Diode Current, $I_{IK}$	
For $V_I < -0.5V$ or $V_I > V_{CC} + 0.5V$ .....	$\pm 20mA$
DC Output Diode Current, $I_{OK}$	
For $V_O < -0.5V$ or $V_O > V_{CC} + 0.5V$ .....	$\pm 50mA$
DC Output Source or Sink Current per Output Pin, $I_O$	
For $V_O > -0.5V$ or $V_O < V_{CC} + 0.5V$ .....	$\pm 50mA$
DC $V_{CC}$ or Ground Current, $I_{CC}$ or $I_{GND}$ (Note 3) .....	$\pm 100mA$

### Thermal Information

Thermal Resistance (Typical, Note 5)	$\theta_{JA}$ (°C/W)
PDIP Package .....	—
SOIC Package .....	—
Maximum Junction Temperature (Plastic Package) .....	150°C
Maximum Storage Temperature Range .....	-65°C to 150°C
Maximum Lead Temperature (Soldering 10s) .....	300°C

### Operating Conditions

Temperature Range, $T_A$ .....	-55°C to 125°C
Supply Voltage Range, $V_{CC}$ (Note 4)	
AC Types .....	1.5V to 5.5V
ACT Types .....	4.5V to 5.5V
DC Input or Output Voltage, $V_I$ , $V_O$ .....	0V to $V_{CC}$
Input Rise and Fall Slew Rate, dt/dv	
AC Types, 1.5V to 3V .....	50ns (Max)
AC Types, 3.6V to 5.5V .....	20ns (Max)
ACT Types, 4.5V to 5.5V .....	10ns (Max)

*CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.*

#### NOTES:

3. For up to 4 outputs per device, add  $\pm 25mA$  for each additional output.
4. Unless otherwise specified, all voltages are referenced to ground.
5.  $\theta_{JA}$  is measured with the component mounted on an evaluation PC board in free air.

### DC Electrical Specifications

PARAMETER	SYMBOL	TEST CONDITIONS		$V_{CC}$ (V)	25°C		-40°C TO 85°C		-55°C TO 125°C		UNITS	
		$V_I$ (V)	$I_O$ (mA)		MIN	MAX	MIN	MAX	MIN	MAX		
<b>AC TYPES</b>												
High Level Input Voltage	$V_{IH}$	-	-	1.5	1.2	-	1.2	-	1.2	-	V	
				3	2.1	-	2.1	-	2.1	-	V	
				5.5	3.85	-	3.85	-	3.85	-	V	
Low Level Input Voltage	$V_{IL}$	-	-	1.5	-	0.3	-	0.3	-	0.3	V	
				3	-	0.9	-	0.9	-	0.9	V	
				5.5	-	1.65	-	1.65	-	1.65	V	
High Level Output Voltage	$V_{OH}$	$V_{IH}$ or $V_{IL}$	-0.05	-0.05	1.5	1.4	-	1.4	-	1.4	-	V
			-0.05	-0.05	3	2.9	-	2.9	-	2.9	-	V
			-0.05	-0.05	4.5	4.4	-	4.4	-	4.4	-	V
			-4	-4	3	2.58	-	2.48	-	2.4	-	V
			-24	-24	4.5	3.94	-	3.8	-	3.7	-	V
			-75 (Note 6, 7)	-75 (Note 6, 7)	5.5	-	-	3.85	-	-	-	V
-50 (Note 6, 7)	-50 (Note 6, 7)	5.5	-	-	-	-	3.85	-	V			

