



## Description

The ZL38080 is part of Microsemi's new Timberwolf audio processor family of products that features the company's innovative *AcuEdge* acoustic technology, which is a set of highly-complex and integrated algorithms. These algorithms are incorporated into a powerful DSP platform that allow the user to extract intelligible information from the audio environment from which they are communicating.

The Microsemi *AcuEdge* Technology ZL38080 is designed to provide leading edge Acoustic Echo Cancellation and Noise Reduction for the Hands-Free Automotive market.

The Microsemi *AcuEdge* Technology license-free, royalty-free intelligent audio Firmware provides AEC, NR and a variety of other voice enhancements to improve both the intelligibility and subjective quality of voice in harsh acoustic environments such as high wind noise, engine and road noise.

The *MiTuner™* Automatic Tuning Kit and ZLS38508 *MiTuner* GUI provide automatic tuning and easy control for manual fine tuning adjustments. Further, the ZLS38508 *MiTuner* GUI provides easy graphical control of the various interconnections required to meet the needs of your application.

## Applications

- Hands-Free Phone and Audio capability for Automotive applications

Document ID# 149152

Version 3

December 2014

### Ordering Information

Device OPN	Package	Packing
ZL38080LDF1	64-pin QFN (9x9)	Tape & Reel
ZL38080LDG1	64-pin QFN (9x9)	Tray

*These packages meet RoHS 2 Directive 2011/65/EU of the European Council to minimize the environmental impact of electrical equipment.*

## Microsemi *AcuEdge* Technology ZLS38080 Firmware

- Wideband and Narrowband Acoustic Echo Cancellation (AEC)
- Full or Half duplex operation, supports long tail AEC (up to 256 ms) in both Narrowband and Wideband operation
- Non-linear echo cancellation provides higher tolerance for speaker distortions
- Advanced Noise Reduction (NR) reduces background noise from the near-end speech signal using Psychoacoustic techniques
- G.169 Automatic Level Control (ALC)
- Automatic Gain Control (AGC)
- Provisions for stereo audio mixing (sample rate of 44.1 or 48 kHz) and stereo music record and playback (sample rate of 48 kHz) with 16 kHz voice processing
- Howling detection/cancellation
  - Prevents oscillation in AEC audio path
- Dynamic Range Compression
- Continuous double talk convergence
- Comfort noise generation
- Long Silence detection
- Mute function
- Programmable tone generation (DTMF)
- Various encoding/decoding options:
  - 16-bit 2's complement (linear)
  - G.722, G.711 A/μ law
- Send and receive path equalizers
  - 16-band for Narrowband mode
  - 22-band for Wideband mode
- 44.1/48 kHz bypass mode
- Configurable Cross-Point Switch

## ZL38080 Hardware Features

- DSP with Voice Hardware Accelerators
- Dual  $\Delta\Sigma$  16-bit digital-to-analog converters (DAC)
  - Sampling up to 48 kHz and internal output drivers
  - Headphone amps capable of 4 single-ended or 2 differential outputs
  - 32 mW output drive power into 16 ohms
  - Impulse pop/click protection
- 1 Digital Microphone input supporting up to 2 Microphones
- 2 TDM ports shared between PCM and Inter-IC Sound (I<sup>2</sup>S)
  - Each port provides sample rate conversion and synchronous and asynchronous TDM bus operation
- SPI Slave port for host processor interface
- Master SPI port for serial Flash interface
- 14 General Purpose Input/Output (GPIO) pins
- General purpose UART port
- Boots from SPI, UART, or Flash allowing easy firmware updates
  - Can run unattended (controllerless), self-booting into a configured operational state
- Crystal-less operation (with a valid TDM clock)
- Ultra-low power and Reset operation mode power

## Performance

- AEC Tail Length: 256 ms
- AEC sampling rate: 8 and 16 kHz
- Single Talk TCLw: > 60 dB
- Double Talk TCLw: > 40 dB
- Double Talk Attenuation: < 3 dB
- Noise reduction up to 30 dB

## The *MiTuner*™ Automatic Tuning Kit and ZLS38508 *MiTuner* GUI

Microsemi's *MiTuner* kit provides hardware, software and support for the automatic tuning of Microsemi's *AcuEdge* Technology audio processors.

