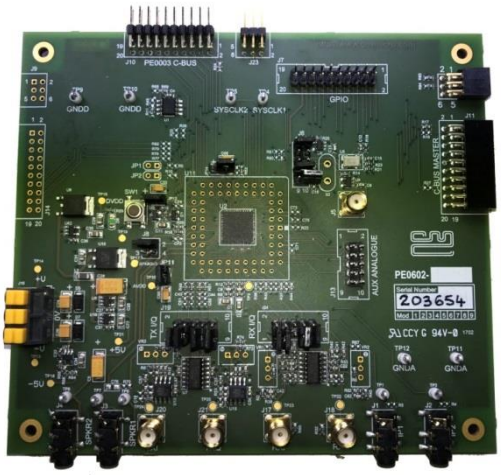
PE0602-xxxx
Evaluation Kit User Manual

UM0602/1 February 2020 **USER MANUAL** Provisional

Features

- **CMX736x *FirmASIC*® product range evaluation**
- **Serial Flash Option for Function Image™ with in-circuit programming**
- **On-board supply regulators operate from a single 6V supply**
- **Instrumentation interface to differential I and Q signals (requires additional –6V supply)**
- **Command and control by PC via the PE0003 Universal Interface Card or user's µC development application or emulator**
- **19.2MHz oscillator, user crystal or external clock input to CMX736x**
- **On-board access to all CMX736x signals, commands and data**



1 Brief Description

The PE0602-xxxx Platform Evaluation Kit is designed to assist in the evaluation and application development of the CMX736x range of *FirmASIC*® products. The kit is in the form of a populated PCB comprising a CMX736x target IC and appropriate supporting components and circuitry.

The board also incorporates all of the necessary power supply regulation facilities for operation from a single 6V supply, or a dual ±6V supply if the instrumentation interface is required.

The board is fitted with a C-BUS connector allowing the PE0602 to be operated by connection to either of the two C-BUS ports on a CML PE0003 Universal Interface Card, and used with the associated PC GUI software, or by direct connection between the CMX736x C-BUS and the user's µC development application or emulation system.

The CMX736x Function Image™ (FI) can be loaded, on power-up, directly into the on-board target IC using the PE0003 interface or the user's system. Alternatively, it can be automatically loaded from the on-board serial memory, on power-up. In this case, the on-board serial memory must be pre-loaded with the FI by using the 'Program Serial Memory' tab on the PE0003 GUI software, or by the user's system utilising the appropriate 'thick stub' programme. All of this software is available from the CML website. Function images suitable for the CMX736x range of products can be downloaded from the CML Technical Portal.

CONTENTS

It is recommended that you check for the latest product datasheet version from the Datasheets page of the CML website: [www.cmlmicro.com].

