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MICROWAVE CORPORATION v05.0514



HMC726LC3C

**14 Gbps, FAST RISE TIME
AND / NAND / OR / NOR GATE**

Typical Applications

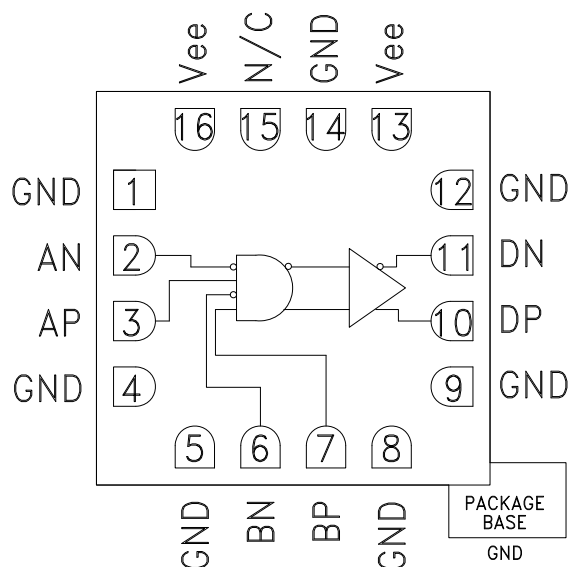
The HMC726LC3C is ideal for:

- 16 G Fiber Channel
- RF ATE Applications
- Broadband Test & Measurement
- Serial Data Transmission up to 14 Gbps
- Digital Logic Systems up to 14 GHz
- NRZ-to-RZ Conversion

Features

Supports High Data Rates: up to 14 Gbps
Differential or Single-Ended Operation
Fast Rise and Fall Times: 19 / 18 ps
Low Power Consumption: 230 mW typ.
Propagation Delay: 95 ps
Single Supply: -3.3 V
16 Lead Ceramic 3x3 mm SMT Package: 9mm²

Functional Diagram



General Description

The HMC726LC3C is an AND/NAND/OR/NOR function designed to support data transmission rates of up to 14 Gbps, and clock frequencies as high as 14 GHz. The HMC726LC3C may be easily configured to provide any of the following logic functions: AND, NAND, OR and NOR.

All differential inputs to the HMC726LC3C are CML and terminated on-chip with 50 Ohms to the positive supply, GND, and may be DC or AC coupled. The differential CML outputs are source terminated to 50 Ohms and may also be AC or DC coupled. Outputs can be connected directly to a 50 Ohm ground-terminated system or drive devices with CML logic input. The HMC726LC3C operates from a single -3.3 V supply and is available in ROHS-compliant 3x3 mm SMT package.

Electrical Specifications, $T_A = +25^\circ\text{C}$, $V_{ee} = -3.3\text{ V}$

Parameter	Conditions	Min.	Typ.	Max	Units
Power Supply Voltage		-3.6	-3.3	-3.0	V
Power Supply Current			70		mA
Maximum Data Rate			14		Gbps
Maximum Clock Rate			14		GHz
Input Voltage Range		-1.5		0.5	V
Input Differential Range		0.1		2.0	Vp-p
Input Return Loss	Frequency <14 GHz		10		dB
Output Amplitude	Single-Ended, peak-to-peak		550		mVp-p
	Differential, peak-to-peak		1100		mVp-p
Output High Voltage			-10		mV
Output Low Voltage			-560		mV
Output Rise / Fall Time	Differential, 20% - 80%		19 / 18		ps

For price, delivery and to place orders: Hittite Microwave Corporation, 2 Elizabeth Drive, Chelmsford, MA 01824