Features include:

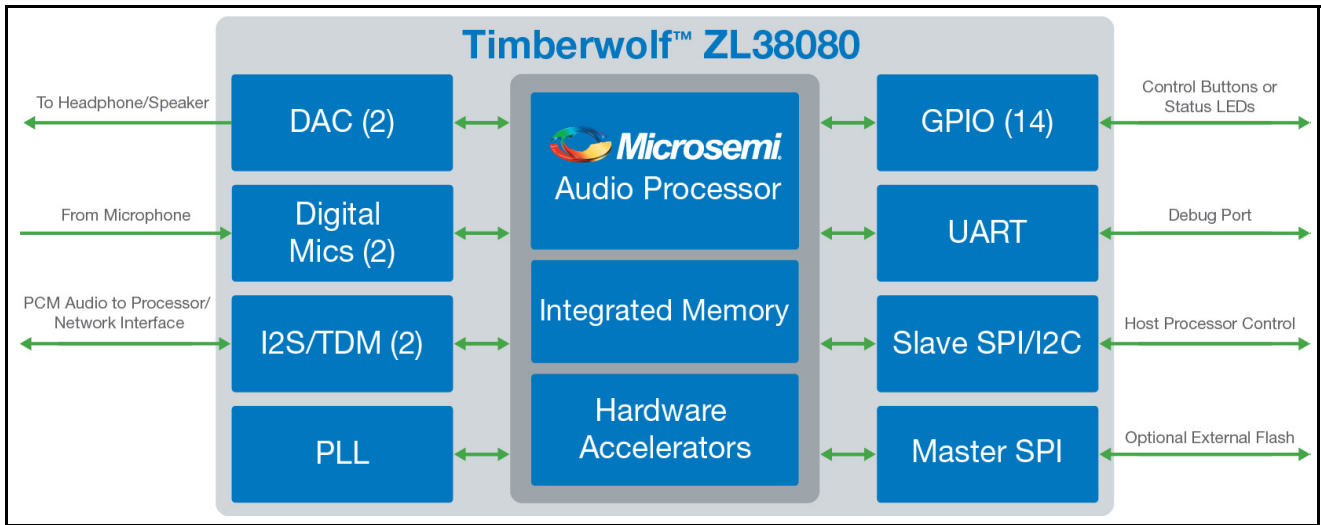


- Auto tuner allows user to automatically tune key parameters of the system
- Visual representation of the audio paths allow variations in the audio routing configuration
- Visual representation of the key building blocks in the transmit (Tx) and receive (Rx) audio paths with drop-down menus to program block parameters
- Set the analog and digital gains
- Configure parameters allows users to “fine tune” the performance

