SV73257A

8KV ESD, Low-Voltage, High-Bandwidth
Quad 2:1 MUX/DEMUX Bus Switch

v0.97
SAVITECH Corporation

SV73257A

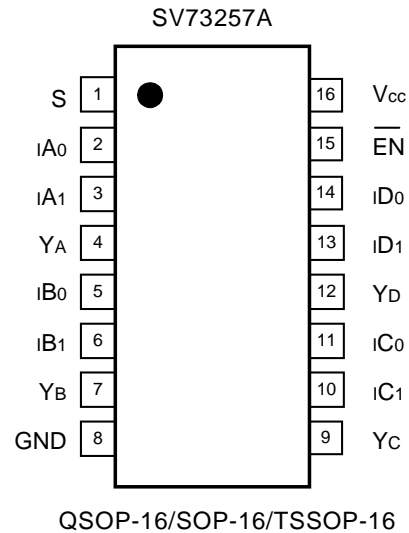## 8KV ESD, Low-Voltage, High-Bandwidth Quad 2:1 MUX/DEMUX Bus Switch

Features

- Very low In-to-Out Ron: 4
- Super-low quiescent current : 0.1uA (typ)
- Loss-less transmission
- Almost no propagation delay
- Built in undershoot clamping diodes
- CMOS/TTL compatible control inputs
- 74F/FCT/LS/AS/ALS257 pin compatible
- Green & Pb-free packages:
  QSOP-16, SOP-16 and TSSOP-16

Description

The SV73257A is an ultra-low Ron, low-power, high-bandwidth, high-speed CMOS/TTL-compatible Quad 2:1 multiplexer/demultiplexer bus switch. It is pin compatible with industry standard 74F/FCT/LS/AS/ALS257 logic devices. Its control inputs were not just designed to meet standard and LV CMOS/TTL logic level, but also designed to be used with most advanced chipset or SOC with 1.8V control inputs and outputs. It built in undershoot clamping diodes on all control inputs and switch inputs that results in robust and reliable switching.

Pin Connection

SV73257A

Pin		Pin	
S	1	16	V_{CC}
IA_0	2	15	$\overline{EN}$
IA_1	3	14	ID_0
Y_A	4	13	ID_1
IB_0	5	12	Y_D
IB_1	6	11	IC_0
Y_B	7	10	IC_1
GND	8	9	Y_C

QSOP-16/SOP-16/TSSOP-16

Function Table

$\overline{EN}$	S	Y_A	Y_B	Y_C	Y_D	Function
H	X	Z	Z	Z	Z	Disable
L	L	IA_0	IB_0	IC_0	ID_0	S=0
L	L	IA_1	IB_1	IC_1	ID_1	S=1

Note:
    H = Logic High
    L = Logic Low

Pin Description

PIN	DESCRIPTION
IA_N - ID_N	Data Inputs
S	Select inputs
L	Enable
Y_A – Y_D	Data outputs
GND	Ground
V_{CC}	Power
NC	No connect

Ordering Information

Ordering Code	Operation Range	Package	Packing
SV73257A-16QP-TR2	-40°C ~ +85°C	QSOP-16	Tape & Reel, 2500pcs
SV73257A-16SP-TR2	-40°C ~ +85°C	SOP-16	Tape & Reel, 2500pcs
SV73257A-16TP-TR3	-40°C ~ +85°C	TSSOP-16	Tape & Reel, 3000pcs

