

**EXHIBIT C**  
**HNS License Sub, LLC**  
**Call Sign E060445**  
**Form 312**  
**Amendment**  
**July 2011**

**Antenna Patterns**

# AvL Technologies

1.0m Ka Band Antenna

Model 1010KVH

Table 1 - Transmit Band Gain

Polarization	29.5 GHz	29.75 GHz	30 GHz
RHCP	47.7 dBi	47.6 dBi	47.8 dBi
LHCP	47.8 dBi	47.7 dBi	47.9 dBi

Table 2 – Receive Band Gain

Polarization	19.7 GHz	19.95 GHz	20.2 GHz
RHCP	44.3 dBi	44.4 dBi	44.6 dBi
LHCP	44.2 dBi	44.4 dBi	44.5 dBi

# **AvL Technologies**

1.0m Ka Band Antenna  
Model 1010KVH

Transmit Band Azimuth Patterns

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
29.5 GHz LHCP

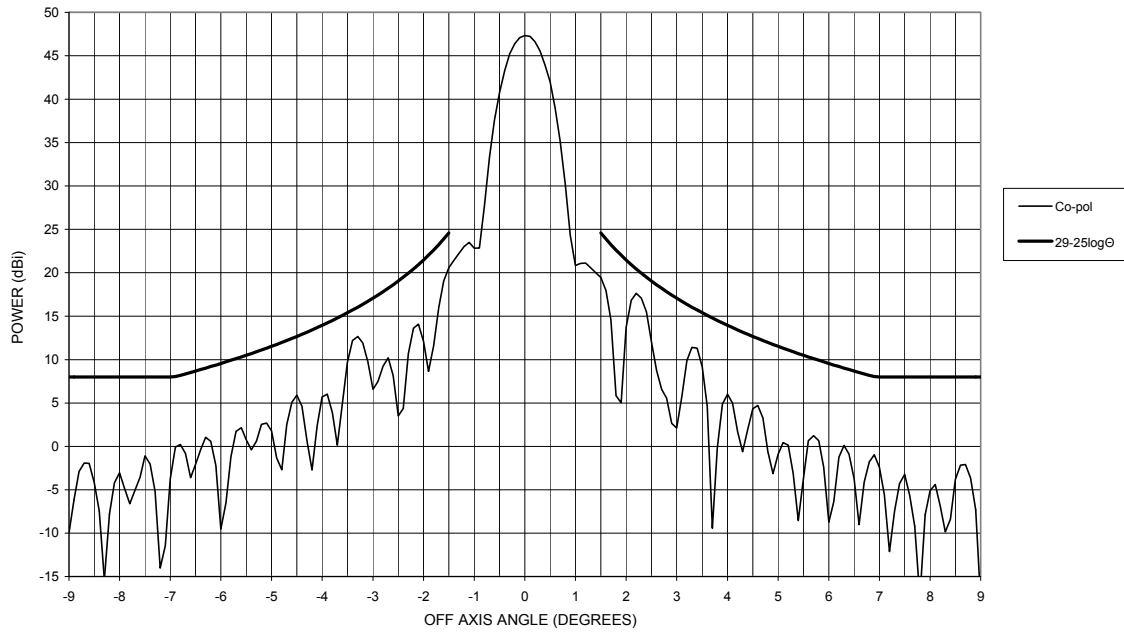


Figure 1 - Co-pol LHCP +/-9° Azimuth Pattern - 29.5GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
29.75 GHz LHCP

