



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
www.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 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 nor the 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, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death 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 an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

FSA805 — USB2.0 High-Speed (480Mbps), UART, and Audio Switch with Negative Signal Capability

Features

- 3:1 Switch Handles:
- Audio Headsets
- UART
- Up to 2 High-Full and Low-Speed USB Data
- Negative-Swing-Capable Audio Channel
- Built-in Termination Resistors for Audio Pop Reduction
- Simple Switch Control Using Two Select Pins

Applications

- Cell Phones, MP3 Players, PDAs

Description

The FSA805 is a 3:1 USB accessory switch that enables USB data, stereo/mono audio, and UART data to share a common connector port. It is designed for high-speed USB 2.0 signaling. The architecture is designed to allow audio signals to swing below ground (to -0.8V) so a common USB and headphone jack can be used for personal media players and portable peripheral devices.

The FSA805 meets both USB Rev. 2.0 and micro-USB specifications.

Ordering Information

Part Number	Operating Temperature Range	Top Mark	Eco Status	Package
FSA805UMX	-40 to +85°C	JZ	Green	12-Lead Quad, UMLP, 1.8x1.8mm

For Fairchild's definition of Eco Status, please visit: http://www.fairchildsemi.com/company/green/rohs_green.html.

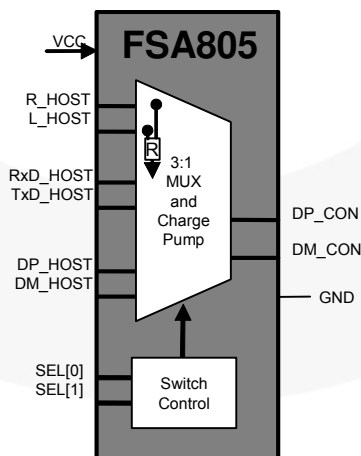


Figure 1. Functional Block Diagram

Application Diagram

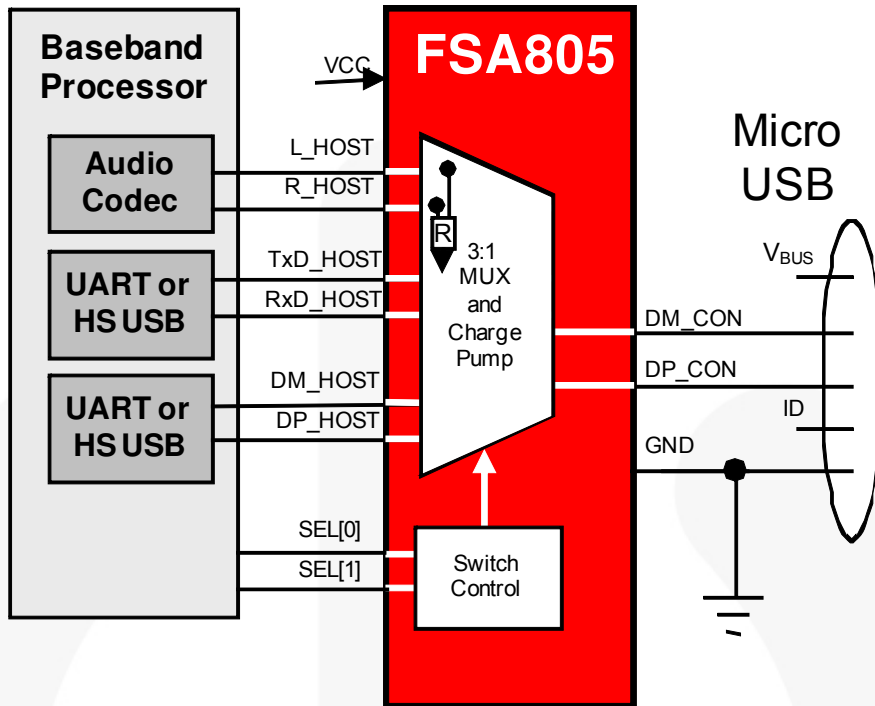


Figure 2. Typical Application

Functional Description

The FSA805 USB2.0 accessory switch is designed to consolidate wired accessories for portable devices, such as cellular telephones and portable audio players. The benefits of consolidation include reduced space requirements from a reduction of connectors and their size. The micro-USB connector, for example, reduces connector height and depth, allowing for slimmer overall designs. Using the USB industry standard and a common connector type for devices such as chargers and headsets, greatly reduces the waste associated with new phone purchases by allowing re-use of the devices.

