

Low power high sensitivity omnipolar hall chip

Description

- The SL253 is a low power, high sensitivity, omnipolar Hall switch designed and manufactured using the CMOS process. The device integrates a voltage regulator, Hall voltage generator, small signal amplifier, chopper regulator, Schmitt trigger and CMOS output driver.
- The chip is characterised by good temperature stability, high stress resistance and high sensitivity, and operates at voltages from 1.8V to 5.5V. They are available in TO92S in-line package and SOT23-3L SMD package, and all packages are RoHS compliant.

Features

- Push-pull output
- ESD performance up to: $\pm 6\text{kV}$
- Operating voltage: 1.8V~5.5V
- Micropower battery-powered applications
- Omnipolar output switch

Application

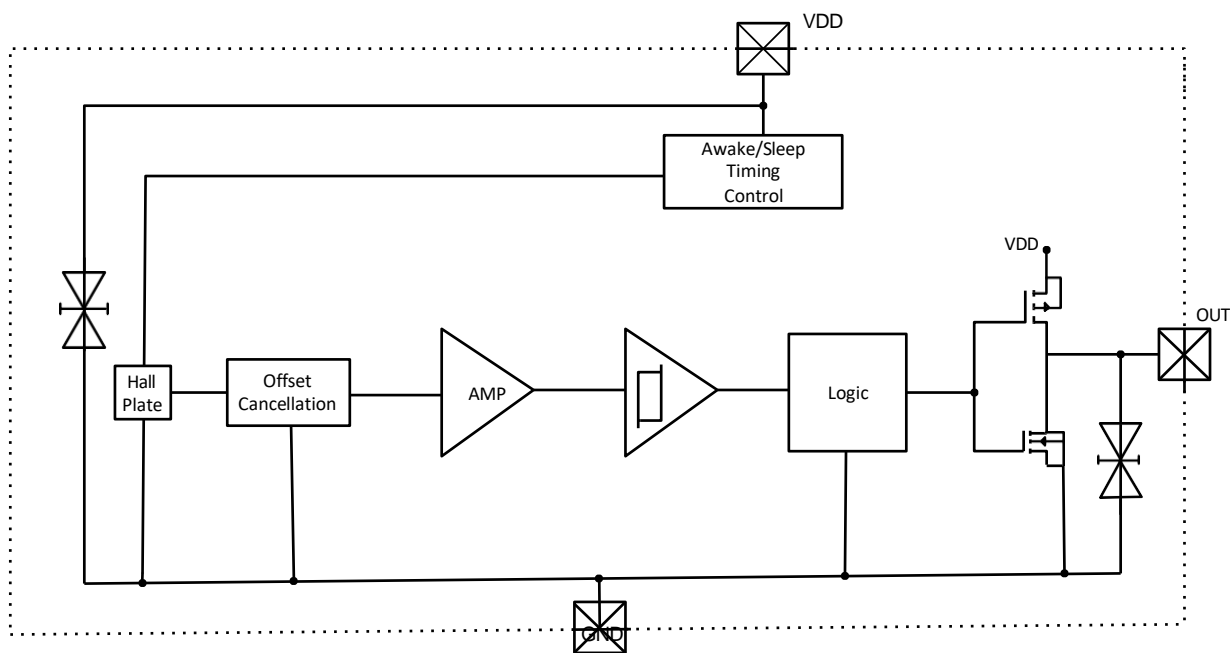
- Solid state switches
- Bluetooth headset charging compartment
- Portable steriliser box
- Notebook computers
- Low duty cycle replacement reed magnetic
- Sensing switches
- Level meter
- Proximity switches

Packagin

Part Number	Package	Ambient, TA	Packing
SL253-9	TO92S	-40°C~85°C	1000/bag
SL253-3	SOT23-3L	-40°C~85°C	3000/reel

