

# Analysis of the Disparity among the FCC's Various Limits on Emitted Power on Frequencies above 960 MHz

Chuck Jackson

13 Dec 1999

# Power Limits

Limits on emitted power are found throughout the FCC rules.

Consider three specific examples:

- Intentional radiators under Part 15
- Unintentional radiators under Part 15
- PCS radios

These rules are similar to those that apply to many other radio services.

# Emission Limits

## Intentional radiator

- 500 ○V/m at 3 meters ( $f > 960$  MHz)

## Unintentional radiator

- Class A digital device
- 300 ○V/m at 10 meters ( $f > 960$  MHz)

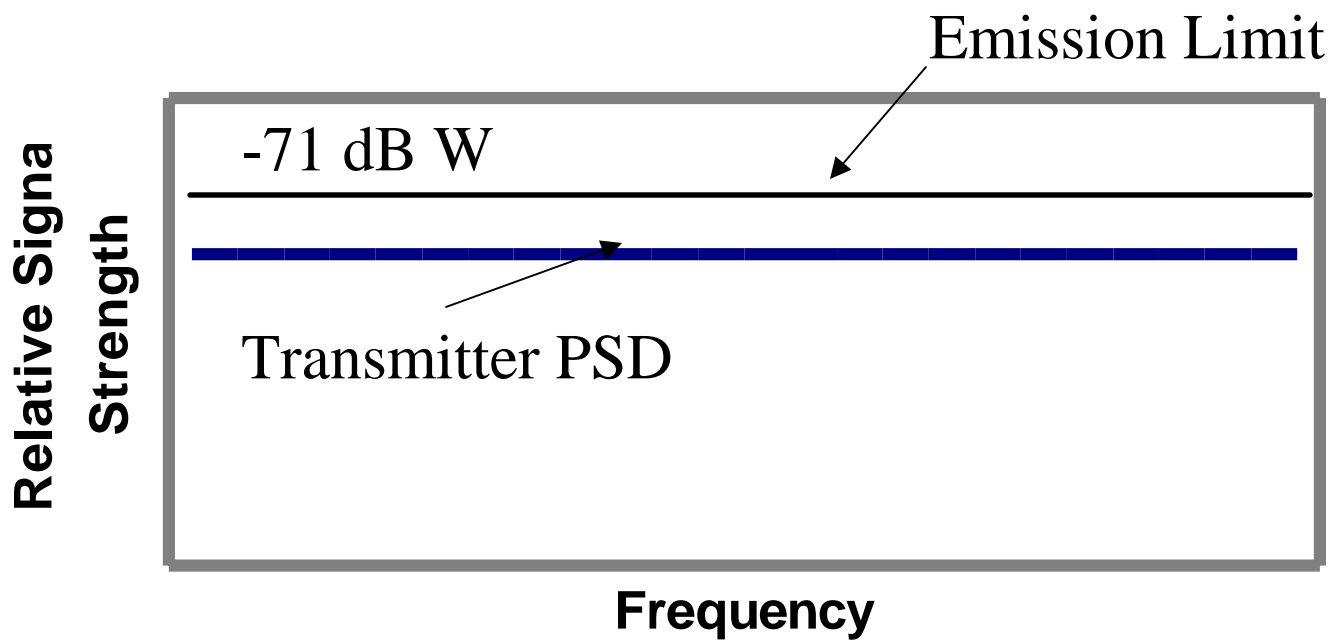
## PCS transmitter

- Below -43 dBW in any 1-MHz band
- For reference kTB is -144 dBW  
(290 K,  $10^6$  Hz)

# Common Currency

mitter	Field Strength $\mu\text{V}/\text{m}$	EIRP at 3 Meters
tentional	500	-71 dBW
nintentional	1,000	-65 dBW
CS	13,000	-43 dBW

