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TK8012

DATA SHEET

Rev 0.90

AMENDMENT HISTORY

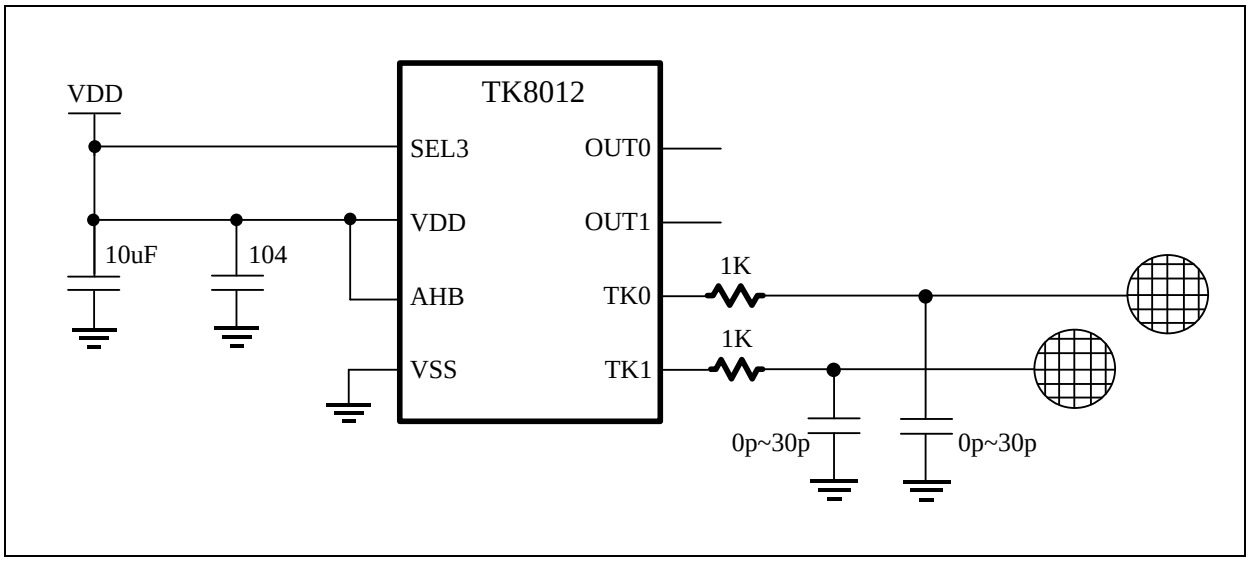
Version	Date	Description
V0.90	Jun, 2018	New release.

CONTENTS

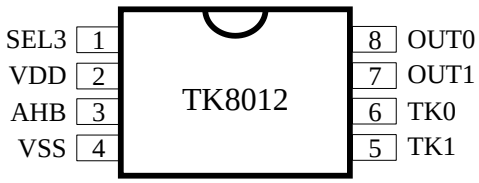
FEATURES

1. Two Key Touch Detector
2. Operation Voltage: 2.1V~5.5V
3. Operation Current: Normal mode =3.1uA, Low Power mode=1.6uA @V_{DD}=3V, short sampling
4. Enter Low Power mode after no activity for 16 second
5. Response Time: Normal mode < 60mS; Low Power mode < 120mS
6. Sensitivity adjusted by TK pin capacitor（0pF~30pF）
7. Selectable key sampling time for Remote application
8. Selectable output level: Active High or Active Low
9. Selectable output mode: Toggle or Direct mode
10. Selectable key press timeout reset: 12 second or Unlimited
11. LVR=1.9V
12. SOT23-6 package

APPLICATION CIRCUIT



PIN ASSIGNMENT



PIN DESCRIPTION

Name	In/Out	Pin Description
OUT0, OUT1	O	Touch Key output
TK0, TK1	I	Touch Key input
AHB	I	OUT0, OUT1 output level selection connect to VDD: OUT0, OUT1 is CMOS active low output connect to VSS: OUT0, OUT1 is CMOS active high output
SEL3	I	OUT0, OUT1 pin mode and sampling time selection connect to VDD: OUT0, OUT1 are Direct mode output with Short sampling time Floating: OUT0, OUT1 are Direct mode output with Long sampling time connect to VSS: OUT0, OUT1 are Toggle mode output with Short sampling time
VDD, VSS	P	Power input pin and ground

DEVICE LIST

	Max. time for key press timeout
TK8012T	12S
TK8012N	Unlimited

FUNCTIONAL DESCRIPTION

1. Output Pin Mode Selection

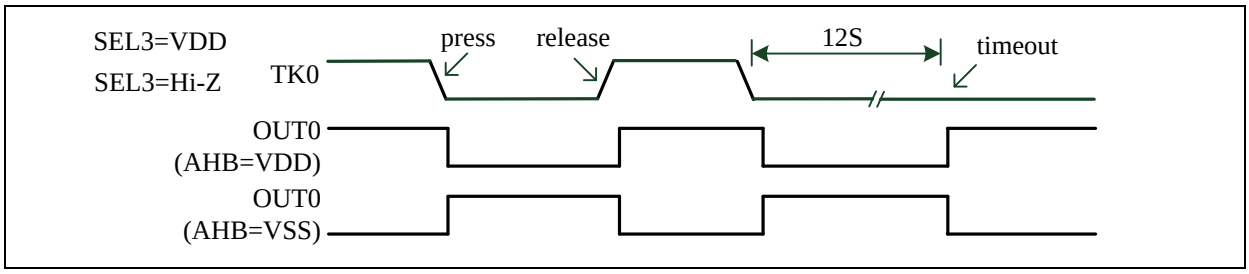
OUT0, OUT1 pin mode are defined by SEL3, AHB.

