SAR Level Measuring For Mobile Cell Phone in Cihan University–Erbil

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Specific Absorption Rate (SAR)

SAR is a measure of the amount of RF or EMF energy that is absorbed by the tissues in the human body.

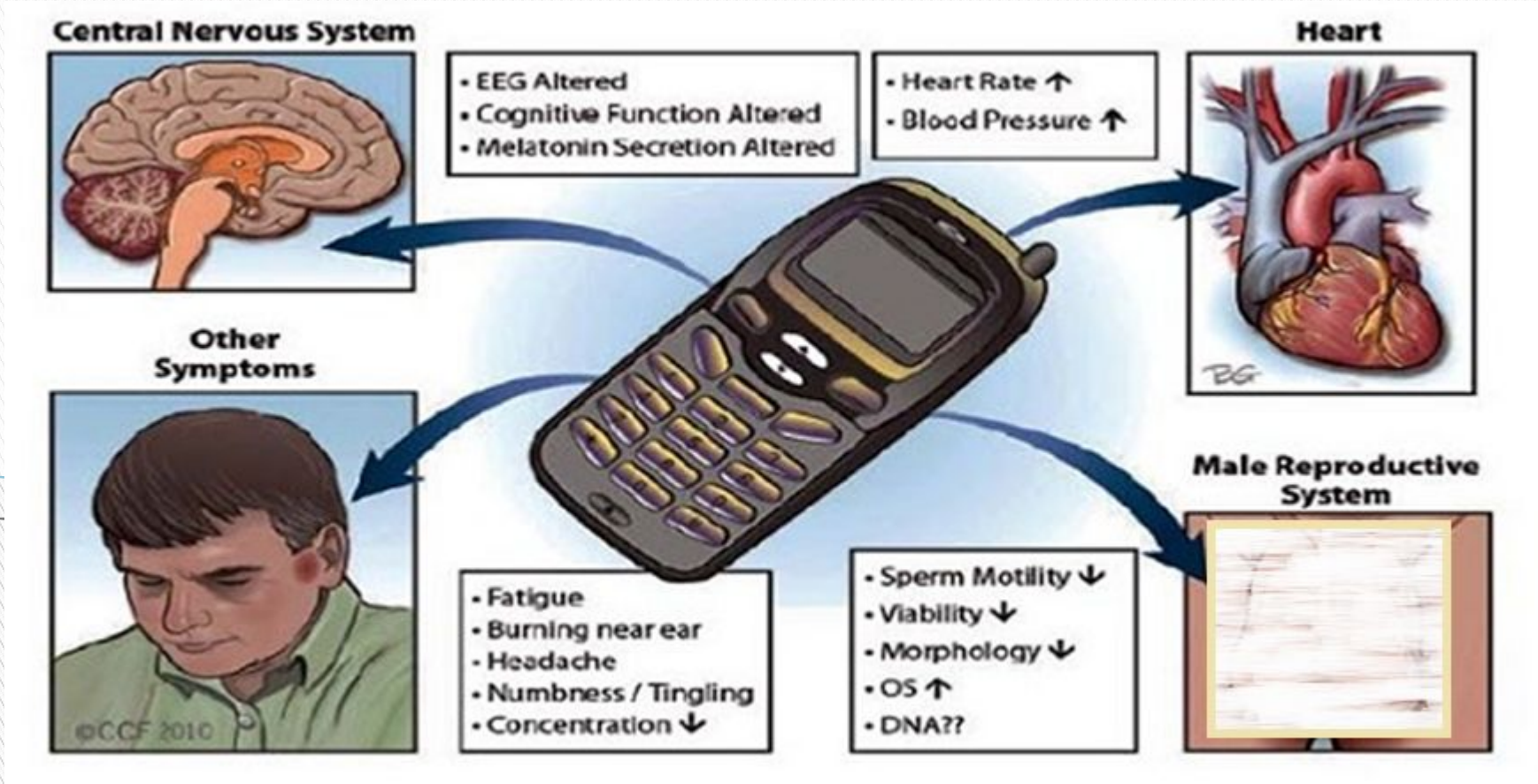
It indicates the average rate at which energy is absorbed for each kilogram of tissue (watts per kg).

This measurement is used to determine whether a mobile phone complies with the safety guidelines

