



VK36Q4 Datasheet

4-channel touch 1-to-1 output

Rev.1.2

Intellectual Property Statement:

Shenzhen Vinka Microelectronics Co., Ltd. (hereinafter referred to as “the Company”) owns legally registered intellectual property rights in both domestic and international jurisdictions. Any unauthorized use of the Company’s products or patented technologies by individuals or organizations is strictly prohibited.

The Company reserves the right to take legal action against any infringement, and to seek full compensation for damages or unlawful gains.

The Company’s name and trademarks are legally protected and may not be used or imitated without explicit written permission. No implied or express license shall be granted under any circumstances.

1 General Description

The VK36Q4 is a 4-channel touch detection chip designed to replace traditional mechanical buttons, making it particularly suitable for compact, interference-resistant, and power-sensitive products.

This chip features excellent anti-interference capability, high penetration performance, a wide operating voltage range, and extremely low static current. The output mode supports active-low logic and provides multi-key detection and a 16-second long-press reset function. Internally, it adopts a specialized integrated circuit design with a high power supply rejection ratio, which effectively prevents false triggering and ensures reliable operation even in complex environments. Its package design contributes to achieving a waterproof, dustproof, aesthetically sealed front panel for the end product.

2 Key Features

- Operating voltage: 2.4-5.5V
- Operating current 20.0 μ A@VDD=3.0V
Standby current 6.0 μ A@VDD=3.0V
- Power-on reset function (POR)
- Low-voltage reset function (LVR)
- The response time is approximately 45ms @VDD=3V
- The overall sensitivity is adjusted by connecting a capacitor to ground through the CS pin. The capacitance value ranges from 1 to 100nF. The larger the capacitance value, the more sensitive it is. It is not allowed not to connect a capacitor.
- Connect a small capacitor to the ground for fine-tuning the sensitivity of each touch channel to make the sensitivity of each channel consistent. The capacitance value ranges from 1 to 100pF. The larger the capacitance value, the less sensitive it is. It is most sensitive without connecting a capacitor.
- Built-in key debouncing, no need for external software to debouncing again
- Pins Q0 to Q3 are the output
Output low level is effective, multi-key mode
Press and hold the button for 16 seconds to reset
- After power-on, there is approximately 0.25 seconds of stabilization time during which all functions are disabled. Do not touch the detection point during this period
- Self-calibrate parameters according to environmental changes.
- It is relatively easy to pass the EMC test
- HBM Electrostatic 4KV-8KV(Class 3A)
- Available Packages:
DFN10L(3.0mm x 3.0mm PP=0,5mm)

