BURR - BROWN ®

DEM-PCM3002-1
DEM-DAI3002-1
DEM-PCM3003
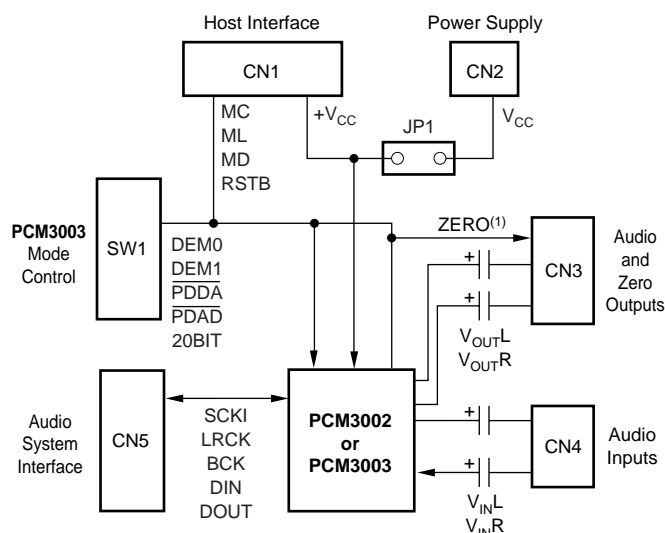# DEM-DAI3003
EVALUATION FIXTURE

GENERAL DESCRIPTION

The DEM-PCM3002-1 and DEM-PCM3003 are basic demonstration boards for the PCM3002 and PCM3003 Stereo Audio CODECS. The demo board includes vertical header connectors for audio clocks & data, power supplies, and Left & Right audio inputs/outputs. A connector is included for accessing the PCM3002's three-wire serial control port, which is used to write the internal registers of the device.

The DEM-DAI3002-1 and DEM-DAI3003 include both the PCM3002/3003 demo board and the DEM-DAI mother board. The DEM-DAI board includes a digital audio receiver and transmitter for interfacing to audio measurement systems and consumer audio equipment that support S/PDIF digital input and output. The DEM-DAI board also includes on-board clock circuitry for stand-alone operation, power supply connectors, and DAC post filters for the Left and Right audio outputs.

ORDERING INFORMATION

PRODUCT	DESCRIPTION
DEM-PCM3002-1	DEM-PCM3002 Demonstration Board, PC Interface Cable, and Demonstration Software
DEM-DAI3002-1	DEM-PCM3002 Demonstration Board, DEM-DAI Mother Board, PC Interface Cable, and Demonstration Software
DEM-PCM3003	Basic Demonstration Board for the PCM3003
DEM-DAI3003	DEM-PCM3003 Demonstration Board and DEM-DAI Mother Board

Host Interface   Power Supply

CN1   CN2

MC
ML   +V_CC   JP1   V_CC
MD
RSTB

PCM3003
Mode   SW1   DEM0   ZERO$^{(1)}$ Audio
Control   DEM1   and
                 $\overline{PDDA}$ +|| Zero
                 $\overline{PDAD}$ +|| CN3 Outputs
                 20BIT
                            $V_{OUT}L$
                            $V_{OUT}R$

Audio   SCKI   **PCM3002**   +||
System   CN5   LRCK   **or**   CN4   Audio
Interface   BCK   **PCM3003**   +|| Inputs
                DIN
                DOUT $V_{IN}L$
                                     $V_{IN}R$

NOTE: (1) PCM3002 only.

LI-525

SBAU027

DEM-PCM3002/3003 HARDWARE DESCRIPTION

The DEM-PCM3002/3003 are basic demonstration boards for the PCM3002 and PCM3003 stereo audio CODECS. They interface directly to the DEM-DAI mother board for quick customer evaluation. A zero insertion force socket is provided for easy replacement of the PCM3002/3003 CODEC. The demo boards also include a connector (CN1) for interfacing to the parallel port of an IBM PC, which is used by the demonstration software for programming the PCM3002 internal registers.

Connectors

CN1 is used to interface the PCM3002 control port to an external host in order to program the CODEC's internal registers. The MC, MD, ML, and RSTB pins of the PCM3002 are buffered by Schmitt-Trigger U2, which provides +5V to +3V logic level translation and edge restoration. A +3V power supply and ground may also be supplied at this connector using the Red (+3V) and Black (GND) banana jacks available on the interface cable (supplied with the DEM-PCM3002-1 and DEM-DAI3002-1).

