Fairchild Semiconductor Product Catalog 2004

Analog & Mixed Signal

Discrete Power

Interface & Logic

Microcontrollers

Optoelectronics

Across the board. Around the world.™

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Fairchild Semiconductor, The Power Franchise™

Product Selector Guides

Company Information

Fairchild Semiconductor is a global company dedicated to designing, manufacturing and marketing high performance semiconductors critical to multiple end markets. With a focus on developing leading-edge power and interface solutions that optimize the system power of the electronics of today and tomorrow, Fairchild's components are used in consumer, communications, computer, industrial and automotive applications.

Fairchild Semiconductor is The Power Franchise™, offering the broadest portfolio of components critical to optimizing system power. From the wall to the board, Fairchild's products provide solutions to the most pivotal design challenges facing the electronics industry today. The fastest growing opportunities can be found providing solutions that minimize, convert, distribute and manage power in electronics applications across multiple end markets. Fairchild is the only semiconductor company focused on these four pillars of power – and is the global leader in providing power building block components. As the world's attention crystallizes on power – whether from an environmental or performance viewpoint Fairchild is positioned ahead of the crowd.

Analog & Mixed Signal products include Power Management, Analog Signal Processing and Data Conversion ICs. Fairchild is driving continued innovation and portfolio expansion in product areas ranging from Off-Line Switchers, DC/DC converters, PFC controllers, Battery Management, Data Converters (A/D and D/A) and Video filters & drivers to LDOs, System management & Supervision, Temp Sensing, Motor ICs and Amplifiers. Fairchild also offers Microcontrollers and Application Specific Standard Products (ASSP).

Fairchild's **Discrete Power** portfolio is one of the industry's broadest, and includes leading edge UltraFET®, PowerTrench® and QFET® MOSFETs, Bipolar Transistors, IGBTs, Ultra-Fast/Ultra-Soft (Stealth™) Rectifiers, Smart Power Modules (SPM™) and RF Power products. Fairchild's extensive discrete packaging includes advanced small package solutions with the advantages of superior size, low package height, and excellent thermal and electrical performance.

Interface & Logic products include PHYs, LVDS, GTLP, differential crosspoint switches, Universal Serial Bus, DIMM and 1284 standard products. Interface & Logic is also comprised of TinyLogic® products, low voltage products, analog switches, bus switches and standard logic products. Fairchild's packaging solutions range from space saving MicroPak™ and DQFN packaging, to high pin count QVSOP and BGA packaging.

Optoelectronic products include optocouplers, Solid State Relays, LED lamps and displays, and infrared components. Our portfolio of industry standard and application specific devices features a variety of advanced solutions including a full-color spectrum of low power and high brightness SMD LEDs, infrared variable sensing, mini-flat packages, surface-mount LEDs and infrared, Solid State Relays and isolated error amplifiers. A complete set of safety approval certifications are available for optocoupler products.

Fairchild employs 10,000 people worldwide and is headquartered in South Portland, Maine. Additional US design and manufacturing facilities are located in California, Pennsylvania, Colorado and Utah with manufacturing, assembly and test sites in Malaysia, Singapore, the Philippines, China and South Korea.

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The Power Franchise™

Power				
AC/DC Conversion	**Battery Management**	**DC/DC Conversion**	**Monitoring/Supervisory**	**Other Power Applications**
Battery Charger Support	Microcontrollers	DC Boost Converters	Microcontrollers	Ballast Controllers
Diodes	Battery Chargers	DC/DC Conversion ICs	Supervisory Circuits	Ground Fault Interrupt
Fairchild Power Switches	Diodes	Diodes	Temperature Sensors	IGBTs
IGBTs	MOSFETs	Linear Regulators	Voltage Detectors	MOSFETs
MOSFETs	Optically Isolated Error	MOSFETs		Motor Drivers/Controllers
Optically Isolated Error	Amplifiers	Optically Isolated Error		Multiplexer/Register for
Amplifiers	Optocouplers	Amplifiers		Microprocessor VID
Optocouplers	Rectifiers	Optocouplers		Solid State Relays
PFC/PWM Combinations	Temperature Sensors	Rectifiers		Supervisory ICs
Power Factor Correction				Transistors
PWM and Phase				Triac Optocouplers
Modulation Controllers				
Rectifiers				
Voltage References				

