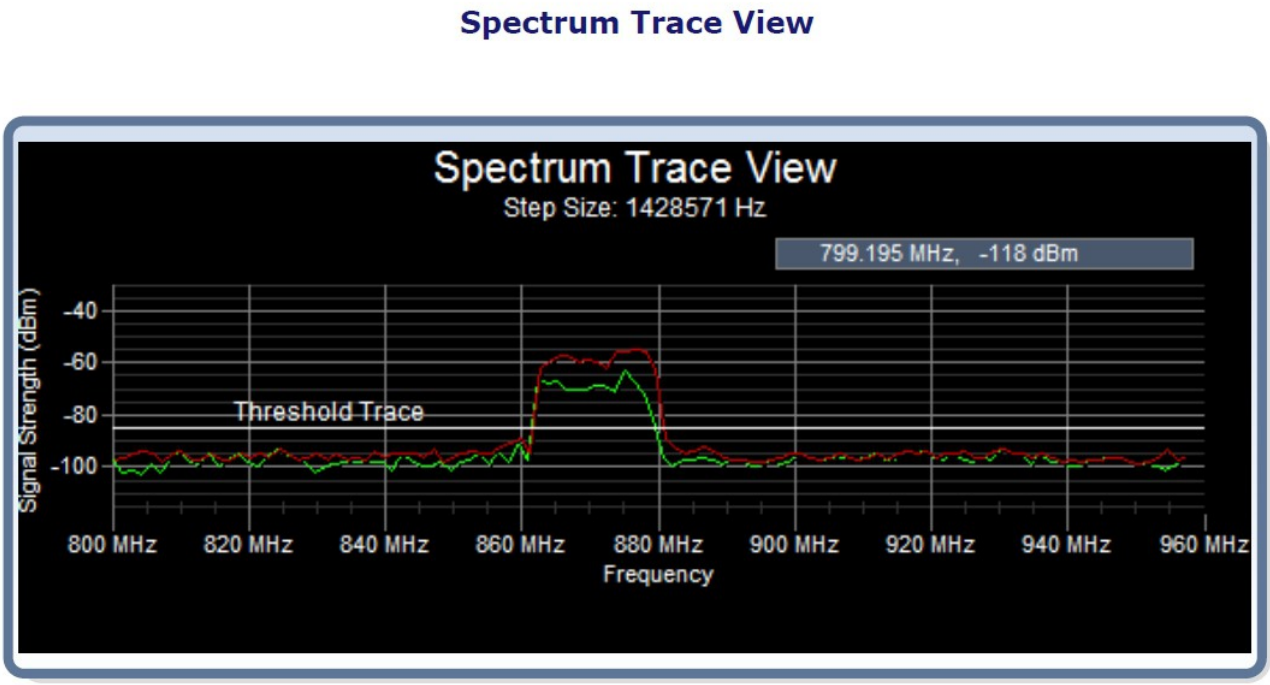
Background EMF (RF)

Measurements taken in Wisconsin, with a HF35c field measurement instrument, showed a background of (very roughly) 200 to 400 uW/m^2

Measurements taken with a spectrum analyzer showed that the likely cause/source of this background is in the 850 Mhz band, from the 3G/4G network.