CN2 provides an alternate connection for the +3V power supply and ground when jumpers are installed at JP1 see the Jumpers section in this data sheet for more information.

CN3 provides access to the PCM3002/3003 Left and Right audio outputs, V_{OL} and V_{OR}, as well as the ZERO output pin of the PCM3002. The audio outputs are AC coupled to CN3. An analog ground connection is also provided.

CN4 provides access to the PCM3002/3003 Left and Right audio inputs, $V_{IN}L$ and $V_{IN}R$. These inputs are AC coupled to the CODEC. An analog ground connection is also provided.

CN5 is used to interface the CODEC to an audio data and clock source, such as the DEM-DAI mother board. All signals are passed through buffer U3, which provides +5V to +3V logic level translation.

Jumpers

Jumper JP1 is used to enable or disable the connection of a +3V power supply and ground through connector CN2. Jumpers should be inserted when using CN2, and removed when using CN1 for power supply connections.

When using the DEM-PCM3002/3003 board with the DEM-DAI mother board, the jumpers on JP1 must be removed so that the DEM-PCM3002/3003 may be powered from a +3V supply connected to CN1.

Switches

The function of DIP switch SW1 is dependent upon which CODEC is being used. For the PCM3003, SW1 provides the necessary mode configuration controls, as shown in Table I. When using the PCM3002, all switches on SW1 should be set to their OFF position.

SW1	DESCRIPTION		
$\overline{PDAD}$ $\overline{PDDA}$	Power Down/Reset		
	$\overline{PDAD}$	**$\overline{PDDA}$**	**FUNCTION**
	OFF	OFF	Reset (ADC and DAC power down)
	OFF	ON	ADC Power Down/DAC Operates Normally
	ON	OFF	DAC Power Down/ADC Operates Normally
	ON	ON	Normal Operation (DAC and ADC Operate Normally)
DEM0 DEM1	Digital De-Emphasis		
	DEM1	**DEM0**	**FUNCTION**
	OFF	OFF	De-Emphasis Enabled for 44.1kHz
	OFF	ON	De-Emphasis Disabled
	ON	OFF	De-Emphasis Enabled for 48kHz
	ON	ON	De-Emphasis Enabled for 32kHz
20BIT	Audio Data Format Selection		
	20BIT = OFF		ADC: 16-Bit, MSB-First, Left-Justified DAC: 16-Bit, MSB-First, Right-Justified
	20BIT = ON		ADC: 20-Bit, MSB-First, Left-Justified DAC: 20-Bit, MSB-First, Right-Justified

TABLE I. DIP Switch Functions for the PCM3003.

Schematic Diagram

Figure 1 provides a complete schematic of the DEM-PCM3002/3003 demo board. Refer to the DEM-DAI data sheet for schematics of the mother board.

DEM-DAI3002/3003

The DEM-DAI3002-1 and the DEM-DAI3003 include both the DEM-PCM3002/3003 demonstration board and the DEM-DAI mother board. The DEM-DAI includes a S/PDIF digital audio receiver and transmitter, making it easy to evaluate the PCM3002/3003 with standard audio test equipment that includes S/PDIF digital I/O. This also allows for direct connection to digital audio equipment, such as CD and DVD players, which incorporate a S/PDIF digital audio output.

Refer to the DEM-DAI data sheet for more information regarding the use and configuration of the mother board.

DEMONSTRATION SOFTWARE

Software is provided with the DEM-PCM3002-1 and DEM-DAI3002-1 to allow programming of the PCM3002's internal registers. The software will operate on computers running Microsoft Windows 3.1, 95, or 98. The demonstration software requires that the PC printer port be connected to connector CN1 of the DEM-PCM3002 using a standard printer cable and the supplied PC interface cable.

Installation

The demo software is distributed on a 3.5-inch floppy disk. There is a single folder on the disk, named "Dem3002". This folder contains the application and all support files. To install the software on your computer, first create a new folder on your hard drive with an appropriate name (e.g., Dem3002, Pcm3002, etc.). Then open the "Dem3002" folder on the installation floppy and copy all of the files in it to your new folder.

