



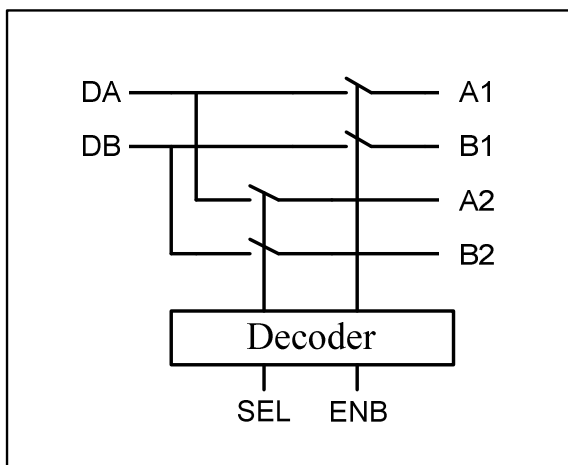
Features

- USB 2.0 compliant (high speed and full speed)
- VDD Supply range : 2.8V to 5V
- Channel On Capacitance : 6.5pF
- Low On-Resistance : 4.5Ω at VDD = 3V
- High Off-Isolation : -36dB at 480Mbps
- Low Crosstalk : -32dB at 480Mbps
- Wide Bandwidth > 800MHz at -3dB
- **System Level ESD Protection Exceeds 8kV (direct contact) for Analog Signal I/O Pin**
- 10-pin QFN Package 1.3mm x 1.6mm (Green Part)

Applications

- Routes Signal for USB 2.0
- Portable Instrumentation

Block Diagram



Truth Table

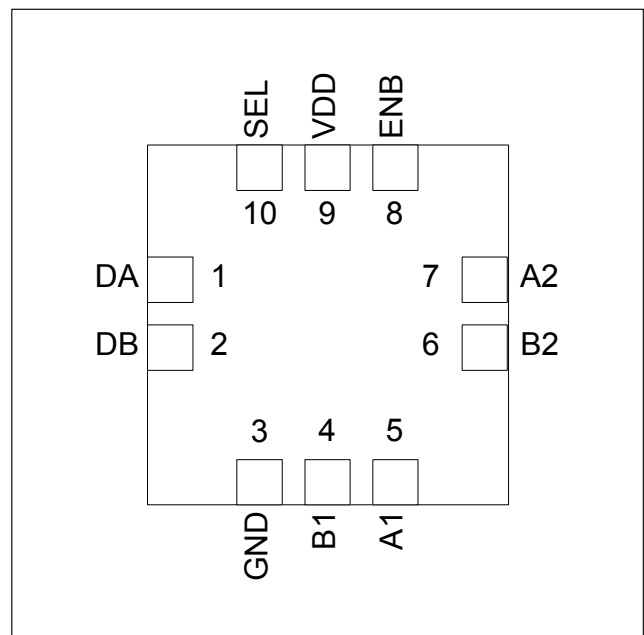
SEL	ENB	DA	DB
X	H	Hi-Z	Hi-Z
L	L	A1	B1
H	L	A2	B2

Description

The AZAW2210F is a differential channel 2:1 multiplexer/demultiplexer switch designed for the application of high speed USB 2.0. The wide bandwidth of this switch allows signals to pass with minimum distortion. The device multiplexes differential outputs from a USB host device to one of two corresponding outputs. It is bidirectional and designed for low bit-to-bit skew, high channel-to-channel noise isolation.

The AZAW2210F is integrated with ESD protection of system level up to +/- 8KV and offers a high-performance, low-cost solution for the switching of high-speed USB2.0 signals.

Pin Configuration



Pin Description

Pin Name	Description
A1, A2, B1, B2	Analog Data I/O
DA, DB	Analog Data I/O
ENB, SEL	Logic Control
VDD	Power
GND	Ground



Absolute Maximum Ratings

Storage Temperature.....	-65°C to +150°C
Supply Voltage to Ground Potential.....	-0.5V to +7.0V
DC Input Voltage.....	-0.5V to +7.0V
DC Output Current.....	120mA
Power Dissipation.....	0.5W

Electrostatic Discharge

	Test Conditions	Level
System Level *(1)	Direct contact @ analog data I/O	+/- 8kV
Component Level *(2)	HBM @ all pin	+/- 8kV
	MM @ all pin	+/- 800V
	CDM @ all pin	+/- 1KV

