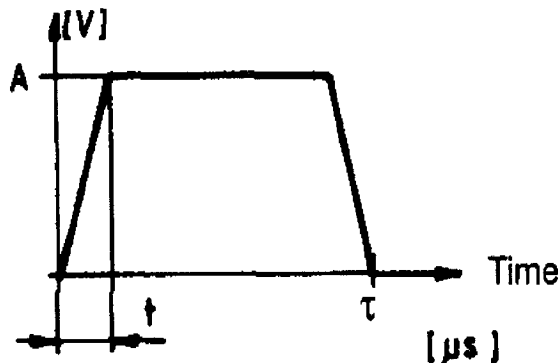1. Explain shortly the following terms or abbreviations: CE, peak detector, LISN, EFT/B and Y-capacitor.

2. Calculate the amplitude density function of the waveform shown below. $A = 100$ V, $\tau = 6$ μs and fall and rise times are $t = 0,07$ μs. How can the result be applied?

$$q(\omega) = \left| \int_{-\infty}^{\infty} f(t) e^{-j\omega t} dt \right|$$

$$F(j\omega) \le \frac{\int_{-\infty}^{\infty} |f(t)| dt}{\omega^n}$$
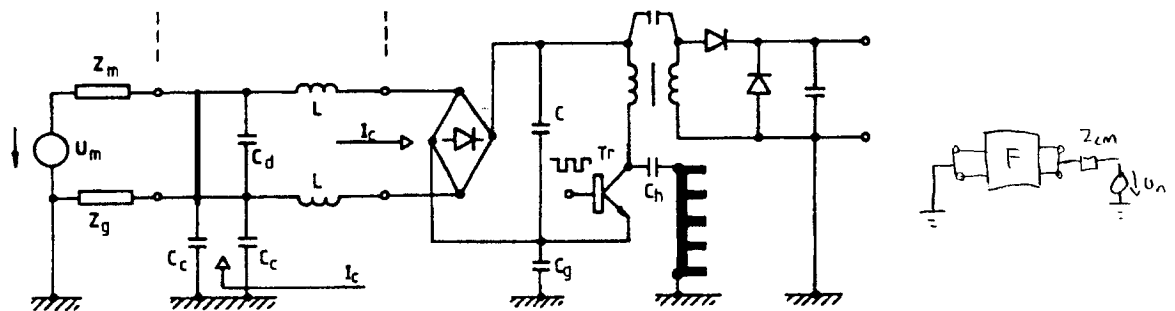
$f_1 = 53,7 \text{ kHz}$

$f_2 = 4,55 \text{ MHz}$

$F(f_1) = 175,5 \text{ dB}\mu V / \text{MHz}$

$F(f_2) = 136,9 \text{ dB}\mu V / \text{MHz}$

3. In the filter shown below $C_d = 47$ nF, $C_C = 2,2$ nF and $L = 0.13$ mH. Draw the schematic diagram of the whole system for common mode noise. Calculate common mode IL of the filter for the frequencies 150 kHz and 1 MHz. Combinations of output and input impedances are 50/50 Ω (Ohm), 0,1/100 Ω (Ohm) and 100/0,1 Ω (Ohm).

150kHz	3,98 dB	1,17 dB	54,92 dB
1MHz	18,30 dB	11,96 dB	71,39 dB

4. Inductive components used in EMI filters and their properties.

Please fill in the electronic course evaluation form at http://palaute.ee.hut.fi/

Thank You!

- Transformer
- solenoid, choke
- common-mode choke
- wires

$\frac{10^6 \mu V}{1 V} = 1$

$\frac{10^6 Hz}{1 MHz} = 1$

$20 \lg \frac{x V / Hz}{1 \mu V / MHz} = 20 \lg \frac{x \frac{V}{Hz} \cdot \frac{10^6 \mu V}{1 V} \cdot \frac{10^6 Hz}{1 MHz}}{1 \frac{\mu V}{MHz}}$