Open the configuration settings file named "Dem3002" with a text editor, such as Notepad. When the file is opened, find the following line:

PCMIFADR = &h378

The &h378 indicates the printer port address that the demo software will use to communicate with the DEM-PCM3002.

This address must be set to &h378, &h278, or &h3BC. Most PC's use &H378 as the default printer port address. If your printer port is not located at &h378, edit the address to match your computers port address.
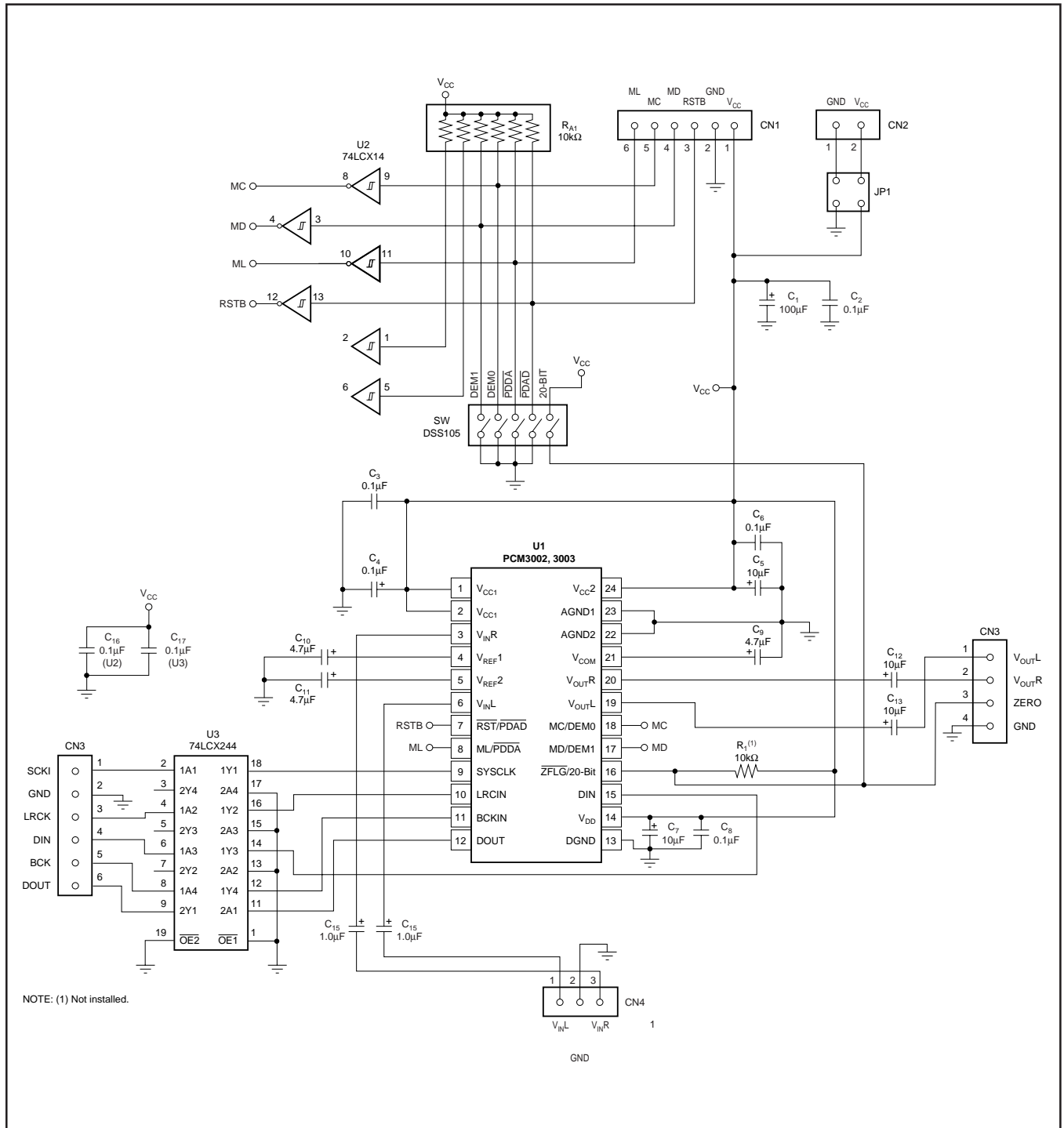

FIGURE 1. Demonstration Board Schematic.