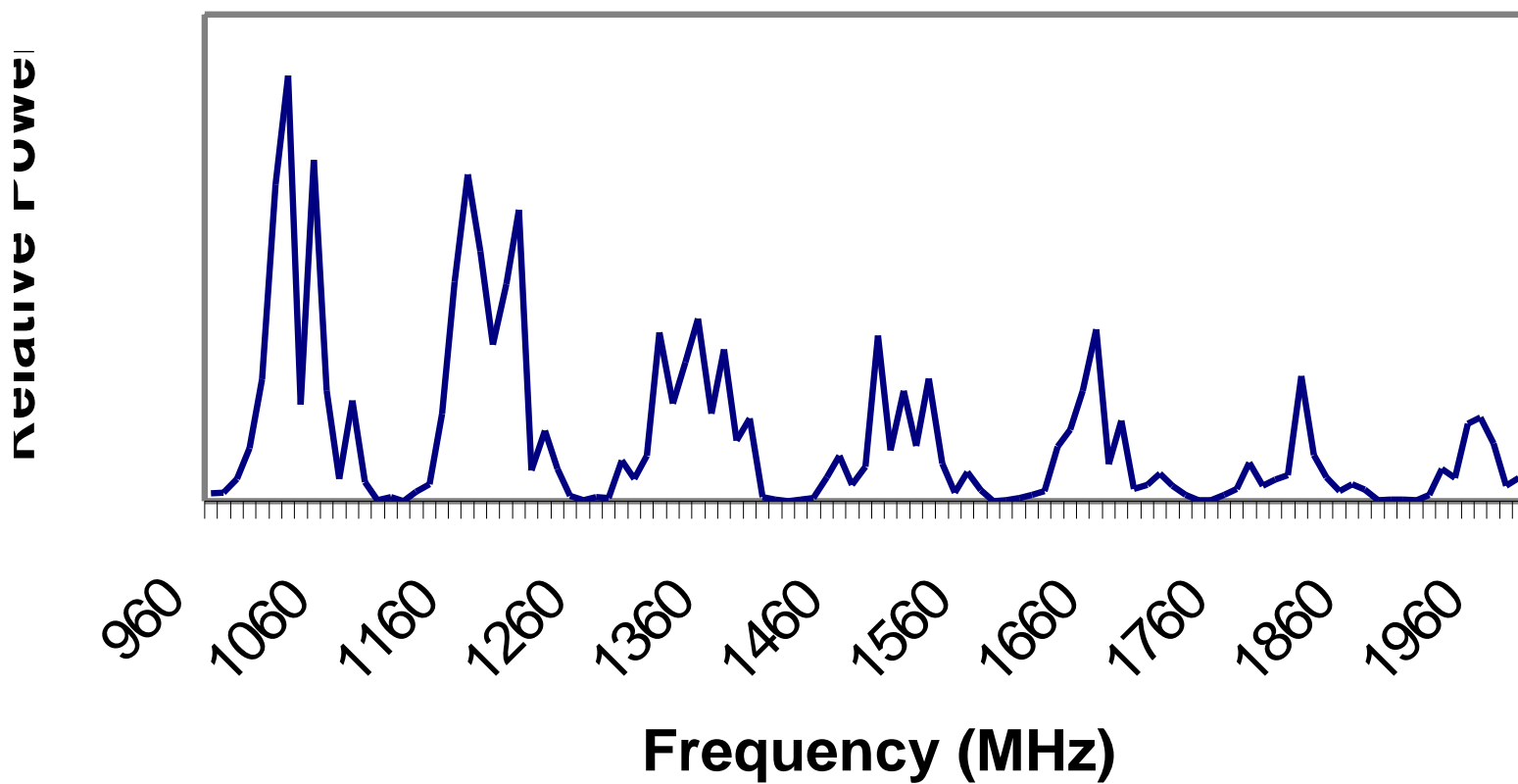
# Wideband Intentional Transmitter PSD





---

## Incidental Emitter PSD



# Simultaneous Constraints

FCC Rules