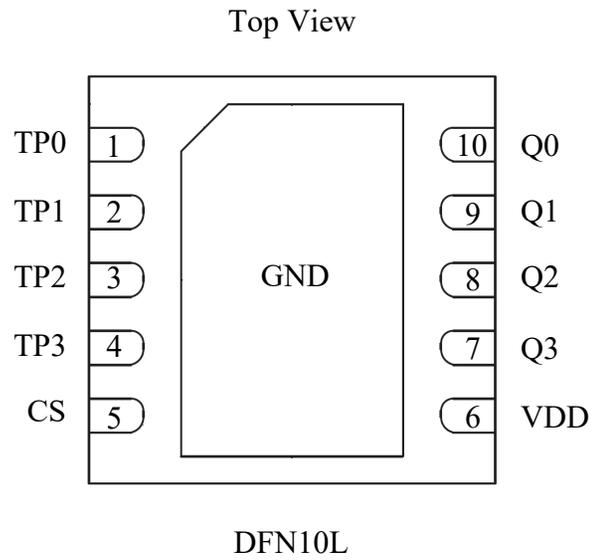
3 Product Selection

Part No.	Touch Channel	Working Voltage	Normal Mode/Standby	Output (/ Optional parameter)	Packaging
VK3601	1	2.4-5.5V	120 μ A/4 μ A(3V)	Direct CMOS output high/low level	SOT23-6
VK3602K	2	2.4-5.5V	60 μ A/8 μ A(3V)	Direct CMOS output high/low level	SOP8
VK3602XS	2	2.4-5.5V	60 μ A/8 μ A(3V)	Latch the CMOS output high/low level	SOP8
VK3603	3	2.4-5.5V	20 μ A/7 μ A(3V)	Direct CMOS output, low level effective	ESOP8
VK3604A	4	2.4-5.5V	20 μ A/7 μ A(3V)	Direct/latch high/low level multi-key/single-key CMOS/ Drain long press to keep output/ Long press for 16 seconds to reset	SOP16
VK3604B	4	2.4-5.5V	20 μ A/7 μ A(3V)	Direct/latch high/low level multi-key/single-key CMOS/ Drain long press to keep output/ Long press for 16 seconds to reset	TSSOP16
VK36E4	4	2.4-5.5V	20 μ A/6 μ A(3V)	Direct/latch high/low level multi-key/single-key CMOS/ Drain long press to keep output/ Long press for 16 seconds to reset	ESSOP10
VK36Q4	4	2.4-5.5V	20 μ A/6 μ A(3V)	Direct/latch high/low level multi-key/single-key CMOS/ Drain long press to keep output/ Long press for 16 seconds to reset	DFN10L
VK3606D	6	2.4-5.5V	20 μ A/7 μ A(3V)	Direct CMOS output, low level effective, multi-key mode, long press for 10 seconds to reset	SOP16
VK3610I	10	2.4-5.5V	45 μ A/9 μ A(3V)	I2C interface +INT pin, multi-key mode, hold for 10 seconds to reset	SOP16
VK3618I	18	2.4-5.5V	60 μ A/16 μ A(3V)	Two groups of touch correspond to I2C interface +INT pin, each group has 9 touch channels, multi-key mode, and reset after holding for 10 seconds	SSOP28

4 Ordering Information

Part No.	Packaging	Tube Qty	Tray(reel)Qty	Box Qty	Total Qty	Notes
VK3601	SOT23-6		3000/reel	30000/box	120000 PCS	
VK3602K	SOP8	100/tube		10000/box	60000 PCS	
VK3602XS	SOP8	100/tube		10000/box	60000 PCS	
VK3603	ESOP8		4000/reel	8000/box	64000 PCS	
VK3604A	SOP16	50/tube		5000/box	50000 PCS	
VK3604B	TSSOP16	100/tube		10000/box	100000 PCS	
VK36E4	ESSOP10		4000/reel	8000/box	64000 PCS	
VK36Q4	DFN10L		5000/reel		40000 PCS	
VK3606D	SOP16	50/tube		5000/box	50000 PCS	
VK3610I	SOP16	50/tube		5000/box	50000 PCS	
VK3618I	SSOP28	50/tube		5000/box	50000 PCS	

5 Package Pinout Information(DFN10L)



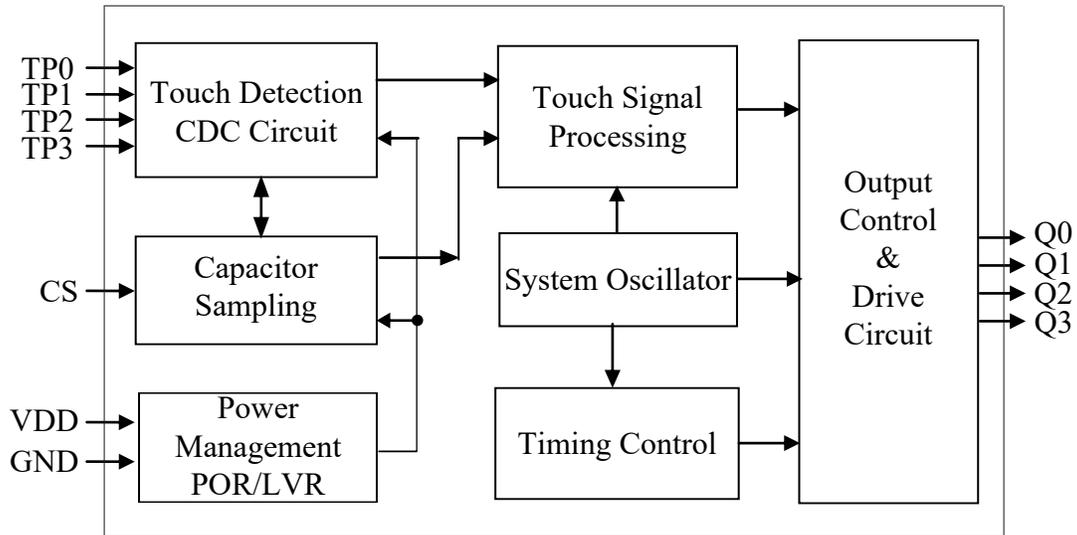
For more information: [Page 9](#)

