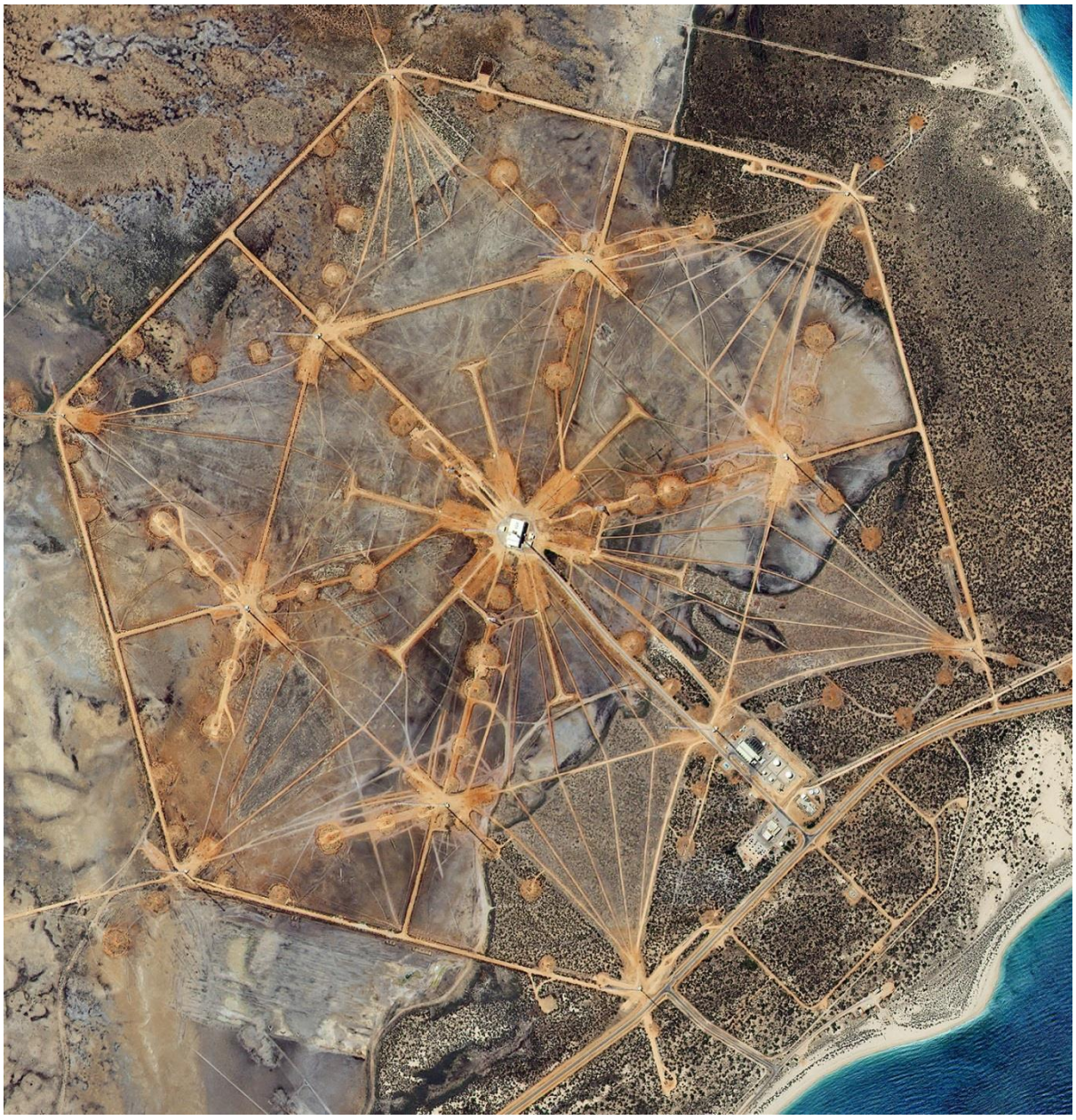
KOMPSAT-3 PRODUCTS SPECIFICATION

Image Data Manual

Fair Access to Space



Northwest Cape, Australia

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July, 2015

KOREA AEROSPACE RESEARCH INSTITUDE

SI IMAGING SERVICES Co., LTD

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1. INTRODUCTION

This image data manual provides customers with the overview of KOMPSAT-3 system, detailed product description, license, order options and ordering process.

2. KOMPSAT-3 SYSTEM OVERVIEW

KOMPSAT-3 is a high performance remote sensing satellite, which provides 0.7 m GSD panchromatic image and 2.8 m GSD multi-spectral image data for various applications. KOMPSAT-3 was launched into a sun synchronous low Earth orbit on the 18th of May, 2012 and the life time of more than 7 years is expected.

2.1 Mission Orbit

The nominal mission orbit has the following characteristics.

- Sun synchronous orbit with 685 km altitude
- 98.13º for inclination
- 13:30 for MLTAN
- 98.58 min nodal period
- Successive orbit distance = 2713km @equator, 2252km @33.5N
- Distance between adjacent pass = 96.9km @ equator, 80.4km @33.5N

Typically, the satellite passes over the certain region in two pass sequences daily, once during the day time and once at night time.

2.2 Mission Constraints

Maximum Imaging Time

In KOMPSAT-3 design, 10 minutes is considered as a maximum imaging time of strip type imaging during one orbit and 50 minutes during one day. The maximum imaging time will be less than 10 minutes depending on mission scenario due to satellite constraints such as power consumption and memory. The constraints are checked by ground station software automatically.

Memory

KOMPSAT-3 has 512 G bit memory for image data. KOMPSAT-3 generates image data with 4.2 G bit per second when no compression is applied. By increasing the compression ratio, imaging time can be increased by the price of image quality.

Roll and Pitch Tilt

The satellite can be tilted up to +/-56 degree from LVLH about roll axis and up to +/-30

degree about pitch axis.

2.3 Imaging Modes

KOMPSAT-3 supports various missions using agile maneuver such as strip imaging, multi point imaging, single pass stereo imaging, wide area along imaging, wide area arbitrarily imaging.

Strip Imaging

For the strip imaging, the spacecraft bus is slewed about the roll and the pitch axis into the reference attitude before the imaging starts. During imaging, this reference attitude is kept nearly constant. Yaw steering is performed during imaging for image quality.

Multi Point Imaging

Multi point imaging is to collect several place image where is left, right, up and down side from satellite pass in a single pass. In this image collection, the satellite has to be tilted in roll & pitch direction as required before starting imaging. During imaging period, satellite has no maneuvers like strip imaging. Yaw steering is performed during imaging for image quality. TDI line rate is adjusted for image quality during maneuver period. The satellite will be operated within agility and power constraints.

Single Pass Stereo Imaging

The single pass stereo imaging is to collect the stereo image of a target during a single pass.

Wide Area Along Imaging

The wide area along imaging is to have wider swath using satellite agility. The wide area along imaging encompasses the imaging of three consecutive strips, lying side by side.

3. KOMPSAT-3 IMAGE DATA

3.1 Product Description

There are two products levels for KOMPSAT-3 image data: Level 1R product and Level 1G product. All products are provided as a bundle (pan + 4 multispectral) or as a pan-sharpened (4 pan-sharpened bands).

3.1.1 Level 1R Product

Level 1R is the product corrected for radiometric and sensor distortions. The difference of relative radiometric response between detectors is corrected and internal detector geometry and mis-registrations between detectors are corrected when applicable. Table 3-1 shows the specification for Level 1R Product.

Table 3-1. Level 1R Product Specification

Product Level	Horizontal Accuracy* (m, CE90) Specification (Expectation)	Maximum Off-Nadir (degree)	Nominal GSD @ nadir (m)	Processing
1R (standard)	70.0 (40.6)	30	0.7	- Without GCP - Using POD/PAD - Radiometric correction - Sensor correction - MTF compensation - Geo-information included

* excluding terrain effect

3.1.2 Level 1G Product

Level 1G is the product corrected for geometric distortions and projected to UTM Table 3-2 shows the specification for Level 1G Product. Processing for Level 1G includes all radiometric corrections and sensor corrections applied to Level 1R processing. Optical distortions are corrected and terrain effects are corrected using coarse DEM, namely SRTM DEM for level 1R. The final product is projected to UTM coordinate.

Table 3-2. Level 1G Product Specification

Product Level	Horizontal Accuracy* (m, CE90) Specification (Expectation)	Maximum Off-Nadir (degree)	GSD (m)	Processing

1G (standard)	70.0 (40.6)	30	0.7	- Without GCP - Using POD/PAD - Radiometric correction - Sensor correction - MTF compensation - Geometrical correction

* excluding terrain effect

3.2 Geolocation accuracy

The geolocation accuracy is measured comparing the location in the image and true location on Earth and compensating the terrain effect. The geodetic location of certain target corresponding points in the image is calculated using the RPC and target height and compared with ground truth (GCP) available. The difference is measurement of geolocation error of that target.

3.2.1 Results of measurements

The horizontal geolocation accuracy of KOMPSAT imagery is given in CE90 standards. CE90 means that more than 90 percent of points have geolocation error less than the given CE90 figure.

Figure 3-1 shows the horizontal accuracy of KOMPSAT-3 measured. In this scatter plot, the horizontal error of KOMPSAT-3 imagery is shown with respect to east direction and north direction. The calculated accuracy is 40.6m CE90 (red circle) or 26.8m RMSE (blue circle).

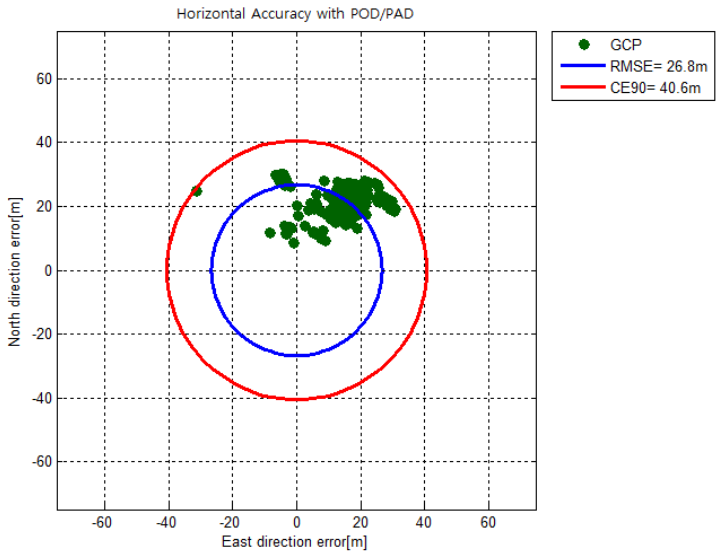

Figure 3-1. Horizontal accuracy of KOMPSAT-3 (Dec, 2014)

3.3 Constituent of Product

Constituents of Bundle Product are shown in Table 3-3. Table 3-3 is applied to both Level 1R and Level 1G product.