Using just five wires for all connection types considerably reduces the cost of wired accessories and simplifies their construction. The FSA805 facilitates adopting this methodology because it is designed to redirect the DP/DM pins from the USB connector to one of three ports at the baseband's discretion.

Applications with Multiple USB Controllers

The FSA805 UART port (RxD_HOST, TxD_HOST) can be used as a High-speed USB interface. This allows it to operate in an application with two USB controllers (one full speed, and the other full or high speed).

In this configuration, it is recommended to configure the switches to OPEN before switching to the other (second) USB interface. The OPEN setting duration should be long enough for the accessory to go to a SE0 state, so when the switch is set to the other (second) USB port, the new controller re-enumerates.

Mode Descriptions

The FSA805 has two select pins to control the switching operations, SEL[0], and SEL[1]. Table 1 describes mode operation.

Table 1. Selection Truth Table

SEL[1]	SEL[0]	Switch Action	Description
0	0	OPEN	Open all switch paths (device in low-power mode) ⁽¹⁾
0	1	USB, UART	Closes USB/UART1 path to D+/D-, default condition ⁽²⁾ - DP_CON connected to RxD_HOST - DM_CON connected to TxD_HOST
1	0	USB, UART	Closes USB/UART2 path to D+/D- - DP_CON connected to DP_HOST - DM_CON connected to DM_HOST
1	1	AUDIO	Closes audio path to D+/D- only - DP_CON connected to R_HOST - DM_CON connected to L_HOST

Notes:

1. When the audio switch is in the OPEN position (Table 1, line1), the R and L are terminated to GND with internal termination resistors to discharge any stray capacitance that could cause audio pop.
2. The SELECT pins are CMOS inputs and should not be left in a floating condition. Some applications require the UART path be in the CLOSED position on power-up for initial programming of the device under test. If that condition is desired, the two SELECT pins should be pulled to the correct levels with external resistors that should exceed 100KΩ to reduce the static power consumption. In other applications, adding weak pull-down resistors to GND defaults the device to all paths open (low-power mode).

Pin Configuration

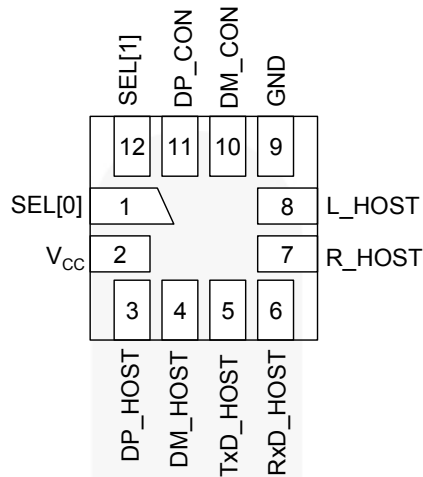


Figure 3. 12-Pin, UMLP Pin Assignments (Top-Through View)

Pin Descriptions

Name	Pin #	Description
USB Interface		
DP_HOST	3	D+ signal, dedicated USB port to be connected to the resident USB transceiver on the phone. Can also be used for UART signaling.
DM_HOST	4	D- signal, dedicated USB port to be connected to the resident USB transceiver on the phone. Can also be used for UART signaling.
Audio Interface		
R_HOST	7	Right audio channel from phone audio-out codec
L_HOST	8	Left audio channel from phone audio-out codec
UART Interface		
TxD_HOST	5	Tx connection from resident UART transceiver on the phone. Can also be used for HS USB signaling.
RxD_HOST	6	Rx connection from resident UART transceiver on the phone. Can also be used for HS USB signaling.
Power Interface		
V _{CC}	2	Input voltage supply pin to be connected to the phone battery output
Connector Interface		
GND	9	Ground
DP_CON	11	Connected to the USB connector D+ pin; depending on the signaling mode, this pin can share D+, R, Rxd, or MIC signals
DM_CON	10	Connected to the USB connector D- pin; depending on the signaling mode, this pin can share D-, L, or Txd signals
Switch Control		
SEL[1:0]	1,12	Switch selection pins; refer to Table 1 for truth table

