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Inclusive design for visual processing: Text accessibility inclusive design

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|---|---|---|---|
| Pro 11-inch (4th generation) | Regular | 2388 | Sensitive |
| Pro 11-inch (4th generation) | Accelerated | 2388 | Sensitive |
| Air (M4) | Regular | 2360 | Sensitive |
| Air (M4) | Accelerated | 2360 | Sensitive |
| Pro 11-inch (M5) | Regular | 2420 | Sensitive |
| Pro 11-inch (M5) | Accelerated | 2420 | Sensitive |
| Pro 13-inch (M5) | Regular | 2752 | Sensitive |
| Pro 13-inch (M5) | Accelerated | 2752 | Sensitive |

## Tracking values

### iOS, iPadOS, visionOS tracking values

| Device | Tracking Accelerated | Raw Hz |
|---|---|---|
| iPad Pro (11-inch) (4th generation) | Yes | 120 |

### 5V Pro

| Body (pixels) | Tracking (120Hz avg) | Tracking (points) |
|---|---|---|
| 1 | -1.00 | -0.12 |
| 2 | -1.00 | -0.12 |
| 3 | -1.00 | -0.12 |
| 4 | -1.00 | -0.12 |
| 5 | -1.00 | -0.12 |
| 6 | -1.00 | -0.12 |
| 7 | -1.00 | -0.12 |
| 8 | -1.00 | -0.12 |
| 9 | -1.00 | -0.12 |
| 10 | -1.00 | -0.12 |
| 11 | -1.00 | -0.12 |
| 12 | -1.00 | -0.12 |
| 13 | -1.00 | -0.12 |
| 14 | -1.00 | -0.12 |
| 15 | -1.00 | -0.12 |
| 16 | -1.00 | -0.12 |
| 17 | -1.00 | -0.12 |
| 18 | -1.00 | -0.12 |
| 19 | -1.00 | -0.12 |
| 20 | -1.00 | -0.12 |
| 21 | -1.00 | -0.12 |
| 22 | -1.00 | -0.12 |
| 23 | -1.00 | -0.12 |
| 24 | -1.00 | -0.12 |
| 25 | -1.00 | -0.12 |
| 26 | -1.00 | -0.12 |
| 27 | -1.00 | -0.12 |
| 28 | -1.00 | -0.12 |
| 29 | -1.00 | -0.12 |
| 30 | -1.00 | -0.12 |
| 31 | -1.00 | -0.12 |
| 32 | -1.00 | -0.12 |
| 33 | -1.00 | -0.12 |
| 34 | -1.00 | -0.12 |
| 35 | -1.00 | -0.12 |
| 36 | -1.00 | -0.12 |
| 37 | -1.00 | -0.12 |
| 38 | -1.00 | -0.12 |
| 39 | -1.00 | -0.12 |
| 40 | -1.00 | -0.12 |
| 41 | -1.00 | -0.12 |
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| 46 | -1.00 | -0.12 |
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| 55 | -1.00 | -0.12 |
| 56 | -1.00 | -0.12 |
| 57 | -1.00 | -0.12 |
| 58 | -1.00 | -0.12 |
| 59 | -1.00 | -0.12 |
| 60 | -1.00 | -0.12 |
| 61 | -1.00 | -0.12 |
| 62 | -1.00 | -0.12 |
| 63 | -1.00 | -0.12 |
| 64 | -1.00 | -0.12 |
| 65 | -1.00 | -0.12 |
| 66 | -1.00 | -0.12 |
| 67 | -1.00 | -0.12 |
| 68 | -1.00 | -0.12 |
| 69 | -1.00 | -0.12 |
| 70 | -1.00 | -0.12 |
| 71 | -1.00 | -0.12 |
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| 111 | -1.00 | -0.12 |
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| 113 | -1.00 | -0.12 |
| 114 | -1.00 | -0.12 |
| 115 | -1.00 | -0.12 |
| 116 | -1.00 | -0.12 |
| 117 | -1.00 | -0.12 |
| 118 | -1.00 | -0.12 |
| 119 | -1.00 | -0.12 |
| 120 | -1.00 | -0.12 |
| 121 | -1.00 | -0.12 |
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| 125 | -1.00 | -0.12 |
| 126 | -1.00 | -0.12 |
| 127 | -1.00 | -0.12 |
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| 136 | -1.00 | -0.12 |
| 137 | -1.00 | -0.12 |
| 138 | -1.00 | -0.12 |
| 139 | -1.00 | -0.12 |
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| 141 | -1.00 | -0.12 |
| 142 | -1.00 | -0.12 |
| 143 | -1.00 | -0.12 |
| 144 | -1.00 | -0.12 |
| 145 | -1.00 | -0.12 |
| 146 | -1.00 | -0.12 |
| 147 | -1.00 | -0.12 |
| 148 | -1.00 | -0.12 |
| 149 | -1.00 | -0.12 |
| 150 | -1.00 | -0.12 |
| 151 | -1.00 | -0.12 |
| 152 | -1.00 | -0.12 |
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| 157 | -1.00 | -0.12 |
| 158 | -1.00 | -0.12 |
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| 162 | -1.00 | -0.12 |
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| 166 | -1.00 | -0.12 |
| 167 | -1.00 | -0.12 |
| 168 | -1.00 | -0.12 |
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| 170 | -1.00 | -0.12 |
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| 172 | -1.00 | -0.12 |
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| 174 | -1.00 | -0.12 |
| 175 | -1.00 | -0.12 |
| 176 | -1.00 | -0.12 |
| 177 | -1.00 | -0.12 |
| 178 | -1.00 | -0.12 |
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| 194 | -1.00 | -0.12 |
| 195 | -1.00 | -0.12 |
| 196 | -1.00 | -0.12 |
| 197 | -1.00 | -0.12 |
| 198 | -1.00 | -0.12 |
| 199 | -1.00 | -0.12 |
| 200 | -1.00 | -0.12 |

