

Embedded USB 2.0 ENGINEERING CHANGE NOTICE

Title: Native Mode Auto-Resume

Applied to: Embedded (eUSB2) Version 1.2

Brief description of the functional changes:
Removing redundancy and inconsistency of eDSPn behaviors during Remote Wake. Also editorial update on eUSPn behavior

Benefits as a result of the changes:
Adding clarity on eDSPn behavior during Remote Wake

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
No impact to existing revision or implementation. Apply to v1.2 implementations only

An analysis of the hardware implications:
There may be impact to hardware implementation.

An analysis of the software implications:
No

An analysis of the compliance testing implications:
No

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Actual Change

(a). Section 4.3.5.2 Remote Wake from L1 and L2

From Text:

- eDSPn, upon detecting Remote Wake, shall acknowledge with the Resume signaling defined in Section 3.3.6 within T_{URSM} as defined by the [USB 2.0](#). It shall complete Resume with EOResume as defined in Section 3.3.5.1.1. If host controller may not be able to direct eDSPn to start resume within T_{URSM} , eDSPn may implement the optional auto-resume defined in Section 3.3.7.1.1 to initiate Resume.

To Text:

- eDSPn, upon detecting Remote Wake, shall follow the behavioral requirement defined in Sections 3.3.7.1.1 and 3.3.7.2.1.

(b). Section 3.3.7.1.1 Native Mode

From Text:

- If it is in FS/LS operation, eUSPn/eDSPn shall adhere to the following rules to perform the Remote Wake operation.
 - eUSPn shall drive Remote Wake K and conclude Remote Wake by disabling its SE Tx at eD-(FS) or eD+(LS). Note that under normal operation, eDSPn has already started Resume by driving Resume K. Disabling SE Tx by eUSPn, instead of driving logic '0' to conclude Remote Wake ensures the continuation of Resume K. Note also that if eDSPn does not initiate Resume before the end of Remote Wake, eUSPn may continue to observe Data K until residue charge is dissipated. A FS example is shown in Figure 3-18. This behavior should be like existing USB 2.0 if Remote Wake completes without Resume. Under this condition, eUSPn shall return to L2 and wait for eDSPn to initiate Resume, or initiate Remote Wake after an implementation specific idle time in L2.
 - eDSPn, upon detecting Remote Wake, shall update LineState, and start driving Resume K when directed. It may optionally perform auto-resume by driving Resume K before being directed. It shall conclude Resume with EOP. Shown in Figure 3-17 is the FS Remote Wake. If it is unable to drive the Resume signal within the 1 ms (T_{URSM}) hub resume timing requirement defined by the USB 2.0 specification, it may remain in L2, prepare for the system exit from low power state and initiate Resume.

(b). Section 3.3.7.1.1 Native Mode

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 - eUSPn shall drive Remote Wake K and conclude Remote Wake by disabling its SE Tx at eD-(FS) or eD+(LS). Note that under normal operation, eDSPn has already started Resume by driving Resume K. Disabling SE Tx by eUSPn, instead of driving logic '0' to conclude Remote Wake ensures the continuation of Resume K. Note also that if eDSPn does not initiate Resume before the end of Remote Wake, eUSPn may continue to observe Data K until residue charge is dissipated. A FS example is shown in Figure 3-18. This behavior should be like existing USB 2.0 if Remote Wake completes without Resume. Under this condition, eUSPn shall either return to L2 and wait for eDSPn to initiate Resume, or initiate Remote Wake after an implementation specific idle time in L2.
 - eDSPn, upon detecting Remote Wake, shall update LineState, and start driving Resume K when directed. It may optionally perform auto-resume by driving Resume K before being directed. It

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