



Is Now Part of



**ON Semiconductor®**

To learn more about ON Semiconductor, please visit our website at  
[www.onsemi.com](http://www.onsemi.com)

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](http://www.onsemi.com). Please email any questions regarding the system integration to [Fairchild\\_questions@onsemi.com](mailto: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](http://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.

# FSA832 — USB 2.0 High-Speed (480 Mbps) Charger Detection IC with Isolation Switch

## Features

|   |   |
|---|---|
| USB Detection                           | USB Battery Charging Rev. 1.2<br>Supports Data Contact Detect (DCD)<br>Dead Battery Provision (DBP)<br>with 30-Minute Timer |
| Proprietary Charger and Other Detection | 2.7 V / 2.0 V on DP/DM<br>DP/DM Floating<br>PS/2 Port Detection   |
| Switch Type                             | Isolation Switch Closes for<br>Charging Downstream Port (CDP)<br>Standard Downstream Port (SDP)                             |
| V <sub>BUS</sub>                        | 28 V Over-Voltage Tolerance<br>-2 V Under-Voltage Tolerance   |
| Package                                 | 10-Lead MicroPak™<br>1.6 x 2.1 mm, 0.5 mm Pitch   |
| Ordering Information                    | FSA832L10X  |

## Description

The FSA832 is a charger detection IC with an integrated isolation switch for use with micro/mini USB port. The FSA832 detects USB battery chargers and is compliant with USB Battery Charging Specification, Rev 1.2 (BC1.2).

The FSA832 also detects proprietary chargers that pull the USB data lines HIGH (2.7 V / 2.0 V), floating data lines, and PS/2 ports. The device determines if a charger, either through a Dedicated Charging Port (DCP) or Charging Downstream Port (CDP), is connected or if a typical PC host, a Standard Downstream Port (SDP), is connected. The FSA832 conforms to all the constraints for the Dead Battery Provision (DBP) within the BC1.2 specification, including a 30-minute timer that cannot exceed 45 minutes per BC1.2.

## Applications

- MP3, Mobile Internet Device (MID), Cell Phone, PDA, Digital Camera, Notebook, and Netbook

## Typical Application

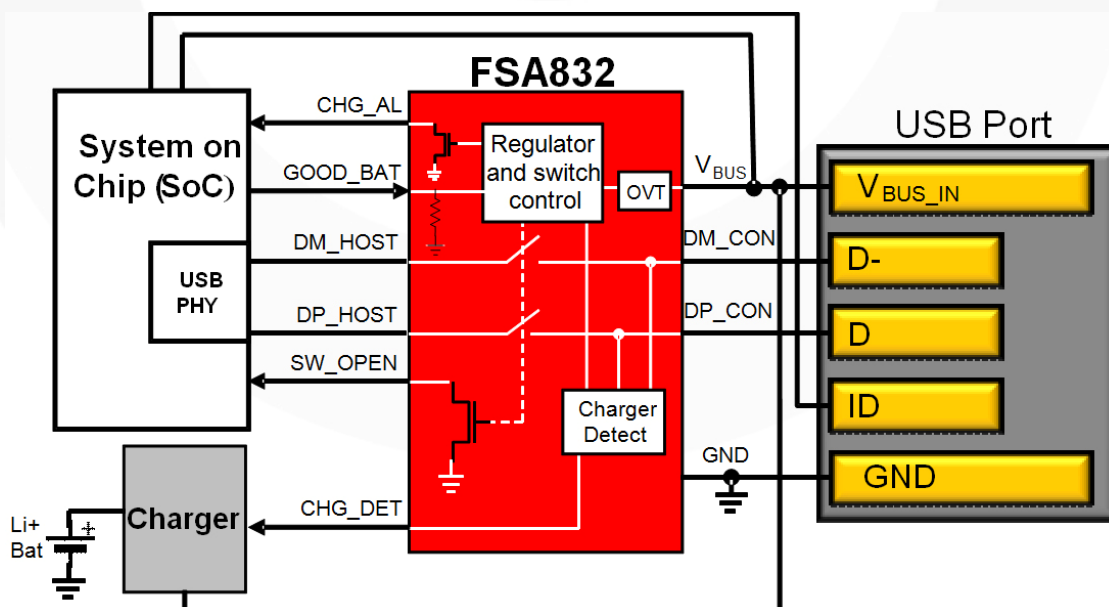


Figure 1. Mobile Phone Example

## Ordering Information

| Part Number | Operating Temperature Range | Top Mark | Package Description                           | Packing Method |
|-------------|-----------------------------|----------|---|----------------|
| FSA832L10X  | -40 to 85°C                 | ZY       | 10-Lead, MicroPak™ 1.6 x 2.1 mm, 0.5 mm Pitch | Tape & Reel    |