Input	
Analog Input and Processing	
ADCs	Timers
Amplifiers	Video Processors
Analog Switches	Voltage References
Comparators	Voltage to Frequency
Multipliers	Converters
Optocouplers	
Interface	
1284 Transceivers	LVDS
Advanced Logic	Memory Module Drivers
Bus Switches	Optocouplers
GTLP	USB Transceivers
Low Voltage Logic	
Optical	
Infrared Products	Solid State Relays

Processors
Microcontroller

Logic
Bus Switches
Low Voltage Logic
Standard Logic
TinyLogic®

Output	
Analog	
Amplifiers	Encoders
Analog Switches	Optocouplers
Comparators	Power Amplifiers
DACs	Video Filters/Drivers
Interface	
1284 Transceivers	LVDS
Advanced Logic	Memory Module Drivers
Bus Switches	Optocouplers
GTLP	USB Transceivers
Low Voltage Logic	
Optical	
Infrared Products	LED Lamps
LED Displays	Solid State Relays
LED Drivers	

Support		
Discrete	**Sensing**	**Feedback & Control**
Diodes	Infrared Products	Infrared Products
JFETs	Optocouplers	Optocouplers
MOSFETs	Temperature Sensors	Solid State Relays
Rectifiers		
Transistors		

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Fairchild Semiconductor's Product Tree

Analog & Mixed Signal

Analog Signal Processing
- Amplifiers
- Analog Multipliers
- Comparators
- Power Amplifiers
- Voltage to Frequency Converters

Data Conversion
- Analog to Digital Converters (ADCs)
- Digital to Analog Converters (DACs)

Power Management
- Battery Charger ICs
- LED Drivers
- Linear Regulators
- References
- Supervisory Circuits
- Switching Regulators

Thermal Management

Video ICs

Discrete Power

Bipolar Power Transistors & JFETs

Diodes & Rectifiers

IGBTs
- IGBT Discrete
- IGBT Modules
- Smart Power Modules (SPM™)