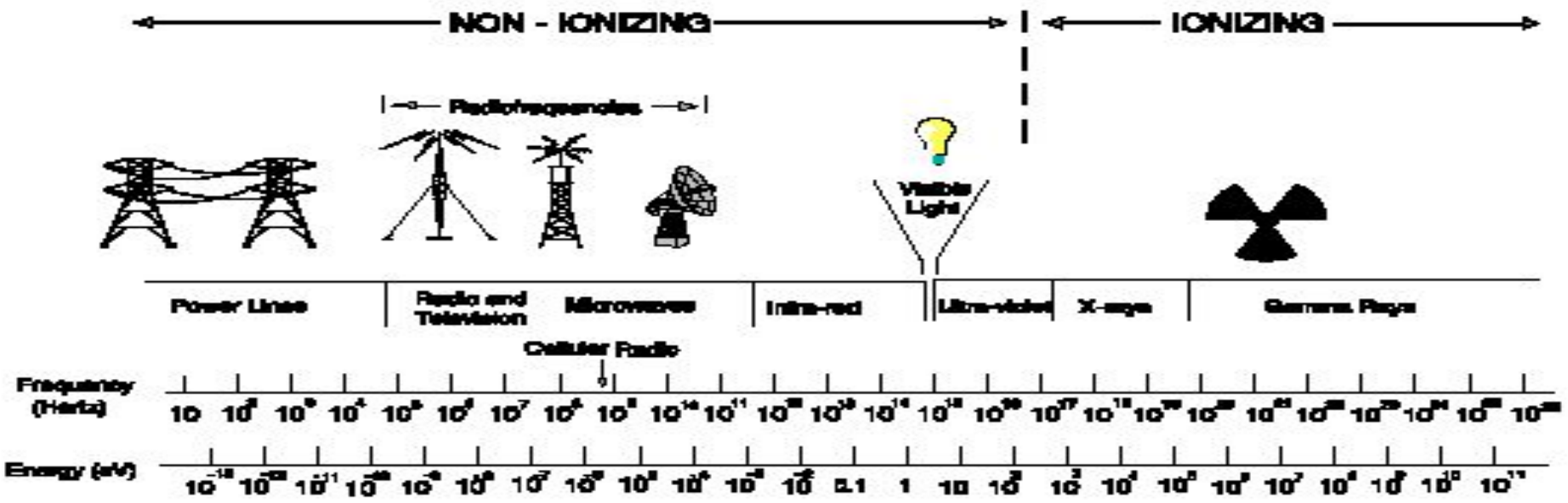
?Why is EMF a pollutant

Electromagnetic pollution (or EMF pollution) is a term given to all the man-made electromagnetic fields (EMFs) of various frequencies, which fill our .homes, workplaces and public spaces

When we call something in our environment a pollutant, we are implying that it is somehow harmful to nature and to ourselves



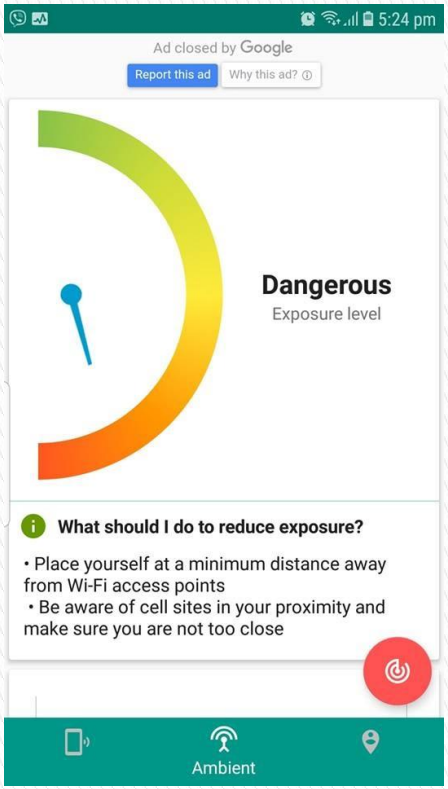
When we refer to electromagnetic pollution, we are generally speaking of frequencies below (oscillating slower than) visible light waves.
Of course, x-rays and gamma rays (which oscillate faster than visible light) are highly dangerous, but we have not filled our homes and workplaces with these rays. We knew they were .dangerous – so we've been careful



?So where does all this EMF pollution come from

Unfortunately, electromagnetic pollution is all around us. Here's a short list of the main culprits:

1. **cell (and other mobile) phones**
2. **computers and related equipment**
3. **electrical appliances (including TV's)**
4. **electronic equipment**
5. **cell phone masts**
6. **radio and TV transmitters**
7. **microwave ovens**
8. **house–wiring**
9. **high and low voltage power lines**
10. **information networks**
11. **cars, motor cycles, buses, trains, planes.**



The measure Specific Absorption Rate(SAR) level in Cihan University buildings and comparing with international (SAR) level

