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**TK8811**

**One Key Touch Detector**

***DATA SHEET Rev 0.91***

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## AMENDMENT HISTORY

| Version | Date     | Description   |
|---------|----------|---|
| V0.90   | May,2020 | New release.  |
| V0.91   | Aug,2020 | Add DFN-6 package information<br>Modify Device List |

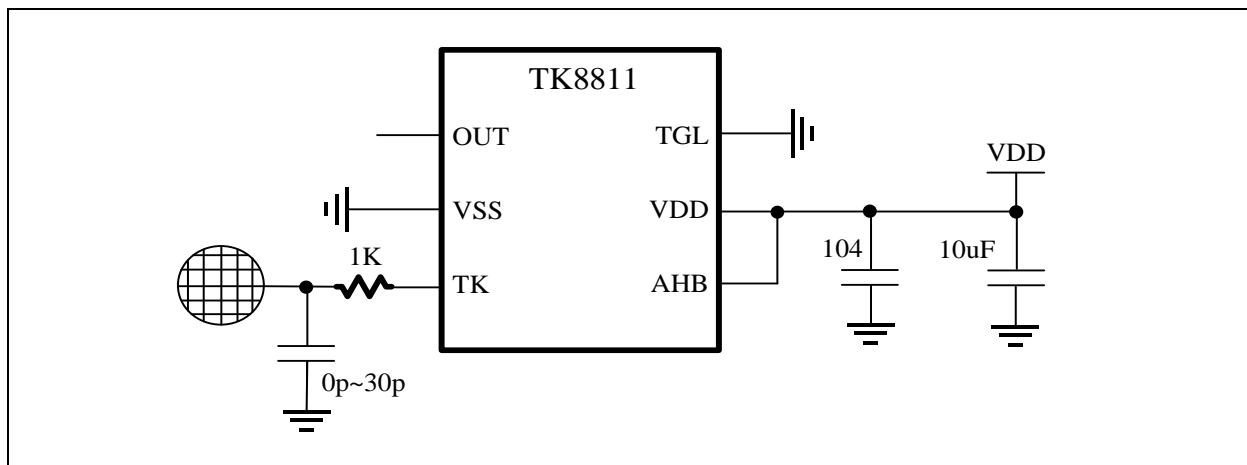
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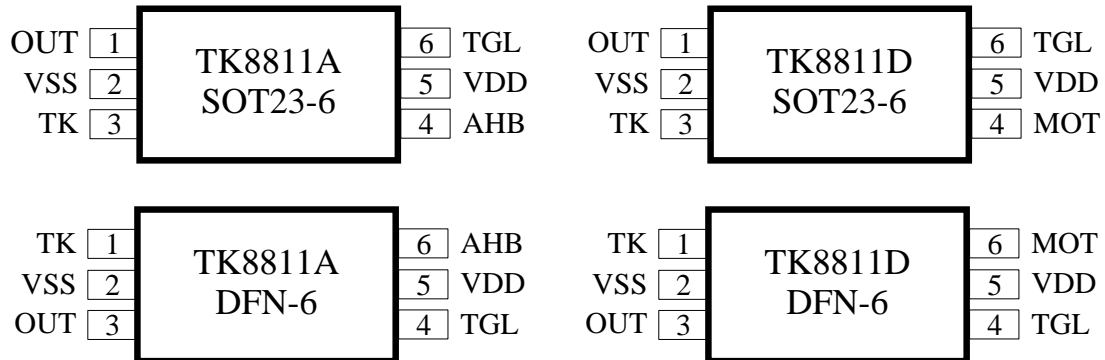
## FEATURES

1. One Key Touch Detector
2. Operation Voltage: 2.2V~5.5V
3. Operation Current(TK8811A1): Normal mode = 2.1uA, Low Power mode= 1.3uA @V<sub>DD</sub>=3V
4. Enter Low Power mode after no activity for 10 second
5. Response Time: Normal mode < 60mS; Low Power mode < 120mS
6. Sensitivity adjusted by TK pin capacitor (0pF~30pF)
7. Selectable output level: Active High, Active Low or Open-Drain
8. Selectable output mode: Toggle or Direct mode
9. Selectable key press time-out reset: 8 second or Unlimited
10. Built-in 2.3V LDO
11. LVR=2.0V
12. SOT23-6, DFN-6 package