Table 3-3. Bundle Product File List

Bundle Product	PAN	Image File (GeoTiff)
		RPC File (text)
	MS1	Image File (GeoTiff)
		RPC File (text)
	MS2	Image File (GeoTiff)
		RPC File (text)
	MS3	Image File (GeoTiff)
		RPC File (text)
	MS4	Image File (GeoTiff)
		RPC File (text)
	Browse Image File (JPEG)	
	JPEG World file(JGW)	
	Thumbnail Image File (JPEG)	
	Auxiliary File (xml)	

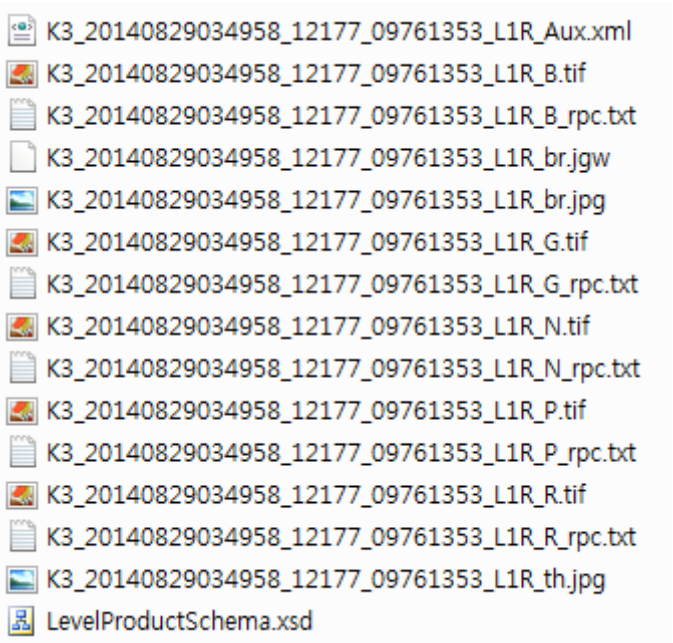

Figure 3-2. Files in Bundle Product

Constituents of pan-sharpened product are shown in Table 3-4. Table 3-4 is applied to both Level 1R and Level 1G product.

Table 3-4. Pan-Sharpened Product File List

Pan-sharpened Product	MS1 (PAN-MS1)	Image File (GeoTiff)
	MS2 (PAN-MS2)	Image File (GeoTiff)
	MS3 (PAN-MS3)	Image File (GeoTiff)
	MS4 (PAN-MS4)	Image File (GeoTiff)
	PAN RPC File	(text)
	Auxiliary File (xml)	

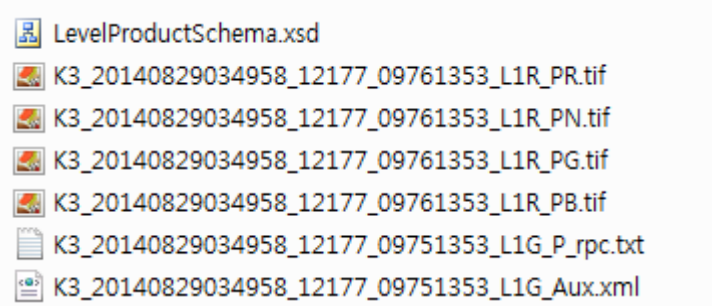

Figure 3-3. Files in Pan-sharpened Product

3.3.1 Image File

The image file consists of image files for PAN, MS1, MS2, MS3, and MS4 band for a bundle and MS1, MS2, MS3, and MS4 for pan-sharpened product. The format of each image file is GeoTIFF.

3.3.1.1 File Naming Convention

Table 3-5 shows the file naming convention for the image file

Table 3-5. File Naming Convention: Image File

* GeoTiff type **K3_"Time"_"OrbNo"_"PassNo""RowNo"_"ProcLevel"_"Band".tif** ex) K3_20140829034958_12177_09751353_L1G_P.tif	
Time	Time when the center point of the image has been observed YYYYMMDDHHMMSS
OrbNo	Number of Orbit
PathNo	Horizontal position of KARI Grid
RowNo	Vertical position of KARI Grid
ProcLevel	Processing Level L1R or L1G

Band	Band Information For Bundle : P- PAN R - Red, G - Green, B - Blue, N – NIR For Pan-sharpened : PB : PAN-Blue PG : PAN-Green PR : PAN-Red P_N : PAN-NIR

3.3.2 RPC File

The RPC file can be used in calculating geo-location information on each pixel of the image. The format of RPC file is text format.

3.3.2.1 File Naming Convention

Table 3-6 shows the file naming convention for the RPC file

Table 3-6. File Naming Convention: RPC File

K3_”Time”_”OrbNo” _”PassNo””RowNo”_”ProcLevel”_”Band_rpc”.txt ex) K3_20140829034958_12177_09751353_L1G_P_rpc.txt	
Time	Time when the center point of the image has been observed YYYYMMDDHHMMSS
OrbNo	Number of Orbit
PathNo	Horizontal position of KARI Grid
RowNo	Vertical position of KARI Grid
ProcLevel	Processing Level L1R or L1G
Band	Band Information P- PAN R - Red, G - Green, B - Blue, N - NIR

3.3.3 Browse/Thumbnail Image File

The Browse/Thumbnail image file consists of Browse/Thumbnail image files for PAN, MS1, MS2, MS3 and MS4 band. The format of each image file is JPEG.

3.3.3.1 File Naming Convention

Table 3-7 shows the file naming convention for the Browse/Thumbnail image file.

Table 3-7. File Naming Convention: Browse/Thumbnail Image

* JPEG type **K3_”Time”_”OrbNo” _”PassNo””RowNo”_”ProcLevel”_”Type”.jpg** ex) K3_20140829034958_12177_09751353_L1G_br.jpg

Time	Time when the center point of the image has been observed YYYYMMDDHHMMSS
OrbNo	Number of Orbit
PathNo	Horizontal position of KARI Grid
RowNo	Vertical position of KARI Grid
ProcLevel	Processing Level L1R or L1G
Type	br – Browse image th – Thumbnail image

3.3.4 Auxiliary File

The auxiliary file provides auxiliary information related to the image file. The format of auxiliary image file is XML.

3.3.4.1 File Naming Convention

Table 3-8 shows the file naming convention for the Auxiliary file.

Table 3-8. File Naming Convention: Auxiliary File

K3_"Time"_"OrbNo" _"PassNo""RowNo"_"ProcLevel_Aux".xml ex) K3_20140829034958_12177_09751353_L1G_Aux.xml	
Time	Time when the center point of the image has been observed YYYYMMDDHHMMSS
OrbNo	Number of Orbit
PathNo	Horizontal position of KARI Grid
RowNo	Vertical position of KARI Grid
ProcLevel	Processing Level L1R or L1G

3.4 Attributes

Table 3-9 shows the data type of attributes which are used in level product.

Table 3-9. Data Type of Attributes of Level Product

Data Type	Bits	Sign	Type Presentation	Default Value
Byte	8	Unsigned	-	0
UShort	16	Unsigned	Little Endian	0
Short	16	Signed	Little Endian	-2^{15}
UInt	32	Unsigned	Little Endian	
Int	32	Signed	Little Endian	-2^{31}

ULong	64	Unsigned	Little Endian	
Long	64	Signed	Little Endian	-2^{63}
Float	32	Signed	Little Endian, IEEE	QNaN
Double	64	Signed	Little Endian, IEEE	QNaN
String	-	-	-	

Table 3-10 shows the convention of flags assigned to attributes.

Table 3-10. Convention of Flags

Assigned Character	Convention/Meaning
a	Attribute is created during this processing level
m	Attribute is modified during this processing level and is filled with new value.
x	Attribute is copied with old value during this processing

3.4.1 Image File

Table 3-11 shows detailed information on attributes for image file.

Table 3-11. Attributes: Image File

Attributes	Definition	Data Type	Dim.	Unit	1 R	1 G
IMG_GEOG_TL	Geographic information for Top Left pixel of the image	Float	2D	Degree (decimal) [Longitude, Latitude]	a	m
IMG_GEOG_TR	Geographic information for Top Right pixel of the image	Float	2D	Degree (decimal) [Longitude, Latitude]	a	m
IMG_GEOG_BL	Geographic information for Bottom Left pixel of the image	Float	2D	Degree (decimal) [Longitude, Latitude]	a	m
IMG_GEOG_BR	Geographic information for Bottom Right pixel of the image	Float	2D	Degree (decimal) [Longitude, Latitude]	a	m
IMG_START_TIME	Imaging Start Time	String	1D	YYYYMMDDHHMM SS.ssssss	a	x
IMG_BAND	Band Information	String	1D	PAN : ‘PAN’ MS1 : ‘MS1’ MS2 : ‘MS2’ MS3 : ‘MS3’ MS4 : ‘MS4’	a	x
IMG_PROJECTION	Projection applied to the image	String	1D	UTM		a

IMG_PARAMETER	Number of zone in projection	String	1D	North/South 1-60		a
IMG_PROJECTION_ELLIPSOID	Earth ellipsoid applied to the image	String	1D	WGS84		a
IMG_PRODUCT_LEVEL	Product Level of the image	String	1D	1R/1G	a	m
IMG_GSD	GSD of the image	Float	2D	Meter [Along-Track, Across-Track]	a	m
IMG_DN_RANGE	Dynamic Range of the image	UInt	2D	[min., max.]	a	m

3.4.2 RPC File

Table 3-12 shows detailed information on attributes for RPC file.

