



J-51

# Digital thermometer -50 ... +150°C



This digital thermometer allows measuring temperature from -50 to +150°C with resolution 0.1°C. This thermometer is based on ICL7107 a/c converter. NPN silicon transistor is used as temperature sensor which is fixed into measurement bridge branch powered from outside, stable reference voltage source of ICL7107 circuit.

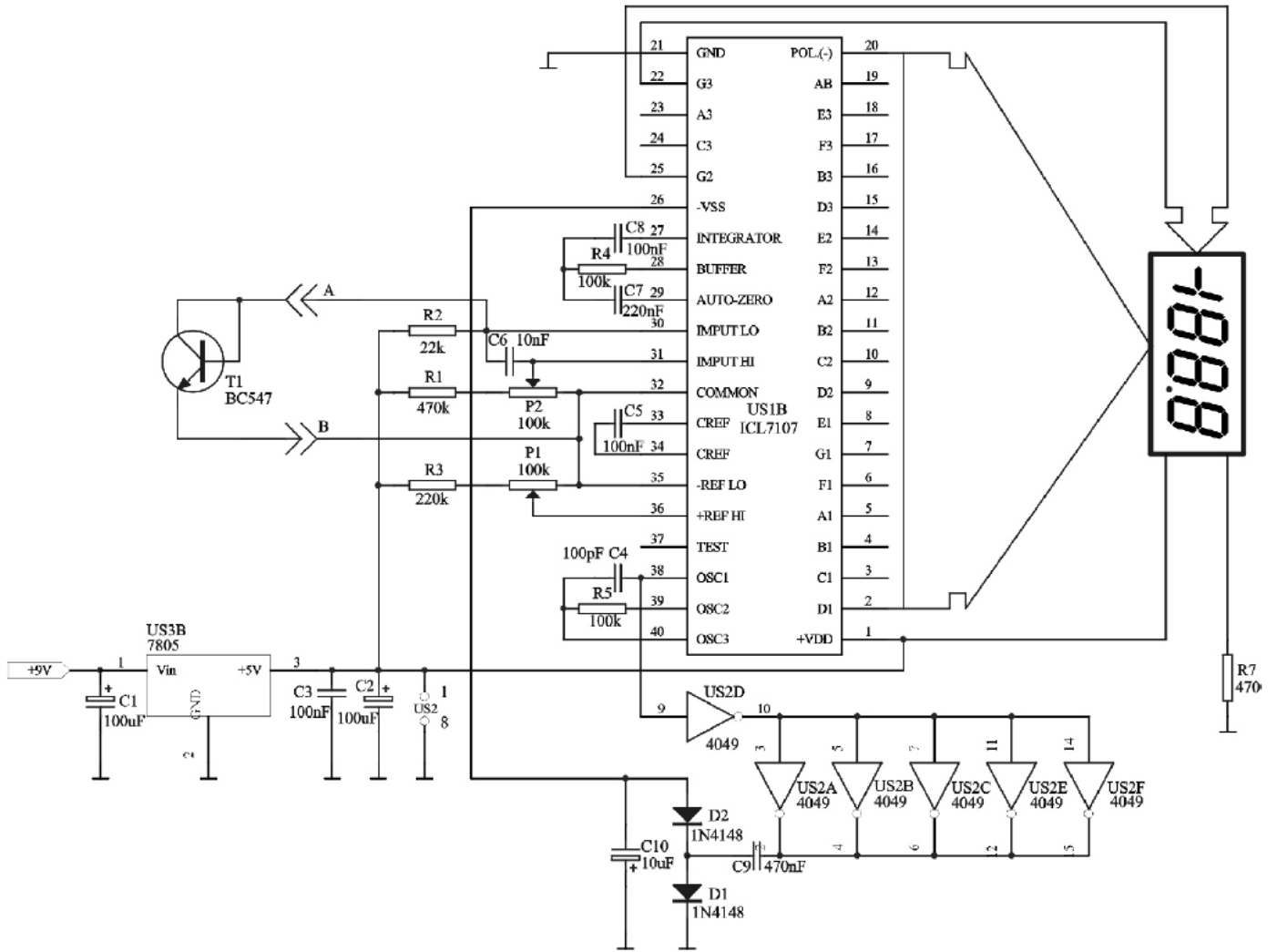
Temperature sensor should be connected with shielded cable to avoid noise which could then be transmitted to converter input (transistor emitter should be connected to shield, collector-base to hot cable). For convenience, sensor tip can be covered by a piece of heat shrink sleeve. ICL7107 needs +5V and -5V feeding voltages. +5V is taken from voltage stabilizer US3 and -5V is generated by simple converter build on US2 circuit. After rectifying and filtering this voltage is transmitted onto 26th pin of US1 component. Value of this voltage is approximately 3,3-3,6V which is enough for correct chip work.

