

# 2:1 MIPI D-PHY (1.5 Gbps) 4 Data Lane Switch

## FSA634

### Description

The FSA634 is configured as a 4 data lane, MIPI D-PHY switch. This single pole double throw (SPDT) switch is optimized for switching between two high speed or low power MIPI sources. The FSA634 is designed for the MIPI specification and allows connection to a CSI or DSI module.

### Features

- Switch Type: SPDT (10x)
- Signal Type: MIPI, D-PHY
- $V_{CC}$ : 1.65 to 4.5 V
- Input Signal: 0 V to  $V_{CC}$
- $R_{ON}$ :
  - ◆ 5  $\Omega$  Typical HS MIPI
  - ◆ 5  $\Omega$  Typical LP MIPI
- $\Delta R_{ON}$ : 0.1  $\Omega$  Typical
- $R_{ON\_FLAT}$ : 0.06  $\Omega$  Typical
- $I_{CCZ}$ : 0.5  $\mu$ A Maximum
- $I_{CC}$ : 32  $\mu$ A Maximum
- $O_{IRR}$ : -30 dB Typical
- Bandwidth: 1.9 GHz Typical
- Xtalk: -38 dB Typical
- $C_{ON}$ : 4.3 pF Typical
- Skew: 3 ps Typical

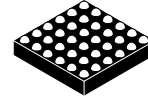
### Applications

- Cellular Phones, Smart Phones
- Tablets
- Laptops
- Displays



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(Bottom View)

**WLCSP36,  
2.06x2.06x0.432  
CASE 567XU**

### MARKING DIAGRAM



VJ = Specific Device Code  
KK = Assembly Lot  
X = Year  
Y = Work Week  
Z = Assembly Location

### ORDERING INFORMATION

See detailed ordering and shipping information on page 7 of this data sheet.

# FSA634

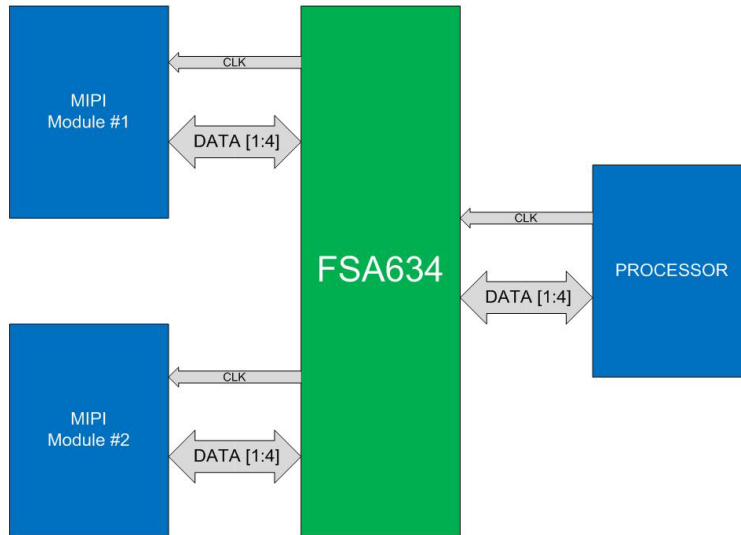
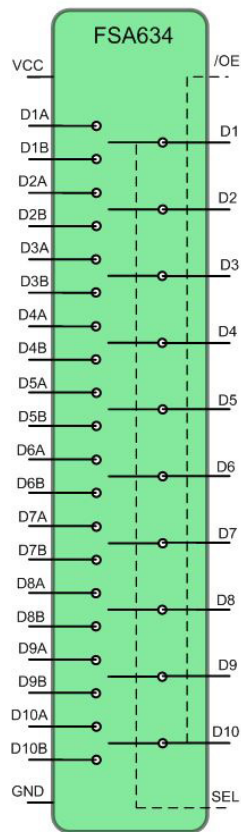