*(1) Tested in accordance with IEC61000-4-2

*(2) Tested in accordance with JEDEC Standard 22

DC Electrical Characteristics (T_A = -40°C to +85°C, VDD = 2.8V to 5V)

Parameters	Description	Test Conditions	Min.	Typ. ⁽¹⁾	Max.	Units
VDD	Supply Power		2.8		5	V
IS	Power Supply Current	VDD = 5V			1	μA
Vswitch	Analog Signal Range		0	-	VDD	V
VH	Input HIGH Voltage	VDD = 5V	2	-	-	V
		VDD = 3.3V	1.6			V
VL	Input LOW Voltage	VDD = 3.3V or 5V	-0.5	-	0.8	V
IH	Input HIGH Current	VDD = 5V., VIN = VDD	-	-	±1	μA
IL	Input LOW Current	VDD = 5V., VIN = GND	-	-	±1	μA
ILK	I/O Leakage Current	VDD = 5V, Vinput = 0 to 5V, switch = off, ENB =HIGH	-	-	±1	μA
Ron	ON-Resistance	VDD = 3V, Vinput = -0.4V to 1.0V, Ion = -40mA	-	4.5	7.5	Ω
ΔRon	Match Between Channels	VDD = 3V, Vinput = -0.4V to 1.0V, Ion = -40mA	-	0.3	-	Ω
Rflat	Ron Flatness	VDD = 3V, Vinput = -0.4V to 1.0V, Ion = -40mA	-	1.8	-	Ω

*(1). VDD=3.3V, T_A=25°C ambient and maximum loading. (unless otherwise mentioned)



Dynamic Characteristics ($T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$, $V_{DD} = 3.3\text{V}$)

Parameters	Description	Test Conditions	Min.	Typ. ⁽¹⁾	Max.	Units
t_{pd}	Propagation Delay	$R_L = 50\Omega$, $C_L = 10\text{pF}^{(2)}$, see Fig. 1		0.25		ns
t_{ON}	Turn On Time – SEL, ENB	$R_L = 50\Omega$, $C_L = 10\text{pF}^{(2)}$, see Fig. 2	-	4	-	ns
t_{OFF}	Turn OFF Time – SEL, ENB	$R_L = 50\Omega$, $C_L = 10\text{pF}^{(2)}$, see Fig. 2	-	4	-	ns
$C_{(ON)}$	Capacitance, switch ON	$V_{IN} = 0\text{V}$, $f = 1\text{MHz}$	-	6.5	-	pF
BW	-3dB Bandwidth	see Fig. 3	-	800	-	MHz
Q_{IRR}	Off Isolation	240MHz, see Fig. 4	-	-36	-	dB
X_{TALK}	Crosstalk	240MHz, see Fig. 5	-	-32	-	dB

*(1). $V_{DD}=3.3\text{V}$, $T_A=25^\circ\text{C}$ ambient and maximum loading. (unless otherwise mentioned)

*(2). C_L includes probe and jig capacitance.

*(3). All input pulses are supplied by generators having the following characteristics : $Z_o = 50\Omega$, $t_r \leq 8\text{ns}$, $t_f \leq 8\text{ns}$.

