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**TK8011**

***DATA SHEET***

***Rev 0.91***

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## AMENDMENT HISTORY

Version	Date	Description
V0.90	Jun, 2018	New release.
V0.91	Jan, 2019	Add DFN-6 Package

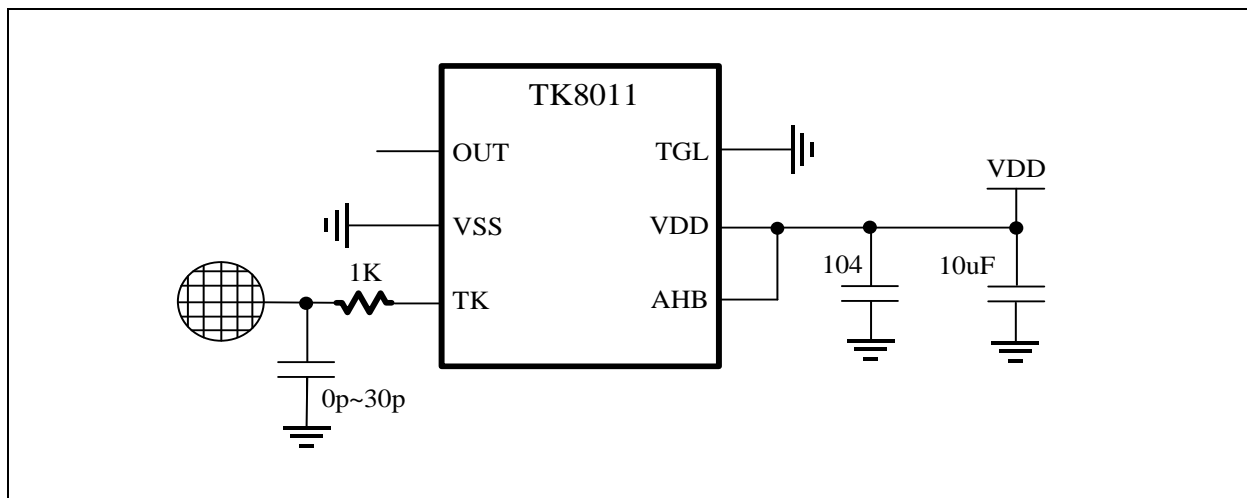
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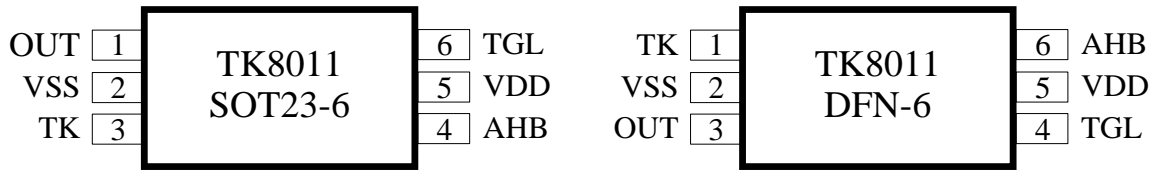
## FEATURES

1. One Key Touch Detector
2. Operation Voltage: 2.1V~5.5V
3. Operation Current: (TK8011TS/NS) : Normal mode =1.9uA @V<sub>DD</sub>=3V
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 / 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 connect to VDD: OUT is Toggle mode output connect to VSS: OUT is Direct mode output
AHB	I	OUT output level selection connect to VDD: OUT is CMOS active low output connect to VSS: OUT is CMOS active high output
SEL3	I	Touch key sampling time selection connect to VDD: Short detection time, for general application connect to VSS: Long detection time, for remote application
VDD, VSS	P	Power input pin and ground

**Note :** SEL3 pin is bonding option according to the part number

## DEVICE LIST

	Max. time for key press timeout	Key Sampling Time	Operation Current @VDD=3V
TK8011TS	12S	Short, for general application	Normal mode =1.9uA Low Power mode =1.3uA
TK8011NS	Unlimited		
TK8011TL	12S	Long, for remote application	Normal mode =3.3uA Low Power mode =1.8uA
TK8011NL	Unlimited		