Figure 1. Typical Application

## PIN DESCRIPTIONS



PIN NAME	DESCRIPTION		
Dn	Common Data Path		
DnA	Data Path A		
DnB	Data Path B		
/OE	Output Enable		
SEL	Control Pin	SEL=0	$\underline{Dn} = \underline{DnA}$
		SEL=1	$\underline{Dn} = \underline{DnB}$
VCC	Power		
GND	Ground		
NC	No Connect		

Figure 2. Analog Symbol

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## PIN DEFINITIONS

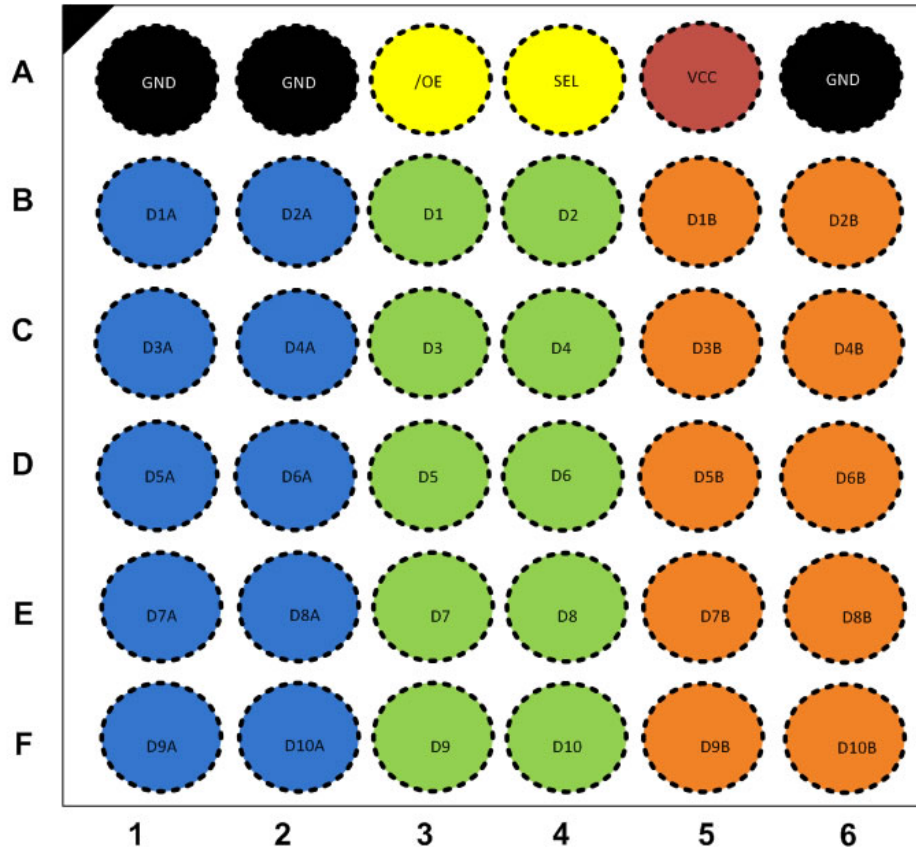


Figure 3. Top Through View

Table 1. BALL-TO-PIN MAPPINGS

Ball	Pin Name	Ball	Pin Name	Ball	Pin Name
A1	GND	C1	D3A	E1	D7A
A2	GND	C2	D4A	E2	D8A
A3	/OE	C3	D3	E3	D7
A4	SEL	C4	D4	E4	D8
A5	V <sub>CC</sub>	C5	D3B	E5	D7B
A6	GND	C6	D4B	E6	D8B
B1	D1A	D1	D5A	F1	D9A
B2	D2A	D2	D6A	F2	D10A
B3	D1	D3	D5	F3	D9
B4	D2	D4	D6	F4	D10
B5	D1B	D5	D5B	F5	D9B
B6	D2B	D6	D6B	F6	D10B

