

DIGSS V 2.0 Image, Audio, and Theater Specifications, January 2018

IMAGE

Line	Parameter	Units	Flat Screens		Domes		Aspirational		Notes
			Four Three	Wide	Four Three	Fulldome	Flat	Dome	
1	Display aspect ratio		~ 1.43:1	≥ 1.85:1	~ 1.43:1	1:1			Ratio of width to height. See SMPTE standard 419M-2005.
2	Addressable vertical resolution	pixels	2864	2160	2864	4096		~5.7K ¹	Assumes square pixels at source ² . Calculated from lines 1 and 3.
3	Addressable horizontal resolution	pixels		4096		4096		~5.7K ¹	Assumes square pixels at source ² .
4	2D frame rate	fps/Hz		24		24		≥60	
5	3D frame rate	fps/Hz		24		24		≥60	
6	Color gamut			ITU Rec 709		ITU Rec 709		ITU Rec 2020	See ITU references.
7	Pixel structure			not visible		not visible			From center reference seat.
8	Contouring			not visible		not visible			No visible banding or posterization effects on flat field images.
9	Color deviation			not visible		not visible			No visible deviation from neutral gray.
10	Compression							Uncompressed 4:4:4 encoding	Equal weight R,G,B.
11	Bit Depth			8-10 bits/color		8-10 bits/color		≥12 bits/color	Non-HDR.
12	White point x			0.3127		0.3127			CIE 1931 x-color coordinate for D65 white at 6504 K CCT within ±0.003.
13	White point y			0.329		0.329			CIE 1931 y-color coordinate for D65 white at 6504 K CCT within ±0.003.

AUDIO

Line	Parameter	Units	Flat Screens		Domes		Aspirational		Notes
			Four Three	Wide	Four Three	Fulldome	Flat	Dome	
14	Channels			5, 6, 7, or 12		5, 6, 7, or 12		≥12	Does not include low-frequency partial channels. Common terms: 5.1, 7.1, 5.0, 6.0.
15	Bit depth	bits		24		24			
16	Sample rate	kHz		48		48			

THEATER ENVIRONMENT

Line	Parameter	Units	Flat Screens		Domes		Aspirational		Notes
			Four Three	Wide	Four Three	Fulldome	Flat	Dome	
17	Aspect ratio of screen		~ 1.43:1	≥ 1.85:1	~ 1.43:1	1:1			Minimum acceptable system performance specifications, as measured from center reference seat.
18	Ambient noise			<NC 25		<NC 25			Ratio of width to height. See SMPTE standard 419M-2005.
19	Reverberation time (RT60)	seconds		0.5		0.5			Overall background noise in seating area. See NC reference.
20	Structural noise			none		none			500Hz octave band. See ISO and SMPTE standards. For theaters wider than 80 feet: 0.7 seconds.
21	Seating rake angle	degrees		20-30		20-30			No audible sound or sympathetic vibration in the presence of audio system energy of 105 dB at any frequency from 20-16,000 Hz.
22	Reference seat point			0.28-0.33 H		center of hemisphere			Angle from horizontal = 0 degrees.
23	Closest seat position			≥0.33 W		≥0.3 W			Fraction of screen height, from base of screen (flat).
24	Farthest seat position			≤ W		N/A			Percentage of screen width, line 26.
25	Widest seat position	ratio/ft/m		≤0.45 W		≥4 ft./1.2 m. from S			Percentage of screen width, line 26.
26	Minimum Screen width W	ft/m		70/21.3		60/18.3 (diameter)			Percentage of screen width, line 26 (flat); S = Dome spring line (dome).
27	Minimum screen height H	ft/m		48.9/14.9		N/A			Minimum screen area: 3,100 sq. ft. (285 sq. m.), per GSCA spec for "Giant Screens."
28	Minimum angular size (HFOV)	degrees		90		180			Calculated from aspect ratio, line 1.
29	Minimum angular size (VFOV)	degrees		~ 67.5		~49			
30	Screen gain			0.8 (matte)/2.1 (silver)		0.35-0.5			Recommended: 0.4 (dome)
31	Screen surface			non-distracting		non-distracting			Free from all visible defects, spectrally neutral, free of visible specular reflections. Total variation <2% in gain and color across expanse.
32	Dome seams			N/A		non-distracting			Seams shall not substantially detract from viewing experience. Seamless domes preferred.
33	Hemispherical integrity	in/cm		N/A		≤0.5/1.25			Deviation from a perfect hemisphere at any point.
34	2D peak white luminance	fL		20		3	31	6	As measured with a reflective luminance meter.
35	3D peak white luminance	fL		10		1	16	4	As measured with a reflective luminance meter through 3D glasses.
36	Luminance uniformity			70%		70%			Corner-to-center average ratio, using 9-point test, per SMPTE S196M and RP098-1995
37	Narrow-angle luminance uniformity			90%		90%			As measured across an angle of ~15%, including across blend zones.
38	3D ghosting			1%		1%			Ghost is <1% of image brightness, in fL, through 3D glasses.
39	Sequential-image contrast ratio			1500:1		1500:1		≥4,000:1	Full-white to full-black ratio, on screen in dark theater.
40	Intra-frame contrast ratio			150:1		10:1			ANSI contrast ratio with 50/50 checkerboard white and black squares. See ANSI reference.
41	Reference Level	dBFS		-20		-20			0 dB VU on monitor/mix console = 20 dB below full scale digital.
42	Reference SPL	dBc		85		85			See SMPTE RP-200, ISO-9568, and ANSI S1.11. Surround speaker levels: 82 dBc. Subwoofer level: SMPTE RP-200.
43	Main speakers (each)	dB SPL		≥105 (unweighted)		≥105 (unweighted)			
44	Main speaker frequency response	Hz		30-16,000		30-16,000			See SMPTE RP200.
45	Subwoofer array	dB SPL		≥110 (unweighted)		≥110 (unweighted)			
46	Subwoofer frequency response	Hz		25-120		25-120			See SMPTE RP141.
47	Intelligibility (ALCONS)			5%		5%			Articulation Loss of Consonants.
48	Intelligibility (STI)			0.68		0.68			Speech Transmission Index.

Notes

- 1 Domes need higher resolution than flat screens to cover the much wider fields of view: 180 degrees at center seat vs. 90 degrees for flat screens, and higher vertical FOV than flat screens.
- 2 Some projection systems use anamorphic, not spherical, lenses, which project non-square pixels.