SEL3	**OUT0, OUT1** output mode	sampling time
VDD	Direct mode	Short
floating	Direct mode	Long
VSS	Toggle mode	Short

AHB	**OUT0, OUT1** output level
VDD	CMOS active Low
VSS	CMOS active High

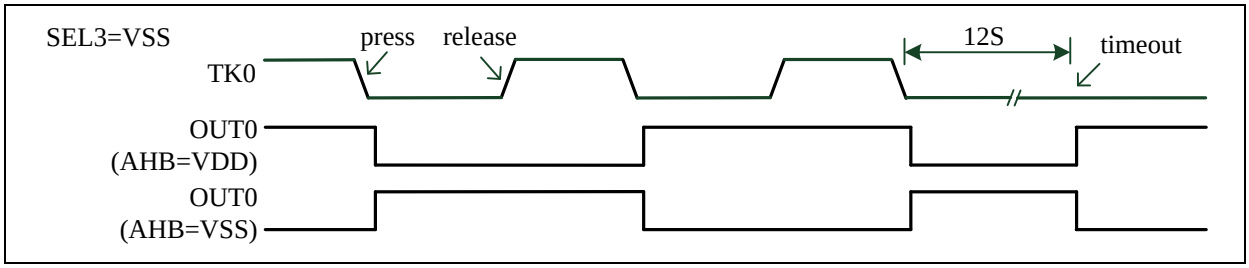
1.1 Direct output mode

The Direct mode waveform is as shown below.



1.2 Toggle output mode

The Toggle mode waveform is as shown below.



2. Touch Sensitivity Adjustment

The sensitivity of touch key can be adjusted by the capacitance of TK pin. The adjustment range is from 0 pF to 30 pF. Smaller capacitance can make higher sensitivity.

3. Key Press Timeout Reset

Long press on the touch key will produce a timeout reset. The maximum time is 12 seconds or unlimited according to the part number.

4. Normal mode and Low Power mode

The chip starts at Normal mode after reset. If no event occurred for 16 second, it switches to Low Power mode. It switches to Normal mode after sampling TK pin's capacitance variation event.

5. Touch Key Sampling Time

If SEL3 is connected to VDD or VSS, the touch key sampling time is short, suitable for general applications. If SEL3 is floating, the touch key sampling time is longer and it is suitable for air separation or remote applications. The sampling time affects the operation current as below.

SEL3	**OUT0, OUT1** output mode	Touch Key Sampling time	Operation Current @VDD=3V
VDD	Direct mode	Short, for general application	Normal mode =3.1uA Low Power mode =1.6uA
VSS	Toggle mode		
floating	Direct mode	Long, for remote application	Normal mode =6.0uA Low Power mode =2.3uA

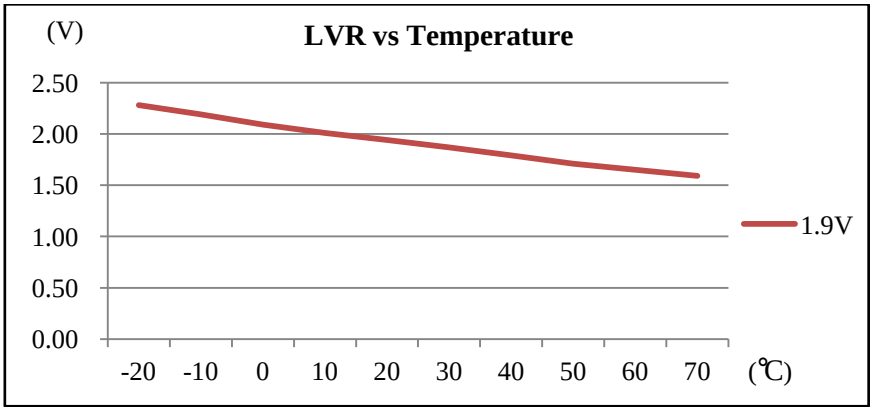
ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Parameter	Rating	Unit
Supply voltage	V_{SS} –0.3 ~ V_{SS} +5.5	V
Input voltage	V_{SS} –0.3 ~ V_{DD} +0.3	
Operating temperature	–20 ~ +70	℃
Storage temperature	–65 ~ +150	