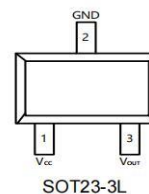


Functional block diagram

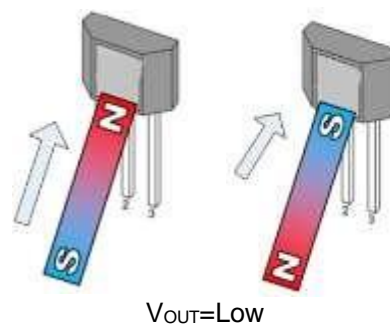
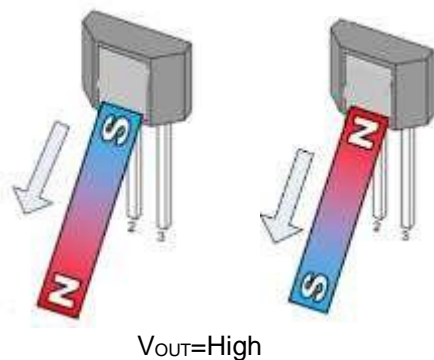


Pin description

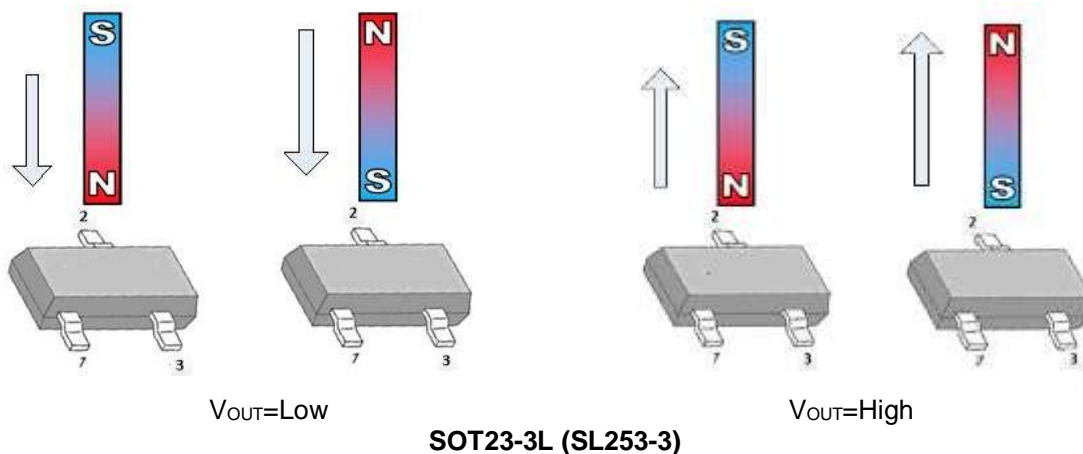
Number	Name	Description
1	V _{CC}	power supply
2	GND	ground
3	V _{OUT}	export



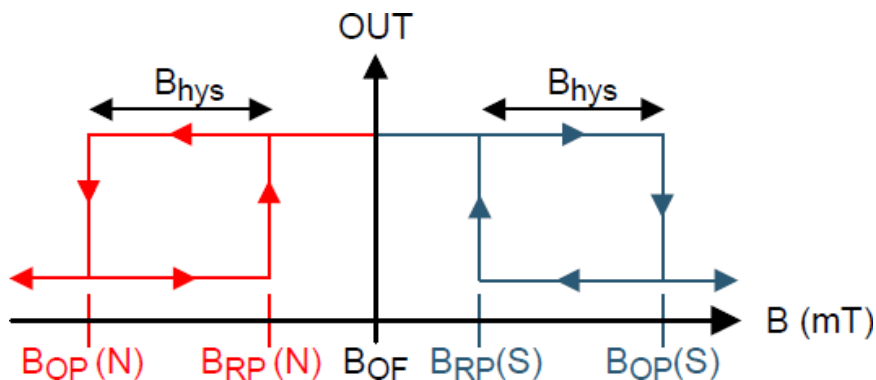
Examples of applications



TO92S(SL253-9)



