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**
- 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
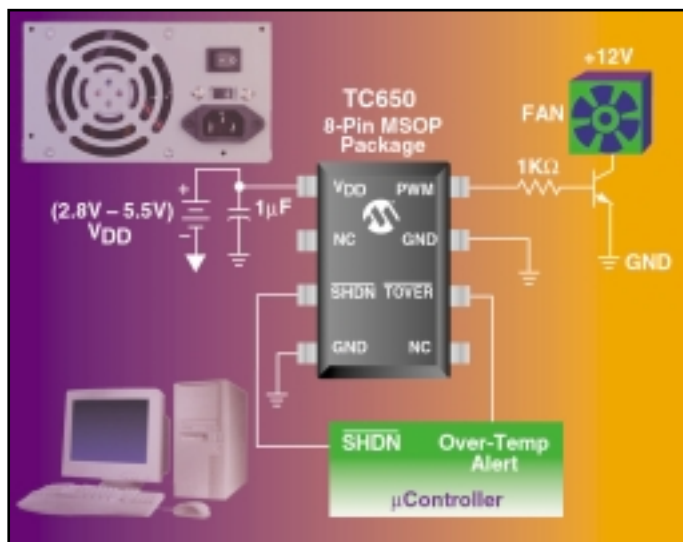- TC652DEMO Development System   DS21506

TC65X Fan Speed Controller Family						
Product	V_{CC} Range	Temperature	# of Pins/ Package	Maximum I_Q	PWM Frequency	Typical Accuracy
TC650	2.8V to 5.5V	–40°C to +125°C	8MS	90μA	15Hz	±1°C
TC651	2.8V to 5.5V	–40°C to +125°C	8MS	90μA	15Hz	±1°C
TC652	2.8V to 5.5V	–40°C to +125°C	8MS	90μA	15Hz	±1°C
TC653	2.8V to 5.5V	–40°C to +125°C	8MS	90μA	15Hz	±1°C

Package Key: MS = MSOP

Americas

Atlanta	(770) 640-0034
Austin – Analog	(512) 345-2030
Boston	(978) 692-3848
Boston – Analog	(978) 371-6400
Chicago	(630) 285-0071
Dallas	(972) 818-7423
Dayton	(937) 291-1654
Detroit	(248) 538-2250
Los Angeles	(949) 263-1888
Mountain View	(650) 968-9241
New York	(631) 273-5305
Rocky Mountain	(480) 792-7966
San Jose	(408) 436-7950
Toronto	(905) 673-0699

Asia /Pacific

Australia	61-2-9868-6733
China – Beijing	86-10-8528-2100
China – Shanghai	86-21-6275-5700
Hong Kong	852-2-401-1200
India	91-80-229-0061
Japan	81-45-471- 6166
Korea	82-2-554-7200
Singapore	65-334-8870
Taiwan	886-2-2717-7175

Europe

Denmark	45-4420-9895
France	33-1-69-53-63-20
Germany	49-89-627-144 0
Germany – Analog	49-89-895-650 0
Italy	39-039-65791-1
United Kingdom	44-118-921-5869

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