iMX7ULP_1N54W

Mask Set Errata

Rev. 1 — 9 December 2024 Errata

1 Mask Set Errata for Mask 1N54W

1.1 Revision History

This report applies to mask 1N54W for these products:

- MCIMX7U5DVP07SC
- MCIMX7U5DVK07SC
- MCIMX7U3DVK07SC

Table 1. Revision History

Revision	Release Date	Significant Changes
1	12/2024	Rev. 1, 12/2024 The following errata were added. ERR052515 Rev. 0, 06/2019 Initial Revision

1.2 Errata and Information Summary

Table 2. Errata and Information Summary

Erratum ID	Erratum Title
ERR010469	ARM A7: A7 core reset as a source for the M4 core
ERR010472	MSMC: Reset delay on A7 domain when interrupt is enabled for Core0 reset sources
ERR010473	uSDHC: Data Timeout Counter Value may be insufficient for HS400 mode
ERR010740	QuadSPI: Insufficient read data may be received in the RX Data Buffer register
ERR011097	LPSPI: Command word not loaded correctly when TXMSK=1
ERR011372	Power: High leakage current on VDD18_IOREF when VDD supplies for PORT segments are turned off in VLLS modes
ERR011403	CA7: LLS/VLPS wakeup time is longer when PMC1_CTRL[LDOOKDIS]=0
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ERR011432	SNVS: TAMPER pin does not retain pull-up/down configuration in VBAT mode
ERR011433	DAC: Transfer error generated when accessing offset addresses 0x19-0x1B
ERR011439	MIPI DSI: Checksum is incorrect for DCS command long packet writes with zero-length data payload
ERR050134	GPIO: GPIO pull-ups/pull-downs may become enabled during reset
ERR050138	PMC: PMC0 PM_STAT[PMC0CURRPM] stuck at VLPR after reset in VLPS/LLS/VLLS modes
ERR052515	FSGPIO: A parametric shift over time is observed on FSGPIO output driver when it is powered above 1.98V

2 Known Errata

ERR010469: ARM A7: A7 core reset as a source for the M4 core

Description

The i.MX 7ULP provides the following reset options between the two ARM cores:

1) M4 core reset of A7 core: There is hardware capability on the SoC for the M4 core to reset the A7 core directly.

2) A7 core reset of M4 core: There is no hardware capability for the A7 to reset the M4 directly. This is achieved through the Messaging Unit (MU). The MU A-side Control Register field MUA_CR[RAIE] provides a software mechanism for the M4 to detect that the A7 has been reset.

Workaround

The A7 reset is mapped as an interrupt to the M4 core so anytime the A7 is reset, an interrupt is triggered to the M4 core. The M4 core can then reset as required using an ISR.

ERR010472: MSMC: Reset delay on A7 domain when interrupt is enabled for Core0 reset sources

Description

The Multicore System Mode Controller (MSMC) System Reset Interrupt Enable (SRIE) feature allows that some reset sources can be delayed to service an interrupt request.

For the A7 domain, this feature can be enabled for Core 0 (M4) reset sources. This can cause potential issues because when the M4 resets, the A7 domain will lose its clock references from the PLLs and will not be able to service the interrupt. Even when the M4 returns from reset, it is not guaranteed that the PLLs will relock without reconfiguration.

Workaround

Do not use the Core 0 reset interrupt function available to the A7 domain.

ERR010473: uSDHC: Data Timeout Counter Value may be insufficient for HS400 mode

Description

When the Data Timeout Counter Value programmed in SYS_CTRL[DTOCV] is set to the maximum value (0xF), the maximum busy timeout is [2^29 * 2.5 ns] = 1.34 s because the root clock is 400 MHz for HS400 mode. For other speed modes, the maximum busy timeout time is longer because the root clock is slower.

Some eMMC datasheets show maximum busy timeout specifications of 1.6 s, so the programmable timeout in the uSDHC will not be long enough for HS400 mode.

This issue only affects HS400 mode with a 200 MHz SD clock. If the SD clock is reduced to 150 MHz, the timing requirements for 1.6 s can be met.

Workaround

1) Reduce the SD clock to 150 MHz

2) Disable hardware timeout and use a software timeout mechanism to generate a 1.6 s timeout

ERR010740: QuadSPI: Insufficient read data may be received in the RX Data Buffer register

Description

Data read from flash through QuadSPI using Peripheral Bus Interface (IPS) may return insufficient data in the RX Buffer Data register (QuadSPI_RBDRn) when the read data size of a flash transaction is programmed to be greater than 32 bytes.