## Pin Configurations

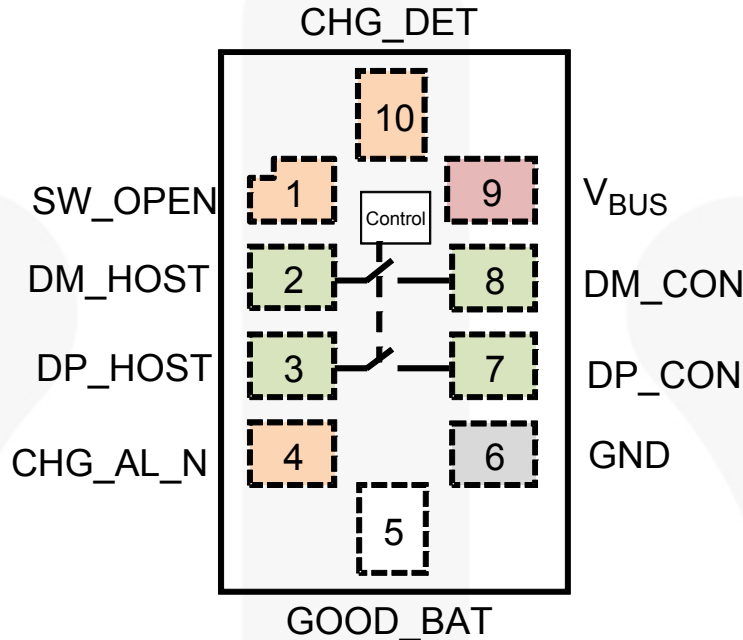


Figure 2. Pin Assignments (Top View)

## Pin Descriptions

| Name                       | Pin # | Description  |
|----------------------------|-------|--|
| <b>USB Interface</b>       |       |  |
| DP_HOST                    | 3     | D+ signal connected to the resident USB transceiver on the phone.  |
| DM_HOST                    | 2     | D- signal connected to the resident USB transceiver on the phone.  |
| <b>Connector Interface</b> |       |  |
| V <sub>BUS</sub>           | 9     | Input voltage supply pin to be connected to the V <sub>BUS</sub> pin of the USB connector.   |
| GND                        | 6     | Ground   |
| DP_CON                     | 7     | Connected to the USB connector D+ pin  |
| DM_CON                     | 8     | Connected to the USB connector D- pin  |
| <b>Status Outputs</b>      |       |  |
| CHG_DET                    | 10    | CMOS push/pull output connected to charger IC to indicate if a charger has been detected (LOW=charger not detected; HIGH=proprietary charger, DCP, or CDP charger detected). |
| SW_OPEN                    | 1     | Open-drain output pin; requires pull-up resistor to I/O voltage supply (LOW=switch closed; Hi-Z=switch open).  |
| CHG_AL_N                   | 4     | CMOS open-drain output pin (LOW=V <sub>BUS</sub> is valid and charge is allowed to be drawn from V <sub>BUS</sub> ; Hi-Z=V <sub>BUS</sub> is not at a valid voltage).        |
| <b>Input Pin</b>           |       |  |
| GOOD_BAT                   | 5     | Input that indicates if the battery is a good battery or a dead battery (V <sub>IL</sub> =dead battery; V <sub>IH</sub> =good battery).                                      |

### Note:

- Output voltage conditions are LOW = V<sub>OL</sub> and HIGH = V<sub>OH</sub>.

**Table 1. Functionality**

| Device Detected  | GOOD_BAT | SW_OP_EN | CHG_AL_N | CHG_DET     | DP_HOST | DM_HOST | DP_CON                             | DM_CON              |
|--|----------|----------|----------|-------------|---------|---------|------------------------------------|---------------------|
| DCP  | X        | Hi-Z     | LOW      | HIGH        | Hi-Z    | Hi-Z    | V <sub>DP_SRC</sub> <sup>(2)</sup> | Hi-Z <sup>(2)</sup> |
| Proprietary Charger  | X        | Hi-Z     | LOW      | HIGH        | Hi-Z    | Hi-Z    | Hi-Z                               | Hi-Z                |
| CDP  | HIGH     | LOW      | LOW      | HIGH        | DP_CON  | DM_CON  | DP_HOST                            | DM_HOST             |
| CDP  | LOW      | Hi-Z     | LOW      | HIGH        | Hi-Z    | Hi-Z    | V <sub>DP_SRC</sub>                | Hi-Z                |
| PS/2 Ports <sup>(3)</sup>  | X        | Hi-Z     | LOW      | LOW         | Hi-Z    | Hi-Z    | Hi-Z                               | Hi-Z                |
| SDP  | HIGH     | LOW      | LOW      | LOW         | DP_CON  | DM_CON  | DP_HOST                            | DM_HOST             |
| SDP  | LOW      | Hi-Z     | LOW      | LOW         | Hi-Z    | Hi-Z    | V <sub>DP_SRC</sub>                | Hi-Z                |
| SDP, CDP, or DCP plugged in and after 30-minute timer expires  | LOW      | Hi-Z     | Hi-Z     | LOW         | Hi-Z    | Hi-Z    | Hi-Z                               | Hi-Z                |
| V <sub>BUS</sub> < V <sub>BUS</sub> valid to V <sub>BUS</sub> > V <sub>BUS</sub> valid operation prior to completing detection of SDP, CDP, or DCP. Upon detection, all outputs switch as in rows above. | X        | Hi-Z     | Hi-Z     | Hi-Z to LOW | Hi-Z    | Hi-Z    | Hi-Z                               | Hi-Z                |