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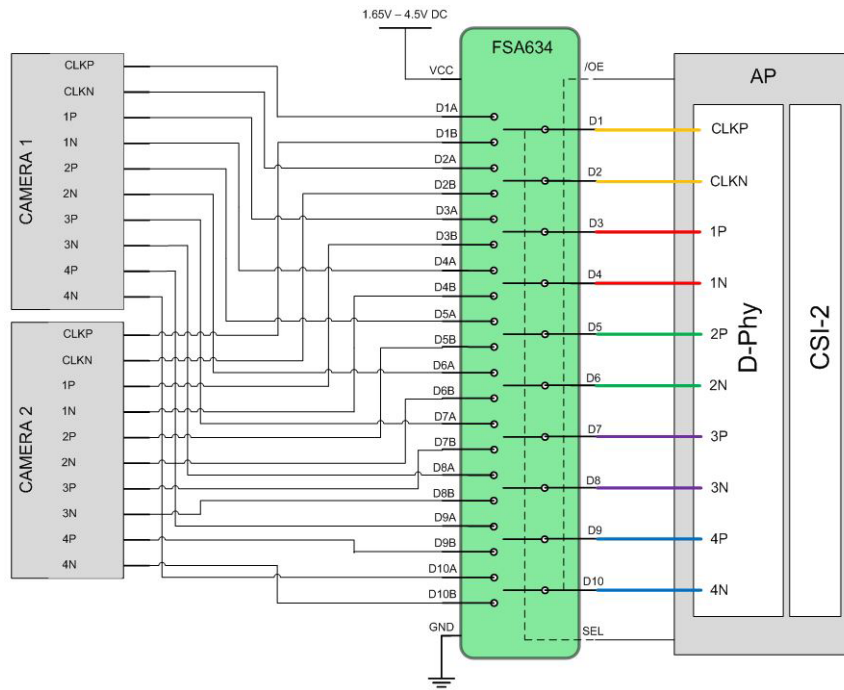


Figure 4. Suggested Configuration for 4 Lane D-PHY

## TRUTH TABLE

SEL	/OE	Function
LOW	LOW	Dn = DnA
HIGH	LOW	Dn = DnB
X	HIGH	All Ports High Impedance

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Unit
V <sub>CC</sub>	Supply Voltage	-0.5	5.25	V
V <sub>CNTRL</sub>	DC Input Voltage (/OE, SEL)	-0.5	V <sub>CC</sub>	V
V <sub>SW</sub>	DC Switch I/O Voltage	-0.3	V <sub>CC</sub>	V
I <sub>IK</sub>	DC Input Diode Current	-50		mA
I <sub>OUT</sub>	DC Output Current		50	mA
T <sub>STG</sub>	Storage Temperature	-65	+150	°C
ESD	Human Body Model, JEDEC: JESD22-A114	All Pins		kV
	Charged Device Model, JEDEC: JESD22-C101	1.5		

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. The input and output negative ratings may be exceeded if the input and output diode current ratings are observed.
2. V<sub>SW</sub> refers to analog data switch paths.

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## RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit	
$V_{CC}$	Supply Voltage	1.65	4.50	V	
$V_{CNTRL}$	Control Input Voltage (SEL, /OE) (Note 3)	0	$V_{CC}$	V	
$V_{SW}$	Switch I/O Voltage (Dn, DAn, DBn)	HS Mode	0	0.425	V
		LP Mode	0	1.3	V
$T_A$	Operating Temperature	-40	+85	°C	

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

3. The control inputs must be held HIGH or LOW; they must not float.

## ELECTRICAL SPECIFICATION TABLE Typical values are at $T_A = 25^\circ\text{C}$ , $V_{CC} = 3.3\text{ V}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
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### DC ELECTRICAL PARAMETERS