## APPLICATION CIRCUIT



## PIN ASSIGNMENT



## PIN DESCRIPTION

| Name     | In/Out | Pin Description   |
|----------|--------|---|
| OUT      | O      | Touch Key output  |
| TK       | I      | Touch Key input   |
| TGL      | I      | OUT pin mode selection<br>connect to VDD: OUT is Toggle mode output<br>connect to VSS: OUT is Direct mode output                            |
| AHB      | I      | OUT pin output level selection (TK8811A)<br>connect to VDD: OUT is CMOS active low output<br>connect to VSS: OUT is CMOS active high output |
| MOT      | I      | Touch key press timeout control (TK8811D)<br>connect to VDD: Unlimited<br>connect to VSS: 8S  |
| VDD, VSS | P      | Power input pin and ground  |

## DEVICE LIST

|          | Max. time for key press timeout | OUT pin output level                   | Sensitivity | 2.3V LDO |
|----------|---------------------------------|--|-------------|----------|
| TK8811A1 | 8S                              | CMOS active high or low defined by AHB | High        | Enable   |
|          |                                 |  |             |          |
| TK8811D1 | 8S or Unlimited defined by MOT  | Open-Drain active low                  | High        | Enable   |
|          |                                 |  |             |          |

Note: The standard part TK8811A1 is recommended.

## FUNCTIONAL DESCRIPTION

### 1. Output Pin Mode Selection

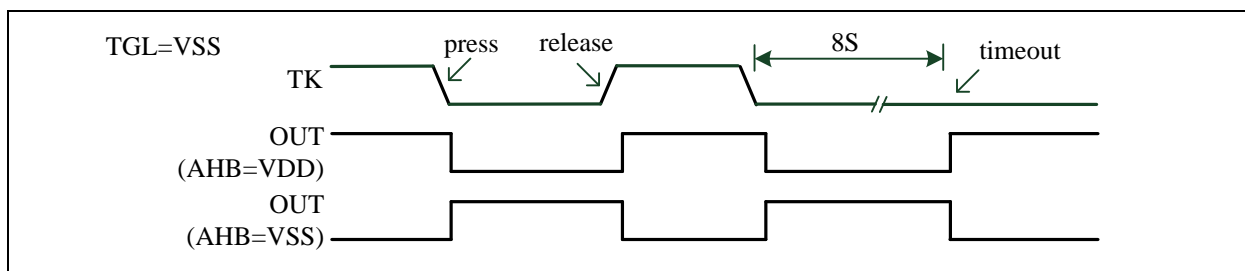
The OUT pin mode is defined by TGL, AHB

| TGL | OUT output mode |
|-----|-----------------|
| VDD | Toggle mode     |
| VSS | Direct mode     |

| AHB | OUT output level |
|-----|------------------|
| VDD | CMOS active Low  |
| VSS | CMOS active High |

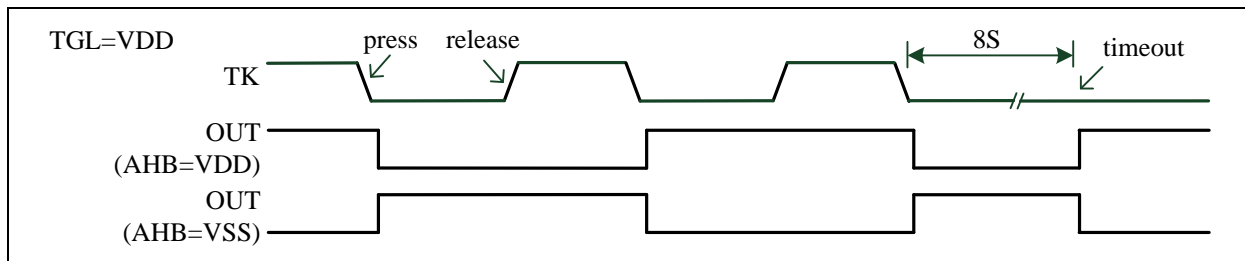
#### 1.1 Direct output mode

This mode needs to connect TGL to VSS. The Direct mode waveform is as shown below.



