

Wide Band Low Noise Amplifier with Auto Gain Control Function

- ✓ **Automatic gain control according to signal intensity brought by integrated signal detector with temperature compensation and hysteresis comparator**
- ✓ **Contribution for excellent sensitivity with high gain and low NF performance**

■ Why does above matter?

LNA with auto gain control (AGC) function, which can automatically select LNA mode or bypass mode, is required for active antenna solutions.

Active antenna for DTV on each home receives different signal intensity due to different location from broadcasting station (BS). Signal intensity from BS to active antennas for DAB/DTV on cars are always changing since the cars are always moving.

Active antenna normally adopts LNA in order to amplify signal from BS. Particularly in EU, radio service has been shifted from FM to DAB whose signal intensity from BS is generally lower than FM. So LNA with high gain and low noise figure (NF) is mandatory for the active antenna. More, bypass function for the LNA is also required in order to avoid saturation when BS is close enough.

Active antenna is usually fed power via coaxial cable. It means that tuner IC can't send gain control signal to the active antenna. In such case, LNA with AGC function is required. There is a solution which allows fine gain adjustment using a variable gain amplifier and a signal level detector, but it will bring much high cost and complex design. Many customers think that two gain modes are enough, which are LNA mode and bypass mode.

From above situation, we would like to propose NJG1740MHH as a reasonable solution for DTV/DAB active antennas. NJG1740MHH has high performance LNA and bypass function which are automatically switched according to signal intensity from BS. The LNA offers high gain and low NF, and bypass function allows to avoid saturation of amplifier. NJG1740MHH has signal detector with temperature compensation, which brings stable gain switching regardless ambient temperature, in order to detect signal intensity from BS. The detected signal is amplified by integrated differential amplifiers then input to hysteresis comparator. The hysteresis comparator translates analog signal input to digital output in order to select LNA active mode or bypass mode according to signal intensity. The hysteresis comparator also helps to avoid excessively frequent gain switching when input power level is around threshold.

■ Features

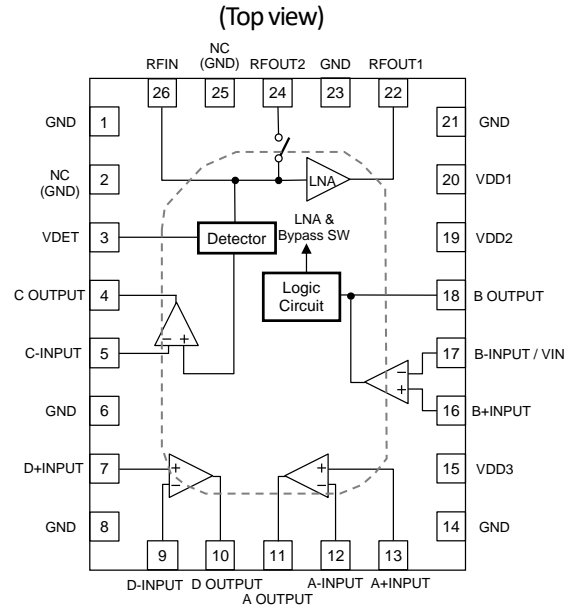
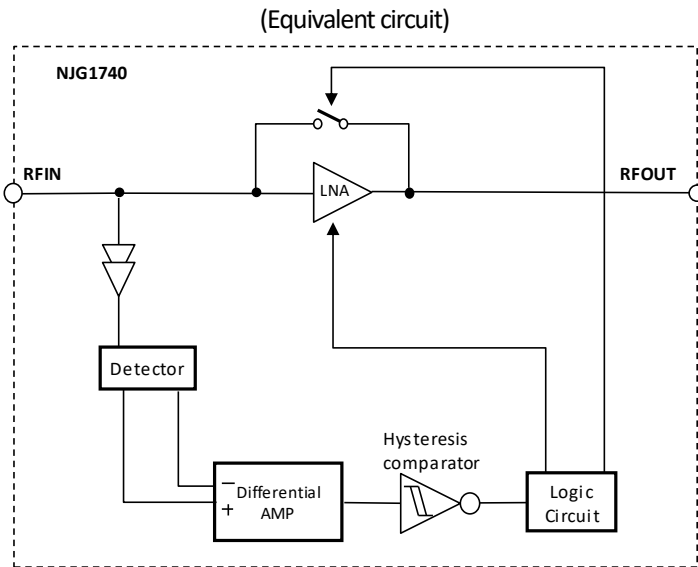
- High gain 18 dB typ. @ 40 to 780 MHz, LNA active mode
- Low noise figure (NF) 0.9 dB typ. @ 174 to 780 MHz, LNA active mode
- Low 3rd order intermodulation distortion (IM3) -105 dBm max. @ Pin = -60 dBm, LNA active mode
- Package size 3.4 x 2.6 mm², 26-pin