Using the Demo Software

Double click on the application file named "dem3002". A window will appear on your screen, as shown in Figure 2. There are two menus near the top of the DF1704 Control window, named Execute and Window.

The Execute menu includes two selections: Reset and Exit. Selecting Reset will instruct the program to re-write all registers with the data currently selected in the Attenuation, Function, and Format Control windows. Selecting Exit will close the application.

The Window menu includes three selections: Attenuate, Function, and DataForm. The following sections provide an explanation of each window.
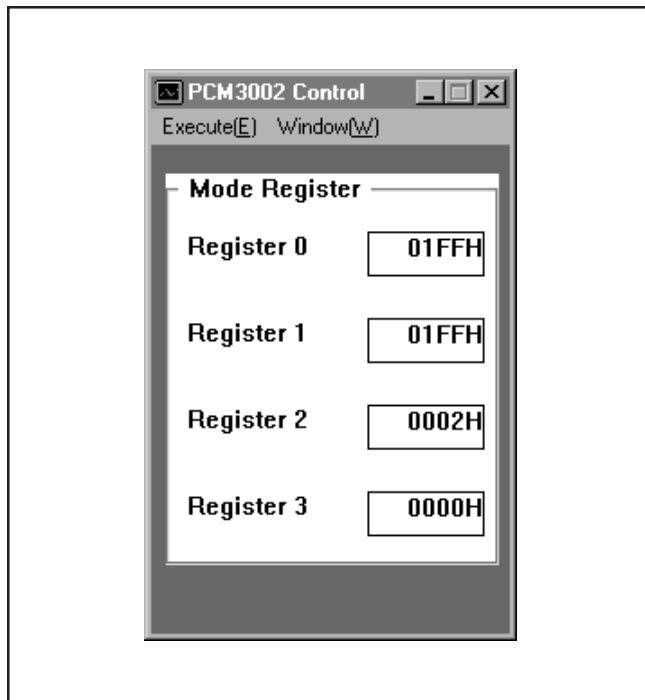

FIGURE 2. PCM3002 Control Window.

HOLD and PASS

Each window has a button near the top. It's labeled either HOLD or PASS. The current setting is toggled by clicking on the button. When set to HOLD, you can change the settings in a window, but they will not be written to the register(s) until the OK button (which appears at the bottom of the window) is pressed. When set to PASS, changes made in a window are immediately written to the corresponding register(s).

The Attenuation Control Window

The Attenuate window is used to set the digital attenuation registers internal to the PCM3002 and is shown in Figure 3. There is an separate attenuator for both the Left and Right output channels, each with it's own independent register to control it's level. In the Attenuation window, there is a slider for each attenuator. Use the slider handle or the arrows at each end of the slider to adjust the attenuation level. The left and right arrow keys on the keyboard can also be used to adjust the level. Just below each slider is a status display showing the current step setting (in decimal) and the corresponding attenuation level in decibels (dB) relative to the input signal level.

The Function Control Window

The Function window is used to configure several PCM3002 functions, including:

- Digital De-Emphasis (DeEmph)
- Infinite Zero Detect Mute (IZD)
- DAC Output Enable (Output)
- Soft Mute (Mute)
- Attenuation Control (AttCtrl), either Independent (L< >R) or Common (L= =R)
- ADC High Pass Filter Bypass (BYPS)
- DAC Power-Down (DAPdn)
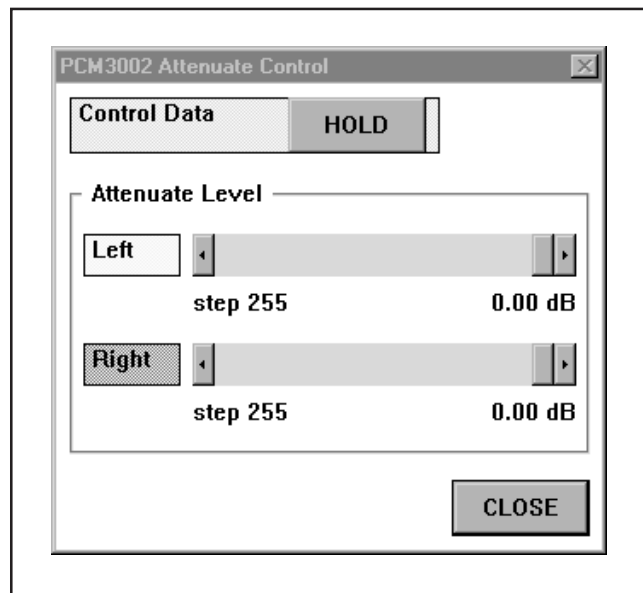- ADC Power-Down (ADPdn)