Table 3-12. Attributes: RPC File

Attributes	Definition	Data Type	Dim.	Unit	1 R	1 G
LINE_OFF	Offset for Line	Double	1D	Pixel		
SAMP_OFF	Offset for Sample	Double	1D	Pixel		
LAT_OFF	Offset for Latitude	Double	1D	Degree		
LONG_OFF	Offset for Longitude	Double	1D	Degree		
HEIGHT_OFF	Offset for Height	Double	1D	Meters		
LINE_SCALE	Scale for Line	Double	1D	Pixel		
SAMP_SCALE	Scale for Sample	Double	1D	Pixel		
LAT_SCALE	Scale for Latitude	Double	1D	Degree		
LONG_SCALE	Scale for Longitude	Double	1D	Degree		
HEIGHT_SCALE	Scale for Height	Double	1D	Meters		
LINE_NUM_COEFF_1	Coefficient 1 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_2	Coefficient 2 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_3	Coefficient 3 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_4	Coefficient 4 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_5	Coefficient 5 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_6	Coefficient 6 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_7	Coefficient 7 for the polynomial of the dividend in RFM for Line	Double	1D		a	m

LINE_NUM_COEFF_8	Coefficient 8 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_9	Coefficient 9 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_10	Coefficient 10 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_11	Coefficient 11 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_12	Coefficient 12 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_13	Coefficient 13 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_14	Coefficient 14 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_15	Coefficient 15 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_16	Coefficient 16 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_17	Coefficient 17 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_18	Coefficient 18 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF_19	Coefficient 19 for the polynomial of the dividend in RFM for Line	Double	1D		a	m
LINE_NUM_COEFF20	Coefficient 20 for the polynomial of the dividend in RFM for Line	Double	1D		a	M
LINE_DEN_COEFF_1	Coefficient 1 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_2	Coefficient 2 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_3	Coefficient 3 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_4	Coefficient 4 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_5	Coefficient 5 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_6	Coefficient 6 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_7	Coefficient 7 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_8	Coefficient 8 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_9	Coefficient 9 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_10	Coefficient 10 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_11	Coefficient 11 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_12	Coefficient 12 for the polynomial of the divisor in RFM for Line	Double	1D		a	m

LINE_DEN_COEFF_13	Coefficient 13 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_14	Coefficient 14 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_15	Coefficient 15 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_16	Coefficient 16 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_17	Coefficient 17 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_18	Coefficient 18 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_19	Coefficient 19 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
LINE_DEN_COEFF_20	Coefficient 20 for the polynomial of the divisor in RFM for Line	Double	1D		a	m
SAMP_NUM_COEFF_1	Coefficient 1 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_2	Coefficient 2 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_3	Coefficient 3 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_4	Coefficient 4 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_5	Coefficient 5 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_6	Coefficient 6 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_7	Coefficient 7 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_8	Coefficient 8 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_9	Coefficient 9 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_10	Coefficient 10 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_11	Coefficient 11 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_12	Coefficient 12 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_13	Coefficient 13 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_14	Coefficient 14 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_15	Coefficient 15 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_16	Coefficient 16 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_17	Coefficient 17 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m

SAMP_NUM_COEFF_18	Coefficient 18 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_19	Coefficient 19 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_NUM_COEFF_20	Coefficient 20 for the polynomial of the dividend in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_1	Coefficient 1 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_2	Coefficient 2 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_3	Coefficient 3 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_4	Coefficient 4 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_5	Coefficient 5 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_6	Coefficient 6 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_7	Coefficient 7 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_8	Coefficient 8 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_9	Coefficient 9 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_10	Coefficient 10 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_11	Coefficient 11 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_12	Coefficient 12 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_13	Coefficient 13 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_14	Coefficient 14 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_15	Coefficient 15 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_16	Coefficient 16 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_17	Coefficient 17 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_18	Coefficient 18 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_19	Coefficient 19 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m
SAMP_DEN_COEFF_20	Coefficient 20 for the polynomial of the divisor in RFM for Sample	Double	1D		a	m

3.4.3 JPEG world File

Table 3-123 shows detailed information on attributes for JGE file.

Table 3-133. Attributes: JGW File

Attributes	Definition	Data Type	Dim.	Unit	1 R	1 G
Line 1	Pixel Size in the x-direction	Double	1D	Map units	a	m
Line 2	Rotation about y-axis	Double	1D	Degree	a	m
Line 3	Rotation about x-axis	Double	1D	Degree	a	m
Line 4	Pixel Size in the y-direction	Double	1D	Map units	a	m
Line 5	x-coordinate of then center	Double	1D	Map units	a	m
Line 6	y-coordinate of then center	Double	1D	Map units	a	m

3.4.4 Browse/Thumbnail Image File

There is no attributes for Browse/Thumbnail image file.

3.4.5 Auxiliary File

Table 3-14 shows detailed information on attributes for auxiliary file.

Table 3-14. Attributes: Auxiliary File

Element		Attribute	Definition	Data Type	Unit	1R	1G
<?xml>			XML Information				
		version	XML version	Float	1.0	a	x
		encoding	Encoding Information	String	UTF-8	a	x
		Standalone	stand-alone	String	yes	a	x
<Auxiliary>							
		xmlns:xsi	Xml schema Element				
		xmlns:xsd	Xml schema Definition				
		xsi	Xml SchemaLocation				
<General>			Root Element of <General>				
	<Satellite>		Satellite Name	String	KOMPSAT-3	a	x
	<Sensor>		Payload Name	String	AEISS	a	x
	<OrbitNumber>		Orbit number for the image	UInt		a	x
	<OrbitDirection>		Direction of satellite movement in orbit	String	Ascending Orbit, Descending Orbit	a	x
	<PassID>		ID for the pass when X-Band RF signal has been received	String	L0F_[Time]_[OrbitNo]_[Duration] - Time : Receiving Time, (UTC) YYYYMMDDHHMMSS ex)20081122072249 - OrbitNo : orbit number ex) 06678 - Duration : imaging duration time(sec) ex) 052	a	x
	<ProductLevel>		Level of Product	String	Level1R, Level1G	a	m
	<ImageFormat>		Image File Format	String	GeoTiff	a	x

	<ImagingMode>		Imaging Mode	String	Strip Imaging Mode, One Path Stereo Imaging Mode, Multi-Pointing Mode, Wide Area Along Imaging Mode, Wide Area Arbitrary Imaging Mode,	a	x
	<Projection>		Projection applied to the image				
	<Type>		Type of the projection	String	UTM		a
	<Parameter>		Zone information of the projection	String	N1-N60 or S1-S60		a
	<EllipsoidType>		Type of Earth ellipsoid for the image	String	WGS84		a
	<ResamplingMethod>		Resampling Method for the image	String	NN (Nearest Neighborhood) BL(Bilinear), CC(Cubic Convolution)	a	m
	<DesignBitsPerPixel>		Number of bits per pixel	UShort	14	a	x
	<DynamicRange>		Dynamic range of the image				
	<DesignMinimum>		Minimum pixel value of the image	UShort	0	a	x
	<DesignMaximum>		Maximum pixel value of the image	UShort	16383	a	x
	<BrowseImage>		Information on Browse Image File				
	<BrowseImageFileName>		Filename of Browse Image File	String		a	x
	<BrowseImageSize>		Size of Browse Image File			a	x
	<Width>		Width of Browse Image	UShort	Pixels	a	x
	<Height>		Height of Browse Image	UShort	Pixels	a	x
	<ThumbnailImage>		Information on Thumbnail Image File				
	<ThumbnailImageFileName>		Filename of Thumbnail Image File	String		a	x
	<ThumbnailImageSize>		Size of Thumbnail Image File				
	<Width>		Width of Thumbnail Image	UShort		a	x
	<Height>		Height of Thumbnail Image	UShort		a	x
	<ApplyMTFC>		Whether MTFC was applied	String	False/True	a	m
	<ApplyPODPAD>		POD/PAD Application to the Image	String	False/True	a	m

	<ApplyPixelBurst>			PixelBurst correction to the Image	String	False/True	a	m
	<ApplyAttitudeBias>			Attitude Bias correction to the Image	String	False/True	a	m
	<ApplyRNUC>			RNUC correction to the Image	String	False/True	a	m
	<CreateDate>			Time when Image File has been created	String	UTC, YYYYMMDDHHMMSS. ss	a	x
	<ProductID>			ID of Level Product	String	Null	a	x
	<PMSVersionNo>			PMS version	String			
<Metadata>				Root Element of <Metadata>				
	<MetadataBlock>			Metadata Information Block				
		<Time>		Time	Double	UTC, YYYYMMDDHHMMSS. ssssss	a	x
		<Position>		Position of the satellite				
			<X>	X Position of the satellite	Double	Km	a	x
			<Y>	Y Position of the satellite	Double	Km	a	x
			<Z>	Z Position of the satellite	Double	km	a	x
		<Velocity>		Velocity of the satellite				
			<VX>	Velocity of the satellite in X direction	Double	km/s	a	x
			<VY>	Velocity of the satellite in Y direction	Double	km/s	a	x
			<VZ>	Velocity of the satellite in Z direction	Double	km/s	a	x
		<Attitude>		Attitude of the satellite				
			<R>	Angular displacement of the roll axis against the orbital reference frame in orbit	Double	Degree (decimal)	a	x
			<P>	Angular displacement of the pitch axis against the orbital reference frame in orbit	Double	Degree (decimal)	a	x
			<Y>	Angular displacement of the yaw axis against the orbital reference frame in orbit	Double	Degree (decimal)	a	x

		<SunAngle>			Angular displacement of the Sun against the orbital reference frame in orbit				
			<Azimuth>		Angular displacement of the Sun in Azimuth direction against the orbital reference frame in orbit	Double	Degree (decimal)	a	x
			<Elevation>		Angular displacement of the Sun in Elevation direction against the orbital reference frame in orbit	Double	Degree (decimal)	a	x
	<AuxiliaryBlock>				Auxiliary Information Block				
	...								
<Image>					Root Element of <Image>			a	x
	<PAN>				Root Element of <PAN>				
		<ImageFileName>			Filename of PAN Image File	String		a	m
		<ImageLevel>			Level of PAN Image File	String	Level1R, Level1G	a	m
		<ImageColor>			Color of PAN Image	String	Not Available	a	x
		<ImagingTime>			Acquisition Time for PAN Image				
			<ImagingStartTime>		Acquisition Start Time for the 1st line of PAN Image				
				<UTC>	Acquisition Time for the 1st line of PAN Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>	Acquisition Time for the 1st line of PAN Image (Julian Day)	Int		a	x
				<JulianFraction>	Acquisition Time for the 1st line of PAN Image (Julian Day)	Double		a	x
			<ImagingCenterTime>		Acquisition Start Time for the middle line of PAN Image				
				<UTC>	Acquisition Time for the middle line of PAN Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>	Acquisition Time for the middle line of PAN Image (Julian Day)	Int		a	x
				<JulianFraction>	Acquisition Time for the middle line of PAN Image (Julian Day)	Double		a	x
			<ImagingEndTime>		Acquisition Start Time for the last line of PAN Image				

