

# USB4 2.0 ENGINEERING CHANGE NOTICE FORM

**Title:** Add SQ224 Pattern to SET\_TX\_COMPLIANCE  
**Operation**  
**Applied to:** USB4 Specification Version 2.0

<b>Brief description of the functional changes:</b>
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Adds a new optional pattern for Gen 4 supporting Routers.
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<b>Benefits as a result of the changes:</b>
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Allows a simpler setup when testing clock switch on Routers assembly with Re-timers.
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<b>An assessment of the impact to the existing revision and systems that currently conform to the USB specification:</b>
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None.
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<b>An analysis of the hardware implications:</b>
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None.
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<b>An analysis of the software implications:</b>
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None.
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<b>An analysis of the compliance testing implications:</b>
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On the Electrical CTS, if a Re-timer support this Pattern, it will be used as part of the Clock Switch test.
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## Actual Change

### (a). Table 8-65 - SET\_TX\_COMPLIANCE Operation Metadata

#### To Text:

DW	Bit(s)	Field Name and Description
0	5:0	<b>Port</b> – Identifies the target USB4 Port. For a Router: This field contains the Adapter Number of the Lane 0 Adapter of the target USB4 Port. For a Re-timer: 0h: Target is the USB4 Port whose SB Register Space is written to. 1h: Target is the USB4 Port whose SB Register Space is not written to.
	8:6	<b>Adapter</b> – Identifies the affected Adapter(s) within the USB4 Port. 000b: TX0 001b: TX1 010b: TX2 (only applies to a Port that supports Asymmetric Link with 3 Tx) 111b: All Adapters All other values are reserved. When this field is set to 111b and the Link is Gen 2/3, the pattern on the Lanes shall have skew between 16 UI and 128 UI.
	12:9	<b>Pattern</b> – Sets the transmitting pattern. 0000b: PRBS31 – a polynomial $G(x) = x^{31} + x^{28} + 1$ shall be used (Gen 2 or Gen 3 only). 0001b: PRBS15 – a polynomial $G(x) = x^{15} + x^{14} + 1$ shall be used (Gen 2 or Gen 3 only). 0010b: PRBS9 – a polynomial $G(x) = x^9 + x^5 + 1$ shall be used (Gen 2 or Gen 3 only). 0011b: PRBS7 – a polynomial $G(x) = x^7 + x^6 + 1$ shall be used (Gen 2 or Gen 3 only). 0100b: SQ2 – a repeating pattern of bits “101010...” (Gen 2 or Gen 3 only). 0101b: SQ4 – a repeating pattern of bits where the repeating pattern is 2 copies of 1b followed by 2 copies of 0b (“1100...” (Gen 2 or Gen 3 only)). 0110b: SQ32 – a repeating pattern of bits where the repeating pattern is 16 copies of 1b followed by 16 copies of 0b (Gen 2 or Gen 3 only). 0111b: SQ128 – a repeating pattern of bits where the repeating pattern is 64 copies of 1b followed by 64 copies of 0b (Required for ports adjacent to the USB Type-C Connector in all rates). 1000b: PRBS11 – a polynomial $G(x) = x^{11} + x^9 + 1$ shall be used (Gen 4 only). 1001b: PRTS7 – a polynomial $G(x) = 2x^7 + x^2 + 1$ over GF(3) shall be used (Gen 4 only). 1010b: PRTS19 – a polynomial $G(x) = 2x^{19} + x^2 + 1$ over GF(3) shall be used (Gen 4 only). 1011b: STAIRS112 – Repeating 448-trit pattern with a sequence of {0t, 1t, 2t, 1t} values each 112UI in duration shall be used (Gen 4 only). <u>1100b: SQ224 – a repeating pattern of trits where the repeating pattern is 112 copies of 0t followed by 112 copies of 2t (Gen 4 only) - optional.</u> 1111b: SLOS1 (Gen 2 or Gen 3 only). For Example: PRBS7 equals 1000 0011 0000 1010 0011 1100 1000 1011 0011 1010 1001 1111 0100 0011 1000 1001 0011 0110 1011 0111 1011 0001 1010 0101 1101 1100 1100 1010 1011 1111 1000 000b STAIRS112 equals a repetition of the following 448 trits: 0000...0001111...1112222...2221111...111 (Gen 4 only) All other values are reserved. <i>Note: The initial seeds for the PRBS11, PRTS7 and PRTS19 patterns are listed in Table 4-65.</i>