

## Replacement of TI TMP75 with Philips LM75A

The LM75A can replace the TI TMP75 without modifying the software or hardware and will behave the same.

### 1. Comparison

Parameters	LM75A	TMP75
✓ Package and Pin-to-pin Drop in Replacement	YES	YES
✓ Functionally Identical (Configuration/etc)	YES	YES
✓ No Software Change (Identical Register Definition)	YES	YES
✓ Accuracy $\pm 3$ °C From $-55$ °C to $125$ °C	YES	YES
✓ Compatible AC/DC spec	YES	YES
✓ Conversion Rate (100 ms)	YES	YES

### 2. Noticeable Differences

The major differences between TMP75 and LM75A are: TMP75 has one shot and programmable conversion rate in the configuration register reserved bits, and I<sup>2</sup>C bus speed up to 3.4Mhz. These bits are in the reserved bits of the LM75A configuration register, and are ignored by the LM75A and will not affect its functionality.

Parameters	LM75A	TMP75	Comments
✓ Temperature Resolution	11-bit <sup>1</sup>	9-bit to 12-bit	LM75A automatically runs at 11-bit. TMP75 resolution needs to program
✓ I <sub>DD</sub> Quiescent (During conversion, I <sup>2</sup> C bus inactive)	100 $\mu$ A	50 $\mu$ A	TMP75 is lower
✓ SMBus TIMEOUT (min / max)	No	25 ms / 35 ms	N/A
✓ Temperature accuracy $\pm 2$ °C	$-25$ °C to $125$ °C	$-25$ °C to $85$ °C	LM75A is Better
✓ I <sup>2</sup> C/SMBus Speed	0 to 400 kHz	10 kHz to 3.4 MHz	No 3.4 MHz master device to interface with TMP75
✓ Config Reg, 01h (bit 7)	Reserved	One shot	LM75A ignores the bit
✓ Config Reg, 01 (bit6:5)	Reserved	Conversion rate	LM75A ignores these bits

**Note:**

1. Still compatible with the existing 9-bit to 12-bit software used by the TMP75 because the extra bits are transparent to the software. Switching to LM75A, the user automatically benefits the 11-bit resolution no software change. Both devices require 16 clock cycles to read the temperature value. It doesn't matter if the intended temperature reading is for 9-bit, 10-bit, 11-bit or 12-bit.

**3. Orderable Part Number Cross Reference**

Package	TMP75	LM75A
SO8/SOIC8	TMP75AID	LM75AD
TSSOP8/MSOP8	N/A	LM75ADP

For more information contact Philips Semiconductors via e-mail – [i2c.support@philips.com](mailto:i2c.support@philips.com)