

HM3257

Low Voltage and High Speed SPDT Analog Switch with True Isolation

Descriptions

The HM3257 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
DFN 1x1-6L	Tape and Reel	HM3257	5,000PCS	C W
DFN 1.1x0.9-6L	Tape and Reel	HM3257F	5,000PCS	C W

Features

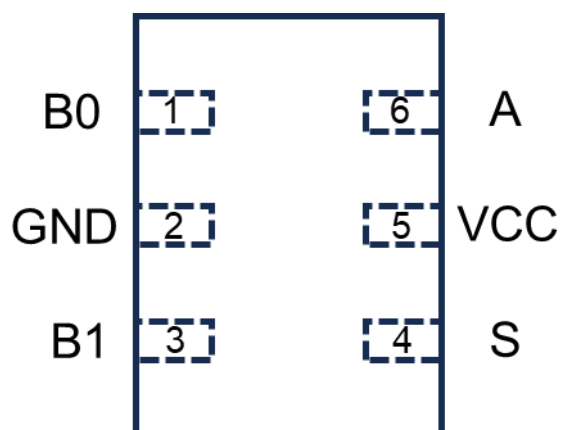
- Pin-to-Pin **BCT4157ELT, WAS3157D**
- Low On-resistance, Ron=1.5Ω when A=5V
- 1.8V Logic Compatible Control Pin
- A Overrides VCC to Achieve True Isolation Even When Supply Is Dead
- High Off-Isolation: **-100dB @ 100KHz**
- Low Channel-to-Channel Crosstalk: **-97dB @ 100KHz**
- High Bandwidth (-3dB @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

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



Pin configuration (Top view)

DFN 1.1×0.9-6L/DFN 1×1-6L

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 _{θJA}	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 _{CC} T	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	Δ R _{ON}	V _A =0~5.5V, I _A =30mA,		0.1	0.2	Ω

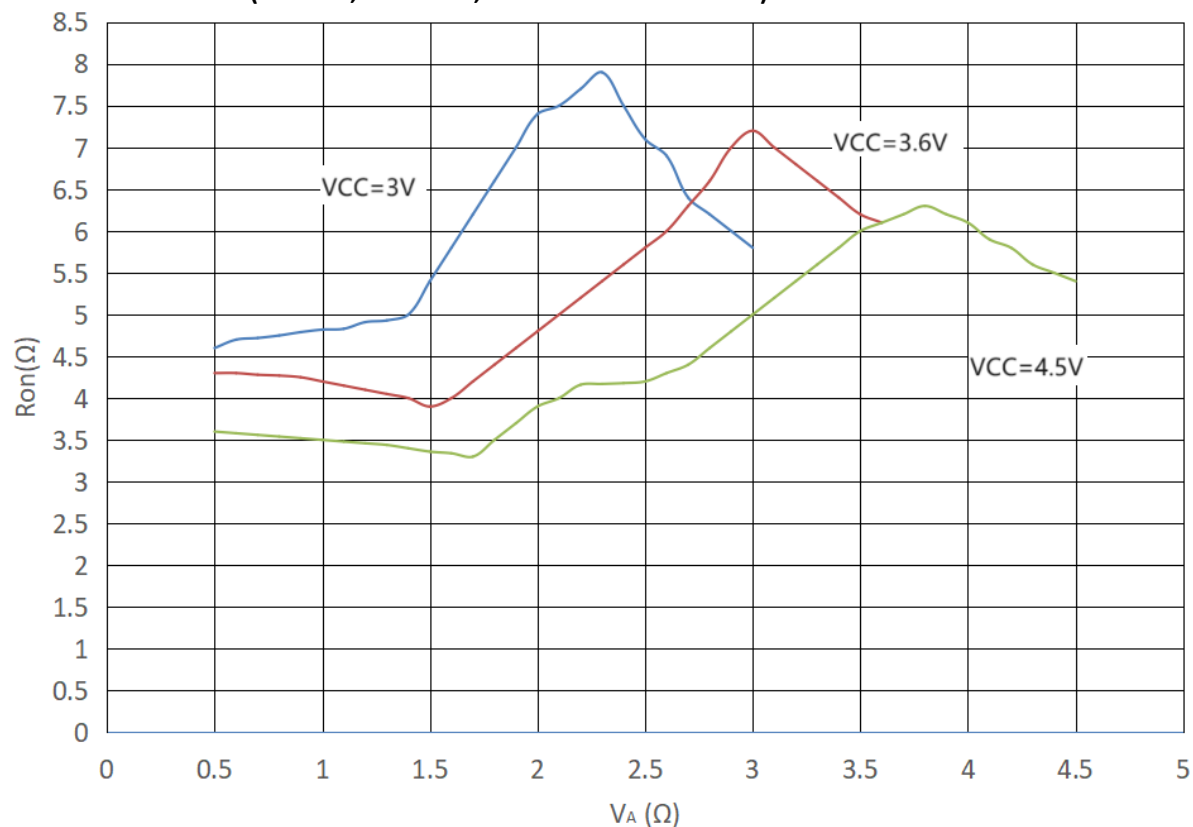
AC Electronics Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)