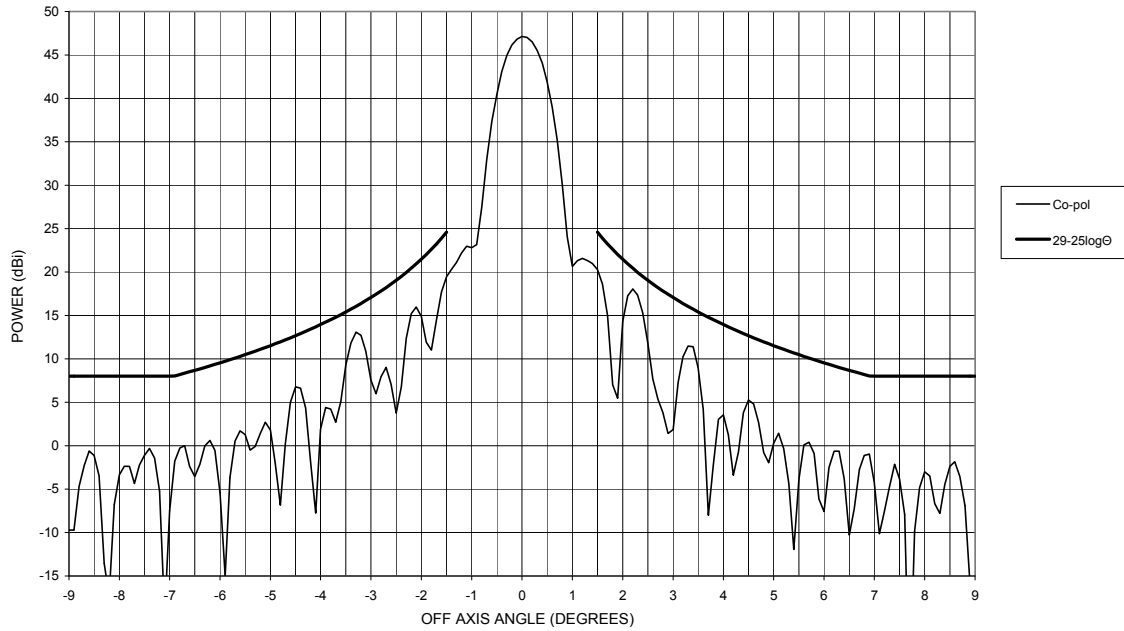


Figure 2- Co-pol LHCP +/-9° Azimuth Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
30 GHz LHCP

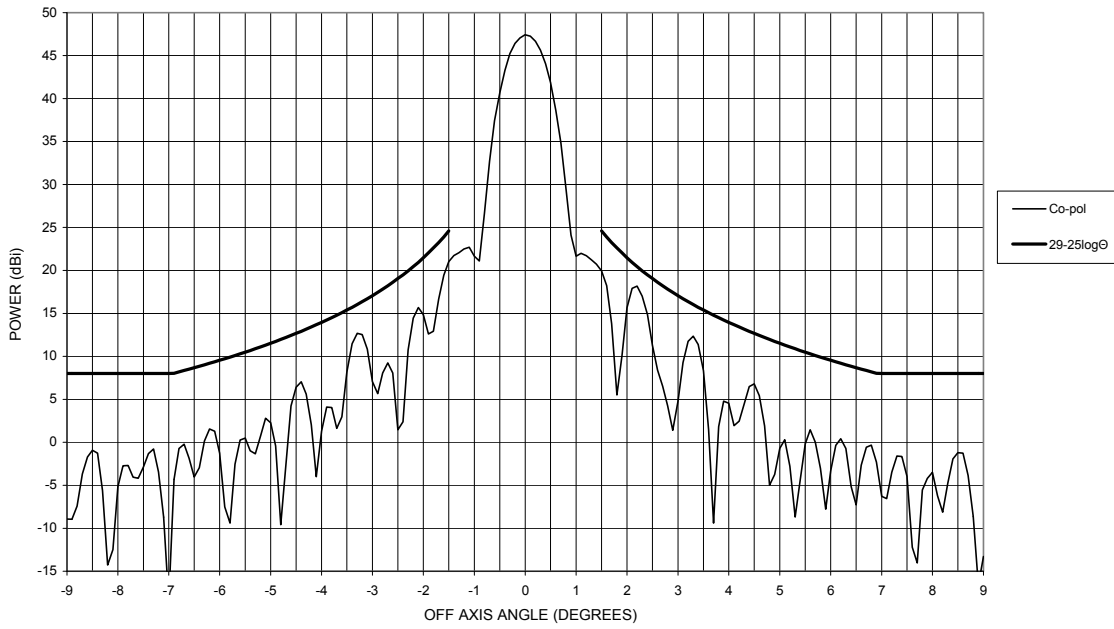


Figure 3- Co-pol LHCP +/-9° Azimuth Pattern - 30GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
29.5 GHz RHCP

