

WAS4644C

MIPI D-PHY 1.5Gbps, 5-Channel Differential, 2:1/1:2 High Speed Switch

Descriptions

The WAS4644C is a 5-Channel differential, 2:1/1:2 high speed switch suited for MIPI D-PHY full channel (4-Lane and 1-Clock) application. The device provides switching on differential channels between Port A to Port B or Port C with SPDT topology. With Typical 1.4GHz -3dB bandwidth, the WAS4644C is suited for MIPI D-PHY (CSI or DSI) 1.5Gbps applications. The WAS4644C features an extremely low on capacitance (Con) of 2.5pF.

The WAS4644C is available in Wafer-Level-Chip-Scale-Package (WLCSP) 36 Ball package with 2.4x2.4x0.5mm. Standard Products are Pb-free and halogen-free.

Features

- Supply voltage : 2.7 ~ 4.5V
- Low On Resistance : 10 Ω
- Low On Capacitance : 2.5pF Typical
- -3dB Bandwidth : 1.4GHz (Typ.)
- WLCSP-36B package

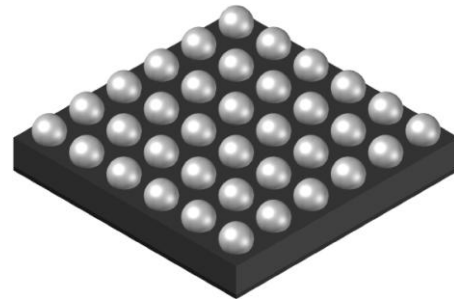
Applications

- Dual Camera for Cell Phones
- Dual LCD Monitor, Digital Camera Displays

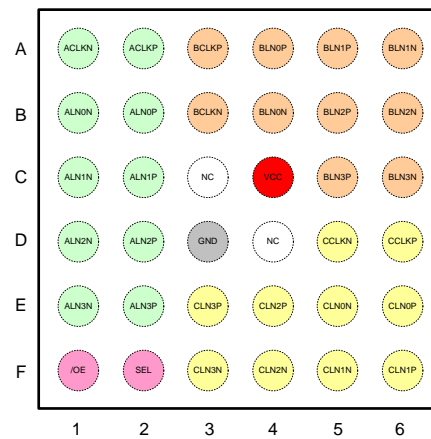
Order information

Device	Package	Shipping
WAS4644C-36/TR	WLCSP-36B	3000/Reel&Tape

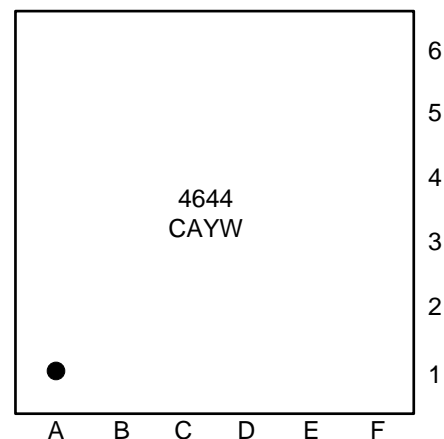
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)



WLCSP-36B (Bottom View)



