4.6.8 Tag Support Levels

The tags and their support levels are given here.

A.   Primary Image (0th IFD) Support Levels

The support levels of primary image (0th IFD) tags are given in **Table 17**, **Table 18**,**Table 19** and **Table 20**.

Table 17   Tag Support Levels (1)   - 0th IFD TIFF Tags –

Tag Name	Field Name	Tag ID		Uncompressed			Compressed
		Dec	Hex	Chunky	Planar	YCC	
Image width	ImageWidth	256	100	M	M	M	J
Image height	ImageLength	257	101	M	M	M	J
Number of bits per component	BitsPerSample	258	102	M	M	M	J
Compression scheme	Compression	259	103	M	M	M	J
Pixel composition	PhotometricInterpretation	262	106	M	M	M	N
Image title	ImageDescription	270	10E	R	R	R	R
Manufacturer of image input equipment	Make	271	10F	R	R	R	R
Model of image input equipment	Model	272	110	R	R	R	R
Image data location	StripOffsets	273	111	M	M	M	N
Orientation of image	Orientation	274	112	R	R	R	R
Number of components	SamplesPerPixel	277	115	M	M	M	J
Number of rows per strip	RowsPerStrip	278	116	M	M	M	N
Bytes per compressed strip	StripByteCounts	279	117	M	M	M	N
Image resolution in width direction	XResolution	282	11A	M	M	M	M
Image resolution in height direction	YResolution	283	11B	M	M	M	M
Image data arrangement	PlanarConfiguration	284	11C	O	M	O	J
Unit of X and Y resolution	ResolutionUnit	296	128	M	M	M	M
Transfer function	TransferFunction	301	12D	O	O	O	O
Software used	Software	305	131	O	O	O	O
File change date and time	DateTime	306	132	R	R	R	R
Person who created the image	Artist	315	13B	O	O	O	O
White point chromaticity	WhitePoint	318	13E	O	O	O	O
Chromaticities of primaries	PrimaryChromaticities	319	13F	O	O	O	O
Offset to JPEG SOI	JPEGInterchangeFormat	513	201	N	N	N	N
Bytes of JPEG data	JPEGInterchangeFormatLength	514	202	N	N	N	N
Color space transformation matrix coefficients	YCbCrCoefficients	529	211	N	N	O	O
Subsampling ratio of Y to C	YCbCrSubSampling	530	212	N	N	M	J
Y and C positioning	YCbCrPositioning	531	213	N	N	M	M
Pair of black and white reference values	ReferenceBlackWhite	532	214	O	O	O	O
Copyright holder	Copyright	33432	8298	O	O	O	O
Exif tag	Exif IFD Pointer	34665	8769	M	M	M	M
GPS tag	GPSInfo IFD Pointer	34853	8825	O	O	O	O

M : Mandatory (shall be recorded)

R : Recommended

O : Optional

N : It is not allowed to record

J : It is not allowed to record (included in JPEG marker)