Function Diagram
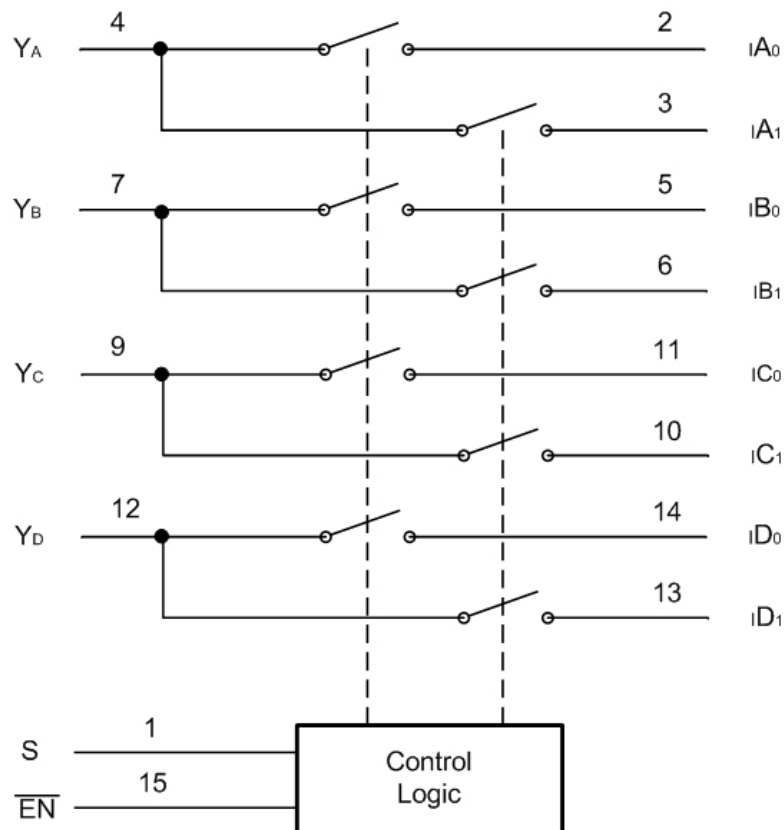
Absolute Maximum Ratings

Parameter	Value	Unit
V_{CC} to GND, Supply Voltage,	7	V
Input Voltage	GND - 0.3 to (V_{CC}) +0.3	V
Storage Temperature Range	-65 to +150	°C
Continuous current through V_{CC} 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.

DC Electrical Characteristics

(TA = -40°C to 85°C, V_{CC} = 4.0V ±10%)

PARAMETER	Description	Test Conditions	MIN	TYP	MAX	UNITS
V_{IH}	Input HIGH Voltage	Guaranteed Logic HIGH Level	1.6		V_{DD}	V
V_{IL}	Input LOW Voltage	Guaranteed Logic LOW level			0.5	V
I_{IH}	Input HIGH Current	V_{CC} = Max, V_{IN} = V_{CC}			±1	µA
I_{IL}	Input LOW Current	V_{CC} = Max, V_{IN} = GND			±1	µA
I_{OZH}	High Impedance Output Current	0 In, Yn Vcc			-1.2	µA
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., V_{IN} = -18mA				V
R_{ON}	Switch On-Resistance	V_{CC} = Min., V_{IN} = 0V, I_{ON} = -40mA or 64mA		4		
		V_{CC} = Min., V_{IN} = 0V, I_{ON} = -15mA		7		

Notes:
1. For max. or min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. V_{DD} = 3.0 - 4.4V, TA = 25°C ambient and maximum loading.
3. Measured by the voltage drop between I_n and Y_n pin at indicated current through the Switch On-Resistance is determined by the lower of the voltages on the two (I_n, Y_n) pins.

Power Supply Characteristics

(V_{DD} = 4.0 – 5.5V)

PARAMETER	Description	Test Conditions		MIN	TYP	MAX	UNITS
I_{CC}	Quiescent Power Supply Current	V_{CC} = Max	V_{IN} = GND or V_{CC}		0.1		µA

Notes:
1. For max. or min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.

Switching Characteristics

PARAMETER	Description	Test Conditions	MIN	TYP	MAX	UNITS
t_{IY}	Propagation Delay I_n to Y_n			0.25		ns
t_{SY}	Bus select time, S to Y_n	C_L = 50pF R_L = 500		3.2		ns
t_{PHZ}, t_{PLZ}	Bus enable time, $\overline{EN}$ to Y_n			3.2		ns
t_{PHZ}, t_{PLZ}	Bus disable time, $\overline{EN}$ to Y_n			1.7		ns

Notes:
1. For max. or min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Guaranteed by design.
3. The switch contributes no propagation delay other than the RC delay of the On-Resistance of the switch and the load capacitance. The time constant for the switch alone is of the order of 0.25ns for 50pF load. Since this time constant is much smaller than the rise/fall times of typical driving signals, it adds very little propagation delay to the system. Propagation delay of the switch when used in a system is determined by the driving circuit on the driving side of the switch and its interactions with the load on the driven side.

