DTV/MPEG2 Test & Measurement

DTV Signal Generator

DSG500
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DTV Signal Generator

DSG500 is the all-in-one DTV signal generator supporting MPEG2 TS and RF Signal generation in one unit. It can cover all DTV standards in one unit including DVB-T, DVB-S, ATSC, Open Cable, DVB-S/S2 and DMB-TH.

DSG500 offers easy connection to various digital television signal sources and receivers, suitable for high-definition (HD) and standard definition (SD) digital television.

Especially, DSG500 supports Digital TV Spec. test for DTV receiver and Tuner manufacturers as below:

- Sensitivity Test: RF Output Level -110 ~ 0dBm (Level Step Size: 0.1dB)
- RF Level Extension -110 ~ +20dBm (Option LE-600)
- C/N Noise Generation: AWGN Noise (Option / FM-203)

Most importantly, DSG500 supports multi signal output (Max. 3 RF) in one unit that allows simultaneous signal use. It will save your cost and time for buying several other DTV signal generators.

**General**

- Modulator: Multi Standard (DVB-T, ATSC, DVB-C, OpenCable, DVB-S/S2, DMB-TH)
- RF Upconverter: Multi RF System (50 ~ 870MHz), Max. 3
- Frequency Resolution: 1Hz
- RF Level: -110 ~ 0 dBm (-110~+20dBm: Option LE-600)
- RF Level Resolution: 0.1dB steps
- MPEG2 TS Generator: Internal Generation
- MPEG2 TS Generator: External DVB-ASI/SPI Output (Option FM20X)
- TS Analysis Information
- Easy Channel Selection by World-wide Channel Table DB
- Real-time A/V Decoding (MPEG2 SD/HD & H.264 QVGA/SD/HD)
- Automatic Modulator setting (NIT Base) * DVB System Only
- Automatic Modulator setting (PCR bitrate Base / Dynamic Mode)
- Manual Modulator Setting (Parameter Setting)
- Manual Bit-rate Setting (Burst mode / Static mode)
- Jitter Injection (TR 101 290 Level Error)
- C/N Noise Generation (AWGN Noise)
- C/N Range: 0~+45dB (Resolution: 0.1dB)
- Noise BW: 0~10MHz according from Signal CH BW (Spec.)
- PS to TS (File, Live) Convert
- TS Packet Size: RAW/188/204/188+16(LVDS)
- Inserting Null Packets (Static Mode)
- Stream & System Monitoring
- Play List (Sequential Play)
- Memory Play on RAM Cache memory
- Touch Screen & Easy Operation GUI (Patent Registered)

**Features**

1. General Characteristics

2. PRBS Pattern Test

3. Intended Application

- Digital TV receiver Design and Manufacturing Test
- Set-top Box / DTV (LCD, PDP) Manufacturing
- Set-top Box / DTV Development and Performance Verification
- Stream Play-out and Recording for Production Line
- Simulation of Digital TV (Terrestrial/Satellite/Cable)
- Broadcasting Transmission
- DTV Chip Development (Tuner/MPEG)
• Analysis of PID, Decoding View and etc

• Error Injection (ETR 290 Priority I, II)

• PS to TS Convert (PS Play)

• Modulation Setting
<Base Model : DSG500 DTV Signal Generator>

**RF Specifications**
- Output Connector : N Type
- RF Output Frequency : 50-870 MHz (VHF/UHF)*
- Frequency Resolution : 1Hz
- Frequency Accuracy : 3 x 10^-6 / 25 °C ± 1 °C
- RF Output Level : -110 ~ 0dBm (-110 ~ +20dBm, optional)
- RF Level Resolution : 0.1dB steps*
- RF Level Accuracy : ±0.5dB
- RF Impedance : 50 Ω

* DVB-S/S2 Model : Frequency 950 ~ 2150MHz 200KHz Step
  - Level : -110 ~ 0 dBm (-110 ~ +20dBm, Optional)
  - Level Resolution : 1dB Step

**OS system**
- Embedded OS

**HDD & ODD system**
- HDD 160G
- ODD Read Only

**User interface system**
- 10.4 inch TFT color LCD (1024 x 768)
- Touch Screen

**External Interface system**
- USB Interface : USB HDD, USB Stick
- Remote Control : RS-232C

**Accessories**
- Keyboard 1set
- AC power code 1set
- N Type Connector / Terminator 1set
- Certification of Calibration 1set
- Operation Manual 1set

**General specifications**
- Power supply : AC 90 to 264V, 50/60Hz
- Power consumption : Less than 400W
- Operating temperature : 10 to 40 °C
- Guaranteed temperature : 15 to 35 °C
- Guaranteed humidity : 20 to 85% RH (No Condensation)
- Storage temperature : -40 to +70 °C / 20 ~ 85% RH
- Operating environment : Indoor
- Operating attitude : Around 2000m
- Over-voltage category : II
- Pollution degree : 2
- Dimensions : 519.7(W) x 435(D) x 231.8(H) mm
- Weight : Approx. 17Kg (Not including options)

