

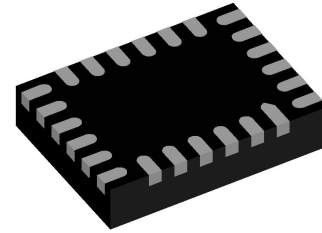
WAS4642Q

Three Port, 2.5GHz, High-Speed MIPI Switch

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

Descriptions

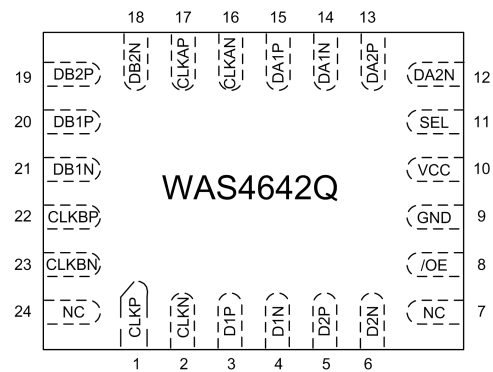
The WAS4642Q is a high-speed analog switch. The pin out is designed to ease differential signal layout and is configured as triple-pole, double-throw switch (TPDT). The WAS4642Q is optimized for switching between two MIPI devices, such as cameras or LCD displays and on-board MAP.



QFN2534-24L

The WAS4642Q is compatible with the requirements of MIPI. The low-capacitance design allows the device to switch signals that exceed 2.5GHz in frequency. Superior channel-to-channel crosstalk immunity minimizes the interference and allows the transmission of high-speed differential signals and single-ended signals, as described by the MIPI specification.

The WAS4642Q is available in QFN2534-24L package. Standard Products are Pb-free and halogen-free.



Pin configuration (Top view)

Features

- Supply voltage : 1.5 ~ 5.5V
- Quiescent Current : 17uA
- Low On Resistance : 11 Ω
- -3dB Bandwidth : 2.5GHz
- QFN2534-24L package

Applications

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



Marking

- 4642** = Device Code
- AQ** = Special Code
- Y** =Year Code
- W** =Week Code

Order information

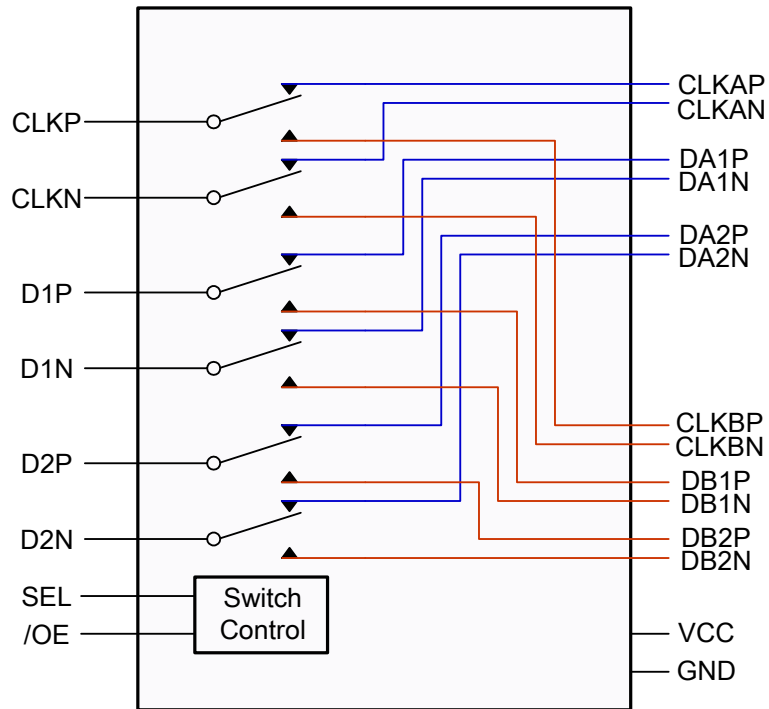
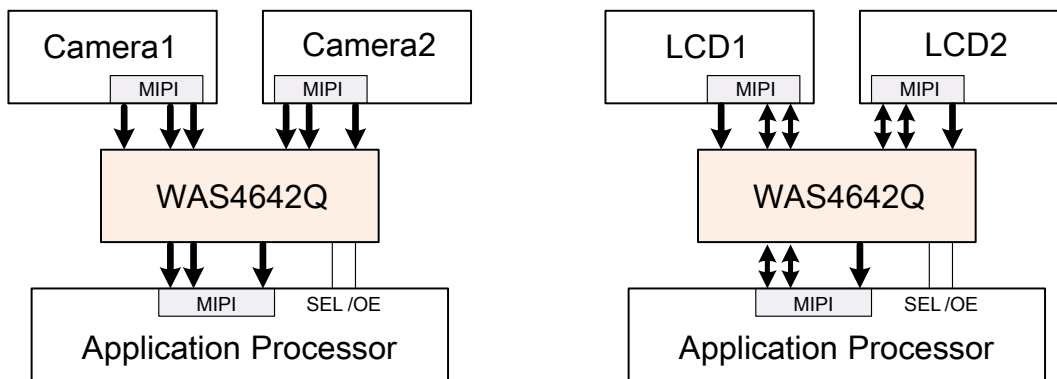
Device	Package	Shipping
WAS4642Q-24/TR	QFN2534-24L	5000/Reel&Tape

