**FSL = Free Space Loss in decibels (dB)**

FSL = 96.6 + 20 log D + 20 log F

| Site Names | Southington, CT | Bristol, CT |
|---|---|---|
| D = Distance in Miles | 5.88 | |
| F= Frequency in GHz | 6.625 | 6.785 |
| FSL (dB)    =========> | -128.411 | -128.619 |

**Receive Signal Level**

The Receive Signal Level (RSL) is the expected strength of a signal when it reaches the
receiving radio. The following formula defines the Receive Signal Level:

Po - Lctx + Gatx - Lcrx + Garx - FSL = RSL

where $P_0$ is the output power of the transmitter (in dBm)

$L_{ctx}$ is the cable loss between the transmitter and its antenna (in dB)

$G_{atx}$ is the gain of the transmitter's antenna (in dBi)

$L_{crx}$ is the cable loss between the receiver and its antenna (in dB)

$G_{arx}$ is the gain of the receiver's antenna (in dBi)

FSL is free space loss (in dB)

| | Southington, CT | loss/100' | Length/Size | Bristol, CT | loss/100' | Length/Size |
|---|---|---|---|---|---|---|
| Po | 24 | | | 24 | | |
| Lctx | -1.365 | 1.3 | 105 | -2.015 | 1.3 | 155 |
| Gatx | 39.9 | | 6 | 39.9 | | 6 |
| Lcrx | -2.015 | 1.3 | 155 | -1.365 | 1.3 | 105 |
| Garx | 39.9 | | 6 | 39.9 | | 6 |

**Rx = Receiver Sensitivity Threshold in dBm BER $10^{-6}$**

| Rx    =========> | -70 |
|---|---|

Fade Margin(Mf) = Receiver Sensitivity Threshold (Rx) - Total Losses (Lt)

Mf = Rx- Lt

| Total Losses | Fade Margin | | Total Losses | Fade Margin | |
|---|---|---|---|---|---|
| -27.991 | -42.009 | dB | -28.199 | -41.801 | dB |

**FSL = Free Space Loss in decibels (dB)**
FSL = 96.6 + 20 log D + 20 log F

| Site Names | Southington, CT | Bristol, CT |
|---|---|---|
| D = Distance in Miles | 5.88 | |
| F= Frequency in GHz | 11.5 | 11.5 |
| FSL (dB)  =========> | -133.202 | -133.202 |

## Receive Signal Level

The Receive Signal Level (RSL) is the expected strength of a signal when it reaches the receiving radio. The following formula defines the Receive Signal Level:

Po - Lctx + Gatx - Lcrx + Garx - FSL = RSL

where $P_0$ is the output power of the transmitter (in dBm)

$L_{ctx}$ is the cable loss between the transmitter and its antenna (in dB)

$G_{atx}$ is the gain of the transmitter's antenna (in dBi)

$L_{crx}$ is the cable loss between the receiver and its antenna (in dB)

$G_{arx}$ is the gain of the receiver's antenna (in dBi)

FSL is free space loss (in dB)

| | Southington, CT | loss/100' | Length/Size | Bristol, CT | loss/100' | Length/Size |
|---|---|---|---|---|---|---|
| Po | 21 | | | 21 | | |
| Lctx | 3.864 | 3.68 | 105 | -5.704 | 3.68 | 155 |
| Gatx | 43 | | 6 | 43 | | 6 |
| Lcrx | -5.704 | 3.68 | 155 | -3.864 | 3.68 | 105 |
| Garx | 43 | | 6 | 43 | | 6 |

**Rx = Receiver Sensitivity Threshold in dBm BER $10^{-6}$**

Rx  =========>  -70

Fade Margin(Mf) = Receiver Sensitivity Threshold (Rx) - Total Losses (Lt)

Mf = Rx- Lt

| Total Losses | Fade Margin | | Total Losses | Fade Margin | |
|---|---|---|---|---|---|
| -35.770 | -34.230 | dB | -35.770 | -34.230 | dB |

**FSL = Free Space Loss in decibels (dB)**

FSL = 96.6 + 20 log D + 20 log F

| Site Names | Southington, CT | Bristol, CT |
|---|---|---|
| D = Distance in Miles | 5.88 | |
| F= Frequency in GHz | 18.5 | 18.5 |
| FSL (dB)          ========> | -137.331 | -137.331 |

## Receive Signal Level

The Receive Signal Level (RSL) is the expected strength of a signal when it reaches the
receiving radio. The following formula defines the Receive Signal Level:

Po - Lctx + Gatx - Lcrx + Garx - FSL = RSL

where $P_0$ is the output power of the transmitter (in dBm)

$L_{ctx}$ is the cable loss between the transmitter and its antenna (in dB)

$G_{atx}$ is the gain of the transmitter's antenna (in dBi)

$L_{crx}$ is the cable loss between the receiver and its antenna (in dB)

$G_{arx}$ is the gain of the receiver's antenna (in dBi)

FSL is free space loss (in dB)

| | Southington, CT | loss/100' | Length/Size | Bristol, CT | loss/100' | Length/Size |
|---|---|---|---|---|---|---|
| Po | 20 | | | 20 | | |
| Lctx | -6.3 | 6 | 105 | -9.3 | 6 | 155 |
| Gatx | 47.5 | | 6 | 47.5 | | 6 |
| Lcrx | -9.3 | 6 | 155 | -6.3 | 6 | 105 |
| Garx | 47.5 | | 6 | 47.5 | | 6 |

**Rx = Receiver Sensitivity Threshold in dBm BER $10^{-6}$**

| Rx          ========> | 68.5 |
|---|---|

Fade Margin(Mf) = Receiver Sensitivity Threshold (Rx) - Total Losses (Lt)

Mf = Rx- Lt

| Total Losses | Fade Margin | | Total Losses | Fade Margin | |
|---|---|---|---|---|---|
| -37.931 | -30.569 | dB | -37.931 | -30.569 | dB |