Descriptions

The WAS3157D-6/TR is a single SPDT low on-resistance analog switch. It can operate from a single 1.5V to 5.5V power supply. The device offers low ON-state resistance and excellent ON-state resistance matching with break-before-make feature, to prevent signal distortion during the transferring of a signal from one channel to another. The device is capable of truly isolation. Even when A overrides VCC, very little current will flow back to the supply.

Order Information

Package		Part Number	Quantity per Reel	Top-Side Marking
DFN1x1(DFN1109-6L)	Tape and Reel	WAS3157D-6/TR	5,000PCS	C W

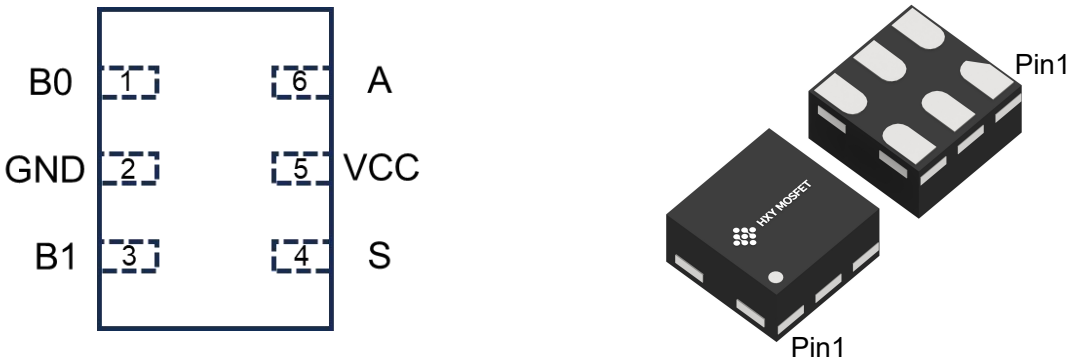
Features

- Pin-to-Pin BCT4157ELT, WAS3157D
- Low On-resistance, Ron=1.5Ω when A=5V
- 1.8V Logic Compatible Control Pin
- A Overrides VCC to Achieve True Isolation Even When Supply Is Dead
- High Off-Isolation: -100dB @ 100KHz
- Low Channel-to-Channel Crosstalk: -97dB @ 100KHz
- High Bandwidth (-3dB @700MHz) Suitable for USB2.0 High-Speed Routing
- Low Quiescent Current (<2uA) With Very Wide Supply Range (1.5V ~ 5.5V)
- ESD HBM: ±5000V

Applications

- Audio, Video, UART, USB2.0 Signal and Supply Routing
- Cell phones and TWS headset

Pin Configuration



Pin configuration (Top view)
DFN1x1(DFN1109-6L)

Functions and Pin Configuration

Pin Number	Symbol	Descriptions
1	B0	Analog/Digital Signal Port (Normally closed)
2	GND	Ground
3	B1	Analog/Digital Signal Port (Normally open)
4	S	Logic Input Control
5	VCC	Single Power Supply
6	A	Common Signal Port

Function Descriptions

Logic Input	Function
S=0	B0=A
S=1	B1=A

Absolute Maximum Ratings (1)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	-0.3 ~ 6.5	V
Control Input Voltage	V_S	-0.3 ~ 6.5	V
Continuous Current Through A, B0, B1		±100	mA
Peak Current Through A, B0, B1 (pulsed at 1ms 50% duty cycle)		±200	mA
Storage Temperature Range	T_{STG}	-55 ~ 150	°C
Junction Temperature under Bias	T_J	150	°C
Lead Temperature (Soldering, 10 seconds)	T_L	260	°C
Thermal resistance	$R_{\theta JA}$	350	°C/W

Recommend operating ratings (2)

Parameter	Symbol	Value	Unit
Supply Voltage Operating	V_{CC}	1.5 ~ 5.5	V
Control Input Voltage	V_S	-0.3 ~ 5.5	V
Input Signal Voltage	V_A	-0.3 ~ 5.5	V
Operating Temperature	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.

