



Data Sheet

DSG9000 HD Radio



Count on the noise leader

DSG9000 HD Radio Series

Features

The DSG9000 series instruments are HD Radio signal sources designed to play pre-recorded test vector files that replicate various HD Radio service modes and channel configurations. Every DSG9000 includes a removable HDD for test vector storage. New test vectors can be added by exchanging the removable HDD. For a basic service fee, the existing drive can be sent to Noisecom for the upgrade. The instruments are certified by iBiquity Digital Corporation, the sole developer and licensor of Digital HD Radio technology.

RF Digital Signal Source Generates Certified HD Radio Test Signals

The DSG9000-02 contains a full suite of test vectors or signals stored on the instruments removable HDD. The DSG9000-02 is a versatile signal source for engineers designing and developing new analog/digital AM or FM HD Radio products. The DSG9000-01 is designed for production testing with a simplified user interface, and includes one vector for AM, and one vector for FM HD Radio. There are no periodic vector upgrades for this unit.

Specifications

General

Processor:	Intel P4 1 MB L2-cache 800 MHz
Memory:	512 MB memory DDR333
Removable Hard Drive:	ATA hard drive 120 GB
Mouse and Keyboard:	PS/2
Dimensions:	7.5" x 17.25" x 19.5" (H x W x D)
Weight:	29 lbs
Operating Temperature:	0 to 50° C
Power Requirements:	115 or 230 VAC (switch) Max current 10 A @ 115 V Freq 47 – 63 Hz



FM Output

Power Output:	-10 dBm
Gain Flatness:	within 1 dB peak to peak from 97.7 - 98.1 kHz
On Channel Spectral Emissions:	< -50 dBc at 97.9 MHz
Wideband Spectral Emissions:	< -60 dBc
SSB Phase Noise:	at 107.9 MHz
Frequency Offset in Hz	dBc
10	-42
100	-67
1K	-77
10K	-87
100K	-107

AM Output

AM Power Output:	> -30 dBm
Gain Flatness:	within 1 dB peak to peak from 1110 – 1130 kHz
On Channel Spectral Emissions:	< -80 dBc at 1710 kHz with > 20.5 kHz offset
Wideband Spectral Emissions:	< -75 dBc
SSB Phase Noise:	at 1710 kHz
Frequency Offset in Hz	dBc
1	-40
10	-50
100	-90
1K	-95
10K	-110
100K	-120

DSG9000-01 Test Vectors

Vector name	Test Description
IB_AMr230a_e0wfc102.bin	AM production test vector
IB_FMr230_e0wfc102.bin	FM production test vector