$V_{IK}$	Clamp Diode Voltage	$I_{IN} = -18\text{ mA}$ , $V_{CC} = 1.8\text{ V}$			-1.2	V
$V_{IH}$	Input Voltage High	$V_{CC} = 1.65\text{ V to } 4.50\text{ V}$	1.0			V
$V_{IL}$	Input Voltage Low	$V_{CC} = 1.65\text{ V to } 4.50\text{ V}$			0.4	V
$I_{IN}$	Control Input Leakage (SEL, /OE)	$V_{SW} = 0\text{ V to } V_{CC}$ , $V_{CC} = 1.65\text{ V to } 4.50\text{ V}$	-500		500	nA
$I_{NO(OFF)}$ , $I_{NC(OFF)}$	Off Leakage Current of Port Dn, DnA, DnB	Dn = 0.3 V to $V_{CC} - 0.3\text{ V}$ ; DnA or DnB = Floating, 0.3 V, or $V_{CC} - 0.3\text{ V}$ ; /OE = 0 V; $V_{CC} = 1.65\text{ V to } 4.5\text{ V}$	-500		500	nA
$I_{A(ON)}$	On Leakage Current of Common Ports (Dn)	Dn = 0.3 V to $V_{CC} - 0.3\text{ V}$ ; DnA or DnB = Floating, 0.3 V, or $V_{CC} - 0.3\text{ V}$ ; /OE = 0 V; $V_{CC} = 1.65\text{ V to } 4.5\text{ V}$	-500		500	nA
$I_{OFF}$	Power-Off Leakage Current	Dn, DnA or DnB; $V_{IN} = 0\text{ V to } 4.5\text{ V}$ ; $V_{CC} = 0\text{ V}$	-500		500	nA
IOZ	Off-State Leakage	$0 \leq \text{Dn, DnA, DnB} \leq 3.6\text{ V}$ , /OE = High, $V_{CC} = 4.5\text{ V}$	-500		500	nA
$R_{ON\_MIPI\_HS\_1p8}$	Switch On Resistance for HS MIPI Applications (Note 5)	$I_{ON} = -10\text{ mA}$ , /OE = 0 V, SEL = $V_{CC}$ or 0 V, DnA or DnB = 0.1 V, 0.2 V, 0.3 V, $V_{CC} = 1.8\text{ V}$		5	12	$\Omega$
$R_{ON\_MIPI\_HS\_2p5}$		$I_{ON} = -10\text{ mA}$ , /OE = 0 V, SEL = $V_{CC}$ or 0 V, DnA or DnB = 0.1 V, 0.2 V, 0.3 V, $V_{CC} = 2.5\text{ V}$		5	9	$\Omega$
$R_{ON\_MIPI\_HS\_3p6}$		$I_{ON} = -10\text{ mA}$ , /OE = 0 V, SEL = $V_{CC}$ or 0 V, DnA or DnB = 0.1 V, 0.2 V, 0.3 V, $V_{CC} = 3.6\text{ V}$		5	9	$\Omega$
$R_{ON\_MIPI\_HS\_4p5}$		$I_{ON} = -10\text{ mA}$ , /OE = 0 V, SEL = $V_{CC}$ or 0 V, DnA or DnB = 0.1 V, 0.2 V, 0.3 V, $V_{CC} = 4.5\text{ V}$		5	9	$\Omega$
$R_{ON\_MIPI\_LP\_1p8}$	Switch On Resistance for LP MIPI Applications (Note 5)	$I_{ON} = -10\text{ mA}$ , /OE = 0 V, SEL = $V_{CC}$ or 0 V, DnA or DnB = 0 V, 0.6 V, 1.2 V, $V_{CC} = 1.8\text{ V}$		5	12	$\Omega$
$R_{ON\_MIPI\_LP\_2p5}$		$I_{ON} = -10\text{ mA}$ , /OE = 0 V, SEL = $V_{CC}$ or 0 V, DnA or DnB = 0 V, 0.6 V, 1.2 V, $V_{CC} = 2.5\text{ V}$		5	9	$\Omega$
$R_{ON\_MIPI\_LP\_3p6}$		$I_{ON} = -10\text{ mA}$ , /OE = 0 V, SEL = $V_{CC}$ or 0 V, DnA or DnB = 0 V, 0.6 V, 1.2 V, $V_{CC} = 3.6\text{ V}$		5	9	$\Omega$
$R_{ON\_MIPI\_LP\_4p5}$		$I_{ON} = -10\text{ mA}$ , /OE = 0 V, SEL = $V_{CC}$ or 0 V, DnA or DnB = 0 V, 0.6 V, 1.2 V, $V_{CC} = 4.5\text{ V}$		5	9	$\Omega$