DC Characteristics（TA=25℃）

Parameter	Sym	Conditions		Min	Typ	Max	Unit
Input High Voltage	V_{IH}	all Input	–	0.8V_{DD}			V
Input Low Voltage	V_{IL}			–	–	0.2V_{DD}	
I/O Port Source Current	I_{OH}	all Output	V_{DD}=3.0V V_{OH}=2.7V	–	5	–	mA
			V_{DD}=5.0V V_{OH}=4.5V	–	10	–	
I/O Port Sink Current	I_{OL}	all Output	V_{DD}=3.0V V_{OL}=0.3V	–	11	–	
			V_{DD}=5.0V V_{OL}=0.5V	–	20	–	
Power Supply Current (Short sampling)	I_{DD}	Normal mode	V_{DD}=5.0V	–	10.4	–	uA
			V_{DD}=3.0V	–	3.1	–	
		Low Power mode	V_{DD}=5.0V	–	6.3	–	
			V_{DD}=3.0V	–	1.6	–	
Power Supply Current (Long sampling)	I_{DD}	Normal mode	V_{DD}=5.0V	–	18.3	–	uA
			V_{DD}=3.0V	–	6.0	–	
		Low Power mode	V_{DD}=5.0V	–	7.8	–	
			V_{DD}=3.0V	–	2.3	–	
Timeout Lead Time	T_{LT}	T type	V_{DD}=3~5V	–	12	–	S
LVR Voltage	V_{LVR}	TA=25℃		1.7	1.9	2.1	V



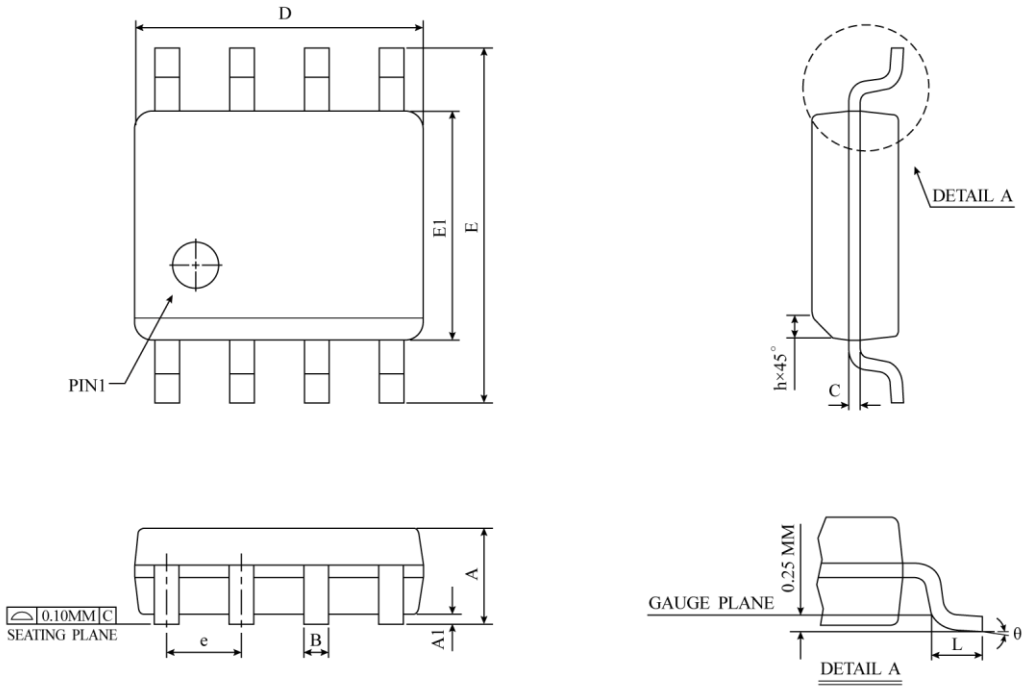
PACKAGE INFORMATION

Ordering Information

Ordering number	Package
TK8012T-201-14	SOP8 (150mil)
TK8012N-202-14	

Package Information

●SOP-8 (150mil) Package Dimension



SYMBOL	DIMENSION IN MM			DIMENSION IN INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.35	1.55	1.75	0.0532	0.0610	0.0688
A1	0.10	0.18	0.25	0.0040	0.0069	0.0098
B	0.33	0.42	0.51	0.0130	0.0165	0.0200
C	0.19	0.22	0.25	0.0075	0.0087	0.0098
D	4.80	4.90	5.00	0.1890	0.1939	0.1988
E	5.80	6.00	6.20	0.2284	0.2362	0.2440
E1	3.80	3.90	4.00	0.1497	0.1536	0.1574
e	1.27 BSC			0.050 BSC		
h	0.25	0.38	0.50	0.0099	0.0148	0.0196
L	0.40	0.84	1.27	0.0160	0.0330	0.0500
θ	0°	4°	8°	0°	4°	8°
JEDEC	MS-012 (AA)					

⚠ * NOTES : DIMENSION " D " DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS AND GATE BURRS SHALL NOT EXCEED 0.15 MM (0.006 INCH) PER SIDE.