MOSFETs
- Load Switches
- Power MOSFETs
- MOSFET/Schottky Combos

Triacs

RF Power

Interface & Logic

Interface
- LVDS
- GTLP
- Interconnect
- DIMM

Logic
- Standard Logic
- Low Voltage Logic
- TinyLogic®

Switches
- Analog Switches
- Bus Switches

Microcontrollers
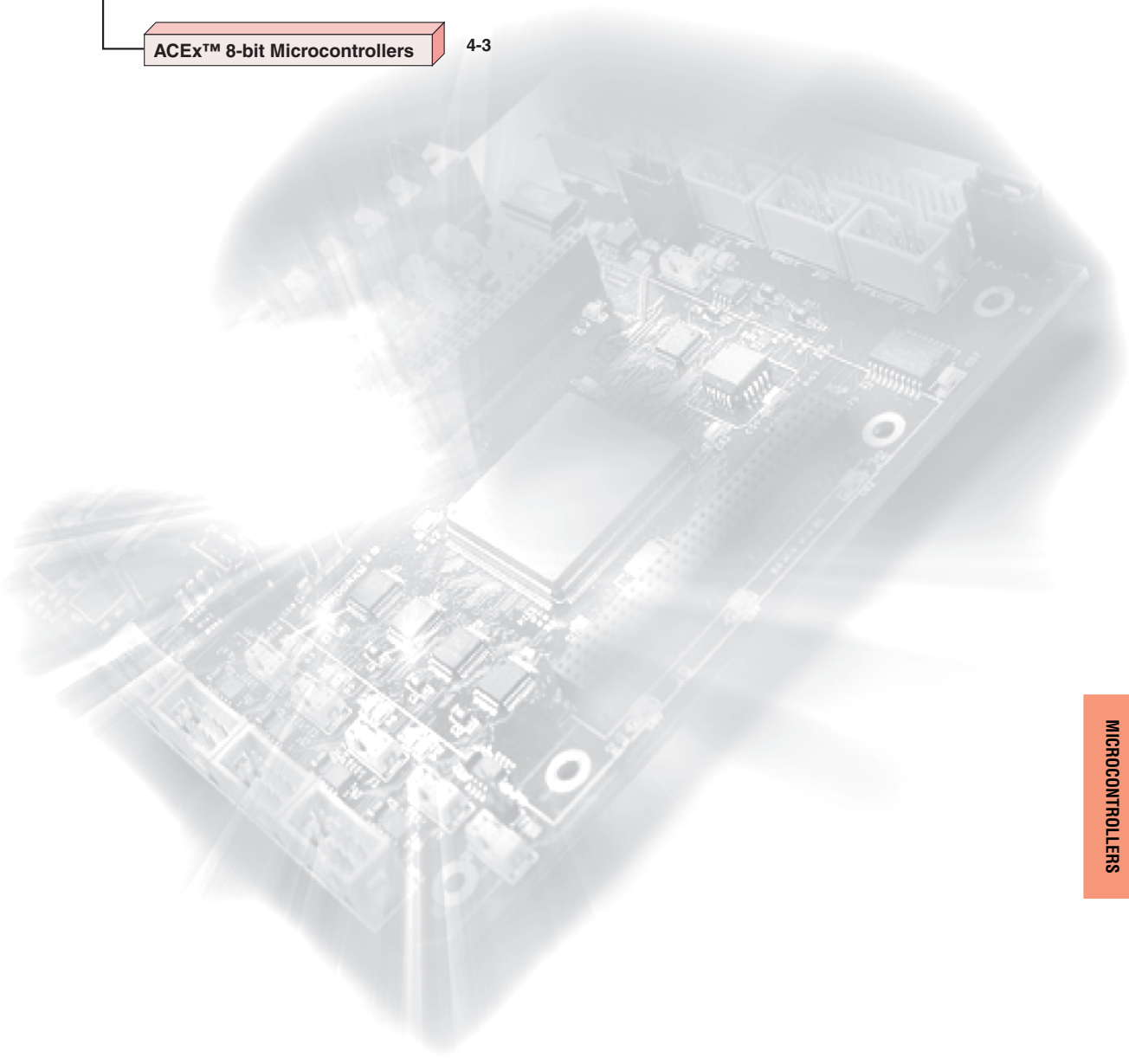
Optoelectronics

Optocouplers

Solid State Relays

LED Lamps & Displays

Infrared Products

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Microcontroller Products

MICROCONTROLLERS

ACEx™ 8-bit Microcontrollers

Products	EE Code Size (Kbytes)	EE Data Size (bytes)	RAM Data Size (bytes)	Brown Out	V_{CC} (min)	V_{CC} (max)	Number of IO	Package
ACE1001	1	64	64	Yes	1.8	5.5	6	DIP SOIC TSSOP
ACE1101	1	64	64	Yes	2.2	5.5	6	DIP SOIC TSSOP
ACE1101B	1	64	64	No	2.7	5.5	6	SOIC TSSOP
ACE1101L	1	64	64	Yes	1.8	5.5	6	DIP SOIC TSSOP
ACE1202	2	64	64	Yes	2.2	5.5	8	SOIC
ACE1202B	2	64	64	Yes	2.7	5.5	8	DIP SOIC
ACE1202L	2	64	64	Yes	1.8	5.5	8	DIP SOIC
ACE1502	2	64	64	Yes	1.8	3.6	8	TSSOP
ACE8000	1	64	64	Yes	2.2	5.5	6	SOIC
ACE8001	1	64	64	Yes	2.2	5.5	6	SOIC TSSOP

MICROCONTROLLERS

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Microcontroller

PDF links for all the packaging information is at: http://www.fairchildsemi.com/packaging/