1.1 History

Version	Changes	Date
1	First release	4th February 2020

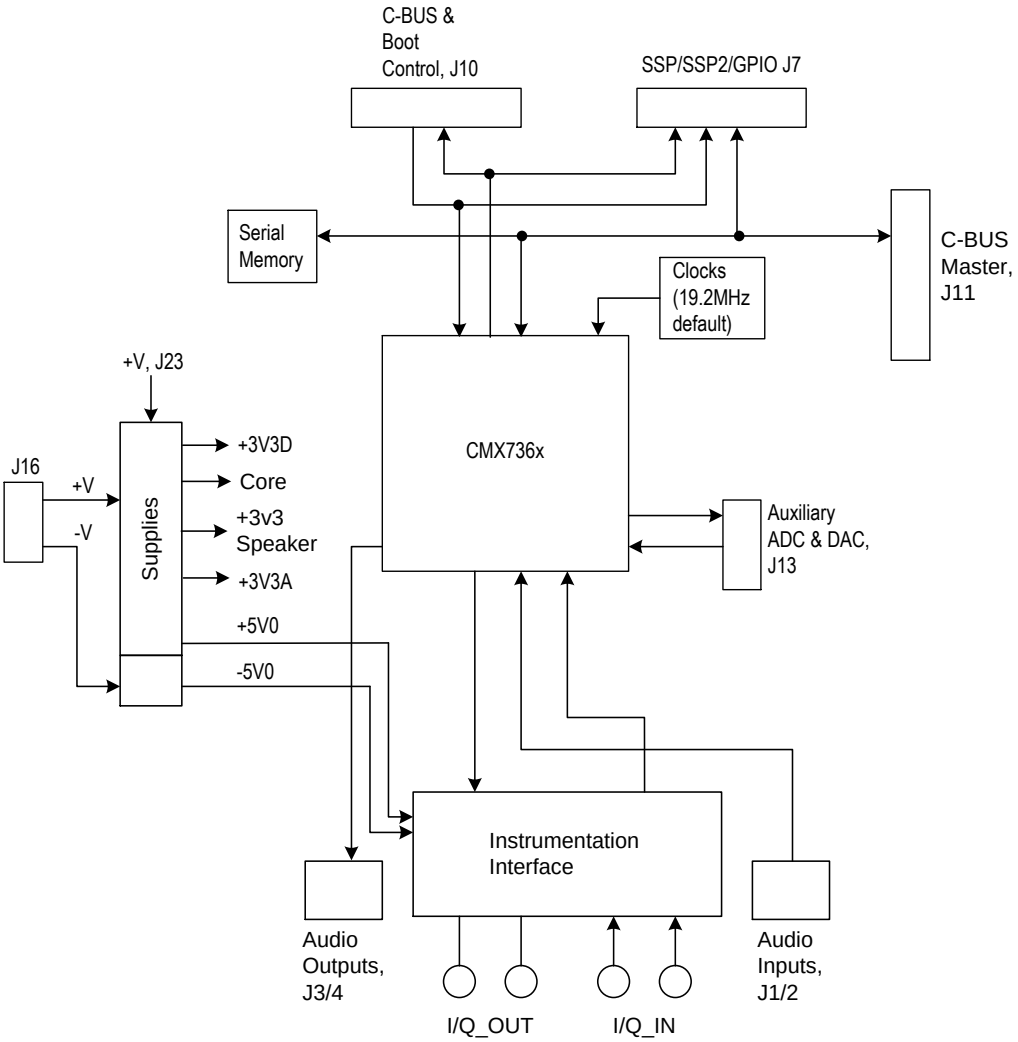


Figure 1 Block Diagram

2 Preliminary Information

The PE0602-xxxx is designed to support the CMX736x range of *FirmASIC*® devices using their respective Function Image™.

The PE0602-xxxx is supplied with a customer-specified target device fitted where xxxx in the product code is the numerical part of the target device product code.

For example:

To evaluate a CMX7364 Function Image™ (FI), order a PE0602-7364.

In this document the PE0602-xxxx will be referred to generically as PE0602.

Note that the Function Image™ will redefine many pin functions and so the pins may be labelled differently as a result. The pin numbers will remain unchanged. The datasheet and user manual appropriate to the product code and Function Image™ should be used as the definitive reference of functionality, rather than this document, which only uses generic pin names.

2.1 Laboratory Equipment

The following laboratory equipment is needed to use this evaluation kit:

A 6V dc regulated power supply or ±6V if the instrumentation interface is required. If the PE0602 is being used with the PE0003 Universal Interface Card, the following items will also be required:

1. An IBM compatible PC with the following requirements:
   - One of the following Windows operating systems installed: Windows 7, Windows 8 or Windows 10
   - USB port
   - Minimum screen resolution 800 x 600. Recommended resolution 1024 x 768 or higher.
2. A USB type A male to mini B male cable.
3. Software application **`ES000335.exe`**, or later version, installed on the PC.

2.2 Handling Precautions

Like most evaluation kits, this product is designed for use in office and laboratory environments. The following practices will help ensure its proper operation.

2.2.1 Static Protection

This product uses low-power CMOS circuits that can be damaged by electrostatic discharge. Partially-damaged circuits can function erroneously, leading to misleading results. Observe ESD precautions at all times when handling this product.

2.2.2 Contents - Unpacking

Please ensure that you have received all of the items on the separate information sheet (EK0602) and notify CML within 7 working days if the delivery is incomplete.

2.3 Approvals

This product is not approved to any EMC or other regulatory standard. Users are advised to observe local statutory requirements, which may apply to this product.

3 Quick Start

This section is divided into two sub-sections. The first is for those users who are using the PE0602 with a PE0003 Universal Interface Card and its Windows PC GUI software. The second is for users who are using the PE0602 by itself, without a PE0003.

3.1 With PE0003

Note that the C-BUS connector, J10, and the power connector J23 are both right-angle headers and are designed to plug directly into sockets J3 (C-BUS 1 port) and J4 respectively, or sockets J7 (C-BUS 2 port) and J8 respectively, of a PE0003.

3.1.1 Setting-Up

- Refer to the PE0003 User Manual and follow the instructions given in the quick start section.

The basic arrangement, when used with the PE0003, is shown below:

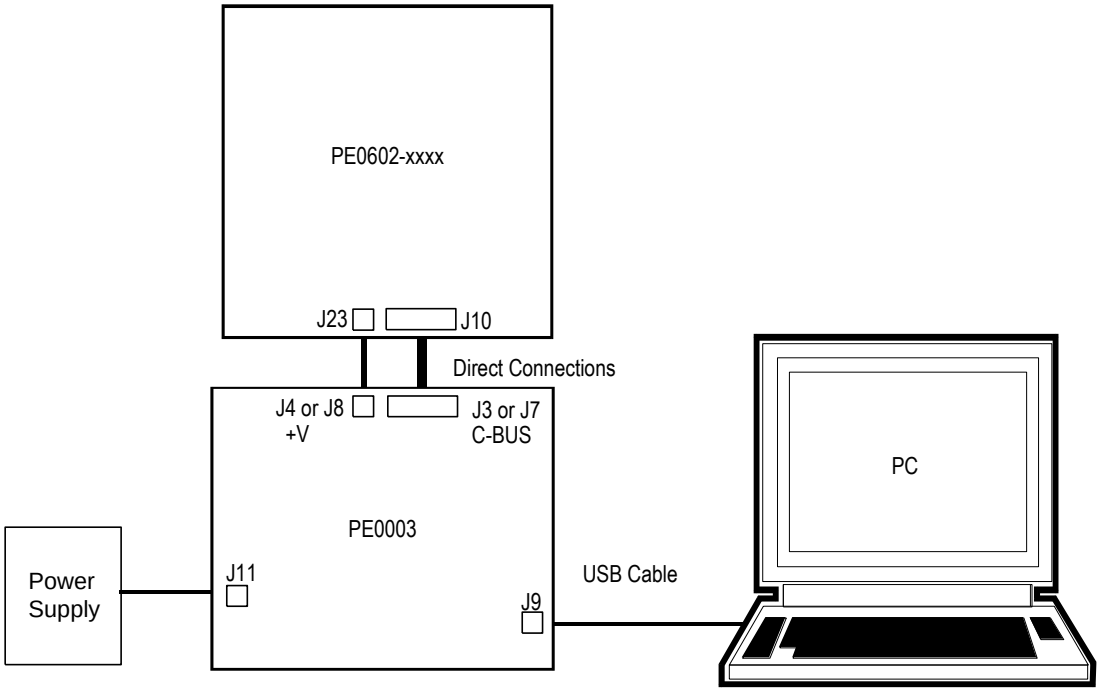


Figure 2 PE0602 used with PE0003

3.1.2 Operation

The Function Image™ (FI) must now be loaded into the CMX736x device. A FI is provided as a 'C' type header file and must be obtained from the CML Technical Portal. There are two methods available for loading the FI:

1. Directly from a file on the PE0003 host PC to the CMX736x
2. From the on-board PE0602 serial memory. To use this method the serial memory must first be programmed with the FI by using the 'FI Manager' tab on the PE0003 GUI software.

The PE0602 should now be ready for evaluation of the CMX736x with the chosen FI.

Please note that to access the CML Technical Portal you need to be authorised by a member of the CML Sales staff. Please contact your local distributor, representative or Area Sales Manager.

3.2 Without PE0003

As an alternative to using the PE0003 Universal Interface Card, users may control the CMX736x target device with a user-supplied host controller card. C-BUS connections are made via connector J10.

A FI for the CMX736x device must be either included in the customer's host system and loaded into the CMX736x device on power-up or programmed into the on-board serial memory following the guidelines in the Application Note: 'Writing a Function Image™ to Serial Memory'- available from the Application Notes area of the CML website.

4 Signal Lists

Table 1 Signal List

CONNECTOR PINOUT				
Connector Ref.	**Connector Pin No.**	**Signal Name**	**Signal Type**	**Description**
J1	tip	IP1	I/P	Audio 1 input
	ring	N/C	-	
	sleeve	GNDA	PWR	Analogue ground
J2	tip	IP2	I/P	Audio 2 input
	ring	N/C	-	
	sleeve	GNDA	PWR	Analogue ground
J3	tip	SPKR1_P	O/P	Speaker 1 (8Ω) +ve
	ring	N/C	-	
	sleeve	SPKR1_N	O/P	Speaker 1 (8Ω) -ve
J4	tip	SPKR2	O/P	Speaker 2 (32Ω)
	ring	N/C	-	
	sleeve	GNDA	PWR	Analogue ground
J5	1	CLK EXT	I/P	External input option for CMX736x
J7	1	GPIO0/SSIN/FSI	BI	CMX736x signal, FI dependent
	2	GPIO1/CLKI	BI	CMX736x signal, FI dependent
	3	GPIO2/SSOUT2	BI	CMX736x signal, FI dependent
	4	GPIO3/SSP2SSOUT1/SSP2FSO	BI	CMX736x signal, FI dependent
	5	GPIO4/SSP2MISO/SSP2SDI	BI	CMX736x signal, FI dependent
	6	GPIO5/SSP2MOSI/SSP2SDO	BI	CMX736x signal, FI dependent
	7	GPIO6/SSP2SSIN/SSP2FSI	BI	CMX736x signal, FI dependent
	8	GPIO7/CLK/CLKO	BI	CMX736x signal, FI dependent
	9	GPIO8/SSP2CLK/SSP2CLKO	BI	CMX736x signal, FI dependent
	10	GPIO9/SSP2CLKI	BI	CMX736x signal, FI dependent
J7	11	GPIO10/SYSCLK2	BI	CMX736x signal, FI dependent
	12	GPIO11/SYSCLK1	BI	CMX736x signal, FI dependent
	13	GPIO12/MOSI/SDO	BI	CMX736x signal, FI dependent
	14	GPIO13/SSOUT1/FSO	BI	CMX736x signal, FI dependent
	15	GPIO14/MISO/SDI	BI	CMX736x signal, FI dependent
	16	GPIO15/SSOUT0	BI	CMX736x signal, FI dependent
	17	GPIO7/CLK/CLKO	BI	CMX736x SSP clock signal, FI dependent
	18	N/C	-	
	19, 20	GNDD	PWR	Digital ground
J8	1	GNDA	PWR	Analogue ground

CONNECTOR PINOUT				
Connector Ref.	**Connector Pin No.**	**Signal Name**	**Signal Type**	**Description**
	2	GNDSA	PWR	Speaker1 analogue ground
	3	SPKR_3V3	PWR	Speaker1 3.3V
	4	SPKR_1_VDD	PWR	Speaker1 Optional external power supply
J10	1	RESETN	I/P	CMX736x Reset control
	2	CSN	I/P	Chip Select. Connects to host μC
	4	CDATA	I/P	Serial data input. Connects to host μC
J10	6	SCLK	I/P	Serial clock input. Connects to host μC
	8	RDATA	O/P	Serial data output. Connects to host μC
	10	IRQN	O/P	Interrupt request. Connects to host μC
	11, 12	GNDD	PWR	Digital ground
	13	N/C	I/P	CMX736x hardware boot control
	14	N/C	I/P	CMX736x hardware boot control
	3, 5, 7, 9, 15 to 20	N/C	-	
J11	1	RESETN	BI	C-BUS master, spare chip select, FI dependent
	2	SSOUT1/GPIO13/FSO	BI	C-BUS master, chip select, FI dependent
	3	GPIO2/SSOUT2	BI	CMX736x signal, FI dependent
	4	SDO/GPIO12/MOSI	BI	C-BUS master, command data, FI dependent
	6	CLK/CLKO/GPIO7	BI	C-BUS master, serial clock, FI dependent
	8	SDI/GPIO14/MISO	BI	C-BUS master, reply data, FI dependent
	10	GPIO11/SYSCLK1	BI	CMX736x signal, FI dependent
	11, 12	GNDD	PWR	Digital ground
	13	GPIO8/SSP2CLK/SSP2CLKO	BI	CMX736x signal, FI dependent
	14	GPIO9/SSP2CLKI	BI	CMX736x signal, FI dependent
	5, 7, 9, 15, 16, 17, 18, 19, 20	N/C	-	
J12	1, 2	GNDD	PWR	Digital ground
	3 to 6	+V	PWR	External supply voltage – daisy-chained from PE0003
J13	1	AUXADC3	I/P	Auxiliary ADC input
	2	AUXDAC0	O/P	Auxiliary DAC output
	3	AUXADC2	I/P	Auxiliary ADC input
	4	AUXDAC1	O/P	Auxiliary DAC output
	5	AUXADC1	I/P	Auxiliary ADC input
	6	AUXDAC2	O/P	Auxiliary DAC output