EMF Measurement

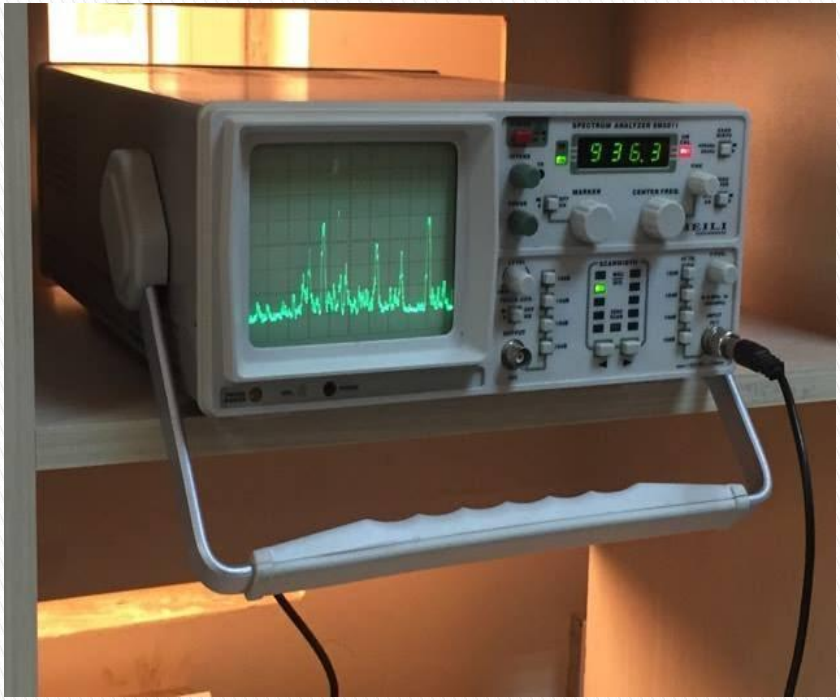
components of the EMF can be

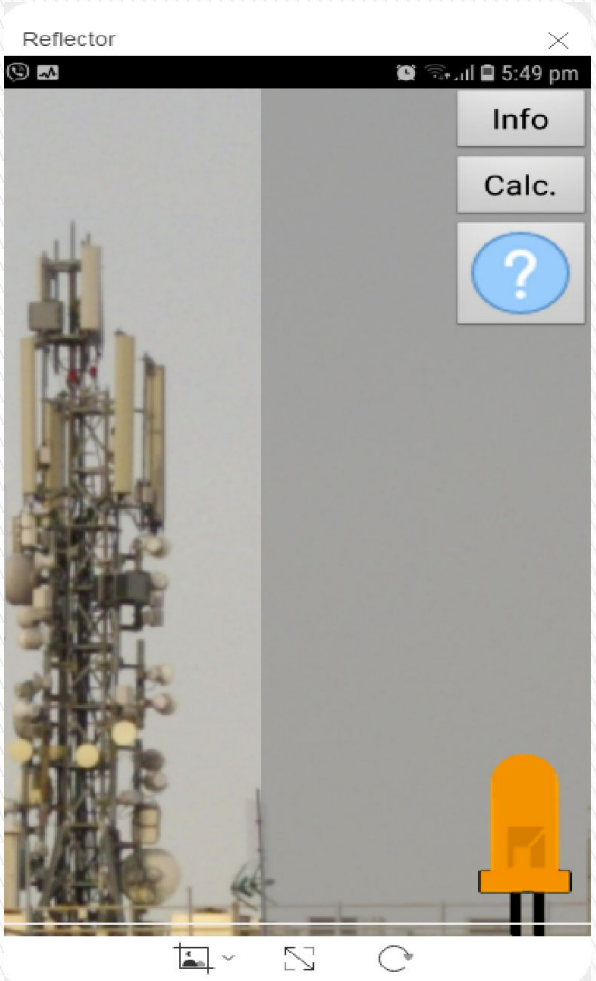
ve more or less effect on human
fect of a dose of absorbed radiation
usually, millisieverts (mSv).

