vivo Log Technical Specification

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Document Version History

Author（s）	Date	Version	Change Note
Peng Cheng Qianqian Liu	08/05/2026	V1.0	Initial Version

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1 vivo Log Transfer Function

1.1 vivo Log Encode Function (OETF)

From linear signal to vivo Log is shown as chart below:

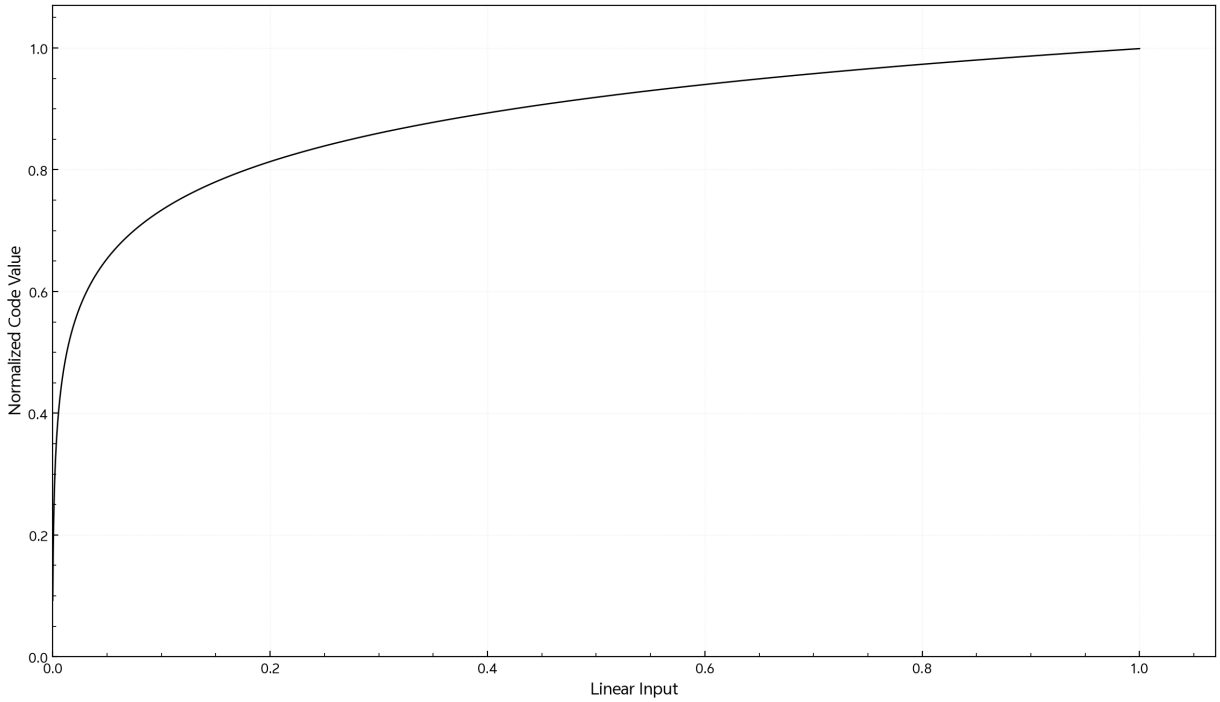


Figure 1 vivo Log OETF for linear input

From linear to vivo Log transfer function is defined as below:

$$E'_{log} = \begin{cases} c \cdot log_{10}(a \cdot E_{lin} + b) + d, & E_{lin} > t_1 \\ e \cdot E_{lin} + f \quad , & else \end{cases}$$

Where:

$$\begin{aligned} a &= 5.558556 \\ b &= 0.076581 \\ c &= 0.265817 \\ d &= 0.382516 \\ e &= 5.775961 \\ f &= 0.092813 \\ t_1 &= 0.006132 \end{aligned}$$

For relative exposure curve is:

