$M_J = 2.0 * 10^{27}$ kg $R_J = 7 * 10^7$ m

$M_\odot = 2.0 * 10^{30}$ kg $R_\odot = 7 * 10^8$ m

$a_J = 7.8 * 10^{11}$ m Albedo = 0.343

(From NASA's Jupiter Fact Sheet)

$G = 6.67 * 10^{-11}\ m^3 kg^{-1} s^{-2}$

Jupiter-Like Planet around Sun-Like Star

Radial Velocity Signal:

$$K = \left(\frac{M_J}{M_\odot}\right)\sqrt{\frac{G M_\odot}{a_J}} * \sin i \quad [m \cdot s^{-1}]$$

$$K = \left(\frac{2*10^{27}\ kg}{2*10^{30}\ kg}\right) * \sqrt{\frac{(6.67*10^{-11}\ m^3 \cdot kg^{-1} \cdot s^{-2}) \cdot (2*10^{30}\ kg)}{7.8*10^{11}\ m}} * \sin i$$

$K = 13.1\ m \cdot s^{-1}$ (Assuming edge on $i = 90°$)

Transit Signal

$$f = \left(\frac{R_J}{R_\odot}\right)^2 \qquad f = \left(\frac{7*10^7\ m}{7*10^8\ m}\right)^2$$

fraction of light blocked by transiting planet

$f = 0.01 = 1\%$

Direct Imaging Signal

$$f = \frac{\pi R_J^2}{4\pi a^2} A$$

fraction of star's light reflected

$$f = \frac{(7*10^7\ m)^2}{4(7.8*10^{11}\ m)^2}(0.343)$$

$f = 6.9 * 10^{-10} = 6.9 * 10^{-8}\%$