DSG9000-02 Test Vectors

AM section

Vector name, file size in MB, Disc #	Test Description
IB_AMr208_e0wfa05.bin ,177, 9	MA1, Audio Mix, clean Channel, with SIS & PA
IB_AMr208_e0wfa07.bin ,177, 13	MA3, audio mix, clean channel, with SIS & PAD
IB_AMr208_e0wfa10.bin ,177, 9	MA1, AWGN audio source, clean channel
IB_AMr208a_e0wfb00.bin ,8 ,12	MA1, analog source = pulsed USASI, digital = BER pattern, clean channel
IB_AMr208_e0wfb01.bin ,8 ,6	MA3, analog source = pulsed USASI, BER pattern, clean channel
IB_AMr208_e0wfb102.bin ,786 ,6	MA1, analog source = pulsed USASI, BER Pattern, C/No = 65 dB-Hz
IB_AMr208_e0wfb104.bin ,786 ,6	MA1, analog source = pulsed USASI, BER Pattern, C/No = 67 dB-Hz
IB_AMr208_e0wfb111.bin ,786 ,6	MA1, analog source = pulsed USASI, BER Pattern, C/No = 74 dB-Hz
IB_AMr208_e0wfb113.bin ,786 ,6	MA1, analog source = pulsed USASI, BER Pattern, C/No = 76 dB-Hz
IB_AMr208_e0wfb119.bin ,786 ,6	MA3 ,BER Pattern, C/No = 50 dB-Hz
IB_AMr208_e0wfb121.bin ,786 ,9	MA3, BER Pattern, C/No = 52 dB-Hz
IB_AMr208_e0wfb124.bin ,786 ,7	MA3, BER Pattern, C/No = 63 dB-Hz
IB_AMr208_e0wfb126.bin ,786 ,7	MA3, BER Pattern, C/No = 65 dB-Hz
IB_AMr208_e0wfb128.bin ,786 ,9	MA3, BER Pattern, C/No = 67 dB-Hz
IB_AMr208_e0wfb130.bin ,786 ,7	MA3, BER Pattern, C/No = 61 dB-Hz
IB_AMr208_e0wfb131.bin ,786 ,12	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +17 dB
IB_AMr208_e0wfb132.bin ,786 ,9	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = -14 dB
IB_AMr208_e0wfb134.bin ,786 ,7	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = -6 dB
IB_AMr208_e0wfb135.bin ,786 ,7	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +6 dB
IB_AMr208a_e0wfb138.bin ,786 ,12	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +20 dB
IB_AMr208_e0wfb145.bin ,786 ,9	MA3, BER Pattern, C/No = 90 dB-Hz, hybrid lower adjacent, D/U = 0 dB
IB_AMr208_e0wfb243.bin ,786 ,9	MA3, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +6 dB
IB_AMr208_e0wfc00.bin 4	, g g, p (,) g g,alignment, clean channel 6
IB_AMr208_e0wfc04.bin ,4 ,6	MA1, Stereo digital / mono analog, 2.5-kHz bi-level tone with calibrated analog and digital time alignment, clean channel
IB_AMr208_e0wfc06.bin ,4 ,6	MA1, stereo music, clean channel
IB_AMr208_e0wfc08.bin ,4 ,6	MA1, Stereo digital / mono analog, 1-kHz tone with calibrated analog and digital audio levels, clean channel
IB_AMr208_e0wfc10.bin ,4 ,9	MA1, 1 kHz tone (left channel only), clean channel
IB_AMr208_e0wfc11.bin ,4 ,9	MA1, 1 kHz tone (right channel only), clean channel
IB_AMr208_e0wfc19.bin ,4 ,12	MA1, analog audio = silence, digital audio = 1 kHz tone (right & left), clean channel
IB_AMr208_e0wfc23.bin ,4 ,6	Analog AM only, music, clean channel
IB_AMr208_e0wfc24.bin ,4 ,6	MA1, digital audio = 1kHz. Tone (Left only), analog audio = silence, C/No = 79 dB-Hz, with SIS & PAD
IB_AMr208_e0wfc26.bin ,4 ,6	Analog AM only, continuous 1kHz tone, clean channel
IB_AMr208_e0wfc29.bin ,4 ,9	MA1, digital audio = 1kHz. Tone (Left only), analog audio = silence, C/No = 76 dB-Hz, with SIS & PAD

IB_AMr208_e0wfc30.bin ,4 ,9	MA3, digital audio = 1kHz. Tone (Left only), C/No = 61 dB-Hz, with SIS & PAD
IB_AMr208_e0wfc31.bin ,4 ,9	MA3, digital audio = 1kHz. Tone (Left only), C/No = 65 dB-Hz, with SIS & PAD
IB_AMr208_e0wfc32.bin ,4 ,9	MA3, digital audio = 1kHz. Tone (Left only), C/No = 76 dB-Hz, with SIS & PAD
IB_AMr201_e0wfc52.bin ,69 ,6	MA1, Music, Blend Control Bits change from 01 to 10
IB_AMr208a_e0wfa12.bin ,177 ,13	MA1, audio mix, clean channel, with SIS & PAD
IB_AMr208_e0wfb02.bin ,22 ,13	MA1, BER Pattern, GCS (triple highway overpass), field recording, 65 MPH vehicle speed
IB_AMr208_e0wfb03.bin ,22 ,13	MA1, BER Pattern, GCS (double highway overpass), field recording, 35 MPH vehicle speed
IB_AMr208_e0wfb04.bin ,22 ,13	MA3, BER Pattern, GCS (double highway overpass), field recording, 35 MPH vehicle speed
IB_AMr208_e0wfb05.bin ,22 ,13	MA3, BER Pattern, GCS (highway overpass, sign, and power lines, field recording at 60 MPH vehicle speed
IB_AMr208_e0wfc27.bin ,4 ,13	MA1, Stereo digital / mono analog, 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = +7 dB
IB_AMr220_e0wfc28.bin ,4,20b	MA1, Stereo digital / mono analog, 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = -8 dB
IB_AMr208c_e0wfa11.bin ,768, 20b	MA1 Audio mix, AWGN. Signal alternates between the following states in this sequence: 1,2,3,2,1,2,3,2,.....1.C/No=68dB-Hz(P1,P3 subcarriers off, ref. subcarriers on) 2.C/No=68dB-Hz (analog & digital ON) 3.C/No=90dB-Hz (analog & digital on)