Phone: 978-250-3343 Fax: 978-250-3373 Order On-line at www.hittite.com

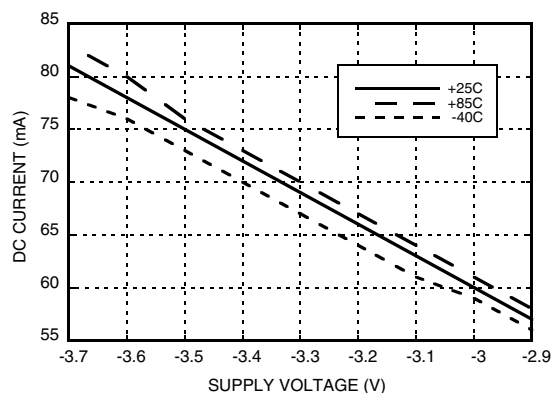
Application Support: Phone: 978-250-3343 or apps@hittite.com

Electrical Specifications (continued)

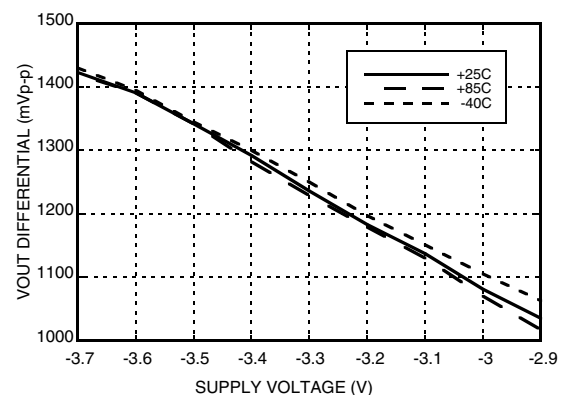
Parameter	Conditions	Min.	Typ.	Max	Units
Output Return Loss	Frequency <14 GHz		10		dB
Small Signal Gain			27		dB
Random Jitter Jr	rms			0.2	ps rms
Deterministic Jitter, Jd	peak-to-peak, 2 ¹⁵ -1 PRBS input [1]		2		ps, p-p
Propagation Delay, td			95		ps

[1] Deterministic jitter calculated by simultaneously measuring the jitter of a 300 mV, 13 GHz, 2¹⁵-1 PRBS input, and a single-ended output

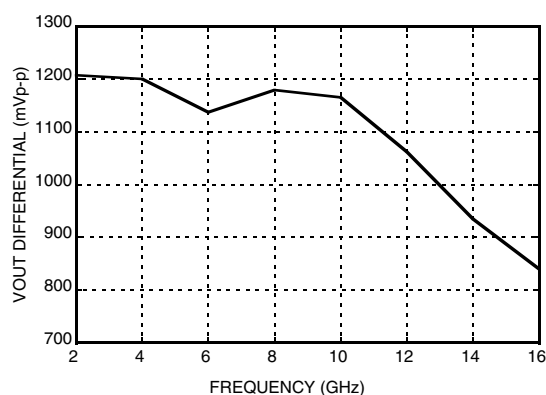
DC Current vs. Supply Voltage [1]



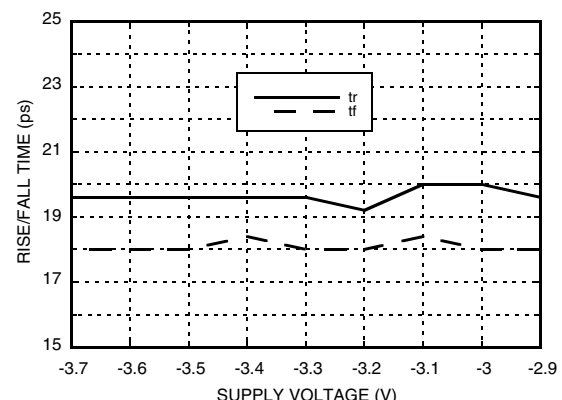
Output Differential Voltage vs. Supply Voltage [2]



Output Differential Voltage vs. Frequency [3]



Rise / Fall Time vs. Supply [1]