**Note:**

- Hi-Z is the internal state of DM\_CON. Since a DCP has been detected, DM\_CON is shorted to DP\_CON externally and DM\_CON is shorted to V<sub>DP\_SRC</sub>. V<sub>DP\_SRC</sub> is not put on DP\_CON for proprietary chargers.
- DP\_CON and DM\_CON are pulled to V<sub>BUS</sub> through a resistor by the PS/2 port when it is connected to the FSA832.

## Functional Description

### Data Contact Detect (DCD)

DCD relies on the D+ and D- lines being present. DCD waits until the internal timeout t<sub>DCD\_TOUT</sub> has expired in the following cases:

- If a charger does not have a D+ pin on the USB connector;
- If the D+ pin is not shorted to D- pin on the connector,
- If D+ is pulled up to a supply; or
- If D+ does not have a sufficient path to ground to defeat a pull-up IDP\_SRC (I<sub>DP\_SRC</sub>) current source.

The FSA832 proceeds with charger detection even though it is unlikely that a charger is present. If there is no charge, the algorithm reports an SDP and closes the switch. If a device is pulling D+ HIGH, this voltage presents itself to the USB transceiver or Physical Layer Interface (PHY) block within a System on Chip (SoC) after the switch is closed.

If the DCD timeout is insufficient and the PHY block is so equipped, DCD and the charging algorithm can be repeated in the PHY block. The stipulation is that the total time from V<sub>BUS</sub> valid to USB transceiver connection with a 1.5 kΩ pull-up to 3.3 V must be one (1) second, per USB 2.0 standards, provided the portable device does not have a dead battery.

### CHG\_AL\_N Output and Output Timing

CHG\_AL\_N output indicates that charge is allowed to be drawn from V<sub>BUS</sub> when CHG\_AL\_N is LOW. When the FSA832 first powers up and prior to detection, the CHG\_AL\_N pin can follow V<sub>BUS</sub> up to 28 V, which is the

absolute maximum V<sub>BUS</sub> voltage allowed. Whenever V<sub>BUS</sub> is at GND, the FSA832 is completely off and the switches and all I/Os are in the Hi-Z state. When V<sub>BUS</sub> climbs above the valid V<sub>BUS</sub> threshold, detection occurs automatically and CHG\_DET, SW\_OPEN, and CHG\_AL\_N all simultaneously switch to the states indicated in Table 1 if GOOD\_BAT is HIGH (see *Dead Battery Provision description for GOOD\_BAT = LOW*).

### Dead Battery Provision

BC1.2 and USB 2.0 allow a portable device (defined as a device with a battery) with a dead battery to take a maximum of 100 mA from the USB V<sub>BUS</sub> line for a maximum of 45 minutes as long as the portable device forces the D+ line to V<sub>DP\_SRC</sub>. The FSA832 starts detection when V<sub>BUS</sub> crosses the V<sub>BUSVLD</sub> threshold and, if it detects a CDP or SDP and GOOD\_BAT is HIGH, automatically closes the switch and does not force the DP\_CON pin to V<sub>DP\_SRC</sub>.

Once charger detection is complete, the FSA832 starts a 30-minute timer and forces the DP\_CON pin to V<sub>DP\_SRC</sub> until the timer elapses. During the 30-minute period; if GOOD\_BAT is LOW, V<sub>DP\_SRC</sub> is applied to DP\_CON and the D+/D- switches are opened. If GOOD\_BAT is HIGH, V<sub>DP\_SRC</sub> is not applied to DP\_CON and the D+/D- switches are closed. If GOOD\_BAT is LOW when the 30-minute timer expires; regardless of whether a proprietary charger, SDP, CDP, or DCP was previously detected; the FSA832 removes V<sub>DP\_SRC</sub> from DP\_CON and forces CHG\_DET LOW and CHG\_AL\_N to Hi-Z (SW\_OPEN remains in Hi-Z). To exit this fault condition, remove V<sub>BUS</sub>, wait for all the V<sub>BUS</sub> Printed Circuit Board

(PCB) capacitance to discharge, and re-apply  $V_{BUS}$ . Table 1 provides the functionality of the pins when the timer expires.