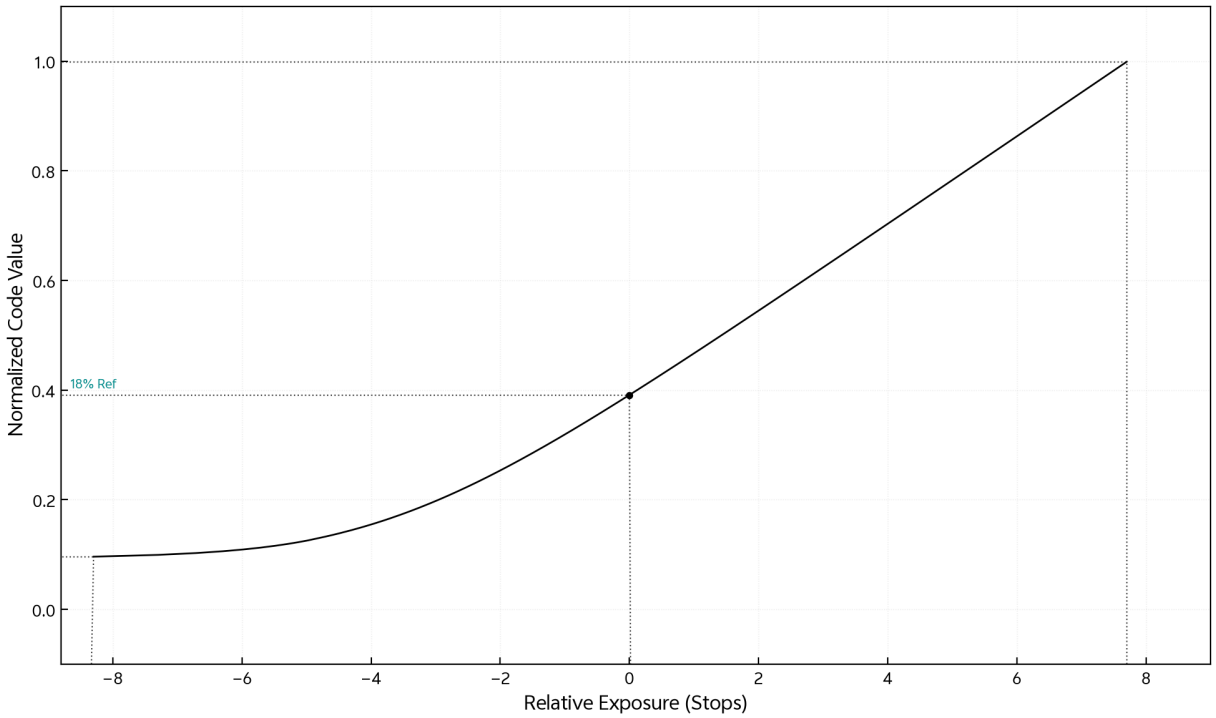


Figure 2 vivo Log OETF for relative exposure

The normalized mid-gray is at about 0.391.

1.2 vivo Log Decode Function (EOTF)

$$E_{lin} = \begin{cases} \dfrac{10^{\frac{(E'_{log}-d)}{c}} - b}{a}, & E'_{log} > t_2 \\ \dfrac{E'_{log} - f}{e}, & else \end{cases}$$

Where:

$$\begin{aligned} a &= 5.558556 \\ b &= 0.076581 \\ c &= 0.265817 \\ d &= 0.382516 \\ e &= 5.775961 \\ f &= 0.092813 \\ t_2 &= 0.128231 \end{aligned}$$

2 vivo Wide Gamut (vivoWG)

2.1 RGB Primaries

The RGB primaries of vivo Wide Gamut are defined as below:

	CIE x	CIE y
Red	0.7063	0.2957
Green	0.1913	0.9623
Blue	0.1115	-0.0492

2.2 White Point

The White Point of vivo Wide Gamut is CIE Standard Illuminant D65

	CIE x	CIE y
White	0.3127	0.3290

2.3 CIE x-y plot of vivo Wide Gamut

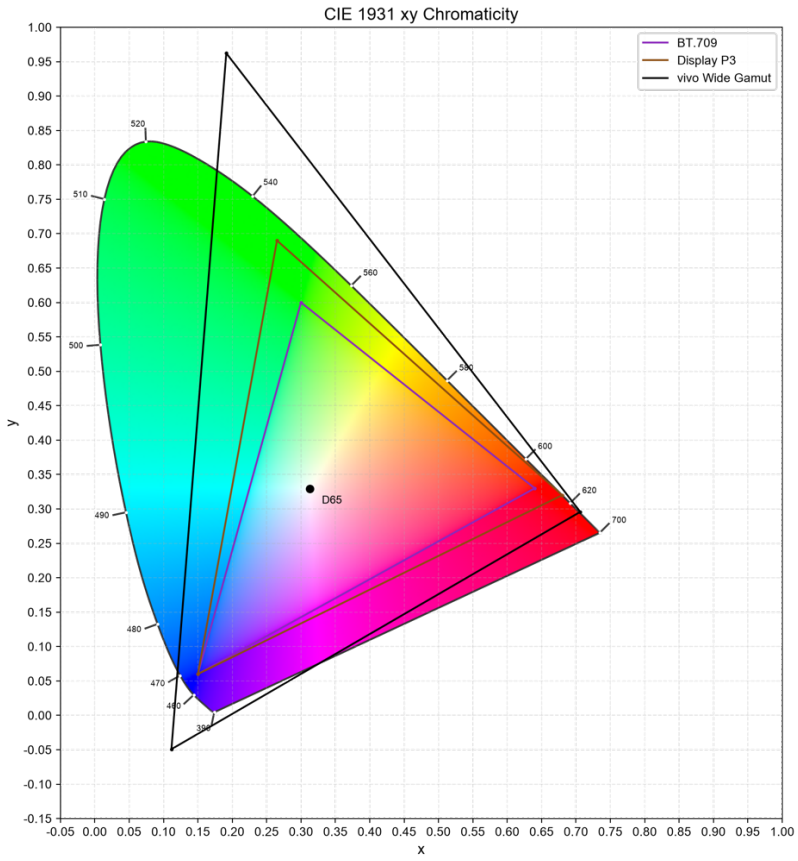


Figure 3: vivo Wide Gamut Color Primaries

2.4 Gamut Conversion

2.4.1 vivo Wide Gamut to CIE XYZ (D65)

The conversion from vivo Wide Gamut RGB to CIE XYZ is defined as follow:

$$\mathrm{XYZ_{D65}} = \mathrm{M_{XYZ}} \cdot \int^{-1} \left(\mathrm{RGB_{vivoLog}}\right)$$

$$M_{XYZ} = \begin{bmatrix} 0.6481 & 0.1575 & 0.1447 \\ 0.2713 & 0.7924 & -0.0638 \\ -0.0017 & -0.1264 & 1.2171 \end{bmatrix}$$

2.4.2 vivo Wide Gamut RGB to DaVinci Wide Gamut

The conversion from vivo Wide Gamut RGB to DWG is defined as below:

$$\mathrm{RGB}_{\mathrm{DWG}} = \mathrm{M}_{\mathrm{DWG}} \cdot \int^{-1} \left(\mathrm{RGB}_{\mathrm{vivoLog}}\right)$$

$$M_{DWG} = \begin{bmatrix} 0.9069 & 0.0345 & 0.0586 \\ 0.0379 & 0.8963 & 0.0657 \\ 0.0703 & 0.0004 & 0.9292 \end{bmatrix}$$

2.4.3 vivo Wide Gamut RGB to ACES AP0

The conversion from vivo Wide Gamut RGB to AP0 is defined as below:

$$\mathrm{RGB}_{\mathrm{AP0}} = \mathrm{M}_{\mathrm{AP0}} \cdot \int^{-1} \left(\mathrm{RGB}_{\mathrm{vivoLog}}\right)$$

$$M_{AP0} = \begin{bmatrix} 0.6820 & 0.1658 & 0.1522 \\ 0.0507 & 0.9887 & -0.0395 \\ -0.0017 & -0.1162 & 1.1180 \end{bmatrix}$$

2.4.4 vivo Wide Gamut RGB to ITU Rec. 709

The conversion from vivo Wide Gamut RGB to ITU Rec.709 is defined as below:

$$\mathrm{RGB}_{709} = \mathrm{M}_{709} \cdot \int^{-1} \left(\mathrm{RGB}_{\mathrm{vivoLog}}\right)$$

$$M_{709} = \begin{bmatrix} 1.6841 & -0.6445 & -0.0397 \\ -0.1193 & 1.3286 & -0.2094 \\ -0.0212 & -0.2866 & 1.3079 \end{bmatrix}$$

2.5 R'G'B' to Y'Cb'Cr' Conversion

R'G'B' to Y'Cb'Cr' conversion follows the ITU Rec.709 standard:

$$Y' = 0.2126 * R' + 0.7152 * G' + 0.0722 * B'$$

$$Cb' = \frac{(B' - Y')}{1.8556}$$

$$Cr' = \frac{(R' - Y')}{1.5748}$$