				<UTC>		Acquisition Time for the last line of PAN Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the last line of PAN Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the last line of PAN Image (Julian Day)	Double		a	x
			<ImagingDuration>			Imaging duration of PAN Image	Double	second	a	x
			<LineScanTime>			Acquisition Time for one line of PAN Image	Double	Micro-sec	a	x
		<ImageSize>				Size of PAN Image File				
			<Width>			Number of Columns of PAN Image	Int		a	m
			<Height>			Number of Rows of PAN Image	Int		a	m
		<ImagingCoordinates>				Coordinates of PAN Image				
			<ImageCoordCenter>			Image coordinates of the center pixel of PAN Image				
				<Column>		Column number of the center pixel of PAN Image	Int		a	m
				<Row>		Row number of the center pixel of PAN Image	Int		a	m
			<ImageGeogCenter>			Geographic coordinates of the center pixel of PAN Image				
				<Latitude>		Latitude corresponding to the center pixel of PAN Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the center pixel of PAN Image	Double	Degree (decimal)	a	m
			<ImageGeogTL>			Geographic coordinates of the top left pixel of PAN Image				
				<Latitude>		Latitude corresponding to the top left pixel of PAN Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top left pixel of PAN Image	Double	Degree (decimal)	a	m
			<ImageGeogTC>			Geographic coordinates of the top center pixel of PAN Image				
				<Latitude>		Latitude corresponding to the top center pixel of PAN Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top center pixel of PAN Image	Double	Degree (decimal)	a	m

			<ImageGeogTR>			Geographic coordinates of the top right pixel of PAN Image				
				<Latitude>		Latitude corresponding to the top right pixel of PAN Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top right pixel of PAN Image	Double	Degree (decimal)	a	m
			<ImageGeogBL>			Geographic coordinates of the bottom left pixel of PAN Image				
				<Latitude>		Latitude corresponding to the bottom left pixel of PAN Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom left pixel of PAN Image	Double	Degree (decimal)	a	m
			<ImageGeogBC>			Geographic coordinates of the bottom center pixel of PAN Image				
				<Latitude>		Latitude corresponding to the bottom center pixel of PAN Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom center pixel of PAN Image	Double	Degree (decimal)	a	m
			<ImageGeogBR>			Geographic coordinates of the bottom right pixel of PAN Image				
				<Latitude>		Latitude corresponding to the bottom right pixel of PAN Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom right pixel of PAN Image	Double	Degree (decimal)	a	m
		<Angle>								
			<Roll>			Roll tilt angle when the center pixel of PAN Image has been acquired	Double	Degree (decimal)	a	m
			<Pitch>			Pitch tilt angle when the center pixel of PAN Image has been acquired	Double	Degree (decimal)	a	m
			<Yaw>			Yaw tilt angle when the center pixel of PAN Image has been acquired	Double	Degree (decimal)	a	m
			<Incidence>			Incidence angle when the center pixel of PAN Image has been acquired	Double	Degree (decimal)	a	m
			<Azimuth>			Azimuth angle when the center pixel of PAN Image has been acquired	Double	Degree (decimal)	a	m
		<CloudCover>				Cloud Cover on PAN Image				
			<Average>			Average of cloud cover on PAN Image	UShort	0 – 9	a	x

			<Section>		id	Zone 0 of PAN Image	UShort	0	a	x
				<Cloud>		Cloud cover on Zone 0 of PAN Image	UShort	0 – 9	a	x
			<Section>		id	Zone 1 of PAN Image	UShort	1	a	x
				<Cloud>		Cloud cover on Zone 1 of PAN Image	UShort	0 – 9	a	x
			<Section>		id	Zone 2 of PAN Image	UShort	2	a	x
				<Cloud>		Cloud cover on Zone 2 of PAN Image	UShort	0 – 9	a	x
			<Section>		id	Zone 3 of PAN Image	UShort	3	a	x
				<Cloud>		Cloud cover on Zone 3 of PAN Image	UShort	0 – 9	a	x
		<DNRange>				Dynamic range of PAN Image				
			<MinimumDN>			Minimum value of pixels in PAN Image	UShort		a	x
			<MaximumDN>			Maximum value of pixels in PAN Image	UShort		a	x
		<ImageGSD>				Ground Sample Distance of PAN Image				
			<Column>			Column Pseudo GSD (Across Track) of the center pixel of PAN Image	Double	Meter	a	m
			<Row>			Row Pseudo GSD (Along Track) of the center pixel of PAN Image	Double	Meter	a	m
		<SatellitePosition>				Position of the satellite when the center pixel of PAN Image has been acquired				
			<Altitude>			Altitude of the satellite when the center pixel of PAN Image has been acquired	Double	Kilometer	a	x
			<SSPLatitude>			Latitude of the sub-satellite point when the center pixel of PAN Image has been	Double	Degree (decimal)	a	x
			<SSPLongitude>			Longitude of the sub-satellite point when the center pixel of PAN Image has been	Double	Degree (decimal)	a	x
		<ImageQuality>				Quality of PAN Image	String		a	x
		<Bandwidth>				Bandwidth of PAN channel	UShort	Nanometer	a	x
		<RadianceConversion>				Coefficient applied in converting digital number of PAN Image into radiance				

			<Gain>			Gain applied in converting digital number of PAN Image into radiance	Double		a	x
			<Offset>			Offset applied in converting digital number of PAN Image into radiance	Double		a	x
	<FocalLength>					Focal length of optical system used in generating PAN Image	Double	meter	a	x
	<CCDAlignment>					PAN CCD Alignment Offset	String	Offset & Gain (fx, fy, lx, ly) in Along/Across Track directions	a	x
	<MS1>					Root Element of <MS1>				
		<ImageFileName>				Filename of MS1 Image File	String		a	m
		<ImageLevel>				Level of MS1 Image File	String	Level1R, Level1G	a	m
		<ImageColor>				Color of MS1 Image	String	Blue	a	x
		<ImagingTime>				Acquisition Time for MS1 Image				
			<ImagingStartTime>			Acquisition Start Time for the 1st line of MS1 Image				
				<UTC>		Acquisition Time for the 1st line of MS1 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the 1st line of MS1 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the 1st line of MS1 Image (Julian Day)	Double		a	x
			<ImagingCenterTime>			Acquisition Start Time for the middle line of MS1 Image				
				<UTC>		Acquisition Time for the middle line of MS1 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the middle line of MS1 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the middle line of MS1 Image (Julian Day)	Double		a	x
			<ImagingEndTime>			Acquisition Start Time for the last line of MS1 Image				
				<UTC>		Acquisition Time for the last line of MS1 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the last line of MS1 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the last line of MS1 Image (Julian Day)	Double		a	x

			<ImagingDuration>			Imaging duration of MS1 Image	Double	second	a	x
			<LineScanTime>			Acquisition Time for one line of MS1 Image	Double	Micro-sec	a	x
		<ImageSize>				Size of MS1 Image File				
			<Width>			Number of Columns of MS1 Image	Int		a	m
			<Height>			Number of Rows of MS1 Image	Int		a	m
		<ImagingCoordinates>				Coordinates of MS1 Image				
			<ImageCoordCenter>			Image coordinates of the center pixel of MS1 Image				
				<Column>		Column number of the center pixel of MS1 Image	Int		a	m
				<Row>		Row number of the center pixel of MS1 Image	Int		a	m
			<ImageGeogCenter>			Geographic coordinates of the center pixel of MS1 Image				
				<Latitude>		Latitude corresponding to the center pixel of MS1 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the center pixel of MS1 Image	Double	Degree (decimal)	a	m
			<ImageGeogTL>			Geographic coordinates of the top left pixel of MS1 Image				
				<Latitude>		Latitude corresponding to the top left pixel of MS1 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top left pixel of MS1 Image	Double	Degree (decimal)	a	m
			<ImageGeogTC>			Geographic coordinates of the top center pixel of MS1 Image				
				<Latitude>		Latitude corresponding to the top center pixel of MS1 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top center pixel of MS1 Image	Double	Degree (decimal)	a	m
			<ImageGeogTR>			Geographic coordinates of the top right pixel of MS1 Image				
				<Latitude>		Latitude corresponding to the top right pixel of MS1 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top right pixel of MS1 Image	Double	Degree (decimal)	a	m

			<ImageGeogBL>			Geographic coordinates of the bottom left pixel of MS1 Image				
				<Latitude>		Latitude corresponding to the bottom left pixel of MS1 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom left pixel of MS1 Image	Double	Degree (decimal)	a	m
			<ImageGeogBC>			Geographic coordinates of the bottom center pixel of MS1 Image				
				<Latitude>		Latitude corresponding to the bottom center pixel of MS1 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom center pixel of MS1 Image	Double	Degree (decimal)	a	m
			<ImageGeogBR>			Geographic coordinates of the bottom right pixel of MS1 Image				
				<Latitude>		Latitude corresponding to the bottom right pixel of MS1 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom right pixel of MS1 Image	Double	Degree (decimal)	a	m
		<Angle>								
			<Roll>			Roll tilt angle when the center pixel of MS1 Image has been acquired	Double	Degree (decimal)	a	m
			<Pitch>			Pitch tilt angle when the center pixel of MS1 Image has been acquired	Double	Degree (decimal)	a	m
			<Yaw>			Yaw tilt angle when the center pixel of MS1 Image has been acquired	Double	Degree (decimal)	a	m
			<Incidence>			Incidence angle when the center pixel of MS1 Image has been acquired	Double	Degree (decimal)	a	m
			<Azimuth>			Azimuth angle when the center pixel of MS1 Image has been acquired	Double	Degree (decimal)	a	m
		<CloudCover>				Cloud Cover on MS1 Image				
			<Average>			Average of cloud cover on MS1 Image	UShort	0-9	a	x
			<Section>		id	Zone 0 of MS1 Image	UShort	0	a	x
				<Cloud>		Cloud cover on Zone 0 of MS1 Image	UShort	0-9	a	x
			<Section>		id	Zone 1 of MS1 Image	UShort	1	a	x
				<Cloud>		Cloud cover on Zone 1 of MS1 Image	UShort	0-9	a	x