CONNECTOR PINOUT				
Connector Ref.	**Connector Pin No.**	**Signal Name**	**Signal Type**	**Description**
J13	7	AUXADC0	I/P	Auxiliary ADC input
	8	AUXDAC3	O/P	Auxiliary DAC output
	9, 10	GNDA	PWR	Analogue ground
J16	3	+V	PWR	External supply voltage, nominally +6V
	2	0V	PWR	External supply ground
	1	-V	PWR	Optional external negative supply voltage, nominally -6V
J17	1	I_IN	I/P	I channel instrument input, single ended
J18	1	Q_IN	I/P	Q channel instrument input, single ended
J19	1	I_OUTP_I	I/P	I channel output positive, instrumentation input
	2	I_OUTP	O/P	I channel output positive
	3	I_OUTN_I	I/P	I channel output negative, instrumentation input
	4	I_OUTN	O/P	I channel output negative
	5, 6	GNDA	PWR	Analogue ground
	7	Q_OUTP_I	I/P	Q channel output positive, instrumentation input
	8	Q_OUTP	O/P	Q channel output positive
	9	Q_OUTN_I	I/P	Q channel output negative, instrumentation input
	10	Q_OUTN	O/P	Q channel output negative
J20	1	I_OUT	O/P	I channel instrumentation output, single ended
J21	1	Q_OUT	O/P	Q channel instrumentation output, single ended
J23	1, 2	GNDD	PWR	Digital ground
	3 to 6	+V	PWR	External supply voltage – daisy-chained from PE0003
J24	1	I_INP_I	O/P	I channel input positive, instrumentation output
	2	I_INP	I/P	I channel input positive
	3	I_INN_I	O/P	I channel input negative, instrumentation output
	4	I_INN	I/P	I channel input negative.
	5, 6	GNDA	PWR	Analogue ground
	7	Q_INP_I	O/P	Q channel input positive, instrumentation output
	8	Q_INP	I/P	Q channel input positive

CONNECTOR PINOUT				
Connector Ref.	**Connector Pin No.**	**Signal Name**	**Signal Type**	**Description**
J24	9	Q_INN_I	O/P	Q channel input negative, instrumentation output
	10	Q_INN	I/P	Q channel negative positive

Notes:

BI	=	Bidirectional
HiZ	=	High impedance
I/P	=	Input
N/C	=	Not connected
O/P	=	Output
PWR	=	Power supply connection

Table 2 Test Points

TEST POINTS		
Test Point Ref.	**Default Measurement**	**Description**
TP1	-	Loop – IP1 - Audio 1 inverting input
TP2	-	Loop – IP2 - Audio 2 inverting input
TP3	3.3V	Pad – CMX736x VBIAS
TP4	CMX736x dependent	Loop – CMX736x GPIO11/SYSCLK1 - FI dependent
TP5	CMX736x dependent	Loop – CMX736x GPIO10/SYSCLK2 - FI dependent
TP6	HiZ	Loop – Speaker 1 (8Ω) –ve output
TP7	HiZ	Loop – Speaker 1 (8Ω) +ve output
TP8	HiZ	Loop – Speaker 2 (32Ω) output
TP9	0V	Loop – GNDD, digital ground
TP10	0V	Loop – GNDD, digital ground
TP11	0V	Loop – GNDA, analogue ground
TP12	0V	Loop – GNDA, analogue ground
TP13	-V	Pad – External negative supply voltage, nominally -6V
TP14	+V	Pad – External supply voltage
TP15	+3.3V	Pad – Output from on-board regulator. DC supply voltage for analogue rail
TP16	+3.3V	Pad – Output from on-board regulator. DC supply voltage for digital rail
TP17	+3.3V	Pad – Output from on-board regulator. Dedicated DC supply voltage for speaker 1 driver
TP18	-5.0V	Pad – Output from on-board regulator. Negative supply voltage for instrumentation interface, -5.0V – if required
TP19	+1.8V	Pad – Output from on-board regulator. Optional external DC supply voltage for CMX736x core
TP20	+1.8V	Pad – CMX736x internally generated core voltage
TP21	+5.0V	Pad – Output from on-board regulator. Positive supply voltage for instrumentation interface, +5.0V – if required
TP22	Q_IN	Q channel instrument input, single ended
TP23	I_IN	I channel instrument input, single ended
TP24	I_OUT	I channel instrumentation output, single ended
TP25	Q_OUT	Q channel instrumentation output, single ended

