

## Dual USB 2.0 ESD Protection Chip for IEC 61000-4-2 level 4

- REVISION 1 -

### INTRODUCTION

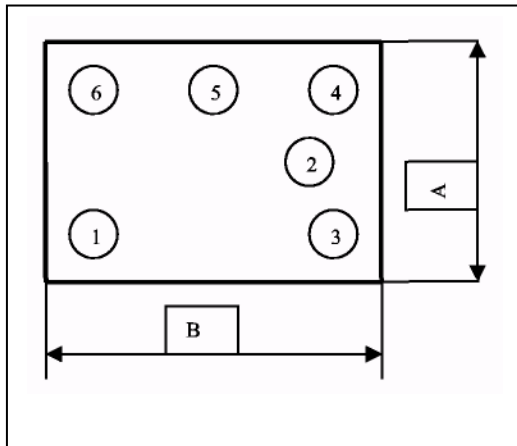
#### DESCRIPTION

The MN4220 is a dual USB 2.0 integrated protection chip compliant the IEC 61000-4-2 level 4 specifications. The MN4220 is ideal for protecting systems using high-speed ports such as DVI or HDMI, along with corresponding ports in removable storage, digital camcorders, DVD-RW drives and other applications where ESD protection is required. The MN4220 is able to protect two data lines against transient overvoltage conditions.

#### APPLICATIONS

- General purpose high-speed data line ESD protection
- DVI ports, HDMI ports in note books, set top box, digital TVs, LCD Displays

#### PHYSICAL CHARACTERISTICS

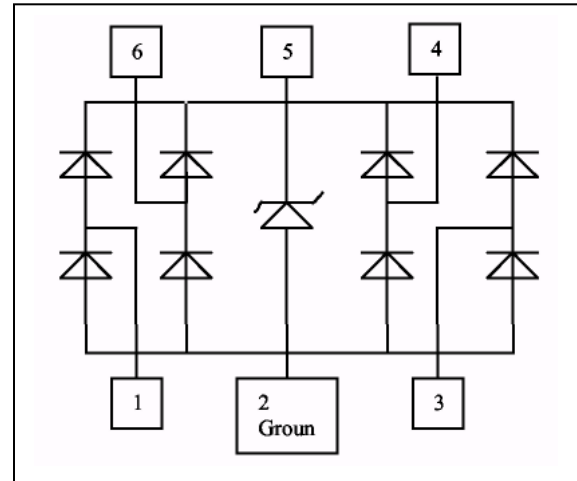


Mechanical data: A=800um; B=580um.  
Pins 1 – 6: Al metallization for bonding Ø100um.

#### FEATURES

- IEC61000-4-2(ESD) and IEC61000-4-4 (EFT) standards
- Low capacitance
- Fast time operation response
- Low leakage current
- Robustness to drive
- Absorbs repetitive ESD conditions
- Integrated and reduced package
- Bidirectional devices
- Available in die and package forms
- Delivery in 6-lead SOT23 or wafer form.

#### ELECTRICAL SCHEMATIC



#### ORDERING INFORMATION

##### MN4220"T"- "P"-TR

"T" for temperature= "C" for commercial (0 - 70°C) or "I" for industrial (-20°C - +85°C) - Default or no indication means "C"