			<Section>		id	Zone 2 of MS1 Image	UShort	2	a	x
				<Cloud>		Cloud cover on Zone 2 of MS1 Image	UShort	0-9	a	x
			<Section>		id	Zone 3 of MS1 Image	UShort	3	a	x
				<Cloud>		Cloud cover on Zone 3 of MS1 Image	UShort	0-9	a	x
		<DNRange>				Dynamic range of MS1 Image				
			<MinimumDN>			Minimum value of pixels in MS1 Image	UShort		a	x
			<MaximumDN>			Maximum value of pixels in MS1 Image	UShort		a	x
		<ImageGSD>				Ground Sample Distance of MS1 Image				
			<Column>			Column Pseudo GSD (Across Track) of the center pixel of MS1 Image	Double	Meter	a	m
			<Row>			Row Pseudo GSD (Along Track) of the center pixel of MS1 Image	Double	Meter	a	m
		<SatellitePosition>				Position of the satellite when the center pixel of MS1 Image has been acquired				
			<Altitude>			Altitude of the satellite when the center pixel of MS1 Image has been acquired	Double	Kilometer	a	x
			<SSPLatitude>			Latitude of the sub-satellite point when the center pixel of MS1 Image has been	Double	Degree (decimal)	a	x
			<SSPLongitude>			Longitude of the sub-satellite point when the center pixel of MS1 Image has been	Double	Degree (decimal)	a	x
		<ImageQuality>				Quality of MS1 Image	String		a	x
		<Bandwidth>				Bandwidth of MS1 channel	UShort	Nanometer	a	x
		<RadianceConversion>				Coefficient applied in converting digital number of MS1 Image into radiance				
			<Gain>			Gain applied in converting digital number of MS1 Image into radiance	Double		a	x
			<Offset>			Offset applied in converting digital number of MS1 Image into radiance	Double		a	x
	<FocalLength>					Focal length of optical system used in generating MS1 Image	Double	meter	a	x

	<CCDAlignment>					MS1 CCD Alignment Offset	String	Offset & Gain (fx, fy, lx, ly) in Along/Across Track directions	a	x
	<MS2>					Root Element of <MS2>				
		<ImageFileName>				Filename of MS2 Image File	String		a	m
		<ImageLevel>				Level of MS2 Image File	String	Level1R, Level1G	a	m
		<ImageColor>				Color of MS2 Image	String	Green	a	x
		<ImagingTime>				Acquisition Time for MS2 Image				
			<ImagingStartTime>			Acquisition Start Time for the 1st line of MS2 Image				
				<UTC>		Acquisition Time for the 1st line of MS2 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the 1st line of MS2 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the 1st line of MS2 Image (Julian Day)	Double		a	x
			<ImagingCenterTime>			Acquisition Start Time for the middle line of MS2 Image				
				<UTC>		Acquisition Time for the middle line of MS2 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the middle line of MS2 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the middle line of MS2 Image (Julian Day)	Double		a	x
			<ImagingEndTime>			Acquisition Start Time for the last line of MS2 Image				
				<UTC>		Acquisition Time for the last line of MS2 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the last line of MS2 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the last line of MS2 Image (Julian Day)	Double		a	x
			<ImagingDuration>			Imaging duration of MS2 Image	Double	second	a	x
			<LineScanTime>			Acquisition Time for one line of MS2 Image	Double	Micro-sec	a	x
		<ImageSize>				Size of MS2 Image File				
			<Width>			Number of Columns of MS2 Image	Int		a	m

			<Height>			Number of Rows of MS2 Image	Int		a	m
		<ImagingCoordinates>				Coordinates of MS2 Image				
			<ImageCoordCenter>			Image coordinates of the center pixel of MS2 Image				
				<Column>		Column number of the center pixel of MS2 Image	Int		a	m
				<Row>		Row number of the center pixel of MS2 Image	Int		a	m
			<ImageGeogCenter>			Geographic coordinates of the center pixel of MS2 Image				
				<Latitude>		Latitude corresponding to the center pixel of MS2 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the center pixel of MS2 Image	Double	Degree (decimal)	a	m
			<ImageGeogTL>			Geographic coordinates of the top left pixel of MS2 Image				
				<Latitude>		Latitude corresponding to the top left pixel of MS2 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top left pixel of MS2 Image	Double	Degree (decimal)	a	m
			<ImageGeogTC>			Geographic coordinates of the top center pixel of MS2 Image				
				<Latitude>		Latitude corresponding to the top center pixel of MS2 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top center pixel of MS2 Image	Double	Degree (decimal)	a	m
			<ImageGeogTR>			Geographic coordinates of the top right pixel of MS2 Image				
				<Latitude>		Latitude corresponding to the top right pixel of MS2 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top right pixel of MS2 Image	Double	Degree (decimal)	a	m
			<ImageGeogBL>			Geographic coordinates of the bottom left pixel of MS2 Image				
				<Latitude>		Latitude corresponding to the bottom left pixel of MS2 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom left pixel of MS2 Image	Double	Degree (decimal)	a	m

			<ImageGeogBC>			Geographic coordinates of the bottom center pixel of MS2 Image				
				<Latitude>		Latitude corresponding to the bottom center pixel of MS2 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom center pixel of MS2 Image	Double	Degree (decimal)	a	m
			<ImageGeogBR>			Geographic coordinates of the bottom right pixel of MS2 Image				
				<Latitude>		Latitude corresponding to the bottom right pixel of MS2 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom right pixel of MS2 Image	Double	Degree (decimal)	a	m
		<Angle>								
			<Roll>			Roll tilt angle when the center pixel of MS2 Image has been acquired	Double	Degree (decimal)	a	m
			<Pitch>			Pitch tilt angle when the center pixel of MS2 Image has been acquired	Double	Degree (decimal)	a	m
			<Yaw>			Yaw tilt angle when the center pixel of MS2 Image has been acquired	Double	Degree (decimal)	a	m
			<Incidence>			Incidence angle when the center pixel of MS2 Image has been acquired	Double	Degree (decimal)	a	m
			<Azimuth>			Azimuth angle when the center pixel of MS2 Image has been acquired	Double	Degree (decimal)	a	m
		<CloudCover>				Cloud Cover on MS2 Image				
			<Average>			Average of cloud cover on MS2 Image	UShort	0-9	a	x
			<Section>		id	Zone 0 of MS2 Image	UShort	0	a	x
				<Cloud>		Cloud cover on Zone 0 of MS2 Image	UShort	0-9	a	x
			<Section>		id	Zone 1 of MS2 Image	UShort	1	a	x
				<Cloud>		Cloud cover on Zone 1 of MS2 Image	UShort	0-9	a	x
			<Section>		id	Zone 2 of MS2 Image	UShort	2	a	x
				<Cloud>		Cloud cover on Zone 2 of MS2 Image	UShort	0-9	a	x
			<Section>		id	Zone 3 of MS2 Image	UShort	3	a	x
				<Cloud>		Cloud cover on Zone 2 of MS2 Image	UShort	0-9	a	x

		<DNRange>			Dynamic range of MS2 Image				
			<MinimumDN>		Minimum value of pixels in MS2 Image	UShort		a	x
			<MaximumDN>		Maximum value of pixels in MS2 Image	UShort		a	x
		<ImageGSD>			Ground Sample Distance of MS2 Image				
			<Column>		Column Pseudo GSD (Across Track) of the center pixel of MS2 Image	Double	Meter	a	m
			<Row>		Row Pseudo GSD (Along Track) of the center pixel of MS2 Image	Double	Meter	a	m
		<SatellitePosition>			Position of the satellite when the center pixel of MS2 Image has been acquired				
			<Altitude>		Altitude of the satellite when the center pixel of MS2 Image has been acquired	Double	Kilometer	a	x
			<SSPLatitude>		Latitude of the sub-satellite point when the center pixel of MS2 Image has been	Double	Degree (decimal)	a	x
			<SSPLongitude>		Longitude of the sub-satellite point when the center pixel of MS2 Image has been	Double	Degree (decimal)	a	x
		<ImageQuality>			Quality of MS2 Image	String		a	x
		<Bandwidth>			Bandwidth of MS2 channel	UShort	Nanometer	a	x
		<RadianceConversion>			Coefficient applied in converting digital number of MS2 Image into radiance				
			<Gain>		Gain applied in converting digital number of MS2 Image into radiance	Double		a	x
			<Offset>		Offset applied in converting digital number of MS2 Image into radiance	Double		a	x
	<FocalLength>				Focal length of optical system used in generating MS2 Image	Double	meter	a	x
	<CCDAlignment>				MS2 CCD Alignment Offset	String	Offset & Gain (fx, fy, lx, ly) in Along/Across Track directions	a	x
	<MS3>				Root Element of <MS3>				
		<ImageFileName>			Filename of MS3 Image File	String		a	m
		<ImageLevel>			Level of MS3 Image File	String	Level1R, Level1G	a	m

		<ImageColor>				Color of MS3 Image	String	Red	a	x
		<ImagingTime>				Acquisition Time for MS3 Image				
			<ImagingStartTime>			Acquisition Start Time for the 1st line of MS3 Image				
				<UTC>		Acquisition Time for the 1st line of MS3 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the 1st line of MS3 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the 1st line of MS3 Image (Julian Day)	Double		a	x
			<ImagingCenterTime>			Acquisition Start Time for the middle line of MS3 Image				
				<UTC>		Acquisition Time for the middle line of MS3 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the middle line of MS3 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the middle line of MS3 Image (Julian Day)	Double		a	x
			<ImagingEndTime>			Acquisition Start Time for the last line of MS3 Image				
				<UTC>		Acquisition Time for the last line of MS3 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the last line of MS3 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the last line of MS3 Image (Julian Day)	Double		a	x
			<ImagingDuration>			Imaging duration of MS3 Image	Double	second	a	x
			<LineScanTime>			Acquisition Time for one line of MS3 Image	Double	Micro-sec	a	x
		<ImageSize>				Size of MS3 Image File				
			<Width>			Number of Columns of MS3 Image	Int		a	m
			<Height>			Number of Rows of MS3 Image	Int		a	m
		<ImagingCoordinates>				Coordinates of MS3 Image				
			<ImageCoordCenter>			Image coordinates of the center pixel of MS3 Image				

