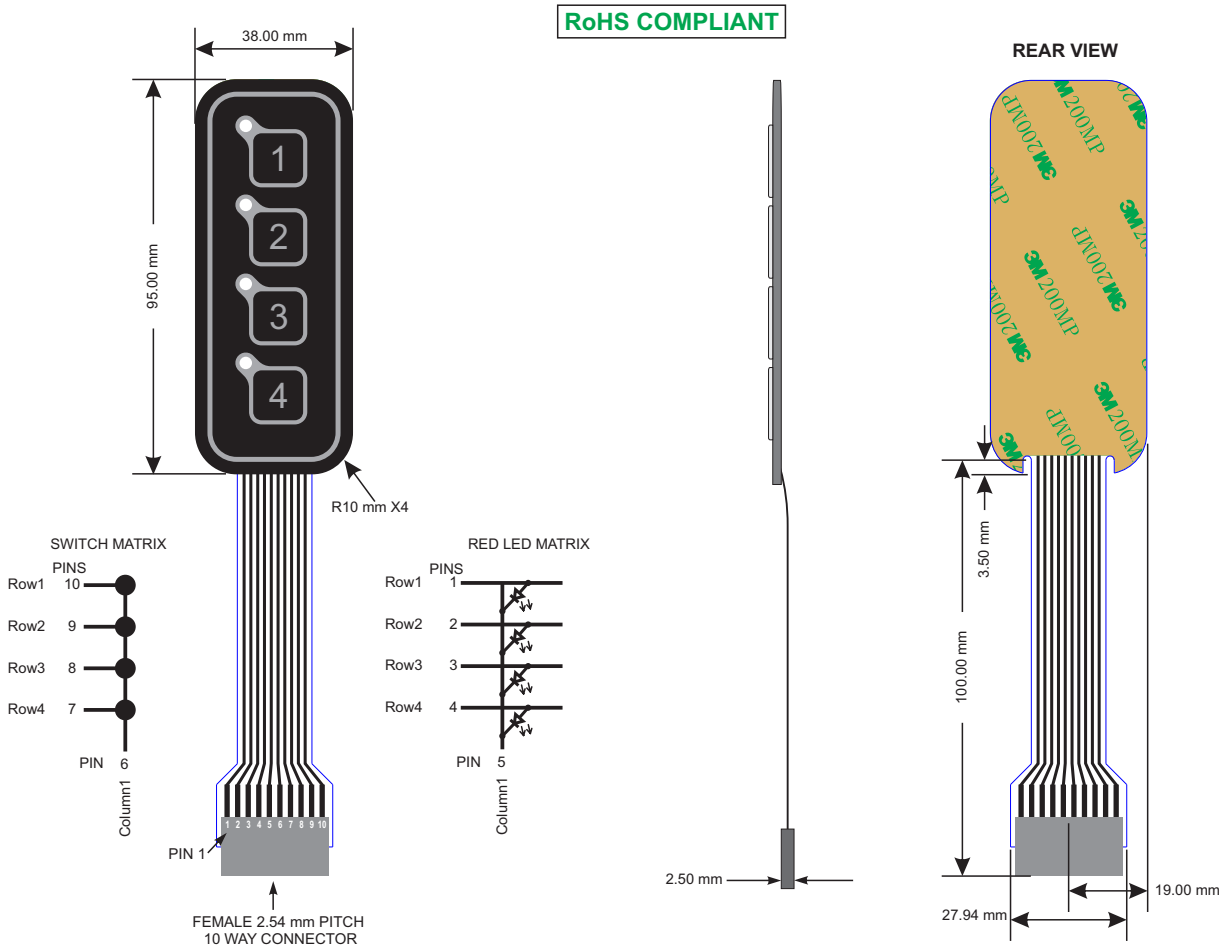
4 KEY MEMBRANE KEYPAD - SELF ADHESIVE
APEM - AC3559ILL

RoHS COMPLIANT



MECHANICAL SPECIFICATIONS:
CONTACT FORCE 400 grams.
TRAVEL 0.80 TO 0.90 mm.
LIFE 1,000,000 OPERATIONS

ELECTRICAL SPECIFICATIONS:
CONTACT VOLTAGE RATING 30V (dc).
CONTACT CURRENT RATING 100mA.
INSULATION RESISTANCE AT 100 V >100 Mohms.
DIELECTRIC STRENGTH 250 V rms.
CAPACITANCE 10 pF typ.
CONTACT BOUNCE BELOW 10 msec. typ.
CONTACT RESISTANCE <30 Ohm
CONTACT MATERIAL Ag
RED LED MAXIMUM CURRENT 20mA.

ENVIRONMENTAL SPECIFICATIONS:
OPERATING TEMPERATURE -30 TO +55 C.
STORAGE TEMPERATURE -40 TO +60 C.

Scanning The Keypad Matrix
The membrane keypad can be interfaced easily to a bi-directional 8 bit port on a microprocessor.
Connect the 4 rows to the lower 4 bits of the port. Pull each of the Rows down to 0V with a 100K resistor.
Configure these 4 bits as inputs.
Connect the column 1 to one of the upper 4 bits of the port. Configure this bit as an output.

Output a '1' on column 1 and look at each row in turn, looking for a '1'. If all rows are '0',return to Row 1 and repeat the same procedure.
If at any time a '1' is detected when reading a row, pause 10mS to allow for key 'bounce' and read that row again. If the row is still '1' there is a key pressed. Branch to carry out the function for that key, then return and read that row again to see if the logic level is now '0', which would signify the key has been released, in which case move on to the next column and resume scanning. Otherwise go round a loop checking for the key to be released before continuing with the scan.

This simple method will detect any single keypress; if more than one key is held down at once the program will register the first key it discovers is pressed depending on where it is in the scan.
Latching functions can be achieved by setting and resetting a flag alternately when a key is pressed.

Driving The LED Matrix
Lighting the LEDs is almost the opposite of reading the keys. Connect the 4 rows and 1 column to an 8 bit output port on the microprocessor. Fit a 270 ohm resistor in series with each of the rows to limit the current to around 10mA. To light an LED, its corresponding row must be set to'1' and its column to '0'. For the LED to be off, its corresponding row or column must both be set to the same logic level - either '1' or '0'.
Depending on the complexity of the equipment, one could constantly go round a loop adjusting the on / off status of each LED to the required state, effectively scanning the LEDs.