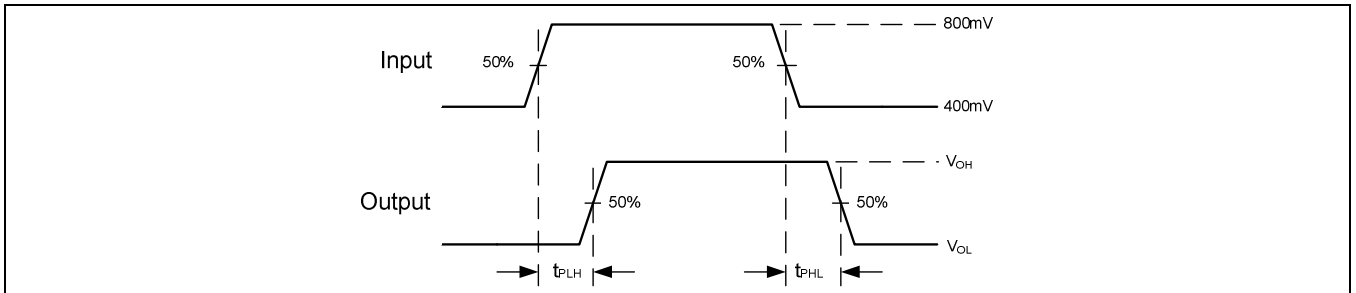


Fig. 1 Propagation Delay

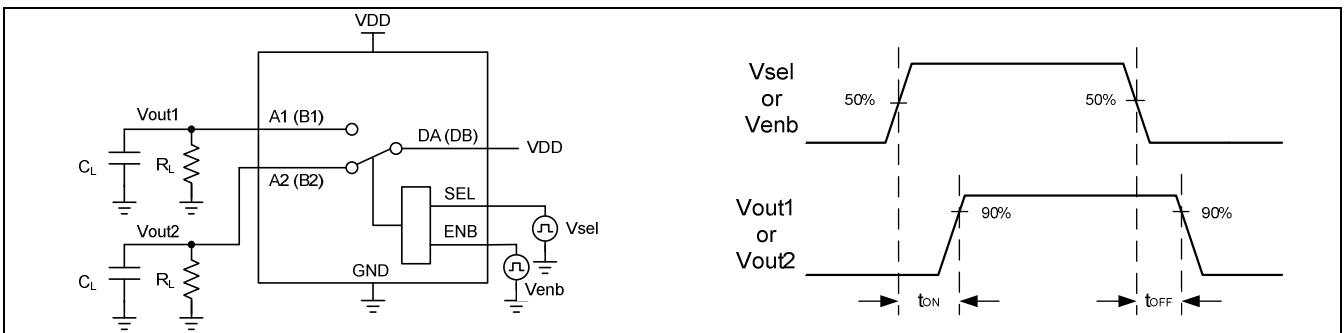


Fig. 2 Switching Time

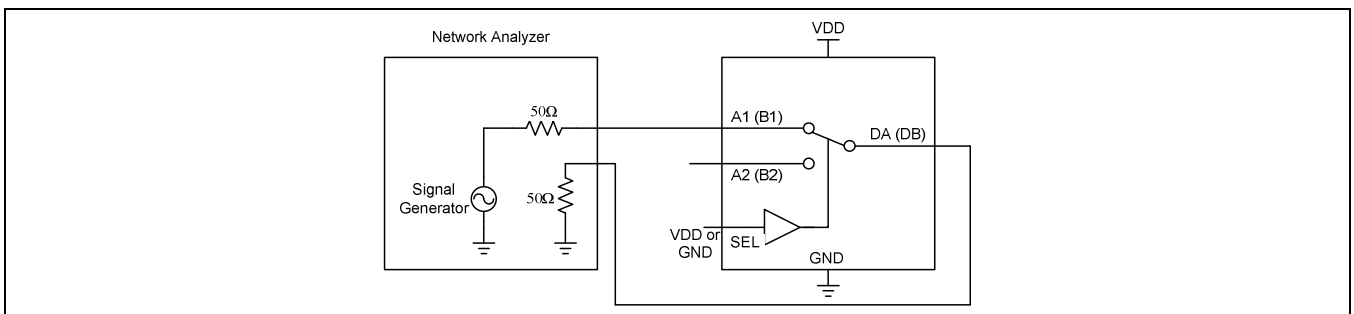


Fig. 3 Bandwidth

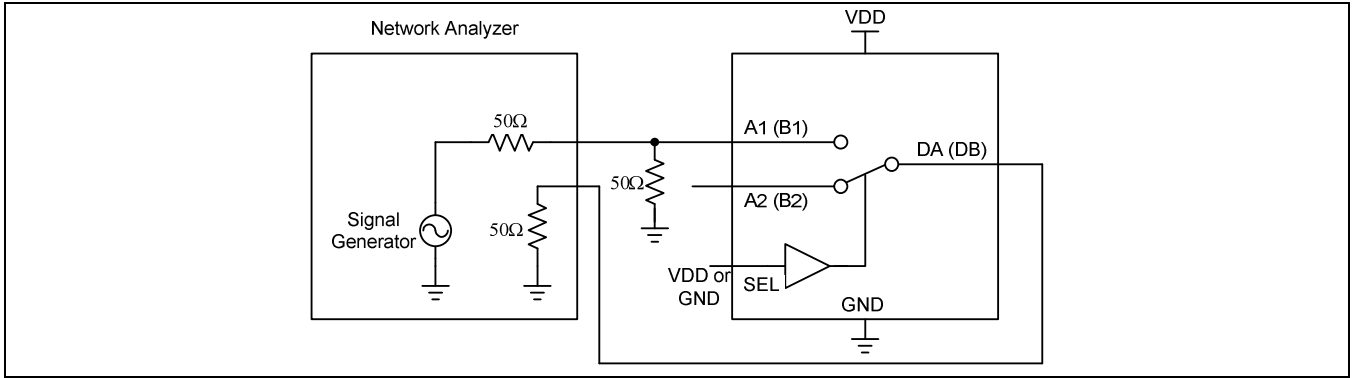