**CD54/74AC280, CD54/74ACT280**

**DC Electrical Specifications (Continued)**

PARAMETER	SYMBOL	TEST CONDITIONS		V <sub>CC</sub> (V)	25°C		-40°C TO 85°C		-55°C TO 125°C		UNITS		
		V <sub>I</sub> (V)	I <sub>O</sub> (mA)		MIN	MAX	MIN	MAX	MIN	MAX			
Low Level Output Voltage	V <sub>OL</sub>	V <sub>IH</sub> or V <sub>IL</sub>	0.05	1.5	-	0.1	-	0.1	-	0.1	V		
			0.05	3	-	0.1	-	0.1	-	0.1	V		
			0.05	4.5	-	0.1	-	0.1	-	0.1	V		
			12	3	-	0.36	-	0.44	-	0.5	V		
			24	4.5	-	0.36	-	0.44	-	0.5	V		
			75 (Note 6, 7)	5.5	-	-	-	1.65	-	-	V		
			50 (Note 6, 7)	5.5	-	-	-	-	-	1.65	V		
Input Leakage Current	I <sub>I</sub>	V <sub>CC</sub> or GND	-	5.5	-	±0.1	-	±1	-	±1	µA		
Quiescent Supply Current MSI	I <sub>CC</sub>	V <sub>CC</sub> or GND	0	5.5	-	8	-	80	-	160	µA		
<b>ACT TYPES</b>													
High Level Input Voltage	V <sub>IH</sub>	-	-	4.5 to 5.5	2	-	2	-	2	-	V		
Low Level Input Voltage	V <sub>IL</sub>	-	-	4.5 to 5.5	-	0.8	-	0.8	-	0.8	V		
High Level Output Voltage	V <sub>OH</sub>	V <sub>IH</sub> or V <sub>IL</sub>	-0.05	4.5	4.4	-	4.4	-	4.4	-	4.4	V	
			-24	4.5	3.94	-	3.8	-	3.7	-	3.7	V	
			-75 (Note 6, 7)	5.5	-	-	3.85	-	-	-	-	-	V
			-50 (Note 6, 7)	5.5	-	-	-	-	-	3.85	-	3.85	V
Low Level Output Voltage	V <sub>OL</sub>	V <sub>IH</sub> or V <sub>IL</sub>	0.05	4.5	-	0.1	-	0.1	-	0.1	V		
			24	4.5	-	0.36	-	0.44	-	0.5	V		
			75 (Note 6, 7)	5.5	-	-	-	1.65	-	-	V		
			50 (Note 6, 7)	5.5	-	-	-	-	-	1.65	V		
Input Leakage Current	I <sub>I</sub>	V <sub>CC</sub> or GND	-	5.5	-	±0.1	-	±1	-	±1	µA		
Quiescent Supply Current MSI	I <sub>CC</sub>	V <sub>CC</sub> or GND	0	5.5	-	8	-	80	-	160	µA		
Additional Supply Current per Input Pin TTL Inputs High 1 Unit Load	ΔI <sub>CC</sub>	V <sub>CC</sub> -2.1	-	4.5 to 5.5	-	2.4	-	2.8	-	3	mA		

**NOTES:**

- Test one output at a time for a 1-second maximum duration. Measurement is made by forcing current and measuring voltage to minimize power dissipation.
- Test verifies a minimum 50Ω transmission-line-drive capability at 85°C, 75Ω at 125°C.

**ACT Input Load Table**

INPUT	UNIT LOAD
All	1.43

NOTE: Unit load is ΔI<sub>CC</sub> limit specified in DC Electrical Specifications Table, e.g., 2.4mA max at 25°C.