Pin descriptions

Pin Number	Symbol	Descriptions
1	CLKP	Clock Path Positive
2	CLKN	Clock Path Negative
3	D1P	Data Path 1 Positive
4	D1N	Data Path 1 Negative
5	D2P	Data Path 2 Positive
6	D2N	Data Path 2 Negative
7	NC	No Connect
8	/OE	Output Enable(Active Low)
9	GND	Ground
10	VCC	Power Supply
11	SEL	Select(0=A, 1=B)
12	DA2N	Data Path A2 Negative
13	DA2P	Data Path A2 Positive
14	DA1N	Data Path A1 Negative
15	DA1P	Data Path A1 Positive
16	CLKAN	Clock Path A Negative
17	CLKAP	Clock Path A Positive
18	DB2N	Data Path B2 Negative
19	DB2P	Data Path B2 Positive
20	DB1P	Data Path B1 Positive
21	DB1N	Data Path B1 Negative
22	CLKBP	Clock Path B Positive
23	CLKBN	Clock Path B Negative
24	NC	No Connect

Function descriptions

SEL	/OE	Function
X	H	Bus switch disconnected
L	L	D1,D2,CLK = DA1,DA2,CLKA
H	L	D1,D2,CLK = DB1,DB2,CLKB

Logic Symbol

Typical applications


Absolute maximum ratings

Parameter	Symbol	Value	Unit
Supply voltage range	VCC	-0.5 ~ 6.5	V
Data input/output voltage range	V _{DATA}	-0.5 ~ 6.5	V
Select input voltage range	V _{SEL}	-0.5 ~ 6.5	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

