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Product List

OB93TS22W28SP

L:PB Free identifier

{No text is Non-PB free, "P" is PB free}

Y: year

WW: week

Description

The OB93TS22W28 is a touch sensor IC.

OB93TS22W28 can provide 22 independent touch keys.

The sensibility of all channels may be adjusted by one capacitor CREF.

Ordering Information

OB93TS ihhKL YWW

i: process identifier { W = 2.2V ~ 5.5V}

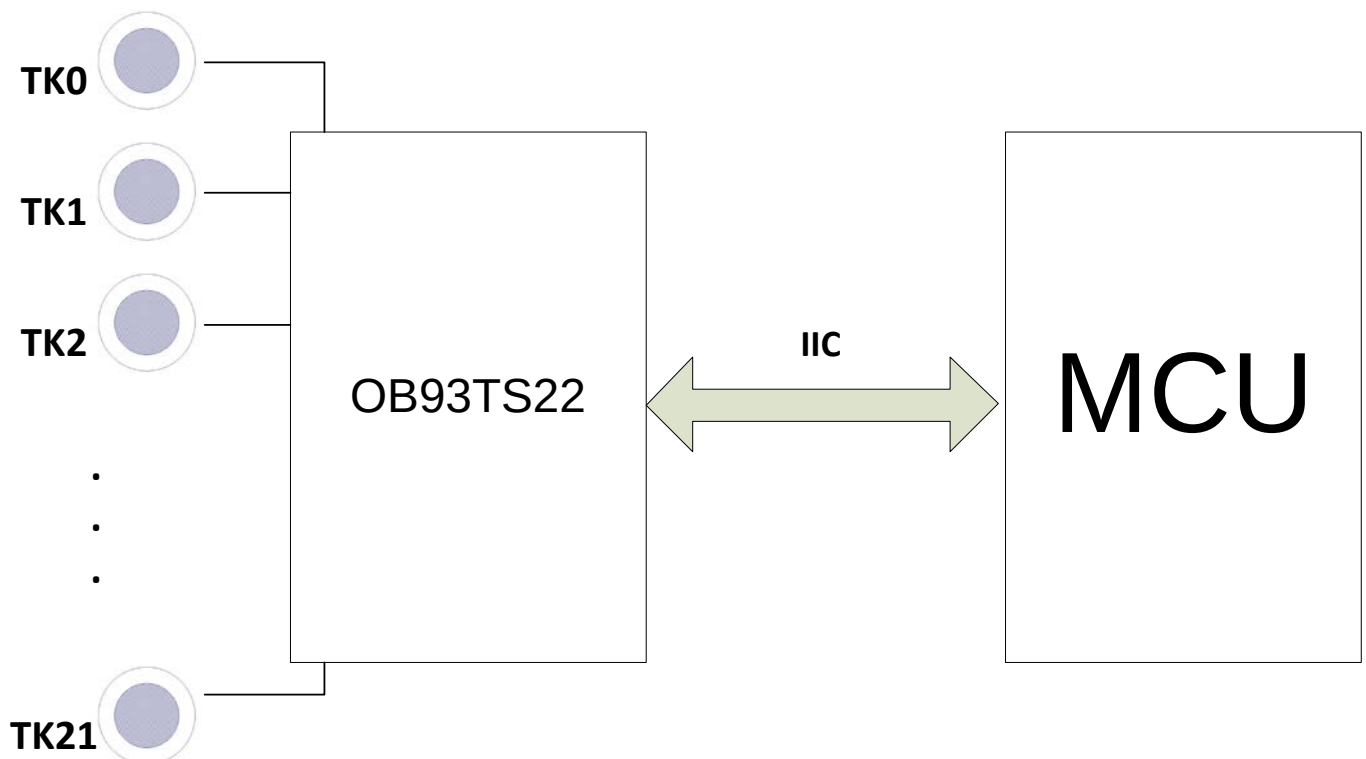
hh: pin count

k: package type postfix {as table below }

Postfix	Package
S	SOP (300 mil)

