ESDA6V1BC6

Application Specific Discretes
A.S.D.

QUAD BIDIRECTIONAL TRANSIL SUPPRESSOR FOR ESD PROTECTION

APPLICATIONS

Where transient overvoltage protection in ESD sensitive equipment is required, such as :

- COMPUTERS
- PRINTERS
- COMMUNICATION SYSTEMS
- VIDEO EQUIPMENT

This device is particularly adapted to the protection of symmetrical signals.

DESCRIPTION

The ESDA6V1BC6 is a monolithic array designed to protect up to 4 lines in a bidirectional way against ESD transients.

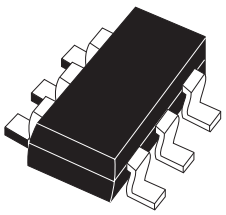
The device is ideal for situations where board space is at a premium.

FEATURES

- 4 BIDIRECTIONAL TRANSIL FUNCTIONS
- ESD PROTECTION FOR DATA, SIGNAL AND V_{CC} BUS
- STAND OFF VOLTAGE RANGE: $\pm$ 5 V MIN.
- LOW LEAKAGE CURRENT < 1 µA
- PEAK PULSE POWER (8/20) = 80W

BENEFITS

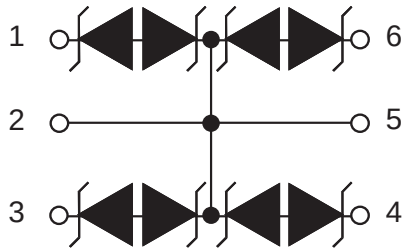
- High ESD protection level : up to 25 kV
- High integration
- Suitable for high density boards



SOT23-6L (SC-74)

FUNCTIONAL DIAGRAM

SOT23-6L



COMPLIES WITH THE FOLLOWING STANDARDS:

- IEC61000-4-2: 15 kV (air discharge)
  8 kV (contact discharge)
- MIL STD 883C-Method 3015-6: class3
  (human body model)

1. ESD protection by ESDA6V1BC6

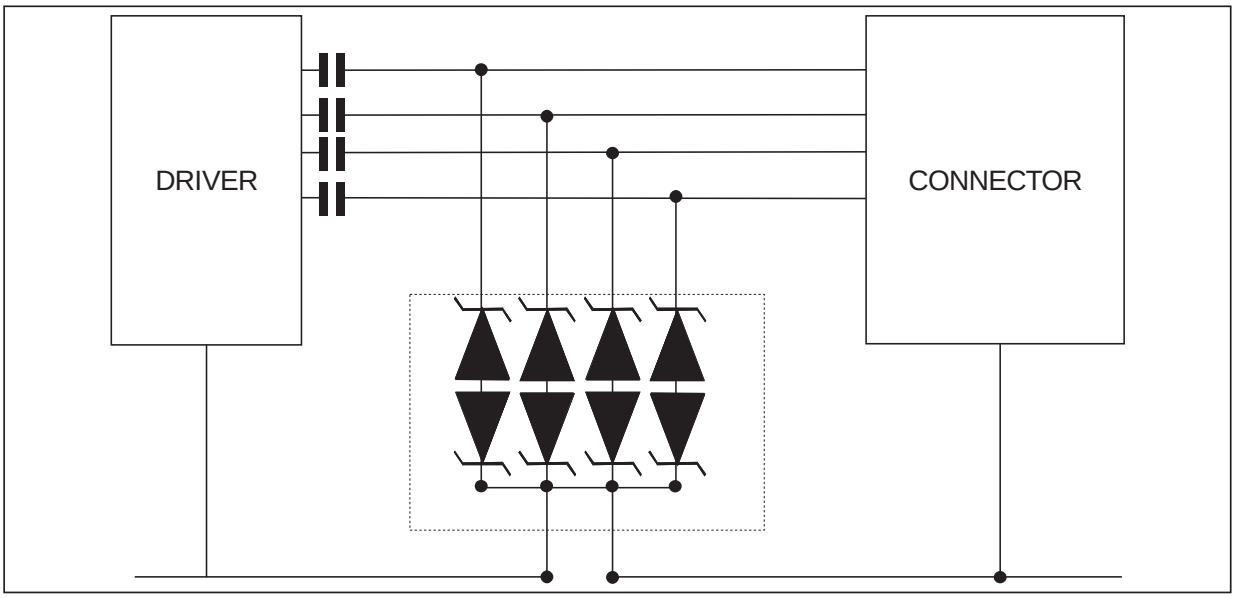
With the focus of lowering the operation levels, the problem of malfunction caused by the environment is critical. Electrostatic discharge (ESD) is a major cause of failure in electronic system.

Transient Voltage Suppressors are an ideal choice for ESD protection and have proven capable in suppressing ESD events. They are capable of clamping the incoming transient to a low enough level such that damage to the protected semiconductor is prevented.