Tools of measurement

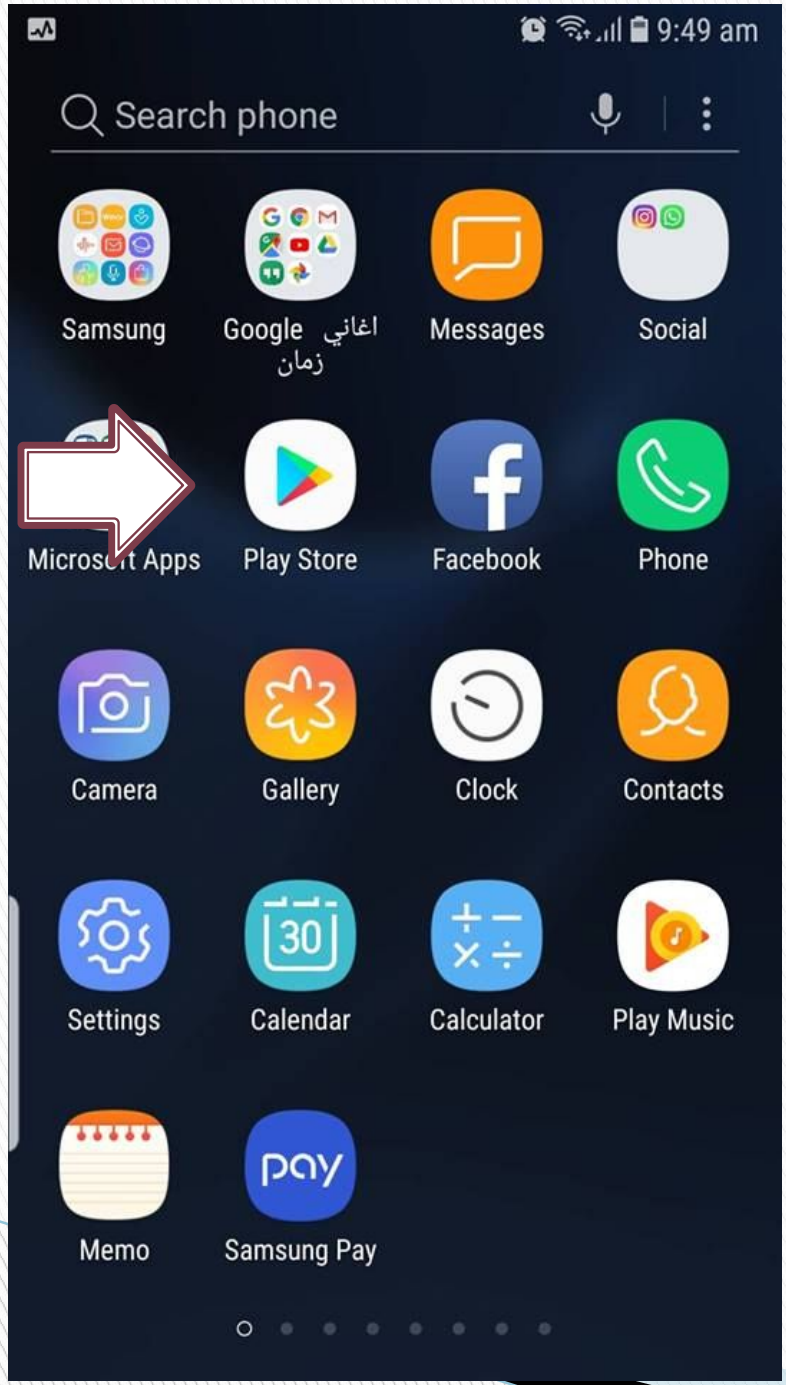
1- spectrum analyser

2- Soft were application





Use your mobile to measure the level of strength signal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Search phone
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Messages
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Clock
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Calendar
Calculator
Play Music
Memo
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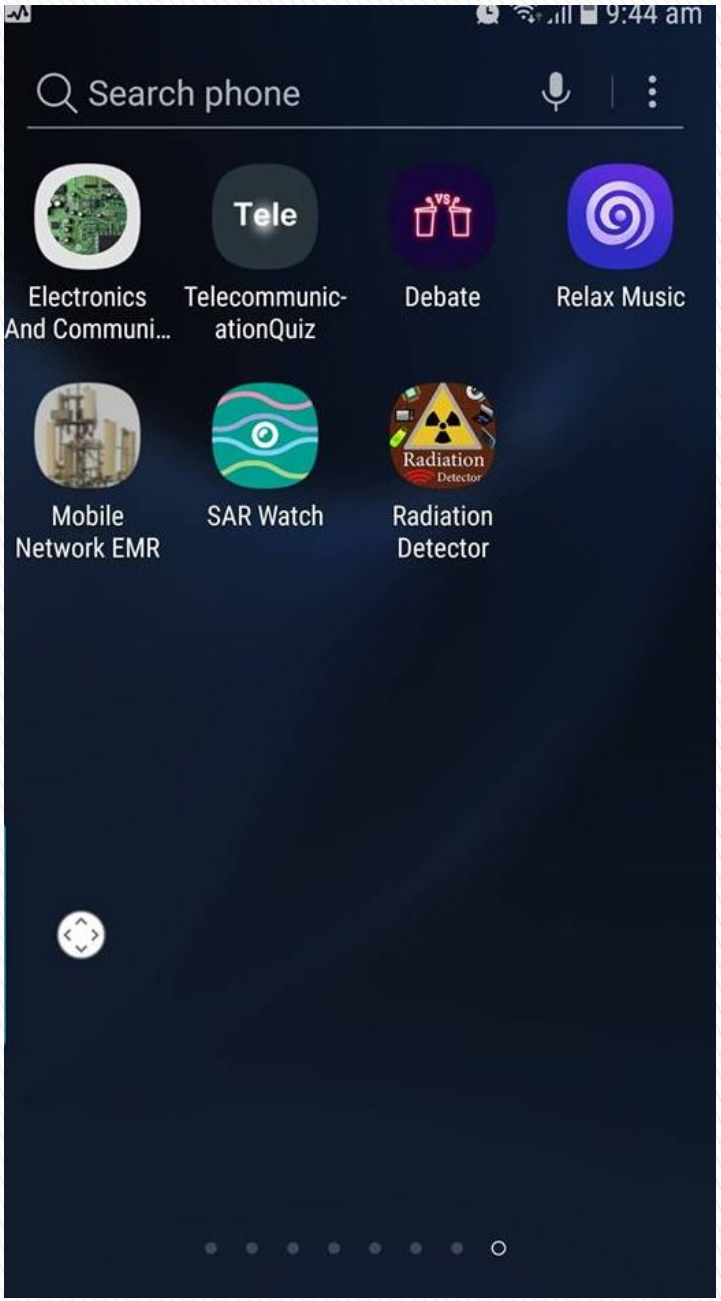
9:44 am
Search phone