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**ELECTRICAL SPECIFICATION TABLE** Typical values are at  $T_A = 25^\circ\text{C}$ ,  $V_{CC} = 3.3\text{ V}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>DC ELECTRICAL PARAMETERS</b>						
$\Delta R_{ON\_MIPI\_HS\_1p8}$	On Resistance Matching Between HS MIPI Channels	$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.1\text{ V}$ , $0.2\text{ V}$ , $0.3\text{ V}$ , $V_{CC} = 1.8\text{ V}$		0.10		$\Omega$
$\Delta R_{ON\_MIPI\_HS\_2p5}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.1\text{ V}$ , $0.2\text{ V}$ , $0.3\text{ V}$ , $V_{CC} = 2.5\text{ V}$		0.10		$\Omega$
$\Delta R_{ON\_MIPI\_HS\_3p6}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.1\text{ V}$ , $0.2\text{ V}$ , $0.3\text{ V}$ , $V_{CC} = 3.6\text{ V}$		0.10		$\Omega$
$\Delta R_{ON\_MIPI\_HS\_4p5}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.1\text{ V}$ , $0.2\text{ V}$ , $0.3\text{ V}$ , $V_{CC} = 4.5\text{ V}$		0.10		$\Omega$
$\Delta R_{ON\_MIPI\_LP\_1p8}$	On Resistance Matching Between LP MIPI Channels	$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.0\text{ V}$ , $0.6\text{ V}$ , $1.2\text{ V}$ , $V_{CC} = 1.8\text{ V}$		0.12		$\Omega$
$\Delta R_{ON\_MIPI\_LP\_2p5}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.0\text{ V}$ , $0.6\text{ V}$ , $1.2\text{ V}$ , $V_{CC} = 2.5\text{ V}$		0.12		$\Omega$
$\Delta R_{ON\_MIPI\_LP\_3p6}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.0\text{ V}$ , $0.6\text{ V}$ , $1.2\text{ V}$ , $V_{CC} = 3.6\text{ V}$		0.12		$\Omega$
$\Delta R_{ON\_MIPI\_LP\_4p5}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.0\text{ V}$ , $0.6\text{ V}$ , $1.2\text{ V}$ , $V_{CC} = 4.5\text{ V}$		0.12		$\Omega$
$R_{ON\_FLAT\_MIPI\_HS\_1p8}$	On Resistance Flatness for HS MIPI Signals	$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.1\text{ V}$ , $0.2\text{ V}$ , $0.3\text{ V}$ , $V_{CC} = 1.8\text{ V}$		0.04		$\Omega$
$R_{ON\_FLAT\_MIPI\_HS\_2p5}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.1\text{ V}$ , $0.2\text{ V}$ , $0.3\text{ V}$ , $V_{CC} = 2.5\text{ V}$		0.06		$\Omega$
$R_{ON\_FLAT\_MIPI\_HS\_3p6}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.1\text{ V}$ , $0.2\text{ V}$ , $0.3\text{ V}$ , $V_{CC} = 3.6\text{ V}$		0.06		$\Omega$
$R_{ON\_FLAT\_MIPI\_HS\_4p5}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.1\text{ V}$ , $0.2\text{ V}$ , $0.3\text{ V}$ , $V_{CC} = 4.5\text{ V}$		0.06		$\Omega$
$R_{ON\_FLAT\_MIPI\_LP\_1p8}$	On Resistance Flatness for LP MIPI Signals	$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.0\text{ V}$ , $0.6\text{ V}$ , $1.2\text{ V}$ , $V_{CC} = 1.8\text{ V}$		0.18		$\Omega$
$R_{ON\_FLAT\_MIPI\_LP\_2p5}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.0\text{ V}$ , $0.6\text{ V}$ , $1.2\text{ V}$ , $V_{CC} = 2.5\text{ V}$		0.28		$\Omega$
$R_{ON\_FLAT\_MIPI\_LP\_3p6}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.0\text{ V}$ , $0.6\text{ V}$ , $1.2\text{ V}$ , $V_{CC} = 3.6\text{ V}$		0.28		$\Omega$
$R_{ON\_FLAT\_MIPI\_LP\_4p5}$		$I_{ON} = -10\text{ mA}$ , $/OE = 0\text{ V}$ , $SEL = V_{CC}$ or $0\text{ V}$ , $DnA$ or $DnB = 0.0\text{ V}$ , $0.6\text{ V}$ , $1.2\text{ V}$ , $V_{CC} = 4.5\text{ V}$		0.28		$\Omega$
$I_{CCZ}$	Quiescent Hi-Z Supply Current	$V_{IN} = 0\text{ V}$ or $V_{CC}$ , $I_{OUT} = 0\text{ A}$ , $V_{CC} = 4.5\text{ V}$			0.5	$\mu\text{A}$
$I_{CC}$	Quiescent Supply Current	$V_{IN} = 0$ or $V_{CC}$ , $I_{OUT} = 0\text{ A}$ , $V_{CC} = 2.5\text{ V}$ to $4.5\text{ V}$		16	32	$\mu\text{A}$
$I_{CC\_1p8}$		$V_{IN} = 0$ or $V_{CC}$ , $I_{OUT} = 0\text{ A}$ , $V_{CC} = 1.8\text{ V}$		15	25	$\mu\text{A}$
$I_{CCT\_4p5}$	Increase in $I_{CC}$ Current Per Control Voltage and $V_{CC}$	$V_{SEL} = 1.65\text{ V}$ , $/OE = 1.65\text{ V}$ , $V_{CC} = 4.5\text{ V}$			4	$\mu\text{A}$
$I_{CCT\_2p5}$		$V_{SEL} = 1.65\text{ V}$ , $/OE = 1.65\text{ V}$ , $V_{CC} = 2.5\text{ V}$			0.1	$\mu\text{A}$