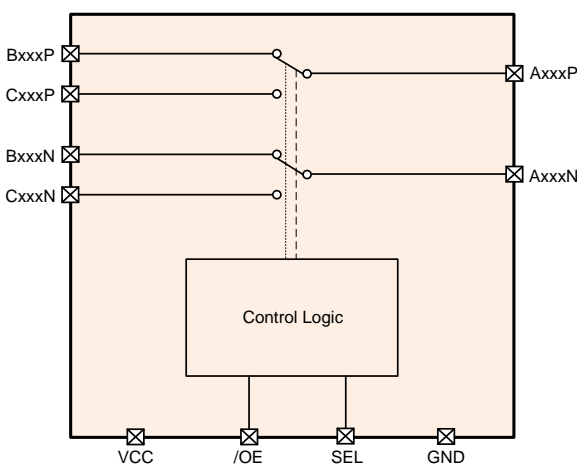
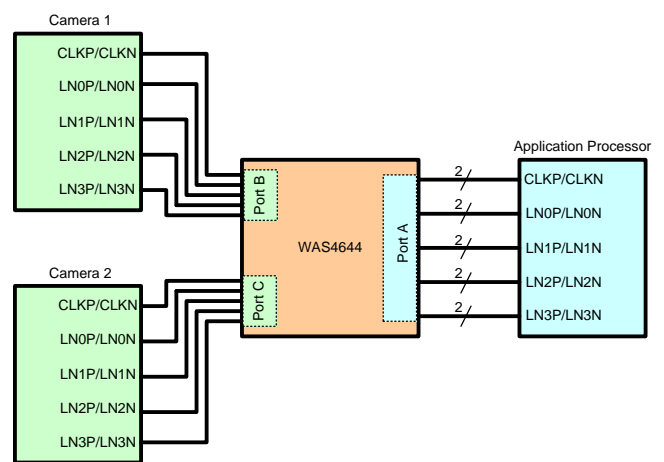
Pin configuration (Top view)


Marking

- 4644** = Device Code
- CA** = Special Code
- Y** = Year Code
- W** = Week Code

Pin descriptions

Pin Number	Symbol	Descriptions
A1, A2 B1, B2 C1, C2 D1, D2 E1, E2	ACLKN, ACLKP ALN0N, ALN0P ALN1N, ALN1P ALN2N, ALN2P ALN3N, ALN3P	Port A for MIPI 1-Clock and 4-Lane differential signal
A3, B3 A4, B4 A5, A6 B5, B6 C5, C6	BCLKP, BCLKN BLN0P, BLN0N BLN1P, BLN1N BLN2P, BLN2N BLN3P, BLN3N	Port B for MIPI 1-Clock and 4-Lane differential signal
D5, D6 E5, E6 F5, F6 F4, E4 F3, E3	CCLKN, CCLKP CLN0N, CLN0P CLN1N, CLN1P CLN2N, CLN2P CLN3N, CLN3P	Port C for MIPI 1-Clock and 4-Lane differential signal
F1	/OE	Enable control, Active Low. Port A, B, C is High impedance while /OE=High
F2	SEL	Port selection control, SEL=0, Port A = Port B SEL=1, Port A = Port C
C4	VCC	Power supply
D3	GND	Ground
C3, D4	NC	Not Connected

Block Diagram & Typical Applications

Block Diagram

Typical Applications

Absolute maximum ratings

Parameter	Symbol	Value	Unit
Supply voltage range	VCC	-0.5 ~ 5.5	V
Data input/output voltage range	V _{DATA}	-0.5 ~ 5.5	V
Select input voltage range	V _{SEL}	-0.5 ~ 5.5	V
Continues output current	I _{OUT}	±50	mA
Junction temperature range	T _J	150	°C
Lead temperature range	T _L	260	°C
Storage temperature range	T _{STG}	-65 ~ 150	°C
Thermal resistance	R _{θJA}	250	°C/W
ESD protection (HBM)	I/O to VCC, I/O to GND	±7000	V
	I/O to I/O	±5000	V