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**Modulator options**

- **DVB-T Module (MM-501)**
  - Broadcasting system
  - Digital Terrestrial TV : DVB-T
  - Transmission Parameter
    - Hierarchical mode : Fully supported
    - Modulation : COFDM
    - FFT : 2K, 8K
    - Guard Interval : 1/4, 1/8, 1/16, 1/32
    - Modulation Modes : QPSK, 16 and 64QAM
    - Coding Rate :
  - **ATSC Module (MM-502)**
  - Broadcasting system
  - Digital Terrestrial TV : ATSC
  - Transmission Parameter
    - Modulation :
    - Modulation Modes :
  - **DVB-C Module (MM-503)**
  - Broadcasting system
  - Digital Cable TV : DVB-C
  - Transmission Parameter
    - Modulation :
    - Modulation Modes :
  - **DVB-S/S2 Module (MM-505)**
  - Broadcasting system
  - Digital Satellite TV : DVB-S/S2
  - Transmission Parameter
    - Modulation :
    - Modulation Modes :
  - **DMB-TH Module (MM-506)**
  - Broadcasting system
  - Digital Terrestrial TV : DMB-TH
  - Transmission Parameter
    - Modulation :
    - Modulation Modes :
    - IFFT :
    - Guard Interval :
    - Coding Rate :

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**RF Options**

- **Upconverter Module (RM-600)**
  - Output Connector : N (female)
  - RF Output Frequency : 50 ~ 870 MHz (VHF/UHF)
  - Channel Bandwidth : 5.6,7 and 8MHz (Depend on modulator)
  - Frequency Resolution : 1Hz
  - Frequency Accuracy : 3 x 10^-6 / 25 °C ±1 °C
  - RF Output Level : -110 ~ 0dBm
  - RF Level Resolution : 0.1dB steps
  - RF Level Accuracy : ±0.5dB
  - RF Impedance : 50 Ω

* Other RF Upconverters : See Ordering Information
<Function Options>

- **ASI Out Module (FM-200)**
  - Output bit rate: 0 ~ 214Mbps
  - Packet Size: 188/214Byte
  - Null Packet Insertion form H/W

- **SPI(LVDS) Out Module (FM-201)**
  - Output bit rate: ~108Mbps
  - DVB/SPI Connector: D-sub 25-pin (Female)
  - Packet Size: 136, 188, 192 and 204Byte

- **GPIB Module (FM-202)**
  - IEEE 488.2

- **AWGN Module (FM-203)**
  - Input/Output: SMA (Female) 50/75Ω Select
  - C/N range: 0 ~ 45dB
  - C/N resolution: 0.1 dB Steps
  - Noise Band Width: 0 ~ 10MHz

- **Null Packet Insertion form H/W**

- **IEEE 488.2**

<Level Options>

**Level Extension Module (LE-600)**
- Output Level Range: -110 ~ +20dBm

 Ordering Information

<table>
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<tr>
<th>Base Model</th>
<th>Description</th>
<th>Notes</th>
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</table>
| DSG500     | DTV Signal Generator Built-in RF Upconverter | • RF Output Frequency: 50-870 MHz (VHF/UHF)  
• Frequency Resolution: 1Hz  
• RF Output Level: -110 ~ 0dBm  
• RF Level Resolution: 0.1dB steps  
• Only RM-600 or RM-601 options available for Additional RF Options |
| DSG500L    | DTV Signal Generator- Light Built-in RF Upconverter | • RF Output Frequency: 50-870 MHz (VHF/UHF)  
• Frequency Resolution: 1KHz  
• RF Output Level: -110 ~ 0dBm  
• RF Level Resolution: 1dB step  
• Only RM-600L or RM-601L options available for Additional RF Options |
| DSG500S    | DTV Signal Generator- DVB-S/S2 Built-in RF Upconverter | • RF Output Frequency: 950 ~ 2150 MHz  
• Frequency Resolution: 200KHz  
• RF Output Level: -110 ~ 0dBm  
• RF Level Resolution: 1dB Step |

**ETC Function Options**

- **HDD 300G (EF-301-300)**
  - SATA 7200RPM
  - HDD size may change according to manufacturer’s condition

- **HDD 600G (EF-302-600)**
  - SATA 7200RPM
  - HDD size may change according to manufacturer’s condition

- **Upgrade Service (EF-304)**
  - S/W & H/W

**Modulator Options**

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<td>MM-502</td>
<td>ATSC Module</td>
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<td>MM-503</td>
<td>DVB-C (Annex – A/C) Module</td>
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<td>MM-504</td>
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<td>MM-505*</td>
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<tr>
<td>MM-506</td>
<td>DMB-TH Module</td>
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</tbody>
</table>

* MM-505 requires RM-600S or RM-601S option

**Ordering Information**

Note1: Single RF (Base Model): Max 5 Modulators Selection  
Note2: Multi RF (Two or Three RF): Max 3 Modulators Selection In total
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<td>- RF Output Frequency : 50-870 MHz (VHF/UHF)</td>
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<td>RM-601</td>
<td>Third Upconverter Module *Note2 *Note3</td>
<td>- RF Output Frequency : 50-870 MHz (VHF/UHF)</td>
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<td>ASI Out Module</td>
<td>* Add Function: Max 2 modules</td>
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<td>EF-302-600</td>
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<tr>
<td>EF-304</td>
<td>Upgrade Service</td>
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*Note1: Requires two DSG500 MM50X Modulator Options in total
*Note2: Requires three DSG500 MM50X Modulator Options in total
*Note3: The third RF upconverter does not support ODD.
*Note4: Requires two DSG500 MM505 Modulator Options
*Note5: Requires three DSG500 MM505 Modulator Options