mail

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from, Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832 Email & Skype: info@chipsmall.com Web: www.chipsmall.com Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





Is Now Part of



ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at <u>www.onsemi.com</u>

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, such associated with such unintended or unauthorized use; even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is a nangle expertence on the application or unautacture of the part. ON Semiconductor and sever regine to indices intended for inplan



SerDes FIN224C 24-Bit Low-Power Serializer/Deserializer

Features

Data & Control Bits	24
Frequency	20MHz
Capability	HVGA
Interface	Microcontroller / RGB
µController Usage	l86 & m68
Dynamic Current	17mA at 10Mhz
Standby Current	10µA
Core Voltage (V _{DDA/S})	2.5V to 3.3V
I/O Voltage (V _{DDP})	1.65V to 3.6V
ESD	15KV (IEC)
Package	MLP-40 (6 x 6mm)
Ordering Information	FIN224CMLX, MLP-40

Related Resources

• For samples and questions, please contact: <u>interface@fairchildsemi.com</u>.

Description

The FIN224C μ SerDesTM is a low-power serializer/ deserializer (μ SerDesTM) that can help minimize the cost and power of transferring wide signal paths. Through the use of serialization, the number of signals transferred from one point to another can be significantly reduced. Typical reduction is 5:1 for unidirectional paths. Through the use of differential signaling, shielding and EMI filters can also be minimized, further reducing the cost of serialization.

The differential signaling is also important for providing a noise-insensitive signal that can withstand radio and electrical noise sources. Major reduction in power consumption allows minimal impact on battery life in mobile applications. It is possible to use a single Phase-Locked Loop (PLL) for most applications, including bi-directional operation.

Applications

- Slider, Folder, and Clamshell Mobile Handsets
- GSM and CDMA Phones



Typical Application

October 2009

Pin Configuration

Pin Name	Description		
STROBE	LVCMOS Strobe Signal for Latching Data into the Serializer (On Rising Edge)		
CKREF	LVCMOS Clock Input and PLL Reference		
CKP	LVCMOS Word Clock Output		
DP[24:1]	LVCMOS Data I/O		
/DIRO	LVCMOS Control Output Inversion of DIRI		
S1, S2	LVCMOS Select Pins, Controls the Mode of Operation, see Table 1		
חוח	UVCMOS Control Soloto Societizor or Departializor Made 0 Deserializer		
DIN	1 Serializer		
DSO+ / DSI-	Serial Data I/O		
DSO- / DSI+			
CKSI+, CKSI-	Serial Clock Input		
CKSO+, CKSO-	Serial Clock Output		
VDDP	Power Supply for Parallel I/O and Internal Circuitry		
VDDS	Power Supply for Serial I/O		
VDDA	Power Supply for Core		
GND	Ground Pins		

Note:

1. $0 = V_{IL}; 1 = V_{IH}.$



Table 1. Seria	Table 1. Serializer / Deserializer, Operation, and Reset Modes					
DIRI	S1	S2	Mode of Operation			
x	0	0	Reset Mode LVCMOS Outputs = High Impedance LVCMOS Inputs = Known State			
1	0	1	Serializer Mode			
0	1	0	Deserializer Mode			

Application Diagrams







Figure 4. Dual-Display µController Interface Block Diagram

Additional Application Information

Flex Cabling: The serial I/O information is transmitted at a high serial rate. Care must be taken implementing this serial I/O flex cable. The following best practices should be used when developing the flex cabling or Flex PCB.

- Keep all four differential serial wires the same length.
- Do not allow noisy signals over or near differential serial wires. Example: No CMOS traces over differential serial wires.
- Design goal of 70 to 130Ω differential characteristic impedance.
- Do not place test points on differential serial wires.
- Design differential serial wires a minimum of 2cm away from the antenna.
- Visit Fairchild's website at <u>http://www.fairchildsemi.com/products/interface/userdes.html</u>, contact your sales representative, or contact Fairchild directly at <u>interface@fairchildsemi.com</u> for applications notes or flex guidelines.

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter			Max.	Unit
V _{DD}	Supply Voltage		-0.5	+4.6	V
	All Input/Output Voltage		-0.5	+4.6	V
T _{STG}	Storage Temperature Range		-65	+150	°C
TJ	Maximum Junction Temperature			+150	°C
TL	Lead Temperature (Soldering, 4 Seconds)			+260	°C
	IEC 61000 Board Level			15.0	
ESD	Human Rody Model JESD22 A114	All Pins		2.5	kV
	Human Body Model, JESD22-ATT4	Serial I/0, /RES, PAR/SPI to GND		8.0	

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to absolute maximum ratings.

Symbol	Parameter	Min.	Max.	Unit
$V_{DDA}, V_{DDS}^{(1)}$	Supply Voltage	2.5	3.3	V
V _{DDP}	Supply Voltage	1.65	3.60	V
T _A	Operating Temperature	-30	+70	°C

Note:

1. V_{DDA} and V_{DDS} supplies must be hardwired together to the same power supply.

Electrical Specifications

Values valid for over supply voltage and operating temperature ranges unless otherwise specified. Typical values are tested at $T_A = 25^{\circ}C$ and $V_{DD} = 2.775V$.