QSOP-16   MECHANICAL DATA

DTEAIL A

DTEAIL A
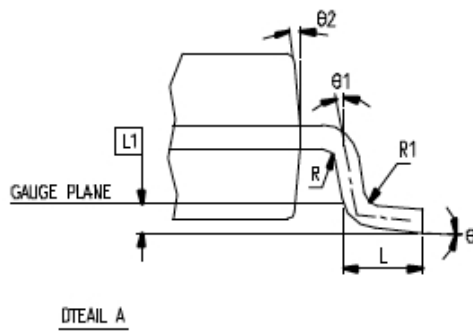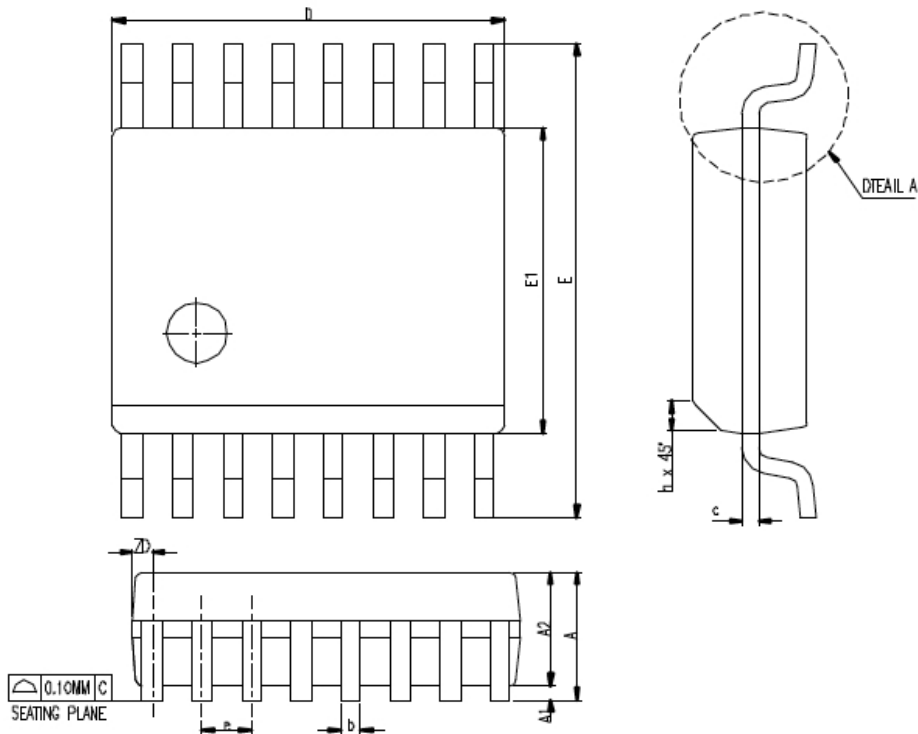
Note:
1. Dimension 0 does not include mold protrusions or gate burrs
2. Mold protrusions and gate burrs shall not exceed 0.006 inch per side.

| Symbol	Dimension in MM			Dimension in Inch		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.35	1.63	1.75	0.053	0.064	0.069
A1	0.10	0.15	0.25	0.004	0.006	0.010
A2			1.50			0.059
b	0.20		0.30	0.008		0.012
c	0.18		0.25	0.007		0.010
e	0.650 BASIC			0.025 BASEC		
D	4.80	4.90	5.00	0.189	0.193	0.197
E	5.79	5.99	6.20	0.228	0.236	0.244
E1	3.81	3.961	3.99	0.150	0.154	0.157
L	0.41	0.635	1.27	0.016	0.025	0.050
h	0.25		0.50	0.010		0.020
L1	0.254 BASIC			0.010 BASIC		
ZD	0.229 REF			0.009 REF		
R1	0.20		0.33	0.008		0.013
R	0.20			0.008		
Θ	0*		8*	0*		8*
$\Theta 1$	0*			0*		
$\Theta 2$	5*	10*	15*	5*	10*	15*
JEDEC	MO-137 (AB)					