Table 3 Jumpers

JUMPERS			
Link Ref.	**Positions**	**Default Position**	**Description**
JP11	1-2	Short	Isolates analogue supply rail from CMX736x
JP13	1-2	Short	Isolates digital supply rail from CMX736x
JP14	1-2	Open	Isolates external +1.8V supply rail from CMX736x
J6	1-2	Short	19.2MHz oscillator clock source
	3-4	Open	External clock source
	5-6	Open	Crystal clock source – if components fitted by customer
	7-8	Short	Ground external clock input
	9-10	Open	Crystal clock source – if components fitted by customer
J8	1-2	Short	Isolates GNDSA of speaker
	3-4	Open	Isolates +3.3V supply of speaker 1 driver
J19	1-2	Open	Isolates I channel output +ve from instrumentation interface
	3-4	Open	Isolates I channel output -ve from instrumentation interface
	7-8	Open	Isolates Q channel output +ve from instrumentation interface
	9-10	Open	Isolates Q channel output -ve from instrumentation interface
J24	1-2	Open	Isolates I channel input +ve from instrumentation interface
	3-4	Open	Isolates I channel input -ve from instrumentation interface
	7-8	Open	Isolates Q channel input +ve from instrumentation interface
	9-10	Open	Isolates Q channel input -ve from instrumentation interface

Table 4 LEDs

LED Ref.	Description
D6	Indicates that the digital supply voltage is present

5 Circuit Schematics and Board Layouts

For clarity, circuit schematics are available as separate high-resolution files. These can be obtained from the CML website.

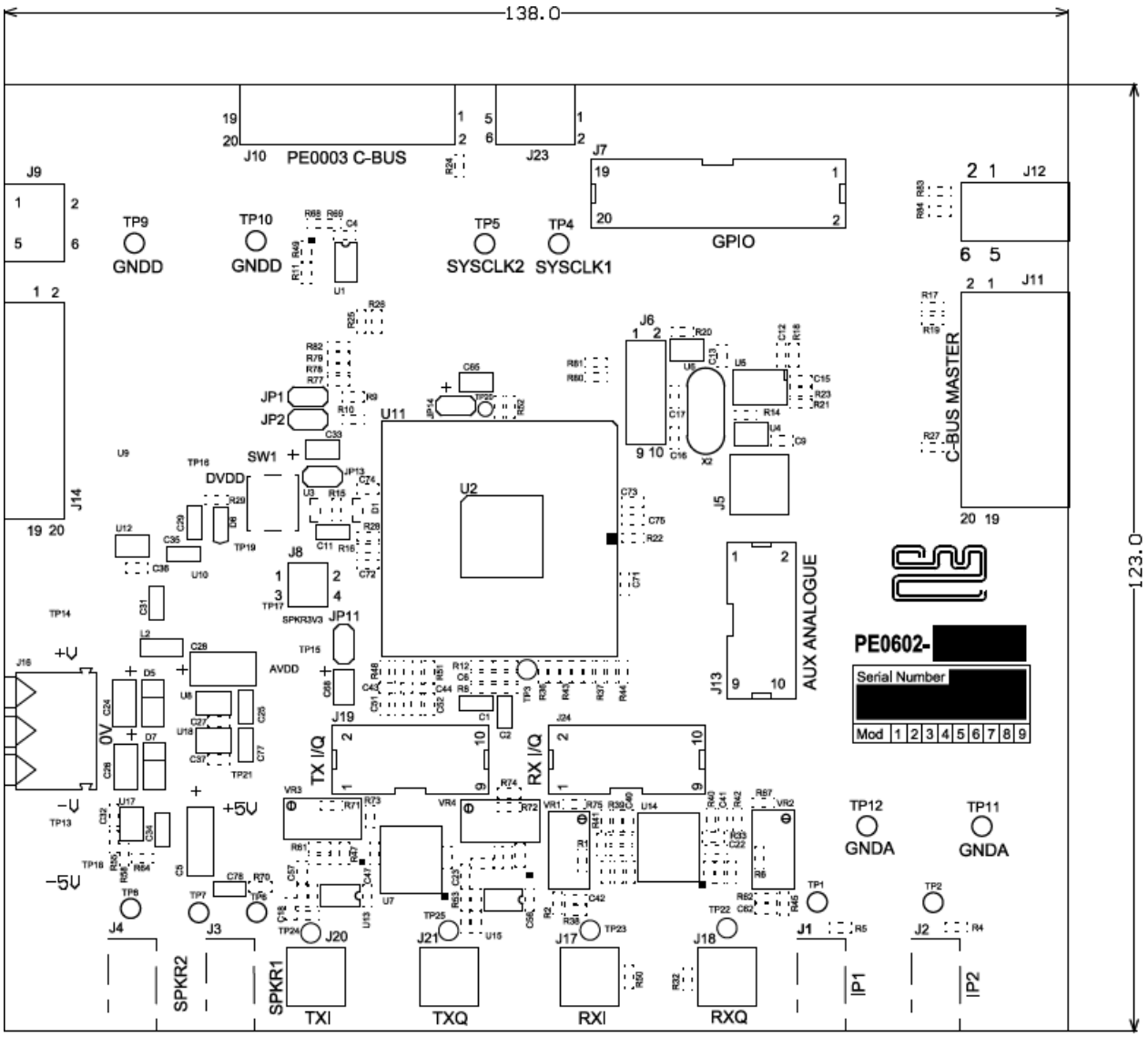


Figure 3 PCB Layout: Top

There is a ring of pads around the CMX736x target device that allow signals at the CMX736x device pins to be probed, see Figure 4.