## AC ELECTRICAL PARAMETERS

$t_{INIT}$	Initialization Time $V_{CC}$ to Output	$R_L = 50\ \Omega$ , $C_L = 5\text{ pF}$ , $V_{SW} = 1.2\text{ V}$ , $V_{CC} = 2.5\text{ V}$ to $4.5\text{ V}$			100	$\mu\text{s}$
$t_{INIT\_1p8}$		$R_L = 50\ \Omega$ , $C_L = 5\text{ pF}$ , $V_{SW} = 1.2\text{ V}$ , $V_{CC} = 1.8\text{ V}$			150	$\mu\text{s}$
$t_{EN}$	Enable Turn-On Time, $/OE$ to Output	$R_L = 50\ \Omega$ , $C_L = 5\text{ pF}$ , $V_{SW} = 1.2\text{ V}$ , $V_{CC} = 2.5\text{ V}$ to $4.5\text{ V}$		120	200	ns
$t_{EN\_1p8}$		$R_L = 50\ \Omega$ , $C_L = 5\text{ pF}$ , $V_{SW} = 1.2\text{ V}$ , $V_{CC} = 1.8\text{ V}$		250	500	ns
$t_{DIS}$	Disable Turn-Off Time, $/OE$ to Output	$R_L = 50\ \Omega$ , $C_L = 5\text{ pF}$ , $V_{SW} = 1.2\text{ V}$ , $V_{CC} = 2.5\text{ V}$ to $4.5\text{ V}$		25	50	ns
$t_{DIS\_1p8}$		$R_L = 50\ \Omega$ , $C_L = 5\text{ pF}$ , $V_{SW} = 1.2\text{ V}$ , $V_{CC} = 1.8\text{ V}$		50	90	ns

