盛微先進科技
SAVITECH.COM

SV7030

Low Power, Low Attenuation,
High-Speed USB 2.0 (480 Mbps) Switch

Revision
v0.95a

SAVITECH Corporation

SV7030

Low Power, Low Attenuation, High-Speed USB 2.0 (480 Mbps) Switch

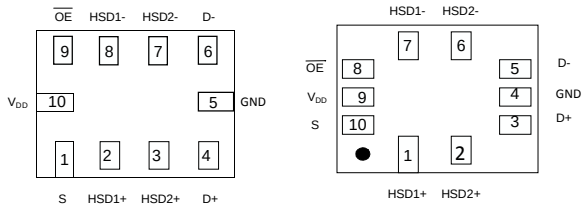
Features

- Wide operating voltage range, +2.5V to +5.5V
- USB 1.1 (full speed) and USB 2.0 (high speed) compliant
- Fast switching time
  - t_{ON}: 25 nS
  - t_{OFF}: 12nS
- -42dB cross-talk at 240MHz
- -32dB off-isolation at 240MHz
- Ultra-Wide Bandwidth: -3dB BW = 750MHz
- Typical R_{ON} is 7 Ω at +3.0V
- Extreme low signal propagation delay

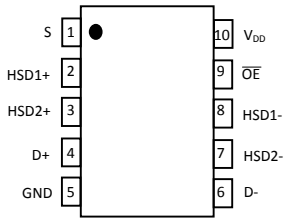
Description

The SV7030 is a cost-effective, low power consumption, high-speed USB2.0 switch targeting on handset, portable and digital consumer applications. Its bandwidth is much higher than the high-speed USB 2.0 (480MHz) requirement that makes it ideal for industry standard full-speed USB1.1 and high-speed USB2.0 applications. It also features low channel cross-talk and high off-isolation that allows low attenuation switching. The SV7030 is acting as a multiplex that multiplexes differential outputs from one of two outputs of the SV7030.

Pin Configuration



WQFN-10 WQFN-10



MSOP-10

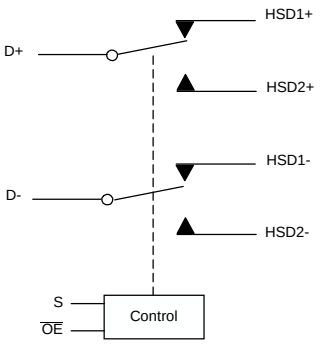
Pin Description

NAME	DESCRIPTION
$\overline{OE}$	Active LOW, Output enable
S	Select input
D+, D-,	Data com port
HSDn+ HSDn-	I/O for USB data path (port 1 and port 2)

Truth Table

SEL	$\overline{OE}$	Function
X	H	Hi-Z
L	L	D+, D- = HSD1n
H	L	D+, D- = HSD2n

Block Diagram



Ordering Information

Ordering Code	Package	Packing
SV7030-10WY-TR3	WQFN-10 1.8 mm x 1.3 mm	Tape & Reel, 3000 pcs
SV7030-10WZ-TR3	WQFN-10 2.0mm x 1.3 mm	Tape & Reel, 3000 pcs
SV7030-10MP-TR3	MSOP-10	Tape & Reel, 3000 pcs

Absolute Maximum Ratings

Parameter	Value	Unit
V_{DD} to GND, Supply Voltage,	6	V
Input Voltage	GND - 0.3 to (V_{DD}) +0.3	V
Storage Temperature Range	-65 to +150	°C
Continuous current through V_{DD} or GND	100	mA
ESD Susceptibility: HBM	8000	V
ESD Susceptibility: MM	400	V

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Caution

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. SAVITECH recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.
ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

