Receiver Dynamic Range

We now know there is a **minimum input** signal power that a receiver can accurately demodulate.

→ *The Minimum Detectable Signal (MDS) defines the **sensitivity** of the receiver*

We also know there is a **maximum input** signal power that a receiver can accurately demodulate.

→ *The receiver 1 dB compression point defines the **saturation** point of the receiver.*

The **ratio** of the input saturation point and the minimum detectable signal is defined as the **total dynamic range** of the receiver.

$$\text{total dynamic range} \doteq \frac{P_{in}^{sat}}{MDS}$$

Note dynamic range is a **unitless** value, therefore dynamic range is most often expressed in **dB**:

$$\text{total dynamic range}\,(\text{dB}) \doteq P_{in}^{sat}\,(\text{dBm}) - MDS\,(\text{dBm})$$