SOP-16   MECHANICAL DATA

Gauge plane
0.2500
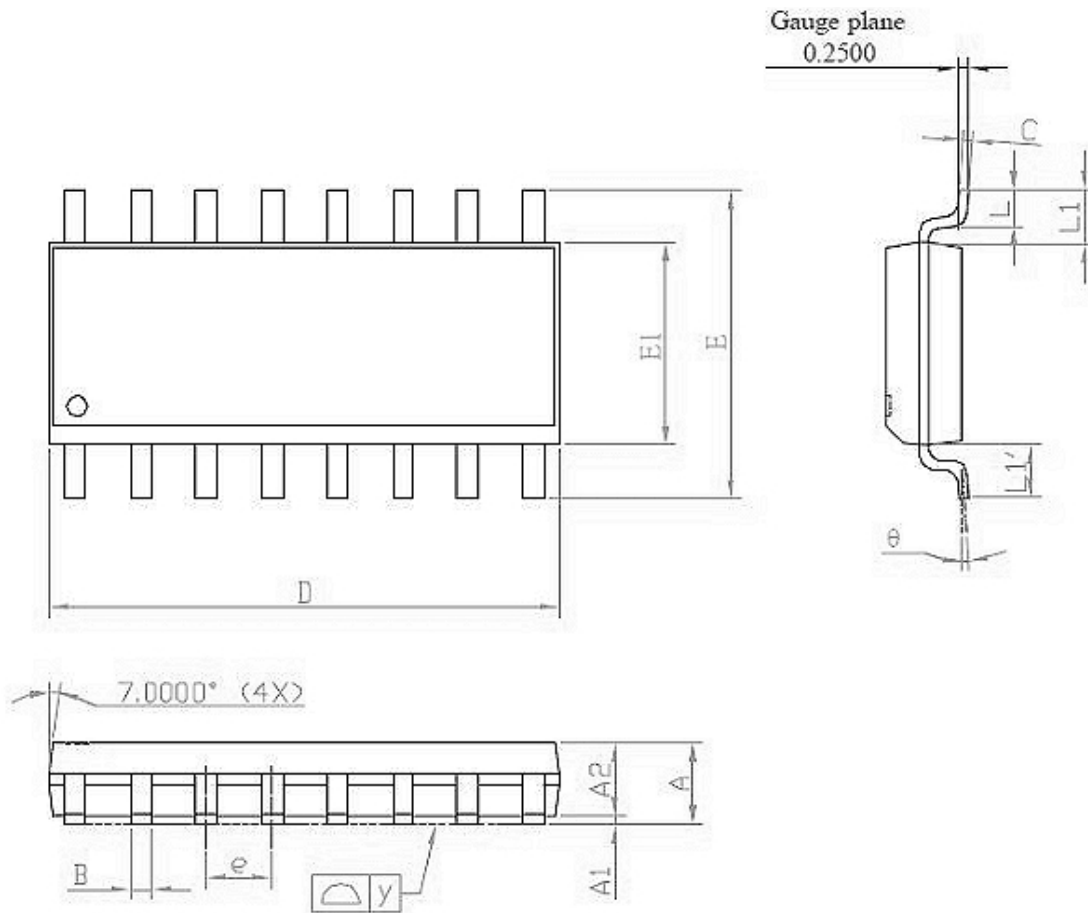
Symbol	Dimension in MM			Dimension in Inch		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.35	1.60	1.75	0.053	0.063	0.069
A1	0.10		0.25	0.004		0.010
A2		1.45			0.057	
B	0.33		0.51	0.013		0.020
C	0.19		0.25	0.007		0.010
D	9.80		10.00	0.386		0.394
E1	3.80	3.90	4.00	0.150		0.157
e		1.27				
E	5.80	6.00	3.20	0.228		0.244
L	0.40		1.27	0.016		0.050
y			0.10			0.004
Θ	0°		8°	0°		8°
|L1-L1'|			0.12			0.005
L1	1.04REF			0.041REF		

