WAN_0187

WM9715L Interrupts and Pinout

INTRODUCTION

The purpose of this document is to provide detailed information on:

- Interrupts on the WM9715L
- Compatibility between WM9712L and WM9715L

WM9715L INTERRUPTS

INTERRUPT TYPES

There are 5 possible interrupt events on the WM9715L, with widely varying frequency and urgency (see table below).

INTERRUPT EVENT	FREQUENCY	URGENCY	PIN
ADC data ready	Up to several hundred Hz when pen is down; zero when pen is up	Requires response within tens of milliseconds (or else the user interface will appear slow / jerky)	ADCIRQ (recommended) or GENIRQ
Pen down	Up to several times per second when using the touch function	Requires response within tens of milliseconds (or else the user interface will appear slow / jerky)	PENDOWN (recommended) or GENIRQ
Over-temperature	Very low (should never occur in a well-designed system)	Response time of 100s of ms is sufficient	GENIRQ
COMP1 alarm	Depends on how COMP1 is used; if used as a “dead battery alarm”, frequency is very low	Depends on how COMP1 is used; if used as a “dead battery alarm”, response time of 100s of ms is sufficient	GENIRQ
COMP2 alarm	Depends on how COMP2 is used; if used as a “low battery alarm”, frequency is very low	Depends on how COMP2 is used; if used as a “low battery alarm”, response time of 100s of ms is sufficient	GENIRQ

Table 1 WM9715L Interrupt Events

In a typical setup (with COMP1 and COMP2 used for battery monitoring), there are 2 interrupt events with high frequency and high urgency (ADC data ready and Pen down), and 3 interrupt events with low frequency and relatively low urgency (over-temperature, COMP1 and COMP2).

INTERRUPT HANDLING

As a general principle, interrupts should be handled in such a way that CPU loading is minimised and the touchscreen interface responds quickly to user input; at the same time, it is also desirable to minimise the number of separate interrupt pins.

With the WM9715L, this goal is usually best achieved by using dedicated interrupt pins (ADCIRQ and PENDOWN) for the frequent and urgent interrupt events (‘ADC data ready’ and ‘pen down’), and a shared interrupt pin (GENIRQ) for less frequent and less urgent interrupt events (over-temperature, COMP1 alarm and COMP2 alarm).

The dedicated ADCIRQ and PENDOWN pins reduce CPU loading and response time, as the CPU immediately knows which interrupt event needs to be serviced (there is no need to read a WM9715L register to determine which event caused the interrupt).

The less frequent and less urgent interrupts are OR'ed into a general interrupt signal (GENIRQ pin) in order to save pins. In this case, the response time is slightly longer because the CPU needs to read register 54h to determine which interrupt event occurred. However, this is acceptable for less urgent interrupt events. The effect on CPU loading is negligible because these interrupt events happen very rarely.

Note that 'ADC data ready' and 'pen down' interrupts can also be OR'ed onto the GENIRQ if desired, e.g. if the host CPU does not have sufficient interrupt inputs.

WM9715L VERSUS WM9712L

PIN OVERVIEW

PIN	WM9715L	WM9712L	COMMENTS
44	DNC	GPIO1	WM9715L does not support GPIO functionality.
45	GENIRQ	GPIO2 / IRQ	GENIRQ = IRQ; new name makes it clear that this is not the only interrupt pin. WM9715L does not support GPIO functionality.
46	PENDOWN	GPIO3 / PENDOWN	WM9715L does not support GPIO functionality.
47	ADCIRQ	GPIO4 / ADA / MASK	ADCIRQ = ADA; new name makes it clear that it can be used as an interrupt pin. WM9715L does not support GPIO or MASK functionality.
48	SPDIF_OUT	GPIO5 / SPDIF_OUT	WM9715L does not support GPIO functionality.

Table 2 WM9715L Versus WM9712L

FUNCTIONALITY

INTERRUPTS

WM9715L interrupt functionality is 100% pin and software compatible with the WM9712L, although pin names are slightly different. The reason for the name change was to make it more obvious how these pins should be used.

GPIO

The WM9715L does not support GPIO functionality. This decision was taken because it was found that GPIO functionality of the WM9712L can hardly ever be used in practice (there are a number of reasons for this, most importantly the fact that most AC'97 controllers do not implement slot 12 and therefore cannot effectively support GPIO over AC'97).

It is recommended to use GPIO pins on the host CPU instead.

Where GPIO over AC'97 functionality is absolutely required (and a suitably compatible AC'97 controller is used), the WM9712L can be used.

MASK

The WM9715L does not support MASK functionality. This decision was taken because it was found that MASK functionality of the WM9712L was rarely used.

SUMMARY

INTERRUPTS

- It is recommended to use the dedicated ADCIRQ and PENDOWN pins for 'ADC data ready' and 'pen down' interrupts, respectively, and the GENIRQ pin for any other interrupt events.

BACKWARD COMPATIBILITY

- The WM9715L does not support the GPIO and MASK features of the WM9712L.
- Other functionality, including interrupts, is 100% pin and software compatible.
- Some changes were made to the naming of interrupt pins to make their function clearer; these changes do not affect functionality or backward compatibility.

APPLICATION SUPPORT

If you require more information or require technical support, please contact the Wolfson Microelectronics Applications group through the following channels:

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