## Tools

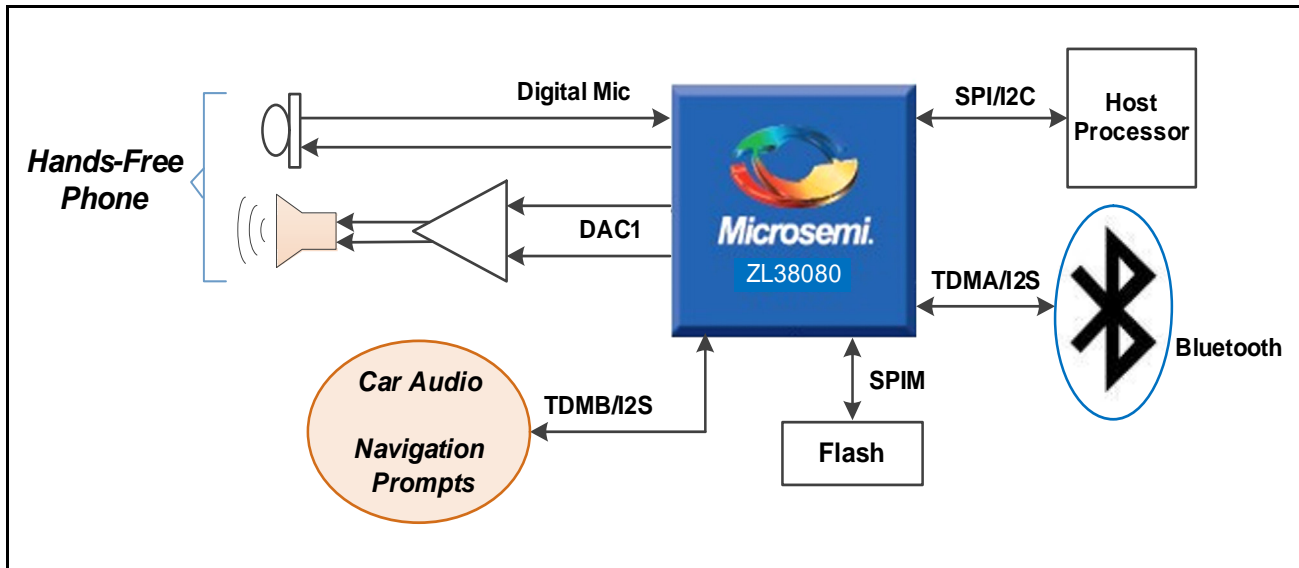
- ZLE38080 Evaluation Kit
- *MiTuner*™ Automatic Tuning Kit
- ZLS38508 *MiTuner*™ GUI

