



Release Notes: JN-AN-1243

DK006 : JN5189/JN5188/K32W061/K32W041/K32W041A/K32W041AM

Zigbee 3.0 Base Device

These release notes provide information on the SDK compatibility, memory usage and change history for the JN-AN-1243 Zigbee 3.0 Base Device Application Note.

1 Public v2005 – 06-Sep-2021

Public release for DK006: JN5189 / JN5188 / K32W061 / K32W041/ K32W041A/ K32W041AM.

1.1 Public v2005: Compatibility

The software provided with this Application Note has been tested with the following evaluation kits and SDK versions. The supplied makefiles are configured to compile for K32W061 chips on the K32W061DK6 SDK which was also used to create the pre-built binaries, there is information on the main Application Note document on how to compile for different chips/SDKs.

Product Type	Part Number	Version	Supported Chips
JN518x Development Kit	JN518x-DK006	-	JN5189 / JN5188
IoT_ZTB Development Kit	IoT_ZTB-DK006	-	K32W061/K32W041/ K32W041A/K32W041AM
MPCXpresso –Toolchain	-	v11.3.0 build 5222	JN5189 / JN5188 K32W061/K32W041/ K32W041A/K32W041AM
Development Kit – SDK	K32W061DK6 K32W041ADK6 K32W041AMDK6	v2.6.4 MR3 QPATCH1	JN5189 / JN5188 K32W061/K32W041/ K32W041A/K32W041AM

1.2 Public v2005: Memory Usage

The applications of this Application Note have the following memory footprints:

```
text data  bss    dec filename
206992 3168 29960 240120 Coordinator_GpProxy_DONGLE
208088 3168 29968 241224 Coordinator_GpProxy_OM15082
222640 3184 30664 256488 Coordinator_NciIcode_NciOta_GpProxy_OM5578
208376 3168 29968 241512 Ssbl_Coordinator_GpProxy_OM15082
203200 1760 27752 232712 Router_GpProxy_OM15081
231484 2048 29940 263472 Router_NtagNwk_NtagOta_GpProxy_Ota_OM15081
213808 1864 28092 243764 Ssbl_Router_NtagNwk_GpProxy_OM15081
162796 1556 18080 182432 EndDevice_OM15082
196844 1828 20284 218956 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
173772 1652 18424 193848 Ssbl_EndDevice_NtagNwk_OM15082
```

1.3 Public v2005: End Device RAM Retention

The End Devices in this Application Note retain the following RAM during sleep:

retain	spare	kb	banks	filename
15416	968	16	-----567	EndDevice_OM15082
3400	696	4	-----7	EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
15608	776	16	-----567	Ssbl_EndDevice_NtagNwk_OM15082

1.4 Public v2005: New Features

None.

1.5 Public v2005: Bug Fixes

JIRA MCB_2674

RNG generates non-random outputs which could cause same network address allocated to different child device during commissioning.

JIRA MCZB_919

Accidental reset during device rejoin could lead to channel number change in NIB.

1.6 Public v2005: Known Issues

JIRA MCZB_710

framework flash driver limitation to K32W041AM variant.

JIRA MCZB_715

Deep Power-Down mode of the embedded MX25R8035F in K32W041AM couldn't be set correctly with framework API.

JIRA MCZB_939

New DIO wakeup mask doesn't take effect after sleep/wakeup cycle.

JIRA MCZB_919

End device channel number in NIB changes accidentally during rejoin.

JIRA MCZB_882

ZPS default confirmation is not implemented for fragmented transmission.

JIRA MCZB_996

sStackEvent.uEvent.sApsTcEvent.uTcData.pKeyDesc->au8LinkKey is not available to application.

2 Public v2004 – 20-Mar-2021

Public release for DK006: JN5189 / JN5188 / K32W061 / K32W041/ K32W041A/ K32W041AM.

2.1 Public v2004: Compatibility

The software provided with this Application Note has been tested with the following evaluation kits and SDK versions. The supplied makefiles are configured to compile for K32W061 chips on the K32W061DK6 SDK which was also used to create the pre-built binaries, there is information on the main Application Note document on how to compile for different chips/SDKs.

