Specification Comparison Between 80C51 and TSC80C51

Description

Due to market request, to improve specification and to optimize and rationalize the offer of its microcontroller family, TEMIC has redesigned the core of its 80C51 microcontroller. This application note compares the typical parameter values that are significantly different from the existing 80C51 to the new TSC80C51. It should be noted that all typical DC or AC parameters are very similar between the two products due to the fact that there is no significant process change.

Features Improvement

- Power supply current is decreased down to 20% in operating mode at maximum frequency. Figure 1 shows Icc operating versus frequency.
- Power supply current is decreased down to 20% in idle mode at maximum frequency. Figure 2 shows Icc idle versus frequency.
- Power supply current is decreased in power down mode. Max specification is now 30µA in commercial and industrial temperature range.
- Frequency is increased to 44 MHz in commercial and industrial temperature range.
- Frequency is increased to 40 MHz in automotive and military temperature range.
- ALE signal can be now disabled by software.

Parameters Differences

Except for power supply current, DC and AC parameters specifications do not change, nevertheless, some parameters (DC or AC) present a different typical distribution considering the product.

DC Parameters

Hereafter is a list of typical DC parameters(1) measured during the characterization phase of the products and that are significantly different from 80C51 to TSC80C51.

	Specification		80C51	TSC80C51		
Symbol(2)	Min	Max	Typical		Unit	Comments
VIL		0.9	1	1.1	V	Higher low level accepted with TSC80C51.
VIH	2.4		1.2	1.4	V	Problem could appear as lower high level were accepted with 80C51.

	Specification		80C51	TSC80C51		
Symbol(2)	Min	Max	Typical		Unit	Comments
IIL		-50	-20	-24	µA	The internal weak pull-up value is lower with TSC80C51.
ITL		-650	-300	-350	µA	The internal strong pull-up value is lower with TSC80C51. Higher current is needed to toggle from logic 1 to logic 0 on port 1, 2 and 3.

AC Parameters

Typical AC parameters are not significantly different from 80C51 to TSC80C51 to expect problems on application.
Typical falling edge and rising edge times of the port I/Os do not differ from 80C51 to TSC80C51.

Power Supply Differences

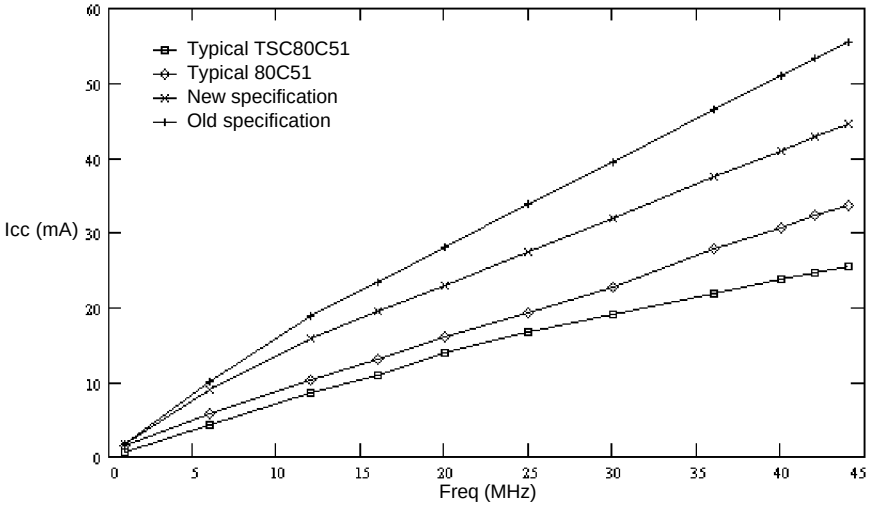

Figure 1. Icc versus frequency in operating mode(1)(3).

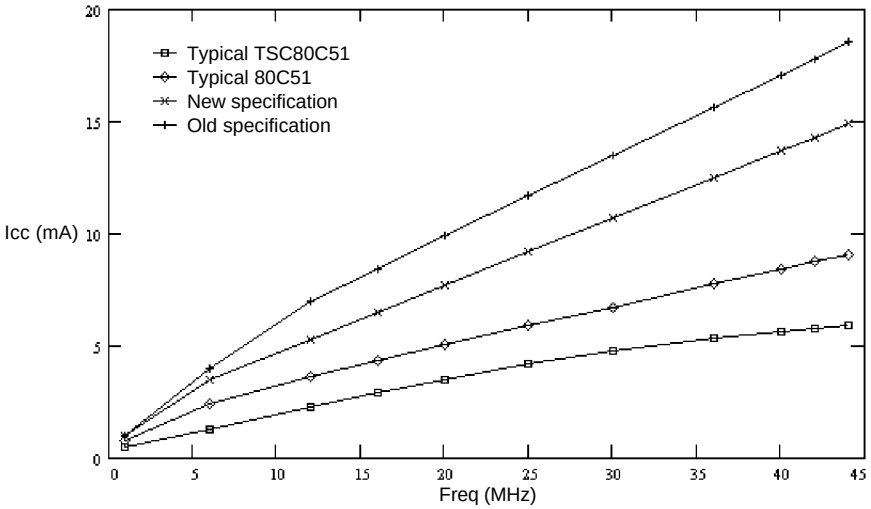

Figure 2. Icc versus frequency in idle mode(1)(3).

Notes:

1. Typical values are based on a limited number of samples and are not guaranteed. The values listed are at room temperature and 5V.
2. Refer to datasheet to get symbol explanation, and test conditions.
3. Valid only within frequency specification of the device under test.