**Device Block Diagram**



**ZL38080 Hands-Free Automotive Audio Processor**

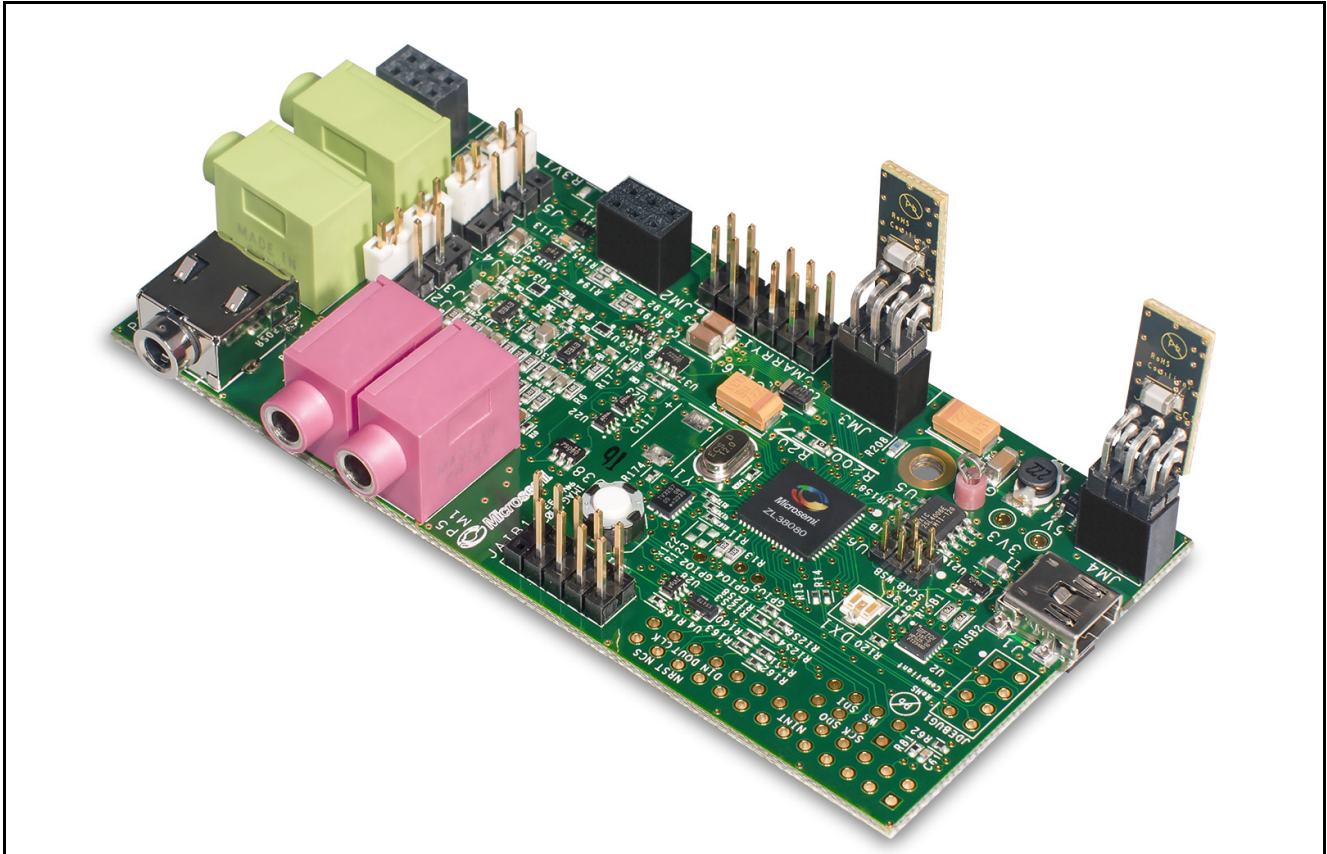
**Typical Application Block Diagram**



**Hands-Free Automotive**

## ZLE38080 Evaluation Kit

The ZLE38080 Evaluation Board is designed to aid and speed up the evaluation of the Microsemi *AcuEdge™* Technology ZL38080 Hands-Free Automotive Audio Processor with the Microsemi *AcuEdge* Technology ZLS38080 Firmware. It provides a simple analog interface that can be connected to microphones and speakers in a plastic enclosure to allow for subjective testing of the Acoustic Echo Canceller. The miniature size allows for easy mounting in an existing plastic enclosure. Easy access to all analog and digital interfaces is provided.