#### 1.2 Toggle output mode

This mode needs to connect TGL to VDD. 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 0pF to 30pF. Smaller capacitance can make higher sensitivity.

## 3. Key Press Timeout Reset

Long press on the touch key will generate a timeout reset. The maximum time is 8 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 10 second, it switches to Low Power mode. It switches to Normal mode after sampling TK pin's capacitance variation event.

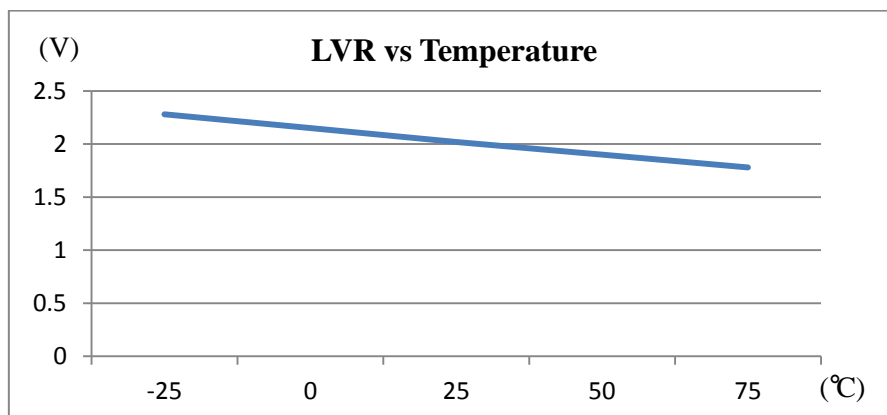
## ELECTRICAL CHARACTERISTICS

### Absolute Maximum Ratings

| Parameter             | Rating                           | Unit |
|-----------------------|----------------------------------|------|
| Supply voltage        | $V_{SS} - 0.3 \sim V_{SS} + 5.5$ | V    |
| Input voltage         | $V_{SS} - 0.3 \sim V_{DD} + 0.3$ |      |
| Operating temperature | -20 ~ +70                        | °C   |
| Storage temperature   | -65 ~ +150                       |      |

### DC Characteristics (TA=25°C)

| 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     | $V_{DD}=3.0V$<br>$V_{OH}=2.7V$ | -           | 5   | -           | mA   |
|                                       |           |                | $V_{DD}=5.0V$<br>$V_{OH}=4.5V$ | -           | 10  | -           |      |
| I/O Port Sink Current                 | $I_{OL}$  | all Output     | $V_{DD}=3.0V$<br>$V_{OL}=0.3V$ | -           | 15  | -           |      |
|                                       |           |                | $V_{DD}=5.0V$<br>$V_{OL}=0.5V$ | -           | 30  | -           |      |
| Power Supply Current<br>(TK8811A1/D1) | $I_{DD}$  | Normal mode    | $V_{DD}=4.2V$                  | -           | 2.4 | -           | µA   |
|                                       |           |                | $V_{DD}=3.0V$                  | -           | 2.1 | -           |      |
|                                       |           | Low Power mode | $V_{DD}=4.2V$                  | -           | 1.5 | -           |      |
| Power Supply Current<br>(TK8811A0/D0) | $I_{DD}$  | Normal mode    | $V_{DD}=4.2V$                  | -           | 5.6 | -           | µA   |
|                                       |           |                | $V_{DD}=3.0V$                  | -           | 2.8 | -           |      |
|                                       |           | Low Power mode | $V_{DD}=4.2V$                  | -           | 3.0 | -           |      |
|                                       |           |                | $V_{DD}=3.0V$                  | -           | 1.4 | -           |      |
| Timeout Lead Time                     | $T_{LT}$  |                | $V_{DD}=3.0V$                  | -           | 8   | -           | S    |
| LVR Voltage                           | $V_{LVR}$ | TA=25°C        |                                | 1.8         | 2.0 | 2.2         | V    |





