

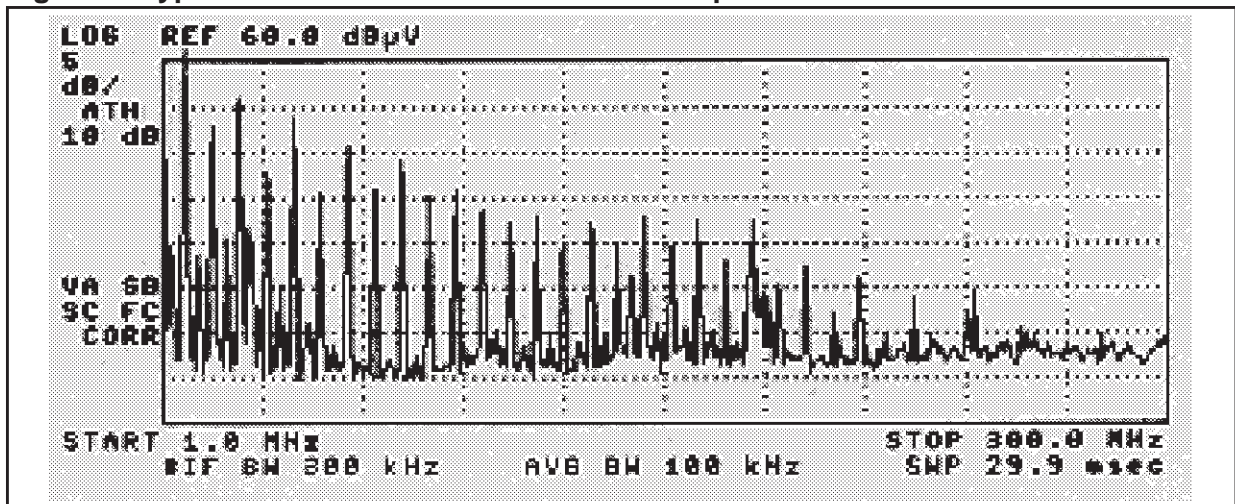
## ST6 MICRO IS EMC CHAMPION

by David Jacquiod & Edouard Presson

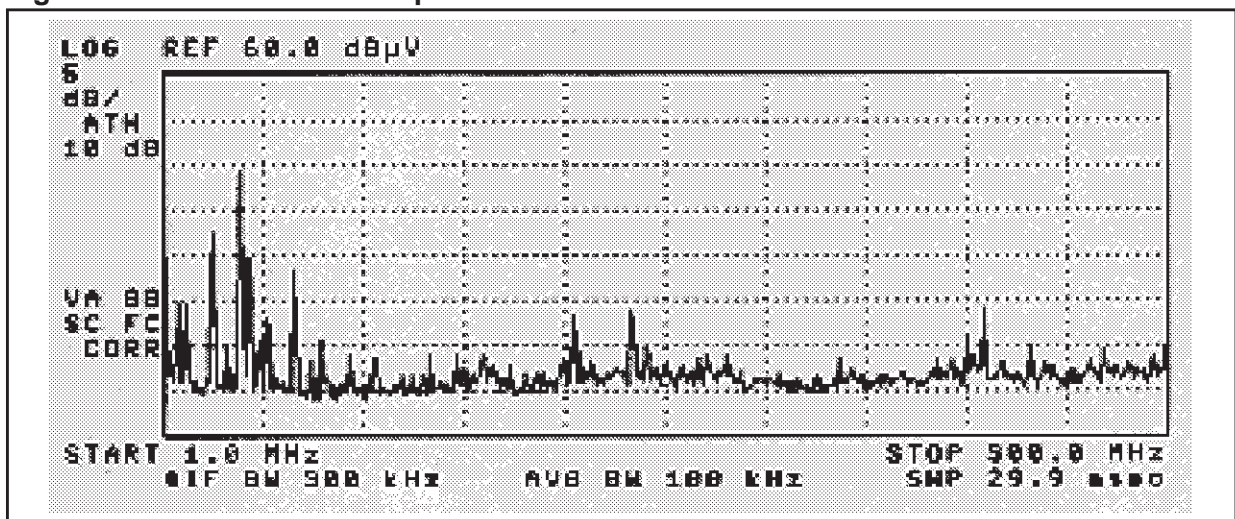
Since January 1996, Electro-Magnetic Compliance is required by international law for any electrical equipment that is manufactured including a printed circuit board.

