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TK8021

DATA SHEET

Rev 0.92

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AMENDMENT HISTORY

Version	Date	Description
V0.90	Jul, 2017	New release.
V0.91	Oct, 2017	Modify SOT23-6 Package Dimension
V0.92	Nov, 2017	Modify detail information

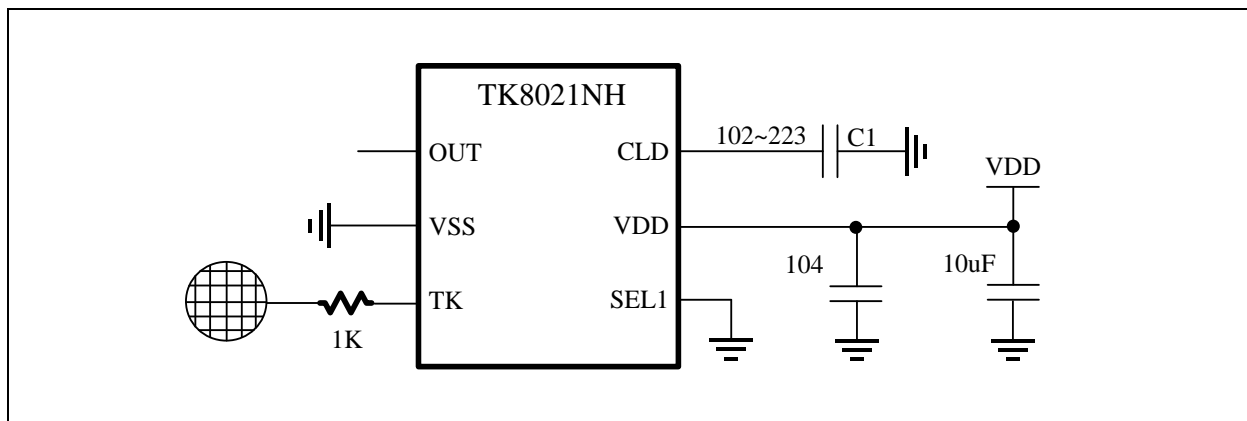
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FEATURES

1. One Key Touch Detector
2. Operation Voltage: 2.1V~5.5V (Type-1, LVR=1.9V) or 1.4V~5.5V (Type-2, LVR=1.2V)
3. Operation Current: 1.4uA @V_{DD}=3V (typical)
4. Enter Low Power mode after no activity for 16 second
5. Sensitivity adjusted by CLD capacitor (1nF~22nF)
6. Selectable output level: Active High, Active Low or Open Drain
7. Selectable output mode: Toggle or Direct mode
8. 16 second or 64 second key press timeout, selectable by IC part number
9. SOT23-6 package

APPLICATION CIRCUIT



PIN ASSIGNMENT



PIN DESCRIPTION

Name	In/Out	Pin Description
OUT	O	Touch Key output
TK	I	Touch Key input
CLD	I/O	Key sensitivity adjust capacitor (1nF~22nF)
SEL1	I	connect to VDD: OUT is Toggle mode output connect to VSS: OUT is Direct mode output
SEL2	I	connect to VDD: OUT is CMOS active low output connect to VSS: OUT is CMOS active high output floating: OUT is Open Drain output.
SEL3	I	connect to VDD: 16 second key press timeout reset connect to VSS: 64 second key press timeout reset
VDD, VSS	P	Power input pin and ground

Note: SEL2 and SEL3 pins are bonding option according to the part number

DEVICE LIST

Type-1 IC Part number	OUT output level	Max. time for key press timeout
TK8021NH	Active Low	16S, @VDD=3V
TK8021PH	Active High	
TK8021ZH	Open Drain	
TK8021MH	Active Low	64S, @VDD=3V
TK8021QH	Active High	
TK8021YH	Open Drain	

Type-1 Device Feature:

- @25°C: Operation Voltage = 2.1V~5.5V, LVR=1.9V
- @VDD=3V: Normal mode current=1.7uA, Low Power mode current=1.2uA

Type-2 IC Part number	OUT output level	Max. time for key press timeout
TK8021NL	Active Low	9S, @VDD=3V 16S, @VDD=1.5V
TK8021PL	Active High	
TK8021ZL	Open Drain	
TK8021ML	Active Low	36S, @VDD=3V 64S, @VDD=1.5V
TK8021QL	Active High	
TK8021YL	Open Drain	

Type-2 Device Feature:

- @25°C: Operation Voltage = 1.4V~5.5V, LVR=1.2V
- @0°C: Operation Voltage = 1.5V~5.5V, LVR=1.35V
- @VDD=3V: Normal mode current=5.2uA, Low Power mode current=3.9uA
- @VDD=1.5V: Normal mode current=1.6uA, Low Power mode current=0.8uA

FUNCTIONAL DESCRIPTION

1. Output Pin Mode Selection

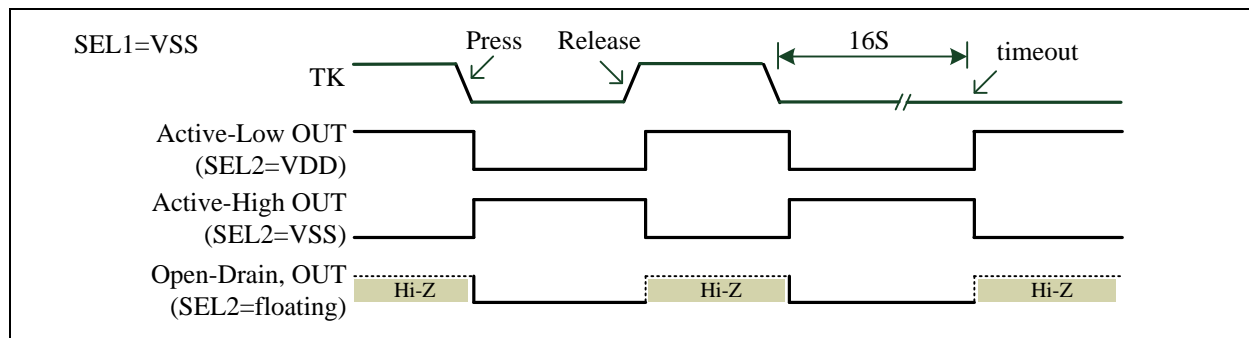
The OUT pin mode is defined by SEL1 and SEL2.

SEL1	OUT output mode
VDD	Toggle mode
VSS	Direct mode

SEL2	OUT output level
VDD	CMOS active Low
VSS	CMOS active High
Floating	Open Drain active Low

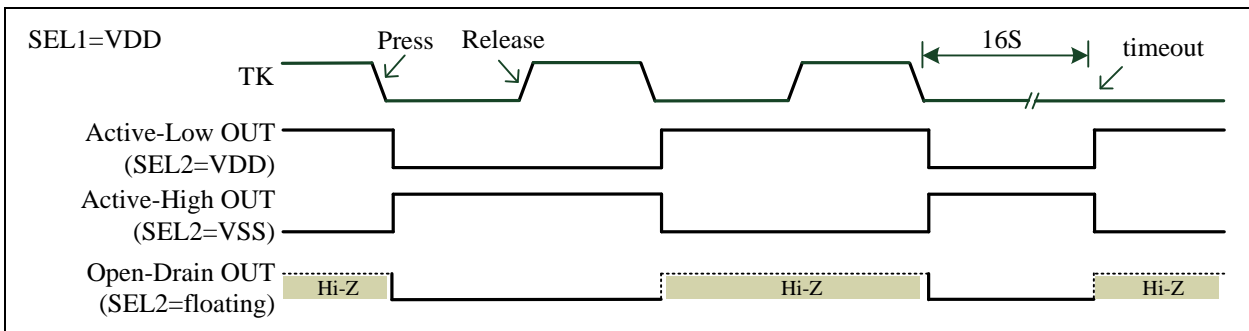
1.1 Direct output mode

This mode needs to connect SEL1 to VSS. The Direct mode waveform is as shown below.



1.2 Toggle output mode

This mode needs to connect SEL1 to VDD. The Toggle mode waveform is as shown below.



2. Touch Sensitivity Adjustment

The Touch Key Sensitivity can be adjusted by CLD pin's capacitor C1 (1nF~22nF). Larger CLD capacitance makes more sensitivity.

3. Key Press Timeout Reset

If the key is pressed more than 16 or 64 seconds (select by part number), the chip reset itself.

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 detecting TK pin's capacitance variation event.