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		Min.	Max.	Unit	
V_{CC}	Supply Voltage from Battery / Baseband		-0.5	6.0	V	
V_{SW}	Switch I/O Voltage	USB	-1.0	$V_{CC} + 0.5$	V	
		Stereo/Mono Audio Path Active	-1.5	$V_{CC} + 0.5$		
		All Other Channels	-0.5	$V_{CC} + 0.5$		
I_{IK}	Input Clamp Diode Current		-50		mA	
I_{SW}	Switch I/O Current (Continuous)	USB		50	mA	
		Audio		60		
		All Other Channels		50		
I_{SWPEAK}	Peak Switch Current (Pulsed at 1ms Duration, <10% Duty Cycle)	USB		150	mA	
		Audio		150	mA	
		All Other Channels		150	mA	
T_{STG}	Storage Temperature Range		-65	+150	°C	
T_J	Maximum Junction Temperature			+150	°C	
T_L	Lead Temperature (Soldering, 10 Seconds)			+260	°C	
ESD	IEC 61000-4-2 System	USB Connector Pins (D+, D-)	Air Gap		13.0	kV
			Contact		8.0	
	JEDEC JESD22-A114, Human Body Model		All Pins		4.5	
	JEDEC JESD22-C101, Charged Device Model		All Pins		1.5	

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.	Units
V_{CC}	Battery Supply Voltage		2.7	4.4	V
V_{SW}	Switch I/O Voltage	USB Path Active	0	3.6	V
		Audio Path Active	-0.8	0.8	V
		UART Active	0	4.4	V
T_A	Operating Temperature		-40	+85	°C

Switch Path DC Electrical Characteristics

All typical values are at $T_A=25^\circ\text{C}$ unless otherwise specified.

Symbol	Parameter	V_{CC} (V)	Conditions	$T_A = -40$ to $+85^\circ\text{C}$			Unit
				Min.	Typ.	Max.	
Host Interface Pins (SEL[1:0])							
V_{IH}	Input High Voltage	3.2 to 4.4		1.3			V
V_{IL}	Input Low Voltage	3.2 to 4.4				0.7	V
Switch Off Characteristics							
I_{OFF}	Power Off Leakage Current	0	All Ports Except Audio Path $V_{SW}=0\text{V}$ to 4.4V , Figure 9			10	μA
USB Switch On Path							
USB Analog Signal Range		3.2 to 4.4		0		3.6	V
R_{ONUSB}	HS Switch On Resistance ⁽³⁾	3.2 to 4.4	$V_{D+/D-}=0\text{V}$, 0.4V , $I_{ON}=8\text{mA}$, Figure 8		6	9	Ω
Audio R/L Switch On Paths							
Audio Analog Signal Range		3.2 to 4.4		-0.8		0.8	V
R_{ONAUD}	Audio Switch On Resistance ⁽³⁾	3.2 to 4.4	$V_{L/R}=-0.8\text{V}$, 0.8V , $I_{ON}=30\text{mA}$, Figure 8			3	Ω
R_{FLAT}	Audio R_{ON} Flatness ⁽⁴⁾	3.2 to 4.4			0.1		
R_{TERM}	Internal Termination Resistors ⁽⁵⁾				1		k Ω
UART Switch On Path							
Analog Signal Range		3.2 to 4.4	$V_{SW}=0\text{V}$, 4.4V , $I_{ON}=8\text{mA}$	0		V_{CC}	V
R_{ONUART}	Switch On Resistance ⁽³⁾	3.2 to 4.4	$V_{TXD/RXD}=0\text{V}$, 3.2V , $I_{ON}=8\text{mA}$, Figure 8		25		Ω
Total Switch Current Consumption							
I_{CCSL}	Battery Supply Sleep Mode Average Current	3.2 to 4.4	Static Current During Sleep Mode (SEL[1:0]=0)		10	15	μA
I_{CCWK}	Battery Supply Active Mode Average Current	3.2 to 4.4	Average Pulse Current (~100 μs Pulse)		80	110	μA
I_{CCSELT}	Increase in I_{CCSL}/I_{CCWK} Current per Control Voltage and V_{CC}	3.2 to 4.4	$V_{SEL} = 2.8\text{V}$ and $V_{CC} = 4.4\text{V}$			8	μA
			$V_{SEL} = 1.8\text{V}$ and $V_{CC} = 4.4\text{V}$			10	μA

