

# Processing Data

## PROCESSING RECOMMENDATION GUIDE

Series & Type	PCB		SMT		Cleaning	
	Wave Solder	Manual Solder	IR Reflow	Vapor Phase	Auto-matic	Manual
A Rockers	x	x			x	
A Toggles	x	x			x	
AB Pushbuttons	x	x			x	
AS Slides	x	x				x
B Illuminated Toggles	x	x			x	
B Toggles	x	x			x	
BB Pushbuttons	x	x			x	
CB Tactiles	x	x			x	
CB3 SMT Tactiles		x	x		x	
CS Slides	x	x				x
D2 Toggles	x					x
DB Pushbuttons	x	x				x
DSA Tilt	x	x				x
DSB Tilt	x	x			x	
EB Pushbuttons (PCB)	x	x				x
FR01 DIP Rotaries	x	x				x
FR02 SMT DIP Rotaries		x	x			x
FS Slides	x	x				x
G Illuminated Toggles	x	x			x	
G Rockers	x	x			x	
G Toggles	x	x			x	
G3B SMT Pushbuttons		x	x		x	
G3T SMT Toggles		x	x		x	
GB Illuminated Plunger	x	x			x	
GB Pushbuttons	x	x			x	
GB2 Pushbuttons	x	x				x
GW Illum. Paddles	x	x				x
GW Rockers/Paddles	x	x				x
HB2 Illum. Pushbuttons	x	x				x
HPO2 Tactiles	x	x				x
HPO3 SMT Tactiles		x	x			x
IS LCD PB & Display	x	x				x
IS OLED PB & Display	x	x				x
JB Illuminated Tactiles	x	x			x	

Series & Type	PCB		SMT		Cleaning	
	Wave Solder	Manual Solder	IR Reflow	Vapor Phase	Auto-matic	Manual
JB Tactiles	x	x			x	
JF Illuminated Tactiles	x	x			x	
JF Tactiles	x	x			x	
JL Illuminated Tactiles	x	x				x
JS DIP Slides	x	x				x
JS SMT DIP Slides		x	x			x
KP Illum. Pushbuttons	x	x				x
M Rockers (PCB)	x	x				x
M Toggles (PCB)	x	x				x
M2B Pushbuttons	x	x			x	
M2T Rockers	x	x			x	
M2T Toggles	x	x			x	
M2100 Illum Act's (PCB)	x	x				x
MB2000 PBs (PCB)	x	x				x
MB2400 PBs (PCB)	x	x				x
MB2500 PBs (PCB)	x	x				x
MRA Rotaries	x	x			x	
MRB Rotaries	x	x			x	
MRF Rotaries	x	x			x	
MRK Rotaries	x	x			x	
MS Illuminated Slides	x	x				x
MS Slides	x	x				x
ND Rotaries	x	x			x	
ND3 SMT Rotaries		x	x		x	
NP01 Pushbuttons	x	x				x
P Rockers (PCB)	x	x				x
P Toggles (PCB)	x	x				x
SK Keylocks (PCB)	x	x			x	
SM Slides	x	x				x
SS Illuminated Slides	x	x				x
SS Slides	x	x				x
SS3 SMT Slides		x	x			x
UB Pushbuttons (PCB)	x	x				x
UB2 Pushbuttons (PCB)	x	x				x

## PROCESS SEALED SWITCHES

NKK, a pioneer in the development of process sealed switches, is ahead of its time as a manufacturer. These process sealed switches are increasingly in demand because of the advancements in automated PC board processing. NKK's expansive family of process compatible devices includes toggles, rockers, pushbuttons, tactiles, rotaries, keylocks and slides in a variety of sizes.

Over 50 years of quality design experience produced the first process sealed switches to satisfy the process requirements of PC

board soldering and cleaning techniques. As the cutaway drawings on our Distinctive Characteristics pages illustrate, our process sealed switches incorporate all the features necessary to accomplish their process compatibility: epoxy sealed terminals, heat resistant resins, interior rubber o-rings, seals, and sleeves, plus ultrasonic welding. The following data has been developed from a comprehensive study of test data, technical literature, and industry practice.

### Automated Cleaning Specifications

#### Temperature Stabilization

To minimize the thermal shock, switches should be allowed to cool to 38°C or to the temperature of the hand or machine cleaning.