				<Column>		Column number of the center pixel of MS3 Image	Int		a	m
				<Row>		Row number of the center pixel of MS3 Image	Int		a	m
			<ImageGeogCenter>			Geographic coordinates of the center pixel of MS3 Image				
				<Latitude>		Latitude corresponding to the center pixel of MS3 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the center pixel of MS3 Image	Double	Degree (decimal)	a	m
			<ImageGeogTL>			Geographic coordinates of the top left pixel of MS3 Image				
				<Latitude>		Latitude corresponding to the top left pixel of MS3 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top left pixel of MS3 Image	Double	Degree (decimal)	a	m
			<ImageGeogTC>			Geographic coordinates of the top center pixel of MS3 Image				
				<Latitude>		Latitude corresponding to the top center pixel of MS3 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top center pixel of MS3 Image	Double	Degree (decimal)	a	m
			<ImageGeogTR>			Geographic coordinates of the top right pixel of MS3 Image				
				<Latitude>		Latitude corresponding to the top right pixel of MS3 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top right pixel of MS3 Image	Double	Degree (decimal)	a	m
			<ImageGeogBL>			Geographic coordinates of the bottom left pixel of MS3 Image				
				<Latitude>		Latitude corresponding to the bottom left pixel of MS3 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom left pixel of MS3 Image	Double	Degree (decimal)	a	m
			<ImageGeogBC>			Geographic coordinates of the bottom center pixel of MS3 Image				
				<Latitude>		Latitude corresponding to the bottom center pixel of MS3 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom center pixel of MS3 Image	Double	Degree (decimal)	a	m

			<ImageGeogBR>			Geographic coordinates of the bottom right pixel of MS3 Image				
				<Latitude>		Latitude corresponding to the bottom right pixel of MS3 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom right pixel of MS3 Image	Double	Degree (decimal)	a	m
		<Angle>								
			<Roll>			Roll tilt angle when the center pixel of MS3 Image has been acquired	Double	Degree (decimal)	a	m
			<Pitch>			Pitch tilt angle when the center pixel of MS3 Image has been acquired	Double	Degree (decimal)	a	m
			<Yaw>			Yaw tilt angle when the center pixel of MS3 Image has been acquired	Double	Degree (decimal)	a	m
			<Incidence>			Incidence angle when the center pixel of MS3 Image has been acquired	Double	Degree (decimal)	a	m
			<Azimuth>			Azimuth angle when the center pixel of MS3 Image has been acquired	Double	Degree (decimal)	a	m
		<CloudCover>				Cloud Cover on MS3 Image				
			<Average>			Average of cloud cover on MS3 Image	UShort	0-9	a	x
			<Section>		id	Zone 0 of MS3 Image	UShort	0	a	x
				<Cloud>		Cloud cover on Zone 0 of MS3 Image	UShort	0-9	a	x
			<Section>		id	Zone 1 of MS3 Image	UShort	1	a	x
				<Cloud>		Cloud cover on Zone 1 of MS3 Image	UShort	0-9	a	x
			<Section>		id	Zone 2 of MS3 Image	UShort	2	a	x
				<Cloud>		Cloud cover on Zone 2 of MS3 Image	UShort	0-9	a	x
			<Section>		id	Zone 3 of MS3 Image	UShort	3	a	x
				<Cloud>		Cloud cover on Zone 3 of MS3 Image	UShort	0-9	a	x
		<DNRange>				Dynamic range of MS3 Image				
			<MinimumDN>			Minimum value of pixels in MS3 Image	UShort		a	x
			<MaximumDN>			Maximum value of pixels in MS3 Image	UShort		a	x

		<ImageGSD>			Ground Sample Distance of MS3 Image				
			<Column>		Column Pseudo GSD (Across Track) of the center pixel of MS3 Image	Double	Meter	a	m
			<Row>		Row Pseudo GSD (Along Track) of the center pixel of MS3 Image	Double	Meter	a	m
		<SatellitePosition>			Position of the satellite when the center pixel of MS3 Image has been acquired				
			<Altitude>		Altitude of the satellite when the center pixel of MS3 Image has been acquired	Double	Kilometer	a	x
			<SSPLatitude>		Latitude of the sub-satellite point when the center pixel of MS3 Image has been	Double	Degree (decimal)	a	x
			<SSPLongitude>		Longitude of the sub-satellite point when the center pixel of MS3 Image has been	Double	Degree (decimal)	a	x
		<ImageQuality>			Quality of MS3 Image	String		a	x
		<Bandwidth>			Bandwidth of MS3 channel	UShort	Nanometer	a	x
		<RadianceConversion>			Coefficient applied in converting digital number of MS3 Image into radiance				
			<Gain>		Gain applied in converting digital number of MS3 Image into radiance	Double		a	x
			<Offset>		Offset applied in converting digital number of MS3 Image into radiance	Double		a	x
	<FocalLength>				Focal length of optical system used in generating MS3 Image	Double	meter	a	x
	<CCDAlignment>				MS3 CCD Alignment Offset	String	Offset & Gain (fx, fy, lx, ly) in Along/Across Track directions	a	x
	<MS4>				Root Element of <MS4>				
		<ImageFileName>			Filename of MS4 Image File	String		a	m
		<ImageLevel>			Level of MS4 Image File	String	Level1R, Level1G	a	m
		<ImageColor>			Color of MS4 Image	String	Near Infrared	a	x
		<ImagingTime>			Acquisition Time for MS4 Image				
			<ImagingStartTime>		Acquisition Start Time for the 1st line of MS4 Image				

				<UTC>		Acquisition Time for the 1st line of MS4 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the 1st line of MS4 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the 1st line of MS4 Image (Julian Day)	Double		a	x
			<ImagingCenterTime>			Acquisition Start Time for the middle line of MS4 Image				
				<UTC>		Acquisition Time for the middle line of MS4 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the middle line of MS4 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the middle line of MS4 Image (Julian Day)	Double		a	x
			<ImagingEndTime>			Acquisition Start Time for the last line of MS4 Image				
				<UTC>		Acquisition Time for the last line of MS4 Image (UTC)	String	YYYYMMDDHHMMSS.ssssss	a	x
				<JulianDay>		Acquisition Time for the last line of MS4 Image (Julian Day)	Int		a	x
				<JulianFraction>		Acquisition Time for the last line of MS4 Image (Julian Day)	Double		a	x
			<ImagingDuration>			Imaging duration of MS4 Image	Double	second	a	x
			<LineScanTime>			Acquisition Time for one line of MS4 Image	Double	Micro-sec	a	x
		<ImageSize>				Size of MS4 Image File				
			<Width>			Number of Columns of MS4 Image	Int		a	m
			<Height>			Number of Rows of MS4 Image	Int		a	m
		<ImagingCoordinates>				Coordinates of MS4 Image				
			<ImageCoordCenter>			Image coordinates of the center pixel of MS4 Image				
				<Column>		Column number of the center pixel of MS4 Image	Int		a	m
				<Row>		Row number of the center pixel of MS4 Image	Int		a	m
			<ImageGeogCenter>			Geographic coordinates of the center pixel of MS4 Image				

				<Latitude>		Latitude corresponding to the center pixel of MS4 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the center pixel of MS4 Image	Double	Degree (decimal)	a	m
			<ImageGeogTL>			Geographic coordinates of the top left pixel of MS4 Image				
				<Latitude>		Latitude corresponding to the top left pixel of MS4 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top left pixel of MS4 Image	Double	Degree (decimal)	a	m
			<ImageGeogTC>			Geographic coordinates of the top center pixel of MS4 Image				
				<Latitude>		Latitude corresponding to the top center pixel of MS4 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top center pixel of MS4 Image	Double	Degree (decimal)	a	m
			<ImageGeogTR>			Geographic coordinates of the top right pixel of MS4 Image				
				<Latitude>		Latitude corresponding to the top right pixel of MS4 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the top right pixel of MS4 Image	Double	Degree (decimal)	a	m
			<ImageGeogBL>			Geographic coordinates of the bottom left pixel of MS4 Image				
				<Latitude>		Latitude corresponding to the bottom left pixel of MS4 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom left pixel of MS4 Image	Double	Degree (decimal)	a	m
			<ImageGeogBC>			Geographic coordinates of the bottom center pixel of MS4 Image				
				<Latitude>		Latitude corresponding to the bottom center pixel of MS4 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom center pixel of MS4 Image	Double	Degree (decimal)	a	m
			<ImageGeogBR>			Geographic coordinates of the bottom right pixel of MS4 Image				
				<Latitude>		Latitude corresponding to the bottom right pixel of MS4 Image	Double	Degree (decimal)	a	m
				<Longitude>		Longitude corresponding to the bottom right pixel of MS4 Image	Double	Degree (decimal)	a	m

		<Angle>							
			<Roll>		Roll tilt angle when the center pixel of MS4 Image has been acquired	Double	Degree (decimal)	a	m
			<Pitch>		Pitch tilt angle when the center pixel of MS4 Image has been acquired	Double	Degree (decimal)	a	m
			<Yaw>		Yaw tilt angle when the center pixel of MS4 Image has been acquired	Double	Degree (decimal)	a	m
			<Incidence>		Incidence angle when the center pixel of MS4 Image has been acquired	Double	Degree (decimal)	a	m
			<Azimuth>		Azimuth angle when the center pixel of MS4 Image has been acquired	Double	Degree (decimal)	a	m
		<CloudCover>			Cloud Cover on MS4 Image				
			<Average>		Average of cloud cover on MS4 Image	UShort	1-9	a	x
			<Section>	id	Zone 0 of MS4 Image	UShort	0	a	x
				<Cloud>	Cloud cover on Zone 0 of MS4 Image	UShort	1-9	a	x
			<Section>	id	Zone 1 of MS4 Image	UShort	1	a	x
				<Cloud>	Cloud cover on Zone 1 of MS4 Image	UShort	1-9	a	x
			<Section>	id	Zone 2 of MS4 Image	UShort	2	a	x
				<Cloud>	Cloud cover on Zone 2 of MS4 Image	UShort	1-9	a	x
			<Section>	id	Zone 3 of MS4 Image	UShort	3	a	x
				<Cloud>	Cloud cover on Zone 3 of MS4 Image	UShort	1-9	a	x
		<DNRange>			Dynamic range of MS4 Image				
			<MinimumDN>		Minimum value of pixels in MS4 Image	UShort		a	x
			<MaximumDN>		Maximum value of pixels in MS4 Image	UShort		a	x
		<ImageGSD>			Ground Sample Distance of MS4 Image				
			<Column>		Column Pseudo GSD (Across Track) of the center pixel of MS4 Image	Double	Meter	a	m
			<Row>		Row Pseudo GSD (Along Track) of the center pixel of MS4 Image	Double	Meter	a	m

		<SatellitePosition>			Position of the satellite when the center pixel of MS4 Image has been acquired				
			<Altitude>		Altitude of the satellite when the center pixel of MS4 Image has been acquired	Double	Kilometer	a	x
			<SSPLatitude>		Latitude of the sub-satellite point when the center pixel of MS4 Image has been	Double	Degree (decimal)	a	x
			<SSPLongitude>		Longitude of the sub-satellite point when the center pixel of MS4 Image has been	Double	Degree (decimal)	a	x
		<ImageQuality>			Quality of MS4 Image	String		a	x
		<Bandwidth>			Bandwidth of MS4 channel	UShort	Nanometer	a	x
		<RadianceConversion>			Coefficient applied in converting digital number of MS4 Image into radiance				
			<Gain>		Gain applied in converting digital number of MS4 Image into radiance	Double		a	x
			<Offset>		Offset applied in converting digital number of MS4 Image into radiance	Double		a	x
	<FocalLength>				Focal length of optical system used in generating MS4 Image	Double	meter	a	x
	<CCDAlignment>				MS4 CCD Alignment Offset	String	Offset & Gain (fx, fy, lx, ly) in Along/Across Track directions	a	x

4. REGULATION GOVERNING IMAGE DSITRIBUTION

4.1 Copyright

In brief, copyright covers a certain number of rights granted to the author of an original work, whether scientific or artistic in nature, which are added to the usual right of ownership. At least under the copyright laws of the Republic of Korea, these rights are granted exclusively and automatically.