When GOOD\_BAT is HIGH and the battery is removed from the portable device while  $V_{BUS}$  is valid, bringing GOOD\_BAT LOW; the FSA832 opens the isolation switches on DP\_CON and DM\_CON and forces the DP\_CON pin to  $V_{DP\_SRC}$ . In this scenario, the timer generally expires because the SoC does not have a supply to bring GOOD\_BAT HIGH unless the battery that was removed is re-inserted within 30 minutes after the USB plug is inserted.

If an SDP or CDP is inserted with GOOD\_BAT HIGH during the 30-minute timer; then GOOD\_BAT changes to LOW, SW\_OPEN changes to Hi-Z, and the counter continues counting until the 30 minutes expires. If GOOD\_BAT then returns to HIGH, SW\_OPEN changes to LOW and finishes out the 30-minute time.

GOOD\_BAT has an internal pull-down resistor to ensure it is LOW when the SoC is powered down. This input is designed to have very  $V_{IH}$  interface with low-voltage SoCs driven with 1.2 V supplies. GOOD\_BAT can be connected to the processor supply voltage because the processor should wake up whenever  $V_{BUS}$  is turned on.

### Proprietary Chargers

Chargers pulling the USB data line DM\_CON HIGH to 2.0 V or 2.7 V and data line DP\_CON HIGH to 2.0 V or 2.7 V are detected by the FSA832 and reported proprietary chargers with a higher charge current allowed. Other chargers that float the DP/DM lines are also detected as a proprietary by means of float detection. This allows a proprietary charger with floating DP/DM to benefit from higher charge current.

### PS/2 Port

Mice and keyboards utilizing the PS/2 port interface pull the clock and data pins of the PS/2 connector HIGH to  $V_{BUS}$  through a resistive pull-up. When the PS/2 device is adapted to a USB interface, the clock and data pins are translated to the DP\_CON and DM\_CON lines of the USB connector, respectively.

The benefit of detecting the PS/2 port as a separate device is the ability to limit the current that can be drawn from the bus, thus protecting the PS/2 port. Once the PS/2 port is detected, the DP\_HOST and DM\_HOST switches remain open to protect the USB PHY connected to DP\_HOST and DM\_HOST from voltages as high as  $V_{BUS}$ .

### Ground Drops

When a DCP is detected,  $V_{DP\_SRC}$  is forced on DP\_CON provided GOOD\_BAT is HIGH or GOOD\_BAT is LOW and the DBP timer has not expired. When  $\sim 1.5$  A is flowing into  $V_{BUS}$  and GND lines of the USB cable, the current can create substantial ground drops that lift the ground of the portable device. This drop adds to the voltage at the DP\_CON pin as seen from the DCP D+ pin. For the maximum ground drop of 375 mV specified in the BC1.2 specification and for the maximum  $V_{DP\_SRC}$  of 0.7 V; the voltage as seen by the DCP would be 1.075 V. Smart DCPs that rely on this voltage detection to determine attach and detach detection need to take this into account.

### $V_{BUS}$ Tolerance

When  $V_{BUS}$  rises, an internal Power-On Reset (POR) detects this voltage and prepares the FSA832 for charger detection.

$V_{BUS}$  voltages up to 28 V can be tolerated by the  $V_{BUS}$  pin.  $V_{BUS}$  can tolerate voltages up to -2 V for cases where a charger is plugged in backwards.

## 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 <sub>BUS</sub> | Voltage from USB Connector                                |  | -2       | 28   | V    |
| V <sub>SW</sub>  | USB Switch I/O Voltage (DP_CON, DM_CON, DP_HOST, DM_HOST) |  | -0.5     | 6.0  | V    |
| I <sub>SW</sub>  | USB Switch Current (DP_CON to DP_HOST, DM_CON to DM_HOST) |  | -30      | +30  | mA   |
| V <sub>I/O</sub> | Voltage from GOOD_BAT, CHG_AL_N, CHG_DET and SW_OPEN I/Os |  | -0.5     | 6.0  | V    |
| V <sub>CA</sub>  | Voltage from CHG_AL_N Output                              |  | -0.5     | 28.0 | V    |
| I <sub>I/O</sub> | CHG_AL_N, CHG_DET and SW_OPEN Outputs Sink/Source Current |  | -5       | +5   | mA   |
| T <sub>STG</sub> | Storage Temperature Range                                 |  | -65      | +150 | °C   |
| T <sub>J</sub>   | Maximum Junction Temperature                              |  |          | +150 | °C   |
| T <sub>L</sub>   | Lead Temperature (Soldering, 10 Seconds)                  |  |          | +260 | °C   |
| ESD              | IEC 61000-4-2 System                                      | USB Pins (DP_CON, DM_CON, V <sub>BUS</sub> ) | Air Gap  | 15   | kV   |
|                  |   |  | Contact  | 8    |      |
|                  | Human Body Model, JEDEC JESD22-A114                       |  | All Pins | 6    |      |
|                  | Charged Device Model, JEDEC JESD22-C101                   |  | All Pins | 1    |      |