Recommend operating ratings

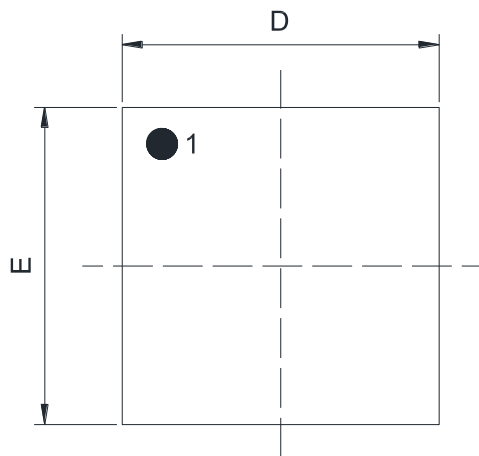
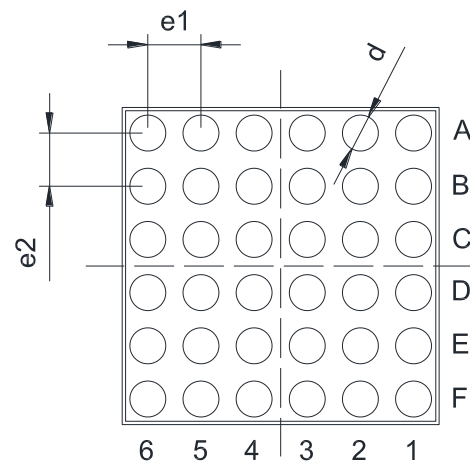
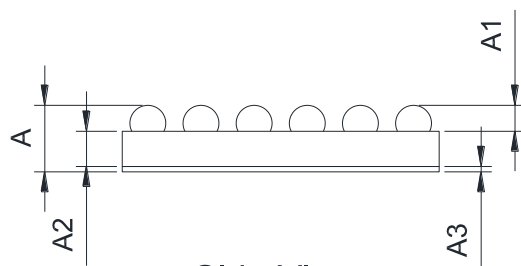
Parameter	Symbol	Value	Unit
Supply voltage range	VCC	2.7 ~ 4.5	V
Data input/output voltage range	V _{DATA}	0.0 ~ 1.2	V
Select input voltage range	V _{SEL}	0.0 ~ VCC	V
Enable control input voltage range	V _{OE}	0.0 ~ VCC	V
Operating temperature range	T _A	-40 ~ 85	°C

Note:

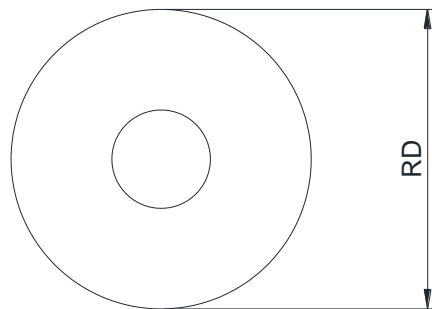
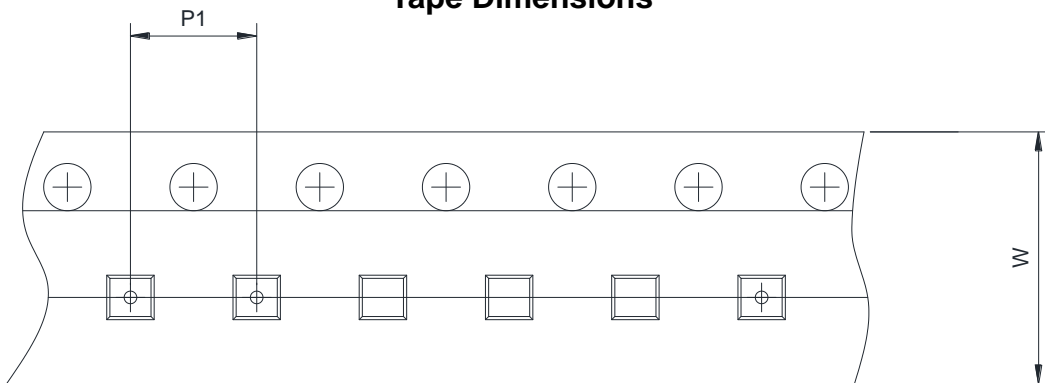
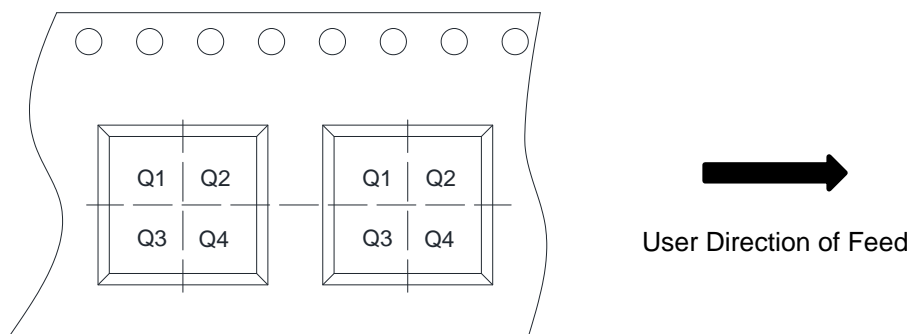
- 1) "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied.
- 2) The input and output negative voltage ratings may be exceeded if the input and output diode current ratings are observed.
- 3) Control input (/OE, SEL) must be held high or Low, it must not float.