The users of KOMPSAT-3 data acknowledge the right of KARI to copyright protection and/or protection against unauthorized use of the KOMPSAT-3 products, in accordance with the copyright laws of the Republic of Korea and applicable international agreements. The intellectual property rights related to the KOMPSAT-3 products are protected through the end-user license agreement. The user of KOMPSAT-3 data undertake to have printed the following copyright notice on all products, in such a way that KARI/s copyright be plain to all "ⓒKARI _____(year of production), Distribution (SI Imaging Services, Republic of Korea)"

The author of a Derived Works and Products is entitled to his own copyright in return for his creative contribution. This copyright is complementary to that owned by KARI.

4.2 General Terms of Sale

When the user buys KOMPSAT-3 image and pays the current stated price, the user obtains in return one or more copies of the products requested. However, the sale is subject to the following conditions;

- The user can only use the KOMPSAT-3 products for his own private needs and is forbidden to make these products or reproductions of these products available to a third party, either on a non-paying or a paying basis, whether temporarily or permanently.
- However, KARI may grant approval to the user to sell these data and reproductions derived from them.
- All KOMPSAT-3 products (including data and derived works) must bear the indication: all "ⓒKARI _____(year of production), Distribution (SI Imaging Services, Republic of Korea)"and be accompanied by a note setting forth the above regulations.

Purchase of KOMPSAT-3 image gives the owner what is generally referred to as a right of private use, which includes the right to transform the image. On the other hand, any and all

collective and public use is prohibited and particularly right to distribute the image.

4.3 Permitted Uses

The END-USER is permitted by KARI a limited, non-exclusive, non-transferable license:

(a) to install the PRODUCT on as many individual computers as needed in its premises, including internal computer network (with the express exclusion of the internet, except as provided under paragraph (g) below) for the Permitted Uses under paragraphs (b) to (i) below;

(b) to make a maximum of ten (10) copies for (I) installation of the PRODUCT as per paragraph (a) above and (II) archiving and back-up purposes;

(c) to use the PRODUCT for its own internal needs;

(d) to alter or modify the PRODUCT to produce VAPs and/or DERIVATIVE WORKS;

(e) to use any VAP for its own internal needs;

(f) to make available the PRODUCT and/or any VAP to contractors and consultants, only for use on behalf of the END-USER, subject to such contractors and consultants agreeing in writing (I) to be bound by the same limitations on use as applicable to the END-USER, and (II) to return the PRODUCT and VAP to END-USER, and to keep no copy thereof, upon completion of the contracting or consulting engagement;

(g) to post an extract, maximum size 1024 x 1024 pixels, of a PRODUCT or a VAP on an internet site, in a JPEG format, with the following credit conspicuously displayed: "includes material © KARI _____(year of production), Distribution (SI Imaging Services, Republic of Korea), all rights reserved" written in full. Such posting shall be used for promotion purposes only, and may in no event allow downloading of the extract posted, nor be used to distribute, sell, assign, dispose of, lease, sublicence or transfer such extract. Prior to any posting, the END-USER shall inform KARI, specifying the URL address used by END-USER: kocust@kari.re.kr;

(h) to print any extract, maximum size 1024 x 1024 pixels, of a PRODUCT or a VAP, and to distribute such print for promotion purposes only. Such print shall include the following credit conspicuously displayed: "includes material ©KARI _____(year of production), Distribution (SI Imaging Services, Republic of Korea), all rights reserved" written in full;

(i) to distribute DERIVATIVE WORKS.

All rights not expressly granted by KARI under the present Article 2.1 are hereby retained by KARI.

4.4 Prohibited Uses

The END-USER recognizes and agrees that the PRODUCT is and shall remain the property of KARI, and contains proprietary information of KARI and thus is provided to the END-USER on a confidential basis.

The END-USER shall not cause any contractor or consultant engaged as per the provisions of Section 4.3(f) to, do any of the following:

(a) do anything not expressly authorized under Section 4.3; and

(b) alter or remove any copyright notice or proprietary legend contained in or on the PRODUCTS.

5. LICENSING

All KOMPSAT-3 image products are subject to the terms of an end-user license that will be provided to the user at the time of delivery. The following commercial licenses are currently available from SI Imaging Services. Certain amount of uplift will be applied to the price for Muli-user, Expand, and Enterprise license and certain amount of discount will be applied to the price for Academic license.

Table 5-1 License

License Type	User copy	Description
Standard	1~5	Permits INTERNAL use of KOMPSAT-3 image product within 1 to 5 users* as identified by the customer at the time of purchase.
Multi-user	6~10	Permits INTERNAL use of KOMPSAT-3 image product within 6 to 10 users* as identified by the customer at the time of purchase.
Expand	11~25	Permits INTERNAL use of KOMPSAT-3 image product within 11 to 25 users* as identified by the customer at the time of purchase.
Enterprise	26+	Permits INTERNAL use of KOMPSAT-3 image product within ANY users* as identified by the customer at the time of purchase.
Academic	1~5	Permits ACADEMIC use of KOMPSAT-3 image product within 1 to 5 users* as identified by the customer at the time of purchase.

- Definition of User includes
  - One private individual
  - One company or corporation but not subsidiaries
  - One state or provincial agency

- All departments of one county government
- All departments of one city government
- One Non-Governmental Organization or Non-Profit Organization
- All departments within a single educational organization within a single country
- One International Agency(such as United Nations) and the sponsoring host nation.

6. WARRANTY INFORMATION

- SI Imaging Services warrants that it has sufficient ownership rights in the PRODUCT to make the PRODUCT available to the END-USER under the terms thereof.
- The PRODUCT is complex; SI Imaging Services does not warrant that the PRODUCT is free of bugs, errors, defects or omissions, and that operation of the PRODUCT will be error free or uninterrupted nor that all non-conformities will or can be corrected. It does not warrant that the PRODUCT shall meet the END-USER's requirements or expectations, or shall be fit for the END-USER's intended purposes. There are no express or implied warranties of fitness or merchantability given in connection with the sale or use of this PRODUCT. SI Imaging Services disclaims all other warranties not expressly provided in End User License Agreement(EULA). In case the medium on which the PRODUCT is supplied by SI Imaging Services to the END-USER is deficient, as demonstrated by the END-USER and accepted by SI Imaging Services, SI Imaging Services shall replace said medium. Any such claim for replacement shall be submitted to SI Imaging Services within seven (7) days after delivery of the PRODUCT to the END-USER.
- In no event shall KARI nor SI Imaging Services, nor anybody having contributed to the development and/or production and/or delivery of the PRODUCT, be liable for any claim, damage or loss incurred by the END-USER, including without limitation indirect, compensatory, consequential, incidental, special, incorporeal or exemplary damages arising out of the use of or inability to use the PRODUCT, and shall not be subject to legal action in this respect. The financial cumulative liability of KARI and SI Imaging Services and of anybody having contributed to developing and/or production and/or delivery of the PRODUCT is limited to distribution of the PRODUCT and shall not in any case exceed the price paid by the END-USER to purchase the PRODUCT.

7. NEW TASKING OPTIONS

- **Minimum Order Size**

The minimum order size of the new tasking order is 100 km^2.

- **Product Type**

Bundle (PAN + MS) or Pan-sharpened are available. Product type needs to be specified on the order form.

- **Product Level**

1R and 1G are available. Product level needs to be specified on the order form.

- **Area of Interest (AOI)**

AOI needs to be specified in the order form as one of following method.

- Circle: center latitude and longitude, radius in km
- Rectangle: latitude and longitude of 4 corners (UL, UR, LL, LR)
- File: shape file or KML/KMZ file.
- Minimum swath of AOI is 5 km.

- **Cloud Cover**

All imagery products acquired by the new tasking order will contain less than equal to 20% cloud cover unless cloud cover condition is specified in the order form.

Certain amount of uplifts will be applied to the price for the cloud cover <=10%.

- **Imaging Mode**

Three imaging modes from the KOMPSAT-3 imaging modes in section 2.3 are available for the new tasking order: **Strip Imaging, Single Pass Stereo Imaging, and Wide Area Along Imaging**. Certain amount of uplift will be applied to the prices for the Single Pass Stereo Imaging and Wide Area Along Imaging.

- **Roll Tilt Angle**

The roll tilt angle at which an image is collected will have impact on the GSD, the look of the image, and the chance of imaging (re-visit time) as well as delivery schedule. The roll tilt angle has no impact on price.

- **Tasking Priority**

Table 7-1. New Tasking Priority

New Tasking Option	Priority	Description	Nominal collection window
Priority Plus	Very High	**Emergency**: Tasking is guaranteed within 4 days from the order if feasible. No feasibility study report is provided and no guarantee for tasking, cloud cover and/or tilt angle constraint. **Assured**: After feasibility study, the tasking on specified date has highest priority among commercial orders. No guarantee for cloud cover.	4 days or specific date
Priority	Higher	Feasibility proposal is provided If acquisition is not completed during the collection window, user changed its priority to Standard or update collection window to continue acquisition	4 weeks
Standard	Standard	Feasibility proposal is provided If acquisition is not completed during the collection window, the tasking shall be canceled automatically.	12 weeks or more

Certain amount of uplift will be applied to the price for Priority and Priority Plus.

- **Delivery Schedule**

Delivery time would not be guaranteed because of area of interest, collection parameters, weather condition, and so on.