Fig. 4 Off Isolation

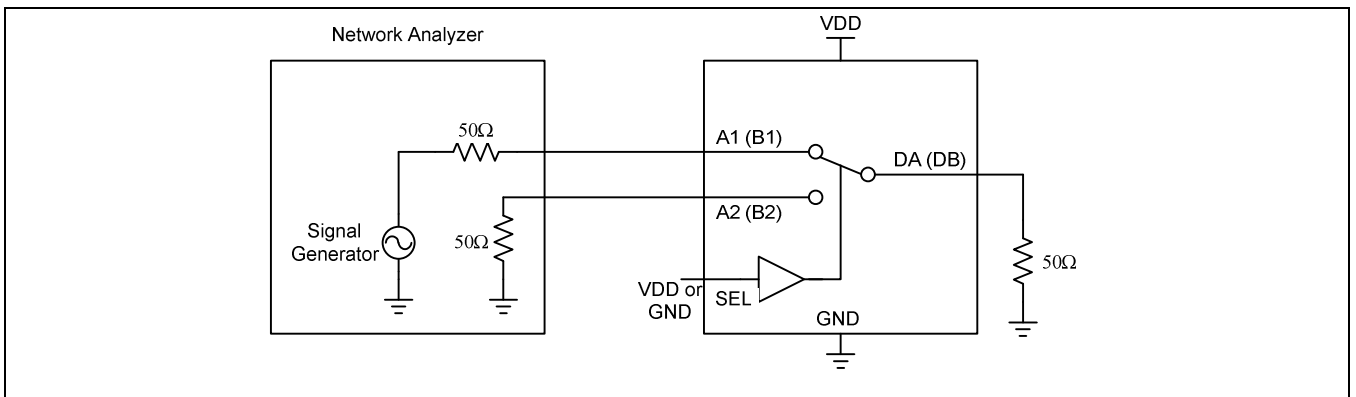


Fig. 5 Crosstalk

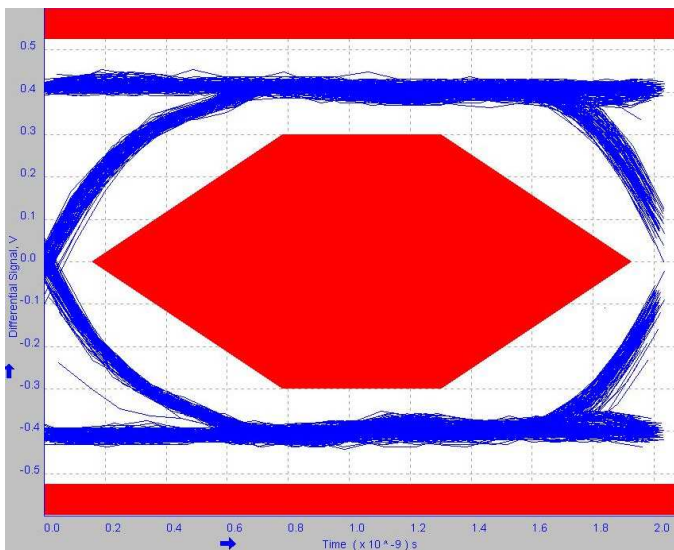


Fig. 6 Eye Pattern: 480-Mbps USB Signal With No Switch (Through Path)