Notes:

- On resistance is determined by the voltage drop between the both sides of the switch at the indicated current through the switch.
- Flatness is defined as the difference between the maximum and minimum values of on resistance over the specified range of conditions.
- Guaranteed by characterization; not production tested.

Switch Path AC Electrical Characteristics⁽⁶⁾

All typical value are for $V_{CC} = 3.8V$ at $T_A = 25^\circ C$ unless otherwise specified.

Symbol	Parameter	Conditions	Typical	Unit	Figure	
Q	Charge Injection	Audio Mode	1.0nF, $V_S = 0V$, $R_S = 0\Omega$	4	pC	Figure 13
		UART Mode		4		
		USB Mode		6		
Xtalk	Active Channel Crosstalk DP_CON to DM_CON	Audio Mode	f=20kHz, $R_T = 32\Omega$, $C_L = 0pF$	-95	dB	Figure 12
		UART Mode	f=1MHz, $R_T = 50\Omega$, $C_L = 0pF$	-75		
		USB Mode				
	Active Channel Crosstalk MIC	MIC on VBUS to R_HOST, L_HOST	f=20kHz, $R_T = 32\Omega$, $C_L = 0pF$	-105		
MIC on DP_CON to L_HOST (DM_CON)						
O_{IRR}	Off Isolation Rejection Ratio	Audio Path L_HOST to DM_CON, R_HOST to DP_CON	f=20kHz, $R_T = 32\Omega$, $C_L = 0pF$	-100	dB	Figure 11
		USB Path DM_HOST to DM_CON, DP_HOST to DP_CON	f=1 MHz, $R_T = 50\Omega$, $C_L = 0pF$	-80		
		UART Path TxD_HOST to DM_CON, RxD_HOST to DP_CON		-85		
THD+N	Total Harmonic Distortion + Noise (Audio Path)	20Hz to 20kHz, $R_L = 16\Omega$, Input Signal Range 1.6V _{pp}	0.037	%	Figure 16	
		20Hz to 20kHz, $R_L = 32\Omega$, Input Signal Range 1.6V _{pp}	0.025	%	Figure 16	
t_j	Total Jitter (USB Mode)	$R_L = 50\Omega$, $C_L = 50pF$, $t_r = t_f = 500ps$ (10-90%) at 480Mbps (PRBS=2 ¹⁵ -1)	130	ps		
BW	-3db Bandwidth (USB Mode DPHost/DMHost)	$R_L = 50\Omega$, $C_L = 0pF$	1150	MHz	Figure 10	
		$R_L = 50\Omega$, $C_L = 5pF$	550	MHz	Figure 10	

Note:

6. Guaranteed by characterization; not production tested.

Capacitance

Symbol	Parameter	V _{CC} (V)	Conditions	T _A = -40 to +85°C			Unit	Figure
				Min.	Typ.	Max.		
C _{IN}	Select Pins Capacitance ⁽⁷⁾	0	V _{BIAS} =0.2V		2.0		pF	Figure 14
C _{ON(D+, D-)}	D+, D- On Capacitance (HS USB Mode) ⁽⁷⁾	3.8	V _{BIAS} =0.2V, f=1MHz		6.5		pF	Figure 15

Note:

7. Guaranteed by characterization; not production tested.

High Speed USB Eye Compliance Results for All FSA805 Signal Paths

The following figures show high-speed USB 2.0 eye diagrams for each path of the FSA805. Full compliance reports are available upon request. Figure 4 shows the eye diagram of the high-speed USB source used for testing of the FSA800 and FSA805 paths.