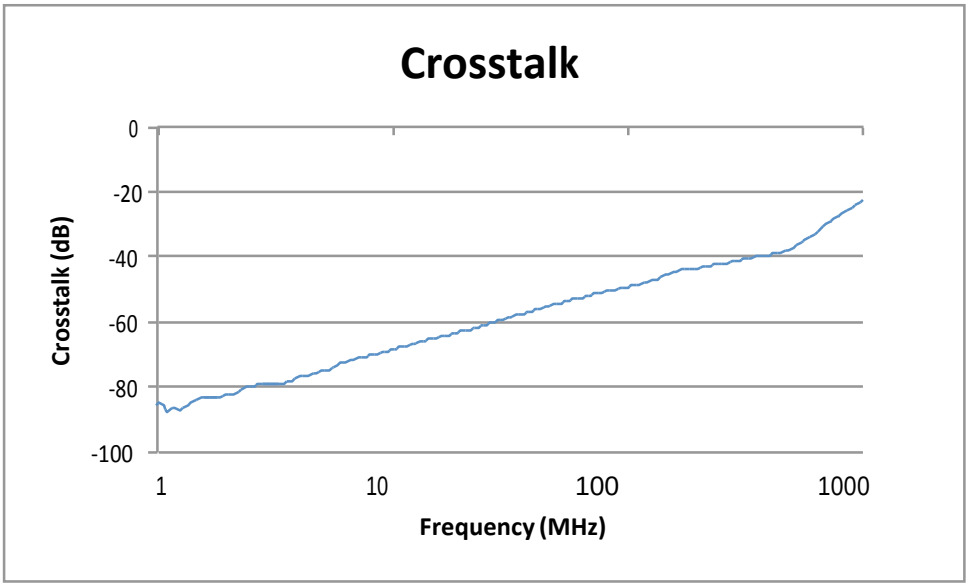
Electrical characteristics

(V_{DD} = +2.5V to +5.5V, GND = 0V, V_{IH} = +1.6V, V_{IL} = +0.5V, T_A = -40°C to +85°C. Typical values are at V_{DD} = +3.3V, T_A = +25°C, unless otherwise noted.)

