



The DSA 2100 is a fully integrated prototype cognitive radio that is ideal for demonstrating the benefits of Dynamic Spectrum Access (DSA) technology and for use as a software development platform. The radio provides a computing platform for integrating partner applications with Shared Spectrum Company (SSC) DSA software.

The DSA 2100 combines several revolutionary technologies to form a highly adaptive communications system. Built around a high-dynamic-range 802.16d transceiver, it automatically navigates the radio spectrum finding optimal frequencies of operation, avoiding interference, and sharing scarce spectrum resources with other spectrum users. The radio uses state-of-the-art spectrum sensors and advanced control algorithms to ensure rapid rendezvous and maximum continuity of service. Its capabilities include, but are not limited to:

- Automated/dynamic spectrum sharing with frequency abandonment upon appearance of non-cooperative user
- Programmable multi-stakeholder restriction of band use (i.e., policy-based radio management)
- Automatic discovery of open/optimal frequencies for clear communication
- Rapid rendezvous upon channel abandonment
- Modular construction enables transceiver configuration for five types of services (e.g., military, public safety, UAV, commercial and TV)
- Software defined detection algorithm and scheduling
- Well defined policy, radio and detector APIs
- Automated spectrum management enables rapid deployment

# DSA 2100

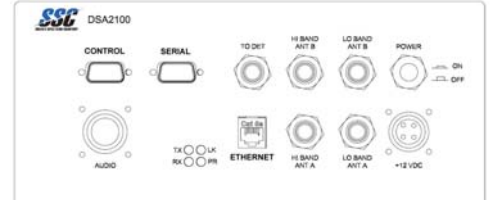


# Reference Design Specifications

# DSA Radio

# DSA 2100

RF Circuit Card Module Frequency Band Options	
DSA Transceiver (Military)	225-512 MHz
	1215-1390 MHz
	1435-1525 MHz
	1755-1850 MHz
	2200-2290 MHz
DSA Transceiver (Public Safety)	138-174 MHz
	220-512 MHz
	764-869 MHz
DSA Transceiver (Commercial)	698-941 MHz
	1390-1435 MHz
	1670-2680 MHz
DSA Transceiver (TV)	174-216 MHz
	516-806 MHz
DSA Transceiver (UAV)	225-600 MHz



Criteria	Specifications
Operating Frequencies	138 MHz to 2.7 GHz (see RF Module Frequency Band Options above)
Channel Bandwidth	1.75, 3.5, 7 MHz (selectable)
Channel Step Size/Resolution	250 kHz for 225-512 MHz for DoD radio 500 kHz for 1215-2290 MHz for DoD radios and other radios
Tuning Speed	300 usec
Signal Format	IEEE 802.16d-2004
Modulation of OFDM Subcarriers	BPSK, QPSK, 16-QAM, 64-QAM (selectable)
Data Coding	Inner Viterbi and outer Reed Solomon 1/2, 2/3, and 3/4
Frequency Stability	+/- 2.5 ppm (-30 to +75C) TCXO, +/-0.25 ppm (0 to +70C) OCXO
Output Power (at antenna port)	0.06 Watt at high band, up to 10 Watt at low band (ALC controlled)
Maximum Antenna Input Power	+ 20 dBm, 0 Volts DC
Sensitivity, typical (at antenna port)	< -100 dBm
Out of Band IIP3	> +5 dBm at maximum gain
IF Freq (IF1/IF2 MHz)	850/140 (Opt. I); 1250/140 (Opt II)
IF and Image Rejection	> 70 dB
Rx Dynamic Range	> 120 dB
Tx Spur Level	-60 dBc
External Reference Clock Frequency	10 MHz
External Reference Clock Interface	1.2v p-p Min - sinusoid, 3.3v TTL
Rx/Tx Antenna S11	-10 dB
Abandon Time	500 ms, 100% in 465 ms
Interference Limit	3 dB, mean: 0.16dB, max: 0.49 dB
Net Formation	30 s w/ six Nodes, 90%: 3.6 s; 100%: 8.68 s
Net Join	4.36 s at 100%; 2.07 s at 90%
Net re-Establish	500 ms
Dimensions (LxWxH)	14 5/8" x 9 7/8" x 4 3/16" (37.15cm x 25.08cm x 10.64cm); Does not include 1" additional width for mounting plate
Weight	13 lbs
Ethernet Port	RJ-45 (TCP-IP)
Audio Port (microphone/headset)	Digi-Key A1644-ND; Tyco Electronics 211400-1
Control Port	DB-9 female
Serial Port	DB-9 male
External Detector (optional)	TNC-female (optional)
Internal GPS Module Antenna Port (optional)	
Antenna Ports (< 1 GHz, the low bands)	TNC-female (default A, optional B)
Antenna Ports (> 1 GHz, the high bands)	TNC-female (default A, optional B)
Source Power	Digi-Key A1300-ND; Tyco Electronics 206060-1
On/Off Power Switch	Plunger: Tyco Electronics W23-X1A1G-10
Source Voltage	12 - 16 VDC

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