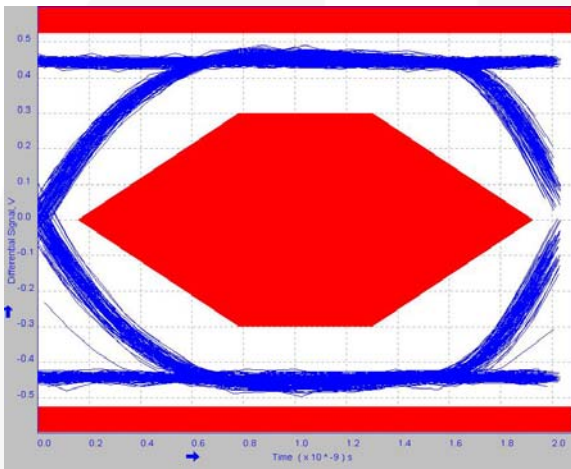


Figure 4. High-Speed Eye Diagram for Source Used for All Testing

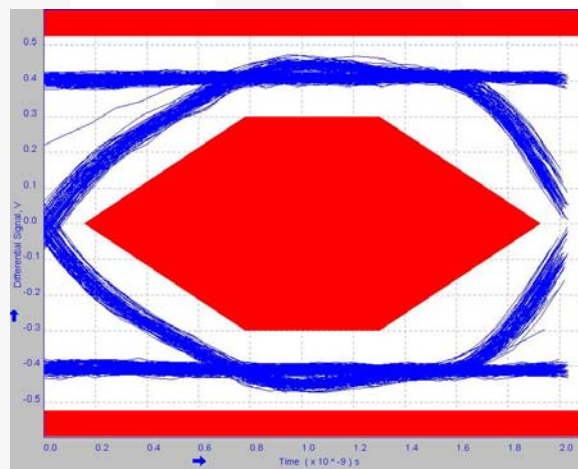


Figure 5. USB (DP_HOST/DM_HOST) Path High-Speed Eye Diagram

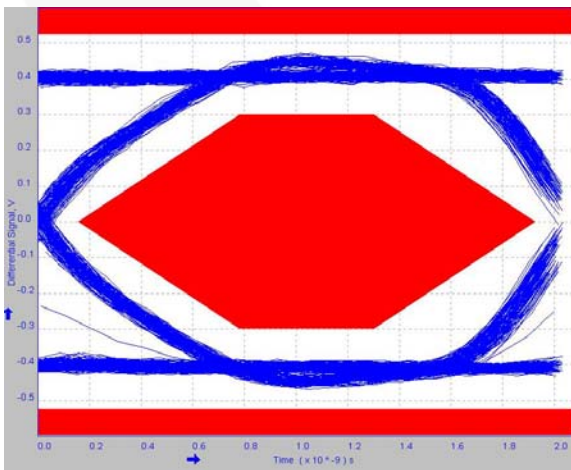


Figure 6. UART (TxD_HOST/RxD_HOST) High-Speed Eye Diagram

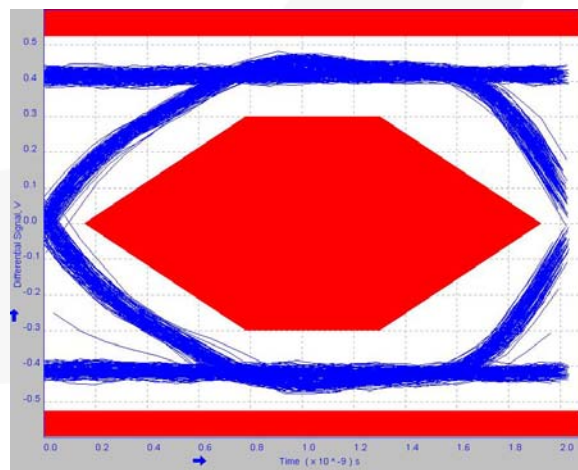


Figure 7. Audio Path High-Speed Eye Diagram

Test Diagrams