Table 18   Tag Support Levels (2)   - 0th IFD Exif Private Tags –

Tag Name	Field Name	Tag ID		Uncompressed			Compres
		Dec	Hex	Chunky	Planar	YCC	sed
Exposure time	ExposureTime	33434	829A	R	R	R	R
F number	FNumber	33437	829D	O	O	O	O
Exposure program	ExposureProgram	34850	8822	O	O	O	O
Spectral sensitivity	SpectralSensitivity	34852	8824	O	O	O	O
Photographic Sensitivity	PhotographicSensitivity	34855	8827	O	O	O	O
Optoelectric coefficient	OECF	34856	8828	O	O	O	O
Sensitivity Type	SensitivityType	34864	8830	O	O	O	O
Standard Output Sensitivity	StandardOutputSensitivity	34865	8831	O	O	O	O
Recommended Exposure Index	RecommendedExposureIndex	34866	8832	O	O	O	O
ISOSpeed	ISOSpeed	34867	8833	O	O	O	O
ISOSpeed Latitude yyy	ISOSpeedLatitudeyyy	34868	8834	O	O	O	O
ISOSpeed Latitude zzz	ISOSpeedLatitudezzz	34869	8835	O	O	O	O
Exif Version	ExifVersion	36864	9000	M	M	M	M
Date and time original image was generated	DateTimeOriginal	36867	9003	O	O	O	O
Date and time image was made digital data	DateTimeDigitized	36868	9004	O	O	O	O
Meaning of each component	ComponentsConfiguration	37121	9101	N	N	N	M
Image compression mode	CompressedBitsPerPixel	37122	9102	N	N	N	O
Shutter speed	ShutterSpeedValue	37377	9201	O	O	O	O
Aperture	ApertureValue	37378	9202	O	O	O	O
Brightness	BrightnessValue	37379	9203	O	O	O	O
Exposure bias	ExposureBiasValue	37380	9204	O	O	O	O
Maximum lens aperture	MaxApertureValue	37381	9205	O	O	O	O
Subject distance	SubjectDistance	37382	9206	O	O	O	O
Metering mode	MeteringMode	37383	9207	O	O	O	O
Light source	LightSource	37384	9208	O	O	O	O
Flash	Flash	37385	9209	R	R	R	R
Lens focal length	FocalLength	37386	920A	O	O	O	O
Subject area	SubjectArea	37396	9214	O	O	O	O
Manufacturer notes	MakerNote	37500	927C	O	O	O	O
User comments	UserComment	37510	9286	O	O	O	O
DateTime subseconds	SubSecTime	37520	9290	O	O	O	O
DateTimeOriginal subseconds	SubSecTimeOriginal	37521	9291	O	O	O	O
DateTimeDigitized subseconds	SubSecTimeDigitized	37522	9292	O	O	O	O
Supported Flashpix version	FlashpixVersion	40960	A000	M	M	M	M
Color space information	ColorSpace	40961	A001	M	M	M	M
Valid image width	PixelXDimension	40962	A002	N	N	N	M
Valid image height	PixelYDimension	40963	A003	N	N	N	M
Related audio file	RelatedSoundFile	40964	A004	O	O	O	O
Interoperability tag	Interoperability IFD Pointer	40965	A005	N	N	N	O
Flash energy	FlashEnergy	41483	A20B	O	O	O	O
Spatial frequency response	SpatialFrequencyResponse	41484	A20C	O	O	O	O
Focal plane X resolution	FocalPlaneXResolution	41486	A20E	O	O	YCC	O
Focal plane Y resolution	FocalPlaneYResolution	41487	A20F	O	O	O	O
Focal plane resolution unit	FocalPlaneResolutionUnit	41488	A210	O	O	O	O
Subject location	SubjectLocation	41492	A214	O	O	O	O
Exposure index	ExposureIndex	41493	A215	O	O	O	O
Sensing method	SensingMethod	41495	A217	O	O	O	O
File source	FileSource	41728	A300	O	O	O	O
Scene type	SceneType	41729	A301	O	O	O	O
CFA pattern	CFAPattern	41730	A302	O	O	O	O
Custom image processing	CustomRendered	41985	A401	O	O	O	O
Exposure mode	ExposureMode	41986	A402	R	R	R	R
White balance	WhiteBalance	41987	A403	R	R	R	R
Digital zoom ratio	DigitalZoomRatio	41988	A404	O	O	O	O
Focal length in 35 mm film	FocalLengthIn35mmFilm	41989	A405	O	O	O	O
Scene capture type	SceneCaptureType	41990	A406	R	R	R	R
Gain control	GainControl	41991	A407	O	O	O	O
Contrast	Contrast	41992	A408	O	O	O	O
Saturation	Saturation	41993	A409	O	O	O	O
Sharpness	Sharpness	41994	A40A	O	O	O	O
Device settings description	DeviceSettingDescription	41995	A40B	O	O	O	O
Subject distance range	SubjectDistanceRange	41996	A40C	O	O	O	O
Unique image ID	ImageUniqueID	42016	A420	O	O	O	O
Camera Owner Name	CameraOwnerName	42032	A430	O	O	O	O

BodySerial Number	BodySerialNumber	42033	A431	O	O	O	O
Lens Specification	LensSpecification	42034	A432	O	O	O	O
Lens Make	LensMake	42035	A433	O	O	O	O
Lens Model	LensModel	42036	A434	O	O	O	O
Lens Serial Number	LensSerialNumber	42037	A435	O	O	O	O
Gamma	Gamma	42240	A500	O	O	O	O

Notation

M : Mandatory (shall be recorded)

R : Recommended

O : Optional

N : It is not allowed to record

J : It is not allowed to record (included in JPEG marker)

Table 19   Tag Support Levels (3)   - 0th IFD GPS Info Tags -

Tag Name	Field Name	Tag ID		Uncompressed			Comp-ressed
		Dec	Hex	Chunky	Planar	YCC	
GPS tag version	GPSVersionID	0	0	O	O	O	O
North or South Latitude	GPSLatitudeRef	1	1	O	O	O	O
Latitude	GPSLatitude	2	2	O	O	O	O
East or West Longitude	GPSLongitudeRef	3	3	O	O	O	O
Longitude	GPSLongitude	4	4	O	O	O	O
Altitude reference	GPSAltitudeRef	5	5	O	O	O	O
Altitude	GPSAltitude	6	6	O	O	O	O
GPS time (atomic clock)	GPSTimeStamp	7	7	O	O	O	O
GPS satellites used for measurement	GPSSatellites	8	8	O	O	O	O
GPS receiver status	GPSStatus	9	9	O	O	O	O
GPS measurement mode	GPSMeasureMode	10	A	O	O	O	O
Measurement precision	GPSDOP	11	B	O	O	O	O
Speed unit	GPSSpeedRef	12	C	O	O	O	O
Speed of GPS receiver	GPSSpeed	13	D	O	O	O	O
Reference for direction of movement	GPSTrackRef	14	E	O	O	O	O
Direction of movement	GPSTrack	15	F	O	O	O	O
Reference for direction of image	GPSImgDirectionRef	16	10	O	O	O	O
Direction of image	GPSImgDirection	17	11	O	O	O	O
Geodetic survey data used	GPSMapDatum	18	12	O	O	O	O
Reference for latitude of destination	GPSDestLatitudeRef	19	13	O	O	O	O
Latitude of destination	GPSDestLatitude	20	14	O	O	O	O
Reference for longitude of destination	GPSDestLongitudeRef	21	15	O	O	O	O
Longitude of destination	GPSDestLongitude	22	16	O	O	O	O
Reference for bearing of destination	GPSDestBearingRef	23	17	O	O	O	O
Bearing of destination	GPSDestBearing	24	18	O	O	O	O
Reference for distance to destination	GPSDestDistanceRef	25	19	O	O	O	O
Distance to destination	GPSDestDistance	26	1A	O	O	O	O
Name of GPS processing method	GPSProcessingMethod	27	1B	O	O	O	O
Name of GPS area	GPSAreaInformation	28	1C	O	O	O	O
GPS date	GPSDateStamp	29	1D	O	O	O	O
GPS differential correction	GPSDifferential	30	1E	O	O	O	O
Horizontal positioning error	GPSHPositioningError	31	1F	O	O	O	O