## FUNCTIONAL DESCRIPTION

### 1. Output Pin Mode Selection

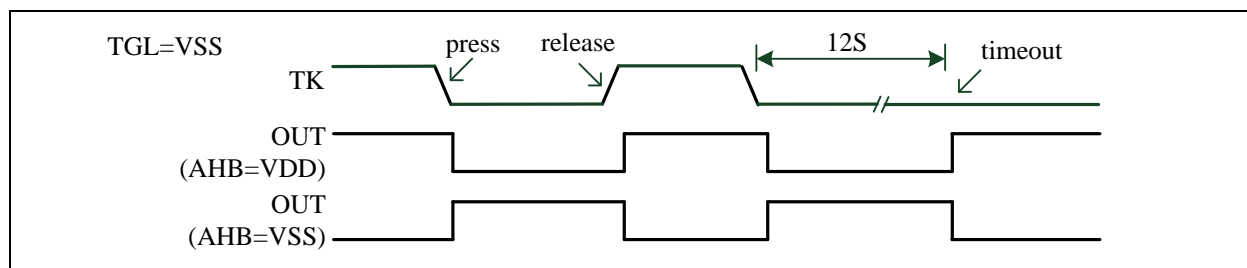
The OUT pin mode is defined by TGL, AHB

TGL	OUT output mode
VDD	Toggle mode
VSS	Direct mode

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

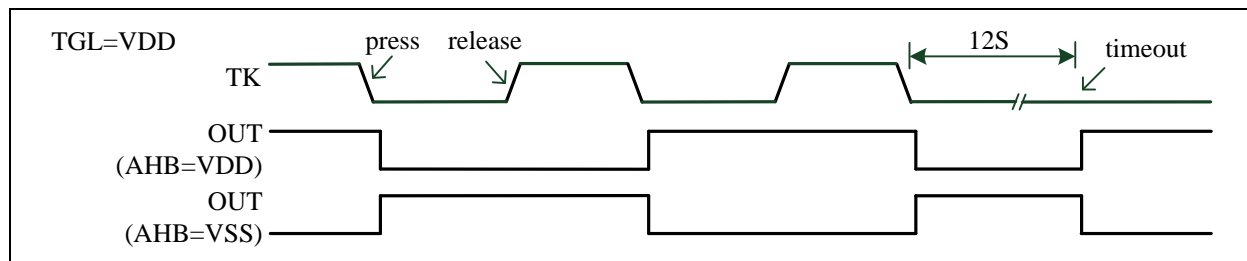
#### 1.1 Direct output mode

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 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, the touch key sampling time is short, suitable for general applications. If SEL3 is connected to VSS, the touch key sampling time is longer and it is suitable for air separation or remote applications. SEL3 pin is bonding option according to the part number.

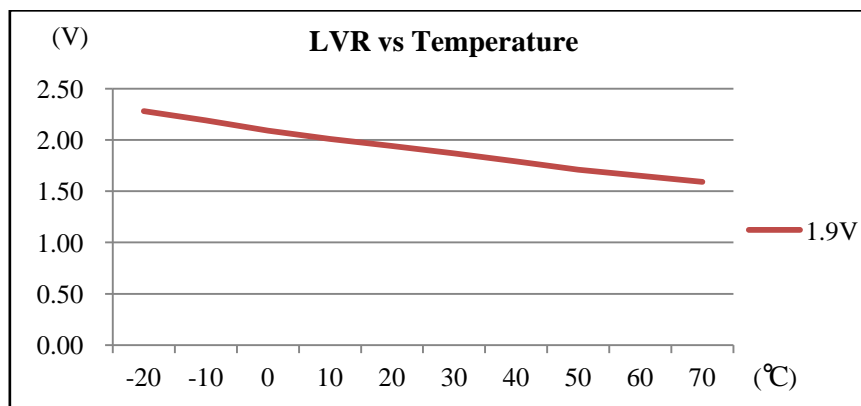
## ELECTRICAL CHARACTERISTICS

### 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	$V_{DD}=3.0V$ $V_{OH}=2.7V$	-	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 TK8011TS/NS	$I_{DD}$	Normal mode	$V_{DD}=5.0V$	-	7.4	-	µA	
		Low Power mode	$V_{DD}=3.0V$	-	1.9	-		
Power Supply Current TK8011TL/NL	$I_{DD}$		Normal mode	$V_{DD}=5.0V$	-	11.5		-
		Low Power mode	$V_{DD}=3.0V$	-	3.3	-		
Timeout Lead Time	$T_{LT}$		TS/TL type	$V_{DD}=3\sim 5V$	-	12	-	S
		$V_{DD}=3.0V$			-	1.8	-	
LVR Voltage	$V_{LVR}$	TA=25°C		1.7	1.9	2.1	V	



