



## Detector Performance Terminology

### Background Temperature

The effective temperature of all radiation sources viewed by the detector, excluding the signal source.

### D-Star (D\*)

A relative measure of sensitivity used to compare the detecting capabilities of different detectors. D\* is the signal-to-noise ratio at a specific electrical frequency with a 1 Hz bandwidth when radiant power is incident on the detector active area.

### Load Resistor

A resistance element that is in series with the detector element; typically matched to the detector's dark resistance

### Noise-Equivalent-Power (NEP)

The amount of required signal radiant power on the detector element area to yield a signal-to-noise ratio of one, and indicates the minimum detectable radiation level; the smaller the NEP value, the better the performance.

### Resistivity

The square areas resistance of a thin film detector, where L and W are equal; L being the separation between the electrodes and W is the length of the detector active area. Resistivity is a function of the detector element temperature and the level of irradiance.

### Responsivity

A value indicating signal output from radiation incident on the detector element. The value where the detector has a maximum spectral response is called peak responsivity. It is a function of detector area, wavelength, and circuit parameters.

### Rise Time-Fall Time

Rise time and fall time are the times in seconds required for the signal response to rise from 10% to 90% and fall from 90% to 10% of the maximum observed signal value. This happens when detectors are exposed to pulses of signal radiant power.

### Spectral Response

Most of the time this is shown as D\* vs. Wavelength, usually presented as a graph showing relative signal as a function of wave length of the incident radiant power.

### Time Constant

A measurement of a detector's speed of response when the detector is exposed to a square wave pulse of radiation. The rise time constant is the time required for the signal voltage to reach 0.63 times its asymptotic value. The decay time constant is the time required for the signal voltage to decay to 0.37 of the asymptotic value. This can also be measured by determining the chopping frequency at which the signal response is 0.707 of its maximum value.