#### Flux

NKK Switches recommends a no-clean (low residue) flux that can be either left on the board or cleaned with a mild organic solvent. A second choice is a synthetic flux that can be effectively removed with an alcohol-based solvent. A water soluble flux is not recommended because of the corrosive nature of the flux residue. The relatively high temperature and energetic cleaning methods needed to ensure complete removal of all flux residues could also be hazardous to the switch.

#### Flux Removal

Cleaning should take place at a slightly elevated room temperature between 38°C and 52°C. Spray pressure should not exceed 25psi. See table of Flux Removal Conditions below to determine recommended depth of submersion, time and temperature.

#### Drying

Drying time should be extended to a one-hour bake at 52°C maximum. This step will eliminate any condensation.

#### Flux Removal Conditions

Series	Depth (mm)	Time (Minutes)	Temperature (°C)
A, B	100	5	—
AB, BB, G, GB, SK-B	50	5	—
CB, CB3, JB, JF, M2B, M2T	50	1	50
G3B, G3T, ND, ND3	100	1	70
MRA, MRB, MRF	50	3	—
SK-E	50	1	60

#### Manual Solder Profiles

Manual Solder Profile	Profile A High Temperature	Profile B Low Temperature
Solder Iron Tip Temperature	390°C	350°C
Time on Terminal	4 seconds	3 seconds
Cycles	2	1

#### Notes:

Profiles A and B are for lead-free.  
Do not exceed these specifications.

# Processing Data

Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

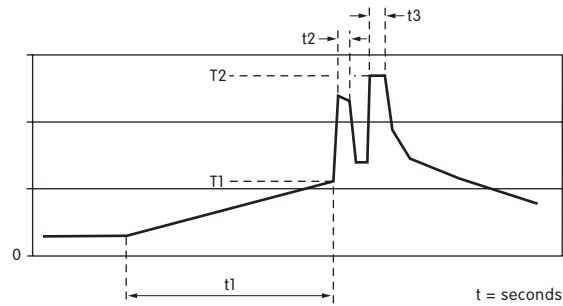
Touch

Indicators

Accessories

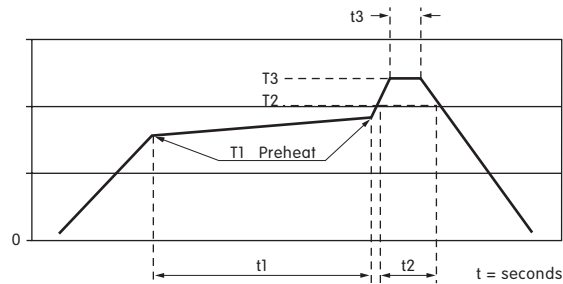
Supplement

## Wave Solder Profiles for Through Hole



Wave Solder Profile	Symbol	Profile A High Temperature	Profile B Low Temperature
Preheat Temperature	T1	110°C	110°C
Preheat Time	t1	40 seconds	30 seconds
Peak Temperature	T2	270°C	270°C
Peak Time	t2 + t3	6 seconds	5 seconds
Thickness of PCB		1.6mm	—
Cycles		2	1
Comments		PCB with No Lead	PCB with No Lead

## Reflow Solder Profiles for SMT



Reflow Solder Profile	Symbol	Profile A High Temperature	Profile B Low Temperature
Preheat Temperature	T1	180°C ~ 200°C	150°C ~ 170°C
Preheat Time	t1	120 seconds	90 seconds
Heating Temperature	T2	230°C	200°C
Heating Time	t2	60 seconds	30 seconds
Peak Temperature (Surface)	T3	250°C	240°C
Peak Time	t3	Not Specified	Not Specified
Thickness of PCB		1.6mm	1.6mm
Cycles		2	1
Comments		PCB with No Lead	PCB with No Lead

### Notes:

The Reflow Solder profile above describes the printed circuit board (PCB) surface temperature. Since the PCB surface temperature and the switch surface temperature will vary depending on the height of the switch, the PCB material, and PCB thickness, ensure that the

switch surface temperature does not exceed 250°C for high temperature (column A), or 240°C for low temperature (column B). Contact the factory if your conditions are more severe than the above specifications.