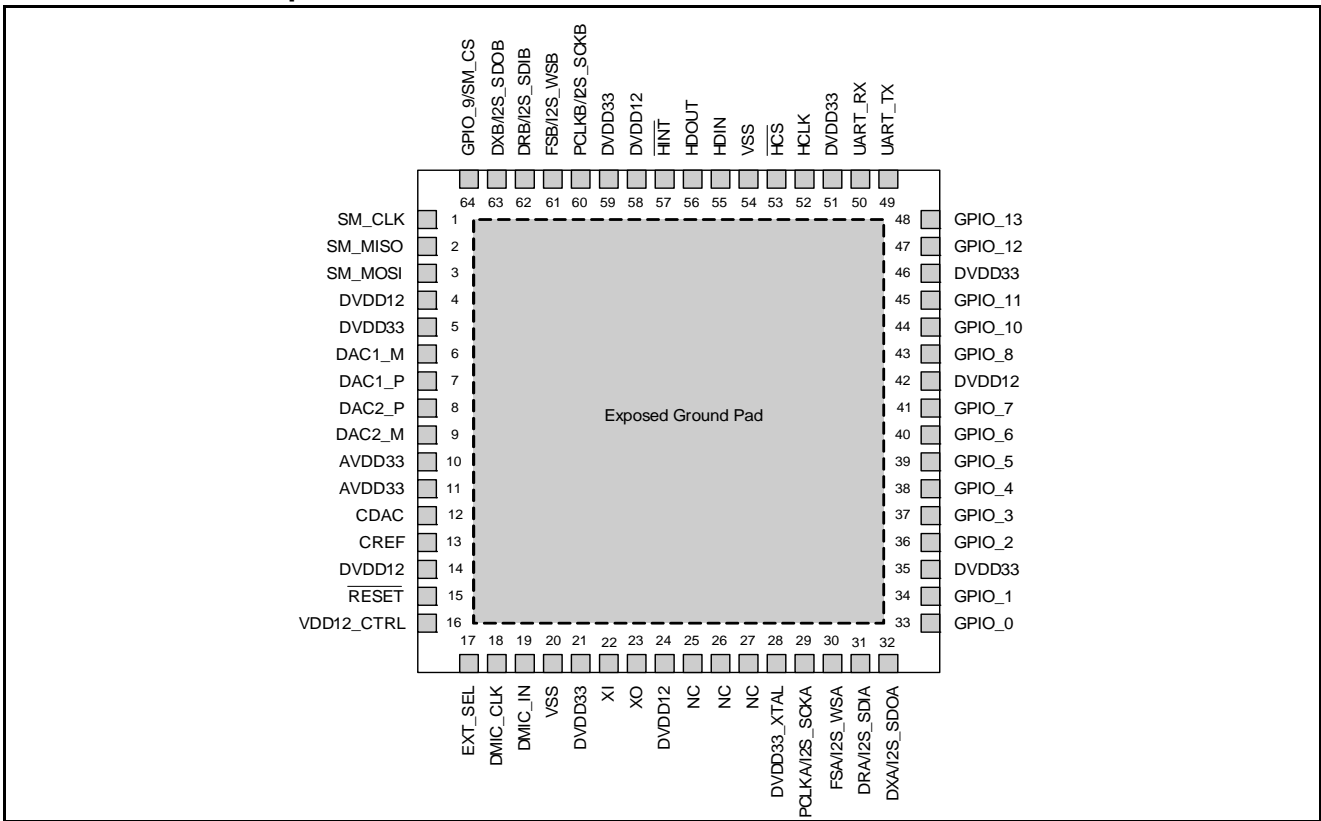


**ZLE38080 Evaluation Board**

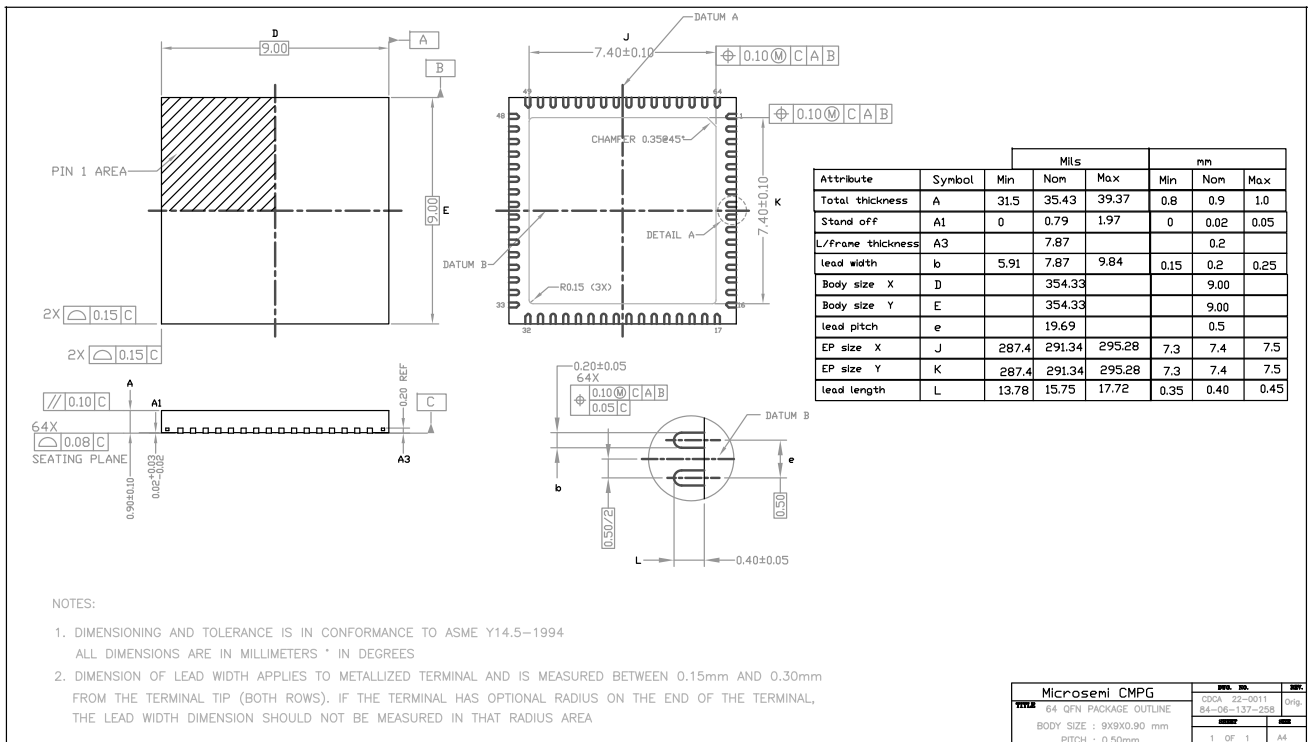
The Evaluation Kit (OPN ZLE38080BADA) is a fully contained design consisting of the ZLE38080 Evaluation Board with USB cable, headset with extension cable, and a speaker.