5.1 VK36Q4/DFN10L Pin Description

No.	Name	I/O	Function Description
1	TP0	I	Touch input: Connect a small capacitor to ground to fine-tune the sensitivity (1-100pF), and it is most sensitive when not connected
2	TP1	I	Touch input: Connect a small capacitor to ground to fine-tune the sensitivity (1-100pF), and it is most sensitive when not connected
3	TP2	I	Touch input: Connect a small capacitor to ground to fine-tune the sensitivity (1-100pF), and it is most sensitive when not connected
4	TP3	I	Touch input: Connect a small capacitor to ground to fine-tune the sensitivity (1-100pF), and it is most sensitive when not connected
5	CS	I	Sensitivity adjustment, connect to ground capacitance (1-100nF)
6	VDD	VDD	Positive power supply
7	Q3	O	Touch output
8	Q2	O	Touch output
9	Q1	O	Touch output
10	Q0	O	Touch output
0	GND	GND	Negative power supply

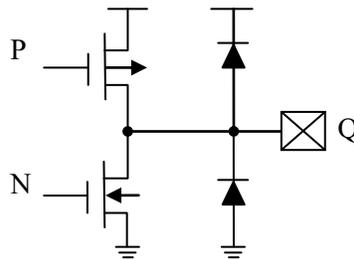
6 Functional Description

6.1 Block Diagram



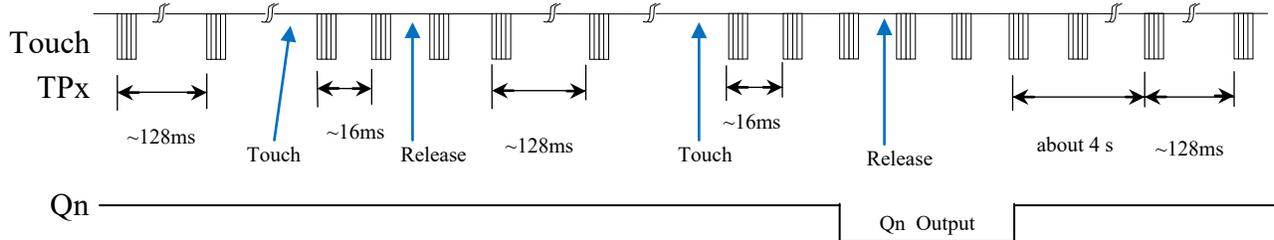
6.2 Output Parameters

The output of VK36Q4 is a CMOS direct output (Q0 to Q3), which is effective at low levels and supports multi-key output. Press and hold for 16 seconds to reset the chip, and the output will return to the power-on state.



6.3 Working Mode

The VK36Q4 chip has two working modes: standby mode and normal mode. The key was touched and switched to the normal mode. The keyless touch 4S automatically enters standby mode to reduce power consumption. When VDD=5V, the Qn output response is approximately 160 milliseconds in standby mode and about 48 milliseconds in working mode.