[1] Data rate = 13 Gbps

[2] Frequency = 10 GHz

[3] V_{ee} = -3.3 V



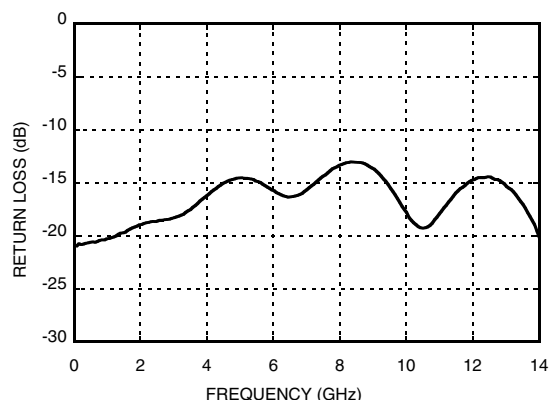
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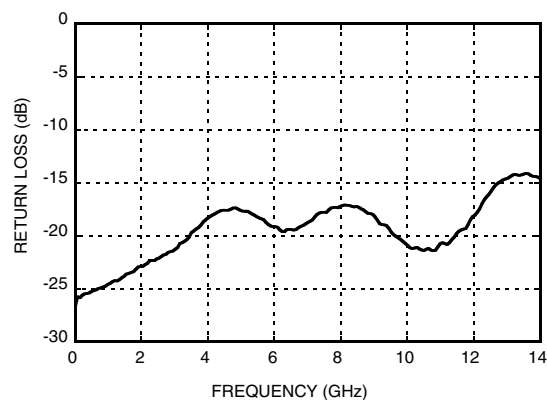
HMC726LC3C

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AND / NAND / OR / NOR GATE**

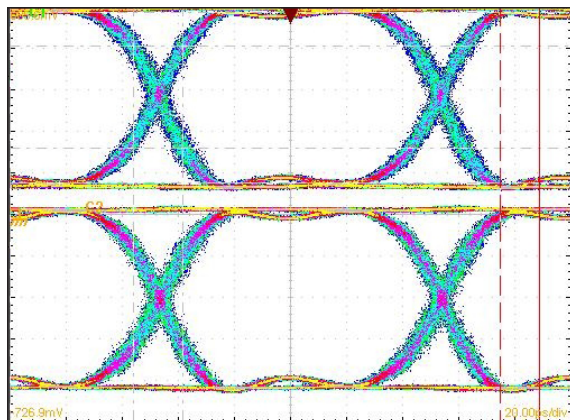
Output Return Loss vs. Frequency



Input Return Loss vs. Frequency

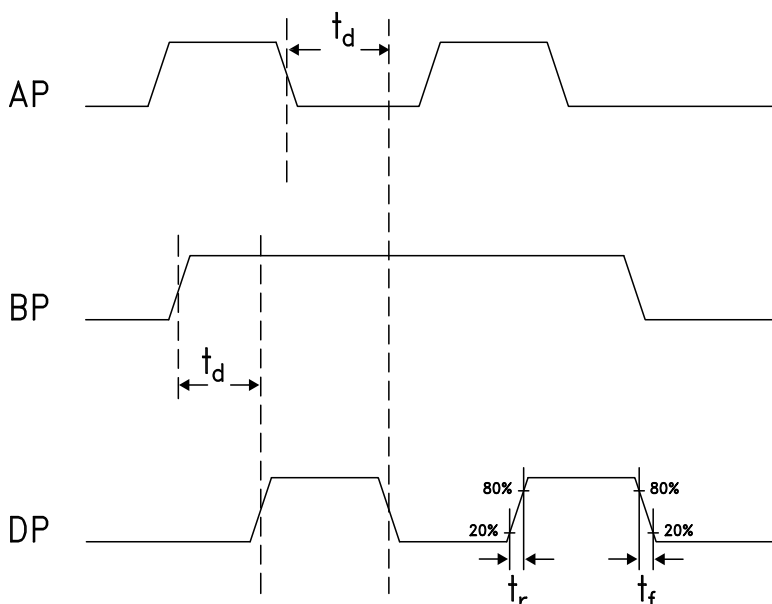


Eye Diagram



[1] Test Conditions:
Pattern generated with an Agilent N4903A Serial BERT.
Eye Diagram presented on a Tektronix CSA 8000.
Device input = 10 Gbps PN code, V_{in} = 300 mVp-p differential.

