



# FSUSB46 — Hi-Speed USB2.0 (480Mbps) DPST Switch with Dedicated Charger Port Detection

## Features

- Low On Capacitance: 7.0pF Typical
- Low On Resistance: 3.9Ω Typical
- Low Power Consumption: 1μA Maximum
  - 15μA Maximum I<sub>CC</sub>T over an Expanded Voltage Range (V<sub>IN</sub>=1.8V, V<sub>CC</sub>=4.3V)
- Wide -3db Bandwidth: > 720MHz
- Packaged in Pb-free, 8-Lead MicroPak™ (1.6mm wide), US8 (3.1mm wide), and UMLP (1.4x1.4mm)
- 8kV ESD Rating, >16kV Power/GND ESD Rating
- Power-Off Protection on All Ports When V<sub>CC</sub>=0V
  - D+/D- Pins Tolerate up to 5.25V

## Applications

- Cell phone, PDA, Digital Camera, and Notebook
- LCD Monitor, TV, and Set-Top Box

## IMPORTANT NOTE:

For additional performance information, please contact [analogswitch@fairchildsemi.com](mailto:analogswitch@fairchildsemi.com).

## Description

The FSUSB46 is a bi-directional, low-power, Hi-Speed, USB2.0 switch. Configured as a double-pole, single-throw switch (DPST) switch, it is optimized for switching a Hi-Speed (480Mbps) source.

The FSUSB46 is compatible with the requirements of USB2.0 and features an extremely low on capacitance (C<sub>ON</sub>) of 3.9pF. The wide bandwidth of this device (720MHz) exceeds the bandwidth needed to pass the third harmonic, resulting in signals with minimum edge and phase distortion. Superior channel-to-channel crosstalk also minimizes interference.

The FSUSB46 contains special circuitry on the switch I/O pins for applications where the V<sub>CC</sub> supply is powered-off (V<sub>CC</sub>=0), which allows the device to withstand an over-voltage condition. This device is designed to minimize current consumption even when the control voltage applied to the /OE pin is lower than the supply voltage (V<sub>CC</sub>). This feature is especially valuable to ultra-portable applications, such as cell phones, allowing for direct interface with the general-purpose I/Os of the baseband processor. An additional feature is the detection of the 1-1 (high/high) state on D+/D- signal an interrupt (INT) to the processor when entering a dedicated charging port mode of operation.

## Ordering Information

Part Number	Operating Temperature Range	Package	Eco Status
FSUSB46L8X	-40 to +85°C	8-Lead MicroPak™ 1.6mm Wide	RoHS
FSUSB46K8X	-40 to +85°C	8-Lead US8, JEDEC MO187, Variation CA 3.1mm	Green
FSUSB46UMX	-40 to +85°C	8-Lead Ultrathin Molded Leadless Package (UMLP), 1.2 x 1.4mm	Green

For Fairchild's definition of "green" Eco Status, please visit: [http://www.fairchildsemi.com/company/green/rohs\\_green.html](http://www.fairchildsemi.com/company/green/rohs_green.html).

MicroPak™ is a trademark of Fairchild Semiconductor Corporation.

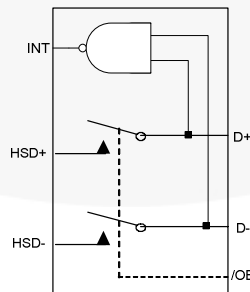


Figure 1. Analog Symbol



**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.

- |   |                        |   |   |
|---|------------------------|---|---|
| Build it Now™   | FPST™                  | PDP SPM™  | The Power Franchise®  |
| CorePLUS™   | F-PFST™                | Power-SPM™  |  |
| CorePOWER™  | FRFET®                 | PowerTrench®  | TinyBoost™  |
| CROSSVOLT™  | Global Power Resource™ | Programmable Active Droop™  | TinyBuck™   |
| CTL™  | Green FPST™            | QFET®   | TinyLogic®  |
| Current Transfer Logic™   | Green FPST™ e-Series™  | QST™  | TINYOPTO™   |
| EcoSPARK®   | GTO™                   | Quiet Series™   | TinyPower™  |
| EfficientMax™   | IntelliMAX™            | RapidConfigure™   | TinyPWM™  |
| EZSWITCH™ *   | ISOPLANAR™             | Saving our world, 1mW at a time™  | TinyWire™   |
|  | MegaBuck™              | SmartMax™   | μSerDes™  |
|  | MICROCOUPLER™          | SMART START™  |  |
| Fairchild®  | MicroFET™              | SPM®  | UHC®  |
| Fairchild Semiconductor®  | MicroPak™              | STEALTH™  | Ultra FRFET™  |
| FACT Quiet Series™  | MillerDrive™           | SuperFET™   | UniFET™   |
| FACT®   | MotionMax™             | SuperSOT™.3   | VCX™  |
| FAST®   | Motion-SPM™            | SuperSOT™.6   | VisualMax™  |
| FastvCore™  | OPTOLOGIC®             | SuperSOT™.8   |   |
| FlashWriter® *  | OPTOPLANAR®            | SupreMOS™   |   |
|   |                        | SyncFET™  |   |
|   |                        |  |   |

\* EZSWITCH™ and FlashWriter® are 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:

- 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](http://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. 135