

- 2.23 A slotted-line experiment is performed with the following results: distance between successive minima = 2.1 cm; distance of first voltage minimum from load = 0.9 cm; SWR of load = 2.5. If $Z_0 = 50 \Omega$, find the load impedance.

$$\text{distance between minima} = \lambda/2 = 2.1 \text{ cm}$$

$$\hookrightarrow \underline{\lambda = 4.2 \text{ cm}}$$

$$\frac{l_{\min}}{\lambda} = \frac{0.9 \text{ cm}}{4.2 \text{ cm}} = 0.2143$$

Move 0.2143λ "WAVELENGTHS TOWARD LOAD"
from $r_{\min}/V_{\min}$ point to read

$$\underline{z_L = 2 - j0.9 \Omega}$$

$$Z_L = z_L Z_0 = (2 - j0.9) 50$$

$$\underline{\underline{Z_L = 100 - j45 \Omega}}$$

$$\text{Bonus: } Z_{L, \text{exact}} = 99.2 - j45.2 \Omega$$

$$z_0 = 50 \mu$$
$$\lambda = 4.2 \text{ cm}$$