**PACKAGE INFORMATION**

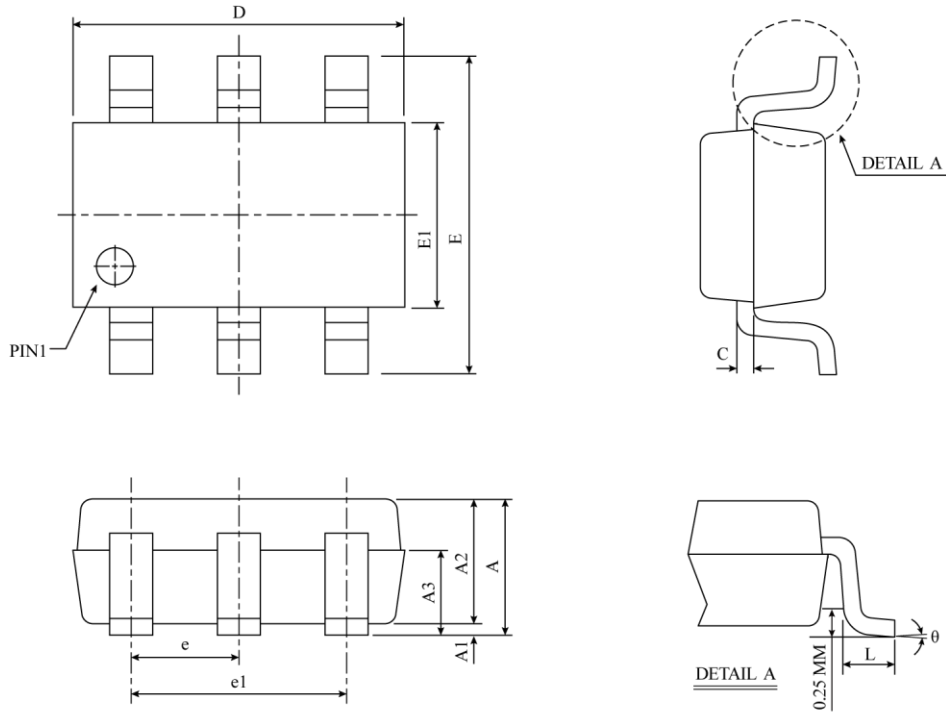
Please note that the package information provided is for reference only. Since this information is frequently updated, users can contact Sales to consult the latest package information and stocks.

**Ordering Information**

| <b>Ordering number</b> | <b>Package</b> |
|------------------------|----------------|
| TK8811A1-101-A8        | SOT23-6        |
| TK8811D1-111-A8        | SOT23-6        |
| TK8811A1-101-C1        | DFN-6          |
| TK8811D1-111-C1        | DFN-6          |