Workaround

For data size greater than 32 bytes, program the IP data transfer size in the IP configuration register (QuadSPI_IPCR[IDATSZ]) to be in multiples of 8 bytes.

ERR011097: LPSPI: Command word not loaded correctly when TXMSK=1

Description

When the Transmit Command Register is written with TCR[TXMSK]=1 and the next write to the TX FIFO is another command, then the first command may not load correctly.

Workaround

When writing the Transmit Command Register with TCR[TXMSK]=1, wait for the TX FIFO to go empty (FSR[TXCOUNT] = 0) before writing another command to the Transmit Command Register.

ERR011372: Power: High leakage current on VDD18_IOREF when VDD supplies for PORT segments are turned off in VLLS modes

Description

Excessive current around 370uA on VDD18_IOREF is observed when both the M4 and A7 cores are in VLLS mode and VDD_PTA, VDD_PTC or VDD_PTE are turned off.

Workaround

VDD_PTA, VDD_PTC and VDD_PTE should remain powered when the M4 and A7 are both in VLLS mode. The expected leakage current for keeping these supplies powered is approximately 2 uA at 3.3V.

ERR011403: CA7: LLS/VLPS wakeup time is longer when PMC1_CTRL[LDOOKDIS]=0

Description

The CA7 wakeup time from LLS/VLPS is significantly longer when PMC1_CTRL[LDOOKDIS]=0. This bitfield selects whether the PMC will check the regulated output from the LDO Regulator during a mode transition.

Approximate wakeup time from LLS when PMC1_CTRL[LDOOKDIS]=1: 41.5 us

Approximate wakeup time from LLS when PMC1_CTRL[LDOOKDIS]=0: 80 us

Approximate wakeup time from VLPS when PMC1_CTRL[LDOOKDIS]=1: 23 us

Approximate wakeup time from VLPS when PMC1_CTRL[LDOOKDIS]=0: 46 us

This issue does not affect systems designed for CA7 LDO Bypass Mode.

Workaround

Set PMC1_CTRL[LDOOKDIS]=1 before entering LLS/VLPS modes. This setting keeps the register asserted when returning to RUN mode. After RUN mode is reached, the register may be de-asserted.

PMC1_CTRL[LDOOKDIS]=0 reduces the response time of the LDO voltage adjustments in RUN mode, while PMC1_CTRL[LDOOKDIS]=1 sets a fixed timing internal for any voltage adjustment. When moving to LLS or VLPS modes, there are no side effects if PMC1_CTRL[LDOOKDIS]=1 is used.

In CA7 LDO Bypass Mode, always set PMC1_CTRL[LDOOKDIS]=1.

ERR011424: Interrupts: NMI_b not serviced by CM4 core when used as wake event from VLLS mode

Description

When NMI_b is used as an event to wake the CM4 core from VLLS mode, the CM4 wakeup occurs but the NMI interrupt is internally disabled when power is restored and does not get serviced by the CM4 core.

In silicon revision B1, a bit was added to SIM_DGO_GP11[7]. In addition to the usual selection of the NMI_b function via IOMUXC0_SW_MUX_CTL_PAD_PTA9, this bit must be set prior to entering CM4 VLLS mode to allow the NMI interrupt to remain active once power is restored and cleared upon exiting VLLS.

During validation of the fix of this issue on silicon revision B1, an associated issue was found. While the implementation of the SIM_DGO_GP11[7] bit is correct, the ROM code regarding handling of the NMI event is incorrect preventing use of NMI as a wake-up event from CM4 VLLS mode.

Workaround

Use a wake-event other than NMI to wake the CM4 from VLLS mode.

ERR011432: SNVS: TAMPER pin does not retain pull-up/down configuration in VBAT mode

Description

The TAMPER pin has the capability to enable an internal pull-up or pull-down resistor. The internal pull-up / pull-down configuration is not retained when the SoC enters VBAT mode.

Workaround

Use an external pull-up or pull-down resistor if the TAMPER function is desired during VBAT mode.

ERR011433: DAC: Transfer error generated when accessing offset addresses 0x19-0x1B

Description

The DAC generates a transfer error for both read and write accesses to offset addresses 0x19-0x1B. These offsets are part of the ITRM register which is 32 bits and starts at offset address 0x18. Accesses to offset address 0x18 work properly.

Workaround

Use only 32-bit accesses to offset address 0x18 to read/write the IRTM register.

ERR011439: MIPI DSI: Checksum is incorrect for DCS command long packet writes with zero-length data payload

Description

According to the MIPI DSI specification, long packets are comprised of a Packet Header and a payload of 0 to 2^16-1 bytes. For the special case of a zero-length payload, the specification requires the checksum must be set to 0xFFFF.