The ZLE38080 Evaluation Board is controlled using the Microsemi *MiTuner™* GUI Software (ZLS38508). The *MiTuner* GUI Software can also be used with the optional Microsemi Audio Interface Box (AIB) Evaluation Kit (OPN ZLE38470BADA) to auto tune the ZLE38080 Evaluation Board.

### Device Pinout – Top View



### Package Outline (64-Pin QFN)



Microsemi CMPG		REV. NO.	REV.
TITLE	64 QFN PACKAGE OUTLINE	CDCA 22-0011	5/16
	BODY SIZE : 9X9X0.90 mm	84-00-137-258	
	PITCH : 0.50mm		AM

Information relating to products and services furnished herein by Microsemi Corporation or its subsidiaries (collectively "Microsemi") is believed to be reliable. However, Microsemi assumes no liability for errors that may appear in this publication, or for liability otherwise arising from the application or use of any such information, product or service or for any infringement of patents or other intellectual property rights owned by third parties which may result from such application or use. Neither the supply of such information or purchase of product or service conveys any license, either express or implied, under patents or other intellectual property rights owned by Microsemi or licensed from third parties by Microsemi, whatsoever. Purchasers of products are also hereby notified that the use of product in certain ways or in combination with Microsemi, or non-Microsemi furnished goods or services may infringe patents or other intellectual property rights owned by Microsemi.

This publication is issued to provide information only and (unless agreed by Microsemi in writing) may not be used, applied or reproduced for any purpose nor form part of any order or contract nor to be regarded as a representation relating to the products or services concerned. The products, their specifications, services and other information appearing in this publication are subject to change by Microsemi without notice. No warranty or guarantee express or implied is made regarding the capability, performance or suitability of any product or service. Information concerning possible methods of use is provided as a guide only and does not constitute any guarantee that such methods of use will be satisfactory in a specific piece of equipment. It is the user's responsibility to fully determine the performance and suitability of any equipment using such information and to ensure that any publication or data used is up to date and has not been superseded. Manufacturing does not necessarily include testing of all functions or parameters. These products are not suitable for use in any medical and other products whose failure to perform may result in significant injury or death to the user. All products and materials are sold and services provided subject to Microsemi's conditions of sale which are available on request.

**For more information about all Microsemi products  
visit our website at  
[www.microsemi.com](http://www.microsemi.com)**

TECHNICAL DOCUMENTATION – NOT FOR RESALE



**Microsemi Corporate Headquarters**  
One Enterprise, Aliso Viejo CA 92656 USA  
Within the USA: +1 (949) 380-6100  
Sales: +1 (949) 380-6136  
Fax: +1 (949) 215-4996

Microsemi Corporation (NASDAQ: MSCC) offers a comprehensive portfolio of semiconductor solutions for: aerospace, defense and security; enterprise and communications; and industrial and alternative energy markets. Products include mixed-signal ICs, SoCs, and ASICs; programmable logic solutions; power management products; timing and voice processing devices; RF solutions; discrete components; and systems. Microsemi is headquartered in Aliso Viejo, Calif. Learn more at [www.microsemi.com](http://www.microsemi.com).

© 2014 Microsemi Corporation. All rights reserved. Microsemi and the Microsemi logo are trademarks of Microsemi Corporation. All other trademarks and service marks are the property of their respective owners.

## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9