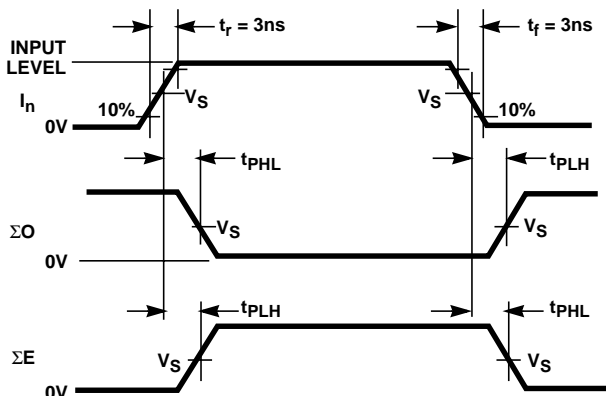
## CD54/74AC280, CD54/74ACT280

### Switching Specifications Input $t_r, t_f = 3\text{ns}$ , $C_L = 50\text{pF}$ (Worst Case)

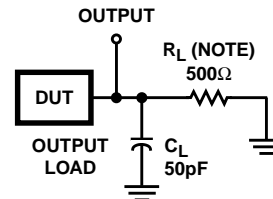
PARAMETER	SYMBOL	$V_{CC}$ (V)	-40°C TO 85°C			-55°C TO 125°C			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
<b>AC TYPES</b>									
Propagation Delay, Any Input to $\Sigma O$	$t_{PLH}, t_{PHL}$	1.5	-	-	239	-	-	263	ns
		3.3 (Note 9)	7.5	-	26	7.3	-	29	ns
		5 (Note 10)	5.4	-	19.1	5.3	-	21	ns
Propagation Delay, Any Input to $\Sigma E$	$t_{PLH}, t_{PHL}$	1.5	-	-	227	-	-	250	ns
		3.3	7.2	-	25	7	-	28	ns
		5	5.2	-	18.2	5	-	20	ns
Input Capacitance	$C_I$	-	-	-	10	-	-	10	pF
Power Dissipation Capacitance	$C_{PD}$ (Note 11)	-	-	115	-	-	115	-	pF
<b>ACT TYPES</b>									
Propagation Delay, Any Input to $\Sigma O$	$t_{PLH}, t_{PHL}$	5 (Note 10)	5.6	-	19.6	5.4	-	21.6	ns
Propagation Delay, Any Input to $\Sigma E$	$t_{PLH}, t_{PHL}$	5	5.6	-	19.6	5.4	-	21.6	ns
Input Capacitance	$C_I$	-	-	-	10	-	-	10	pF
Power Dissipation Capacitance	$C_{PD}$ (Note 11)	-	-	115	-	-	115	-	pF

**NOTES:**

8. Limits tested 100%
9. 3.3V Min is at 3.6V, Max is at 3V.
10. 5V Min is at 5.5V, Max is at 4.5V.
11.  $C_{PD}$  is used to determine the dynamic power consumption per package.  
 AC:  $P_D = V_{CC}^2 f_i (C_{PD} + C_L)$   
 ACT:  $P_D = V_{CC}^2 f_i (C_{PD} + C_L) + V_{CC} \Delta I_{CC}$  where  $f_i$  = input frequency,  $C_L$  = output load capacitance,  $V_{CC}$  = supply voltage.



**FIGURE 1.**



NOTE: For AC Series Only: When  $V_{CC} = 1.5\text{V}$ ,  $R_L = 1\text{k}\Omega$ .

	AC	ACT
Input Level	$V_{CC}$	3V
Input Switching Voltage, $V_S$	$0.5 V_{CC}$	1.5V
Output Switching Voltage, $V_S$	$0.5 V_{CC}$	$0.5 V_{CC}$

**FIGURE 2. PROPAGATION DELAY TIMES**

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PACKAGING INFORMATION

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
CD54AC280F3A	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
CD54ACT280F3A	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
CD74AC280E	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
CD74AC280EE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
CD74AC280M	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74AC280M96	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74AC280M96E4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74AC280M96G4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74AC280ME4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74AC280MG4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74ACT280E	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
CD74ACT280EE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
CD74ACT280M	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74ACT280M96	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74ACT280M96E4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74ACT280M96G4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74ACT280ME4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD74ACT280MG4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

<sup>(1)</sup> The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSELETE:** TI has discontinued the production of the device.

<sup>(2)</sup> Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**TBD:** The Pb-Free/Green conversion plan has not been defined.

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

<sup>(3)</sup> MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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**TAPE AND REEL BOX INFORMATION**



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**



Device	Package	Pins	Site	Reel Diameter (mm)	Reel Width (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
CD74AC280M96	D	14	SITE 41	330	16	6.5	9.0	2.1	8	16	Q1
CD74ACT280M96	D	14	SITE 41	330	16	6.5	9.0	2.1	8	16	Q1



**TAPE AND REEL BOX DIMENSIONS**



Device	Package	Pins	Site	Length (mm)	Width (mm)	Height (mm)
CD74AC280M96	D	14	SITE 41	346.0	346.0	33.0
CD74ACT280M96	D	14	SITE 41	346.0	346.0	33.0

J (R-GDIP-T\*\*)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



DIM \ PINS **	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



4040083/F 03/03

- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package is hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
  - Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

N (R-PDIP-T\*\*)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - (C) Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
  - (D) The 20 pin end lead shoulder width is a vendor option, either half or full width.