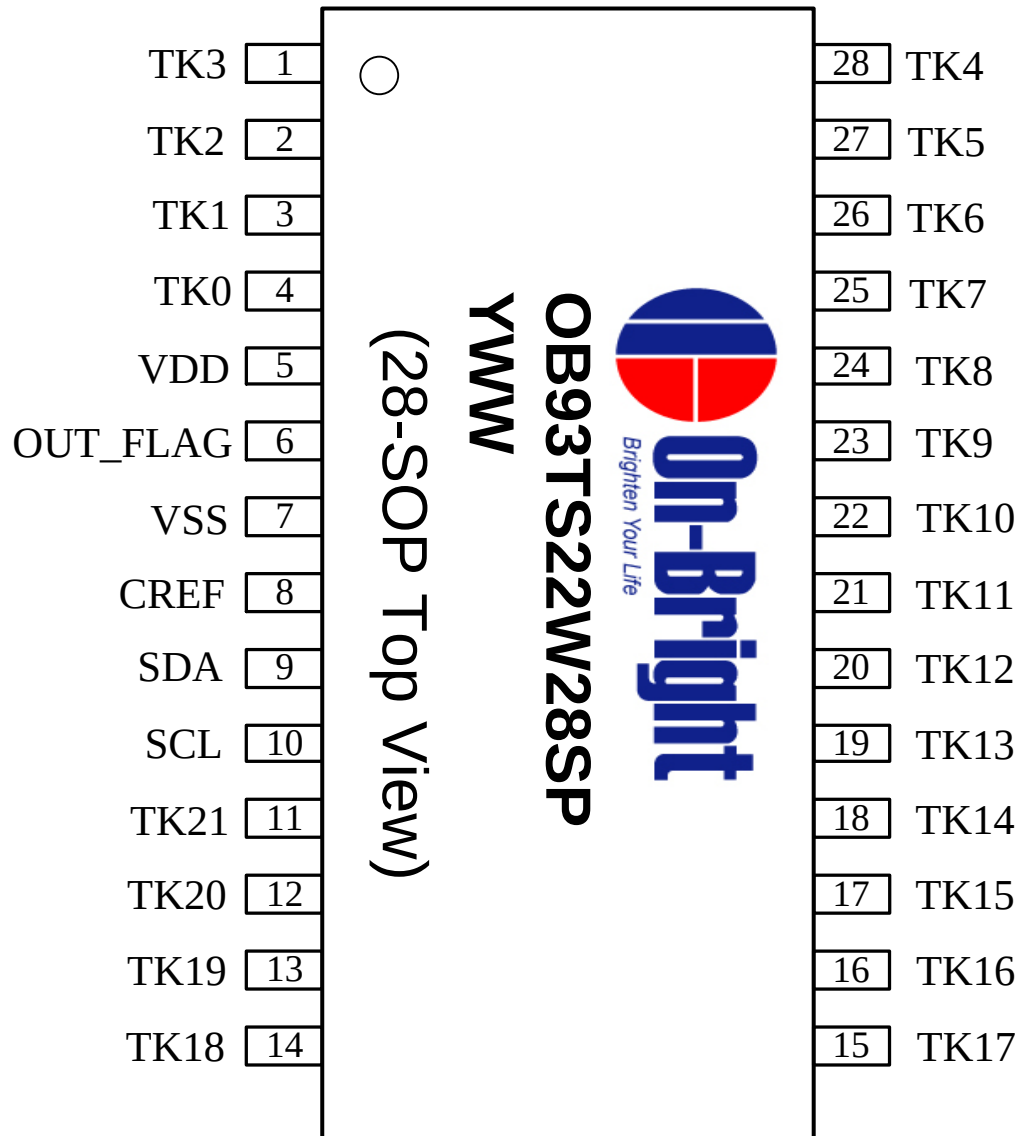
Features

- Operating Voltage: 2.2V ~ 5.5V
- 22 channel touch key
- Auto-calibration
- Adjustable Sensibility
- Output Format: IIC
- Sleep-Mode and Any-key Wakeup