Electronics Characteristics (Ta=25°C, VCC=3.6V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Power Supply and Digital Input Characteristics						
Select and OE logic high level	V _{IH}	VCC=3.6~4.5V	1.5			V
		VCC=2.3~3.6V	1.3			V
Select and OE logic low level	V _{IL}	VCC=3.6~4.5V			0.6	V
		VCC=2.3~3.6V			0.4	V
Supply quiescent current	I _{CC}	OE=0V		85	120	uA
		OE=VCC			1	uA
Analog Switch Characteristics						
On-Resistance	R _{ON}	VCC=3.0V, V _{DATA} =0~0.4V, I _{OUT} =10mA		10	12	Ω
On-Resistance match	Δ R _{ON}	VCC=3.0V, V _{DATA} =0~0.4V, I _{OUT} =10mA		0.5		Ω
On-Resistance flatness	R _{FLAT(ON)}	VCC=3.0V, V _{DATA} =0~0.4V, I _{OUT} =10mA		0.5		Ω
Dynamic Characteristics						
Enable turn-on time, OE to Output	T _{EN}	C _L =5pF, R _L =50Ω, V _{SW} =1.2V		150	180	us
Disable turn-off time, OE to Output	T _{EN}	C _L =5pF, R _L =50Ω, V _{SW} =1.2V		100	120	ns
Select input to switch on time	T _{ON}	C _L =5pF, R _L =50Ω, V _{SW} =1.2V		100	120	ns
Select input to switch off time	T _{OFF}	C _L =5pF, R _L =50Ω, V _{SW} =1.2V		200	300	ns
Break-Before-Make time	T _{BBM}	C _L =5pF, R _L =50Ω, V _{SW} =1.2V		50		ns
AC Characteristics						
-3dB Bandwidth	BW	R _L =50Ω, C _L =0pF	1.1	1.4		GHz
Off isolation	OIRR	R _L =50Ω, F=750MHz V _{SW} =-0dBm		-39		dB
Crosstalk	Xtalk	R _L =50Ω, F=750MHz V _{SW} =-0dBm		-43		dB
Capacitance						
Select pin input capacitance	C _{IN}	VCC=0V, F=1MHz		3		pF
Out Off capacitance	C _{OFF}	VCC=3.3V, OE=3.3V, F=1MHz		2		pF
Out On capacitance	C _{ON}	VCC=3.3V, OE=0V, F=1MHz		2.5		pF

Package outline dimensions
WLCSP-36B

Top View

Bottom View

Side View

Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.445	0.500	0.555
A1	0.175	0.195	0.215
A2	0.240	0.265	0.290
A3	0.030	0.040	0.050
D	2.360	2.385	2.410
E	2.360	2.385	2.410
e1	0.400		
e2	0.400		
d	0.250	0.270	0.290

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


RD	Reel Dimension	<input checked="" type="checkbox"/> 7inch	<input type="checkbox"/> 13inch
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8mm	<input type="checkbox"/> 12mm <input type="checkbox"/> 16mm
P1	Pitch between successive cavity centers	<input type="checkbox"/> 2mm	<input checked="" type="checkbox"/> 4mm <input type="checkbox"/> 8mm
Pin1	Pin1 Quadrant	<input checked="" type="checkbox"/> Q1	<input type="checkbox"/> Q2 <input type="checkbox"/> Q3 <input type="checkbox"/> Q4