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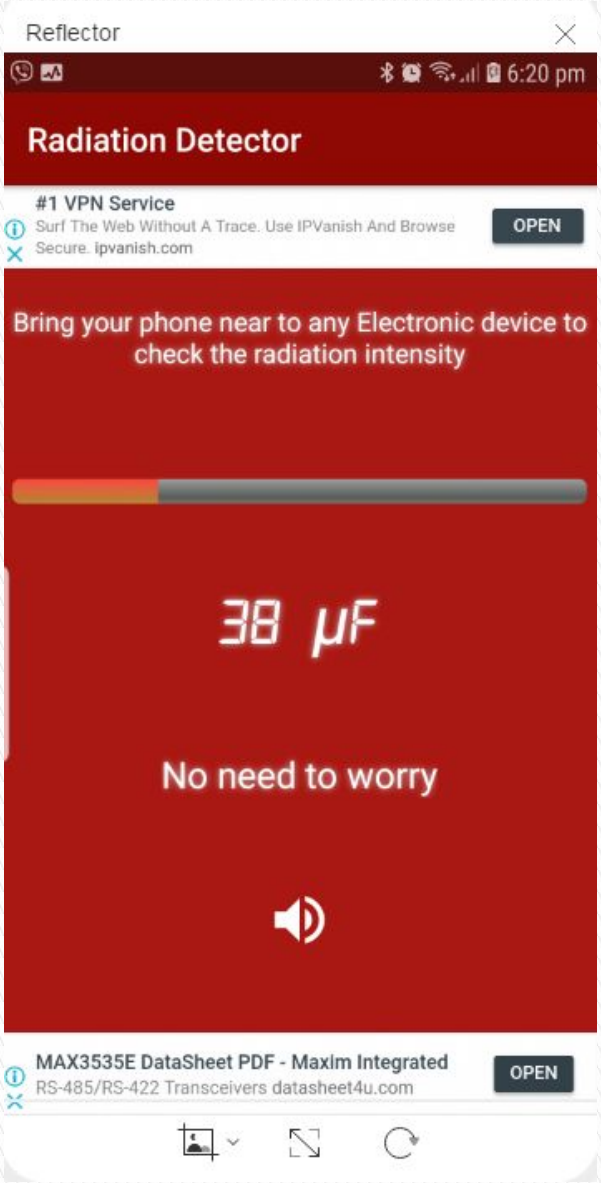
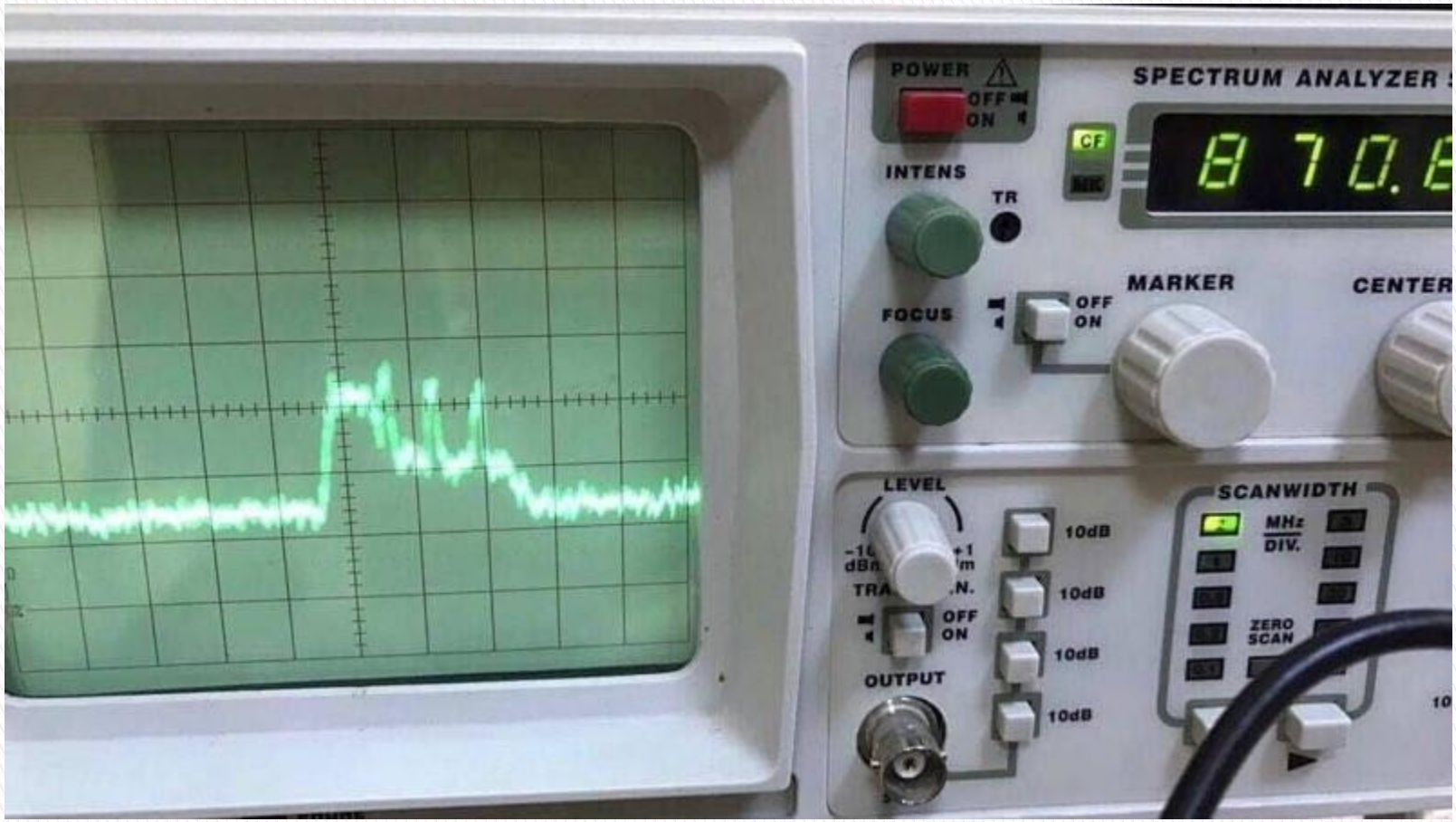
Debate
Relax Music
Mobile Network EMR
SAR Watch
Radiation Detector
Radiation Detector


Reflector
6:20 pm
Radiation Detector
#1 VPN Service
Surf The Web Without A Trace. Use IPVanish And Browse Secure. ipvanish.com
OPEN
Bring your phone near to any Electronic device to check the radiation intensity
38 µF
No need to worry
MAX3535E DataSheet PDF - Maxim Integrated
RS-485/RS-422 Transceivers datasheet4u.com
OPEN