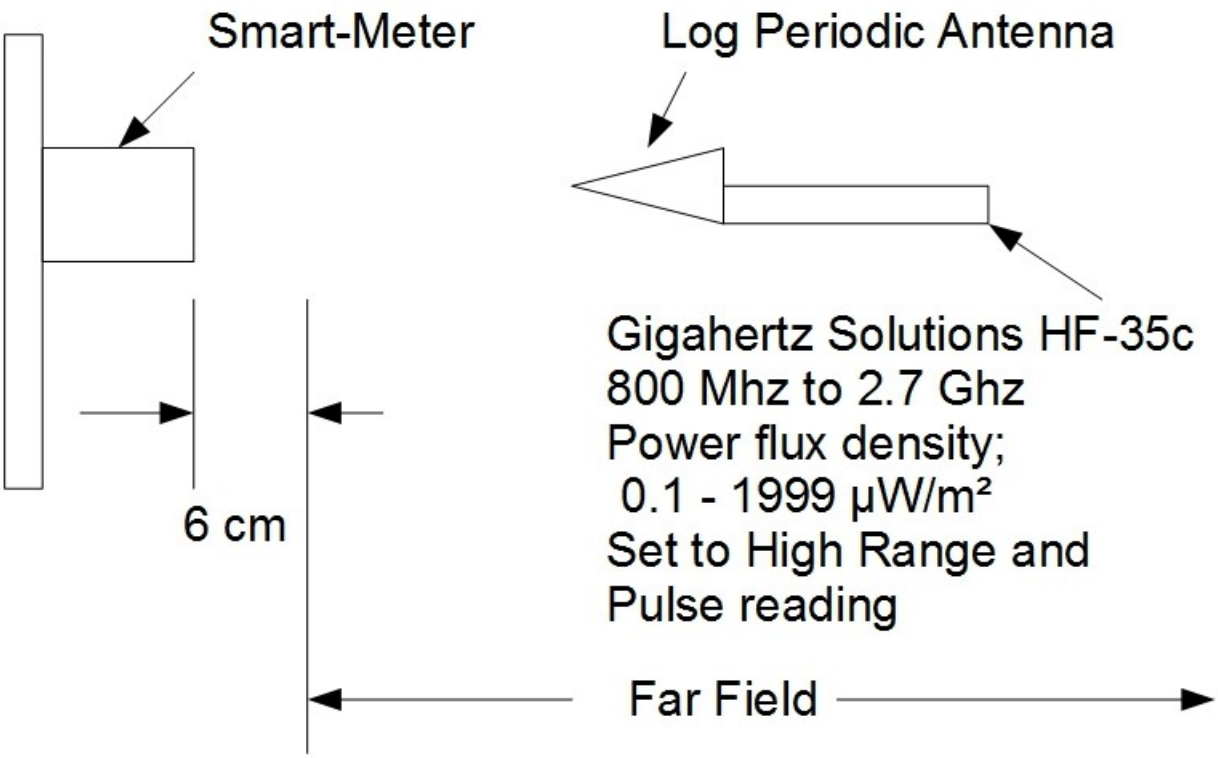
Steady background in the 850 Mhz region is shown below in the spectrum analyzer plot;



HF35c Measurements of Smart Meter radiation

Measurements taken, approximately 2 feet from smart meter, were in the Far Field, as shown by the the following diagram.

It is necessary to be in the Far Field to make meaningful measurements.



Calculation of Far Field Boundary

R = (2 d^2) / L

C = F x L
C / F = L
3 x 10^10 / 9 x 10^8 = .333 x 10^2
L = 33.3 cm

d is generously taken to be 10 cm

R = (2 x 10^2) / 33.3
R = 6 cm

Discussion

Measurements with the HF35c revealed burst of EMF (RF) many times per minute.

Peak readings were in the range of 1400 uW/m^2

This peak strength is well above the recommended safe levels, per European Academy For Environmental Medicine.

Day Time recommended levels are 100 uW / m^2
1400 / 100 = Smart Meter radiation was **14 times higher** than **Day Time** recommended levels

Night Time recommended levels are 10 uW / m^2
1400 / 10 = Smart Meter radiation was **140 times higher** than **Night Time** recommended levels

Sensitive Persons recommended levels are 1 uW / m^2
1400 / 1 = Smart Meter radiation was **1400 times higher** than **Sensitive Persons** recommended levels

See following pages for data, specifications and images.

Summary

1] The frequency of bursts of EMF (RF) from the Smart Meter is much higher than the 6-times-per-day that the utility is saying it is.
It is perhaps thousands of times higher.

2] The peak power density of the Smart-Meter radiation is substantially higher than the European Academy For Environmental Medicine recommended for all categories; Day, Night, Sensitive (see above).