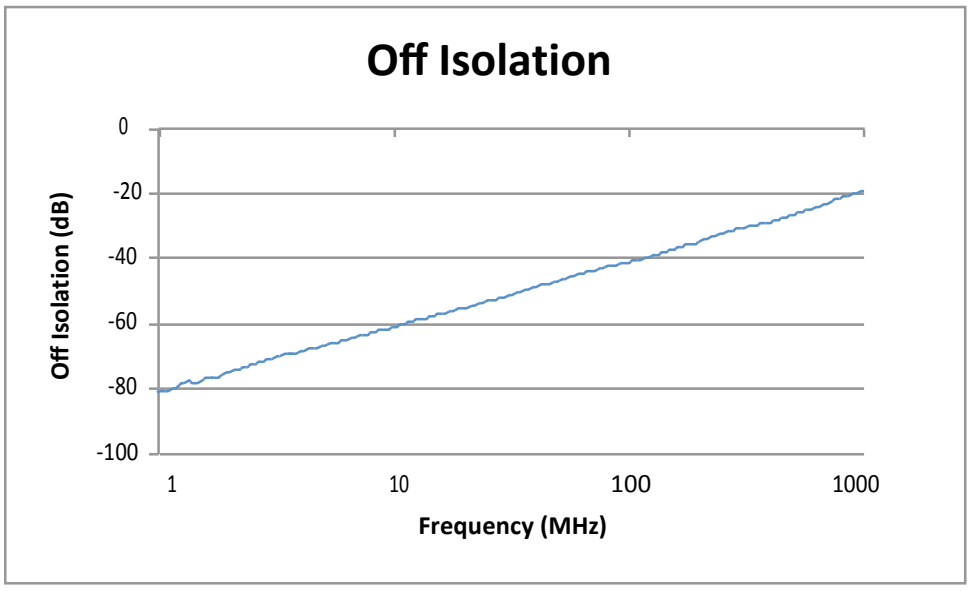
PARAMETER	SYMBOL	CONDITIONS	TEMP	MIN	TYP	MAX	UNITS
ANALOG SWITCH							
Analog I/O Voltage (HSD1+, HSD1-, HSD2+, HSD2-)	V_{IS}		-40℃ to +85℃	0		V_{DD}	V
On-Resistance	R_{ON}	V_{DD} = 3.0V, V_{IS} = 0V to 0.4V, I_D =8mA	+25□		7		Ω
On-Resistance Match Between Channels	ΔR_{ON}	V_{DD} = 3.0V, V_{IS} = 0V to 0.4V, I_D =8mA	+25℃	0.1		0.5	Ω
On-Resistance Flatness	$R_{FLAT(ON)}$	V_{DD} = 3.0V, V_{IS} = 0V to 1.0V, I_D =8mA	+25℃	0.5		1	Ω
Power Off Leakage Current (D_+, D_-)	I_{OFF}	V_{DD} = 0V, VD = 0V to 3.6V, VS , V_{OE} = 0V or 3.6V	-40℃ to +85℃			1	μA
Increase in I+ per Control Voltage	I_{CCT}	V_{DD} = 3.6V, V_S or V_{OE} = 2.6V	-40℃ to +85℃			2	μA
Source Off Leakage Current	$I_{HSD2(OFF)}$,$I_{HSD1(OFF)}$	V_{DD} = 3.6V, V_{IS} = 3.3V/ 0.3V, V_D =0.3V/ 3.3V	-40℃ to +85℃			1	μA
Channel On Leakage Current	$I_{HSD2(ON)}$,$I_{HSD1(ON)}$	V_{DD} = 3.6V, V_{IS} = 3.3V/ 0.3V, V_D =3.3V/ 0.3V or floating	-40℃ to +85℃			1	μA
DIGITAL INPUTS							
Input High Voltage	V_{IH}		-40℃ to +85℃	1.6			V
Input Low Voltage	V_{IL}		-40℃ to +85℃			0.5	V
Input Leakage Current	I_{IN}	V_{DD} = 3.0V, V_S , V_{OE} = 0V or V_{DD}	-40℃ to +85℃			1	μA
DYNAMIC CHARACTERISTICS							
Turn-On Time	t_{ON}	V_{IS} = 0.8V, R_L = 50Ω, C_L = 10pF	+25℃		25		ns
Turn-Off Time	t_{OFF}		+25℃		12		ns
Break-Before-Make Time Delay	t_D	V_{IS} = 0.8V, R_L = 50Ω, C_L = 10pF	+25℃		5		ns
Propagation Delay	t_{PD}	R_L = 50Ω, C_L = 10pF	+25℃		0.25		ns
Off Isolation	O_{ISO}	Signal = 0dBm, R_L = 50Ω, f =240MHz	+25℃		-32		dB
Channel-to-Channel Crosstalk	X_{TALK}	Signal = 0dBm, R_L = 50Ω, f =240MHz	+25℃		-42		dB
-3dB Bandwidth	BW	Signal = 0dBm, R_L = 50Ω, C_L= 5pF	+25℃		750		MHz
Channel-to-Channel Skew	t_{SKEW}	R_L = 50Ω, C_L = 10pF	+25℃		0.02		ns
Charge Injection Select Input to Common I/O	Q	V_G = GND, C_L = 1.0nF, R_G = 0Ω, Q = C_L x V_{OUT}	+25℃		10		pF
HSD+, HSD-, D+, D- ON Capacitance	CON		+25℃		4.5		pF
POWER REQUIREMENTS							
Power Supply Range	V_{DD}		-40℃ to +85℃	2.5		5.5	V
Power Supply Current	I_{CC}	V_{DD} = 3.0V, V_S , V_{OE} = 0V or V_{DD} c	-40℃ to +85℃			1	μA

Specifications are subject to change without notice.