Hit at least several tracking values (e.g. 120Hz avg) on iPad Pro and based on image resolution of 1920 pixel (W) and 1080 pixel (H) (e.g. 16:9 aspect).

### macOS tracking values

| Body (pixels) | Tracking (120Hz avg) | Tracking (points) |
|---|---|---|
| 1 | -1.00 | -0.12 |
| 2 | -1.00 | -0.12 |
| 3 | -1.00 | -0.12 |
| 4 | -1.00 | -0.12 |
| 5 | -1.00 | -0.12 |
| 6 | -1.00 | -0.12 |
| 7 | -1.00 | -0.12 |
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| 10 | -1.00 | -0.12 |
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| 12 | -1.00 | -0.12 |
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| 15 | -1.00 | -0.12 |
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| 18 | -1.00 | -0.12 |
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| 99 | -1.00 | -0.12 |
| 100 | -1.00 | -0.12 |
| 101 | -1.00 | -0.12 |
| 102 | -1.00 | -0.12 |
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| 105 | -1.00 | -0.12 |
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| 173 | -1.00 | -0.12 |
| 174 | -1.00 | -0.12 |
| 175 | -1.00 | -0.12 |
| 176 | -1.00 | -0.12 |
| 177 | -1.00 | -0.12 |
| 178 | -1.00 | -0.12 |
| 179 | -1.00 | -0.12 |
| 180 | -1.00 | -0.12 |
| 181 | -1.00 | -0.12 |
| 182 | -1.00 | -0.12 |
| 183 | -1.00 | -0.12 |
| 184 | -1.00 | -0.12 |
| 185 | -1.00 | -0.12 |
| 186 | -1.00 | -0.12 |
| 187 | -1.00 | -0.12 |
| 188 | -1.00 | -0.12 |
| 189 | -1.00 | -0.12 |
| 190 | -1.00 | -0.12 |
| 191 | -1.00 | -0.12 |
| 192 | -1.00 | -0.12 |
| 193 | -1.00 | -0.12 |
| 194 | -1.00 | -0.12 |
| 195 | -1.00 | -0.12 |
| 196 | -1.00 | -0.12 |
| 197 | -1.00 | -0.12 |
| 198 | -1.00 | -0.12 |
| 199 | -1.00 | -0.12 |
| 200 | -1.00 | -0.12 |

Hit at least several tracking values (e.g. 120Hz avg) on iPad Pro and based on image resolution of 1920 pixel (W) and 1080 pixel (H) (e.g. 16:9 aspect).