6.4 Sensitivity Adjustment

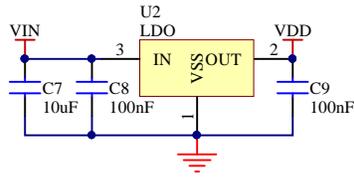
The sensitivity of VK36Q4 is related to the size of the touch PAD, the thickness of the shell, the size of the sensitivity capacitance, etc. The sensitivity should be adjusted according to the actual application of the product. The sensitivity can be adjusted from the following four aspects:

1. Touch the area of the PAD
Under other unchanged conditions, the larger the touch area, the more sensitive it is, but the area must be within the effective area.
2. The thickness of the shell
Under other unchanged conditions, the thinner the casing, the higher the sensitivity; the thicker the casing, the lower the sensitivity. However, the thickness must not exceed the maximum limit.
3. Adjust the capacitance value of pin CS to ground
CS adjusts the overall sensitivity, with the larger the value, the more sensitive it is. Commonly used values range from 1 to 100nF, and for some special applications, there are also those exceeding 200nF. CS capacitors should be selected with smaller temperature coefficients, such as X7R and NPO.
4. Adjust the small capacitance between the touch foot and the ground
The sensitivity is fine-tuned by touching the small capacitance of the touch foot to the ground. The larger the capacitance, the lower the sensitivity. It is most sensitive without a capacitance. Common values range from 1 to 100pF.

Shell thickness (acrylic or glass)	CS Electrical value (for reference only)
<3mm	10nF/25V
3-6mm	22nF/25V
6-10mm	47nF/25V

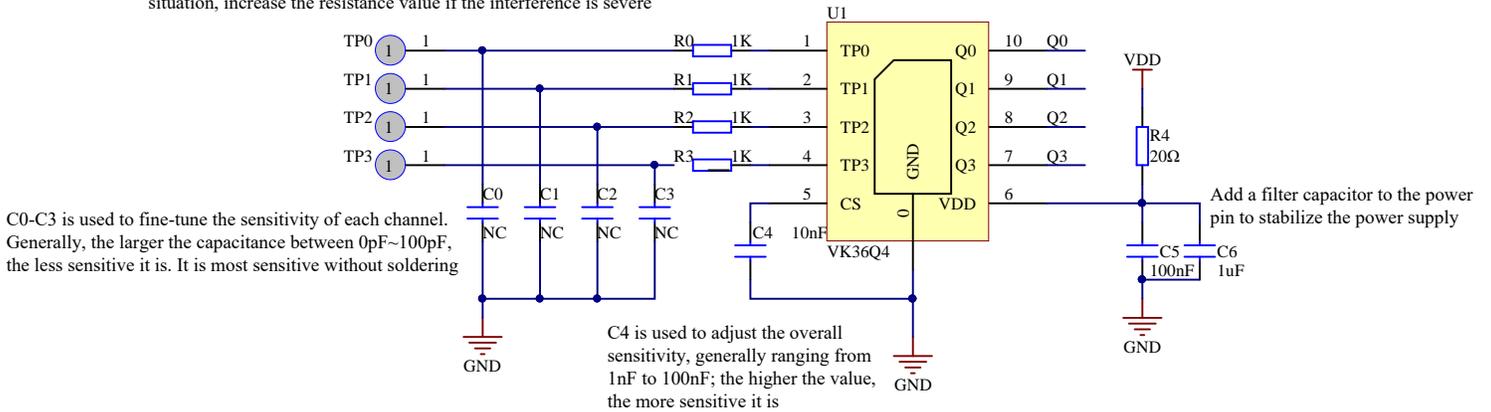
7 Application Circuits

It is recommended to use LDO for power supply



The touch pin is connected in series with a 1K resistor to enhance anti-interference performance. Generally, a 1K resistor is connected in series

The resistance range is 0R to 10K. Depending on the interference situation, increase the resistance value if the interference is severe



Notes:

1. On the PCB, the length of the line from the touch PAD to the touch pin should be as short as possible, and the touch traces must not be parallel or cross with other lines.
2. The power supply must be stable. Fluctuations, rapid drift or interference in the supply voltage may cause abnormal sensitivity or false detection.
3. The board covering the PCB must not contain any metal or conductive materials, and the same applies to the surface coating.
4. A 0.1μF capacitor must be used between VDD and GND, and the distance from the VDD and GND pins of the chip should be the shortest. It is recommended to add a 20Ω resistor and a 1μF capacitor on the power supply.
5. CS adjusts the overall sensitivity. This capacitor must be connected and placed as close to the chip as possible. The larger it is, the more sensitive it is. Common values range from 1 to 100nF, and for some special applications, there are also those exceeding 200nF. CS capacitors should be selected with a smaller temperature coefficient and stability, such as X7R and NPO.
6. Fine-tune the sensitivity of capacitors C0-C3(0~100pF) to ensure consistent sensitivity across all channels. The smaller the capacitance value, the more sensitive it is. The highest sensitivity is achieved without connecting capacitors. Sensitivity adjustments must be made based on the actual PCB application. For conventional applications, it is not necessary to connect them. Capacitors with smaller temperature coefficients and greater stability, such as X7R and NPO, must be selected.
7. Resistors R0-R3 are mainly used to effectively prevent radio frequency interference and enhance anti-static capability. The common values range from 470R to 1K, with a maximum not exceeding 10K. Resistors should be placed as close as possible to the chip. For conventional applications, they can be omitted.

8 Electrical Characteristics

Absolute Maximum Ratings

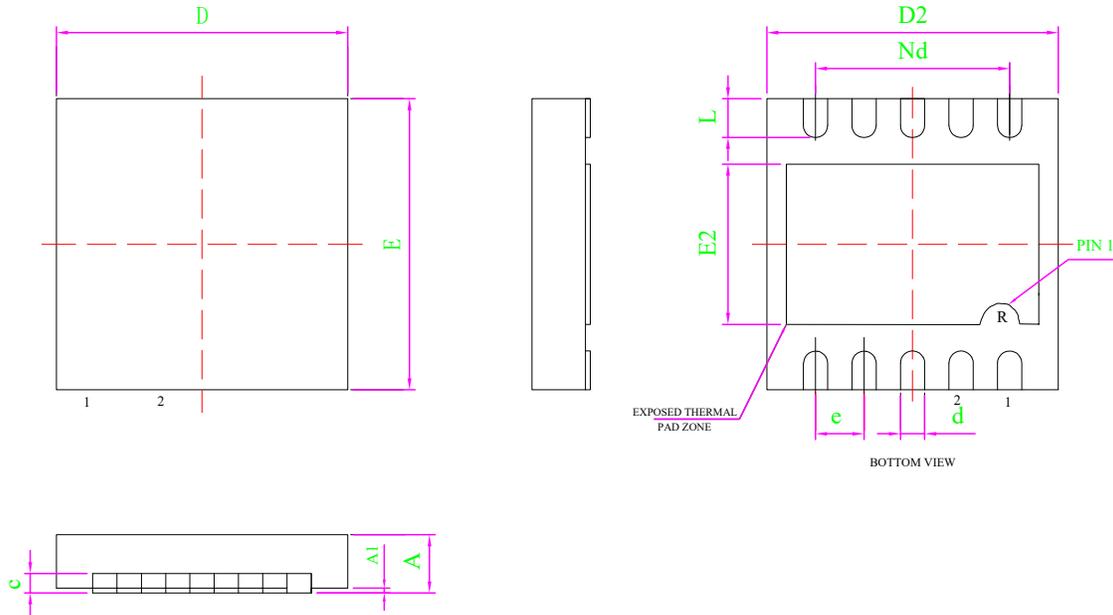
Parameter	Symbol	Ratings	Unit
Power Voltage	VDD	-0.3~6.0	V
Input Voltage	V _{IN}	GND-0.3~VDD+0.3	V
Storage Temperature	T _{STG}	-50~+125	°C
Operating Temperature	T _{OTG}	-40~+85	°C
Human Body Mode	ESD	≧4	KV