The MIPI DSI controller produces an incorrect checksum for DCS commands issued via long packets with zero-length payloads in DSI Low-Power mode (LP). There is no issue for similar commands issued in DSI High-Power mode (HP).

This issue should not affect normal application operation because packets with zero data length will normally be sent using the short packet format. However, because the MIPI DSI spec specifically states this behavior, MIPI DSI certification will fail with long packets of zero-length.

Workaround

Use short packet format to send DCS commands with zero length data payloads.

ERR050134: GPIO: GPIO pull-ups/pull-downs may become enabled during reset

Description

During reset, the failsafe GPIOs (Ports A, B, C, E, and F) are supposed to be in the input/H-Z state. Due to a reset issue, the GPIO buffers may come up as Hi-Z with an internal pull-up or pull-down being enabled. The issue persists until the associated internal core supply is on (VDD_DIG0 for Ports A and B; VDD_DIG1 for Ports C, E, and F). After the internal core supply is present, the issue is cleared and the GPIOs will behave as expected.

Ports A and B are susceptible to this issue, however it will only occur until VDD_DIG0 is on. In this case, the GPIO issue will clear before RESET0_b is released.

On Ports C, E, and F, the issue will persist until VDD_DIG1 is turned on internally by the M4. Therefore, the issue will persist after RESET0_b is released until the boot ROM process enables VDD_DIG1 to the A7 domain.

This issue occurs only on power-on reset (POR). After the core supplies have been turned on, the issue will not occur on subsequent resets (including when the A7 exits VLLS mode).

Port D GPIOs are not affected.

Workaround

1) For critical signals that must be controlled during reset, choose GPIOs on ports A, B, or D.

2) For critical signals on ports C, E, and F, include a strong enough pull-up or pull-down on the board to overdrive the internal pull-up or pull-down if it occurs. The internal pull-up/pull-downs may be as strong as approximately 20k ohms.

ERR050138: PMC: PMC0 PM_STAT[PMC0CURRPM] stuck at VLPR after reset in VLPS/ LLS/VLLS modes

Description

The Real-Time Domain PMC0 Current Power Mode status bits (PMC0 PM_STAT[PMC0CURRPM]) become stuck indicating VLPR mode (0x3) if a reset occurs when the Real-Time Domain is in VLPS, LLS, or VLLS mode and those power modes were reached from VLPR mode (i.e. RUN -> VLPR -> VLPS/LLS/VLLS). Notice that VLLS wake-up always includes a reset regardless of the wakeup source (RESET0_B, GPIO, NMI, etc.) so this issue is always seen after a wake-up via GPIO/NMI pin events.

Workaround

If PMC0 PM_STAT[PMC0CURRPM] is not used, no action is required.

If the Real-Time Domain needs to go from VLPR to one of the affected modes (i.e. VLPS/LLS/VLLS), go from VLPR to RUN first, and then go to the target mode (VLPS, LLS, or VLLS).

ERR052515: FSGPIO: A parametric shift over time is observed on FSGPIO output driver when it is powered above 1.98V

Description

When FSGPIO is powered above 1.98V, a parametric shift over time is observed on FSGPIO output driver, where the output low drive current (IOL) is degraded, leading to a longer fall time and output low voltage level (VOL) is increased. Analog and input functionality is not impacted.

PTA, PTC, PTE and PTF are impacted. PTB is FSGPIO, but it is powered with 1.8V mode (1.71-1.98V) only, therefore PTB is not impacted.

For new or updated designs use 1.8V mode (1.71-1.98V) for the FSGPIO power supply. For the legacy designs, refer to Technote TN00188 for IOL and fall time degradation information when operating above 1.98V. If it is determined that IO does not meet the mission profile requirement of the end application, implement the workaround.

Workaround

The I/O power supplies, VDD_PTA, VDD_PTC, VDD_PTE and VDD_PTF should be connected to 1.8V mode (1.71-1.98V).

The voltage range is controlled by PT*_RANGE_CTRL of SIM_DGO_GP11(Address 0x 410A3080).

00b – Continuos Mode

01b – Low Range Mode

10b – High Range Mode

Both 00b and 01b are allowed. Recommend to set the field to 01b to use low voltage range 1.8V for better delay performance and power consumption if the power supply is 1.8V.

Note these SIM_DGO_GP11 registers update requires the special sequence documented in the System Integration Module(SIM) chapters of iMX7ULP RM.

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