Pattern Generation Modules Specifications and Characteristics

16720A Pattern Generator Characteristics

Maximum memory depth	16 MVectors
Number of output channels at ≤ 300 MHz clock	24
Number of output channels at ≤ 180 MHz clock	48
Number of output channels at ≤ 200 MHz clock	24
Number of output channels at ≤ 100 MHz clock	48
Number of different macros	100
Maximum number of lines in a macro	1024
Maximum number of parameters in a macro	10
Maximum number of macro invocations	1000
Maximum loop count in a repeat loop	20000
Maximum number of repeat loop invocations	1000
Maximum number of "Wait" event patterns	4
Number of input lines to define a pattern	3
Maximum number of modules in a system	5
Maximum width of a vector (in a 5 module system)	240 bits
Maximum width of a label	32 bits
Maximum number of labels	126
Maximum number of vectors in binary format	16 MVectors
Minimum number of vectors in binary format	4096

Lead Set Characteristics

Agilent 10474A 8-channel probe lead set	Provides most cost effective lead set for the 16522A and 16720A clock and data pods. Grabbers are not included. Lead wire length is 12 inches.
Agilent 10347A 8-channel probe lead set	Provides 50 Ω coaxial lead set for unterminated signals, required for 10465A ECL Data Pod (unterminated). Grabbers are not included.
Agilent 10498A 8-channel probe lead set	Provides most cost effective lead set for the 16522A and 16720A clock and data pods. Grabbers are not included. Lead wire length is 6 inches.

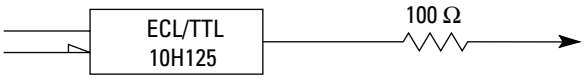
Pattern Generation Modules Specifications and Characteristics

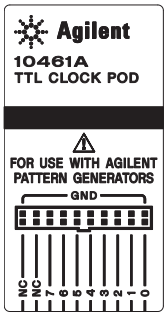
Data Pod Characteristics

Note: Data Pod output parametrics depend on the output driver and the impedance load of the target system. Check the device data book for the specific drivers listed for each pod.

Agilent 10461A TTL Data Pod

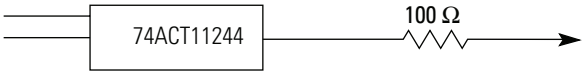
Output type	10H125 with 100 Ω series
Maximum clock	200 MHz
Skew [1]	typical < 2 ns; worst case = 4 ns
Recommended lead set	Agilent 10474A

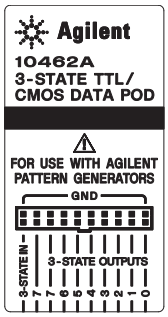




Agilent 10462A 3-State TTL/CMOS Data Pod

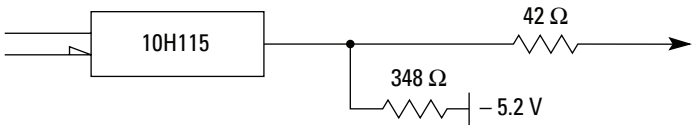
Output type	74ACT11244 with 100 Ω series; 10H125 on non 3-state channel 7 [2]
3-state enable	negative true, 100 KΩ to GND, enabled on no connect
Maximum clock	100 MHz
Skew [1]	typical < 4 ns; worst case = 12 ns
Recommended lead set	Agilent 10474A

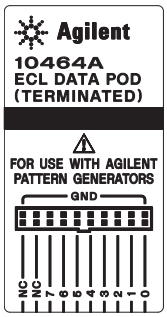




Agilent 10464A ECL Data Pod (terminated)

Output type	10H115 with 330 Ω pulldown, 47 Ω series
Maximum clock	300 MHz
Skew [1]	typical < 1 ns; worst case = 2 ns
Recommended lead set	Agilent 10474A

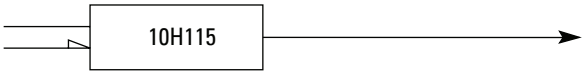


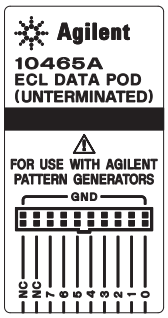


Pattern Generation Modules Specifications and Characteristics

Agilent 10465A ECL Data Pod (unterminated)

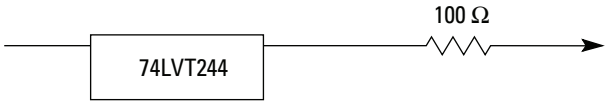
Output type	10H115 (no termination)
Maximum clock	300 MHz
Skew [1]	typical < 1 ns; worst case = 2 ns
Recommended lead set	Agilent 10347A