FM Section

Vector name, file size in MB, Disc #	Test Description
IB_FMr208c_e0wfa05.bin ,1036, 1	MP1, Audio Mix, clean Channel, with SIS and PAD
IB_FMr208c_e0wfa25.bin ,1036 ,1	MP6, Audio Mix, clean Channel
IB_FMr208c_e0wfa98.bin ,34,1	Analog FM only, continuous stereo 1kHz tone, clean channel
IB_FMr208c_e0wfa99.bin ,259,1	Analog FM only, stereo music, clean channel
IB_FMr208c_e0wfc00.bin ,69,1	MP1, stereo pulsed 125-Hz tone (active 0.37 seconds, off 11.51 seconds) with calibrated analog and digital time alignment
IB_FMr208c_e0wfc03.bin ,69,1	MP1, Stereo 4-kHz bi-level tone with calibrated analog and digital time alignment, clean channel
IB_FMr208c_e0wfc08.bin ,34,1	MP1, Stereo 1-kHz tone with calibrated analog and digital audio levels, clean channel
IB_FMr208c_e0wfc09.bin ,34,10	MP1, 1 kHz tone (left channel only), clean channel
IB_FMr208c_e0wfc10.bin ,34,10	MP1, 1 kHz tone (right channel only), clean channel
IB_FMr208e_e0wfc12.bin ,34,10	MP1, 8 kHz tone (left channel only), clean channel
IB_FMr208e_e0wfc13.bin ,34,10	MP1, 8 kHz tone (right channel only), clean channel
IB_FMr208c_e0wfc30.bin ,34,1	MP1, analog audio = silence, digital audio = 1 kHz tone (right & left), clean channel
IB_FMr208c_e0wfc46.bin ,34,1	MP6, BER Pattern, clean channel
IB_FMr201_e0wfc52.bin ,1105,1	MP1, Music, Blend Control Bits change from 01 to 10
IB_FMr208g_e0wfc94.bin ,1036 ,11	MP5, digital audio = 1kHz. Tone (Left only), analog audio = silence, Cd/No = 58 dB-Hz, with SIS & PAD
IB_FMr208c_e0wfc201.bin ,1036 ,2	MP1, analog source = audio mix, BER Pattern, Cd/No = 54 dB-Hz
IB_FMr208c_e0wfc203.bin ,2073, 2	MP1, analog source = audio mix, BER Pattern, Cd/No = 56 dB-Hz
IB_FMr208c_e0wfc204.bin ,34,1	MP1, analog source = audio mix, BER Pattern, clean channel
IB_FMr208c_e0wfc206.bin ,1036 ,2	MP1, analog source = audio mix, BER Pattern, Cd/No = 57 dB-Hz, urban fast fading
IB_FMr208d_e0wfc208.bin ,2073 ,14	MP1, analog source = audio mix, BER Pattern, Cd/No = 60 dB-Hz, urban fast fading
IB_FMr208c_e0wfc209.bin ,1036 ,4	MP1, analog source = audio mix, BER Pattern, no noise, urban fast fading
IB_FMr208c_e0wfc227.bin ,1036 ,3	MP1, analog source = audio mix, BER Pattern, Cd/No = 62 dB-Hz, urban fast fading, hybrid lower 1st adjacent, D/U = +6 dB
IB_FMr208c_e0wfc230.bin ,2073, 3	MP1, analog source = audio mix, BER Pattern, Cd/No = 65 dB-Hz, urban fast fading, hybrid lower 1st adjacent, D/U = +6 dB
IB_FMr208d_e0wfc538.bin ,1036 ,4	MP5, BER Pattern, Cd/No = 53 dB-Hz

FM Section (cont.)