Timing Diagram



Truth Table

Input		Outputs
A	B	D
L	L	L
L	H	L
H	L	L
H	H	H
Notes: A = AP - AN B = BP - BN D = DP - DN		H - Positive voltage level L - Negative voltage level



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**HMC726LC3C**

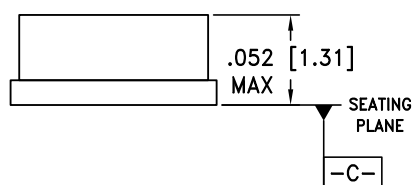
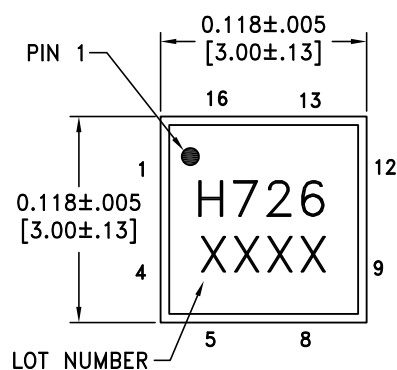
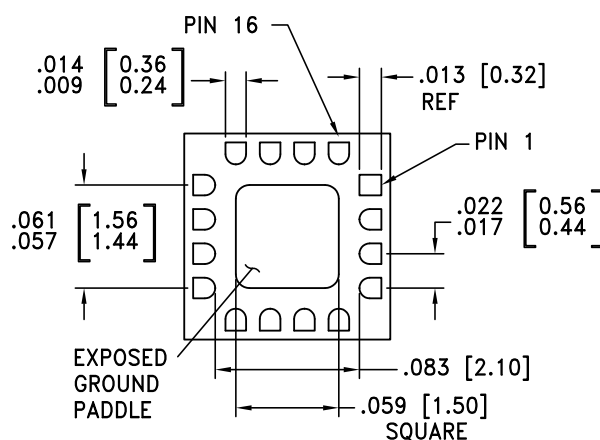
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Absolute Maximum Ratings

Power Supply Voltage (Vee)	-3.75 V to +0.5 V
Input Signals	-2 V to +0.5 V
Output Signals	-1.5 V to +1 V
Continuous Pdiss (T = 85 °C) (derate 17 mW/°C above 85 °C)	0.68 W
Thermal Resistance (R _{th j-p}) Worst case junction to package paddle	59 °C/W
Maximum Junction Temperature	125 °C
Storage Temperature	-65 °C to +150 °C
Operating Temperature	-40 °C to +85 °C
ESD Sensitivity (HBM)	Class 1C



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

Outline Drawing**BOTTOM VIEW****NOTES:**

1. PACKAGE BODY MATERIAL: ALUMINA
2. LEAD AND GROUND PADDLE PLATING:
30-80 MICROINCHES GOLD OVER 50 MICROINCHES MINIMUM NICKEL.
3. DIMENSIONS ARE IN INCHES [MILLIMETERS].
4. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
5. PACKAGE WARP SHALL NOT EXCEED 0.05 mm DATUM -C-
6. ALL GROUND LEADS MUST BE SOLDERED TO PCB RF GROUND.
7. PADDLE MUST BE SOLDERED TO GND.

