

## RADARSAT SYSTEMS: SATELLITE CHARACTERISTICS

To gain more insight into the capabilities and technical aspects of the Canadian Earth Observation satellites RADARSAT-1, RADARSAT-2 and RADARSAT Constellation, below you will find an illustration and a table comparing their features in terms of system characteristics and beam modes.

Page			RADARSAT-1	RADARSAT-2	RADARSAT Constellation
Mission life	GENERAL	High Resolution			
SAR antenna dimensions   15 m x 1.5 m   15 m x 1.5 m   2.2 m x 1.7 m main power cone panet we two for RS1 and 2)		Total mass at launch	2.750 kg	2,200 kg	1,300 kg
Bus 3.55 m x 2.46 m 3.7 m x 1.36 m Canadian SmallSat Bus  Look Direction Right looking Routine left- and right-looking operation Increased re-visit time for improved monitoring efficiencies Right looking to increase revisit  Active Antenna C-band C-band C-band Contre Frequency 5.3 6Hz 5.405 GHz 5.405 GHz Bandwidth 30 MHz 100 MHz 100 MHz Bandwidth 30 MHz 100 MHz 100 MHz Polarization HH HH, VV, HV, VH HH, VV, HV, VH, Compact Polarimetry  Aperture Length 15 m 15 m 5.75 m 1.37 m 1.38 m  Aperture width 1.5 m 1.37 m 1.38 m  Mass 679 kg 750 kg 400 kg approximate  Deployment Mechanism Extendable support structure (ESS) Extendable support structure (ESS) Simple strut deployment with a kinematically decouple internal support structure  Altitude 793-821 km 798 km 592.7 km  Duration of one orbit 100.7 min 100.7 min 96.4 min  Descending node 600 hrs 600 hrs  Ascending node 18:00 hrs 18:00 hrs 18:00 hrs		Mission life	5 years	7 years	7 years (each satellite)
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Look Direction Right looking Routine left- and right-looking operation increased re-visit time for improved monitoring efficiencies by Multiple sate littles will eliminate need for left and right looking Multiple sate littles will eliminate need for left and right looking for improved monitoring efficiencies by Multiple sate littles will eliminate need for left and right looking Multiple sate littles will eliminate need for left and right looking for the form proved monitoring efficiencies by Multiple sate littles will eliminate need for left and right looking Multiple sate littles will eliminate need for left and right looking Multiple sate littles will eliminate need for left and right looking Multiple sate littles will eliminate need for left and right looking Multiple sate littles will eliminate need for left and right looking Multiple sate littles will eliminate need for left and right looking Multiple sate little view left and right looking Multiple sate little view left and right looking for look of Hz and constant sate of the first sate of the first sate of the sate of the first sate o					
Active Antenna C-band Contre Frequency 5.3 GHz 5.405 GHz 5.405 GHz 5.405 GHz 5.405 GHz 100 MHz 10		Bus	3.55 m x 2.46 m	3.7 m x 1.36 m	Canadian SmallSat Bus
Centre Frequency 5.3 GHz 5.405 GHz 5.405 GHz  Bandwidth 30 MHz 100 MHz 100 MHz  Polarization HH HH HH, VV, HV, VH HH, VV, HV, VH HH, VV, HV, VH, Compact Polarimetry  Polarization Isolation > 20 dB > 25 dB > 28 dB as of latest specs > 30 dB pending change request  Aperture Length 15 m 15 m 6.75 m  Aperture width 1.5 m 1.37 m 1.38 m  Mass 679 kg 750 kg 400 kg approximate  Deployment Mechanism Extendable support structure (ESS) Extendable support structure (ESS) Simple strut deployment with a kinematically decoupled internal support structure  Attitude 793-821 km 798 km 592.7 km  Inclination 98.6 degrees 98.6 degrees 97.74 degrees  Duration of one orbit 100.7 min 100.7 min 96.4 min  Descending node 6:00 hrs 6:00 hrs 6:00 hrs 18:00 hrs 18:00 hrs 18:00 hrs	L	Look Direction	Right looking		Multiple satellites will eliminate need for left and right
Bandwidth 30 MHz 100 MHz 100 MHz 100 MHz Polarization HH HH HH HH HH WHY. HV. VH. VH. Compact Polarimetry Polarization Isolation > 20 dB > 28 dB as of latest specs > 30 dB pending change request Aperture Length 15 m 15 m 6.75 m Aperture width 1.5 m 1.37 m 1.38 m Mass 679 kg 750 kg 400 kg approximate Deployment Mechanism Extendable support structure (ESS) Extendable support structure (ESS) Simple strut deployment with a kinematically decoupled internal support structure Inclination 98.6 degrees 98.6 degrees 97.74 degrees Duration of one orbit 100.7 min 100.7 min 96.4 min Descending node 6:00 hrs 6:00 hrs 18:00 hrs 18:00 hrs 18:00 hrs 18:00 hrs 18:00 hrs		Active Antenna	C-band	C-band C-band	C-band
Polarization HH HH, VV, HV, VH HH, VV, HV, VH HH, VV, HV, VH, Compact Polarimetry  Polarization Isolation > 20 dB		Centre Frequency	5.3 GHz	5.405 GHz	5.405 GHz
Polarization Isolation  > 20 dB  > 25 dB  > 28 dB as of latest specs  > 30 dB pending change request  Aperture Length  Aperture width  1.5 m  1.37 m  1.38 m  Mass  679 kg  750 kg  400 kg approximate  Deployment Mechanism  Extendable support structure (ESS)  Extendable support structure (ESS)  Simple strut deployment with a kinematically decoupled internal support structure  Attitude  793-821 km  798 km  592.7 km  Inclination  98.6 degrees  97.74 degrees  Duration of one orbit  100.7 min  100.7 min  96.4 min  Descending node  6:00 hrs  6:00 hrs  18:00 hrs  18:00 hrs		Bandwidth	30 MHz	100 MHz	100 MHz
Aperture Length Aperture width 1.5 m 1.37 m 1.38 m Mass 679 kg Deployment Mechanism Extendable support structure (ESS) Extendable support structure (ESS) Simple strut deployment with a kinematically decoupled internal support structure  Altitude 793-821 km 798 km 592.7 km Inclination 98.6 degrees 98.6 degrees 97.74 degrees Duration of one orbit 100.7 min 100.7 min 96.4 min  Descending node 6:00 hrs 6:00 hrs 6:00 hrs 18:00 hrs 18:00 hrs		Polarization	нн	HH, VV, HV, VH	HH, VV, HV, VH, Compact Polarimetry
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Mass 679 kg 750 kg 400 kg approximate Deployment Mechanism Extendable support structure (ESS) Extendable support structure (ESS) Simple strut deployment with a kinematically decoupled internal support structure  Altitude 793-821 km 798 km 592.7 km Inclination 98.6 degrees 98.6 degrees 97.74 degrees  Duration of one orbit 100.7 min 100.7 min 96.4 min  Descending node 6:00 hrs 4 15 min Ascending node 18:00 hrs 18:00 hrs 18:00 hrs 18:00 hrs	¥	Aperture Length	15 m	15 m	6.75 m
Deployment Mechanism  Extendable support structure (ESS)  Extendable support structure (ESS)  Simple strut deployment with a kinematically decoupled internal support structure  793-821 km  798 km  592.7 km  Inclination  98.6 degrees  97.74 degrees  Duration of one orbit  100.7 min  100.7 min  96.4 min  Descending node  6:00 hrs  6:00 hrs  6:00 hrs  18:00 hrs  18:00 hrs		Aperture width	1.5 m	1.37 m	1.38 m
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Inclination   98.6 degrees   98.6 degrees   97.74 degrees	L	Deployment Mechanism	Extendable support structure (ESS)	Extendable support structure (ESS)	
Duration of one orbit 100.7 min 100.7 min 96.4 min  Descending node 6:00 hrs 6:00 hrs 6:00 hrs 6:00 hrs 18:00 hrs 18:00 hrs 18:00 hrs	Г	Altitude	793-821 km	798 km	592.7 km
Ascending node 18:00 hrs 18:00 hrs 18:00 hrs		Inclination	98.6 degrees	98.6 degrees	97.74 degrees
Ascending node 18:00 hrs 18:00 hrs 18:00 hrs	ם	Duration of one orbit	100.7 min	100.7 min	96.4 min
Ascending node 18:00 hrs 18:00 hrs 18:00 hrs	ב   כ	Descending node	6:00 hrs	6:00 hrs	6:00 hrs +/- 15 min
Sun-synchronous 14 orbits per day 14 orbits per day 14.92 per day		Ascending node	18:00 hrs	18:00 hrs	18:00 hrs
		Sun-synchronous	14 orbits per day	14 orbits per day	14.92 per day

