

## Replacement of Analog Device's ADT75 with Philips LM75A

The LM75A replaces ADT75 without modifying hardware or software when the default temperature set-points are used.

The LM75A's  $T_{OS}$  and  $T_{HYS}$  registers are 8-bit while those of the ADT75 are 12-bit. If the  $T_{OS}$  and  $T_{HYS}$  registers must be accessed, then it is necessary to perform a 1-byte write/read when accessing those registers of the LM75A and a 2-byte write/read for the ADT75. Software change will be necessary.

However, in most cases, LM75A or ADT75 are used as thermal watchdog and their default  $T_{OS}$  and  $T_{HYS}$  values are used, it is often not necessary to change the  $T_{OS}$  or  $T_{HYS}$  registers, therefore, in that case, no software change is required.

### 1. Comparison

Parameters	LM75A	ADT75
✓ 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 $\pm 2$ °C From $-25$ °C to $100$ °C	YES	YES
✓ Compatible AC/DC spec	YES	YES
✓ Identical thermal shutdown default setting ( $T_{OS}$ and $T_{hysteresis}$ )	YES	YES

### 2. Noticeable Differences

The major difference between LM75A and ADT75 is: The LM75A has a wider operating voltage down to 2.8 V while the ADT75 has a low  $V_{DD}$  voltage at 3.0 V. The LM75A  $T_{OS}$  and  $T_{HYS}$  registers are 8-bit while those of ADT75 are 12-bit. The LM75A does not have one-shot register while ADT75 has a one-shot register (04h) that does not impact the software. The table below summarizes the differences.

Parameters	LM75A	ADT75	Comments	
✓ Temperature Accuracy $\pm 3$ °C	$-55$ °C to $125$ °C	$-55$ °C to $100$ °C	LM75A is better	
✓ Temperature Resolution	11-bit <sup>1</sup>	12-bit	ADT75 has higher resolution	
✓ Configuration register (01h)	Bit 7	Reserve	SMBus Alert	LM75A ignores the bit
	Bit 6	Reserve	Reserve (0)	LM75A ignores the bit
	Bit 5	Reserve (0)	One-shot	LM75A ignores the bit
✓ $T_{OS}$ Register (02h)	8-bit <sup>2</sup>	12-bit	1-byte read/write for LM75A	
✓ $T_{HY}$ Register (03h)	8-bit <sup>2</sup>	12-bit	1-byte read/write for LM75A	

✓ One-shot (04h)	NO	YES	LM75A doesn't have one-shot
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**Note:**

1. Still compatible with the existing 12-bit software used by the ADT75 because the extra bits are transparent to the software. Both devices require 16 clock cycles to read the temperature value.
2. 1-byte or 8 clock cycle is required to access the LM75A and 2-byte or 16 clock cycles for the ADT75

**3. Orderable Part Number Cross Reference**

Package	ADT75	LM75A
SO8/SOIC	ADT75ARZ	LM75AD
TSSOP8/MSOP8	ADT75ARM, ADT75ARMZ	LM75ADP

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