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking ^[2]
HMC726LC3C	Alumina, White	Gold over Nickel	MSL3 ^[1]	H726 XXXX

[1] Max peak reflow temperature of 260 °C

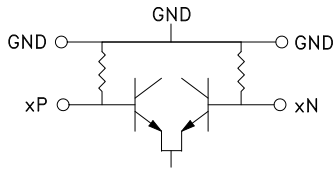
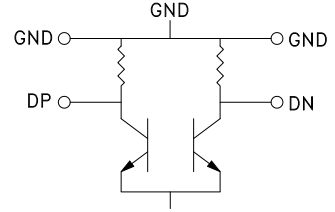
[2] 4-Digit lot number XXXX

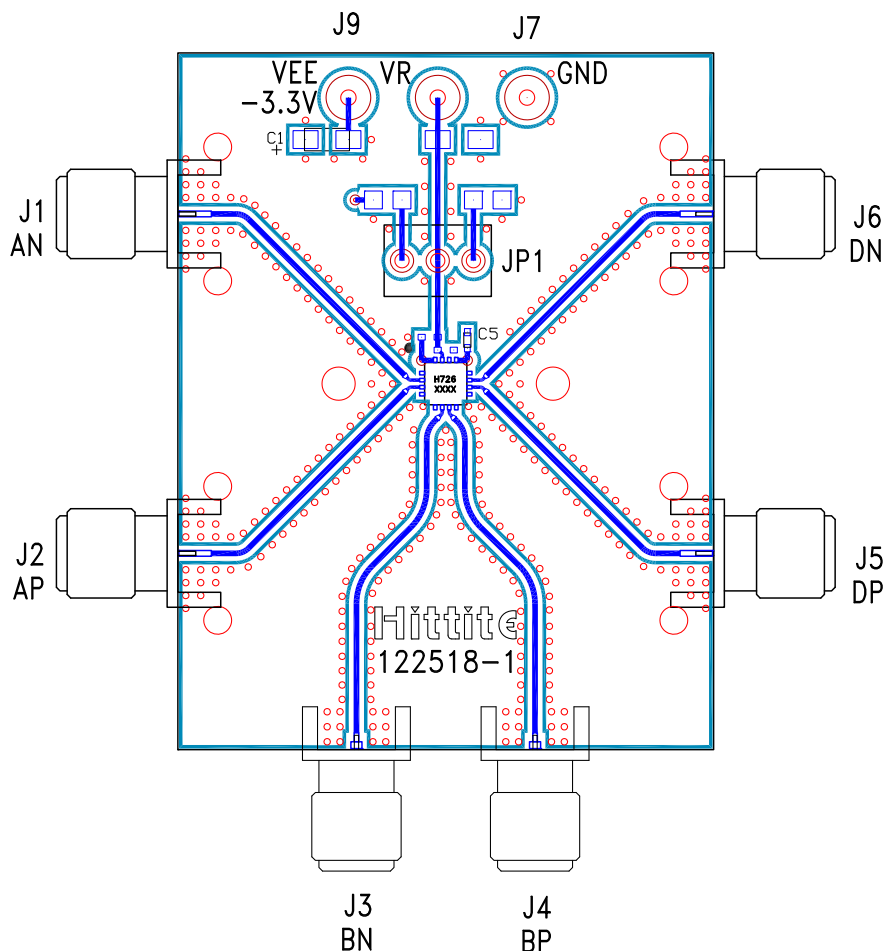
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Phone: 978-250-3343 Fax: 978-250-3373 Order On-line at www.hittite.com

Application Support: Phone: 978-250-3343 or apps@hittite.com

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 4, 5, 8, 9, 12	GND	Signal Grounds	
2, 3 6, 7	AN, AP BN, BP	Differential Data Inputs, Current Mode Logic (CML) referenced to positive supply.	
10, 11	DP, DN	Differential Data Outputs, Current Mode Logic (CML) referenced to positive supply.	
13, 16	Vee	Negative Supply	
14, Package Base	GND	Supply Ground	
15	N/C	No Connection required. This pin may be connected to RF/DC ground without affecting performance.	