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**ELECTRICAL SPECIFICATION TABLE** Typical values are at  $T_A = 25^\circ\text{C}$ ,  $V_{CC} = 3.3\text{ V}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>AC ELECTRICAL PARAMETERS</b>						
$t_{ON}$	Turn-On Time, SEL to Output	$R_L = 50\ \Omega$ , $C_L = 5\ \text{pF}$ , $V_{SW} = 1.2\ \text{V}$ , $V_{CC} = 2.5\ \text{V}$ to $4.5\ \text{V}$ , SEL = H to L, SEL = L to H			200	ns
$t_{ON\_1p8}$		$R_L = 50\ \Omega$ , $C_L = 5\ \text{pF}$ , $V_{SW} = 1.2\ \text{V}$ , $V_{CC} = 1.8\ \text{V}$ , SEL = H to L, SEL = L to H			300	ns
$t_{OFF}$	Turn-Off Time SEL to Output	$R_L = 50\ \Omega$ , $C_L = 5\ \text{pF}$ , $V_{SW} = 1.2\ \text{V}$ , $V_{CC} = 2.5\ \text{V}$ to $4.5\ \text{V}$ , SEL = H to L, SEL = L to H			200	ns
$t_{OFF\_1p8}$		$R_L = 50\ \Omega$ , $C_L = 5\ \text{pF}$ , $V_{SW} = 1.2\ \text{V}$ , $V_{CC} = 1.8\ \text{V}$ , SEL = H to L, SEL = L to H			300	
$t_{BBM}$	Break-Before-Make Time	$R_L = 50\ \Omega$ , $C_L = 5\ \text{pF}$ , $V_{SW} = 1.2\ \text{V}$ , $V_{CC} = 1.65\ \text{V}$ to $4.5\ \text{V}$	10	50		ns
OIRR	Off Isolation for MIPI (Note 5)	$R_L = 50\ \Omega$ , $f = 750\ \text{MHz}$ , $/OE = V_{CC}$ , $V_{SW} = -1\ \text{dBm}$ (200 mV <sub>PP</sub> ), $V_{CC} = 1.65\ \text{V}$ to $4.5\ \text{V}$		-30		dB
XTALK	Crosstalk for MIPI (Note 5)	$R_L = 50\ \Omega$ , $f = 750\ \text{MHz}$ , $V_{SW} = -1\ \text{dBm}$ (200 mV <sub>PP</sub> ), $V_{CC} = 1.65\ \text{V}$ to $4.5\ \text{V}$		-38		dB
BW	Bandwidth at -3dB (Note 5)	$R_L = 50\ \Omega$ , $C_L = 0\ \text{pF}$ , $V_{CC} = 3\ \text{V}$		1.9		GHz
$t_{SK(O)}$	Channel-to-Channel Single-Ended Skew (Note 5)	TDR-Based Method ( $V_{SW} = 0.2\ V_{PP}$ , $C_L = C_{ON}$ ), $V_{CC} = 3.3\ \text{V}$		3	20	ps
$t_{SK(P)}$	Skew of Opposite Transitions of the Same Output (Note 5)	TDR-Based Method ( $V_{SW} = 0.2\ V_{PP}$ , $C_L = C_{ON}$ ), $V_{CC} = 3.3\ \text{V}$		3	20	ps

## CAPACITANCE

$C_{IN}$	Control Pin Input Capacitance (Note 5)	$V_{CC} = 0\ \text{V}$ , $f = 1\ \text{MHz}$		2.7		pF
$C_{ON}$	Out On Capacitance (Note 5)	$V_{CC} = 3.3\ \text{V}$ , $/OE = 0\ \text{V}$ , $f = 1\ \text{MHz}$		4.3		pF
$C_{OFF}$	Out Off Capacitance (Note 5)	$V_{CC}$ and $/OE = 3.3\ \text{V}$ , $f = 1\ \text{MHz}$		1.9		pF

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

NOTE: Guarantee Levels:

- Guaranteed by Design. Characterized on the ATE or Bench.
- Guaranteed by Design and Characterization, not Production Tested.

The table below pertains to the Packaging information on the following page.