Product Type	Part Number	Version	Supported Chips
JN518x Development Kit	JN518x-DK006	-	JN5189 / JN5188
IoT_ZTB Development Kit	IoT_ZTB-DK006	-	K32W061/K32W041/ K32W041A/K32W041AM
MPCXpresso –Toolchain	-	v11.3.0 build 5222	JN5189 / JN5188 K32W061/K32W041/ K32W041A/K32W041AM
Development Kit – SDK	K32W061DK6 K32W041ADK6 K32W041AMDK6	v2.6.3 MR3	JN5189 / JN5188 K32W061/K32W041/ K32W041A/K32W041AM

2.2 Public v2004: Memory Usage

The applications of this Application Note have the following memory footprints:

```

text data  bss    dec filename
206400 3160 29252 238812 Coordinator_GpProxy_DONGLE
207560 3160 29260 239980 Coordinator_GpProxy_OM15082
222048 3176 29956 255180 Coordinator_NciIcode_NciOta_GpProxy_OM5578
207848 3160 29260 240268 Ssbl_Coordinator_GpProxy_OM15082
202608 1756 27044 231408 Router_GpProxy_OM15081
230956 2044 29232 262232 Router_NtagNwk_NtagOta_GpProxy_Ota_OM15081
213280 1860 27384 242524 Ssbl_Router_NtagNwk_GpProxy_OM15081
161972 1564 17392 180928 EndDevice_OM15082
195956 1820 19596 217372 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
172948 1660 17736 192344 Ssbl_EndDevice_NtagNwk_OM15082

```

2.3 Public v2004: End Device RAM Retention

The End Devices in this Application Note retain the following RAM during sleep:

```

retain spare  kb    banks filename
14728 1656    16 -----567 EndDevice_OM15082
   3160   936     4 -----7 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
14920 1464    16 -----567 Ssbl_EndDevice_NtagNwk_OM15082

```

2.4 Public v2004: New Features

None.

2.5 Public v2004: Bug Fixes

None.

2.6 Public v2004: Known Issues

JIRA MCZB_710

framework flash driver limitation to K32W041AM variant.

JIRA MCZB_715

Deep Power-Down mode of the embedded MX25R8035F in K32W041AM couldn't be set correctly with framework API.

3 Public v2003 – 23-Dec-2020

Public release for DK006: JN5189 / JN5188 / K32W061 / K32W041.

3.1 Public v2003: Compatibility

The software provided with this Application Note has been tested with the following evaluation kits and SDK versions. The supplied makefiles are configured to compile for K32W061 chips on the K32W061DK6 SDK which was also used to create the pre-built binaries, there is information on the main Application Note document on how to compile for different chips/SDKs.

Product Type	Part Number	Version	Supported Chips
JN518x Development Kit	JN518x-DK006	-	JN5189 / JN5188
IoT_ZTB Development Kit	IoT_ZTB-DK006	-	K32W061 / K32W041
MPCXpresso –Toolchain		v11.2.1 build 4149	JN5189 / JN5188 K32W061 / K32W041
Development Kit – SDK	K32W061DK6	v2.6.2 MR2	JN5189 / JN5188 K32W061 / K32W041

3.2 Public v2003: Memory Usage

The applications of this Application Note have the following memory footprints:

```

text data  bss    dec filename
205200 3160 29368 237728 Coordinator_GpProxy_DONGLE
206360 3160 29376 238896 Coordinator_GpProxy_OM15082
220848 3176 30072 254096 Coordinator_NciIcode_NciOta_GpProxy_OM5578
206648 3160 29376 239184 Ssbl_Coordinator_GpProxy_OM15082
201408 1756 27160 230324 Router_GpProxy_OM15081
229820 2044 29868 261732 Router_NtagNwk_NtagOta_GpProxy_Ota_OM15081
212080 1860 27500 241440 Ssbl_Router_NtagNwk_GpProxy_OM15081
160584 1544 17504 179632 EndDevice_OM15082
194696 1816 20244 216756 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
171560 1640 17848 191048 Ssbl_EndDevice_NtagNwk_OM15082

```

3.3 Public v2003: End Device RAM Retention

The End Devices in this Application Note retain the following RAM during sleep:

```

retain spare  kb    banks filename
14824 1560    16  -----567 EndDevice_OM15082
    3224  872     4  -----7 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
15016 1368    16  -----567 Ssbl_EndDevice_NtagNwk_OM15082

```

3.4 Public v2003: New Features

None.

3.5 Public v2003: Bug Fixes

None.

3.6 Public v2003: Known Issues

None.

4 Public v2002 – 21-Aug-2020

Public release for DK006: JN5189 / JN5188 / K32W061 / K32W041.