Pin Configuration

28 Pin SOP



Pin Description

28L SOP	Symbol	I/O	Description
1	TK3	I	Touch Key Channel 3
2	TK2	I	Touch Key Channel 2
3	TK1	I	Touch Key Channel 1
4	TK0	I	Touch Key Channel 0
5	VDD	I	Power supply
6	OUT_FLAG	O	Button Status Indication
7	VSS	I	Power supply
8	CREF	I	Touch Key external capacitor (Recommend:10nF~100nF. Typical: 47nF)
9	SDA	I	IIC SDA pin
10	SCL	I	IIC SCL pin
11	TK21	I	Touch Key Channel 21
12	TK20	I	Touch Key Channel 20
13	TK19	I	Touch Key Channel 19
14	TK18	I	Touch Key Channel 18
15	TK17	I	Touch Key Channel 17
16	TK16	I	Touch Key Channel 16
17	TK15	I	Touch Key Channel 15
18	TK14	I	Touch Key Channel 14
19	TK13	I	Touch Key Channel 13
20	TK12	I	Touch Key Channel 12
21	TK11	I	Touch Key Channel 11
22	TK10	I	Touch Key Channel 10
23	TK9	I	Touch Key Channel 9
24	TK8	I	Touch Key Channel 8
25	TK7	I	Touch Key Channel 7
26	TK6	I	Touch Key Channel 6
27	TK5	I	Touch Key Channel 5
28	TK4	I	Touch Key Channel 4

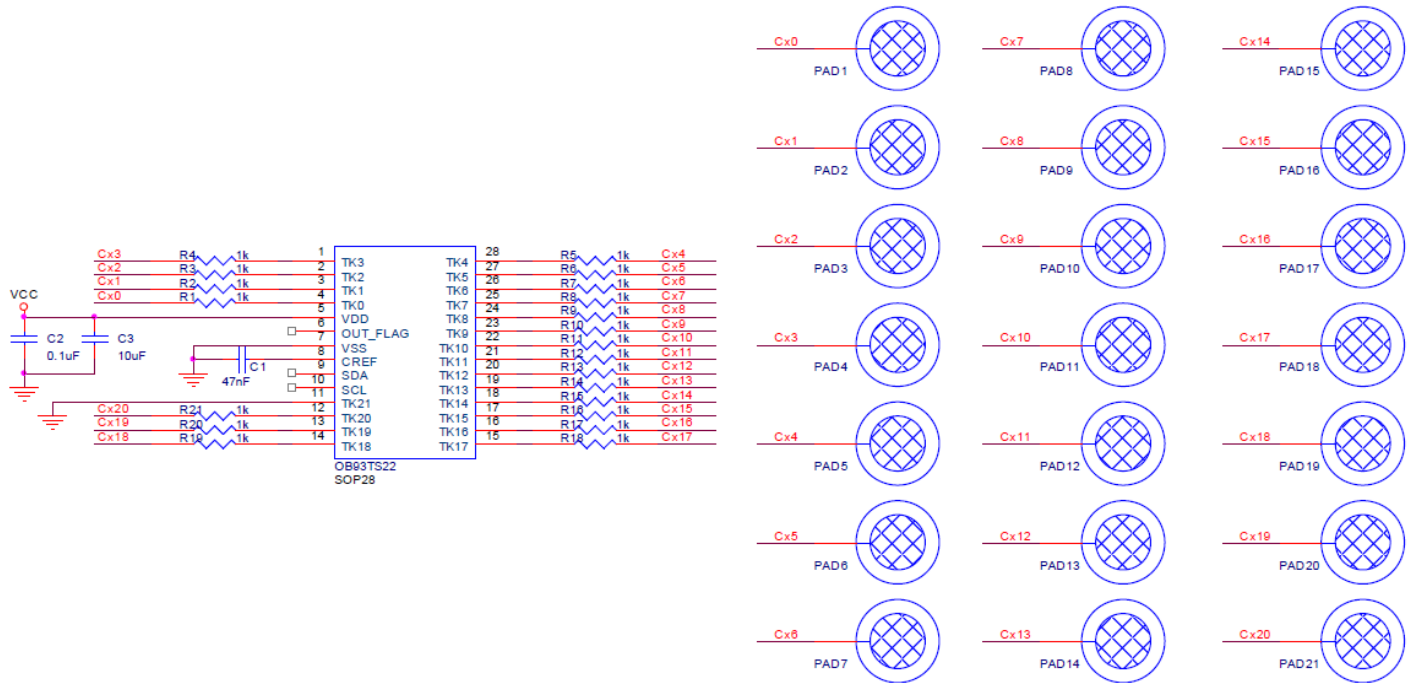
Function Description

1. The Application Circuit

C1: Adjustable Sensibility. 10nF~100nF. Please put them close to touch IC.