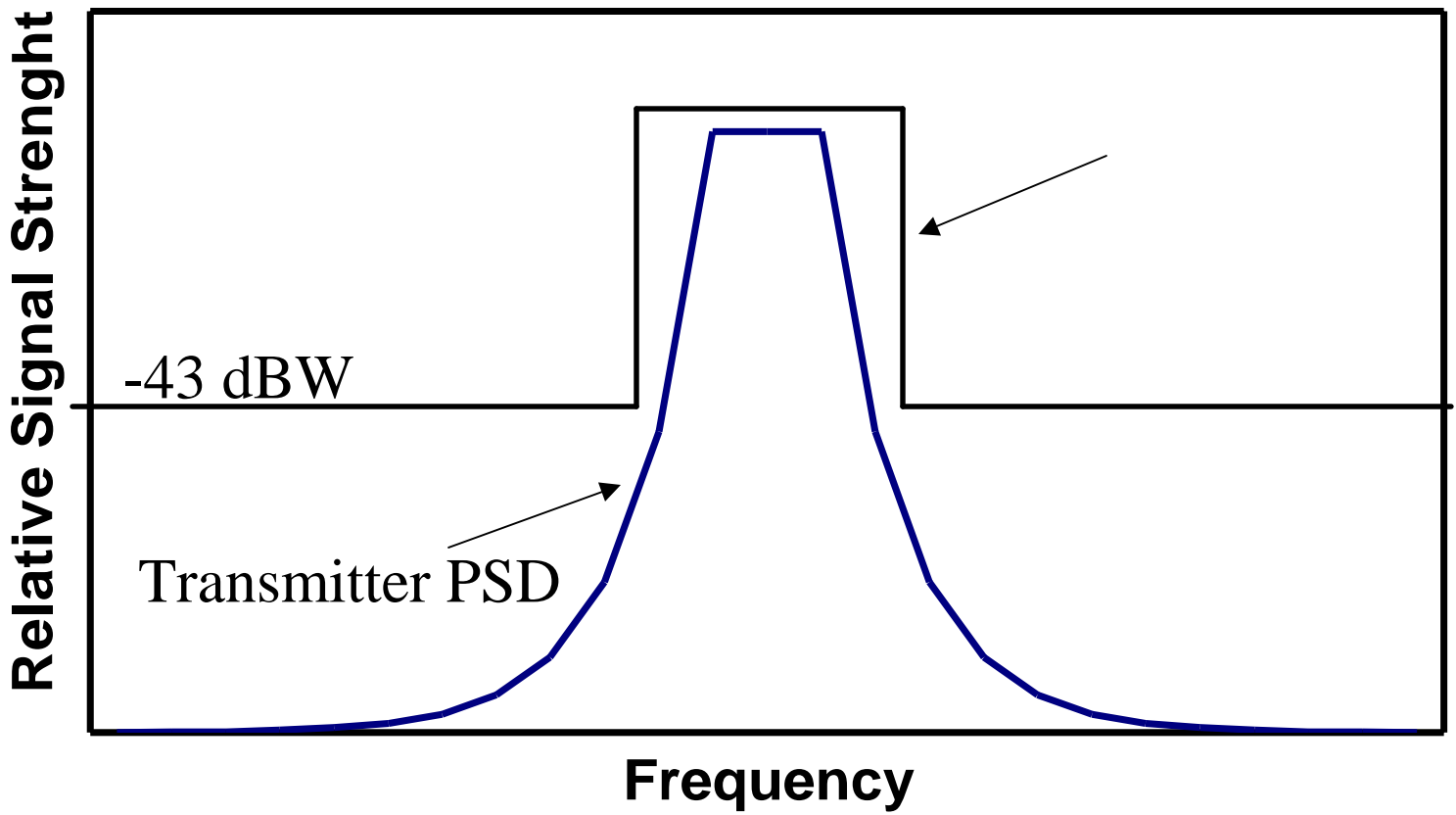
Laws of Physics

The FCC's out-of-band constraints on PCS transmitters are really more like boundary conditions for the roll-off of the passband filters.