FIGURE 3. Attenuation Window.

All functions are controlled using check boxes, with the exception of the De-Emphasis and Attenuation Controls, which use pop-up menus. Figure 4 shows the Function Control window. For more information regarding the functions controlled by this window, please refer to the PCM3002/3003 data sheet.

The Format Control (or DataForm) Window
The Format Control window is used to set the audio data formats for the ADC and DAC, LRCIN clock polarity, and the ADC-to-DAC Loop Back function. Pop-up menus are used to select LRCIN polarity and data formats, while a check box is used to toggle the status of the Loop Back function (On or Off). Figure 5 shows the Format Control window. For more information regarding the functions controlled by this window, please refer to the PCM3002/3003 data sheet.
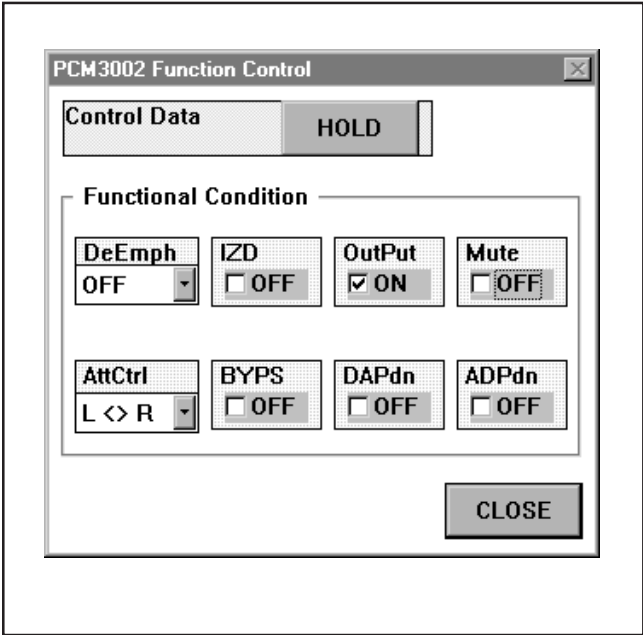
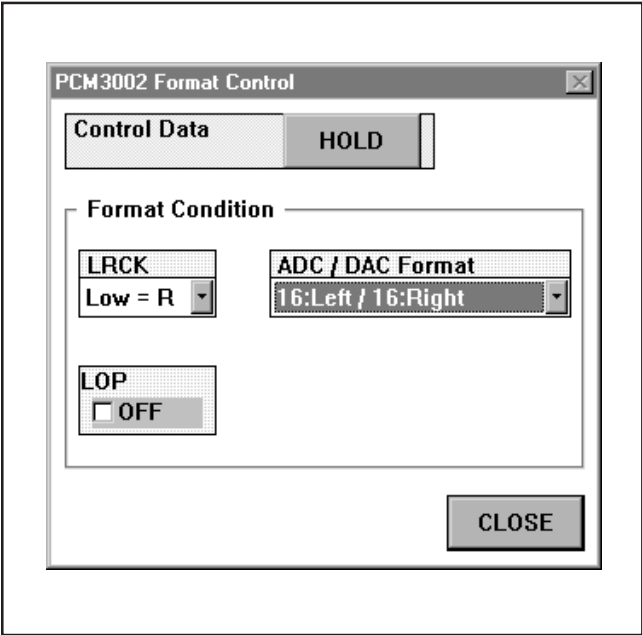

FIGURE 4. Function Control Window.

FIGURE 5. Format Control Window.

DEM-PCM3002, DEM-PCM3003

BURR - BROWN®
BB

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgment, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Customers are responsible for their applications using TI components.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.

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

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.