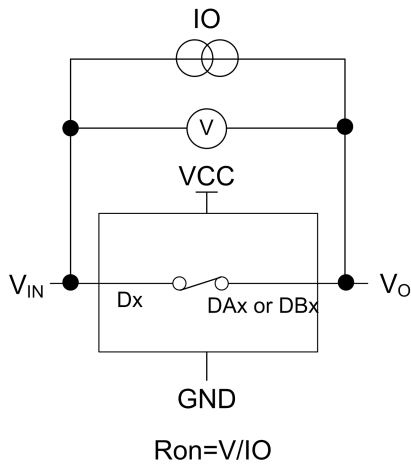
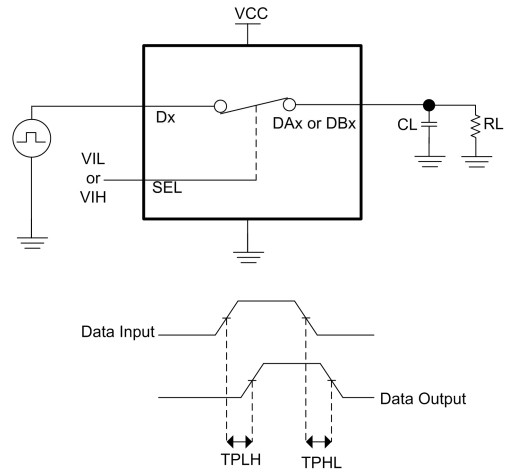
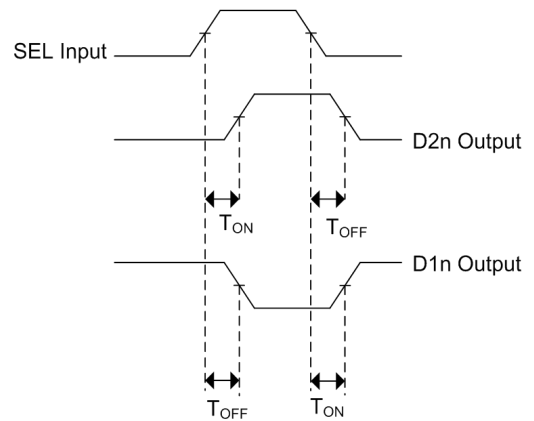
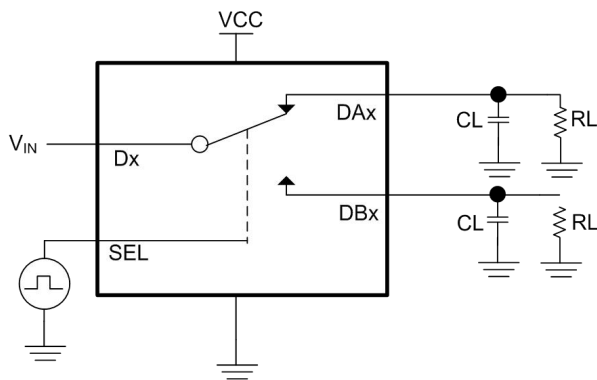
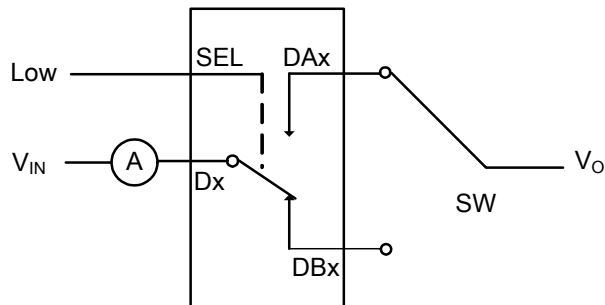
Parameter	Symbol	Value	Unit
Supply voltage range	VCC	1.5 ~ 5.5	V
Data input/output voltage range	V _{DATA}	0.0 ~ VCC	V
Select input voltage range	V _{SEL}	0.0 ~ VCC	V
Enable control input voltage range	V _{IOE}	0.0 ~ VCC	V
Operating temperature range	T _A	-40 ~ 85	°C

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 must be held high or Low, it must not float.

Electronics Characteristics (Ta=25°C, VCC=2.5V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
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}	I _{OUT} =0, V _{SEL} > 1.5V or V _{SEL} < 0.7V		17	35	uA
Select input leakage current	I _{SEL}	V _{SEL} =VCC			±1.0	uA
Off state switch leakage current	I _{OFF}	See figure 4			±1.0	uA
On-Resistance	R _{ON}	VCC=3.0V, V _{DATA} =0~0.4V, I _{OUT} =8mA, See figure 1		11	13	Ω
On-Resistance match	Δ R _{ON}	VCC=3.0V, V _{DATA} =0~0.4V, I _{OUT} =8mA, See figure 1		0.2		Ω
On-Resistance flatness	R _{FLAT(ON)}	VCC=3.0V, V _{DATA} =0~1.0V, I _{OUT} =8mA, See figure 1		2		Ω
Propagation delay time	T _{PD}	C _L =5pF, R _L =50Ω See figure 2		0.2		ns
Select input to switch on time	T _{ON}	C _L =10pF, R _L =50Ω See figure 3		75	120	ns
Select input to switch off time	T _{OFF}	C _L =10pF, R _L =50Ω See figure 3		40	80	ns
Break-Before-Make time	T _{BBM}	Generated by design		5		ns
-3dB Bandwidth	BW	R _L =50Ω, C _L =0pF See figure 5		2.5		GHz
Off isolation	OIRR	R _L =50Ω, F=100MHz See figure 6		-40		dB
Crosstalk	Xtalk	R _L =50Ω, F=100MHz See figure 7		-42		dB
Charge injection (Select input to common I/O)	Q _g	C _L =0.1nF, VCC=3.3V R _G =0Ω, V _G =GND		5		pC
Select pin input capacitance	C _{IN}	VCC=0V		6		pF
D1n, D2n, Dn Off capacitance	C _{OFF}	VCC=3.3V, /OE=3.3V		5		pF
D1n, D2n, Dn On capacitance	C _{ON}	VCC=3.3V, /OE=0V		4		pF

