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GoPro Hero4 Black

Best possible combinations of fps and resolution.

Video resolution: 3840 x 2160 pixels / 30fps (UltraHD) fixed @ 14mm (eq 35mm)

Battery life: 1h:10m (protune enabled 4K)

4K	16:9		
30fps-NTSC	wide	14mm / crop	60mbit
4K Super	16:9 - 4:3 maximum resolution		
23fps-NTSC/PAL	wide	14mm / hqresize	60mbit
2.7K	16:9		
50fps-PAL	wide	14mm / hqresize	60mbit
50fps-PAL	medium	21mm / hqresize	60Mbit * best
2.7K	4:3		
30fps-NTSC	wide	14mm / hqresize	60mbit
1440p	4:3		
60fps-NTSC	wide	14mm / resize	48mbit
1080p	16:9		
60fps-NTSC	wide	14mm / hqresize	45mbit
60fps-NTSC	medium	21mm / hqresize	45mbit
120fps	narrow	28mm / crop	60mbit
H264 Parameters - High Profile 5.1			
Color Space: YUV	Chroma subsampling: 4:2:0	Bit Depth: 8bit	Color Primaries: BT.709
Reference Frames: 1	Color Range: Full	CABAC: Yes	Bitrate 48-60Mbit/s

Encoding chip: Ambarella A9 <http://www.ambarella.com>

Sensor: 4072x3046 SONY 1/2.3" 12Mpix BI-CMOS Exmor R IMX117

* HQResize: image is resized from sensor (high quality)

* Crop: image is cropped from sensor (no quality problems)

In other modes there are **"skipped lines" - huge quality loss**, that is why I don't list them.

Outdoor shooting

6500K / GoPro Colors* / -0.5EV

*In high contrast situation - Flat Colors

Set **sharpness to low** always because picture is oversharpened in default settings.

GoPro HERO HDR recording

It's possible to record full HDR in 4K on GoPro HERO, but there are a lot of color noise in picture. This can be possible when you are shoot in flat profile, with native color preset (it's very close to bt2020). Then you can encode this video in HEVC/10bit with added HDR10 metadata.

Mobile XIAOMI 14 Ultra

Pixel size: 1.6µm

Only main camera can be used in 10bit mode (Master Cinema/Dolby Vision) and HEVC

Note	Resolution	Framerate	Bits	Approx. bitrate	Metadata
*broken	4K	120fps	8bit	~40mbit variable	none
*not valid	4K	60fps	10bit	~80mbit variable	Dolby Vision
*not valid	4K	30fps	10bit	~40mbit variable	Dolby Vision
Video	4K	30fps	10bit	~40mbit variable	Master Cinema

Note	Resolution	Framerate	Bits	Approx. bitrate	Metadata
Video	8K	30fps	10bit	~70mbit variable	none

Mobile LENOVO Vibe Z2 Pro

Pixel size: 1.12µm

Max Video quality: **3840 x 2160 pixels / 30fps up to 100Mbit/s with Optical Stabilization**

CyanogenMod 14.1 (Android 7.1) + **Cinema FV-5**

f2.2 / 4mm (25mm) 5800K in settings mean ~6500K real on display or 100,88,90

H264 Parameters - Base Line 5.1		
Color Space: YUV	Chroma subsampling: 4:2:0	Bit Depth: 8bit
Reference Frames: 1	CABAC: No	Bitrate 65-100Mbit/s

Supported functions: Auto Exposure Lock, Auto White Balance Lock, Focus Lock, ISO Lock

Mobile phone can write 4K 100Mbit/s with additional software. In default settings there are a lot of sharpness.

Set sharpness to zero.

100Mbit/s → 750MB/min

65Mbit/s → 488MB/min

40Mbit/s → 300MB/min

Encoding chip: Qualcomm Snapdragon 801 / Adreno 330

Sensor: 5328 x 3000 1/2.6" 16Mpix ISOCELL **S5K2P8**

Optics: Optical Stabilization

[Sample 4K Video on Youtube.com](#)

Canon EOS 600D

Pixel size: 4.3µm

Video resolution: 1920 x 1080 pixels / 35fps

CMOS Deshaker: 57% / Crop 19%

No moaré/aliasing at 1080p + Crop 3x (bad named Digital Zoom in menu)

It's floating 2Mpix window on 18Mpix sensor with digital stabilization

H264 Parameters - Base Line 5.0			
Color Space: YUV	Chroma subsampling: 4:2:0	Bit Depth: 8bit	Color primaries: BT709
Reference Frames: 1	CABAC: No	Bitrate 45Mbit/s	Color range: Full

Lens

Sigma 18-50mm		
18mm	f4* / f16	DoF-2.8cm
32mm	f3.5* / f11	DoF-1cm
50mm	f4.5 / f8* / f11	DoF-0.5cm

* best 32mm/f8

<https://www.imaging-resource.com/lenses/sigma/18-50mm-f2.8-4.5-dc-os-hsm/review/>

Sigma 70-300mm		
70mm	f4 / f8*	DoF-6.6cm
100mm	f8* / f16	DoF-3.6cm
200mm	f8* / f11	DoF-1cm / 0.34
300mm	f8 / f11*	DoF-0.4cm / 0.13

* best 100mm/f11

<https://www.imaging-resource.com/lenses/sigma/70-300mm-f4-5.6-dg-macro/review/>

Samyang 35mm
35mm f5.6* / f11

<https://www.imaging-resource.com/lenses/samyangrokinon/35mm-f1.4-aspherical-umc/review/>

Canon HFS100

1920x1080x25p/30p NTSC

(progressive mode must be selected in postproduction because stream is marked as interlaced for broadcast compatibility)

Setting	Description
FrameRate	PF25 / 30 for NTSC
xvColor	On
AGCLimit	6dB or 0dB
Quality	MXP 24Mbit/s 1080p
Custom Effect	Sharpness Low
Crop mode	1.7x*

Manual color calibration required (cool via auto-whitebalance)

*For best picture quality you must set **1.7x crop** mode otherwise aliasing occurred.
Crop is 2Mpix window on 8Mpix sensor - this enable optical and digital stabilization at once.

H264 Parameters - High Profile 4.0			
Color Space: YUV	Chroma subsampling: 4:2:0	Bit Depth: 8bit	Color Space: BT.709
Reference Frames: 2	Scan type: Interlaced*	CABAC: Yes	Bitrate 24Mbit/s

* Fake in PF mode

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