DC Electronics Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input logic high level	V_{IH}	VCC: 3.3 ~ 5.5V	1.6			V
		VCC: 1.5 ~ 3.3V	1.4			V
Input logic low level	V_{IL}	VCC: 3.3 ~ 5.5V			0.6	V
		VCC: 1.5 ~ 3.3V			0.4	V
Supply quiescent current	I_{CC}	I_A=0, V_S =0 or V_S =VCC			1.0	uA
Increase in I_{CC} per input	I_{CCT}	I_A=0, VCC=4.5V V_S>1.8 or V_S<0.5			1.0	uA
Off state leakage from A to B0 (or B1)	I_A	V_A = 5.5V , $V_{B0(or\ B1)}$ = 0V			±2.0	uA
On-Resistance	R_{ON1}	V_A=0 ~ 0.5V, I_A=30mA		3.0	3.5	Ω
	R_{ON2}	V_A=0.5 ~ 2.0V, I_A=30mA		3.6	3.9	Ω
	R_{ON3}	V_A=2.0 ~ 4.0V, I_A=30mA		2.5	3.5	Ω
	R_{ON4}	V_A=4.0 ~ 5.5V, I_A=30mA		1.5	1.8	Ω
On-Resistance Flatness	R_{FLAT1}	V_A=0 ~ 0.5V, I_A=30mA		0.7		Ω
	R_{FLAT2}	V_A=0.5 ~ 2.0V, I_A=30mA		0.5		Ω
	R_{FLAT3}	V_A=2.0 ~ 4.0V, I_A=30mA		1.6		Ω
	R_{FLAT4}	V_A=4.0 ~ 5.5V, I_A=30mA		0.3		Ω
On-Resistance Matching Between Channels	ΔR_{ON}	V_A=0~5.5V, I_A=30mA,		0.1	0.2	Ω

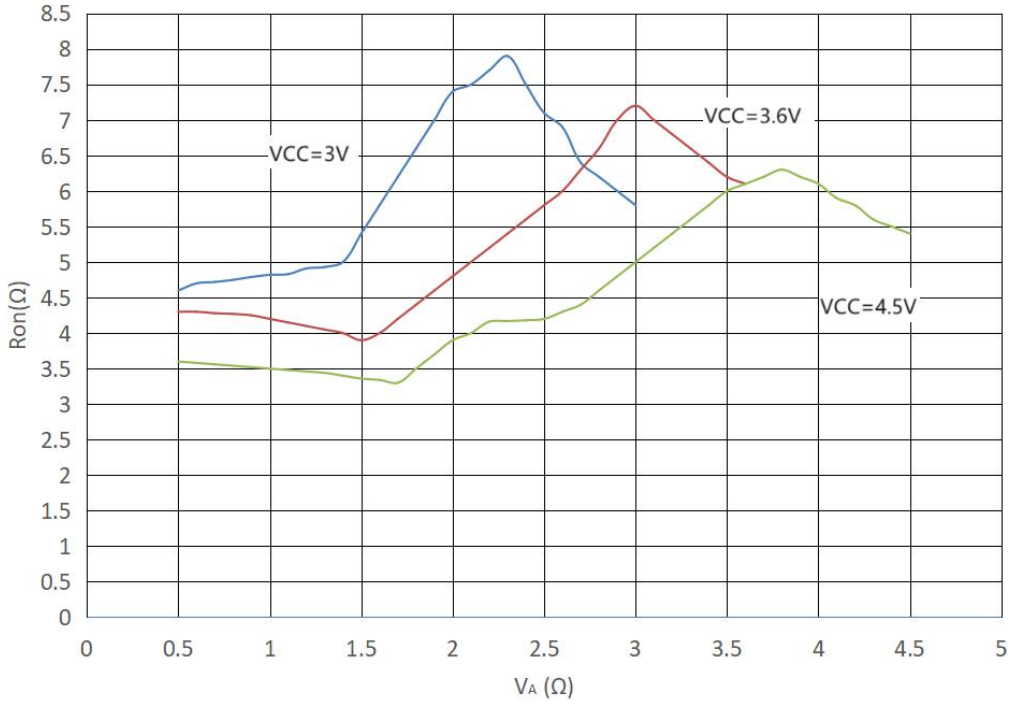
Capacitance (Ta=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off capacitance	C_{OFF}	F=100KHz, VCC=3.3		5		pF
On capacitance	C_{ON}	F=100KHz, VCC=3.3		7		pF