Test Circuit

Figure 1: On-Resistance

Figure 2: Propagation delay time

Figure 3: Select input to switch on/off time


Conditions : $V_{IN} = 4.5V$, $V_O = Gnd$

Figure 4: Off state switch leakage current

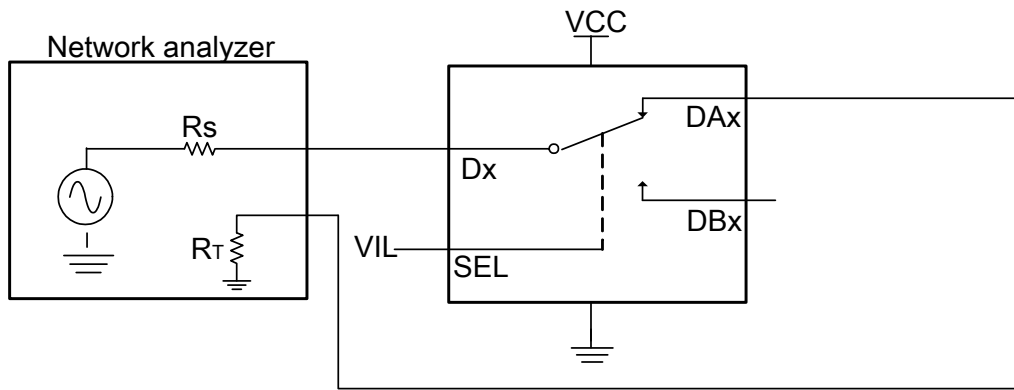


Figure 5: Bandwidth (BW)

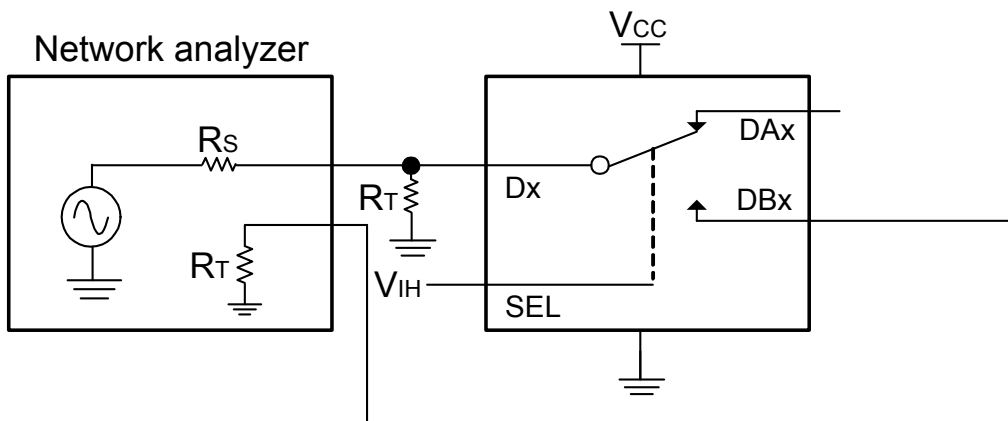


Figure 6: Off isolation (OIRR)

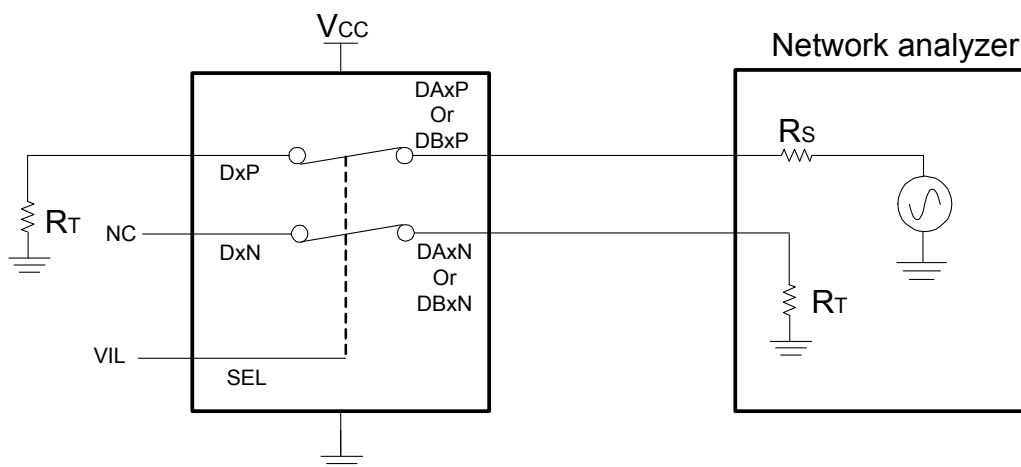
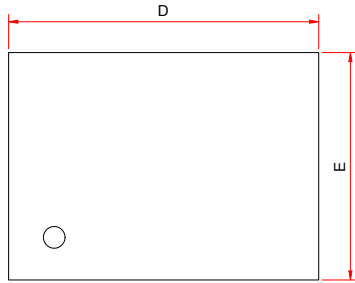
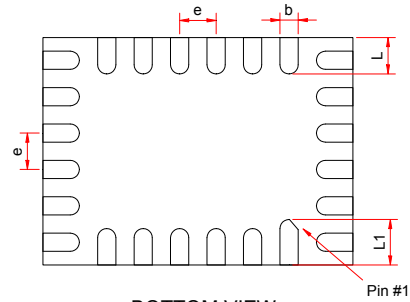