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

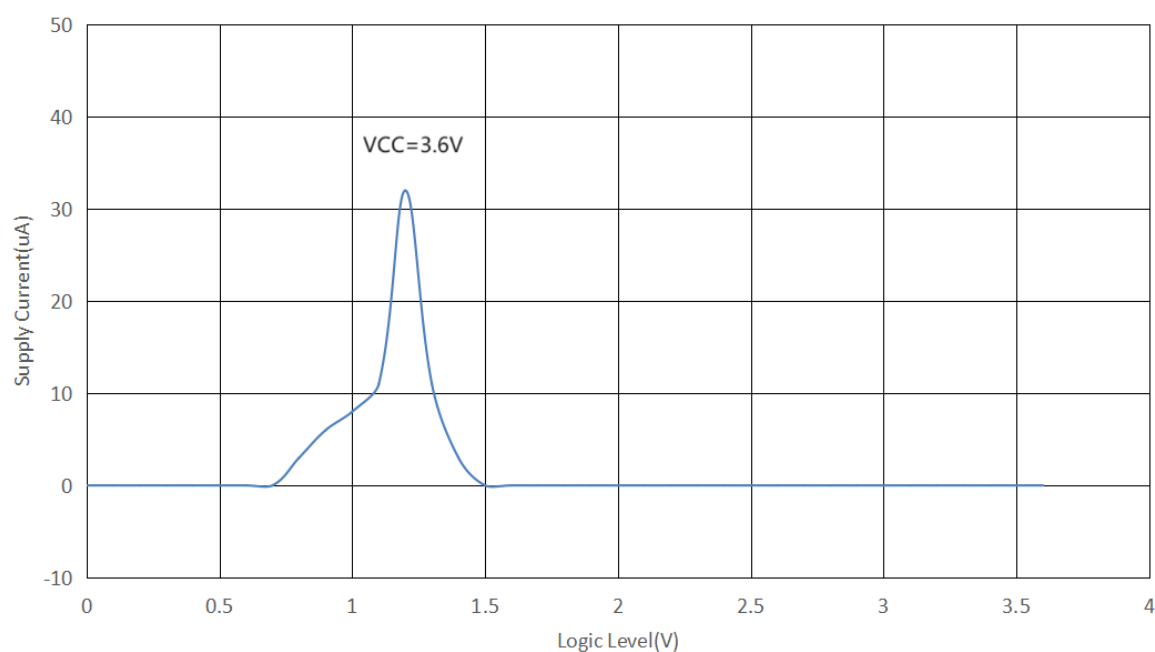
Capacitance (Ta=25°C unless otherwise noted)

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

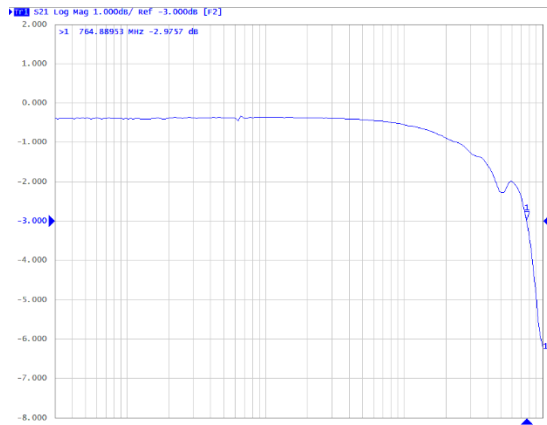
Typical Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)