---

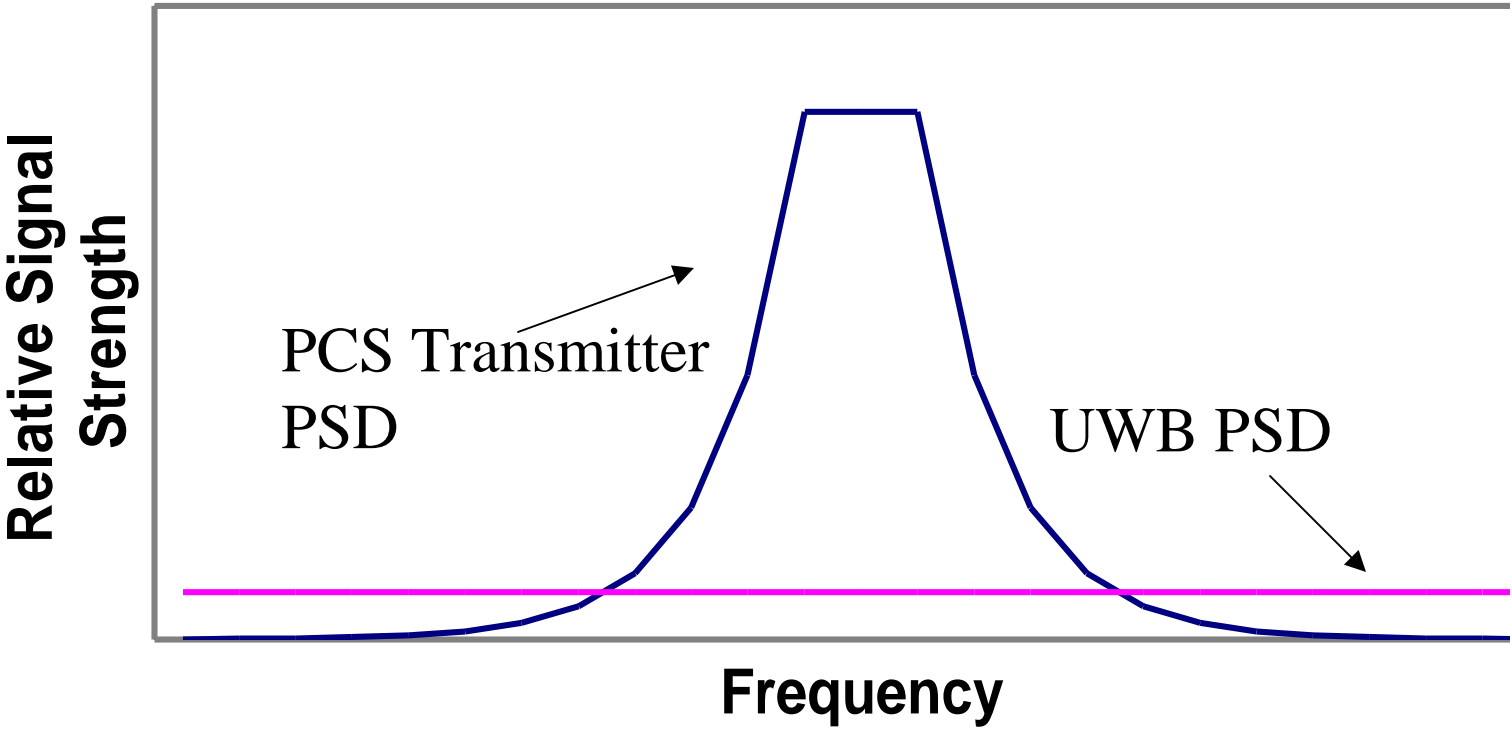
---

## PCS Transmitter Emissions

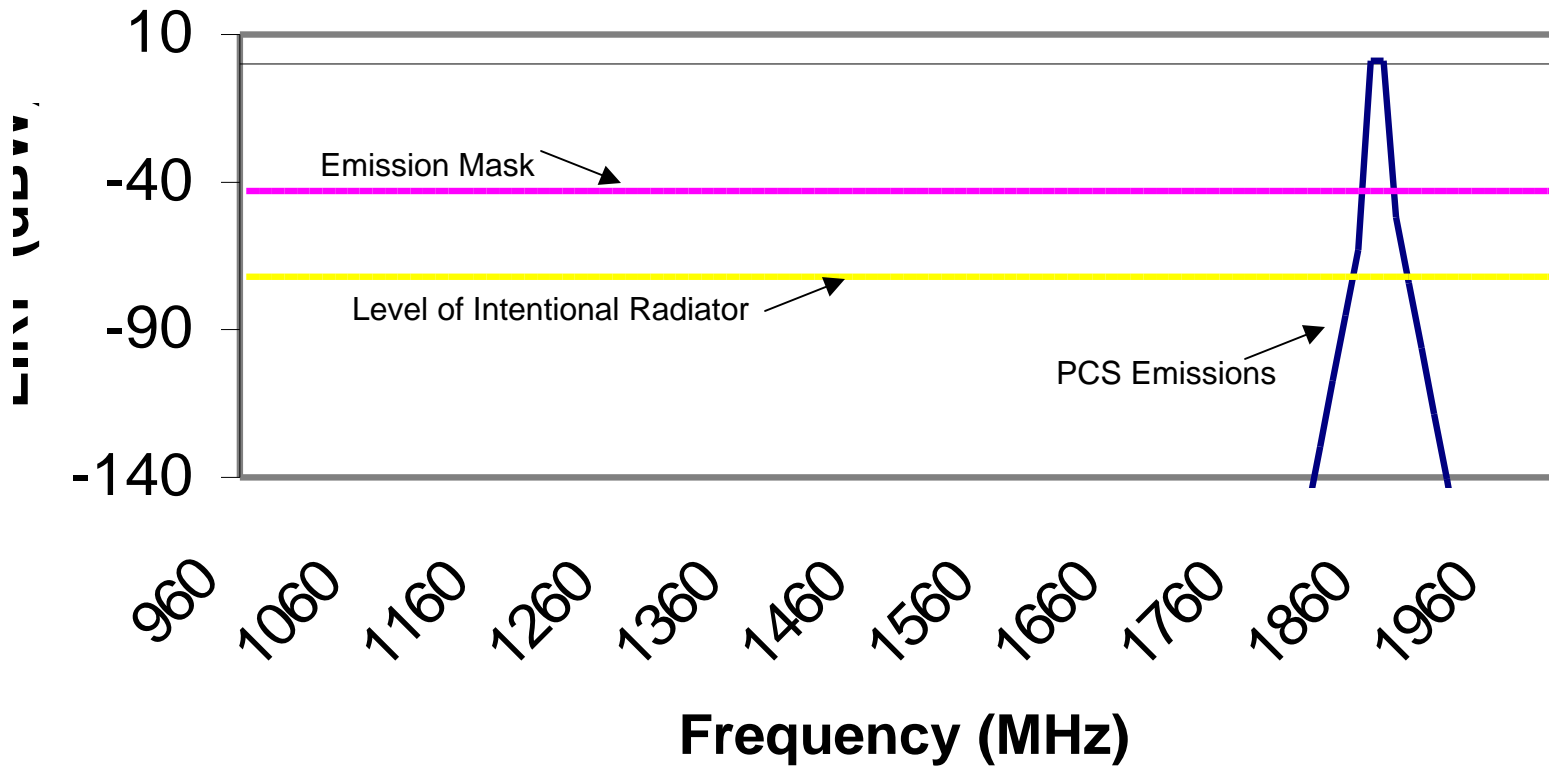


---

# Comparison: Intentional vs. PCS (I)



# Comparison: Intentional vs. PCS (II)



# PCS: An Additional Constraint

## **§24.238 Emission limits.**

(e) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, in its discretion, require greater attention than specified in this section.

# Conclusions

The FCC does hold intentional radiators to somewhat tighter limits than it holds unintentional radiators.

Under reasonable system models, this disparity does not mean that intentional radiators are less likely to cause harmful interference than are unintentional radiators such as personal computers.