Surface mount TVS arrays offer the best choice for minimal lead inductance.

They serve as parallel protection elements, connected between the signal line to ground. As the transient rises above the operating voltage of the device, the TVS array becomes a low impedance path diverting the transient current to ground.

Bidirectional protection for 0V biased signals.



The ESDA6V1BC6 array is the ideal product for use as board level protection of ESD sensitive semiconductor components.

The tiny SOT23-6L package allows design flexibility in the design of “crowded” boards where the space saving is at a premium. This enables to shorten the routing and can contribute to improve ESD performance.

2. Circuit Board Layout

Circuit board layout is a critical design step in the suppression of ESD induced transients. The following guidelines are recommended :

- The ESDA6V1BC6 should be placed as near as possible to the input terminals or connectors.
- Minimise the path length between the ESD suppressor and the protected device
- Minimise all conductive loops, including power and ground loops
- The ESD transient return path to ground should be kept as short as possible.
- Use ground planes whenever possible.

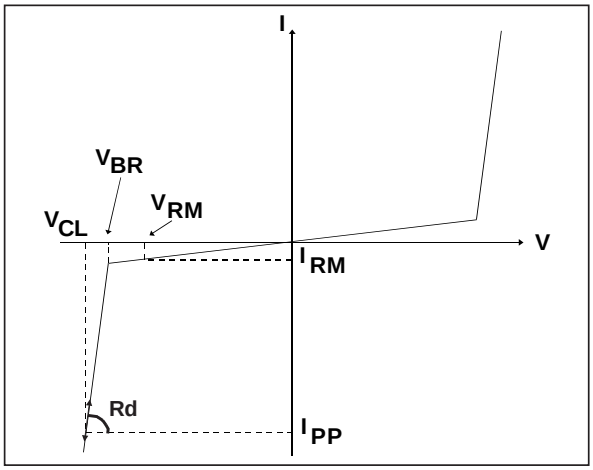
ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25°C)

Symbol	Test conditions	Value	Unit
V_{PP}	ESD discharge - MIL STD 883C - Method 3015-6 IEC61000-4-2 air discharge IEC61000-4-2 contact discharge	25 15 8	kV
P_{PP}	Peak pulse power (8/20µs)	80	W
T_j	Junction temperature	150	°C
T_{stg}	Storage temperature range	-55 to +150	°C
T_L	Lead solder temperature (10 second duration)	260	°C
T_{op}	Operating temperature range (note 1)	-40 to +125	°C

Note 1: Variation of parameters is given by curves.

ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C)

Symbol	Parameter
V_{RM}	Stand-off voltage
V_{BR}	Breakdown voltage
V_{CL}	Clamping voltage
I_{RM}	Leakage current
I_{PP}	Peak pulse current
C	Capacitance
Rd	Dynamic resistance



Type	V_{BR} @ I_R			I_{RM} @ V_{RM}		Rd	αT	C
	min.	max.		max.		typ. note 1	max.	typ. 0V bias
	V	V	mA	µA	V	Ω	10^{-4}/°C	pF
ESDA6V1BC6	6.1	8	1	1	5	1.35	3	20

Note 1 : Square pulse, Ipp = 3A, tp=2.5µs.

Fig. 1: Peak power dissipation versus initial junction temperature.

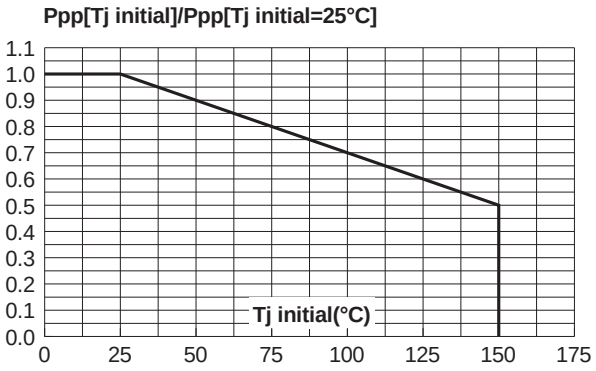


Fig. 2: Peak pulse power versus exponential pulse duration (Tj initial = 25 °C).

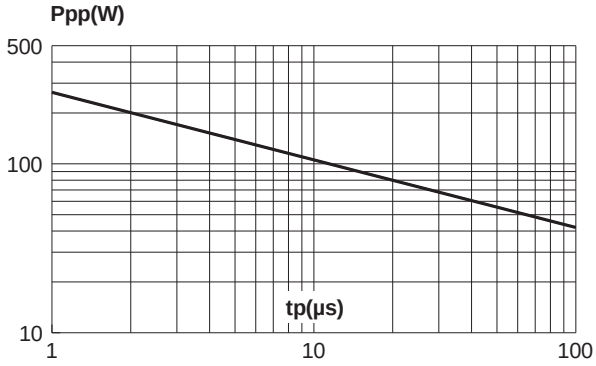


Fig. 3: Clamping voltage versus peak pulse current (Tj initial = 25 °C).
Rectangular waveform tp = 2.5 µs.