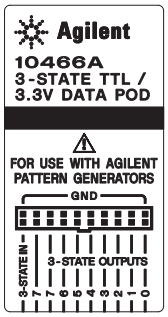




Agilent 10466A 3-State TTL/3.3 volt Data Pod

Output type	74LVT244 with 100 Ω series; 10H125 on non 3-state channel 7 [2]
3-state enable	negative true, 100 KΩ to GND, enabled on no connect
Maximum clock	200 MHz
Skew [1]	typical < 3 ns; worst case = 7 ns
Recommended lead set	Agilent 10474A



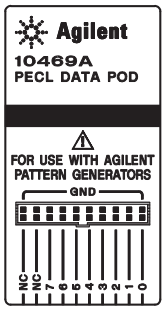


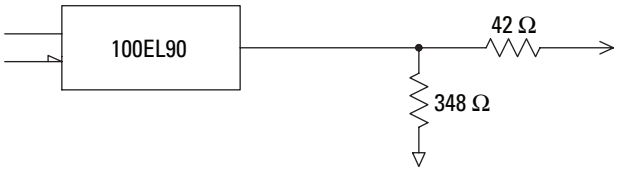
[1] Typical skew measurements made at pod connector with approximately 10 pF/50 KΩ load to GND; worst case skew numbers are a calculation of worst case conditions through circuits. Both numbers apply to any channel within a single or multiple module system.
[2] Channel 7 on the 3-state pods has been brought out in parallel as a non 3-state signal. By looping this output back into the 3-state enable line, the channel can be used as a 3-state enable.

Pattern Generation Modules Specifications and Characteristics

Agilent 10469A 5 volt PECL Data Pod

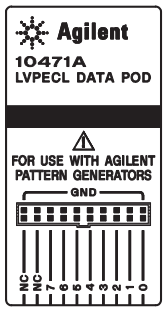
Output type	100EL90 (5V) with 348 ohm pulldown to ground and 42 ohm in series
Maximum clock	300 MHz
Skew [1]	typical < 500 ps; worst case = 1 ns
Recommended lead set	Agilent 10498A

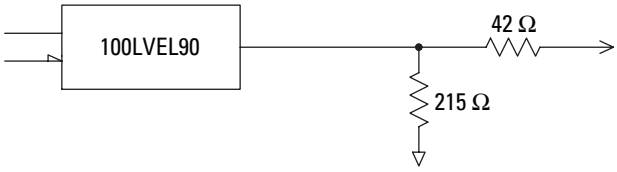




Agilent 10471A 3.3 volt LVPECL Data Pod

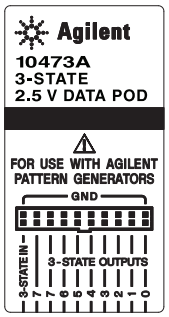
Output type	100LVEL90 (3.3V) with 215 ohm pulldown to ground and 42 ohm in series
Maximum clock	300 MHz
Skew [1]	typical < 500 ps; worst case = 1 ns
Recommended lead set	Agilent 10498A

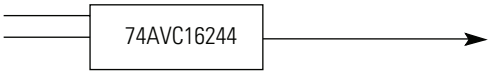




Agilent 10473A 3-State 2.5 Volt Data Pod

Output type	74AVC16244
3-state enable	negative true, 38 KΩ to GND, enabled on no connect
Maximum clock	300 MHz
Skew [1]	typical < 1.5 ns; worst case = 2 ns
Recommended lead set	Agilent 10498A





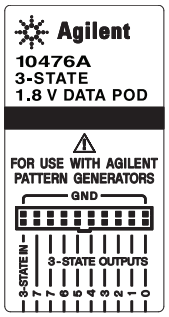
[1] Typical skew measurements made at pod connector with approximately 10 pF/50 KΩ load to GND; worst case skew numbers are a calculation of worst case conditions through circuits. Both numbers apply to any channel within a single or multiple module system.

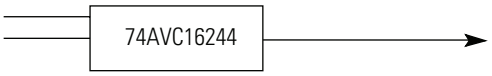
[2] Channel 7 on the 3-state pods has been brought out in parallel as a non 3-state signal. By looping this output back into the 3-state enable line, the channel can be used as a 3-state enable.