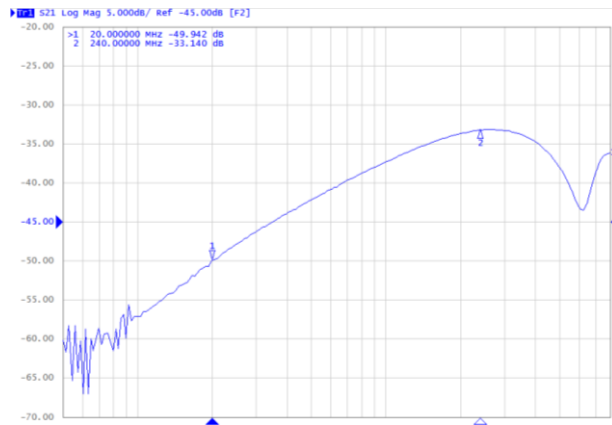
R_{on} vs. VCC and V_A voltage



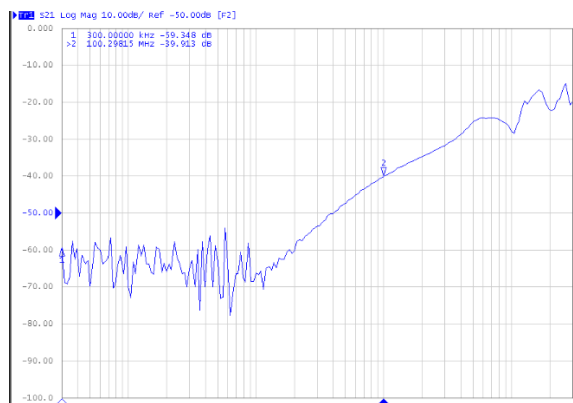
Supply Current vs. Logic Input



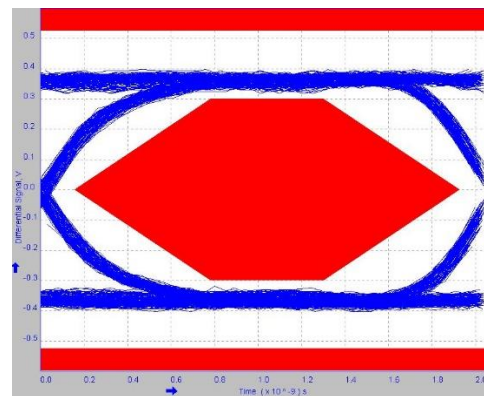
Insertion Loss (-3dB Bandwidth)



Off Isolation



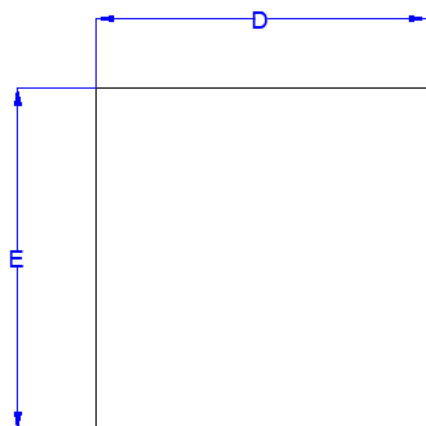
Cross-talk



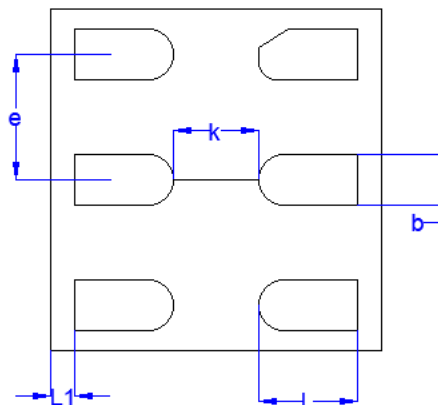
Eye Diagram (480Mbps)