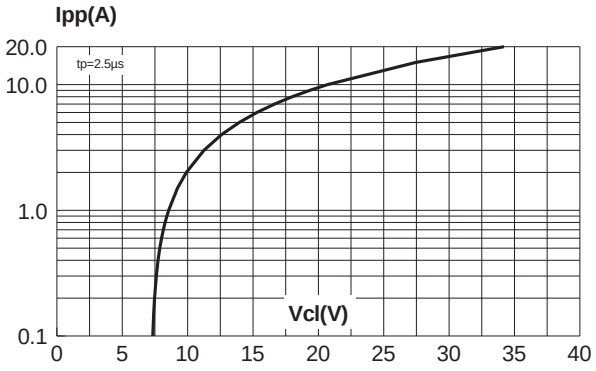


Fig. 4: Capacitance versus reverse applied voltage (typical values).

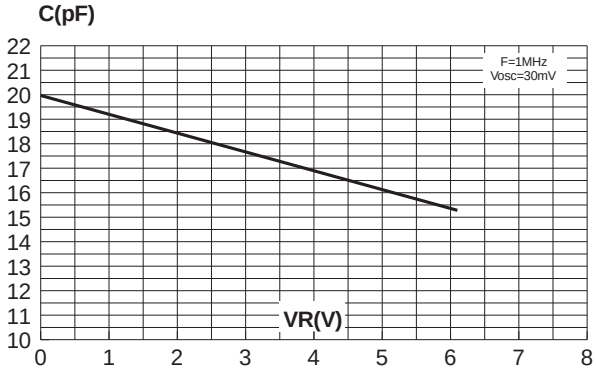
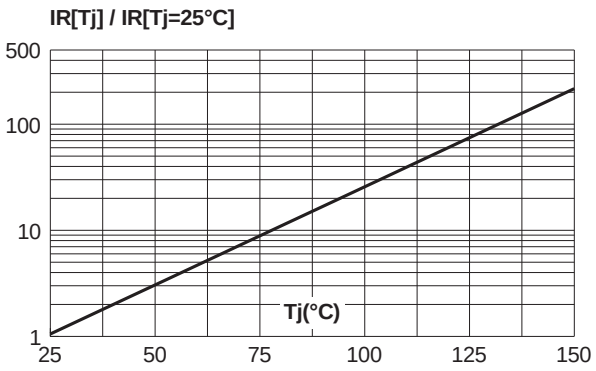


Fig. 5: Relative variation of leakage current versus junction temperature (typical values).



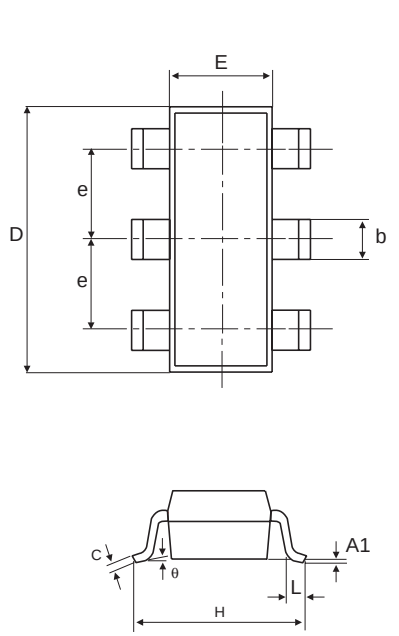
ORDER CODE

ESDA 6V1 B C6

- ESDA: ESD ARRAY
- 6V1: V_{BR} min.
- B: Bidirectional
- C6: PACKAGE: C6: SOT23-6L (SC-74)

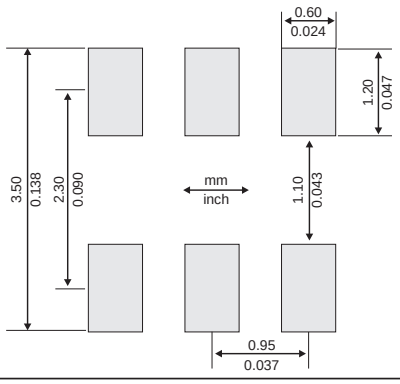
PACKAGE MECHANICAL DATA

SOT23-6L



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.45	0.035		0.057
A1	0		0.10	0		0.004
A2	0.90		1.30	0.035		0.0512
b	0.35		0.50	0.0137		0.02
c	0.09		0.20	0.004		0.008
D	2.80		3.00	0.11		0.118
E	1.50		1.75	0.059		0.0689
e		0.95			0.0374	
H	2.60		3.00	0.102		0.118
L	0.10		0.60	0.004		0.024
θ			10°			10°

FOOTPRINT



MARKING

Type	Marking
ESDA6V1BC6	BS55

Packaging: Standard packaging is tape and reel.