Pattern Generation Modules Specifications and Characteristics

Agilent 10476A 3-State 1.8 Volt Data Pod

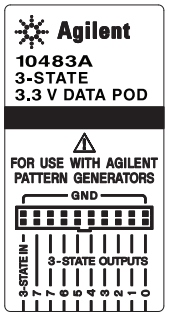
Output type	74AVC16244
3-state enable	negative true, 38 KΩ to GND, enabled on no connect
Maximum clock	300 MHz
Skew [1]	typical < 1.5 ns; worst case = 2 ns
Recommended lead set	Agilent 10498A

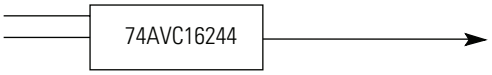




Agilent 10483A 3-State 3.3 Volt Data Pod

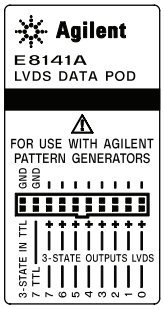
Output type	74AVC16244
3-state enable	negative true, 38 KΩ to GND, enabled on no connect
Maximum clock	300 MHz
Skew [1]	typical < 1.5 ns; worst case = 2 ns
Recommended lead set	Agilent 10498A

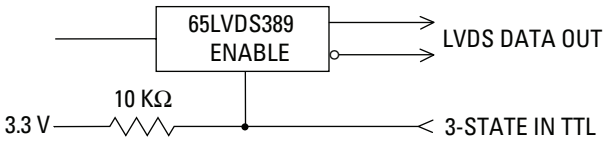




Agilent E8141A LVDS Data Pod

Output type	65LVDS389 (LVDS data lines) 10H125 (TTL non-3-state channel 7)
3-state enable	positive true TTL; no connect=enabled
Maximum clock	300 MHz
Skew	typical < 1 ns; worst case = 2 ns
Recommended lead set:	E8142A
Recommended lead set	Agilent 10498A





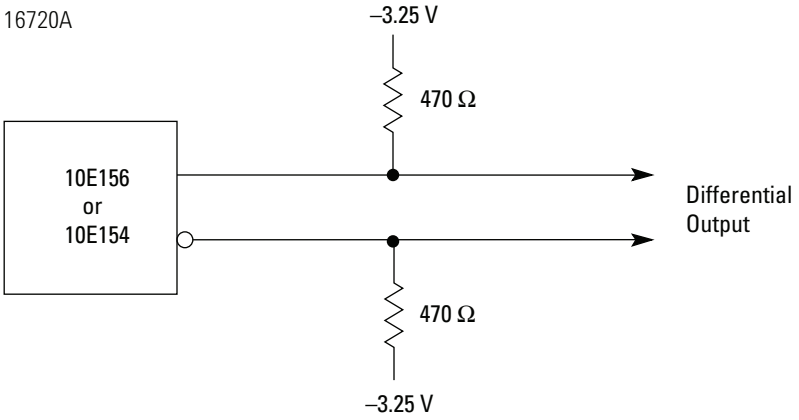
[1] Typical skew measurements made at pod connector with approximately 10 pF/50 KΩ load to GND; worst case skew numbers are a calculation of worst case conditions through circuits. Both numbers apply to any channel within a single or multiple module system.

Pattern Generation Modules Specifications and Characteristics

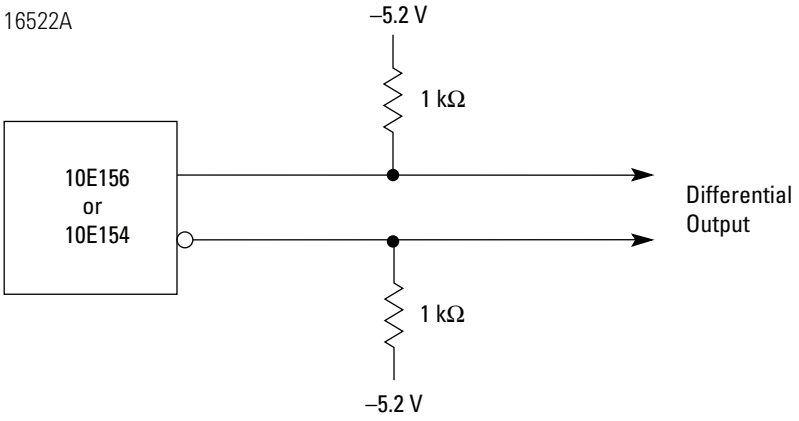
Data Cable Characteristics Without a Data Pod

The Agilent 16720A and 16522A data cables without a data pod provide an ECL terminated (1 KΩ to –5.2V) differential signal (from a type 10E156 or 10E154 driver). These are usable when received by a differential receiver, preferably with a 100 Ω termination across the lines. These signals should not be used single ended due to the slow fall time and shifted voltage threshold (they are not ECL compatible).