Package Name	ACE Prefix	FMS Prefix	Pkg Method	Qty	Suffix
DIP-8 (Plastic)	N	N	Tube	40	N
DIP-14 (Plastic)	N14	N14	Tube	25	N14
SOIC-8	M8	M8	Tube	95	M8
SOIC-8	M8X	M8X	Tape&Reel	2500	M8X
SOIC-14	M	M	Tube	55	M
SOIC-14	MX	MX	Tape&Reel	2500	MX
TSSOP-8	MT8	MT8	Tube	100	MT8
TSSOP-8	MT8	MT8	Tape&Reel	2500	MT8X
TSSOP-14	MT	MT	Tube	94	MT14& MT
TSSOP-14	MTX	MTX	Tape&Reel	2500	MT14X& MTX

PACKAGING

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Microcontroller

ACE™ (Arithmetic Controller Engine)

ACE 1502 E MT8 X

ACE™ (Arithmetic Controller Engine)

Package Designator Suffix

| M = SO-14 Lead |
| MT = TSSOP-14 Lead |
| MT8 = TSSOP-8 Lead |
| N = DIP – 8 Lead |
| N14 = DIP – 14 Lead |

M8 = SO-8 Lead

Temperature Range

| E = -40°C to +85°C |
| V = -40°C to +125°C |

Device Designator

ACE™ (Arithmetic Controller Engine)

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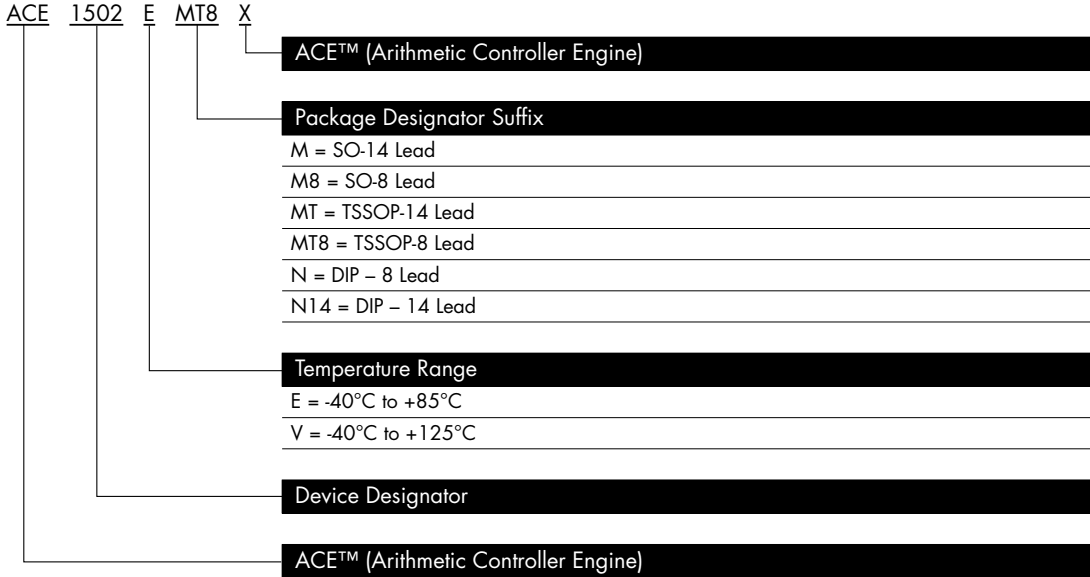
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Fairchild Semiconductor offers a wide range of design tools including online selection and simulation tools, software downloads, and developer kits. Details can be found below. The web site for this information is http://www.fairchildsemi.com/design_tools/

Models and Simulation Tools

http://www.fairchildsemi.com/models

Fairchild provides a full range of simulation resources including SPICE and IBIS models, as well as simulation tools.

Design Tools

Fairchild Power Switch Designer Software

http://www.fairchildsemi.com/design_tools/

This software currently only works with Windows 95 and Windows 98.

