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Technical Note: 26029 0.2

CPG Technical Marketing

FSB_Sense Circuitry

Abstract:

This technical note is intended for AMD motherboard partners developing products based on mobile AMD Athlon™ and AMD Duron™ processors model 8 and higher. This document describes the motherboard circuitry required to automatically determine the Front Side Bus (FSB) speed of the processor.

This information will be incorporated into the next revision of the *AMD Athlon™ Processor-Based Motherboard Design Guide*, order# 24363.

Problem:

Currently mobile motherboards are unable to automatically distinguish between processors that have 100-MHz FSB and those that have a 133-MHz FSB.

Solution:

Mobile Model 8 and higher processors have a pin named FSB_Sense that when used with the appropriate FSB_Sense circuitry allows the motherboard to distinguish between processors that have a 100-MHz FSB and those that have a 133-MHz FSB.

Note: For the exact location of the FSB_Sense Pin refer to the appropriate processor data sheet.

The logic level of the FSB_Sense pin can be used to automatically configure the frequency strapping of the system clock generator and Northbridge. Most clock generators currently being used have the capability of selecting between 100-MHz and 133-MHz FSB frequencies by manipulating a single Frequency Select strap that is latched by the clock generator shortly after it powers up. For the Northbridge frequency strapping, there may be one or two straps that must be manipulated as it powers up. The logic level of the FSB_Sense signal from the CPU will typically need to be inverted to match the logic level of the clock generator and Northbridge strap inputs.

The FSB_Sense pin will have an open circuit connection for mobile processors with a 100-MHz FSB. The FSB_Sense pin will be connected to the VSS (GND) plane of the processor through

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a pull-down resistor for processors with a 133-MHz FSB. By adding an external pullup resistor to the motherboard, the logic level of the FSB_SENSE pin can be used to identify the proper bus frequency for the processor according to the following table:

Table 1. Front Side Bus Sense Truth Table

FSB_Sense	Bus Frequency
1	100 MHz
0	133 MHz

Figure 1 is a circuit that can be used to invert the FSB_Sense signal and automatically configure the clock generator and Northbridge strap.

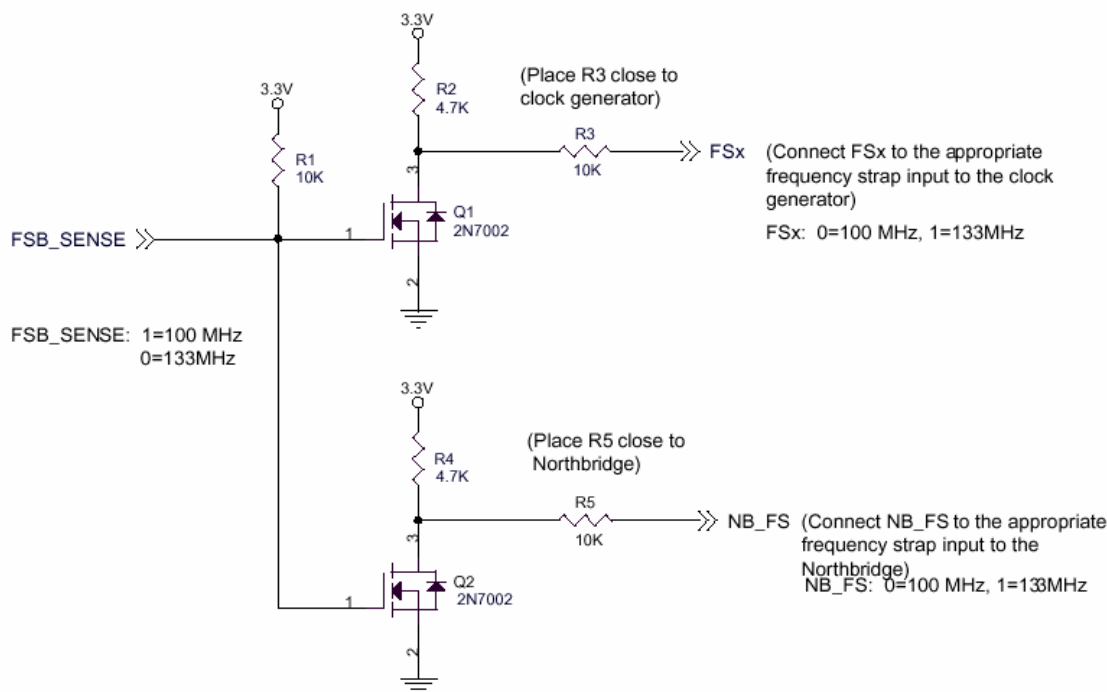


Figure 1. Inverting Circuit for FSB_Sense

There are some clock generators currently being used that do not require the FSB_Sense signal to be inverted. Figure 2 is a circuit that can be used to configure the clock generator in this case. The inverter for the Northbridge strap in Figure 1 is still required.

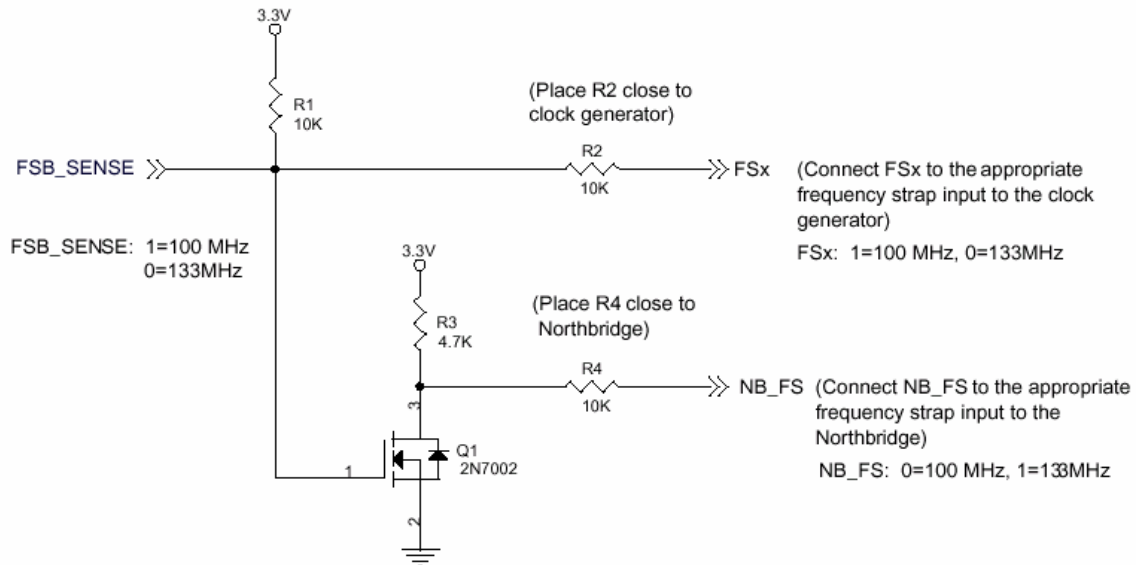


Figure 2. Non-Inverting Circuit for FSB_Sense

Contact your local AMD Field Applications Engineer (FAE) for assistance in determining the best course of action for a particular notebook computer design.

Relevant Data Sheet:

- *Mobile AMD Athlon™ XP Processor Model 8 Data Sheet*, order# 24940 revision A-4 or higher.