The TC650, TC651, TC652, and TC653 are fan speed controller products with built-in temperature sensor. The TC650, TC651, TC652, and TC653 are pulse width modulation (PWM) fan speed controllers for DC brushless fans. These devices adjust the speed of the fan according to the temperature level, therefore reducing acoustic noise, minimizing power consumption, and extending fan life. Temperature data from an on-board temperature sensor is translated into a fractional speed from 40% to 100%. The TC65X family features a PWM frequency of 15Hz. These devices offer a typical accuracy of ±1°C with a low typical operating current of 50µA.

The devices are fully specified from 2.8V to 5.5V over the -40°C to +125°C temperature range. A variety of features address a broad application spectrum: shutdown mode for further power savings, FanSense™ technology for fan fault detection, auto-shutdown for automatic fan shut-off, minimum fan speed for constant cooling, and over-temperature alert for overheating detection. All devices are available in small 8-pin MSOP packages.

These devices are ideal for every application utilizing DC fans, especially where acoustic noise and fan reliability are very important. Applications may include computers, projectors, servers, datacom equipment, telecom equipment, power supplies, set-top boxes, fan racks, and test equipment.

Features:
- Temperature proportional fan speed control
- FanSense™ technology protects against fan and system failure
- 2.8V to 5.5V supply voltage range
- Low 50µA operating current
- ±1°C typical accuracy
- 15Hz pulse width modulation (PWM) frequency
- Shutdown mode
- Built-in over-temperature alert
- Temperature range: -40°C to +125°C
- 8-Pin MSOP package

Related Application Notes:
- AN58 Suppressing Acoustic Noise in Pulse Width Modulation (PWM) Fan Speed Control Systems
- AN59 Speed Error in Pulse Width Modulation (PWM) Fan Control Systems
### Additional Information:
- Microchip’s web site: [www.microchip.com](http://www.microchip.com)
- Microchip's Technical Library CD-ROM, Order No. DS00161
- Analog Interface Handbook, Order No. DS00207
- Product Line Card, Order No. DS00148
- Analog Design Pack CD-ROM, Order No. DS51205

### Related Tools:
- TC650DEMO Development System DS21453
- TC652DEMO Development System DS21506

### TC65X Fan Speed Controller Family

<table>
<thead>
<tr>
<th>Product</th>
<th>VCC Range</th>
<th>Temperature</th>
<th># of Pins/Package</th>
<th>Maximum IQ</th>
<th>PWM Frequency</th>
<th>Typical Accuracy</th>
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</thead>
<tbody>
<tr>
<td>TC650</td>
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**Package Key:** MS = MSOP