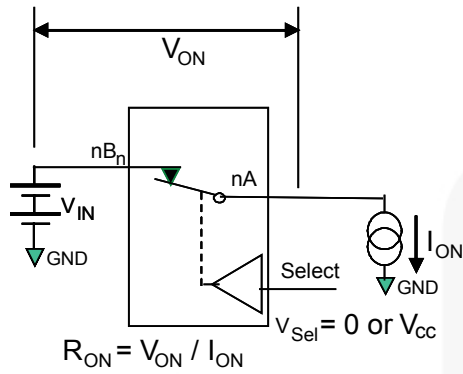
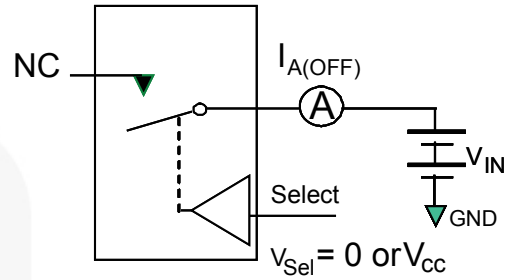


Figure 8. On Resistance



**Each switch port is tested separately.

Figure 9. Off Leakage

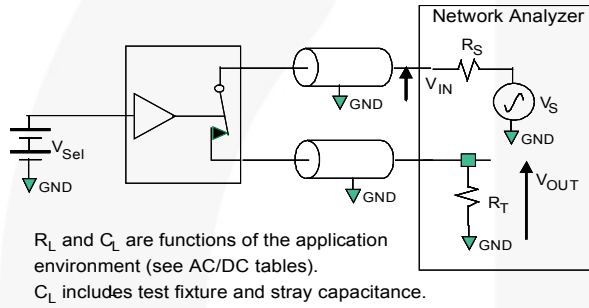


Figure 10. Bandwidth

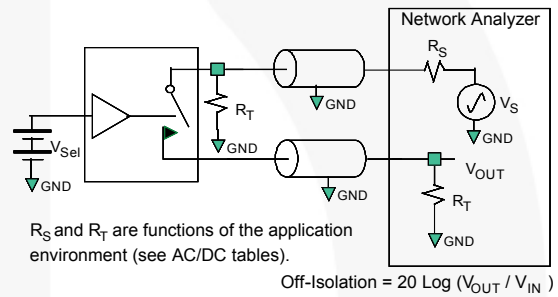


Figure 11. Channel Off Isolation

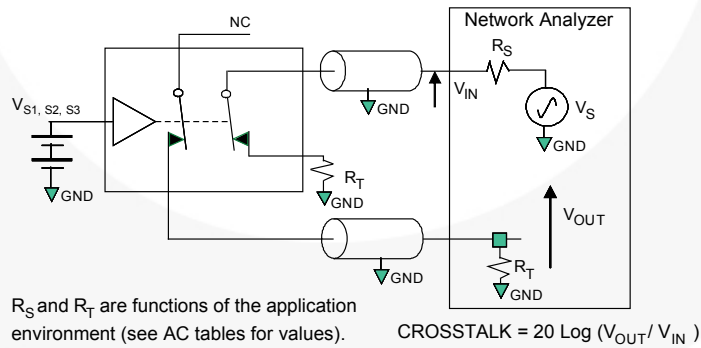


Figure 12. Adjacent Channel Crosstalk

Test Diagrams (Continued)