## 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 <sub>BUS</sub> | V <sub>BUS</sub> Input HIGH Voltage | 4    | 6    | V    |
| V <sub>SW</sub>  | Switch I/O Voltage for USB Path     | 0    | 3.6  | V    |
| T <sub>A</sub>   | Operating Temperature               | -40  | +85  | °C   |

## DC Electrical Characteristics

Unless otherwise indicated,  $V_{BUS}=4\text{ V to }6\text{ V}$  and  $T_A=-40\text{ to }+85^\circ\text{C}$ . Typical values are at  $T_A=25^\circ\text{C}$  unless otherwise specified.

| Symbol   | Parameter   | Condition  | Min. | Typ. | Max. | Unit          |
|--|---|--|------|------|------|---------------|
| <b>Status Outputs</b>  |   |  |      |      |      |               |
| $V_{OHCD}$   | Output HIGH Voltage (CHG_DET)   | $I_{OH}=-2\text{ mA}$  | 2.0  |      |      | V             |
| $V_{OL}$   | Output LOW Voltage (CHG_DET, CHG_AL_N, SW_OPEN)   | $I_{OL}=2\text{ mA}$   |      |      | 0.4  | V             |
| $t_{DIFF}$   | Skew Between Any Output (CHG_DET, CHG_AL_N, SW_OPEN) Switching Relative to Other Outputs Switching  | $I_{I/O}=\pm 2\text{ mA}$ , CHG_AL_N=20 k $\Omega$ to 5 V, SW_OPEN=10 k $\Omega$ to 1.8 V                                |      |      | 100  | ns            |
| <b><math>V_{BUS}</math> Pin</b>                                      |   |  |      |      |      |               |
| $V_{BUSVLD}$   | $V_{BUS}$ Valid Detection Threshold <sup>(4)</sup>  |  | 0.8  |      | 4.0  | V             |
| $I_{BUSIN}$  | $V_{BUS}$ Input Leakage   | $V_{BUS}=0\text{ V to }0.8\text{ V}$   |      |      | 3    | $\mu\text{A}$ |
| $I_{VBUSACT}$  | $V_{BUS}$ Active Mode Average Current   | USB Path Active, USB Switch Closed After Charger Detection   |      |      | 250  | $\mu\text{A}$ |
| $t_{OUT}$  | Time from $V_{BUS}$ Valid Asserted to CHG_DET, CHG_AL_N and SW_OPEN Outputs Valid for BC1.2 Standard Accessory Detection (SDP, DCP, or CDP) | DP_CON Pulled Down to GND with 15 k $\Omega$ ; All Voltages Forced on $V_{BUS}$ , DP_CON, DM_CON, and GND simultaneously |      |      | 250  | ms            |
| <b>Switch Characteristics</b>  |   |  |      |      |      |               |
| $I_{OFF}$  | Power Off Leakage Current   | USB Path $V_{BUS}=0\text{ V}$ , $V_{SW}=0\text{ V}$ or 3.6 V, Figure 4   |      |      | 10   | $\mu\text{A}$ |
| $R_{ONUSB}$  | High-Speed USB Range Switch On Resistance <sup>(4)</sup>  | $V_{DP\_CON} / V_{DM\_CON}=0\text{ V}$ , 0.4 V; $I_{ON}=8\text{ mA}$ ; Figure 3; $V_{BUS}=4\text{ V to }6\text{ V}$      |      | 4.5  | 6.0  | $\Omega$      |
| <b>Control Input</b>   |   |  |      |      |      |               |
| $V_{IH}$   | Input HIGH Voltage (GOOD_BAT)   |  | 1.1  |      |      | V             |
| $V_{IL}$   | Input LOW Voltage (GOOD_BAT)  |  |      |      | 0.5  | V             |
| $R_{PD}$   | Pull-Down Resistance (GOOD_BAT)   |  | 1    |      |      | M $\Omega$    |
| $I_{IN}$   | Input Leakage Current (GOOD_BAT)  | $V_{BUS}=5\text{ V}$ , GOOD_BAT=0 V to 4.4 V   |      |      | 10   | $\mu\text{A}$ |
| $I_{IOFF}$   | Off-State Leakage Current (GOOD_BAT)  | $V_{BUS}=0\text{ V}$ , GOOD_BAT=0 V to 4.4 V   |      |      | 10   | $\mu\text{A}$ |
| $t_{DBP}$  | Dead Battery Provision (DBP) Timer  |  | 15   | 30   | 45   | min           |
| $t_{GB}$   | Time from GOOD_BAT Asserted to SW_OPEN De-Asserted, Switches Closed and Meet the $R_{ONUSB}$ Specification                                  |  |      |      | 30   | ms            |
| $t_{DB}$   | Time from GOOD_BAT De-asserted to SW_OPEN Asserted, Switches Opened   |  |      |      | 65   | ms            |
| <b>Battery Charger Detection Parameters from BC1.2 Specification</b> |   |  |      |      |      |               |
| $V_{DAT\_REF}$   | Data Detect Voltage   |  | 0.25 |      | 0.40 | V             |
| $V_{DM\_SRC}$  | D- Source Voltage <sup>(5)</sup>  |  | 0.5  |      | 0.7  | V             |
| $V_{DP\_SRC}$  | D+ Source Voltage <sup>(5)</sup>  |  | 0.5  |      | 0.7  | V             |
| $V_{LGC}$  | Logic Threshold   |  | 0.8  |      | 2.0  | V             |
| $I_{DM\_SINK}$   | D- Sink Current   |  | 25   |      | 175  | $\mu\text{A}$ |
| $I_{DP\_SINK}$   | D+ Sink Current   |  | 25   |      | 175  | $\mu\text{A}$ |
| $I_{DP\_SRC}$  | Data Contact Detect Current Source  |  | 7    |      | 13   | $\mu\text{A}$ |

