For the Hann function I get

x(0) = 0, x(1) = 0.146, x(2) = 0.5, x(3) = 0.854, x(4) = 1, x(5) = 0.854, x(6) = 0.5, x(7) = 0.146, x(8) = 0 ; N = 9

Considering both positive and negative frequencies, DFT transforms this to

X(0) = 4, X(1) = -2.19 – j0.8, X(2) =0.16 + j0.14, X(3) = 0.03 + j0.05, X(4) = 0.0027 + j0.015, X(5) = 0.0027 – j0.015, X(6) = 0.03 – j0.05, X(7) = 0.16 –j0.14, X(8) = -2.19 + j0.8

|X(0)|/N = 4/9 = 0.444v = 0.2 watts = 22.95 dBm = dc or average value. **MATLAB = 30 dBm**

PEAK ; |X(1)|/N = 2.33/9 = 0.26v (pk) = 0.0676 watt (pk) = 18.3 dBm (pk) **MATLAB = 23.98 dBm**

RMS ; |X(1)|/N = 2.33/9 = 0.26v (pk) = 0.26/√2 v (rms) = 0.184 watt (rms) = 22.65 dBm (rms) **MATLAB = 23.98 dBm**

PEAK ; |X(2)|/N = 0.21/9 = 0.023v (pk) = 0.00053 watt (pk) = -2.76 dBm (pk) **MATLAB = -32.99 dBm**

RMS ; |X(2)|/N = 0.21/9 = 0.023v (pk) = 0.023/√2 v (rms) = 0.00027 watt (rms) = -5.78 dBm (rms) **MATLAB = -32.99 dBm**

I built a very simple model in MATLAB, Simulink (no coding required) consisting of a signal generator, an oscilloscope and a spectrum analyser.

The MATLAB readings above were taken from a power spectrum plot in the spectrum analyser – not sure if they are peak/rms.

n =	0	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
x(n) =	0	0	0.1464466	0.1464466	0.5	0.5	0.853553391	0.853553391	1	1	0.853553391	0.853553391	0.5	0.5	0.1464466	0.1464466	0	0
f =	Re	Im	Re	Im	Re	Im	Re	Im	Re	Im	Re	Im	Re	Im	Re	Im	Re	Im

0	0	0	0.1464466	0	0.5	0	0.853553391	0	1	0	0.853553391	0	0.5	0	0.1464466	0	0	0

X(0) = REAL (0.15 + 0.5 + 0.85 + 1 + 0.85 + 0.5 + 0.15) = 4

IM = 0