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RADARSAT-1

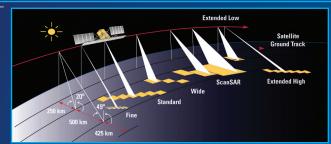
RADARSAT-2

50 x 50

100 x 100

11 x 9

## **BEAM MODES**



Beam Modes	Nominal Swath Width (km)	Nominal Resolution (m)
Fine	45	8
Standard	100	30
Wide	150	30
Scansar narrow	300	50
Scansar wide	500	100
Extended high incidence	75	18-27
Extended low incidence	170	30
Beam Modes	Nominal Swath Width (km)	Approximate Resolution (m) *1

are	250 km 250 km	20° 49°	Ultra-fine Beams	Standard Boarns Standard Quad-Pol (reduced swath widt	Wide- Swath Beams	Fine- Resolution Multi-look Fine Fine Quad-Pol (reduced swath	(High incidence)
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Selective Polarization	Fine	50
Transmit H or V receive H and/or V	Standard	100
	Low incidence	170
	High incidence	75

ScanSAR narrow

ScanSAR wide

Fine Quad-pol

Wide

Polarimetric Transmit H and V on alternate pulses / receive H and V on any pulse

**Selective Single Polarization** Transmit H or V receive H or V

Standard Quad-pol 25 25 x 28 20 3 x 3 Ultra-Fine

150

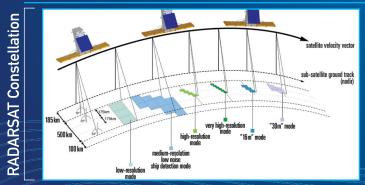
300

500

25

\*1. Ground range by azimuth

Spottignt	18	3 X I
Multi-Look Fine	50	11 x 9



Beam Modes	Nominal Swath Width (km)	Approximate Resolution (m)
Low Resolution	500	100 x 100
Medium Resolution (Maritime)	350	50 x 50
Medium Resolution (Land)	30	16 x 16
Medium Resolution (Land)	125	30 x 30
High Resolution	30	5 x 5
Very High Resolution	20	3 x 3
Ice/Oil Low Noise	350	100 x 100
25 m ship mode	350	Variable
Spotlight mode	5	1 x 3

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