8.1 DC Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions (25 °C)	
						VDD	Conditions
Operating voltage	VDD	2.4	3.0	5.5	V	—	—
Operating current	I _{OP}	—	20	40	μA	3.0V	CS=10nF
		—	30	60		5.0V	
Standby current	I _{ST}	—	6	12	μA	3.0V	CS=10nF
		—	12	24		5.0V	
Output sink current	I _{IL}	—	10	—	mA	3.0V	V _{OL} =0.5V
		—	14	—		5.0V	
Output source current	I _{OL}	—	-6	—	mA	3.0V	V _{OH} =2.8V
		—	-9	—		5.0V	V _{OH} =4.5V
Input low voltage	V _{IL}	—	—	0.2	VDD	VDD	Input low voltage
Input high voltage	V _{IH}	0.8	—	1	VDD	VDD	Input high voltage
Output response time	T _R	—	45	—	mS	3.0V	Normal mode
		—	48	—		5.0V	Normal mode
		—	150	—	mS	3.0V	Standby mode
		—	160	—		5.0V	Standby mode

9 Package Information

9.1 DFN10L(3.0mm x 3.0mm PP=0.5mm)



SYMBOL	MILLIMETER		
	MIN	MID	MAX
A	0.70	0.75	0.80
A1	-	0.02	0.05
b	0.18	0.23	0.28
c	0.18	0.20	0.25
D	2.90	3.00	3.10
D2	2.30	2.40	2.50
e	0.50 BSC		
Nd	2.00 BSC		
E	2.90	3.00	3.10
E2	1.60	1.70	1.80
L	0.30	0.40	0.50
R	0.20 BSC		
L/F载体尺寸	2.6*1.9		

10 Disclaimer

Warranty and liability — The information provided in this document is believed to be accurate and reliable. However, Shenzhen Vinka Microelectronics Co., Ltd. (hereinafter “the Company”) makes no warranties, express or implied, as to the completeness or suitability of this information for any specific purpose.

In no event shall the Company be liable for any indirect, incidental, or consequential damages, including but not limited to loss of profits, equipment damage, or system failure, arising out of the use of this product or documentation, regardless of the legal theory under which such liability is asserted.

Right to change — The Company reserves the right to modify any information contained herein without prior notice. The latest version of this document is available at:

<https://www.szvinka.com/>

Applicability — This product is not designed or intended for use in life-critical, medical, or safety systems where failure could result in injury or death. The customer shall assume full responsibility for any such use.

Application — All product application descriptions provided herein are intended for illustrative purposes only.

The Company makes no representations or warranties, express or implied, regarding the suitability of any specific application without further testing or modification.

The customer is solely responsible for determining whether the Company’s products are appropriate for their intended applications or end customers.

The customer shall ensure proper design practices, implementation safeguards, and operational validation to minimize risks associated with product use.

The Company shall not be held liable for any defects, losses, costs, or damages arising from weaknesses or failures in the customer’s own products or applications, or from the integration or use of third-party products.

Furthermore, the customer shall conduct all necessary testing and validation for any third-party deployment of the Company’s products to avoid potential misuse or associated damages. The Company assumes no liability in this regard.

Commercial terms of sale — Unless otherwise agreed in writing, sales of this product are subject to the Company’s standard terms and conditions of sale. The Company expressly rejects the applicability of the customer’s general terms and conditions.

Export control — This product may be subject to applicable export control regulations. The customer is solely responsible for compliance with such regulations, including obtaining any necessary export licenses.

11 Revision History

No.	Version	Date	Modify the content	Check
1	1.0	2018-08-10	Original version	YES
2	1.1	2020-02-11	Add reference circuit	YES
3	1.2	2025-12-12	Update version	YES

[1] Consult the recently published documents before starting or finishing the design.

[2] Since the release of this document , the device product status described in this document may have changed and may differ in several cases. The latest product status information can be found on the Internet at <https://www.szvinka.com/>