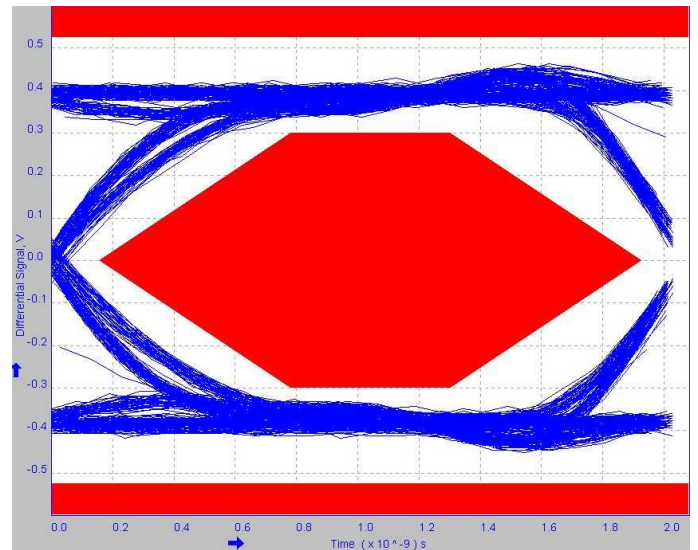
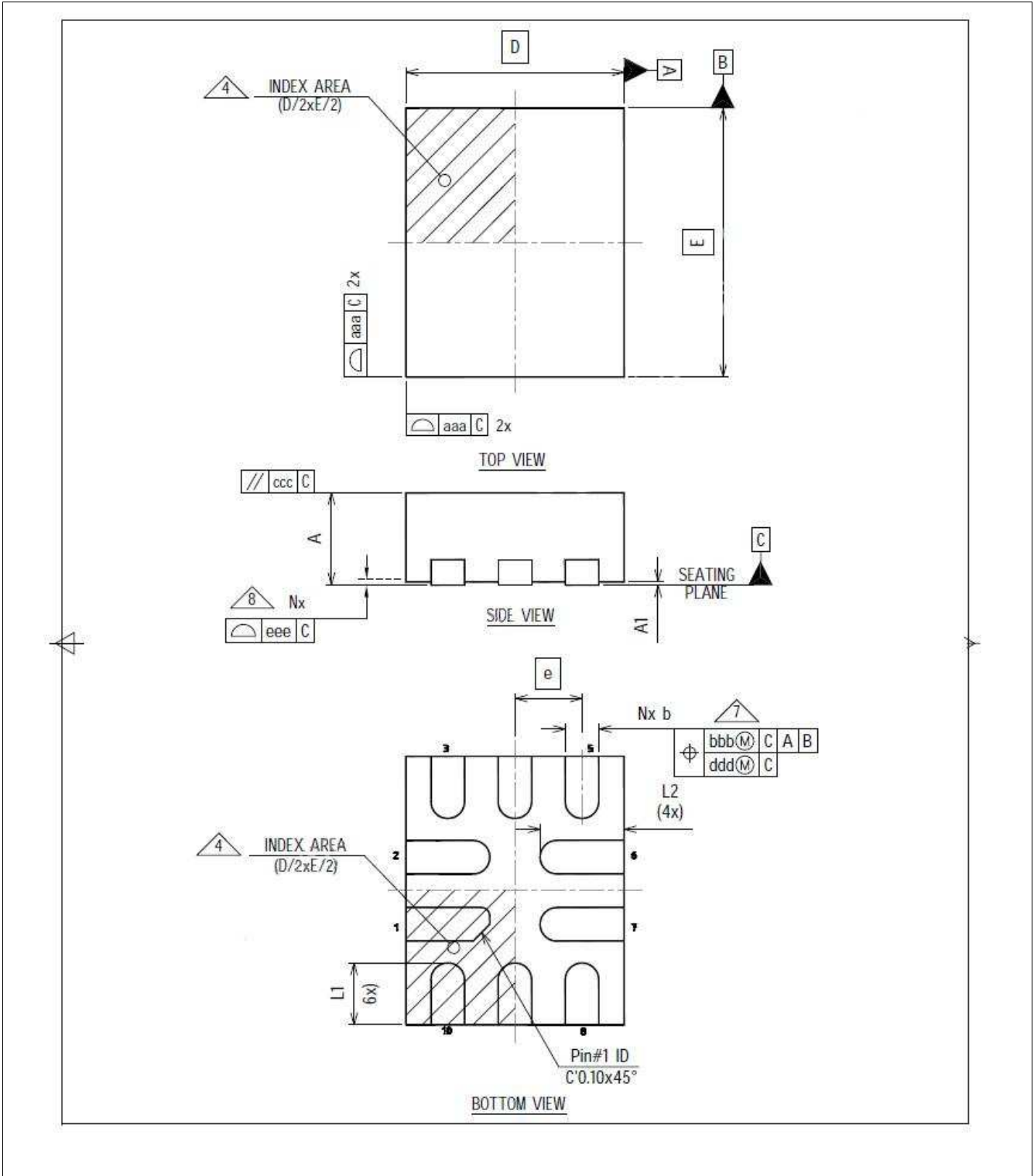