4.1 Public v2002: Compatibility

The software provided with this Application Note has been tested with the following evaluation kits and SDK versions. The supplied makefiles are configured to compile for K32W061 chips on the K32W061DK6 SDK which was also used to create the pre-built binaries, there is information on the main Application Note document on how to compile for different chips/SDKs.

Product Type	Part Number	Version	Supported Chips
JN518x Development Kit	JN518x-DK006	-	JN5189 / JN5188
IoT_ZTB Development Kit	IoT_ZTB-DK006	-	K32W061 / K32W041
MPCXpresso –Toolchain		v11.2.0 build 4120	JN5189 / JN5188 K32W061 / K32W041
Development Kit – SDK	K32W061DK6	v2.6.1 MR1	JN5189 / JN5188 K32W061 / K32W041

4.2 Public v2002: Memory Usage

The applications of this Application Note have the following memory footprints:

```

text data  bss    dec filename
202368 3128 29284 234780 Coordinator_GpProxy_DONGLE
203528 3128 29292 235948 Coordinator_GpProxy_OM15082
218016 3144 29988 251148 Coordinator_NciIcode_NciOta_GpProxy_OM5578
203816 3128 29292 236236 Ssbl_Coordinator_GpProxy_OM15082
198640 1720 27076 227436 Router_GpProxy_OM15081
226988 2008 29784 258780 Router_NtagNwk_NtagOta_GpProxy_Ota_OM15081
209248 1824 27416 238488 Ssbl_Router_NtagNwk_GpProxy_OM15081
158184 1512 17424 177120 EndDevice_OM15082
192312 1800 20148 214260 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
169156 1628 17784 188568 Ssbl_EndDevice_NtagNwk_OM15082

```

4.3 Public v2002: End Device RAM Retention

The End Devices in this Application Note retain the following RAM during sleep:

```

retain spare kb    banks filename
14712 1672 16 ----567 EndDevice_OM15082
3224 872 4 -----7 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
14936 1448 16 ----567 Ssbl_EndDevice_NtagNwk_OM15082

```

4.4 Public v2002: New Features

None.

4.5 Public v2002: Bug Fixes

MCUZIGBEE-2592: EndDevice RamOpt OTA via Router : fail to rejoin and continue when Router powered off

Application now monitors ZPS_EVENT_NWK_POLL_CONFIRM message, accumulate the error and do rejoin once the errors is bigger than the threshold. Find below code in AN.

```

#ifndef SLEEP_MIN_RETENTION
    if (psStackEvent->uEvent.sNwkPollConfirmEvent.u8Status == MAC_ENUM_NO_ACK)
        u8NumOfPollFailure++;
    else
        u8NumOfPollFailure = 0;

```

```

    if(u8NumOfPollFailure > MAX_POLL_FAILURE)
    {
        DBG_vPrintf(TRACE_APP, "\nPoll failure exceed MAX_POLL_FAILURE, start BDB rejoin\n");
        BDB_vRejoinCycle(TRUE);
        u8NumOfPollFailure=0;
    }
#endif

```

MCB-1924: ZED sleep current is too high, should about 1.15uA for 4K RAM retention.

Update makefile to select correct mode for 32K clock. Find below code in makefile and AN.

```

CLK_32K = 1
ifeq ($(CLK_32K), 1)
CFLAGS += -DgClkUseFro32K=1
CFLAGS += -DgPWR_UseAlgoTimeBaseDriftCompensate=1
# 32k FRO automatic calibration (0 = disable, 1 = enable)
CFLAGS += -DgClkRecalFro32K=0
else
CFLAGS += -DgClkUseFro32K=0
Endif

#ifdef APP_LOW_POWER_API
static void PreSleep(void)
#else
PWRM_CALLBACK(PreSleep)
#endif
{
...
/* Minimize GPIO power consumption */
BOARD_SetPinsForPowerMode();
}

```

4.6 Public v2002: Known Issues

None.

5 Public v2001 – 17-Apr-2020

Public release for DK006: JN5189 / JN5188 / K32W061 / K32W041.

5.1 Public v2001: Compatibility

The software provided with this Application Note has been tested with the following evaluation kits and SDK versions. The supplied makefiles are configured to compile for K32W061 chips on the K32W061DK6 SDK which was also used to create the pre-built binaries, there is information on the main Application Note document on how to compile for different chips/SDKs.