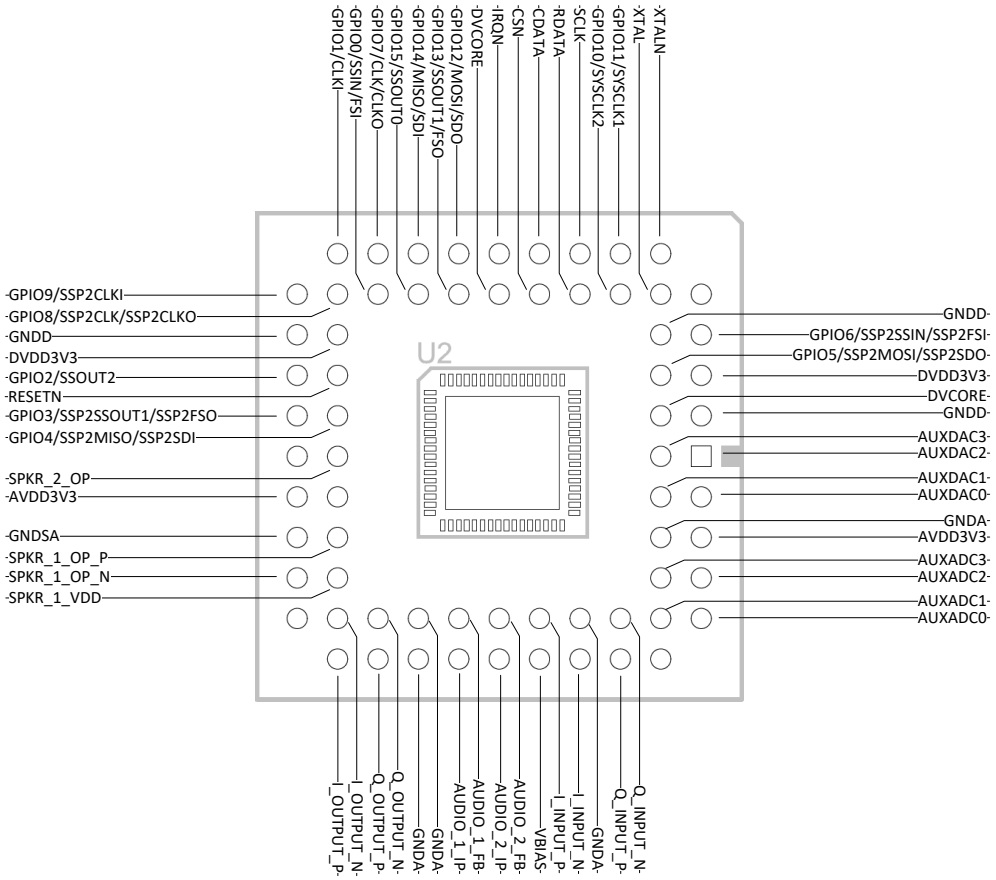


Figure 4 CMX736x Probe Points

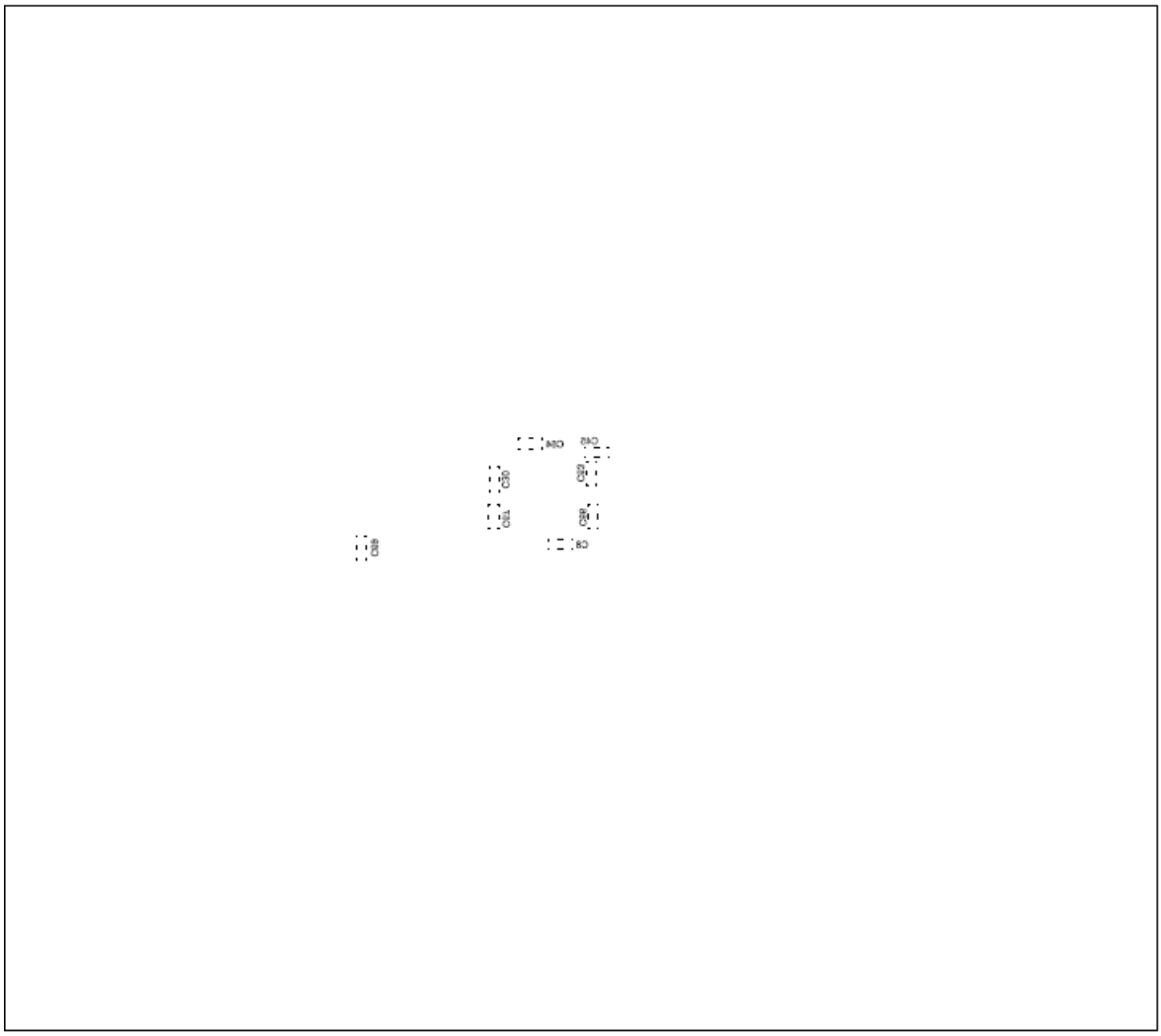


Figure 5 PCB Layout: Bottom

6 Detailed Description

6.1 Hardware Description

The PE0602, as shipped, may not have the optimum configuration or component values for all function images. Check the PE0602 schematic against recommendations in the specific CMX736x datasheet.

6.1.1 Power Supplies

The board is fitted with six voltage regulators.

U8 and U9 provide the analogue and digital supply rails respectively. U10 provides a separate supply rail for the CMX736x speaker driver and U12 provides an external 1.8V supply option for the CMX736x core. The input to these four regulators should be provided by an external 6V dc regulated power supply, which can be daisy chained from the PE0003 or connected to the board via connector J16, a push type connector. LED illumination confirms the on-board presence of the +3.3V dc digital voltage supply.

U17 provides a negative supply rail for the instrumentation interface. If required, an additional –6V dc regulated supply should be connected at J16. U18 provides a positive supply rail for the instrumentation interface.

Each supply has a test point where it can be monitored; see Table 3 Jumpers.

6.1.2 Clock Options

The PCB is designed to provide three CMX736x device clock options. The board is supplied with a 19.2MHz TCXO module fitted. If supported by the FI being evaluated, fitting a 0R link in position R22 allows adjustment from CMX736x AuxDAC3.

Other options are an external clock source at J5 or a quartz crystal oscillator circuit at C16, C17 and X2 (not fitted).

Header J6 is used with jumper sockets to select the required option as shown in the table below. Shaded cells illustrate locations where a jumper socket should be fitted.

Table 5 Clock Select Jumper Positions

J4 Jumper Position	Clock Option		
	19.2MHz oscillator (default)	External	Quartz crystal
1-2	■		
3-4		■	
5-6			■
7-8	■		■
9-10			■

6.1.3 Control Interface

The C-BUS and CMX736x boot control signals are brought out on connector J10. This is a right angle male header designed to plug directly into the PE0003 Universal Interface Card's matching female header.

6.1.4 Serial Memory

The serial memory, U1, can be used for non-volatile storage of a Function Image™. The PE0602 is shipped with a blank serial memory.