## ORDERING INFORMATION

Part Number	Operating Temperature Range	Package	Top Mark
FSA634UCX	-40 to +85°C	36-Ball WLCSP, Non-JEDEC 2.06 x 2.06 mm, 0.35 mm Pitch	VJ

# MECHANICAL CASE OUTLINE

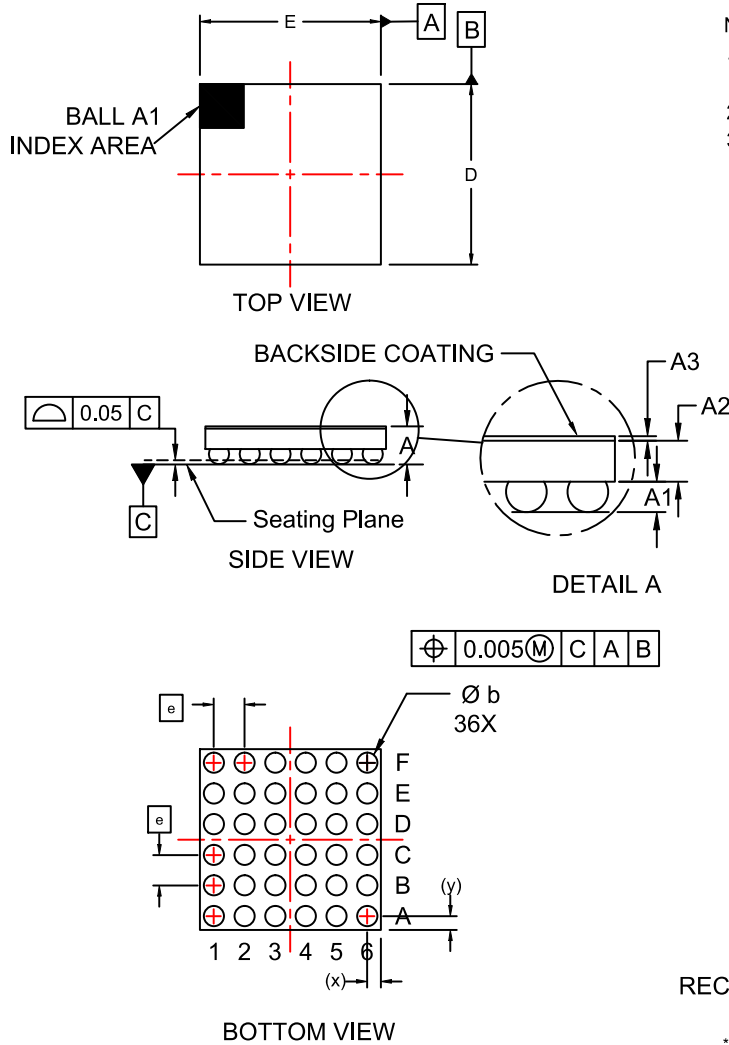
## PACKAGE DIMENSIONS

ON Semiconductor®



**WLCSP36 2.06x2.06x0.432**  
CASE 567XU  
ISSUE O

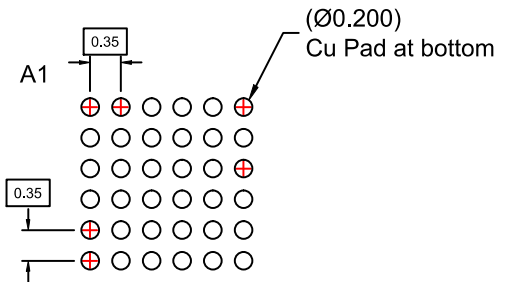
DATE 26 APR 2019



**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DATUM C APPLIES TO THE SPHERICAL CROWN OF THE SOLDER BALLS

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.391	0.432	0.473
A1	0.154	0.174	0.194
A2	0.215	0.233	0.251
A3	0.022	0.025	0.028
b	0.211	0.231	0.251
D	2.03	2.06	2.09
E	2.03	2.06	2.09
e	0.35 BSC		
x	0.140	0.155	0.170
y	0.140	0.155	0.170



**RECOMMENDED MOUNTING FOOTPRINT\*  
(NSMD PAD TYPE)**

\*FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

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<b>DESCRIPTION:</b>	<b>WLCSP36 2.06x2.06x0.432</b>	<b>PAGE 1 OF 1</b>

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