"P" for packaging= "ST" for SOT, "WF" for wafer\* form

"TR" for Tape and Reel - No indication means delivery in tube

\* Minimum quantity= 1 wafer

### Absolute maximum ratings

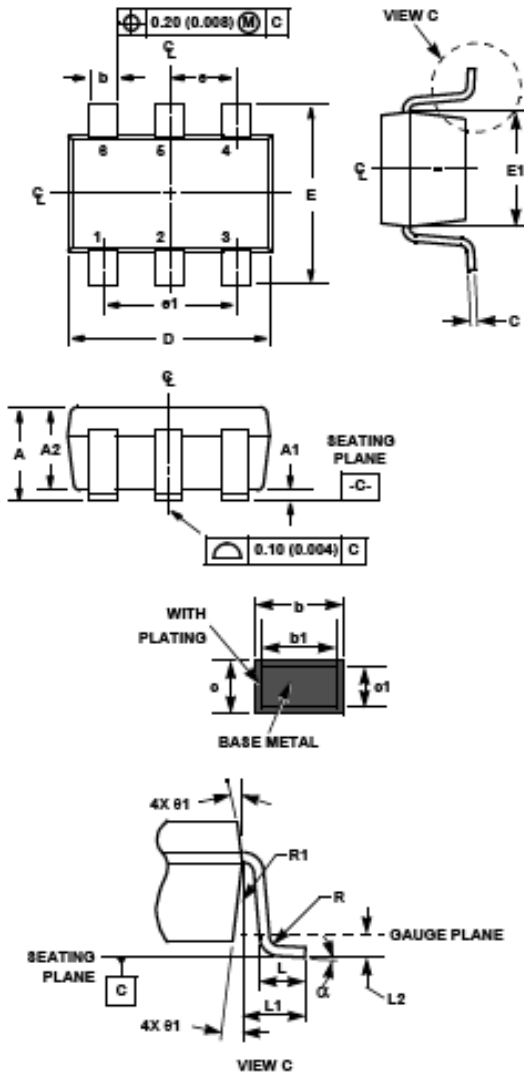
Parameter	Symbol	Conditions	Value	Unit
DC input voltage range	$V_{IO}$		+5.5 max.	V
Electrostatic Discharge, all pins	ESD	IEC 61000-4-2, level 4. Contact	±8.0	kV
Max. junction temperature	$T_j$		+125	°C

### Electrical Characteristics at $T_j=25^{\circ}\text{C}$

Symbol	Parameter	Conditions	MIN.	TYP.	MAX.	Unit
$I_{LEAK}$	Diode reverse leakage current. Pins 1, 3, 4, 6 to ground	$V = +3.0\text{ V}$	-	-	100	nA
$V_{BR}$	Zener diode breakdown voltage. Pin 5 to 2	$I_z = 1\text{ mA}$	6.1	7.0	8.5	V
$C_Z$	Zener diode capacitance to ground. Pin 5 to 2	$F = 1\text{ MHz}$ , $V_{DC} = 0\text{ V}$ Pin 5 = +3.0 V	-	40	-	pF
$V_F$	Forward voltage	$I_F = 1\text{ mA}$		0.7		V
$C_{IO}$	Pin capacitance to ground. Pins 1,3, 4, 6 to 2	$V_{DC} = 0\text{V}$ ; $F = 1\text{ MHz}$ Pin 5 = +3.0 V	-	1.0	-	pF

**PACKAGE DIMENSIONS**

**6-Lead SOT23**



**P6.064**

**6 LEAD SMALL OUTLINE TRANSISTOR PLASTIC PACKAGE**

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.036	0.057	0.90	1.45	-
A1	0.000	0.0059	0.00	0.15	-
A2	0.036	0.051	0.90	1.30	-
b	0.012	0.020	0.30	0.50	-
b1	0.012	0.018	0.30	0.45	
c	0.003	0.009	0.08	0.22	6
c1	0.003	0.008	0.08	0.20	6
D	0.111	0.118	2.80	3.00	3
E	0.103	0.118	2.60	3.00	-
E1	0.060	0.068	1.50	1.75	3
e	0.0374 Ref		0.95 Ref		-
e1	0.0748 Ref		1.90 Ref		-
L	0.014	0.022	0.35	0.55	4
L1	0.024 Ref.		0.60 Ref.		
L2	0.010 Ref.		0.25 Ref.		
N	6		6		5
R	0.004	-	0.10	-	
R1	0.004	0.010	0.10	0.25	
α	0°	8°	0°	8°	-

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**NOTES:**

1. Dimensioning and tolerance per ASME Y14.5M-1994.
2. Package conforms to EIAJ SC-74 and JEDEC MO178AB.
3. Dimensions D and E1 are exclusive of mold flash, protrusions, or gate burrs.
4. Footlength L measured at reference to gauge plane.
5. "N" is the number of terminal positions.
6. These Dimensions apply to the flat section of the lead between 0.08mm and 0.15mm from the lead tip.
7. Controlling dimension: MILLIMETER. Converted Inch dimensions are for reference only