1. This image mode is called B-mode.
2. wavelength = speed of sound / frequency

Fat: = 0.29 mm

Muscle: = 0.3162 mm

1. Fat acoustic impedance is Z1 and muscle is Z2

PRC = = = = 0.104

PTC = = = = 1.104

1. average speed of sound = (SOS in fat x thickness of fat + SOS in muscle x thickness of muscle) / total thickness

=

= 1,548.25 m/s

Round trip time = 2 x depth / speed of sound

= 2 x 0.040 m / 1,548.25 m/s

= 0.000052 s

= 0.052 ms

1. # of scan lines = FOV width / scan line interval = 35 mm / 0.25 mm = 140

time per scan line = round trip time x 2 = 0.000052 s x 2 = 0.000104 s = 0.104 ms

total scan time = (# of scan lines \* time per scan line)

= 140 \* 0.000104 s

= 0.01456 s

= 14.56 ms

1. frame rate = 1 / (time per scan line) = 1 / 0.000104 s = 9,615 frames per second
2. attenuation coefficient of fat = 0.63 dB/cm @ 1 MHzattenuation (dB) = 2 x attenuation coefficient x round trip distance x frequency

= 2 \* 3.15 dB/cm \* 2cm \* 5 MHz

= 12.6 dB