Output state diagram



Limit parameters

Parameter	Symbol	Value	Units
power supply voltage	V_{CC}	6	V
reverse voltage	V_{CCR}	-0.3	V
output current	I_{OUT}	5	mA
output voltage	V_{OUT}	6	V
operating ambient temperature	T_A	-40~85	°C
storage temperature	T_S	-50~150	°C

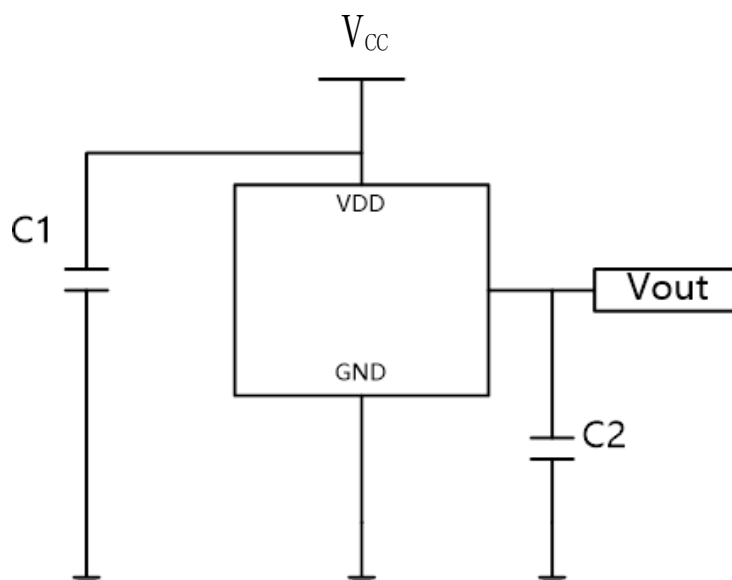
The absolute maximum rating is the limit that the chip can withstand; exceeding this value may cause permanent damage to the chip.

Electrical and magnetic characteristics ($T_A=25^{\circ}\text{C}$, $V_{CC}=3.0\text{V}$)

Parameter	Symbol	Test Conditions	Typ	Max	Units
operating voltage	V_{CC}			5.5	V
output low voltage	V_{OL}	$I_{OUT}=1\text{mA}$		0.2	V
output high voltage	V_{OH}	$I_{OUT}=-1\text{mA}$			V
output current	I_{OUT}	at low output voltage		3	mA
		at high output voltage			mA
operating current	I_{awk}	upon awakening	2.8		mA
average power supply current	I_{DD}		5	10	μA
wake-up mode time	T_{awk}		20		μs
sleep mode time	T_p		20		ms
operating frequency	F_w		50		Hz
operate point	B_{op}		± 22		Gs
release point	B_{rp}		± 14		Gs
hysteresis	B_{hys}	$ B_{op}-B_{rp} $	8		Gs

