Application Note

Document No.: AN1154

APM32F103xE series USB is forcibly suspended

Version: V1.0

1 Introduction

This application note is about the software configuration of the APM32F103xE series for the USB forced suspension method, aiming to solve the problem that the USB cannot be initialized normally when both the D+ D_ of the USB are pulled to a high level.

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2.1 problem description

When the USB is plugged into the charging port of the socket and both the D+ D_ of the USB are pulled to a high level, the USB cannot be initialized normally, and the program repeatedly gets stuck in the USB interrupt. It works normally when plugged into a computer or other devices.

2.2 Software Solution

2.2.1 Find the USB interrupt handling function

```
188  */
189 #ifdef APM32F10X_HD
190 #if USB_SELECT == USB1
191  void USBD1_LP_CAN1_RX0_IRQHandler(void)
192  #else
193  void USBD2_LP_CAN2_RX0_IRQHandler(void)
194 #endif /* USB_SELECT */
195  #else
196 #if USB_SELECT == USB1
197  void USBD1_LP_CAN1_RX0_IRQHandler(void)
198  #else
199  void USBD2_LP_IRQHandler(void)
200 #endif /* USB_SELECT */
201 #endif
202 {
203     USBD_IsrHandler(&usbDeviceHandler);
204 }
205
206
```

2.2.2 Find the ESOFFLG status judgment

main.c | apm32f10x_int.c | apm32f10x.h | apm32f10x_usb_device.c

```
1383  void USBD_IsrHandler(USBD_HANDLE_T* usbdh)
1384  {
1385      /* Handle Correct Transfer */
1386      if(USBD_ReadIntFlag(usbdh->usbGlobal, USBD_INT_CTR))
1387      {
1388          USBD_EP_CTRHandler(usbdh);
1389      }
1390
1391      /* Handle USB Reset interrupt */
1392      if(USBD_ReadIntFlag(usbdh->usbGlobal, USBD_INT_RST))
1393      {
1394          USBD_ClearIntFlag(usbdh->usbGlobal, USBD_INT_RST);
1395
1396          USBD_EnumDoneCallback(usbdh);
1397
1398          USBD_SetDevAddress(usbdh, 0x00);
1399      }
1400
1401      /* Handle Packet Memory Overflow */
1402      if(USBD_ReadIntFlag(usbdh->usbGlobal, USBD_INT_PMAOU))
1403      {
1404          USBD_ClearIntFlag(usbdh->usbGlobal, USBD_INT_PMAOU);
1405      }
1406
1407      /* Handle Failure Of Transfer */
1408      if(USBD_ReadIntFlag(usbdh->usbGlobal, USBD_INT_ERR))
1409      {
1410          USBD_ClearIntFlag(usbdh->usbGlobal, USBD_INT_ERR);
1411      }
1412
1413      /* Handle Wakeup Request */
1414      if(USBD_ReadIntFlag(usbdh->usbGlobal, USBD_INT_WKUP))
1415      {
1416
1417          USBD_ResetLowerPowerMode(usbdh->usbGlobal);
1418          USBD_ResetForceSuspend(usbdh->usbGlobal);
1419
1420          USBD_ResumeCallback(usbdh);
1421
1422          USBD_ClearIntFlag(usbdh->usbGlobal, USBD_INT_WKUP);
1423      }
1424
1425      /* Handle Suspend Mode Request */
1426      if(USBD_ReadIntFlag(usbdh->usbGlobal, USBD_INT_SUS))
1427      {
1428          USBD_SuspendHandler(usbdh);
1429
1430          USBD_SuspendCallback(usbdh);
1431      }
1432
1433      /* Handle Start Of Frame */
1434      if(USBD_ReadIntFlag(usbdh->usbGlobal, USBD_INT_SOF))
1435      {
1436          USBD_ClearIntFlag(usbdh->usbGlobal, USBD_INT_SOF);
1437
1438          USBD_SOFCallback(usbdh);
1439      }
1440
1441      /* Handle Expected Start of Frame */
1442      if(USBD_ReadIntFlag(usbdh->usbGlobal, USBD_INT_ESOF))
1443      {
1444          USBD_ClearIntFlag(usbdh->usbGlobal, USBD_INT_ESOF);
1445      }
1446  }
```

2.2.3 Add a forced suspension code

```
1438            USBD_SofCallback(usbdh);
1439        }
1440
1441        /* Handle Expected Start of Frame */
1442        if(USBD_ReadIntFlag(usbdh->usbGlobal, USBD_INT_ESOF))
1443        {
1444            USBD_ClearIntFlag(usbdh->usbGlobal, USBD_INT_ESOF);
1445            USBD_SetForceSuspend(usbdh->usbGlobal);
1446        }
1447    }
1448
1449    #endif /* defined (USB_DEVICE) */
1450
1451    #if defined (USB_OTG)
```

3 Revision history

Table 1 Document Revision History

Date	Version	Revision History
May,2025	1.0	New

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