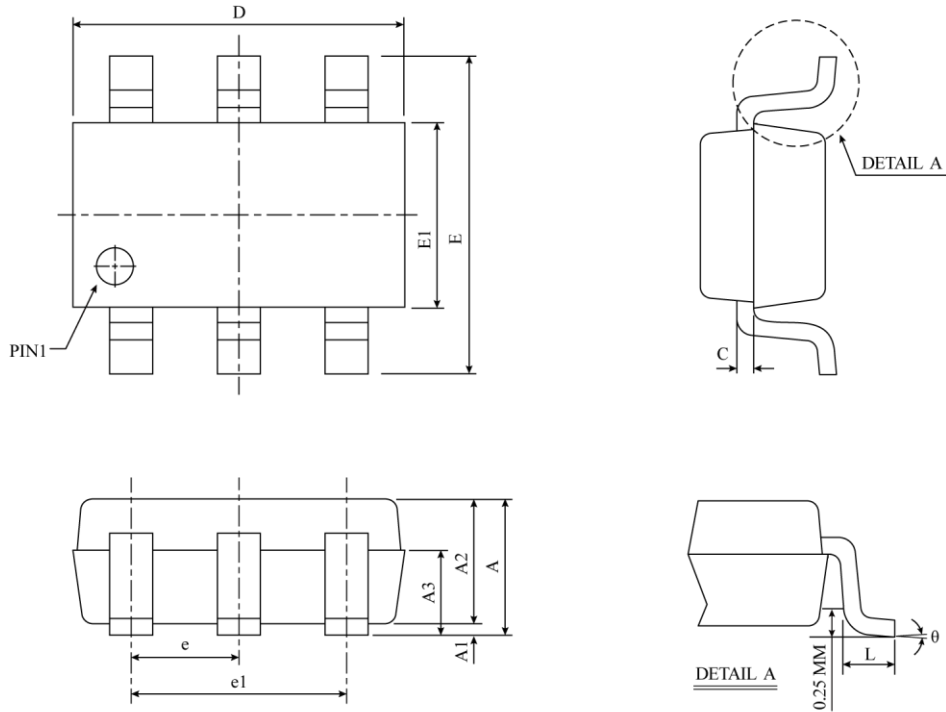


**PACKAGE INFORMATION****Ordering Information**

<b>Ordering number</b>	<b>Package</b>
TK8011TS-101-A8	SOT23-6
TK8011NS-102-A8	
TK8011TL-101-A8	
TK8011NL-102-A8	
TK8011TL-101-C1	DFN-6
TK8011NL-102-C1	

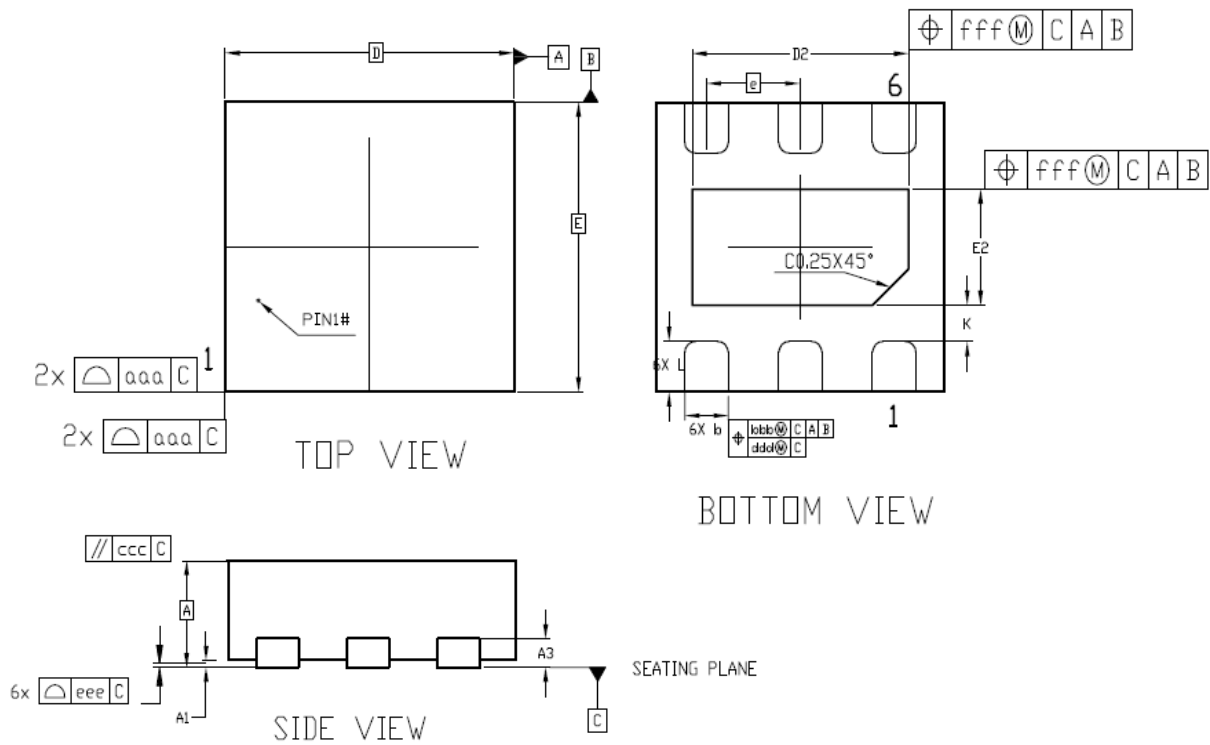
**Package Information**

## • 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
θ	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		