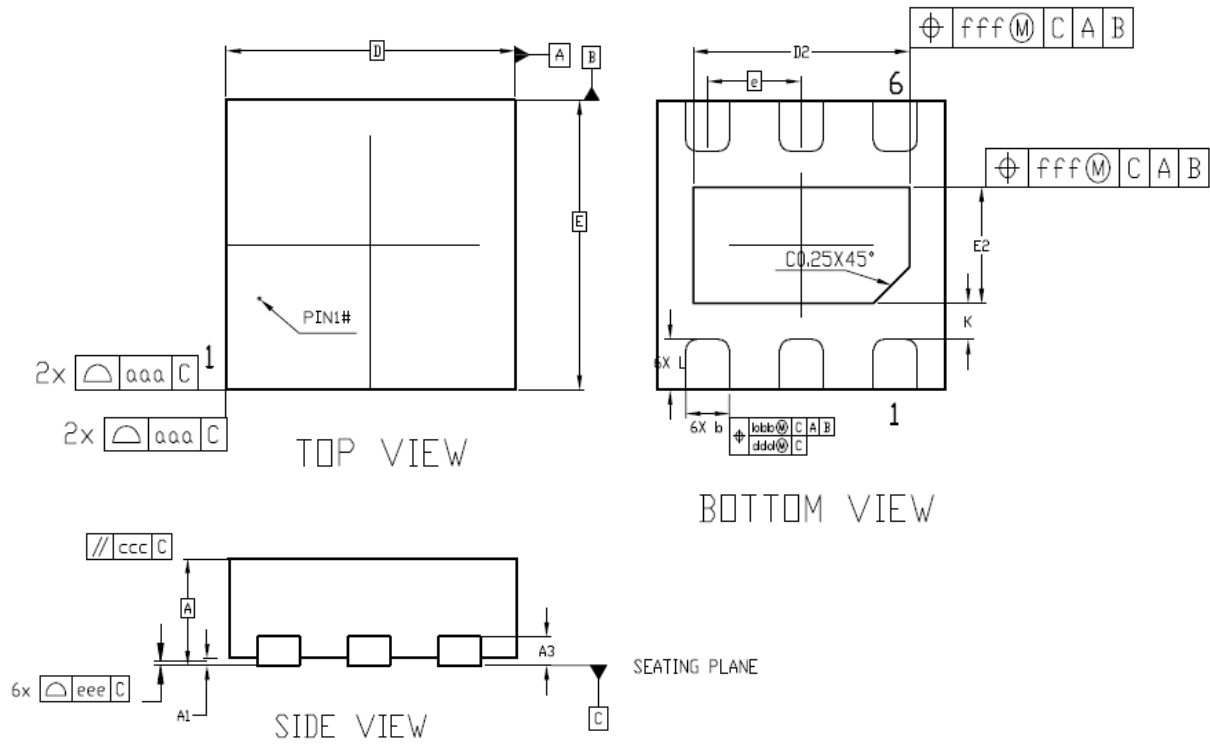
**Package Information**

## • SOT23-6 Package Dimension



| SYMBOL   | DIMENSION IN MM |      |      | DIMENSION IN INCH |       |       |
|----------|-----------------|------|------|-------------------|-------|-------|
|          | MIN             | NOM  | MAX  | MIN               | NOM   | MAX   |
| A        | -               | -    | 1.45 | -                 | -     | 0.057 |
| A1       | 0               | 0.08 | 0.15 | 0                 | 0.003 | 0.006 |
| A2       | 0.90            | 1.10 | 1.30 | 0.035             | 0.043 | 0.051 |
| A3       | 0.60            | 0.65 | 0.70 | 0.024             | 0.026 | 0.028 |
| c        | 0.12            | 0.16 | 0.19 | 0.005             | 0.006 | 0.007 |
| D        | 2.82            | 2.92 | 3.02 | 0.111             | 0.115 | 0.119 |
| E        | 2.70            | 2.90 | 3.10 | 0.106             | 0.114 | 0.122 |
| E1       | 1.52            | 1.62 | 1.72 | 0.060             | 0.064 | 0.068 |
| e        | 0.85            | 0.95 | 1.05 | 0.033             | 0.037 | 0.041 |
| e1       | 1.80            | 1.90 | 2.00 | 0.071             | 0.075 | 0.079 |
| L        | 0.35            | 0.48 | 0.60 | 0.014             | 0.019 | 0.024 |
| $\theta$ | 0°              | 4°   | 8°   | 0°                | 4°    | 8°    |
| JEDEC    | M0-178 (AB)     |      |      |                   |       |       |

△ \* NOTES : ALL DIMENSIONS REFER TO JEDEC STANDARD MO-178 AB  
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

**DFN-6 Package Dimension**


| DIM SYMBOL | MIN.    | NOM.     | MAX. |
|------------|---------|----------|------|
| A          | 0,70    | 0,75     | 0,80 |
|            | 0,80    | 0,85     | 0,90 |
| A1         | 0       | 0,02     | 0,05 |
| A3         | -       | 0,20 REF | -    |
| b          | 0,25    | 0,30     | 0,35 |
| D          | 2,00BSC |          |      |
| E          | 2,00BSC |          |      |
| D2         | 1,40    | 1,50     | 1,60 |
| E2         | 0,70    | 0,80     | 0,90 |
| e          | 0,65BSC |          |      |
| L          | 0,30    | 0,35     | 0,40 |
| K          | 0,25    | -        | -    |
| aaa        | 0,15    |          |      |
| bbb        | 0,10    |          |      |
| ccc        | 0,10    |          |      |
| ddd        | 0,05    |          |      |
| eee        | 0,08    |          |      |
| fff        | 0,10    |          |      |