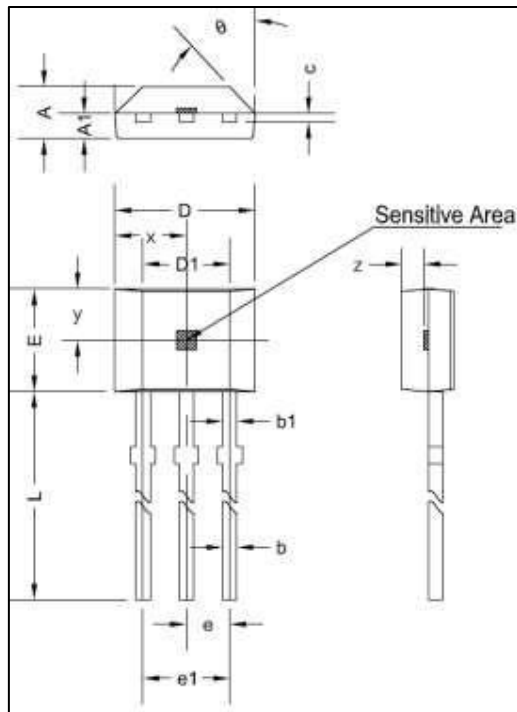
Application circuit

$C1=0.1\mu\text{f}, C2=100\text{pF}$

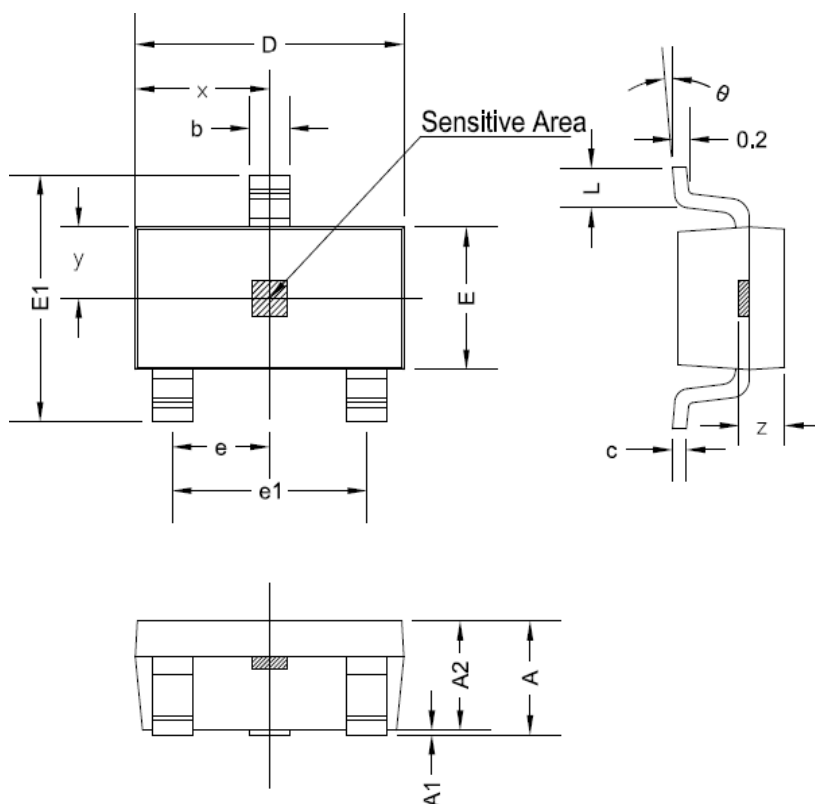


Outline Dimensions

TO92S Package Outline



Symbol	Size (mm)		Size (in inches)	
	Min	Max	Min	Max
A	1.42	1.67	0.056	0.066
A1	0.66	0.86	0.026	0.034
b	0.35	0.56	0.014	0.022
b1	0.4	0.55	0.016	0.022
C	0.36	0.51	0.014	0.02
D	3.9	4.2	0.154	0.165
D1	2.97	3.27	0.117	0.129
E	2.9	3.28	0.114	0.129
e	1.270TYP		0.050TYP	
e1	2.44	2.64	0.096	0.104
L	13.5	15.5	0.531	0.61
x	2.025TYP		0.080TYP	
y	1.545TYP		0.061TYP	
z	0.500TYP		0.020TYP	
θ	45°TYP		45°TYP	

SOT23-3L Package Outline


Symbol	Size (mm)		Size (in inches)	
	Min	Max	Min	Max
A	1.05	1.25	0.041	0.049
A1	0	0.1	0	0.004
A2	1.05	1.15	0.041	0.045
b	0.3	0.5	0.012	0.02
c	0.1	0.2	0.004	0.008
D	2.82	3.02	0.111	0.119
E	1.5	1.7	0.059	0.067
E1	2.65	2.95	0.104	0.116
e	0.950TYP		0.037TYP	
e1	1.8	2	0.071	0.079
L	0.3	0.6	0.012	0.024
x	1.460TYP		0.057TYP	
y	0.800TYP		0.032TYP	
z	0.600TYP		0.024TYP	
θ	0°	8°	0°	8°