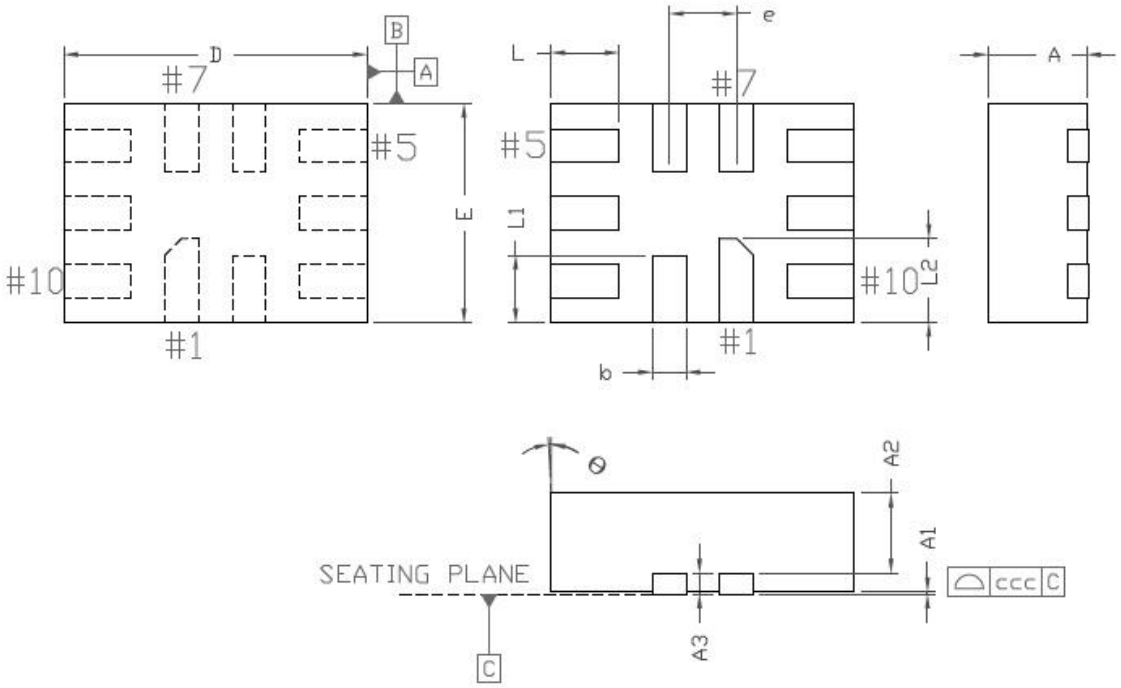
Crosstalk



Off Isolation

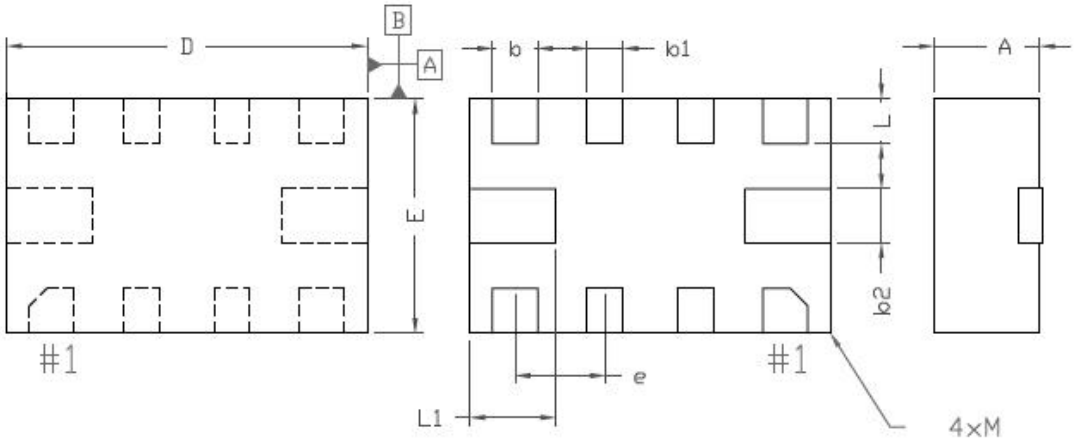


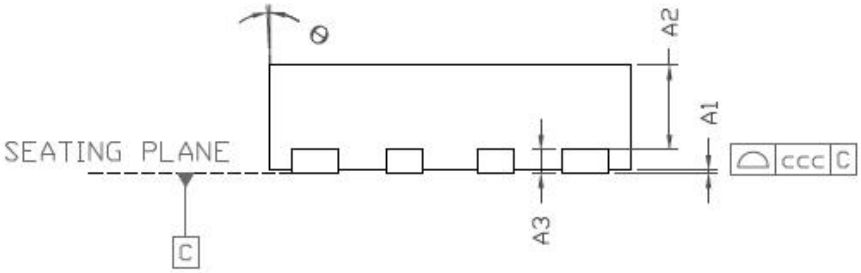
10L-WQFN MECHANICAL DATA



Symbol	Dimension in MM		
	Min.	Mom.	Max.
A	0.55	0.60	0.65
A1	0.00	---	0.05
A2	0.423	---	0.523
A3	---	0.127REF	---
b	0.15	0.25	0.25
D	1.75	1.8	1.85
E	1.25	1.3	1.35
e	---	0.4BSC	---
L	0.35	0.40	0.45
L1	0.35	0.40	0.45
L2	0.45	0.50	0.55
Θ	-12	---	0
ccc	---	0.08	---
M	---	---	0.05
Burr	0.00	0.03	0.06