Product Type	Part Number	Version	Supported Chips
JN518x Development Kit	JN518x-DK006	-	JN5189 / JN5188
IoT_ZTB Development Kit	IoT_ZTB-DK006	-	K32W061 / K32W041
MPCXpresso –Toolchain		v11.1.1 build 3241	JN5189 / JN5188 K32W061 / K32W041
Development Kit – SDK	K32W061DK6	v2.6.0 RFP RC5	JN5189 / JN5188 K32W061 / K32W041

5.2 Public v2001: Memory Usage

The applications of this Application Note have the following memory footprints:

```

text data  bss    dec filename
202912 3128 29272 235312 Coordinator_GpProxy_DONGLE
204072 3128 29280 236480 Coordinator_GpProxy_OM15082
218496 3144 29976 251616 Coordinator_NciIcode_NciOta_GpProxy_OM5578
204360 3128 29280 236768 Ssbl_Coordinator_GpProxy_OM15082
199332 1720 27064 228116 Router_GpProxy_OM15081
227700 2008 29772 259480 Router_NtagNwk_NtagOta_GpProxy_Ota_OM15081
209872 1824 27404 239100 Ssbl_Router_NtagNwk_GpProxy_OM15081
158864 1520 17424 177808 EndDevice_OM15082
192812 1796 20148 214756 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
169708 1620 17768 189096 Ssbl_EndDevice_NtagNwk_OM15082

```

5.3 Public v2001: End Device RAM Retention

The End Devices in this Application Note retain the following RAM during sleep:

```

retain spare kb    banks filename
14712  1672 16  -----567 EndDevice_OM15082
  3224   872  4  -----7 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
14920  1464 16  -----567 Ssbl_EndDevice_NtagNwk_OM15082

```

5.4 Public v2001: New Features

None.

5.5 Public v2001: Bug Fixes

artf734822: OTA end request error due to server power off during OTA process

When server power off then power on, device will restart the OTA, but the flash driver needs to reinit as well.

5.6 Public v2001: Known Issues

None.

6 Public v2000 – 9-Mar-2020

Public release for DK006: JN5189 / JN5188 / K32W061 / K32W041.

6.1 Public v2000: Compatibility

The software provided with this Application Note has been tested with the following evaluation kits and SDK versions. The supplied makefiles are configured to compile for JN5189 chips on the JN5189DK6 SDK which was also used to create the pre-built binaries,

there is information on the main Application Note document on how to compile for different chips/SDKs.

Product Type	Part Number	Version	Supported Chips
JN518x Development Kit	JN518x-DK006	-	JN5189 / JN5188
K32W061 Development Kit	K32W061-DK006	-	K32W061 / K32W041
MPCXpresso –Toolchain		v11.1.0 build 3209	JN5189 / JN5188 K32W061 / K32W041
Development Kit – SDK	JN5189DK6	v2.6.0 build 110	JN5189 / JN5188 K32W061 / K32W041

6.2 Public v2000: Memory Usage

The applications of this Application Note have the following memory footprints:

```

text data  bss    dec filename
202760 3128 29084 234972 Coordinator_GpProxy_DONGLE
203916 3128 29092 236136 Coordinator_GpProxy_OM15082
218340 3144 29788 251272 Coordinator_NciIcode_NciOta_GpProxy_OM5578
204204 3128 29092 236424 Ssbl_Coordinator_GpProxy_OM15082
199104 1720 26876 227700 Router_GpProxy_OM15081
227408 2008 29584 259000 Router_NtagNwk_NtagOta_GpProxy_Ota_OM15081
209708 1824 27216 238748 Ssbl_Router_NtagNwk_GpProxy_OM15081
158768 1520 17248 177536 EndDevice_OM15082
192648 1800 19972 214420 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
169676 1620 17592 188888 Ssbl_EndDevice_NtagNwk_OM15082

```

6.3 Public v2000: End Device RAM Retention

The End Devices in this Application Note retain the following RAM during sleep:

```

retain spare kb    banks filename
14536 1848 16 -----567 EndDevice_OM15082
3224 872 4 -----7 EndDevice_NtagNwk_NtagOta_Ota_RamOpt_OM15082
14744 1640 16 -----567 Ssbl_EndDevice_NtagNwk_OM15082

```

6.4 Public v2000: New Features

None – first release.

6.5 Public v2000: Bug Fixes

None – first release.

6.6 Public v2000: Known Issues

None – first release.

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