Reflector
6:23 pm
Radiation Detector
#1 VPN Service
Surf The Web Without A Trace. Use IPVanish And Browse Secure. ipvanish.com
OPEN
Bring your phone near to any Electronic device to check the radiation intensity
465 µF
Extremely High Radiations Detected
LM393 DataSheet PDF - National Semiconductor
Low Power Low Offset Voltage Dual Comparators
OPEN

Table : SAR Limits for head, neck and trunk	
Guideline	**SAR limit - Head, Neck and Trunk**
Health Canada Safety Code	W/kg averaged over 1 gram of 1.6 *tissue
Europe	2.0 W/kg average over any 10 grams of tissue**
Australia	W/kg averaged over 1 gram of 1.6 tissue
US	W/kg averaged over 1 gram of 1.6 tissue
India	1.6 W/kg averaged over 1 gram of tissue
ICNIRP	2.0 W/kg average over any 10 grams of tissue**


POWER
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SPECTRUM ANALYZER
CF
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FOCUS
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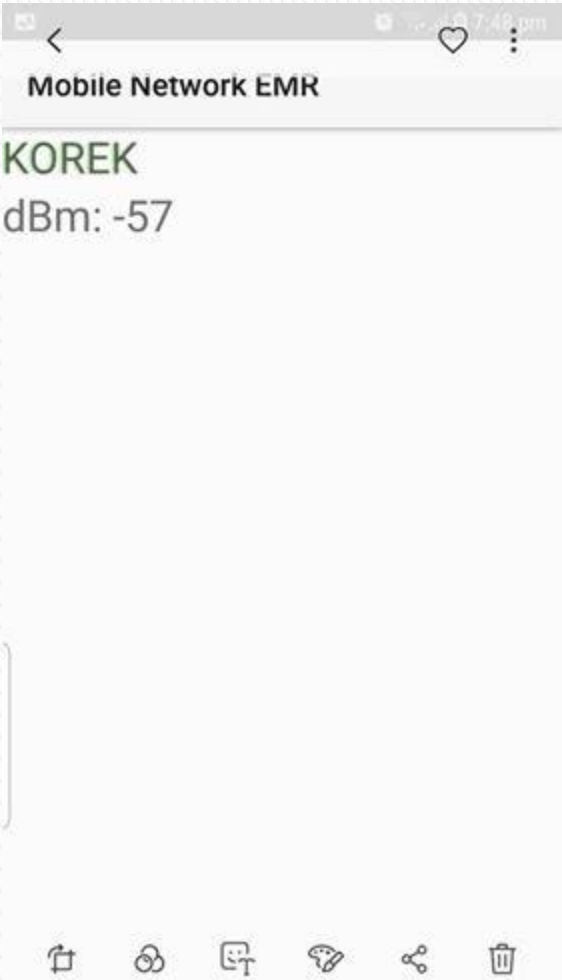
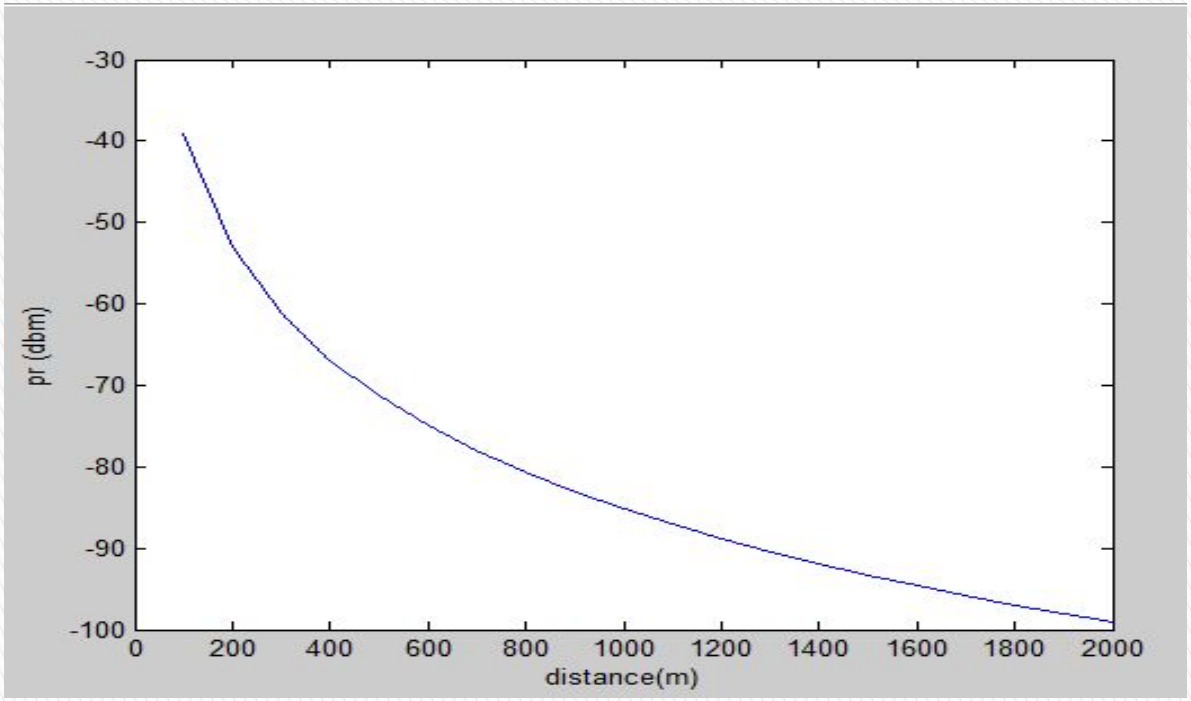
DIV.
ZERO
SCAN