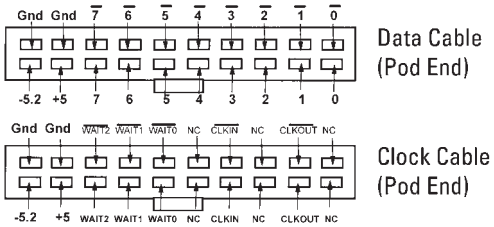
16720A



16522A



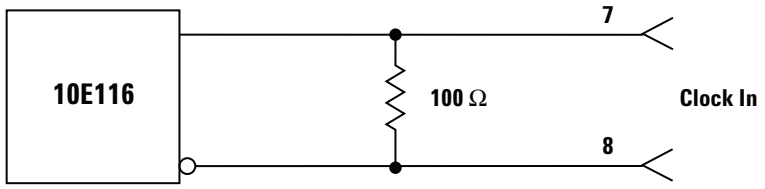
16720A and 16522 CABLE PIN OUTS

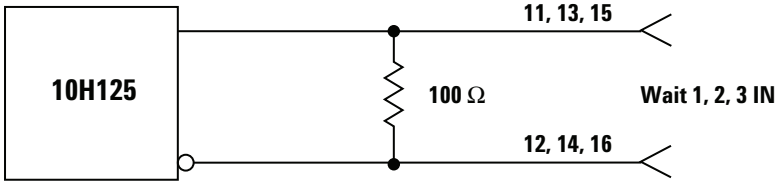


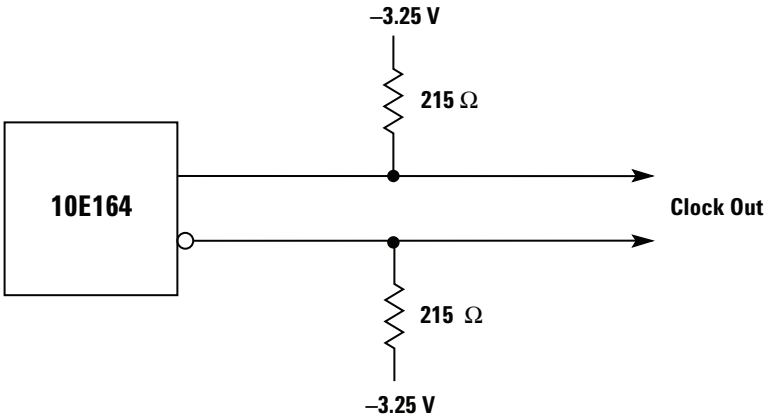
Pattern Generation Modules Specifications and Characteristics

Clock Cable Characteristics Without a Clock Pod

The Agilent 16720A and 16522A clock cables without a clock pod provide an ECL terminated (1 KΩ to –5.2V) differential signal (from a type 10E164 driver). These are usable when received by a differential receiver, preferably with a 100 Ω termination across the lines. These signals should not be used single ended due to the slow fall time and shifted voltage threshold (they are not ECL compatible).





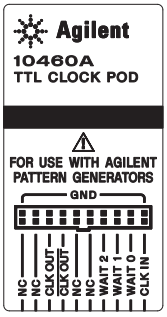


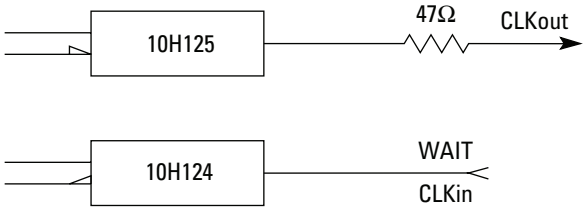
Pattern Generation Modules Specifications and Characteristics

Clock Pod Characteristics

10460A TTL Clock Pod

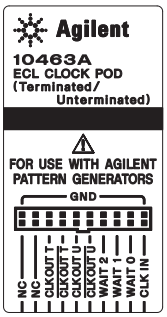
Clock output type	10H125 with 47 Ω series; true & inverted
Clock output rate	100 MHz maximum
Clock out delay	approximately 8 ns total in 14 steps (16720A only); 11 ns maximum in 9 steps (16522A only)
Clock input type	TTL – 10H124
Clock input rate	dc to 100 MHz
Pattern input type	TTL – 10H124 (no connect is logic 1)
Clock-in to clock-out	approximately 30 ns
Pattern-in to recognition	approximately 15 ns + 1 clk period
Recommended lead set	Agilent 10474A