■ Application Example

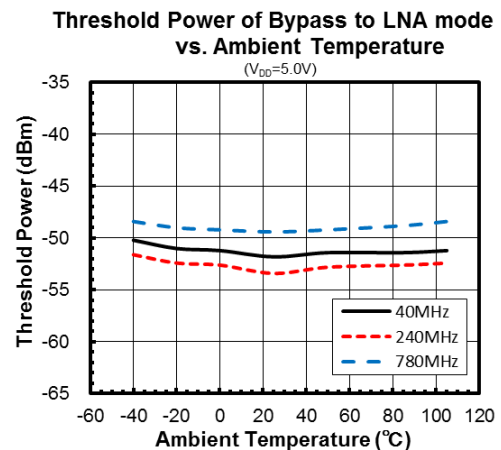
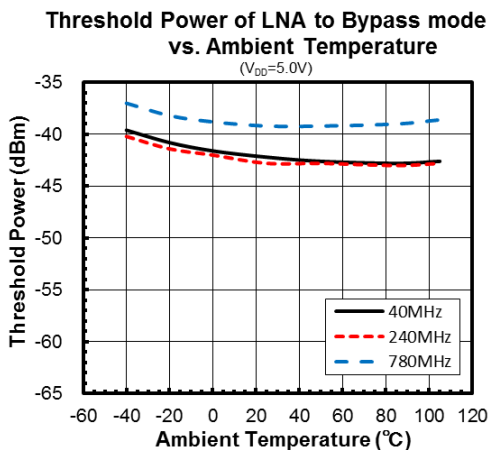
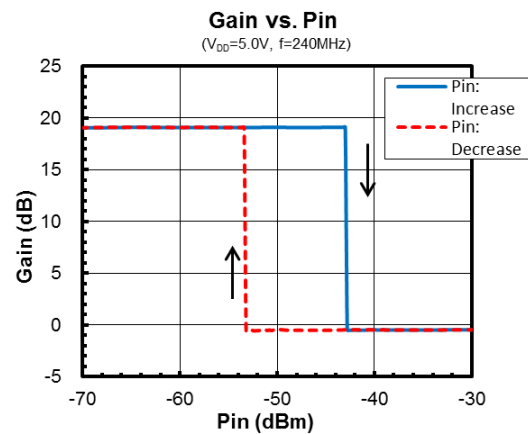
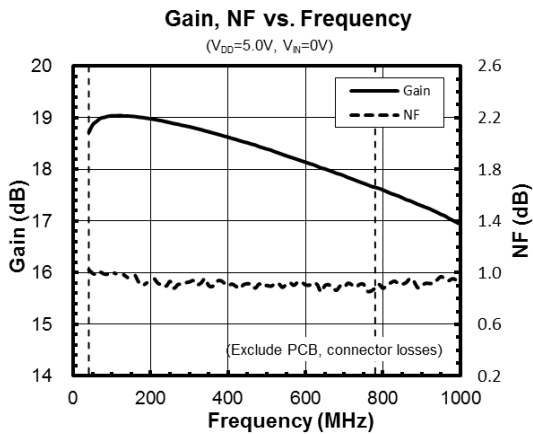
DTV, DAB, FM, other terrestrial broadcast applications



■ Block Diagram



■ ELECTRICAL CHARACTERISTIC EXAMPLE



[Datasheet link](#)



* All information, specifications and product descriptions in this document are subject to change at any time, without prior notice.
* Contact your local NJR office or your distributor to obtain the latest specifications before placing your product order.



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