Contents:

• FPS Designer Software Installation Notes – Instructions and Requirements (.txt file)

• FPS Designer Software Installer (.exe file)

• FPS Designer User Guide (.pdf file)

FAN4810 PFC Controller (.xls)

http://www.fairchildsemi.com/design_tools/
This interactive tool helps designers select the power and control components needed to successfully design PFC circuits based on a FAN4810 PFC controller.

FETBench

http://www.transim.com/fairchild/fairchild_index.html

MOSFET design workbench featuring WebSIM™ and other resources for the design engineer

Synchronous buck MOSFET loss calculations with Excel Model (.pdf)

http://www.fairchildsemi.com/design_tools/

Developer Tools

ACEx™ Developer Tool Kit

http://www.fairchildsemi.com/products/micro/acex_dtk.html

Sample Code

ACEx™ sample code downloads

http://www.fairchildsemi.com/products/micro/sw/sample_code.html

Download code to assist in your designs with ACEx™

DESIGN TOOLS

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Quality System

The success of Fairchild is dependent upon the level of service that we can provide to our customers. One of the ways that we provide this high level of service is through a comprehensive quality system. Fairchild's Quality Strategy stresses four key areas:

* Designing In Quality
* Building In Quality
* Customer Service
* Continuous Improvement

This quality system bolsters Fairchild's strategic initiatives of product innovation, cost-effective manufacturing and superior customer service.

Fairchild has a strong focus on *Supplier Quality*. Quality systems and programs are in place for all Fairchild suppliers worldwide including direct raw materials, fabrication, assembly and test subcontractors. These include a comprehensive rating system, controlled supplier lists, documented qualification procedures and environmental standards specifications.

Fairchild is committed to *Development Quality*. Development processes are based on the QS9000 Advanced Product Quality Planning (APQP) methodology. APQP is a concurrent engineering process that examines the processes, products and technologies to assure the end products work optimally. These developmental processes include a phase review system wherein at each point in the process, there is an opportunity to decide whether to continue or discontinue development as appropriate. Integral to the APQP methodology is the use of Failure Mode and Effects Analysis (FMEA) to examine the various ways that product, process or equipment failures can occur and develop control plans to proactively prevent the failures.

Fairchild's *Manufacturing Qualit*y systems are founded on the principles of Built-In Quality. Quality is an integral part of every step in the manufacturing process, starting with the development process itself. Fairchild's Manufacturing and Engineering groups make extensive use of statistical methods such as Design of Experiments to determine optimal process parameters and Statistic Process Control (SPC) to monitor the process performance. Continuous Improvement efforts use information available from sources such as customers, process control monitors, reliability testing and final test operations to generate action plans that will push the factories ever closer to quality perfection.

Service Quality is not just an afterthought at Fairchild. It is a major part of our quality system. An integral part of Fairchild's Service Quality is the Customer Quality Engineering (CQE) group, which is a global organization of engineers dedicated to addressing all process, product or service quality issues that customers may have. CQE also acts as the customer advocate within Fairchild and is available to support customers with qualification information, surveys, questionnaires and other inquiries. Additional service support is available through a new virtual organization of customer quality champions who are trained and certified to provide direct customer support from each of Fairchild's manufacturing sites. Fairchild's service quality includes fully equipped failure analysis labs at all manufacturing locations to test customer returned samples.

The Future

All of Fairchild's manufacturing sites are in the process of enhancing their quality systems to meet the requirements of the TS-16949 standard. Quality systems based on this standard have a very strong link to the associated business processes. Another part of our future direction is an active focus on environmental quality. With the billions of parts that semiconductor manufacturers ship, it is imperative that these products do not contaminate the environment. Fairchild is contributing to this effort through compliance to industry standards such ISO-14001, conversion to lead-free plating, elimination of hazardous or restricted substances in our products and minimization of waste from our manufacturing processes.

We will continue to improve our processes, products and services to provide customers with design solutions that offer a true competitive advantage. This drive for continuous improvement is ingrained in our culture and a key to the future success of Fairchild Semiconductor and our customers.