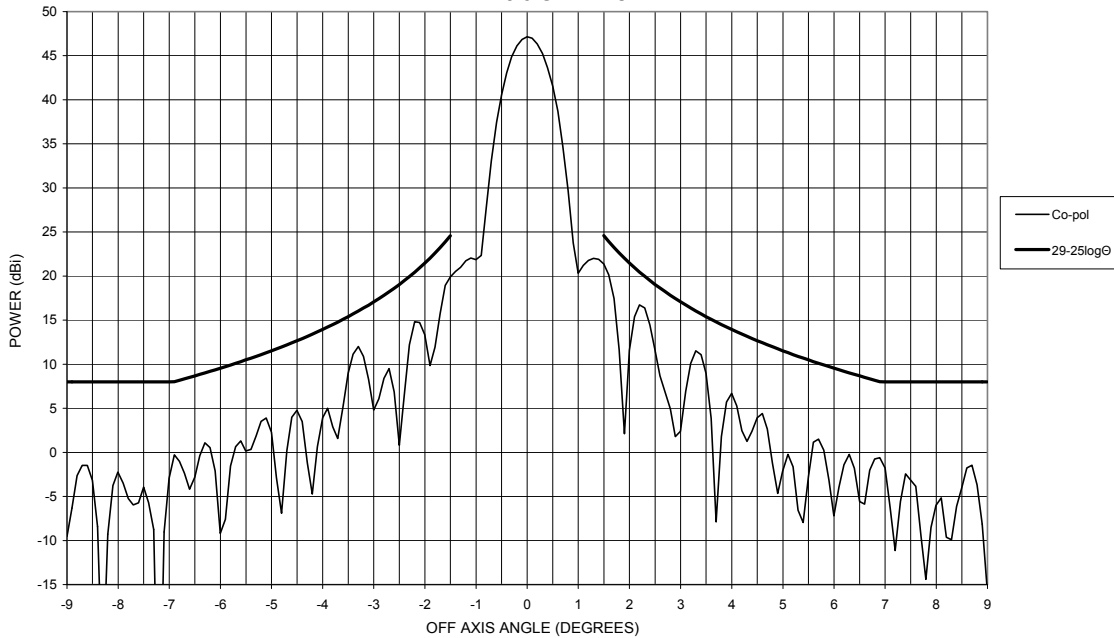


Figure 4- Co-pol RHCP +/-9° Azimuth Pattern - 29.5GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
29.75 GHz RHCP

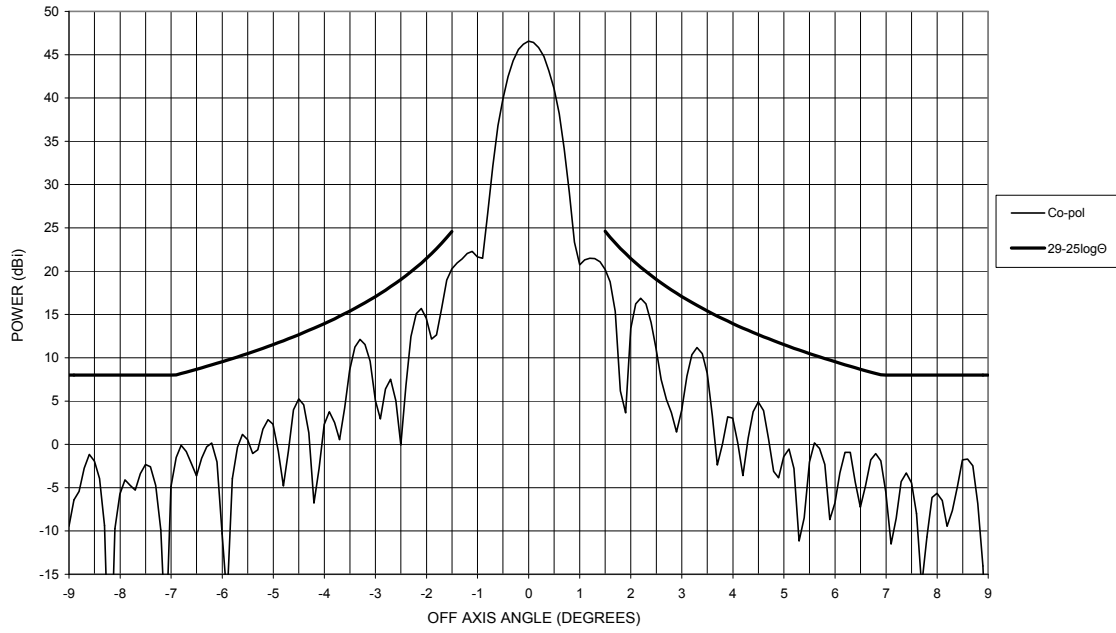


Figure 5- Co-pol RHCP +/-9° Azimuth Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
30 GHz RHCP