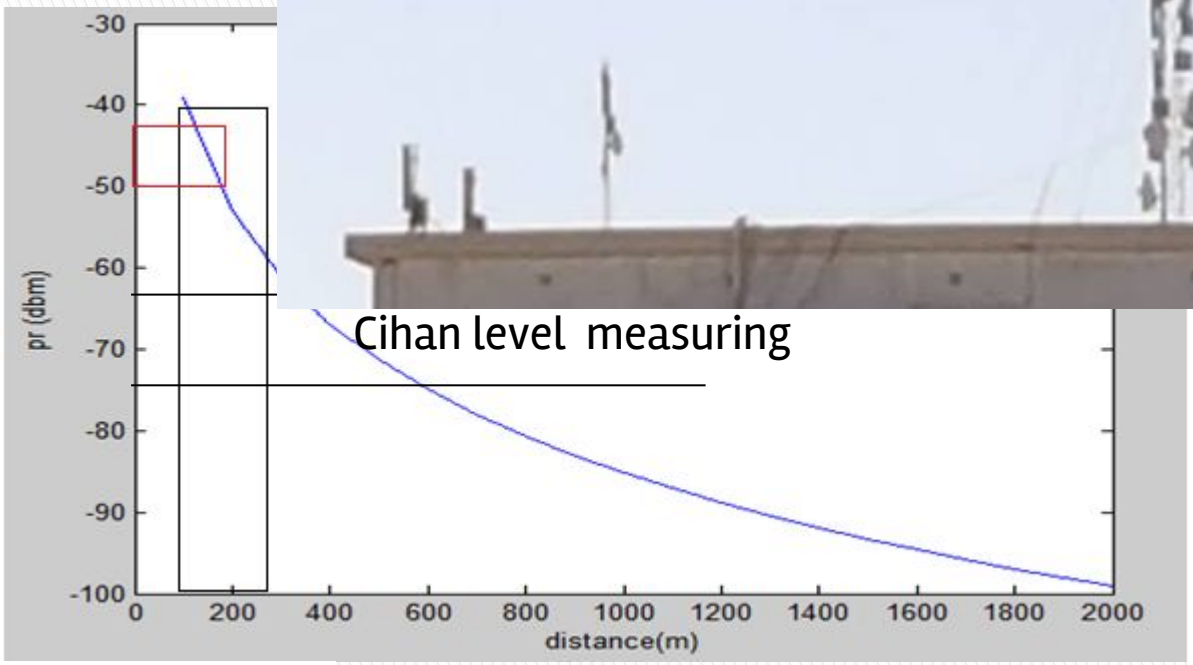




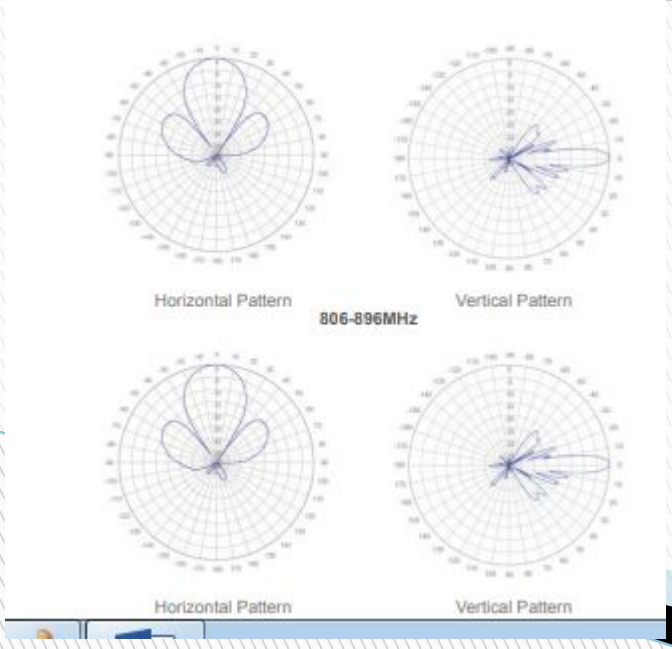
The relation between the EIRP of base station and distance

Signal Power measuring in Cihan University (800-900) MHz

Place	Power in dBm
Building 1	76-
Building 2	76-
Building 3	86-
Building 4	80-
Building 5	85-
Building 6	71-
Cafeteria	66-
Building 8	to -73 63-
Building 9	74-
Research center	63-



Cihan level measuring



- Wall attenuation
- Antenna type and shape of the pattern
- Multipath
- Calibration of measuring tools .
- Human error in reading