TSSOP-16   MECHANICAL DATA
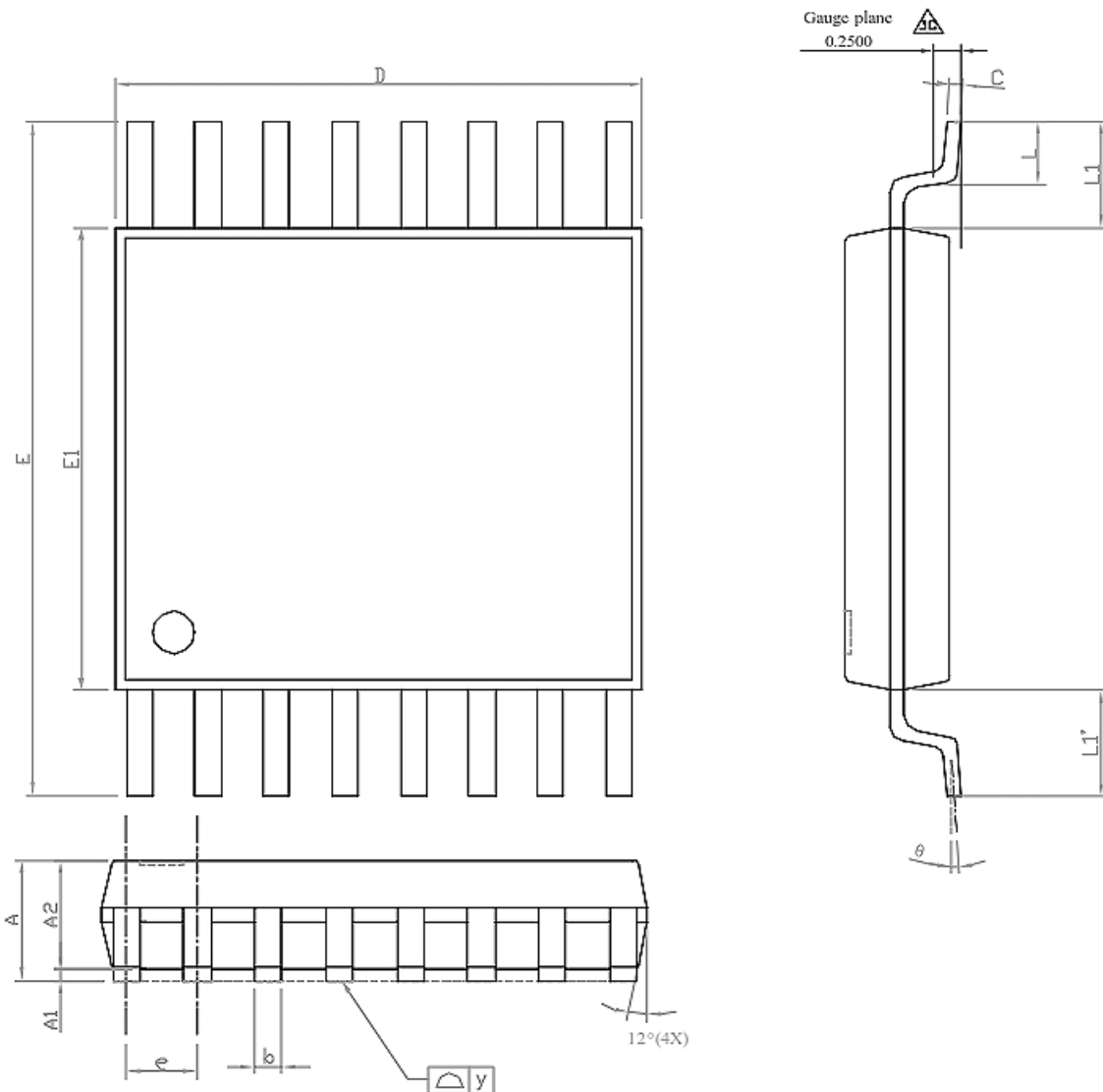
SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	——	——	1.20	——	——	0.048
A1	0.05	——	0.15	0.002	——	0.006
A2	0.80	1.00	1.05	0.031	0.039	0.041
b	0.19	——	0.30	0.007	——	0.012
C	0.09	——	0.20	0.004	——	0.008
D	4.90	5.00	5.10	0.193	0.197	0.201
E	6.20	6.40	6.60	0.244	0.252	0.260
E1	4.30	4.40	4.50	0.169	0.173	0.177
e	——	0.65	——	——	0.026	——
L	0.45	0.60	0.75	0.018	0.024	0.030
y	——	——	0.10	——	——	0.004
θ	0°	——	8°	0°	——	8°
⚠ L1-L1'	——	——	0.12	——	——	0.005
⚠ L1	1.00REF			0.039REF		

NOTE
1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS
2. TOLERANCE ±0.1 mm UNLESS OTHERWISE SPECIFIED
3. COPLANARITY : 0.1 mm
4. LEAD BURR LESS THAN 5mil ⚠
5. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.
6. FOLLOWED TO JEDEC MO-153

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