### watchOS tracking values

| Body (pixels) | Tracking (120Hz avg) | Tracking (points) |
|---|---|---|
| 1 | -1.00 | -0.12 |
| 2 | -1.00 | -0.12 |
| 3 | -1.00 | -0.12 |
| 4 | -1.00 | -0.12 |
| 5 | -1.00 | -0.12 |
| 6 | -1.00 | -0.12 |
| 7 | -1.00 | -0.12 |
| 8 | -1.00 | -0.12 |
| 9 | -1.00 | -0.12 |
| 10 | -1.00 | -0.12 |
| 11 | -1.00 | -0.12 |
| 12 | -1.00 | -0.12 |
| 13 | -1.00 | -0.12 |
| 14 | -1.00 | -0.12 |
| 15 | -1.00 | -0.12 |
| 16 | -1.00 | -0.12 |
| 17 | -1.00 | -0.12 |
| 18 | -1.00 | -0.12 |
| 19 | -1.00 | -0.12 |
| 20 | -1.00 | -0.12 |
| 21 | -1.00 | -0.12 |
| 22 | -1.00 | -0.12 |
| 23 | -1.00 | -0.12 |
| 24 | -1.00 | -0.12 |
| 25 | -1.00 | -0.12 |
| 26 | -1.00 | -0.12 |
| 27 | -1.00 | -0.12 |
| 28 | -1.00 | -0.12 |
| 29 | -1.00 | -0.12 |
| 30 | -1.00 | -0.12 |
| 31 | -1.00 | -0.12 |
| 32 | -1.00 | -0.12 |
| 33 | -1.00 | -0.12 |
| 34 | -1.00 | -0.12 |
| 35 | -1.00 | -0.12 |
| 36 | -1.00 | -0.12 |
| 37 | -1.00 | -0.12 |
| 38 | -1.00 | -0.12 |
| 39 | -1.00 | -0.12 |
| 40 | -1.00 | -0.12 |
| 41 | -1.00 | -0.12 |
| 42 | -1.00 | -0.12 |
| 43 | -1.00 | -0.12 |
| 44 | -1.00 | -0.12 |
| 45 | -1.00 | -0.12 |
| 46 | -1.00 | -0.12 |
| 47 | -1.00 | -0.12 |
| 48 | -1.00 | -0.12 |
| 49 | -1.00 | -0.12 |
| 50 | -1.00 | -0.12 |
| 51 | -1.00 | -0.12 |
| 52 | -1.00 | -0.12 |
| 53 | -1.00 | -0.12 |
| 54 | -1.00 | -0.12 |
| 55 | -1.00 | -0.12 |
| 56 | -1.00 | -0.12 |
| 57 | -1.00 | -0.12 |
| 58 | -1.00 | -0.12 |
| 59 | -1.00 | -0.12 |
| 60 | -1.00 | -0.12 |
| 61 | -1.00 | -0.12 |
| 62 | -1.00 | -0.12 |
| 63 | -1.00 | -0.12 |
| 64 | -1.00 | -0.12 |
| 65 | -1.00 | -0.12 |
| 66 | -1.00 | -0.12 |
| 67 | -1.00 | -0.12 |
| 68 | -1.00 | -0.12 |
| 69 | -1.00 | -0.12 |
| 70 | -1.00 | -0.12 |
| 71 | -1.00 | -0.12 |
| 72 | -1.00 | -0.12 |
| 73 | -1.00 | -0.12 |
| 74 | -1.00 | -0.12 |
| 75 | -1.00 | -0.12 |
| 76 | -1.00 | -0.12 |
| 77 | -1.00 | -0.12 |
| 78 | -1.00 | -0.12 |
| 79 | -1.00 | -0.12 |
| 80 | -1.00 | -0.12 |
| 81 | -1.00 | -0.12 |
| 82 | -1.00 | -0.12 |
| 83 | -1.00 | -0.12 |
| 84 | -1.00 | -0.12 |
| 85 | -1.00 | -0.12 |
| 86 | -1.00 | -0.12 |
| 87 | -1.00 | -0.12 |
| 88 | -1.00 | -0.12 |
| 89 | -1.00 | -0.12 |
| 90 | -1.00 | -0.12 |
| 91 | -1.00 | -0.12 |
| 92 | -1.00 | -0.12 |
| 93 | -1.00 | -0.12 |
| 94 | -1.00 | -0.12 |
| 95 | -1.00 | -0.12 |
| 96 | -1.00 | -0.12 |
| 97 | -1.00 | -0.12 |
| 98 | -1.00 | -0.12 |
| 99 | -1.00 | -0.12 |
| 100 | -1.00 | -0.12 |
| 101 | -1.00 | -0.12 |
| 102 | -1.00 | -0.12 |
| 103 | -1.00 | -0.12 |
| 104 | -1.00 | -0.12 |
| 105 | -1.00 | -0.12 |
| 106 | -1.00 | -0.12 |
| 107 | -1.00 | -0.12 |
| 108 | -1.00 | -0.12 |
| 109 | -1.00 | -0.12 |
| 110 | -1.00 | -0.12 |
| 111 | -1.00 | -0.12 |
| 112 | -1.00 | -0.12 |
| 113 | -1.00 | -0.12 |
| 114 | -1.00 | -0.12 |
| 115 | -1.00 | -0.12 |
| 116 | -1.00 | -0.12 |
| 117 | -1.00 | -0.12 |
| 118 | -1.00 | -0.12 |