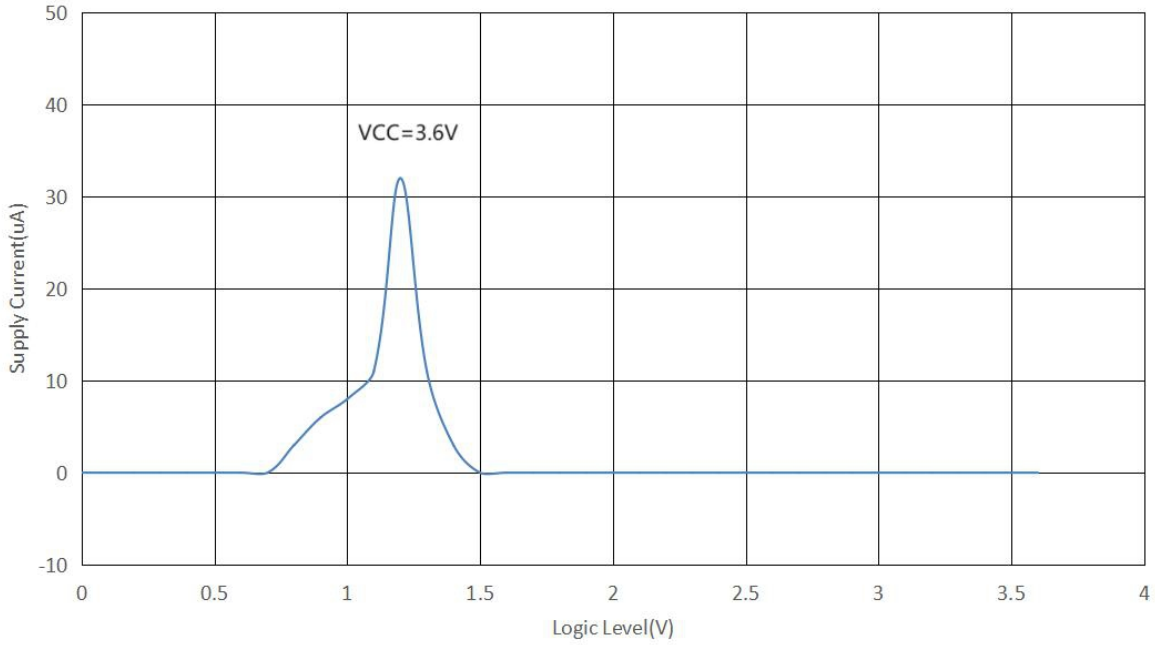
AC Electronics Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Time	T_{ON}	V_A=1.5V, C_L=35pF, R_L=50Ω		200		ns
Turn-Off Time	T_{OFF}	V_A=1.5V, C_L=35pF, R_L=50Ω		200		ns
Break-Before-Make time	T_{BBM}	V_A=1.5V, C_L=35pF, R_L=50Ω		500		ns
-3dB Bandwidth	BW	R_L=50Ω, C_L=0pF		700		MHz
Off isolation	OIRR	F=1KHz, R_L=50Ω		-81		dB
		F=10KHz, R_L=50Ω		-80		dB
Crosstalk	Xtalk	F=1KHz, R_L=50Ω		-83		dB
		F=10KHz, R_L=50Ω		-82		dB
Total Harmonic Distortion	THD	F=20Hz to 20KHz V_A=600mVp-p @R_L=32Ω,		-80		dB

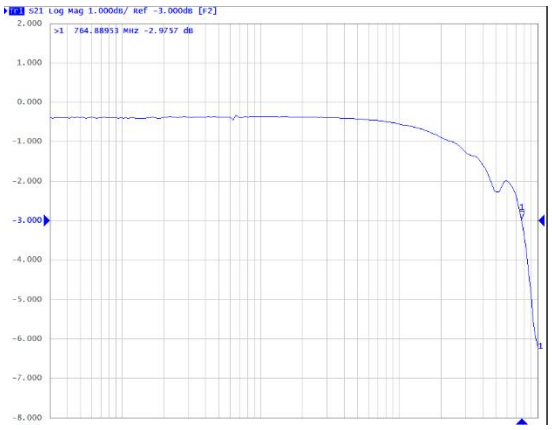
Typical Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)



