Lab1-Note by TA

□ $P = \lim_{T\to\infty} \frac{1}{2T}\int_{-T}^{T} |x(t)|^2 dt$, $E = \lim_{T\to\infty}\int_{-T}^{T} |x(t)|^2 dt$

Finite energy ⇒ average power = 0 ; energy signal

Finite power ⇒ energy → ∞ ; power signal.

□ Energy Spectral Density ⇒ $ESD = |X(f)|^2$

→ Parseval's Relation

$$E_{xx} = \int_{-\infty}^{\infty} |X(f)|^2 df = \int_{-\infty}^{\infty} |x(t)|^2 dt$$

□ Power Spectral Density ⇒ $S_{xx}(f) = \lim_{T\to\infty} \frac{|X_T(f)|^2}{2T}$, $X_T(f) = \int_{-T}^{T} x(t) e^{-j2\pi ft} dt$

$$P_{xx} = \int_{-\infty}^{\infty} S_{xx}(f)\, df$$

→ power 시간에 대해 적분 = energy

ESD를 주파수에 대해 적분 = energy

PSD를 주파수에 대해 적분 = power

PSD : spectrum analyzer 통해 측정

power : power meter "

$$x_{측정}(t) \cong \underbrace{h_{p.m}(t)}_{\text{한정된 대역폭}} * x_{sig}(t)$$

□ $P_{dBm} = 10 \log_{10} P_{mW}$, $P_{dBW} = 30 + P_{dBm}$

$P_{out} = \underset{(-10dBm)}{P_{sig}} - L_{att} + G_{VGA}$ @ $f_c = 433.92MHz$

G_{VGA} (0dB ~ 30dB . 5dB 단위) ... 1 [7회 측정]
$L_{att} = 10dB$

L_{att} (10dB ~ 90dB 10dB 단위) ... 2 [9회 측정]
$G_{VGA} = 10dB$

" $\underset{dBm}{P_{out}} = \underset{dBm}{\boxed{?}} + \underset{dB}{G_{VGA}} - \underset{dB}{L_{att}}$ "