

Replacement of National LM75 with Philips LM75A

The LM75A can replace the National LM75 (LM75B or LM75C) without modifying the software or hardware and will behave exactly the same or better.

1. Comparison

Parameters	LM75A	LM75
✓ Package and Pin-to-pin Drop in Replacement	YES	YES
✓ Functionally Identical (Configuration/etc) ¹	YES	YES
✓ No Software Change (Identical Register Definition)	YES	YES
✓ Accuracy ± 3 °C From -55 °C to 125 °C	YES	YES
✓ Same AC/DC Parameters	YES	YES
✓ Conversion Rate (100 ms)	YES	YES

2. Noticeable Differences

These differences make the LM75A a better device, do not impact the currently written software for LM75 or are only used if higher temperature sensor resolution is desired.

Parameters	LM75A	LM75	Comments
✓ Temperature Resolution	11-bit ²	9-bit	LM75A is Better
✓ I _{DD} Quiescent (During conversion, I ² C bus inactive)	100 μ A	250 μ A	LM75A is Better
✓ SMBus TIMEOUT	Not supported	LM75C – not supported LM75B - supported (hold SDA low 325 ms max)	N/A

3. Orderable Part Number Cross Reference

¹ With one exception, the LM75 has SMBus TIMEOUT that limits it to a minimum bus speed of 3kHz.

² Still compatible with the existing 9-bit software used by the LM75 because the extra bits are transparent to the software and are not used. If the user wants higher resolution when switching to the LM75A, then they simply modify the software to read the two additional bits after the 9th bit. The 11-bit mode gives the temperature resolution of 0.125 °C as compared with the 9-bit mode of 0.5 °C. Both devices require 16 clock cycles to read the temperature value. It doesn't matter if the intended temperature reading is for 8-bit, 9-bit, or 11-bit.



Package	LM75	LM75A
SO8/SOIC 3.3 v	LM75BIM-3	LM75AD
SO8/SOIC 5 v	LM75BIM-5	LM75AD
SO8/SOIC 3.3 v	LM75CIM-3	LM75AD
SO8/SOIC 5 v	LM75CIM-5	LM75AD
TSSOP8/MSOP 3.3 v	LM75BIMM-3	LM75ADP
TSSOP8/MSOP 5 v	LM75BIMM-5	LM75ADP
TSSOP8/MSOP 3.3v	LM75CIMM-3	LM75ADP
TSSOP8/MSOP 5 v	LM75CIMM-5	LM75ADP

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