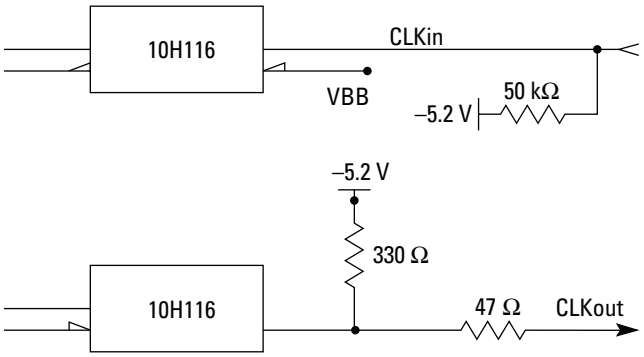




10463A ECL Clock Pod

Clock output type	10H116 differential unterminated; and differential with 330 Ω to –5.2V and 47 Ω series
Clock output rate	300 MHz maximum
Clock out delay	approximately 8 ns total in 14 steps (16720A only); 11 ns maximum in 9 steps (16522A only)
Clock input type	ECL – 10H116 with 50 KΩ to –5.2v
Clock input rate	dc to 300 MHz
Pattern input type	ECL – 10H116 with 50 KΩ (no connect is logic 0)
Clock-in to clock-out	approximately 30 ns
Pattern-in to recognition	approximately 15 ns + 1 clk period
Recommended lead set	Agilent 10474A

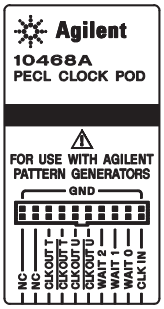


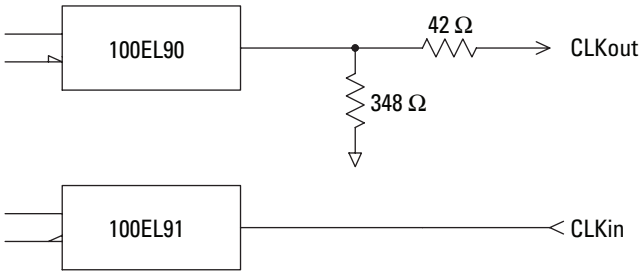


Pattern Generation Modules Specifications and Characteristics

10468A 5 volt PECL Clock Pod

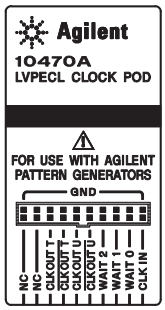
Clock output type	100EL90 (5V) with 348 ohm pulldown to ground and 42 ohm in series
Clock output rate	300 MHz maximum
Clock out delay	approximately 8 ns total in 14 steps (16720A only); 11 ns maximum in 9 steps (16522A only)
Clock input type	100EL91 PECL (5V), no termination
Clock input rate	dc to 300 MHz
Pattern input type	100EL91 PECL (5V), no termination (no connect is logic 0)
Clock-in to clock-out	approximately 30 ns
Pattern-in to recognition	approximately 15 ns + 1 clk period
Recommended lead set	Agilent 10498A

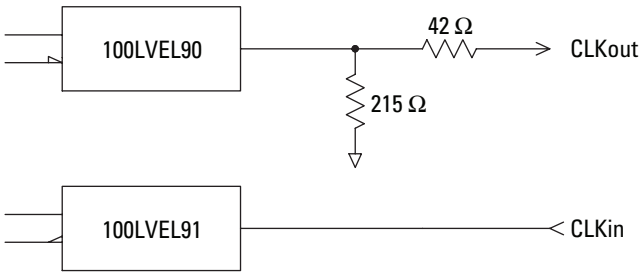




10470A 3.3 volt LVPECL Clock Pod

Clock output type	100LVEL90 (3.3V) with 215 ohm pulldown to ground and 42 ohm in series
Clock output rate	300 MHz maximum
Clock out delay	approximately 8 ns total in 14 steps (16720A only); 11 ns maximum in 9 steps (16522A only)
Clock input type	100LVEL91 LVPECL (3.3V), no termination
Clock input rate	dc to 300 MHz
Pattern input type	100LVEL91 LVPECL (3.3V), no termination (no connect is logic 0)
Clock-in to clock-out	approximately 30 ns
Pattern-in to recognition	approximately 15 ns + 1 clk period
Recommended lead set	Agilent 10498A