R1~R21: 560Ω~1KΩ. Please put them close to touch IC.

Unused touch key channels must be connected to ground, such as TK21.



2. Output Indication

When any touch key is touched, OB93TS22 will output a low level signal from OUT_FLAG, and output IIC code in the same time. MCU can read the IIC code when OUT_FLAG signal is low.

2.1 IIC Device Address

7 Bit Slave Address	D7	D6	D5	D4	D3	D2	D1	D0	8 Bit Slave Address
0x30	0	1	1	0	0	0	0	0(W)	0x60
0x30	0	1	1	0	0	0	0	1(R)	0x61

2.2 Format for Register Write and Read

Register write format:

Start	Slave Addr + W	A	Reg Addr	A	Data	A	Data	A		Data	A	Stop
-------	----------------	---	----------	---	------	---	------	---	-------	------	---	------

Register read format:

Start	Slave Addr + W	A	Reg Addr	A
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Re-Start	Slave Addr + R	A	Data	A	Data	A		Data	N	Stop
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☐ from master to slave

A = acknowledge (SDA LOW)

N = not acknowledge (SDA HIGH)

☒ from slave to master

S = START condition

P = STOP condition

2.3 Register Map

Name	Register Address (in Hex)	Data (in Hex)	Access	Executable Mode
Get firmware version	[0x10]	Data*4	R	Setup/Normal
Software reset device	[0x13]	-	W	Setup/Normal
Start scan (Normal mode)	[0x14]	-	W	Setup/Normal
Stop scan (Setup mode)	[0x15]	-	W	Setup/Normal
Power-saving mode	[0x16]	Data	R/W	Setup/Normal
Get Touch Key scan status	[0x17]	Data*3	R	Setup/Normal
Channel configuration	[0x20+channel number]	Data*2	R/W	Setup/Normal

Command	Format for Data			
Get firmware version	Version[31:24]	Version[23:16]	Version[15:8]	Version[7:0]

Version[15:0] : Firmware version.

Command	Format for Data	
Power-saving mode	00[7:6]	IdleTime[5:0]

IdleTime[5:0]: Idle time exceeds the set to enter power-saving mode.

0: Disable power-saving mode.

1: $1 \times 0.2 = 0.2$ Sec

2: $2 \times 0.2 = 0.4$ Sec

⋮

63: $63 \times 0.2 = 12.6$ Sec

Command	Format for Data		
Get Touch Key scan status	Key Status[23:16]	Key Status[15:8]	Key Status[7:0]

Key Status[22:0]: 22 Touch Key Status.

Key Status[n]: 0: No touch

1: Touch

Command	Format for Data		
Channel configuration	Release[7:4]	Sensitivity [3:0]	De-bounce[7:0]

Release[7:4]: Release time.

0: Disable Release time function

1: $1 \times 0.82 = 0.82$ Sec

2: $2 \times 0.82 = 1.64$ Sec

⋮

15: $15 \times 0.82 = 12.3$ Sec

Sensitivity[3:0]: Sensitivity.

1: The sensitivity of the worst, but at least the chance of malfunction.

⋮

15: The best sensitivity, but the highest probability malfunction.

De-bounce[7:0]: 0~255: De-bounce coefficient.

Operating Conditions

Symbol	Description	Min.	Typ.	Max.	Unit.	Remarks
TA	Operating temperature	-40	25	85	°C	Ambient temperature under bias
VDD	Supply voltage	2.2		5.5	V	

DC Characteristics

TA = -40°C to 85°C, Vcc = 5.0V

Symbol	Parameter	Valid	Min	TPY	Max	Units	Conditions
VOL	Output Low-voltage	OUT_FALG,DATA			0.45	V	IOL=16mA Vcc=5V
VOH	Output High-voltage	OUT_FALG,DATA	2.4			V	IOH= -250uA
ICC	Power Supply Current	VDD		3.3	5	mA	Active mode