

ESDALCL6-2SC6

Datasheet - production data

Very low capacitance and low leakage current ESD protection

Features

- 2 data-line protection
- Protects V_{BUS}
- Very low capacitance: 2.5 pF typ.
- Very low leakage current:
 - 10 nA at 3 V
 - 1 nA at 1 V
- RoHS compliant

Complies with the following standards:

- IEC 61000-4-2 level 4 and higher:
 - 30 kV (air discharge)
 - 15 kV (contact discharge)
- MIL STD883G-Method 3015-7
 - 25 kV (human body model)

Applications

- USB 2.0 ports up to 480 Mb/s (high speed)
- Compatible with USB 2.0
- Ethernet port: 10/100 Mb/s
- SIM card protection
- Video line protection
- Portable healthcare equipment

Description

The ESDALCL6-2SC6 is a monolithic application specific device dedicated to ESD protection of high speed interfaces, such as USB 2.0, ethernet links and video lines.

The very low line capacitance secures a high level of signal integrity without compromising in protecting sensitive chips against the most stringently characterized ESD strikes.

Its low leakage current makes it suitable for portable equipment.

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Figure 1. Functional diagram (top view)



This is information on a product in full production.

1 Characteristics

Symbol	Pa	Value	Unit		
	Peak pulse voltage	IEC 61000-4-2 air discharge	30	kV	
V _{PP}		IEC 61000-4-2 contact discharge	15		
		MIL STD883G-Method 3015-7	25		
T _{stg}	Storage temperature range		-55 to +150	°C	
Тj	Operating junction temperature range		-40 to +125	°C	
ΤL	Lead solder temperature (10 seconds duration)		260	°C	

Table 2.

2. Electrical characteristics (T_{amb} = 25 °C)

Symbol	Parameter	Test conditions	Value			Unit	
Symbol	Falameter	Test conditions	Min.	Тур.	Max.	Unit	
V _{BR}	I _R = 1 mA		6			V	
	$V_{RM} = 3 V$, V_{CC} to GND				10	nA	
I _{RM}	$V_{RM} = 1 V, V_{CC}$ to GND				1	- 114	
V _F	Forward voltage	I _F = 10 mA			1.1	V	
V _{CL}		I _{PP} = 1 A, 8/20 μs Any I/O pin to GND			12	V	
	Clamping voltage	I _{PP} = 5 A, 8/20 μs Any I/O pin to GND			17	V	
C _{i/o-GND}	Capacitance between I/O and GND	V 1.65 V		2.5	3.5	рF	
$\Delta C_{i/o-GND}$	Capacitatice between 1/0 and Civid	vR = 1.03 v		0.015		Ч	
C _{i/o-i/o}	Capacitance between I/O	V _B = 1.65 V		1.2	1.7	рF	
ΔC _{i/o-i/o}		VH - 1.05 V		0.04			

Figure 2.

(typical values) C(pF) 3.0 2.5 2.0 sc=30mv Tj=25°C 1.5 C--1.0 0.5 Data line voltage (V) 0.0 4.0 4.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 5.0

Capacitance versus voltage

Figure 4. Leakage current versus junction temperature (typical values, $V_{\rm R}$ = 1 V)



Figure 6. ESD response to IEC 61000-4-2 (+8 kV contact discharge)





Figure 5. Leakage current versus reverse applied voltage (typical values)



Figure 7. ESD response to IEC 6100-4-2 (-8 kV contact discharge)







Figure 8. S21 attenuation measurement

Figure 9. USB2.0 eye diagram

2 Ordering information scheme







3 Package information

- Epoxy meets UL94, V0
- Lead-free packages

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK[®] is an ST trademark.

Table 3. SOT23-6L dimensions



Figure 11. SOT23-6L footprint dimensions in mm

Figure 12. SOT23-6L marking





4 Ordering information

Table 4.Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
ESDALCL6-2SC6	LL26	SOT23-6L	16.7 mg	3000	Tape and reel

5 Revision history

Table 5.Document revision history

Date	Revision	Changes
31-Oct-2012	1	First issue.



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