Evaluation PCB

List of Materials for Evaluation PCB 122520 ^[1]

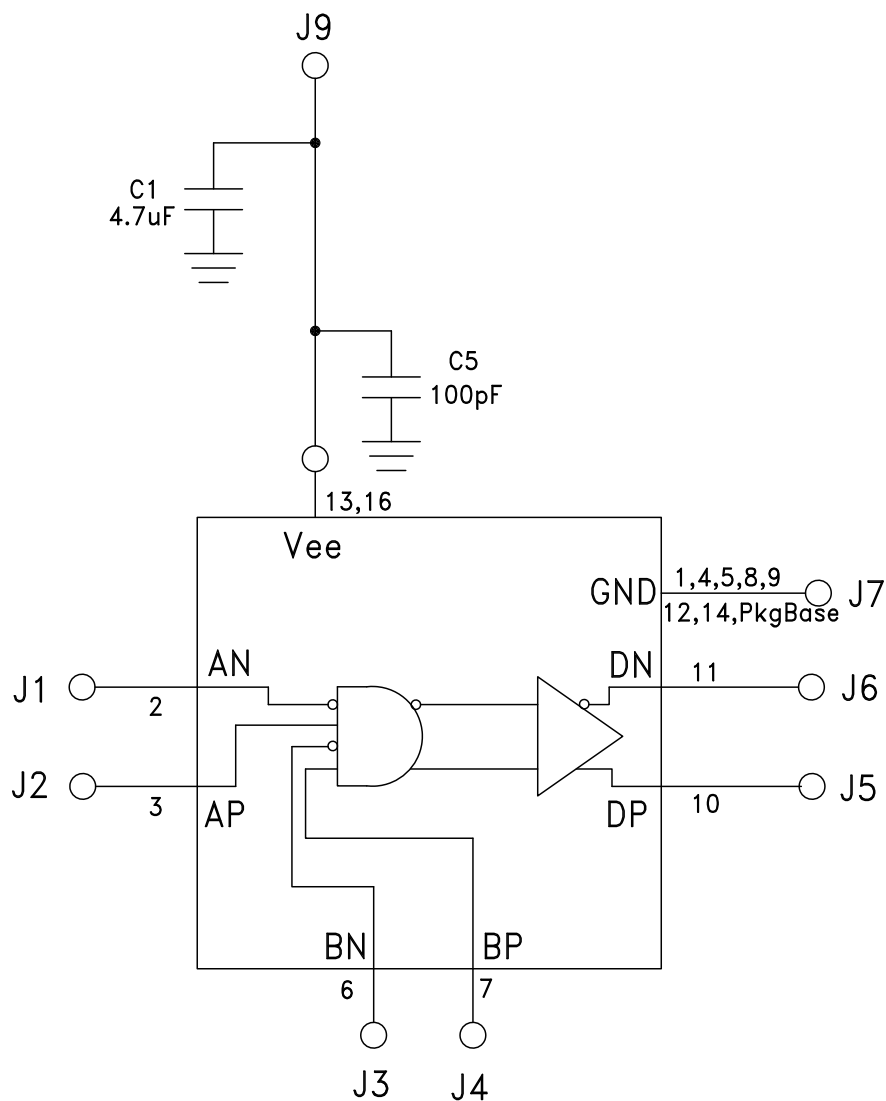
Item	Description
J1 - J6	PCB Mount SMA RF Connectors
J7, J9	DC Pin
C1	4.7 μ F Capacitor, Tantalum
C5	100 pF Capacitor, 0402 Pkg.
U1	HMC726LC3C High Speed Logic, AND / NAND / OR / NOR
PCB ^[2]	122518 Evaluation Board

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Arlon 25FR or Rogers 4350

The circuit board used in the application should use RF circuit design techniques. Signal lines should have 50 Ohm impedance while the package ground leads should be connected directly to the ground plane similar to that shown. The exposed package base should be connected to GND. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation circuit board shown is available from Hittite upon request.

Application Circuit





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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