L-band power calculation per FCC rule

			GPS	
	From (source):		test equipment feeding into spacecraft antenna via test coupler	
	To (target):		FCC defined target location	
f	Frequency:	MHz	1575	L5
λ	Wavelength λ=c/f:	m	0.190	
	Source power:	dBm	-5	network analyzer
	Loss to amplifier:	dB	0	no amplifier
	Amplifier model:		n/a	no amplifier
	Amplifier gain:	dB	0	no amplifier
	Test coupler	dB	-30	flight test coupler coupling value. Spec is TBD right now for L-band coupler, assume 30 dB.
	Loss to antenna:	dB	-0.5	on-board loss from test coupler to antenna. Estimate
	Source antenna model:		TBD	Assume same array as GCCS program. Built by RYMSA.
	Source antenna gain:	dBi	34	Peak (boresight) gain of RYMSA array for L5 transmit frequency
	Isotropic power at source antenna:	dBm	-1.5	
		W	0.09	
d	Distance from antenna to target	m	30	per FCC instructions
	Spreading Loss = 10 log (1/4πd^2)	dB/m2	-40.53	
	Flux at target	dBm/m2	-42.03	
	Flux at target	dBW/m2	-72.03	
	Flux at target	W/m2	0.0000	
	Field at target V=sqrt(Power * Freespace R	V/m	0.005	
	Isotropic Area = 10 log (λ^2/4π)	dBm2	-25.40	
	Power at target antenna:	dBm	-67.44	
	Target antenna gain:	dBi	0	isotropic antenna per FCC instructions
	Target loss from antenna to test equipmen	dB	0	not applicable in this case
	Power at target:	dBm	-67.44	
	Spreading bandwidth	MHz	24.00	per FCC instructions
	Spreading bandwidth convert to dB	dB-Hz	73.80	
	Spread power at target	dBm/24 MHz	-141.24	
	Maximum allowed	**dBm/24 MHz**	-140	per FCC instructions
	margin	dB	1.24	

c, speed of light	299792458	*m/s*	
R, free space resistance	*376.99112*	*ohms*	*characteristic resistance of free space, 120*pi*