8. ARCHIVE ORDER OPTIONS AND DELIVERY SCHEDULE

- **Minimum Order Size**

The minimum order size of the archive order is currently 25 km^2. Minimum swath of AOI should be greater than 5 km.

- **Media**

KOMPSAT-3 image products are delivered on DVD or electronically via FTP. Media need to be specified on the order form.

- **Product Type**

Bundle (PAN + MS) or Pan-sharpened are available. Product type needs to be specified on the order form.

- **Product Level**

1R and 1G are available. Product level needs to be specified on the order form.

- **Delivery Service**

Delivery services are applied only for the archive order. Delivery service needs to be specified on the order form. Standard delivery would be applied as default.

Table 8-1 Delivery Service (Archive Order)

[Delivery Service] : only for Archive Orders	
Standard	3 working days** after confirmation of order
Rush	1 working days** after confirmation of order

** Duration required for delivery depends on the volume of order. The above figure indicates usual duration for a single scene. The duration is not guaranteed and commercially reasonable efforts will be applied.

Certain amount of uplifts will be applied to the price for the Rush delivery service.

Customer Support or regional reseller will provide information when a product will be processed, and how soon it can be delivered.

9. ORDERING INFORMATION

9.1 How to Order KOMPSAT-3 Image Data

Order for new tasking or the archived image may be placed by two methods:

- Through regional reseller: Contact information of each reseller can be founded on SI Imaging Services home page.
- By calling SI Imaging Services customer support representatives

  ◆ Customer Support Representative
  - E-mail : sales@si-imaging.com
  - Phone : +82-70-7006-6058
  - Hours of Operation : 09:00am ~ 06:00 PM (+9GMT), Monday to Friday
  - Web : http://si-imaging.com
  - Address : 441 Expo-ro, Yuseong-gu, Daejeon, 305-714, Korea

9.1.1 Order Process

In case of order through the regional reseller, ordering process is as per SIIS - Reseller interface. The client requests the new tasking order or archive order to reseller, and the reseller will provide all support required for ordering to the customer.

In case of order directly inputted to SIIS, steps in the ordering process for new tasking order and archive order are as follows:

Figure 9-1. Order Process

9.1.2 Cancellation Policy

To avoid unnecessary operation of satellite and to maximize operation for image processing, a cancellation fee would be applicable to orders that are cancelled after the order has been confirmed. Cancelation condition and fee are described in the following table.

Table 9-1. Cancellation Fee

Orders	Conditions	Cancellation Fee
Archive	before processing start	no charge
	after processing start	100%
New Tasking	24 hours before imaging	30%
	otherwise	100%

9.2 Catalog Search

The customers for KOMPSAT-3 data can access the search and catalog system for KOMPSAT-3 data through Arirang Satellite Image Search (http://arirang.kari.re.kr) website.

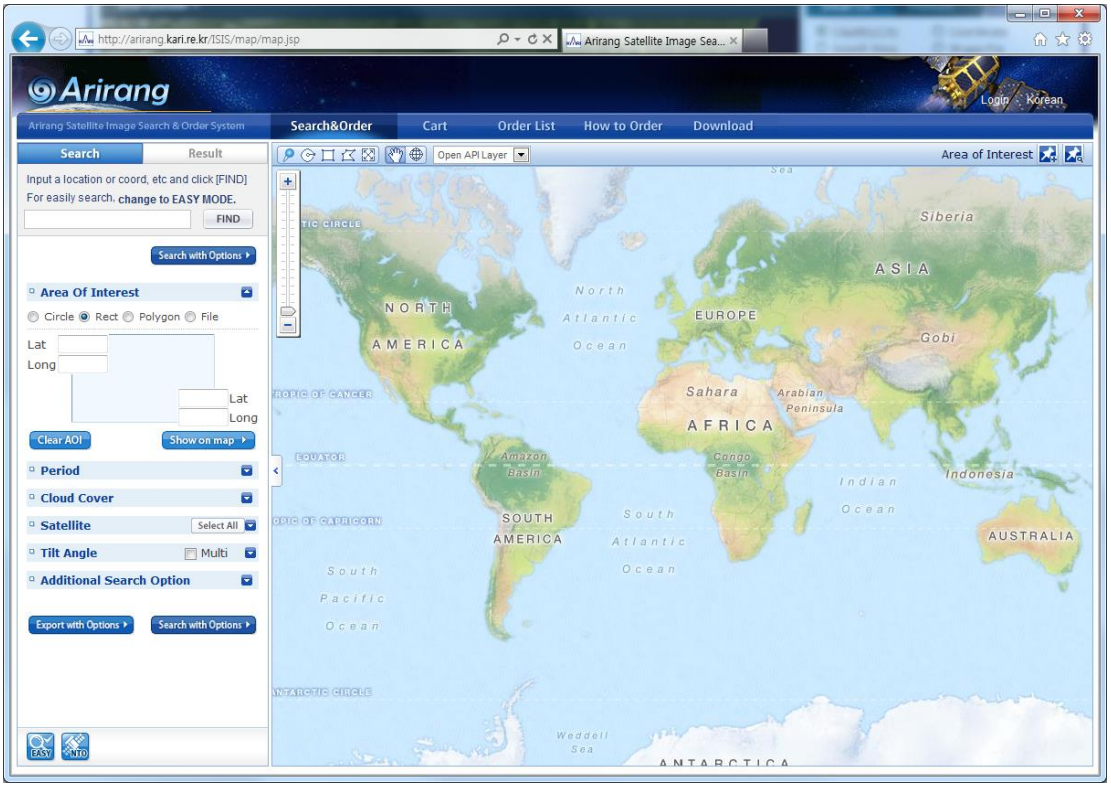

Figure 9-2 Arirang Satellite Image Search Homepage

10. SAMPLE ORDER FORM

This order form is for both new tasking order and archive order. Customer should fill appropriate conditions in the order form, sign at the end of page, then send it to user desk at SI Imaging Services.

KOMPSAT Imagery Products Order Form

SI Imaging Services
Satrec Initiative Group

www.si-imaging.com / Contact US: sales@si-imaging.com / 441, Expo-ro, Yuseong-gu, Daejeon, 305-714, Republic of Korea

Order Date : (dd/mm/yyyy)	**/ / (GMT)**	**OrderID : (internal use only)**

Reseller / Purchaser Information

Billing Info ☐ Purchaser is also End User

Company :	Division :
Contact name :	Position :
Address :	
Country :	
Phone No :	Fax No :
E-mail :	

Shipping Info ☐ Same as Billing Info

Company :	Division :
Contact name :	Position :
Address :	
Country :	
Phone No :	Fax No :
E-mail :	

General Order Information

☐ *New Task Order* ☐ *Archive Order*

1. Licensing Information

☐ Standard licence (1~5)

☐ Multi-User licence (6~10)

☐ Expand (11~25)

☐ Enterprise (26+)

☐ Academic

2. Application Fields

☐ Agriculture	☐ Mapping and Land management	☐ Defense and Security
☐ Forestry	☐ Maritime and Coastal	☐ Natural Resources and Engineering
☐ Hazards	☐ Urban Planning	☐ Other :

Production Specifications

New Task Order Info

1. Product Type (GeoTiff)

(1) Satellite : ☐ KOMPSAT-2 ☐ KOMPSAT-3 ☐ KOMPSAT-2 & -3 (mixed)

(2) Produt Type : ☐ Bundle(Pan+MS) ☐ Pan-Sharpened

(3) Product Level : ☐ 1R ☐ 1G

1R : Radiometric Correction

1G : K2 - Georectified without GCP , K3 – Georectified without GCP(Orthorectified Imagery)

(4) Ancillary Precision : ☐ Normal ☐ Precise

2. Parameters

(1) Term of Validity : / / ~ / / (dd/mm/yyyy)

(2) Tilt Angle (±30) : ± °

(3) Stereo : ~ , ~ (exa :-30~0, 0~30)

☐ Multi Pass Stereo(K2,K3) ☐ Single Pass Stereo(K3)

(4) Cloud Coverage : ☐ 0% ☐ <=10% ☐ <=15% ☐<=20% ☐<=30% ☐ <=50%

(5) Snow&Ice : ☐ 0% ☐ <=10% ☐ <=20% ☐<=30% ☐ <=50%

(6) Haze&Sand Wind : ☐No ☐Yes

3. Priority

☐ Priority Plus (specific date : dd/mm/yyyy) ☐ Priority ☐ Standard

4. Delivery Media

☐ FTP ☐ DVD

5. Request Zone info

Country : Place Name :

6. AOI

Surface : km^2

(Minimum order size : 100 km^2 / Minimum swath is 5 km at least)

(Stereo Products : Minimum order size : 100 km^2 / Minimum swath is 10 km at least)

☐ Circle

Center Latitude	Center Longitude	Radius

☐ Rectangle

	Latitude	Longitude
UL		
UR		
LL		
LR		

☐ Shapefile or KML/KMZ file

File Name :

7. Additional Description

Archive Order Info

1. Scene or File List (http://arirang.kari.re.kr)

Scene ID (or File Name)				
Country/Place				
Option	Shift (default Value : 0)		Order Size (km^2 or scene)	
	Product Type		Process Level	
	Delivery Media		Delivery Service	
Scene ID (or File Name)				
Country/Place				
Option	Shift (default Value : 0)		Order Size (km^2 or scene)	
	Product Type		Process Level	
	Delivery Media		Delivery Service	
Scene ID (or File Name)				
Country/Place				
Option	Shift (default Value : 0)		Order Size (km^2 or scene)	
	Product Type		Process Level	
	Delivery Media		Delivery Service	
Scene ID (or File Name)				
Country/Place				
Option	Shift (default Value : 0)		Order Size (km^2 or scene)	
	Product Type		Process Level	
	Delivery Media		Delivery Service	
Scene ID (or File Name)				
Country/Place				
Option	Shift (default Value : 0)		Order Size (km^2 or scene)	
	Product Type		Process Level	
	Delivery Media		Delivery Service	

ID or File Name A scene ID or and exported file(kmz, html, csv, and etc...) name of "Arirang " syetem.
Shift -5 ~ 5 (default Value : 0)
Order size(km^2) Full Scene or AOI.
- Minimum order size is 25 km^2. (*Minimum swath is 5 km at least)*
- AOI file in KML or Shape need to be attached.

Product Type Bundle or Pan Sharpened (both in GEOTIFF format)
Process Level 1R or 1G
Delivery Media FTP or DVD
Delivery Service Standard or Rush

2. Additional Description

Issued by the Reseller/ Purchaser,

Date : ______________________

Signature : ______________________