IB_FMr208d_e0wfc540.bin ,1036 ,4	MP5, BER Pattern, Cd/No = 55 dB-Hz
IB_FMr208d_e0wfc542.bin ,2073 ,10	MP5, BER Pattern, Cd/No = 57 dB-Hz
IB_FMr208c_e0wfc546.bin ,1036 ,3	MP5, BER Pattern, Cd/No = 56 dB-Hz, urban fast fading
IB_FMr208c_e0wfc547.bin ,2073 ,5	MP5, BER Pattern, Cd/No = 57 dB-Hz, urban fast fading
IB_FMr208c_e0wfc548.bin ,2073 ,5	MP5, BER Pattern, Cd/No = 59 dB-Hz, urban fast fading
IB_FMr208d_e0wfc549.bin ,2073 ,8	MP5, BER Pattern, Cd/No = 60 dB-Hz, urban fast fading
IB_FMr208c_e0wfc27.bin ,34 ,13	MP1, Stereo 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = +7 dB
IB_FMr208c_e0wfc28.bin ,34 ,13	MP1, Stereo 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = -8 dB
IB_FMr208j_e0wfa104.bin ,1036,15	MP1, 2 programs; Prog 1: on P1, 65 kbit/s; Prog 4: on P1, 31 kbit/s
IB_FMr208j_e0wfa105.bin ,1036 ,15	MP1, 3 programs; Prog 1: on P1, 52 kbit/s; Prog 6: on P1, 22 kbit/s; Prog 4: on P1, 22 kbit/s
IB_FMr208j_e0wfa106.bin ,1036 ,15	MP2, 2 programs; Prog 1: on P1, 96 kbit/s; Prog 4: on P3, 12 kit/s
IB_FMr208x_e0wfc888.bin ,1036,15	MP1, digital audio = 1-kHz stereo tone, analog audio = silence, Cd/No= 58 dB-Hz, with SIS & PSD, PSD = 58 dB-Hz, with SIS & PSD, PSD 0x01 (reserved value)
IB_FMr208j_e0wfa107.bin ,1036 ,16	MP2, 3 programs; Prog 1: on P1, 52 kit/s; Prog 6: on P1, 44 kit/s; Prog 4: on P3, 12 kit/s
IB_FMr208j_e0wfa108.bin ,1036 ,16	MP3, 2 programs; Prog 1: on P1, 96 kit/s; Prog 4: on P3, 24 kit/s
IB_FMr208j_e0wfa109.bin ,1036 ,16	MP3, 3 programs; Prog 1: on P1, 52 kit/s; Prog 6: on P1, 44 kit/s; Prog 4: on P3, 24 kit/s
IB_FMr208i_e0wfa58.bin ,2073 ,17	MP1, Audio Mix, AWGN, Cd/No changes from 52, 62, 52, 62, ... dB-Hz, 15 seconds in each state
IB_FMr208j_e0wfa11.bin ,1036,17	MP1, Audio Mix, clean Channel (same as a05 vector but different audio, SIS, and PSD), TXGain = +2 dB – fixed error in session type – changed from 01 to 00
IB_FMr208j_e0wfc89.bin ,242 ,17	MP1, digital audio = 1-kHz stereo tone, analog audio = silence, Cd/No = 58 dB-Hz, with SIS & PSD
IB_FMr208j_e0wfc31.bin 242 17	MP1, AWGN audio source, clean channel
IB_FMr208c_e0wfc211.bin ,1036 ,18	MP1, analog source = audio mix, BER Pattern, AWGN Channel, Cd/No = 58 dB-Hz, analog-only upper first adjacent, D/U = +6 dB
IB_FMr220a_e0wfc553.bin ,1036 ,18	MP5, BER Pattern, AWGN Channel, Cd/No = 55 dB-Hz, analog-only lower first adjacent, D/U = -4 dB
IB_FMr220a_e0wfc555.bin ,2073 ,18	MP5, BER Pattern, AWGN Channel, Cd/No = 57 dB-Hz, analog-only lower first adjacent, D/U = -4 dB
IB_AMr208a_e0wfc33.bin ,4 ,19	MA1, Stereo digital (left only) / mono analog, 4-kHz tone, clean channel – fixed phase discontinuity when file wraps around
IB_AMr208a_e0wfc34.bin ,4 ,19	MA1, Stereo digital (right only) / mono analog, 4-kHz tone, clean channel
IB_FMr208c_e0wfa141.bin ,1036,19	MP1, 3 programs Prog 1: on P1, rate changes, 52 kit/s / 74 kit/s every 90 sec. Prog 4: on P1, 22 kit/s Prog 6: on P1, 22 kit/s for 90 seconds then off for 90 seconds
IB_FMr208d_e0wfa143.bin ,1036 ,19	MP3, 3 programs; Prog 1: on P1, 52 kit/s Prog 4: on P3, 24 kit/s for 90 seconds then off for 90 seconds Prog 6: on P1, 44 kit/s
IB_FMr220a_e0wfc100.bin ,34 ,20B	MP3, 3 programs Analog: 1 kHz tone ; Prog 1: 1 kHz tone; Prog 4: 1 kHz tone; Prog 6: 1 kHz tone (all level aligned)
IB_FMr220a_e0wfc101.bin ,34 ,20B	MP3, 3 programs Analog: 1 kHz tone ; Prog 1: 2 kHz tone; Prog 4: 400 Hz tone; Prog 6: 4 kHz tone
IB_FMr220a_e0wfa13.bin ,34 ,20B	MP1, 1 kHz audio tone, clean=channel, PSD contains full ISO-8859-1 character set

Ordering Information

DSG9000-01	HD Radio Digital Signal Generator For Production Test
DSG9000-02	HD Radio Digital Signal Generator For Full Development

Options

DSG9opt01	15 Inch LCD Monitor
DSG9opt02	Antenna Package (AM loop & FM Whip)
DSG9opt03	Vector update for Model - 02 only
DSG9opt04	Model - 01 to Model - 02 test vector upgrade
DSG9opt05	RF Amplifier & Attenuator Unit
DSGopt06	Remote Control Amplifier & Attenuator Unit



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