As early as 1991, STMicroelectronics took this change in the law into account when planning the design and manufacture of the ST62 microcontroller family. An EMC environment was installed in the Design, Quality and Engineering center and ST quality standards were enlarged to include EMC performance criteria, with the result that the ST62 microcontrollers meet the EMC standards five years ahead of most 8-bit microcontrollers.

**Figure 1. Typical 8-Bit Microcontroller Emission Spectrum**



**Figure 2. ST6225 Emission Spectrum**



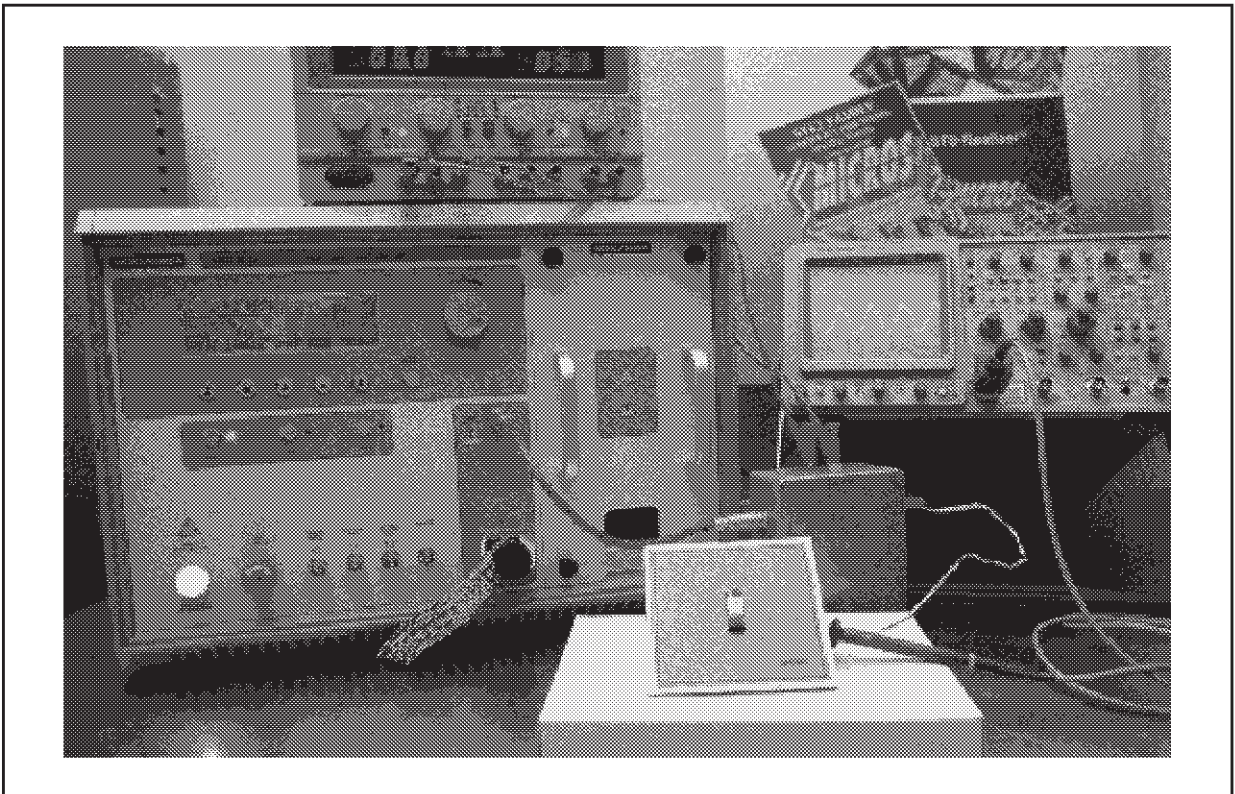
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This dramatic lead makes the ST62 microcontroller family ideally suited to creating EMC compliant applications quickly and easily using standard PCBs and software.

Due to the fact that several EMC norms apply to applications and not to components, STMicroelectronics has created a methodology and specified component level criteria, that relate to application standards like IEC 1000-4-4 or SAE 1752/3.

Close customer collaboration has allowed the methodology to be fine-tuned and new EMC tests have been created that are adapted to specific applications.

**Figure 3. Test Bench for susceptibility Measurement (Fast transient voltage test)**



With the continuous progress of the diffusion process for integrated circuits, particularly with the shrinking chip geometries, the natural trend is to increasing clock speed and decreasing EMC performance.