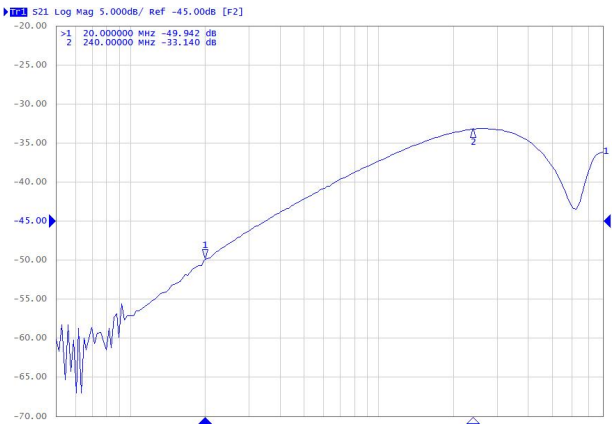
Ron vs. VCC and VA voltage



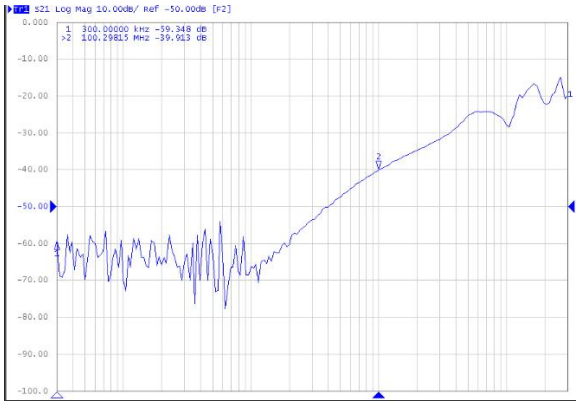
Supply Current vs. Logic Input



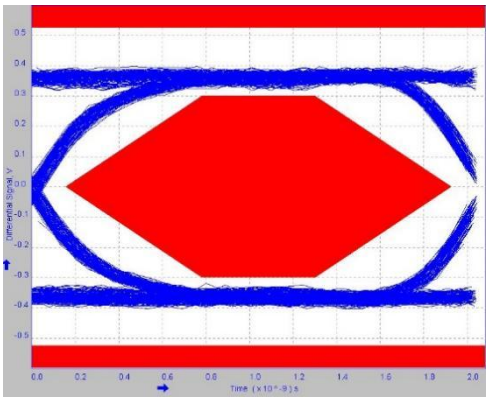
Insertion Loss (-3dB Bandwidth)



Off Isolation



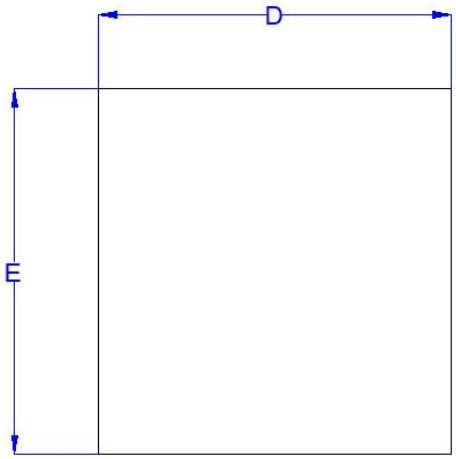
Cross-talk



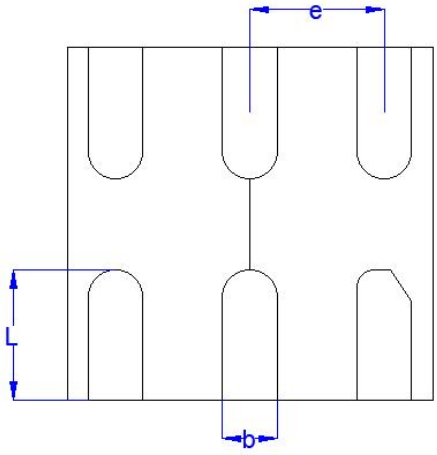
Eye Diagram (480Mbps)