Fig. 7 Eye Pattern: 480-Mbps USB Signal With Switch



Mechanical Details
10-pin QFN 1.3mm x 1.6mm
PACKAGE DIAGRAMS



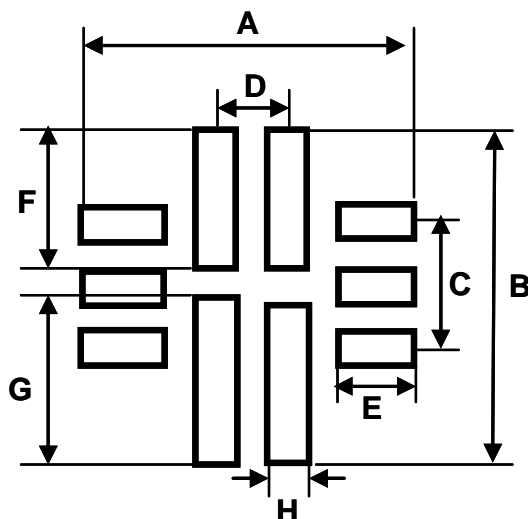


Dimension Table				NOTE
Variation Symbol	Thickness : UT (U1316E-NJ1)			
	MINIMUM	NOMINAL	MAXIMUM	
A	0.50	0.55	0.60	
A1	0.00	0.02	0.05	
b	0.15	0.20	0.25	7
D	1.30 BSC			
E	1.60 BSC			
e	0.40 BSC			
L1	0.27	0.37	0.47	
L2	0.40	0.50	0.60	
aaa	0.05			
bbb	0.07			
ccc	0.05			
ddd	0.05			
eee	0.05			
N	10			3
ND	3			5
NE	2			5
NOTES	1 2			
LF DWG NO.	B-2835			
REV.	1			

NOTE:

1. Dimensioning and tolerancing conform to ASME Y14.5M-1994.
2. All dimensions are in millimeters.
3. N is the total number of terminals.
4. The location of the terminal #1 identifier and terminal numbering convention conforms to JEDEC publication 95 SPP-002.
5. ND and NE refer to the number of terminals on D and E side respectively.
6. NJ refers to NON JEDEC REGISTERED.
7. Dimension b applies to metallized terminal and is measured between 0.15mm and 0.30mm from the terminal tip. If the terminal has the optional radius on the other end of the terminal, the dimension b should not be measured in that radius area.
8. Coplanarity applies to the terminals and all other bottom surface metallization.

Land Layout



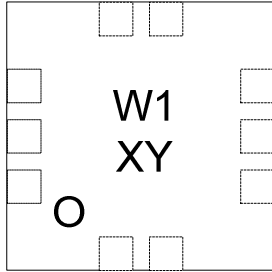
DIMENSIONS		
DIM	MILLIMETERS	INCHES
A	1.9	0.074
B	1.6	0.062
C	0.8	0.031
D	0.4	0.015
E	0.5	0.019
F	0.7	0.027
G	0.75	0.029
H	0.25	0.009

Notes:

This LAND LAYOUT is for reference purposes only. Please consult your manufacturing partners to ensure your company's PCB design guidelines are met.



Marking Code



Part Number	Marking Code
AZAW2210F	W1 XY

W1 = Device Code
X = Date Code
Y = Control Code

Revision History

Revision	Modification Description
Revision 2011/2/17	Preliminary release.
Revision 2011/10/28	Formal release.
Revision 2011/11/25	Modify bandwidth to 800MHz.
Revision 2012/2/17	1. Add date code and control code in marking code. 2. Add land layout. 3. Add eye diagram
Revision 2012/6/13	Add Max. Ron