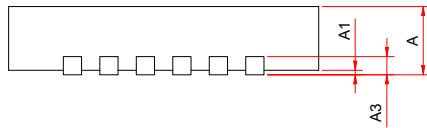
Figure 7: Crosstalk (Xtalk)

PACKAGE OUTLINE DIMENSIONS
QFN2534-24L


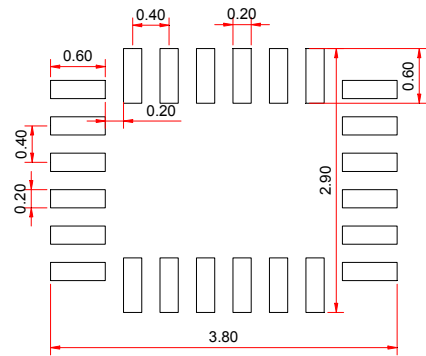
TOP VIEW



BOTTOM VIEW

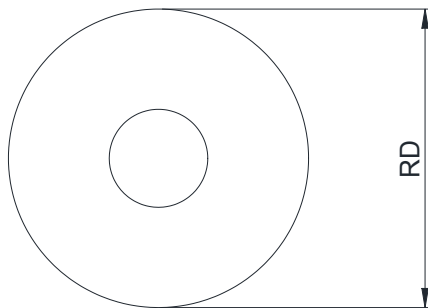
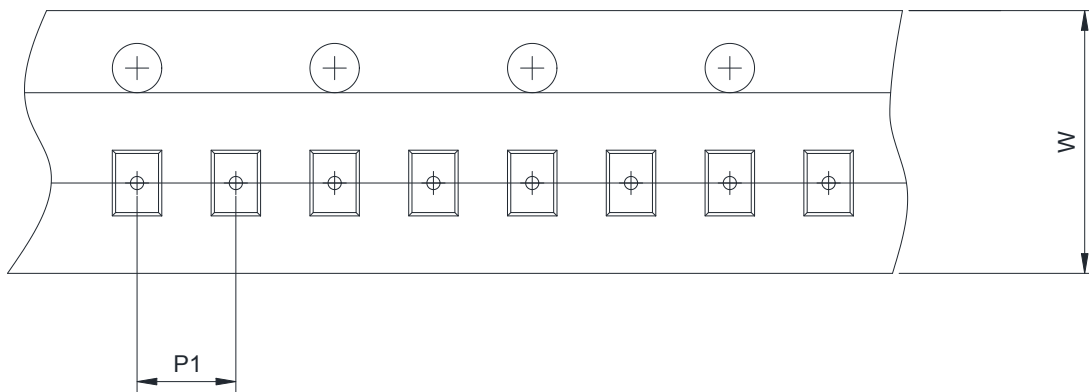
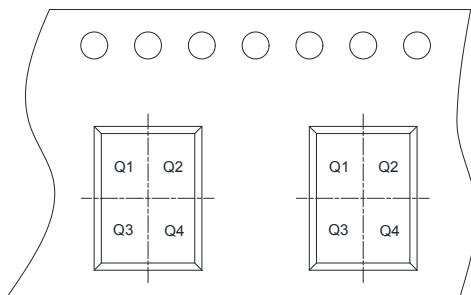


SIDE VIEW



RECOMMENDED LAND PATTERN(Unit:mm)

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.70	0.75	0.80
A1	0.00	-	0.05
A3	0.20Ref		
D	3.35	3.40	3.45
E	2.45	2.50	2.55
L	0.30	0.40	0.50
L1	0.40	0.50	0.60
b	0.15	0.20	0.25
e	0.40BSC		

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape



 User Direction of Feed

RD	Reel Dimension	<input type="checkbox"/> 7inch	<input checked="" type="checkbox"/> 13inch
W	Overall width of the carrier tape	<input type="checkbox"/> 8mm	<input checked="" 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