1. Compute the forward resistance of the 1N4448 diode when working in the normal operating range of 4-20 mA.

1000

1N4448

I_F - Forward Current (mA)
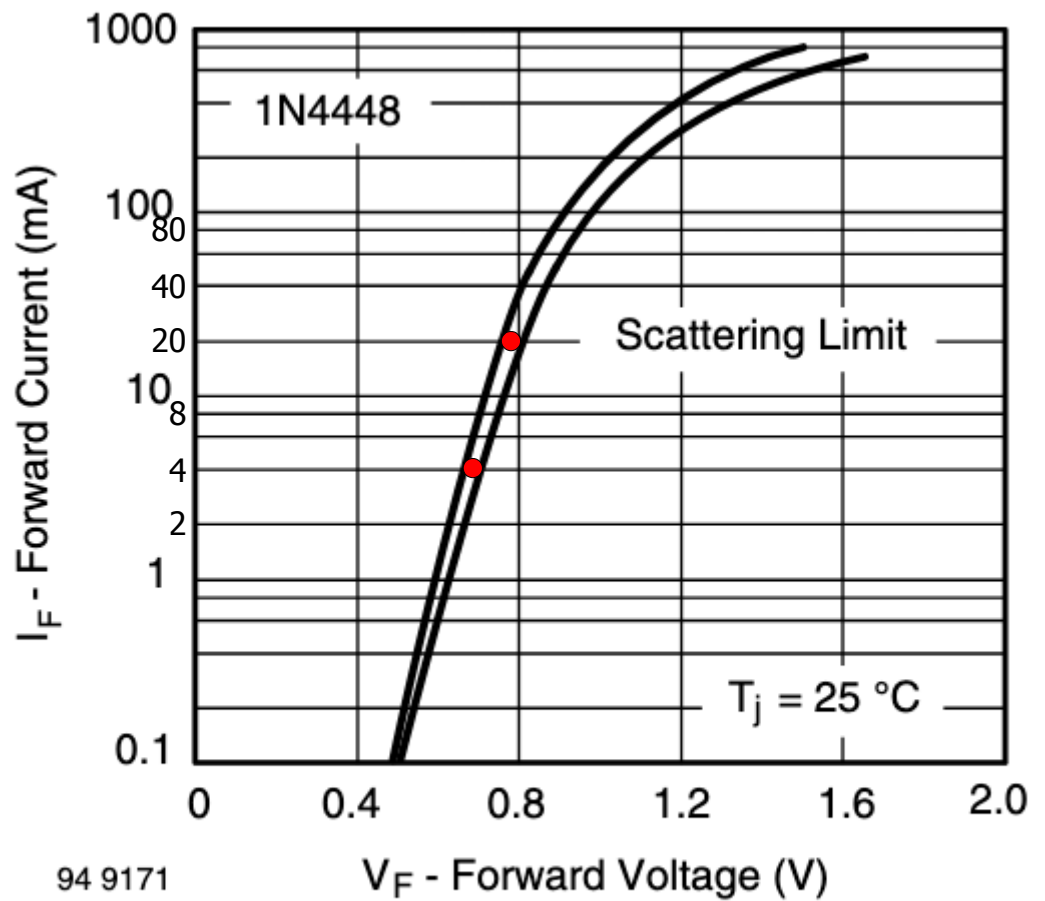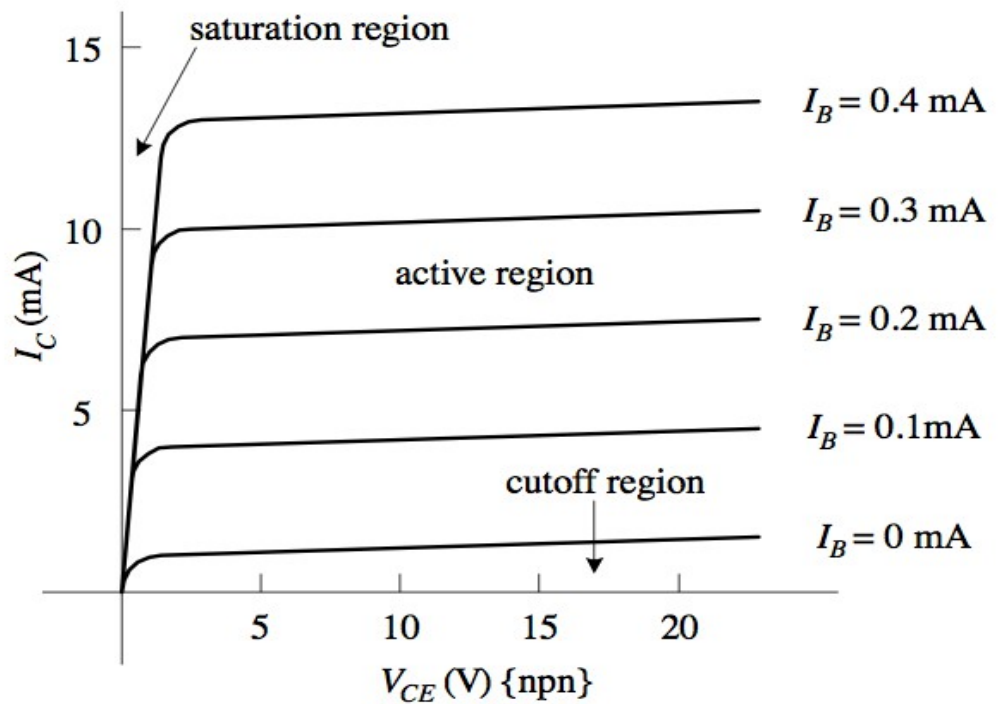
Scattering Limit

T_j = 25 °C

0.1

0   0.4   0.8   1.2   1.6   2.0

94 9171

V_F - Forward Voltage (V)

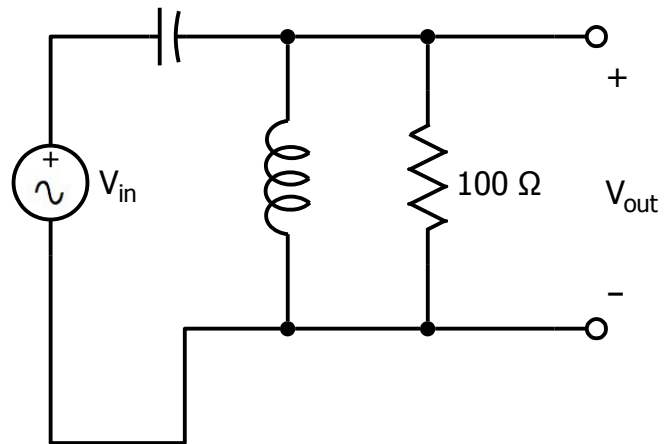Fig. 2 - Forward Current vs. Forward Voltage

$R = 6.25\ \Omega$

2. Compute the approximate current gain of this NPN transistor if the input base current is ±0.1 mA with an offset of 0.2 mA. Current gain $G = I_C/I_B$.

$G = 30$ (rather low for a BJT)

EE3 Fall 2020
Practice Problems 7

One can make use of resonance to provide amplification at a given frequency. In this circuit, we want the gain $|V_{out}/V_{in}|$ to be 10 at 1 KHz. Find L and C.

$C = 15.9 \ \mu F$
$L = 1.59 \ mH$