D (R-PDSO-G14)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 (0,15) per end.
  - D. Body width does not include interlead flash. Interlead flash shall not exceed .017 (0,43) per side.
  - E. Reference JEDEC MS-012 variation AB.



Поставка электронных компонентов

**Юридический адрес организации:**  
198099, г. Санкт-Петербург, ул. Калинина, дом 2, кор. 4, лит А.  
**Фактический адрес организации:**  
198099, г. Санкт-Петербург, ул. Калинина, дом 2, кор. 4, лит А.  
ИНН 780277764  
КПП 780501001  
Р/С 40702810422510004035 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в Санкт-Петербурге К/С 30101810900000000703  
БИК 044030703  
**Телефон:** 8 (812) 309-44-11 (многоканальный)  
**Факс:** 8 (812) 309-44-11  
**Электронная почта:** [sales@timechips.ru](mailto:sales@timechips.ru)  
**Сайт:** [timechips.ru](http://timechips.ru)

## Информационное письмо

Компания «ТаймЧипс» - одна из наиболее динамично развивающихся компаний в сфере поставок электронных компонентов. Мы поставляем широкую номенклатуру электронных компонентов отечественных и импортных производителей, как напрямую, так и с крупных мировых складов, позволяющих охватить выборочную номенклатуру более 300 брендов, а также специализируемся на поставках дисплеев и является официальным дистрибьютором компании Shenzhen Startek Electronic Technology Co, на территории Российской Федерации.

Наличие собственной логистики позволяет в кратчайшие сроки доставлять товар нашим клиентам. В нашей компании имеется Конструкторский отдел, где наши специалисты проводят технические консультации клиентов, квалифицированную поддержку и помощь российским разработчикам. Осуществляем Поставки импортной продукции под контролем ВП МО РФ, на предприятия Оборонно-промышленного комплекса России. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001-2011.

Благодаря нацеленности на результат, мы уверенно занимаем новые позиции на рынке, заинтересовывая Клиента не только актуальными ценами и гибким подходом, но и постоянным вниманием.

**Миссия** – обеспечение долгосрочного и взаимовыгодного партнерства с клиентами.

**Наша цель** – Обеспечение клиентам самого широкого ассортимента электронных компонентов и бесперебойности поставок.

**Мы - это развитие! Мы задаем темп! Мы разные, но вместе! Мы работаем для вас!**

Так же имеем прямые поставки от производителей:

TAI-SAW Пав-компоненты ([www.taisaw.com](http://www.taisaw.com))

TRANSCOM СВЧ-компоненты ([www.transcominc.com.tw](http://www.transcominc.com.tw))

Mini Circuits ВЧ-СВЧ-компоненты ([minicircuits.com](http://minicircuits.com))

SAMTEC- разъемы ([www.samtec.com](http://www.samtec.com))

4Star Разъемы РЧ (Даташиты по продукции 4Star, которые Вы сможете загрузить по этой ссылке: <https://yadi.sk/i/tPjnmGGrpmbYj>)

ULNION Преобразователи напряжения ([converterdc.com/](http://converterdc.com/))

**Отличные рекомендации на рынке, уверенность в качестве поставляемой продукции делают нас надежными партнерами для наших клиентов.**

**«ТаймЧипс» - это:**

- Гарантия качества поставляемой продукции;
- Широкий ассортимент;
- Минимальные сроки поставок;
- Техническая поддержка;
- Подбор комплектации;
- Индивидуальный подход;
- Гибкие цены.

**Модули, микросхемы, пассивные компоненты, Xilinx (XC), Altera (EP,EPF, EPM) и силовая электроника** – это наши ведущие позиции, на поставку которых мы гарантированно дадим Вам самые выгодные предложения!

**В структуру компании так же входит конструкторский отдел, который помогает разработчикам и конструкторам в решении следующих задач:**

- Оценка стоимости проекта по компонентам;
- Подбор оптимального решения при выборе компонента;
- Подбор аналогов;
- Техническая поддержка;
- Консультации у производителей;
- Поставка прототипов;

*С Уважением, Чернов Павел.*

*Руководитель отдела продаж ООО "ТАЙМЧИПС"*

*Официальный дистрибьютор Shenzhen Startek Electronic Technology Co.,Ltd в России (USB Display Modules , LED Displays, Serial Modules).*

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