The chip select signal for the serial memory is provided by the SSOUT0 signal from the CMX736x device. If the serial memory is not required, this signal, or the GPIO15 option of the same pin, can be used for another purpose by moving the 0Ω link from position R69 to position R68. The signal GPIO15/SSOUT0 is then available at connector J7, and also J11.

6.1.5 Baseband Interfacing

The availability and usage of these signals are Function Image™ dependent.

The CMX736x differential I and Q inputs are fed through a RC network. Specific requirements for this network are FI dependent. Differential signals can be input to the RC networks at header, J24. CML evaluation kits for RF receiver products have matching headers, but the I or Q signal polarity must be observed. Alternatively, check Function Image™ documentation for the possibility of a programmable signal inversion.

The CMX736x differential I and Q outputs are fed through a RC network. Specific requirements for this network are FI dependent. The differential signals output from the RC networks can be monitored at header, J19. CML evaluation kits for RF transmitter products have matching headers, but the I or Q signal polarity must be observed. Alternatively, check Function Image™ documentation for the possibility of a programmable signal inversion.

The CMX736x device audio input amplifiers for IP1 and IP2 are configured as ac coupled, unity gain, inverting amplifiers. The inputs to these circuits are fed from connectors J1 and J2 respectively.

The CMX736x device speaker outputs, SPKR1 and SPKR2, are fed to connectors J3 and J4 respectively. The SPKR1 output can drive an 8Ω speaker and requires that the driver supply, SPKR_3V3, be connected via jumpers in-circuit between pins 3, 4 and 1, 2 of header J8.

Connector J13 provides access to auxiliary ADCs 1 to 4 and auxiliary DACs 1 to 4 of the CMX736x device.

6.1.6 Instrumentation Interface

An instrumentation interface has been provided to enable connection of the differential I and Q signals to laboratory equipment that has only single-ended connections. Use of this section of the PE0602 requires an additional negative supply rail, nominally –6V.

The input path has an effective gain of 6dB.

The input path is configured for, nominally, 0V offset in the differential signal input to the CMX736x. This can be made adjustable by removing resistors R1 and R6 and fitting the resistors R75 and R67 with 5.1kΩ resistors and and VR1 and VR2 with 20kΩ potentiometers in for the I and Q input paths respectively. Bourns type 3386P or similar will fit the footprints provided.