Thermometer assembly should begin from soldering cramps and RC components. ICL7107 circuit is very sensitive to static electricity thus you should use DIP40 holder. US3 voltage stabilizer should be fixed onto aluminum radiator with area of a few cm<sup>2</sup>. R7 resistor should be fixed from paths side.

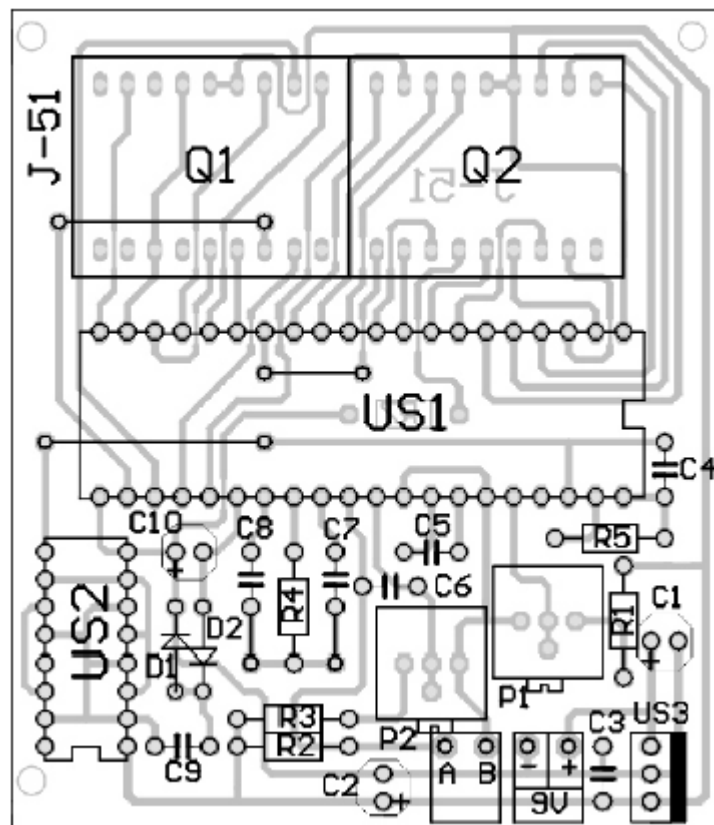
Thermometer scaling should be started after a few minutes warming up time. Immerse temperature sensor in water with ice cubes. Set 00.0 reading on the LED display using P2 regulator. Then immerse sensor in boiling water and set 100.0 reading using P1 regulator. Scaling should be made a few times. Temperature meter can be powered by adapter with voltage 9...12V and current approximately 300mA.

### Package contains:

US1	.....	ICL7107	R1	.....	470k
US2	.....	4049(4050)	R2	.....	22k
US3	.....	7805	R3	.....	220k
Q1,Q2	.....	TDDG5250	R4,R5	.....	100k
D1,D2	.....	1N4148	R7	.....	470
T1	.....	BC547, etc.	P1,P2	.....	HELITRIM...100k
C1,C2	.....	100µF/16V	HOLDER	.....	DIP40
C3	.....	100nF ceramic	HOLDER	.....	DIP16
C4	.....	100pF ceramic	PRINTED CIRCUIT BOARD		
C5,C8	.....	100nF MKSE			
C6	.....	10nF			
C9	.....	470nF MKSE			
C10	.....	10µF/16V			



Schematic diagram



Assembly diagram