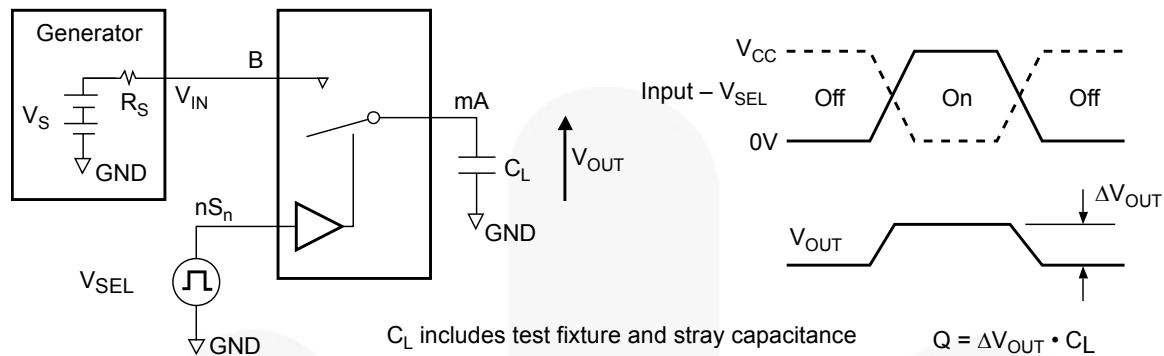


Figure 13. Charge Injection Test

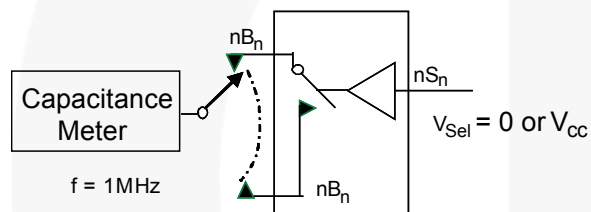


Figure 14. Channel Off Capacitance

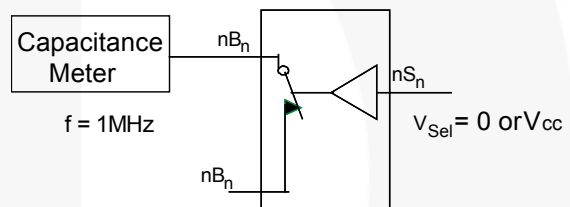


Figure 15. Channel On Capacitance

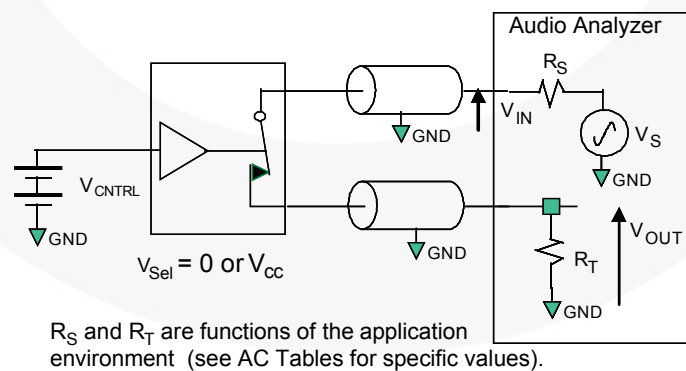


Figure 16. Total Harmonic Distortion

Physical Dimensions

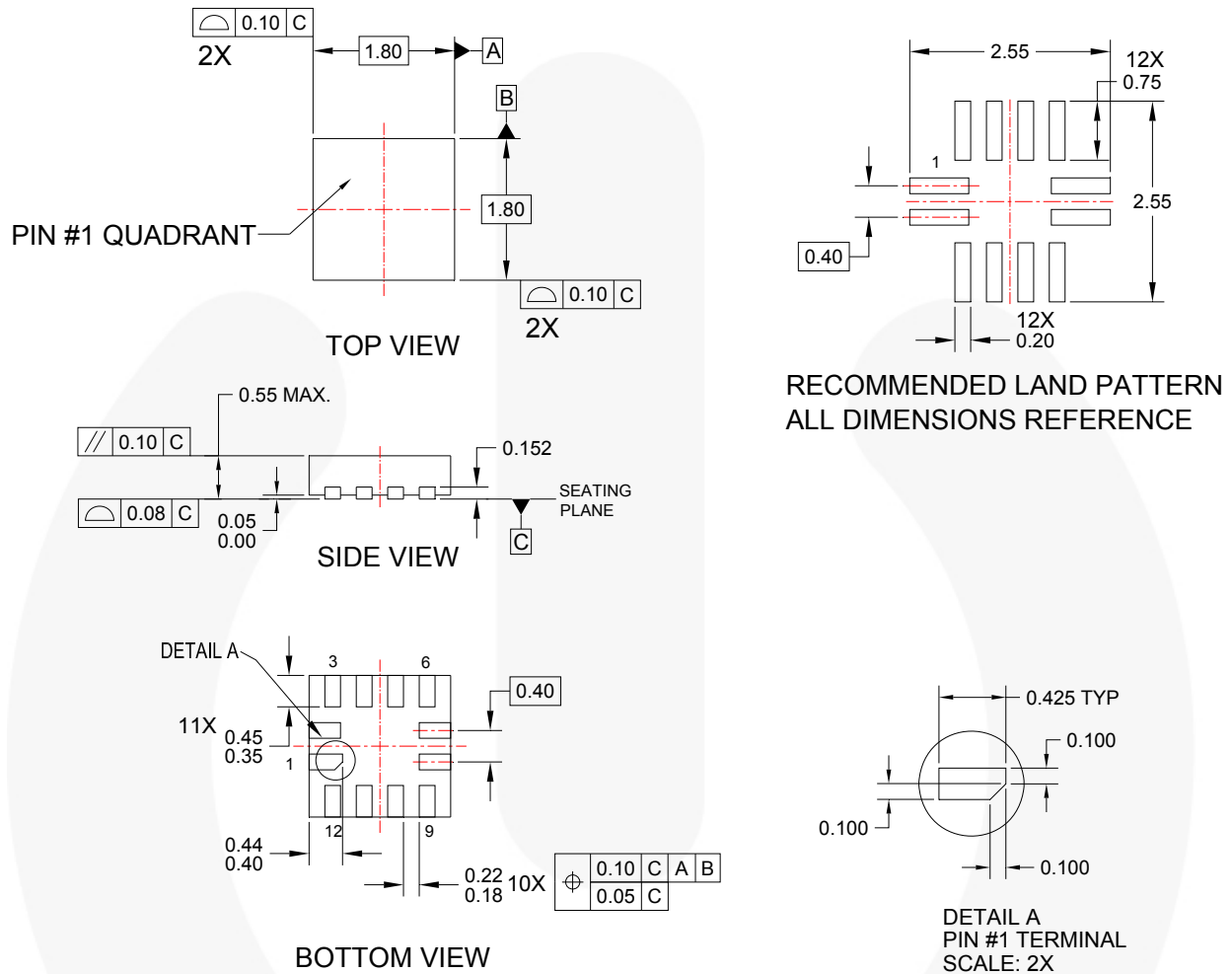


Figure 17. 12-Lead Quad, UMLP, 1.8x1.8mm

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:
<http://www.fairchildsemi.com/packaging/>



TRADEMARKS

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

- | | | | |
|--------------------------|-------------------------|---------------------------------------|----------------------|
| AccuPower™ | FRFET® | PowerTrench® | The Power Franchise® |
| Auto-SPM™ | Global Power Resource ™ | PowerXS™ | |
| Build it Now™ | Green FPS™ | Programmable Active Droop™ | TinyBoost™ |
| CorePLUS™ | Green FPS™ e-Series™ | QFET® | TinyBuck™ |
| CorePOWER™ | Gmax™ | QS™ | TinyCalc™ |
| CROSSVOL™ | GTO™ | Quiet Series™ | TinyLogic® |
| CTL™ | IntelliMAX™ | RapidConfigure™ | TINYOPTO™ |
| Current Transfer Logic™ | ISOPLANAR™ | | TinyPower™ |
| DEUXPEED® | MegaBuck™ | Saving our world, 1mW/W/kV at a time™ | TinyPWM™ |
| Dual Cool™ | MICROCOUPLER™ | SignalWise™ | TinyWire™ |
| EcoSPARK® | MicroFET™ | SmartMax™ | TriFault Detect™ |
| EfficientMax™ | MicroPak™ | SMART START™ | TRUECURRENT™* |
| | MicroPak2™ | SPM® | µSerDes™ |
| Fairchild® | MillerDrive™ | STEALTH™ | |
| Fairchild Semiconductor® | MotionMax™ | SuperFET™ | UHC® |
| FACT Quiet Series™ | Motion-SPM™ | SuperSOT™-3 | Ultra FRFET™ |
| FACT® | OptoHIT™ | SuperSOT™-6 | UniFET™ |
| FAST® | OPTOLOGIC® | SuperSOT™-8 | VCX™ |
| FastvCore™ | OPTOPLANAR® | SupreMOS™ | VisualMax™ |
| FETBench™ | | SyncFET™ | XST™ |
| FlashWriter® | PDP SPM™ | Sync-Lock™ | |
| FPS™ | Power-SPM™ | | |
| F-PFS™ | | | |

* Trademarks of System General Corporation, used under license by Fairchild Semiconductor.

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:

1. 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.
2. 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

Definition of Terms

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. 147

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 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 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 nor the 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, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death 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 an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

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