Package Outline Dimensions

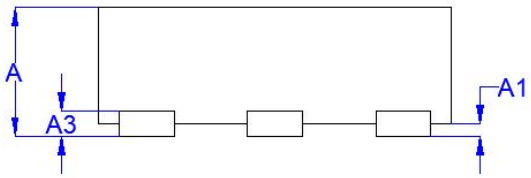
DFN1x1(DFN1109-6L)



TOP VIEW



BOTTOM VIEW

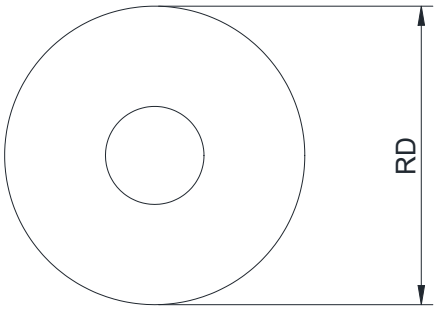


SIDE VIEW

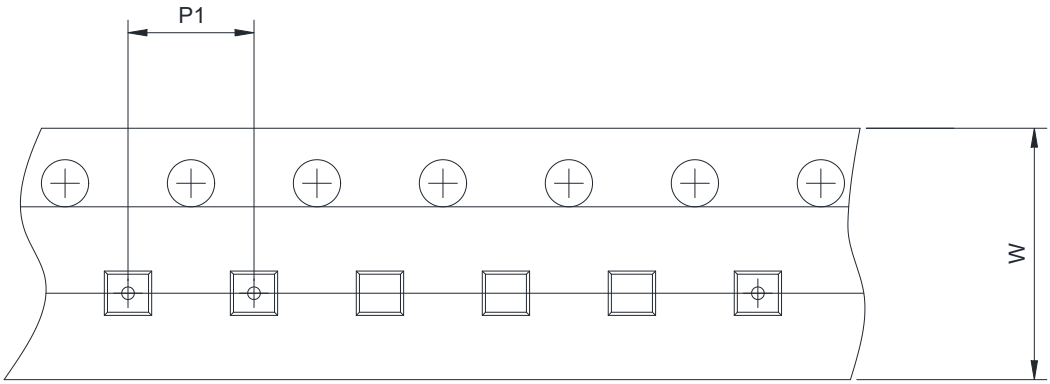
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.50	0.55	0.60
A1	0.00	-	0.05
A3	0.15 Ref.		
b	0.10	0.15	0.20
D	0.95	1.00	1.05
E	0.95	1.00	1.05
e	0.35 BSC		
L	0.30	0.40	0.50

Tape And Reel Information

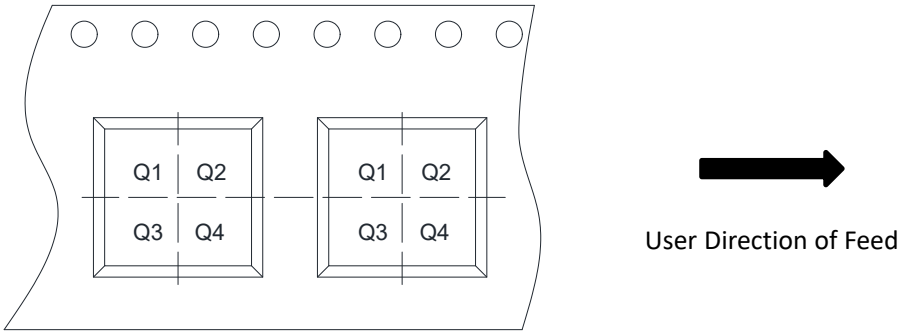
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



R	Reel Dimension	☑ 7inch ☐ 13inch
W	Overall width of the carrier tape	☑ 8mm ☐ 12mm ☐ 16mm
P1	Pitch between successive cavity centers	☐ 2mm ☑ 4mm ☐ 8mm
Pin1	Pin1 Quadrant	☑ Q1 ☐ Q2 ☐ Q3 ☐ Q4

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