To get a good compromise between clock speed and EMC performance, the ST62s, in the newer, faster technology versions, have a modified design that allows EMC performance to be maintained or even improved. A set of EMC design rules has been applied, and the Electrical Simulators like STSPICE, ELDO, VERILOG allow the EMC performance to be optimized.

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EMS trend with chip process scale factor.

**Example (tested with fast transient voltage burst):**

Scale factor (Left)	1.2 $\mu$	0.8 $\mu$
ST6220	2kV	4kV

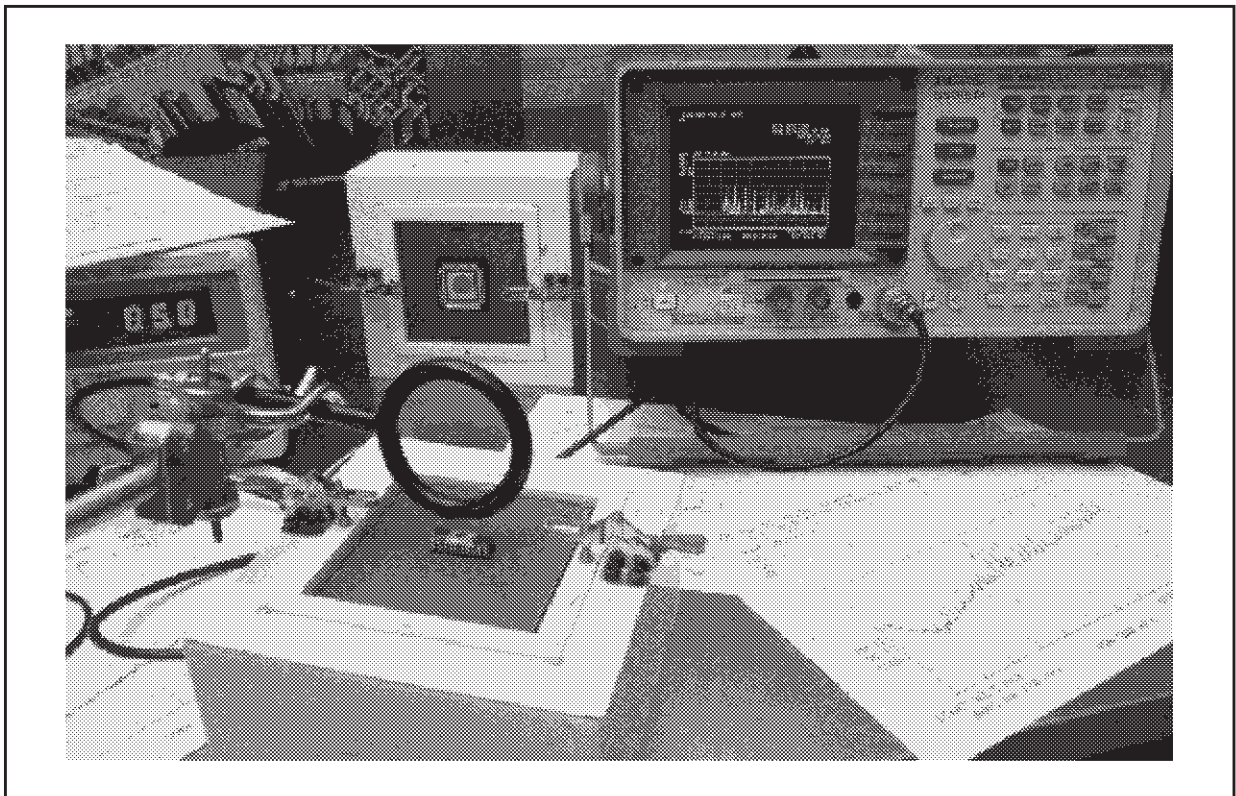
As an additional benefit, several architectural features of the ST62 family permit applications to be optimized for EMC quality:

- possibility of hard wiring the watchdog enable
- full accessibility of data/program spaces for selfcheck routines
- triggers for all inputs.

All the released ST62 variants are available in OTP/EEPROM versions which allow EMC improvements to be validated at PCB level and in functional tests with running software.

An ST62 application note has recently been published, describing how to develop with ST62 from an EMC perspective.

**Figure 4. Test Bench for Emission Measurement**



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