SAR Measurement

Electric Field (RMS)

enter the RMS electric field | V/m

Conductivity of Material (σ)

enter the conductivity of material | S/m

Mass Density (m_d)

enter the mass density | Kg/m^3

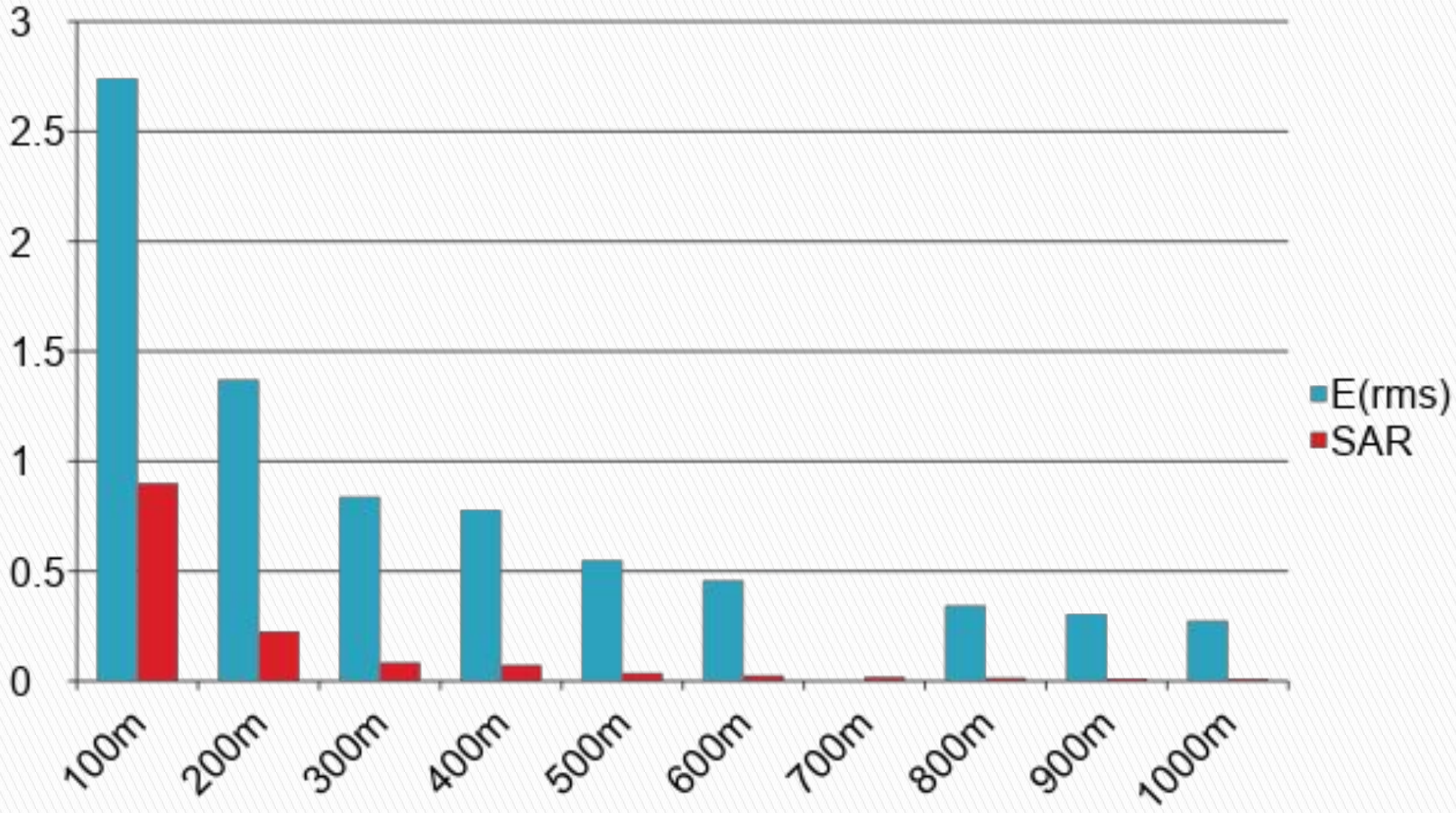
Conductivity of Material(σ)=150

Mass Density(m_d)=1250

SAR Measurement

distance	(E(rms	SAR
100m	2.74	0.9009
200m	1.37	0.2252
300m	0.837	0.0841
400m	0.778	0.0726
500m	0.549	0.0362
600m	0.457	0.0251
700m	0.39	0.0183
800m	0.343	0.0141
900m	0.305	0.0112
1000m	0.274	0.009

Chart For SAR Measurement ,Electric Filed with Distance



Exposure to high doses of radiation over a short period of time

This photo is an example of radiation burns injury suffered by a person who had exposure to radiation higher than the SAR limit of hand.

MREM: measurement Roentgen Equivalent Man
Is unit to measure the dose of radiation

Hair Loss

The higher the dose of radiation, the faster hair loss occurs If the radiation dose does not exceed 300,000 mrem, it is possible that hair will grow back

Reduce My Exposure to RF Radiation from My Mobile Phone

- the shorter the time you spend on a mobile phone, the smaller the RF radiation exposure. You could use a hands–free kit or use a mobile phone connected to a remote antenna to increase the distance between your body and the source of the RF radiation, since the exposure level drops off dramatically with distance.

- 400 meters is also a good distance to keep from cell towers, assuming that you know they are there. (They're getting hard to spot.)

- The mobile phone still emits radiation but you can hold it quite far away from your body while you use it.
- use the speaker–phone facility or you can hold the phone several inches away from your ear .
- If you can't avoid having a long conversation with a mobile phone next to your ear, switch ears every two or three minutes.

- Children under 10 should never use a cell phone except in an emergency, **children much more vulnerable (in danger) than adults.**

Thanks