Continued on the following page...

## DC Electrical Characteristics

Unless otherwise indicated,  $V_{BUS}=4\text{ V to }6\text{ V}$  and  $T_A=-40\text{ to }+85^\circ\text{C}$ . Typical values are at  $T_A=25^\circ\text{C}$  unless otherwise specified.

| Symbol           | Parameter                    | Condition | Min. | Typ. | Max. | Unit |
|------------------|------------------------------|-----------|------|------|------|------|
| $t_{DCD\_DBNC}$  | Data Contact Detect Debounce |           | 10   |      |      | ms   |
| $t_{DCD\_TOUT}$  | Time for DCD to Timeout      |           | 300  | 450  | 900  | ms   |
| $t_{VDPSRC\_ON}$ | D+ Voltage Source On Time    |           | 40   |      |      | ms   |
| $t_{VDMSRC\_ON}$ | D- Voltage Source On Time    |           | 40   |      |      | ms   |

### Notes:

- Guaranteed by characterization; not production tested.
- The voltage source,  $V_{DP\_SRC} / V_{DM\_SRC}$ , is able to source at least  $250\ \mu\text{A}$  when the output voltage is in the specified range. This voltage source should not pull  $DP\_CON / DM\_CON$  below  $2.2\text{ V}$  when  $DP\_CON / DM\_CON$  is pulled to a voltage of  $3.0\text{ V}$  minimum or  $3.6\text{ V}$  maximum with a resistance of  $900\ \Omega$  minimum or  $1575\ \Omega$  maximum.

## AC Electrical Characteristics

Unless otherwise specified, values are at  $T_A=-40\text{ to }+85^\circ\text{C}$ ; all typical values are for  $V_{CC}=3.3\text{ V}$  at  $T_A=25^\circ\text{C}$ .

| Symbol    | Parameter  | Condition   | Min. | Typ. | Max. | Unit | Figure   |
|-----------|--|---|------|------|------|------|----------|
| Xtalk     | Active Channel Crosstalk, $DP\_COM$ to $DM\_CON^{(6)}$                                 | $F=1\text{ MHz}$ , $R_T=50\ \Omega$ , $C_L=0\text{ pF}$   |      | -78  |      | dB   | Figure 6 |
|           |  | $F=240\text{ MHz}$ , $R_T=50\ \Omega$ , $C_L=0\text{ pF}$ |      | -36  |      |      |          |
| $O_{IRR}$ | Off Isolation Rejection Ratio, $DM\_HOST$ to $DM\_CON$ , $DP\_HOST$ to $DP\_CON^{(6)}$ | $f=1\text{ MHz}$ , $R_T=50\ \Omega$ , $C_L=0\text{ pF}$   |      | -84  |      | dB   | Figure 5 |
|           |  | $f=240\text{ MHz}$ , $R_T=50\ \Omega$ , $C_L=0\text{ pF}$ |      | -34  |      |      |          |
| BW        | Bandwidth of Switch <sup>(6)</sup>   | $R_T=50\ \Omega$  |      | 1.5  |      | GHz  | Figure 5 |

### Note:

- Guaranteed by characterization; not production tested.

## Capacitance

Unless otherwise specified, values are at  $T_A=-40\text{ to }+85^\circ\text{C}$ .