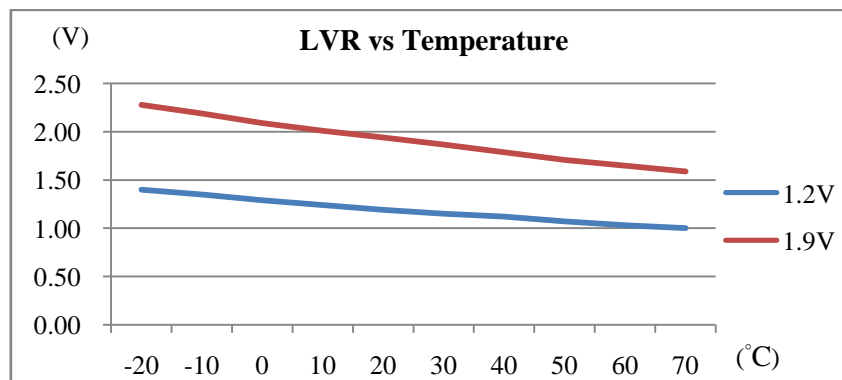
ELECTRICAL CHARACTERISTICS

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	-	0.8 V_{DD}		V	
Input Low Voltage	V_{IL}			-	-		0.2 V_{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	-	mA
			$V_{DD}=5.0V$ $V_{OL}=0.5V$	-	20	-	
Power Supply Current Normal mode	I_{DD}	LVR=1.9V	$V_{DD}=5.0V$	-	5.7	-	uA
		LVR=1.9V	$V_{DD}=3.0V$	-	1.7	-	
		LVR=1.2V		-	5.2	-	
		LVR=1.2V	$V_{DD}=1.5V$	-	1.6	-	
Power Supply Current Low Power mode	I_{DD}	LVR=1.9V	$V_{DD}=5.0V$	-	4.5	-	uA
		LVR=1.9V	$V_{DD}=3.0V$	-	1.2	-	
		LVR=1.2V		-	3.9	-	
		LVR=1.2V	$V_{DD}=1.5V$	-	0.8	-	
Timeout Lead Time	T_{LT}	LVR=1.9V	$V_{DD}=3\sim 5V$	-	16/64	-	S
		LVR=1.2V	$V_{DD}=3.0V$	-	9/36	-	
			$V_{DD}=1.5V$	-	16/64	-	
LVR Voltage	V_{LVR}	select 1.9V		1.7	1.9	2.1	V
		select 1.2V		1.0	1.2	1.4	



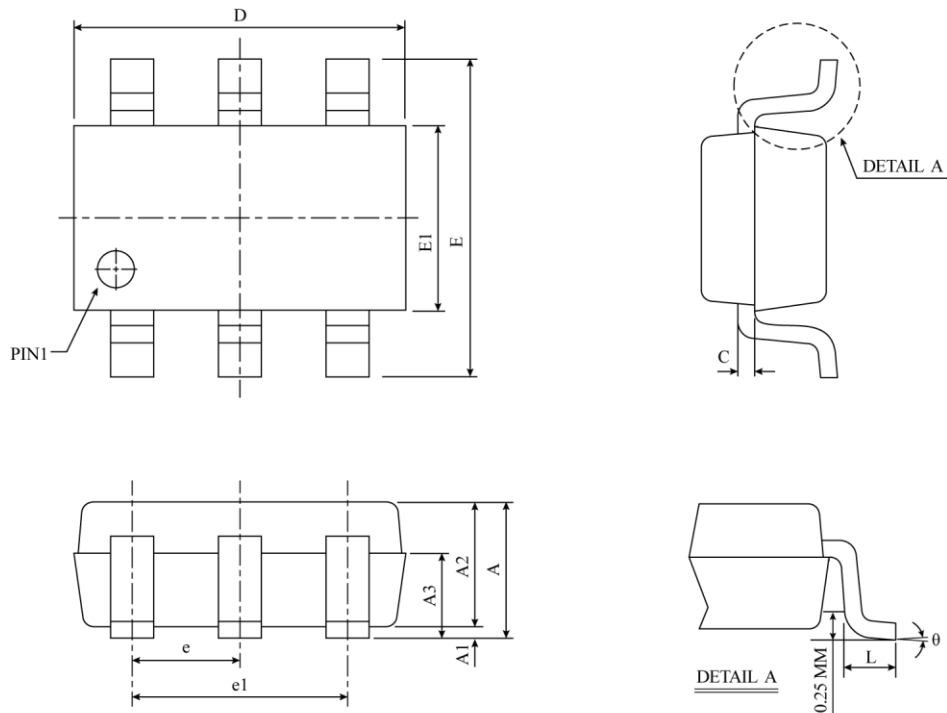
PACKAGE INFORMATION

Ordering Information

Ordering number	Package
TK8021NH-101-A8	SOT23-6
TK8021NL-102-A8	
TK8021PH-101-A8	
TK8021PL-102-A8	
TK8021ZH-101-A8	
TK8021ZL-102-A8	
TK8021MH-101-A8	
TK8021ML-102-A8	
TK8021QH-101-A8	
TK8021QL-102-A8	
TK8021YH-101-A8	
TK8021YL-102-A8	

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.