European Academy for Environmental Medicine Recommended Levels

https://europaem.eu/en/

Table 3 Precautionary guidance values for radio-frequency radiation

EUROPAEM-EMF-Guideline-2016-for-the-prevention-and-treatment-of-EMF-related-health-problems.pdf

RF Source Max Peal/Peak Hold	Daytime Exposure	Nighttime Exposure	Sensitive Populations
Radio broadcast FM	10,000 uW/m^2	1,000 uW/m^2	100 uW/m^2
TETRA	1,000 uW/m^2	100 uW/m^2	10 uW/m^2
DVBT	1,000 uW/m^2	100 uW/m^2	10 uW/m^2
GSM (2G) 900/1800 MHz	100 uW/m^2	10 uW/m^2	1 uW/m^2
DECT	100 uW/m^2	10 uW/m^2	1 uW/m^2
UMTS (3G)	100 uW/m^2	10 uW/m^2	1 uW/m^2
LTE (4G)	100 uW/m^2	10 uW/m^2	1 uW/m^2
GPRS (2.5G) with PTTCH* (8.33 Hz pulsing)	10 uW/m^2	1 uW/m^2	0.1 uW/m^2
DAB+ (2.4 Hz pulsing)	10 uW/m^2	1 uW/m^2	0.1 uW/m^2
WiFi 2.4/5.6 GHz (10 Hz pulsing)	10 uW/m^2	1 uW/m^2	0.1 uW/m^2

*PTTCH Packet timing advance control channel

Smart Meter Comparison; European Academy and FCC

DECT (Digital Enhanced Cordless Telephone) is chosen as a comparison device with a smart-meter because, DECT is spread spectrum and frequency hopping like the smart-meter.

FCC allowable level is 60,000 times higher than Euro Academy **DAYTIME** recommendations
FCC allowable level is 600,000 times higher than Euro Academy **NIGHTTIME** recommendations
FCC allowable level is 6,000,000 times higher than Euro Academy **SENSITIVE** recommendations

FCC Maximum Exposure Levels, Document; oet56e4

300 to 1500 MHz max exposure; f/1500 mw/cm^2
Above 1500 Mhz = 1 mw/cm^2

	mw/cm^2	uW/cm^2	uW/m^2
900 Mhz =	0.6 mw/cm^2	600 uW/cm^2	6 million uW/m^2
1800 Mhz =	1 mw/cm^2	1000 uW/cm^2	10 million uW/m^2
2.4 Ghz =	1 mw/cm^2	1000 uW/cm^2	10 million uW/m^2

United States Carrier Frequency Use [edit]

Carrier	2G Frequency in MHz Band name			3G Frequency in MHz Band name			4G LTE Frequency in MHz Band number												
	800	850	1900	850	1700 2100	1900	600	L700	L700	U700	800	850	1700 2100	1900	2300	2500	3500	5200	5700
	SMR	CLR	PCS	CLR	AWS	PCS	71	12,17	29[1]	13	26	5	4,66	2,25	30	41	48	252	255
AT&T	No	No	No	UMTS	No	UMTS	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No			
T-Mobile	No	No	GSM	No	UMTS	UMTS	Yes	Yes	No	No	No	Yes[2]	Yes	Yes	No	No		Yes[3]	Yes
Sprint	CdmaOne[4]	No	CdmaOne	No	No	CDMA2000	No	No	No	No	Yes	No	No	Yes	No	Yes			
Verizon	No	CdmaOne	CdmaOne	CDMA2000	No	CDMA2000	No	No	No	Yes	No	Yes	Yes	Yes	No	No			
U.S. Cellular	No	CdmaOne	CdmaOne	CDMA2000	No	CDMA2000	No	Yes	No	No	No	Yes	Yes	Yes	No	No			

Technical Data

HF-35c

Frequency range:	800 MHz - 2.7 GHz
Measurement range:	Power flux density: 0.1 - 1999 µW/m²
Precision:	Basic accuracy (CW) including linearity tolerance: +/- 6 dB Zero offset and rollover +/- 9 digits
Sensor:	Logarithmic periodic antenna
Audio analysis:	Identification of pulsed radiation sources (mobile radio (GSM, UMTS/G3), cordless telephones (DECT), WLAN (Bluetooth), air-traffic control-radar) by means of an acoustic signal proportional to the modulation frequency
Signal rating:	Display of peak value as well as average value (switchable)
Power supply:	9 Volt alkaline manganese battery (included), average operation time 6 - 7 hours (depending on the operating mode) Low-Batt. indication Auto-power-off


Audio
HF 35C
HF-Analyser
800 MHz-2500 MHz
192.0
µW/m²
1999
µW/m²
Signal
RMS
Peak
Power
93.3
Power Flux Density