Notation

M : Mandatory (shall be recorded)

R : Recommended

O : Optional

N : It is not allowed to record

J : It is not allowed to record (included in JPEG marker)

Table 20 Tag Support Levels (4) - 0th IFD Interoperability Tag –

| Tag Name | Field Name | Tag ID | | Uncompressed | | | Comp |
		Dec	Hex	Chunky	Planar	YCC	-ressed
Interoperability Identification	InteroperabilityIndex	1	1	N	N	N	O

Notation

M : Mandatory (shall be recorded)

R : Recommended

O : Optional

N : It is not allowed to record

J : It is not allowed to record (included in JPEG marker)

B. Thumbnail (1st IFD) Support Levels

The support levels of thumbnail (1st IFD) tags are shown in **Table 21**.

Table 21   Tag Support Levels (5)   - 1st IFD TIFF Tag -

Tag Name	Field Name	Tag ID Dec	Tag ID Hex	Uncompressed Chunky	Uncompressed Planar	Uncompressed YCC	Comp-ressed
Image width	ImageWidth	256	100	M	M	M	J
Image height	ImageLength	257	101	M	M	M	J
Number of bits per component	BitsPerSample	258	102	M	M	M	J
Compression scheme	Compression	259	103	M	M	M	M
Pixel composition	PhotometricInterpretation	262	106	M	M	M	J
Image title	ImageDescription	270	10E	O	O	O	O
Manufacturer of image input equipment	Make	271	10F	O	O	O	O
Model of image input equipment	Model	272	110	O	O	O	O
Image data location	StripOffsets	273	111	M	M	M	N
Orientation of image	Orientation	274	112	O	O	O	O
Number of components	SamplesPerPixel	277	115	M	M	M	J
Number of rows per strip	RowsPerStrip	278	116	M	M	M	N
Bytes per compressed strip	StripByteCounts	279	117	M	M	M	N
Image resolution in width direction	XResolution	282	11A	M	M	M	M
Image resolution in height direction	YResolution	283	11B	M	M	M	M
Image data arrangement	PlanarConfiguration	284	11C	O	M	O	J
Unit of X and Y resolution	ResolutionUnit	296	128	M	M	M	M
Transfer function	TransferFunction	301	12D	O	O	O	O
Software used	Software	305	131	O	O	O	O
File change date and time	DateTime	306	132	O	O	O	O
Person who created the image	Artist	315	13B	O	O	O	O
White point chromaticity	WhitePoint	318	13E	O	O	O	O
Chromaticities of primaries	PrimaryChromaticities	319	13F	O	O	O	O
Offset to JPEG SOI	JPEGInterchangeFormat	513	201	N	N	N	M
Bytes of JPEG data	JPEGInterchangeFormatLength	514	202	N	N	N	M
Color space transformation matrix coefficients	YCbCrCoefficients	529	211	N	N	O	O
Subsampling ratio of Y to C	YCbCrSubSampling	530	212	N	N	M	J
Y and C positioning	YCbCrPositioning	531	213	N	N	O	O
Pair of black and white reference values	ReferenceBlackWhite	532	214	O	O	O	O
Copyright holder	Copyright	33432	8298	O	O	O	O
Exif tag	Exif IFD Pointer	34665	8769	O	O	O	O
GPS tag	GPSInfo IFD Pointer	34853	8825	O	O	O	O

Notation

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R : Recommended

O : Optional

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J : It is not allowed to record (included in JPEG marker)

4.7 JPEG Marker Segments Used in Exif

In addition to the compressed data (Interoperability coded data), a compressed file contains one each of the marker segments APP1, DQT, DHT, SOF and SOS. The compressed data begins with an SOI and ends with an EOI marker. A restart marker (DRI, RSTm) may be inserted optionally. Another option is to have two or more APP2 marker segments. APPn other than APP1 and APP2 or COM segments are not used by Exif. However Exif/DCF readers should be designed skip over unknown APPn and COM.APP1