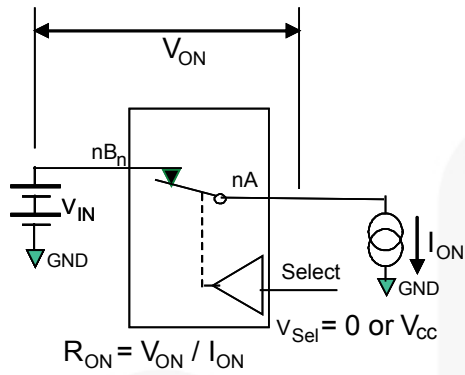
| Symbol    | Parameter  | Condition                                  | Typical | Unit | Figure   |
|-----------|--|--|---------|------|----------|
| $C_{OFF}$ | $DP\_CON$ , $DM\_CON$ Off Capacitance <sup>(7)</sup> | $V_{BIAS}=0.2\text{ V}$ , $f=1\text{ MHz}$ | 3.2     | pF   | Figure 7 |
| $C_{ON}$  | $DP\_CON$ , $DM\_CON$ On Capacitance <sup>(7)</sup>  | $V_{BIAS}=0.2\text{ V}$ , $f=1\text{ MHz}$ | 5.8     | pF   | Figure 8 |

### Note:

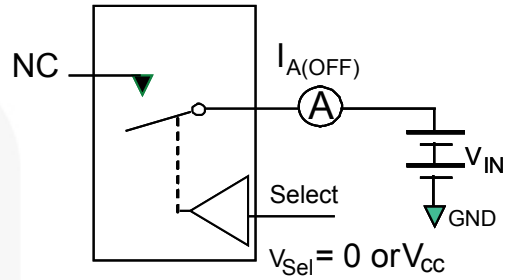
- Guaranteed by characterization; not production tested.



**Test Diagrams**

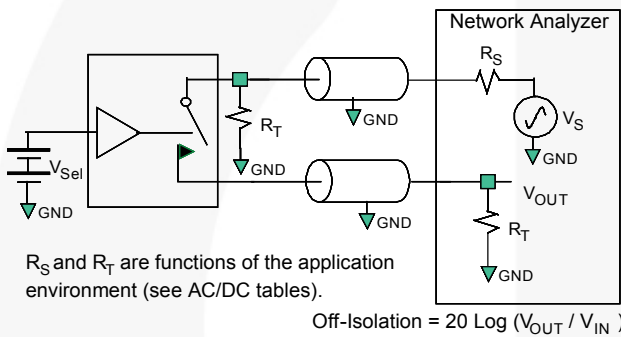


**Figure 3. On Resistance**

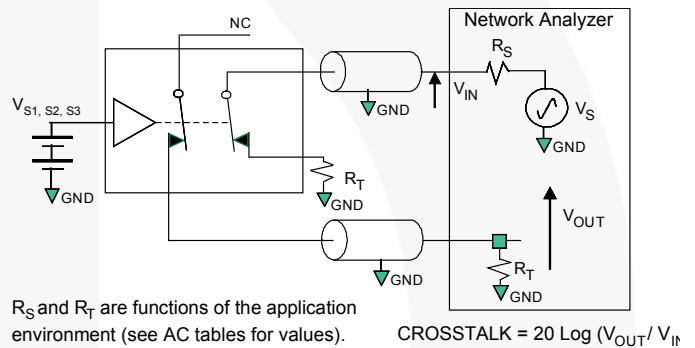


\*\*Each switch port is tested separately.