PACKAGE OUTLINE DIMENSIONS

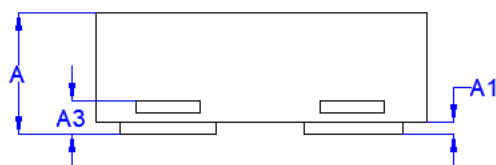
DFN1109-6L



TOP VIEW



BOTTOM VIEW

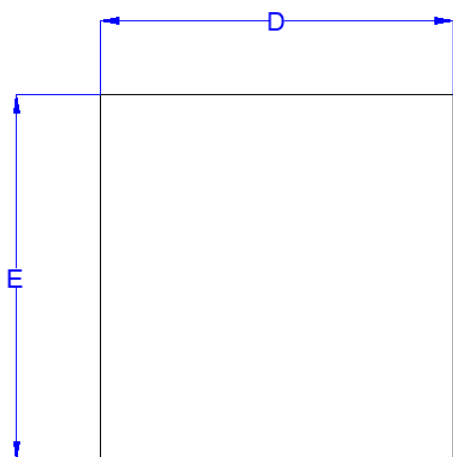


SIDE VIEW

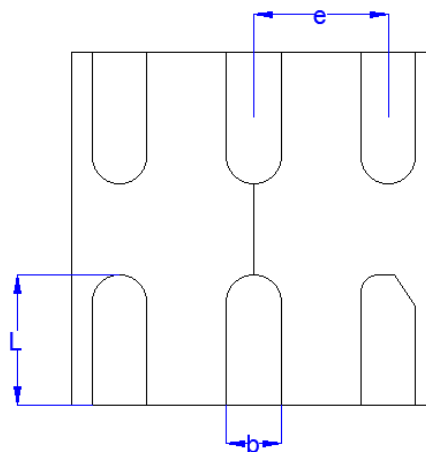
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.40	0.45	0.50
A1	0.00	0.02	0.05
A3	0.15 Ref.		
b	0.15	0.20	0.25
D	0.80	0.90	1.00
E	1.00	1.10	1.20
e	0.40 BSC		
L	0.22	-	0.35
L1	0.05 Ref.		
k	0.20 Ref.		

PACKAGE OUTLINE DIMENSIONS

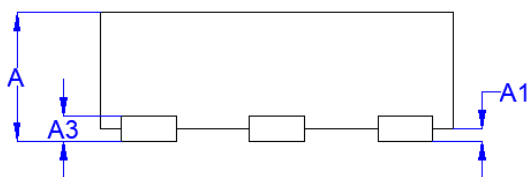
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TOP VIEW



BOTTOM VIEW

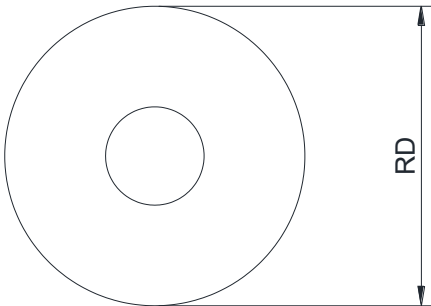


SIDE VIEW

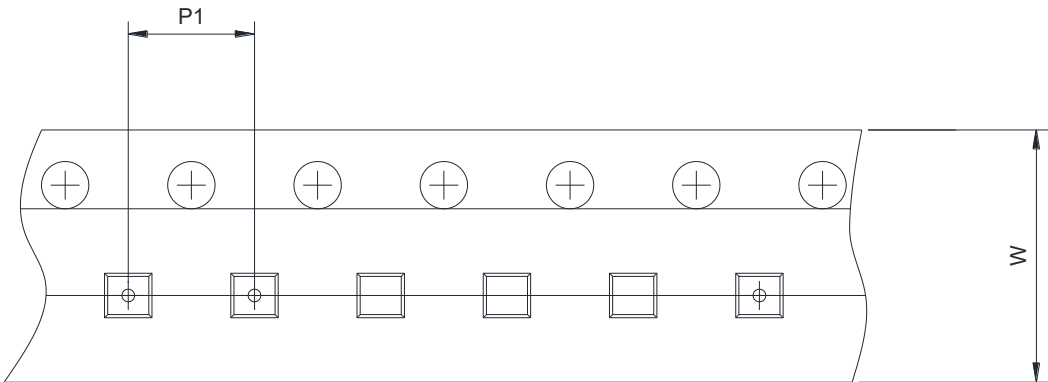
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.50	0.55	0.60
A1	0.00	-	0.05
A3	0.15 Ref.		
b	0.10	0.15	0.20
D	0.95	1.00	1.05
E	0.95	1.00	1.05
e	0.35 BSC		
L	0.30	0.40	0.50

TAPE AND REEL INFORMATION

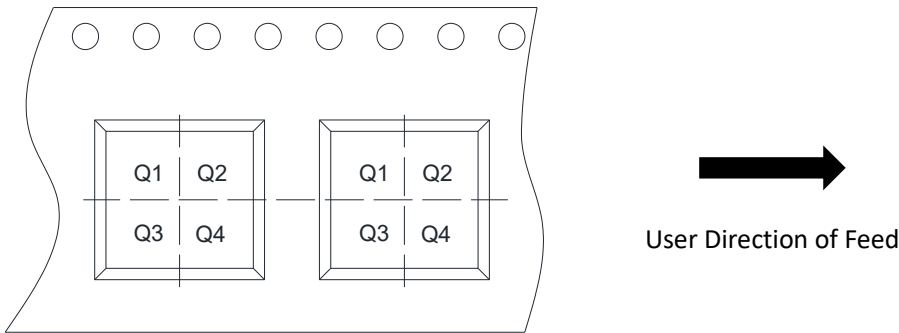
Reel Dimensions



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