Symbol	Parameter	Test Conditions		Min.	Тур.	Max.	Unit	
DC Parallel	I/O Characteristics				•			
VIH	Input High Voltage				$0.65 \text{ x } V_{\text{DDP}}$		V _{DDP}	V
VIL	Input Low Voltage				GND		0.35 x V _{DDP}	V
			V _{DDP} = 3.3±	£0.30V				
V _{OH}	Output High Voltage	I _{OH} = -2.0mА	$V_{DDP} = 2.5 \pm$	£0.20V	0.75 x V _{DDP}			V
			V _{DDP} = 1.8	£0.18V				
			$V_{DDP} = 3.34$	£0.30V	-			
V _{OL}	Output Low Voltage	I _{OH} = -2.0mA	$V_{DDP} = 2.54$	£0.20V			0.25 x V _{DDP}	V
			$V_{DDP} = 1.84$	£0.18V				
I _{IN}	Input Current				-5		5	μA
DC Serial C	haracteristics							1
I _{ODH}	Output High Source Current					-1.75		mA
I _{ODL}	Output Low Source Current					0.95		mA
I _{OZ}	Disabled Output Leakage Current	CKSO, DSO = 0 S2 = S1 = 0V	IV to V _{DDS} ,			±1	±5	μA
l _{IZ}	Disabled Input Leakage Current	CKSO, DSO = 0 S2 = S1 = 0V	IV to V _{DDS} ,			±1	±5	
R _{TRM}	CKSI, DS Internal Receiver Termination	n Resistor				100		Ω
Z	Serial Transmission Line Impedance				70	100	130	Ω
Power Char	acteristics							
IDDA/S _{SER}	V _{DDA} , V _{DDS} Serializer Static Current	All DP and Cont CKREF, DIRI =	rol Inputs at 0 1	V or No		4.5		mA
IDDA/S _{DES}	V _{DDA} , V _{DDS} Derializer Static Current	All DP and Control Inputs at 0V or No CKREF, DIRI = 0			5		mA	
	Dynamic Serializer Current			10MHz		11		mA
IDDSER	IDD _{SER} = IDDA + IDDS + IDDP	CRREI - STRC	DL, DIRI - T	20MHz		15		mA
	Dynamic Deserializer Current	CKREE = STRC		10MHz		7		mA
IDDDES	IDD _{SER} = IDDA + IDDS + IDDP		DE, DIN - 0	20MHz		10		mA
IDD_PD	V _{DD} Power-Down Current IDD PD = IDDA + IDDS + IDDP	S1 = S2 = 0 All Inputs at GND or V _{DD}			0.1		μA	
AC Serialize	er, DIRI = 1 Specifications	_		-				
f _{MAX}	Maximum CKREF Frequency	tclkt	←→		2		20	MHz
f _{REF}	CKREF Frequency Relative to		4 90% 90%		1.1 x f _{STROBE}	1	20	MHz
t _{срwн}	CKREF Clock HIGH Time		10	»%¥	0.2	0.5		т
t _{CPWL}	CKREF Clock LOW Time	- ←	- tTCP		0.2	0.5		т
t _{CLKT}	LVCMOS Input Transition Time	CKREF 50%		50%			90	ns
t _{spwн}	STROBE Pulse Width HIGH/LOW			-	(Tx4) / 26		(Tx22) / 26	ns
t _{STC}	DP[n] Setup to STROBE		→ → ←	t _{нтс}	2.5			ns
t _{нтс}	DP[n] Hold to STROBE	DP[24:1]			2.0			ns

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
t _{TPLLS0}	Phase Lock Loop Stabilization Time	VDD/VDDA S1 or S2 CKREF CKS0			200	μs
t _{TPLLD0}	PLL Disable Time Loss of Clock				30	μs
AC Deseria	lizer, DIRI = 0 Specifications					
t _{skew_ds-} cks	Allowed DS-CKS Input Signal Skew		-150		150	ps
t _{RCOH}	CKP Out Low Time	Data Time CKP DP[1:12] Data	13a-3		13a+3	ns
t _{ксон}	CKP Out High Time	CKREF 50%	13a-3		13a+13	ns
t _{PDV}	Data Valid to CKP Low	CKREF = STROBE, a = $(1/f)/13$	8a-6		8a+1	ns
t _{ROLH}	Output Rise Time (20% to 80%)	tROLH + + + + + + + + + + ROHL DPn 20%		18		ns
t _{ROLH}	Output Fall Time (20% to 80%)	DPn BpF		18		ns
AC Enable	and Disable Timing					
t _{PLZ(HZ)}	Deserializer Disable Time	S1 or S2			25	ns
t _{PZL(ZH)}	Deserializer Enable Time				2	μs
t _{PLZ(HZ)}	Serializer Disable Time	S1 or S2			25	ns
t _{PZL(ZH)}	Serializer Enable Time	DS+,CKS0+			65	ns

Notes:

2. Skew is measured from either the rising or falling edge of CKSO clock to the rising or falling edge of DSO. Signals are edge aligned. Both outputs should have identical load conditions for this test to be valid.

3. If CKREF is not equal to STROBE for the serializer, the CKP signal does not maintain a 50% duty cycle. The low time of CKP remains 13 bit times.



Por Fairchild's definition of Eco Status	please visit: http://www.fairchildsemi.com/company/green/robs_green.html



DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

- Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
- A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

ANTI-COUNTERFEITING POLICY

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Sales Support.

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handling and storage and provide access to Fairchild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

PRODUCT STATUS DEFINITIONS

Datasheet Identification	Product Status	Definition		
Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.		
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.		
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.		
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.		

Rev. 143

µSerDes[™] FIN224C

24-Bit Low-Power Serializer/Deserializer

ON Semiconductor and are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at <u>www.onsemi.com/site/pdf/Patent-Marking.pdf</u>. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor has against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death ass

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor 19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada Email: orderlit@onsemi.com N. American Technical Support: 800–282–9855 Toll Free USA/Canada Europe, Middle East and Africa Technical Support: Phone: 421 33 790 2910

Japan Customer Focus Center Phone: 81-3-5817-1050 ON Semiconductor Website: www.onsemi.com

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

© Semiconductor Components Industries, LLC