| 119 | -1.00 | -0.12 |
| 120 | -1.00 | -0.12 |
| 121 | -1.00 | -0.12 |
| 122 | -1.00 | -0.12 |
| 123 | -1.00 | -0.12 |
| 124 | -1.00 | -0.12 |
| 125 | -1.00 | -0.12 |
| 126 | -1.00 | -0.12 |
| 127 | -1.00 | -0.12 |
| 128 | -1.00 | -0.12 |
| 129 | -1.00 | -0.12 |
| 130 | -1.00 | -0.12 |
| 131 | -1.00 | -0.12 |
| 132 | -1.00 | -0.12 |
| 133 | -1.00 | -0.12 |
| 134 | -1.00 | -0.12 |
| 135 | -1.00 | -0.12 |
| 136 | -1.00 | -0.12 |
| 137 | -1.00 | -0.12 |
| 138 | -1.00 | -0.12 |
| 139 | -1.00 | -0.12 |
| 140 | -1.00 | -0.12 |
| 141 | -1.00 | -0.12 |
| 142 | -1.00 | -0.12 |
| 143 | -1.00 | -0.12 |
| 144 | -1.00 | -0.12 |
| 145 | -1.00 | -0.12 |
| 146 | -1.00 | -0.12 |
| 147 | -1.00 | -0.12 |
| 148 | -1.00 | -0.12 |
| 149 | -1.00 | -0.12 |
| 150 | -1.00 | -0.12 |
| 151 | -1.00 | -0.12 |
| 152 | -1.00 | -0.12 |
| 153 | -1.00 | -0.12 |
| 154 | -1.00 | -0.12 |
| 155 | -1.00 | -0.12 |
| 156 | -1.00 | -0.12 |
| 157 | -1.00 | -0.12 |
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| 167 | -1.00 | -0.12 |
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| 169 | -1.00 | -0.12 |
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| 171 | -1.00 | -0.12 |
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| 173 | -1.00 | -0.12 |
| 174 | -1.00 | -0.12 |
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| 184 | -1.00 | -0.12 |
| 185 | -1.00 | -0.12 |
| 186 | -1.00 | -0.12 |
| 187 | -1.00 | -0.12 |
| 188 | -1.00 | -0.12 |
| 189 | -1.00 | -0.12 |
| 190 | -1.00 | -0.12 |
| 191 | -1.00 | -0.12 |
| 192 | -1.00 | -0.12 |
| 193 | -1.00 | -0.12 |
| 194 | -1.00 | -0.12 |
| 195 | -1.00 | -0.12 |
| 196 | -1.00 | -0.12 |
| 197 | -1.00 | -0.12 |
| 198 | -1.00 | -0.12 |
| 199 | -1.00 | -0.12 |
| 200 | -1.00 | -0.12 |

Hit at least several tracking values (e.g. 120Hz avg) on iPad Pro and based on image resolution of 1920 pixel (W) and 1080 pixel (H) (e.g. 16:9 aspect).

## Resources

### Related

Tracking Ink sample code (macOS)

AR Bookends

### Developer documentation

Apple Pencil and touch — SwiftUI

Pen, stylus and finger — UIKit

Ink — AppKit

### Videos

Use pencil with the iPad Pro, Apple TV and more

Meet the expanded Pro Pencil and USB-C Pencil

The details of UI hoverpoints

## Change log

| Date | Changes |
|---|---|
| December 16, 2025 | Added recommended adaptivity to the Pro Pencil, Pro Pencil (USB-C), and Apple Pencil (USB-C). |
| March 7, 2025 | Expanded guidance for Dynamic Type. |
| June 10, 2024 | Added tracking values for iPadOS 17 beta. Added a note to iOS 16 and iPadOS 16 beta 1 that tracking values are not available on iPad Pro (12.9-inch) (6th generation). |
| September 12, 2023 | Updated to include tracking values for iPad Pro (11-inch) (4th generation). |
| June 21, 2023 | Updated to include guidance for visionOS. |




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