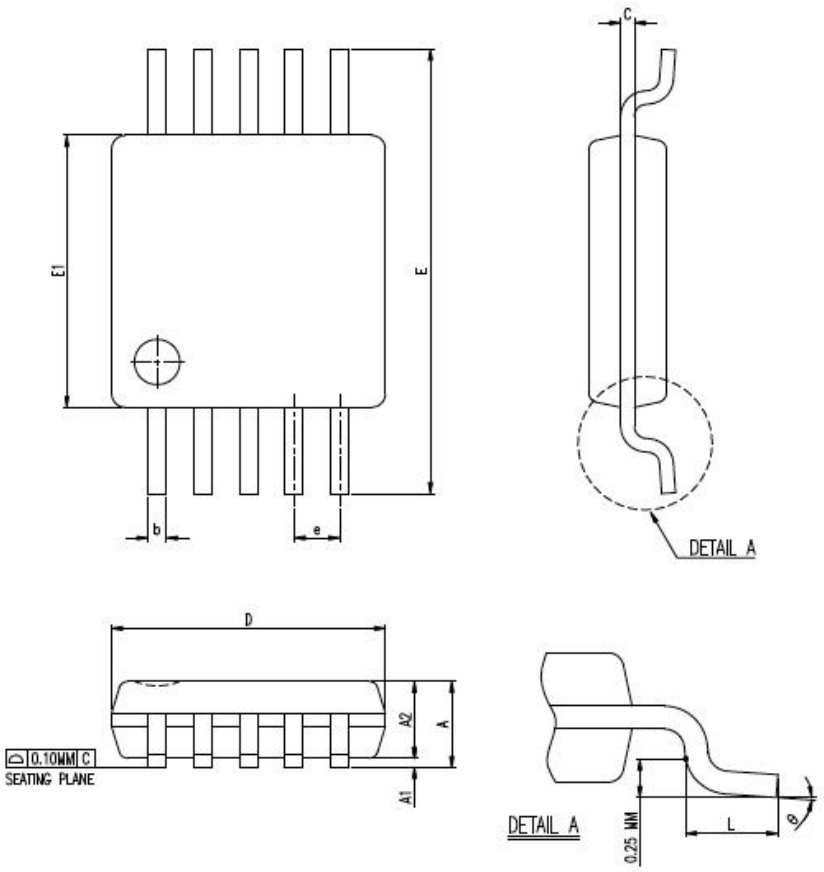
10L-WQFN MECHANICAL DATA





Symbol	Dimension in MM		
	Min.	Mom.	Max.
A	0.55	0.60	0.65
A1	0.00	---	0.05
A2	0.423	---	0.523
A3	---	0.127REF	---
b	0.20	0.25	0.30
b1	0.15	0.20	0.25
b2	0.25	0.30	0.35
D	1.95	2.00	2.05
E	1.25	1.30	1.35
e	---	0.50BSC	---
L	0.20	0.25	0.30
L1	0.425	0.475	0.525
Θ	-12	---	0
ccc	---	0.08	---
M	---	---	0.05
Burr	0.00	0.03	0.06

MSOP-10 MECHANICAL DATA



Symbol	Dimension in MM			Dimension in Inch		
	Min.	Mom.	Max.	Min.	Mom.	Max.
A	0.81	1.02	1.10	0.032	0.040	0.043
A1	0.05		0.15	0.002		0.006
A2	0.75	0.86	0.95	0.030	0.034	0.037
b	0.17	0.20	0.27	0.007	0.008	0.011
C	0.13	0.15	0.23	0.005	0.006	0.009
D	2.90	3.00	3.10	0.114	0.118	0.122
E	4.75	4.90	5.05	0.187	0.193	0.199
E1	2.90	3.00	3.10	0.114	0.118	0.122
e	0.50BASIC			0.020 BASIC		
L	0.40	0.55	0.70	0.016	0.022	0.028
Θ	0*	3*	6*	0*	3*	6*
JEDEC						

***Notes:**

Dimension “D” does not include mold flash, Protrusions or gate burrs.
Mold flash, tie bar burrs and fate burrs shall not exceed 0.12 MM (0.05 Inch) per end dimension “E1” dose not include interlead flash.
Interlead flash shall not exceed 0.25MM (0.010 Inch) per side.