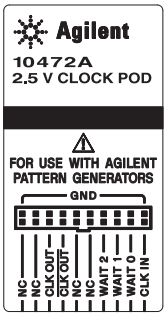


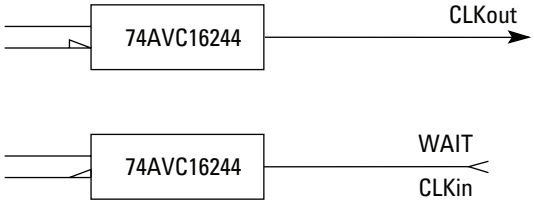


Pattern Generation Modules Specifications and Characteristics

10472A 2.5 volt Clock Pod

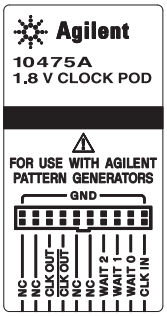
Clock output type	74AVC16244
Clock output rate	200 MHz maximum
Clock out delay	approximately 8 ns total in 14 steps (16720A only); 11 ns maximum in 9 steps (16522A only)
Clock input type	74AVC16244 (3.6V max)
Clock input rate	dc to 200 MHz
Pattern input type	74AVC16244 (3.6V max; no connect is logic 0)
Clock-in to clock-out	approximately 30 ns
Pattern-in to recognition	approximately 15 ns + 1 clk period
Recommended lead set	Agilent 10498A

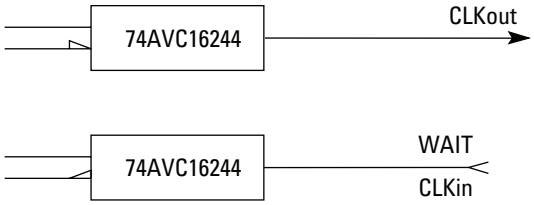




10475A 1.8 volt Clock Pod

Clock output type	74AVC16244
Clock output rate	200 MHz maximum
Clock out delay	approximately 8 ns total in 14 steps (16720A only); 11 ns maximum in 9 steps (16522A only)
Clock input type	74AVC16244 (3.6V max)
Clock input rate	dc to 200 MHz
Pattern input type	74AVC16244 (3.6V max; no connect is logic 0)
Clock-in to clock-out	approximately 30 ns
Pattern-in to recognition	approximately 15 ns + 1 clk period
Recommended lead set	Agilent 10498A

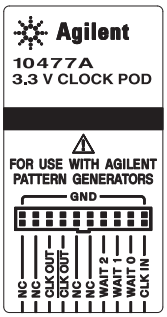


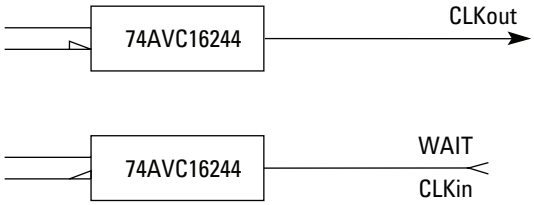


Pattern Generation Modules Specifications and Characteristics

10477A 3.3 volt Clock Pod

Clock output type	74AVC16244
Clock output rate	200 MHz maximum
Clock out delay	approximately 8 ns total in 14 steps (16720A only); 11 ns maximum in 9 steps (16522A only)
Clock input type	74AVC16244 (3.6V max)
Clock input rate	dc to 200 MHz
Pattern input type	74AVC16244 (3.6V max; no connect is logic 0)
Clock-in to clock-out	approximately 30 ns
Pattern-in to recognition	approximately 15 ns + 1 clk period
Recommended lead set	Agilent 10498A





E8140A LVDS Clock Pod

Clock output type	65LVDS179 (LVDS) and 10H125 (TTL)
Clock output rate	200 MHz maximum (LVDS and TTL)
Clock out delay	approximately 8 ns total in 14 steps
Clock input type	65LVDS179 (LVDS with 100 ohm)
Clock input rate	dc to 150 MHz (LVDS)
Pattern input type	10H124 (TTL) (no connect = logic 1)
Clock-in to clock-out	approximately 30 ns
Pattern-in to recognition	approximately 15 ns + 1 clk period
Recommended lead set	Agilent 10498A