6.1.7 Digital Interfacing

Connector J7 provides access to all general purpose I/O lines and to a synchronous serial port.

Use of these signals is Function Image™ dependent. In some cases they will have no function. See relevant CMX736x documentation.

Connector J11 is configured as a C-BUS master and compatible with CML evaluation kits with C-BUS slave connectors. Another chip select can be routed by desoldering R17, that connects the RESETN signal, and fitting R19. The RESETN signal can be routed through pin 16 of J11 by soldering R27.

6.2 Function Image™

There are two methods by which a FI may be loaded into the CMX736x device:

Whenever power is removed from the PE0602 the FI data will be erased from the CMX736x device. Therefore, whenever power is applied a FI must be loaded, either from the serial memory or via the C-BUS interface.

If the PE0602 is used with the PE0003 Universal Interface Card function images can be loaded as described in the PE0003 User Mannual, available from the CML website.

6.2.1 Load Function Image™ via C-BUS

The process of loading a FI via C-BUS is described in the PE0003 User Manual section 7.4.3 “FI Manager Tab”, loading a FI when the “Source is PC”

6.2.2 Load Function Image™ from Serial Memory Device

The process of loading a FI from Serial Memory Device is described in the PE0003 User Manual section 7.4.3 “FI Manager Tab”, loading a FI when the “Source is Serial Memory”

6.2.3 Program Serial Memory

The process of programming a FI into Serial Memory is described in the PE0003 User Manual section 7.4.3 “FI Manager Tab”, loading a FI when the “Source is Serial Memory”.

The ES0003 to program the Serial Memory requires a Thick Stub program that configures the 736x to work as a bridge to the Serial Memory. The Thick stub is “**`EF0602_M25P10_10_xxxx.h`**” or later versions, where xxxx should match the last four digits of the PE0602 product code. e.g. use “**`EF0602_M25P10_10_7364.h`**” for PE0602-7364.

7 Performance Specification

7.1 Electrical Performance

7.1.1 Absolute Maximum Ratings

Exceeding these maximum ratings can result in damage to the evaluation kit.

	Min.	Max.	Units
Supply (+V – 0V)	-0.3	9.0	V
Supply (-V – 0V)	0.3	-9.0	V
Voltage on any connector pin to V_{SS}	-0.3	3.6	V
Current into or out of +V and V_{SS} pins	0	+0.45	A
Current into or out of any other connector pin	-20	+20	mA

7.1.2 Operating Limits

Correct operation of the Evaluation Kit outside these limits is not implied.

	Notes	Min.	Max.	Units
Supply (+V – 0V)		5.5	6.5	V
Supply (-V – 0V)		-5.5	-6.5	V
External Clock Frequency		3.0	24.576	MHz

7.1.3 Operating Characteristics

For the following conditions unless otherwise specified:

Evaluation device clock frequency = 19.2MHz, +V = 6.0V, T_{AMB} = +25°C.

For CMX736x parameters, see relevant CMX736x datasheet.

	Notes	Min.	Typ.	Max.	Units
DC Parameters					
I_{DD}	1, 2	-	60	-	mA
- I_{DD}	1, 2	-	-30	-	mA
+3V3A		3.15	3.3	3.45	V
+3V3D		3.15	3.3	3.45	V
+3V3SPKR		3.15	3.3	3.45	V
+1V8_CORE		1.70	1.8	1.85	V
+5V0		4.71	5.0	5.3	V
-5V0		-4.71	-5.0	-5.3	V
Analogue Parameters					
Output Impedances					
I/Q_OUTP/N	3	-	51	-	Ω
Speaker 1	4				
Speaker 2	4				
Input Impedances					
IP1 and IP2		-	50	-	kΩ
I/Q_INP/N	4				
I/Q_IN		-	51	-	Ω
External Clock Input					
'High' Pulse Width		21	-	-	ns
'Low' Pulse Width		21	-	-	ns
Input Impedance		10	-	-	MΩ

Notes:

1. PCB current consumption. Not the current consumption of the CMX736x.
2. Not including any current drawn from pins by external circuitry.
3. Small signal impedance.
4. CMX736x parameter, see relevant CMX736x datasheet.

7.1.4 Operating Characteristics - Timing Diagrams

Please refer to relevant CMX736x datasheet for details.

About *FirmASIC®*

CML's proprietary *FirmASIC®* component technology reduces cost, time to market and development risk, with increased flexibility for the designer and end application. *FirmASIC®* combines Analogue, Digital, Firmware and Memory technologies in a single silicon platform that can be focused to deliver the right feature mix, performance and price for a target application family. Specific functions of a *FirmASIC®* device are determined by uploading its Function Image™ during device initialization. New function images may be later provided to supplement and enhance device functions, expanding or modifying end-product features without the need for expensive and time-consuming design changes. *FirmASIC®* devices provide significant time to market and commercial benefits over Custom ASIC, Structured ASIC, FPGA and DSP solutions. They may also be exclusively customised where security or intellectual property issues prevent the use of Application Specific Standard Products (ASSP's).

CML Microcircuits

United Kingdom p: +44 (0) 1621 875500 e: sales@cmlmicro.com techsupport@cmlmicro.com

Singapore p: +65 62888129 e: sg.sales@cmlmicro.com sg.techsupport@cmlmicro.com

United States p: +1 336 744 5050 800 638 5577 e: us.sales@cmlmicro.com us.techsupport@cmlmicro.com

www.cmlmicro.com