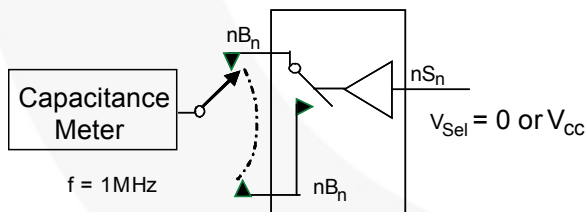
**Figure 4. Off Leakage**



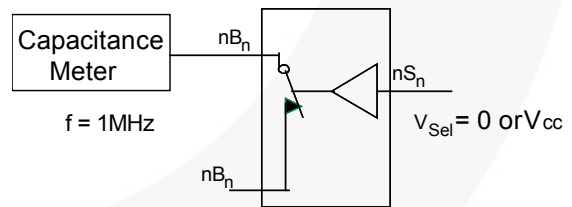
**Figure 5. Channel Off Isolation**



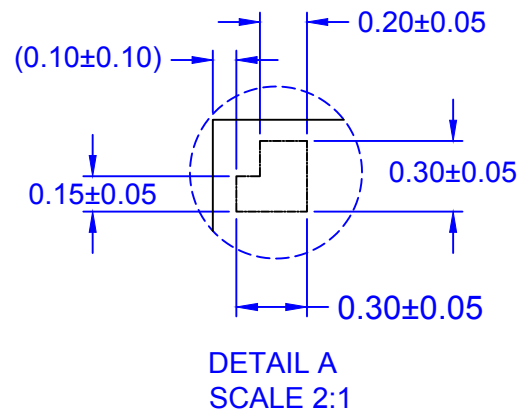
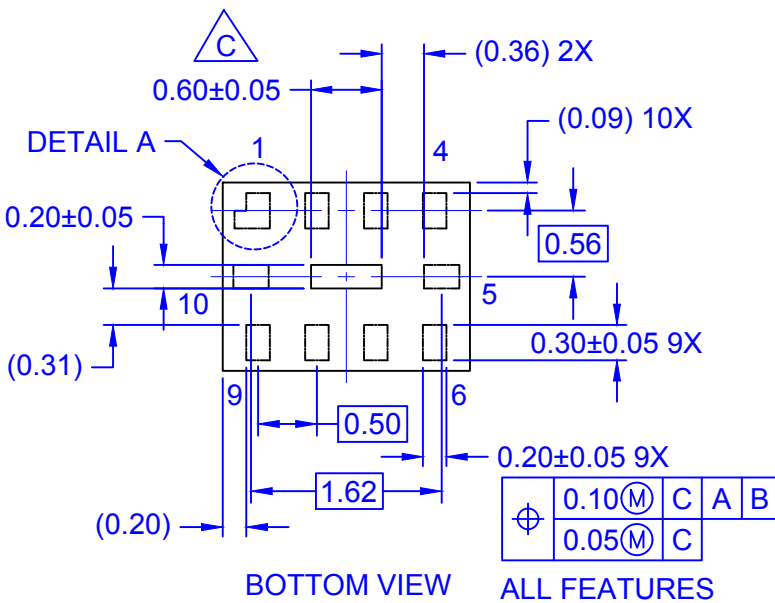
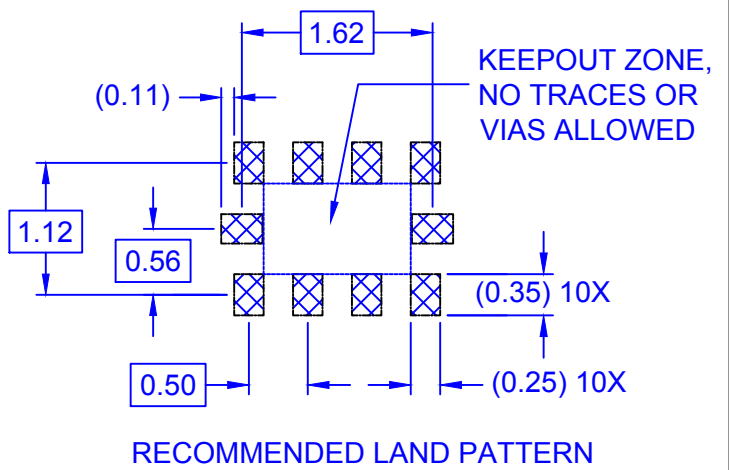
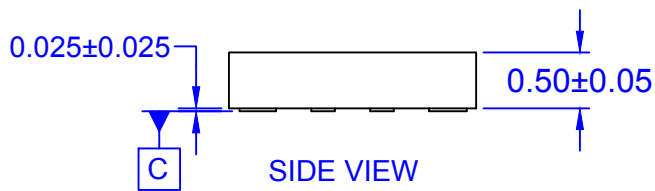
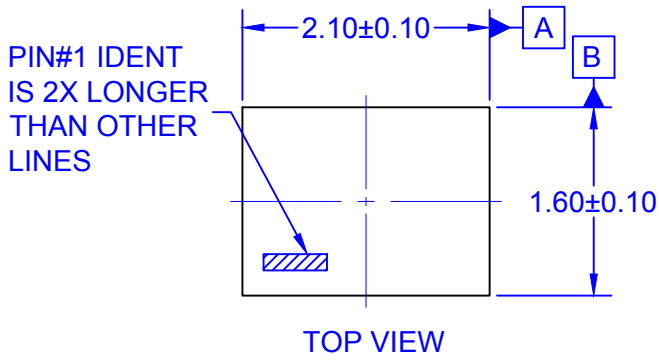
**Figure 6. Active Channel Crosstalk**



**Figure 7. Channel Off Capacitance**



**Figure 8. Channel On Capacitance**



NOTES:

- A. PACKAGE CONFORMS TO JEDEC REGISTRATION MO-255, VARIATION UABD.
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. PRESENCE OF CENTER PAD IS PACKAGE SUPPLIER DEPENDENT. IF PRESENT IT IS NOT INTENDED TO BE SOLDERED AND HAS A BLACK OXIDE FINISH.
- D. DRAWING FILENAME: MKT-MAC10ArevG.
- E. DIMENSIONS WITHIN ( ) ARE UNCONTROLLED.

ON Semiconductor



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](http://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](mailto: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](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>  
For additional information, please contact your local  
Sales Representative

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[ON Semiconductor:](#)

[FSA832L10X](#)



**Стандарт  
Электрон  
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

**Наши контакты:**

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331