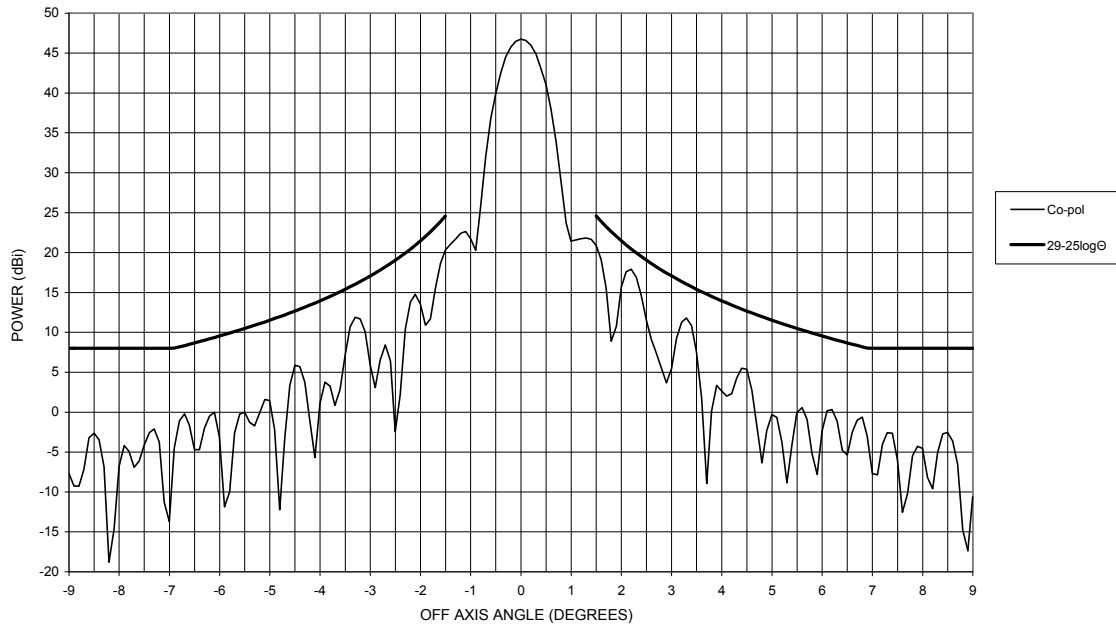


Figure 6- Co-pol RHCP +/-9° Azimuth Pattern - 30GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Cross-pol Pattern  
29.5 GHz LHCP

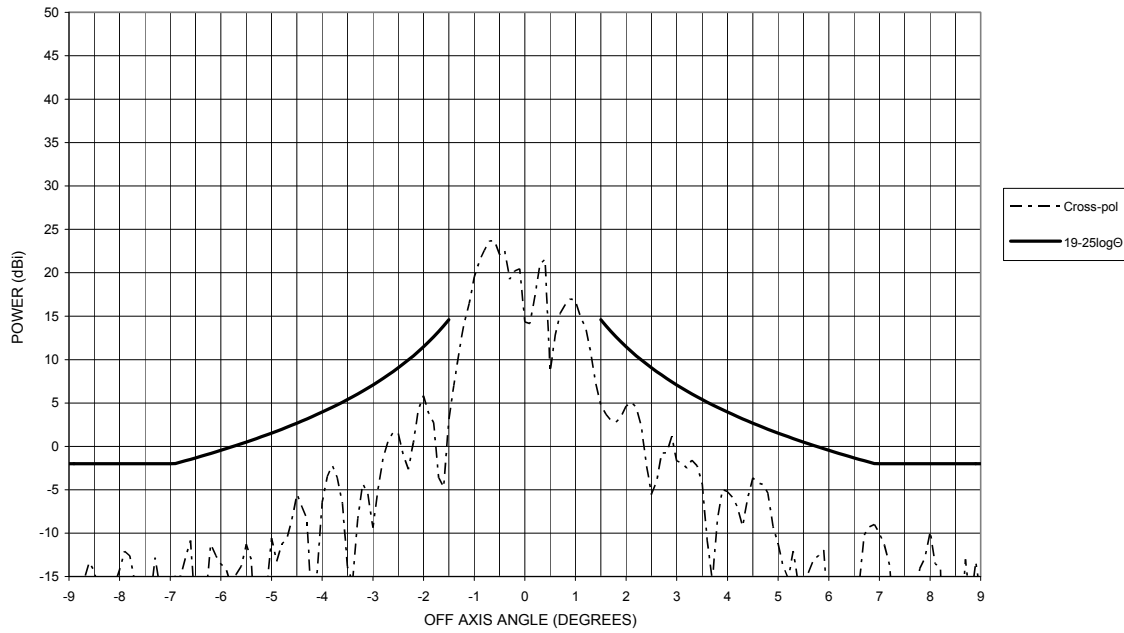


Figure 7- Cross-pol LHCP  $\pm 9^\circ$  Azimuth Pattern - 29.5GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Cross-pol Pattern  
29.75 GHz LHCP

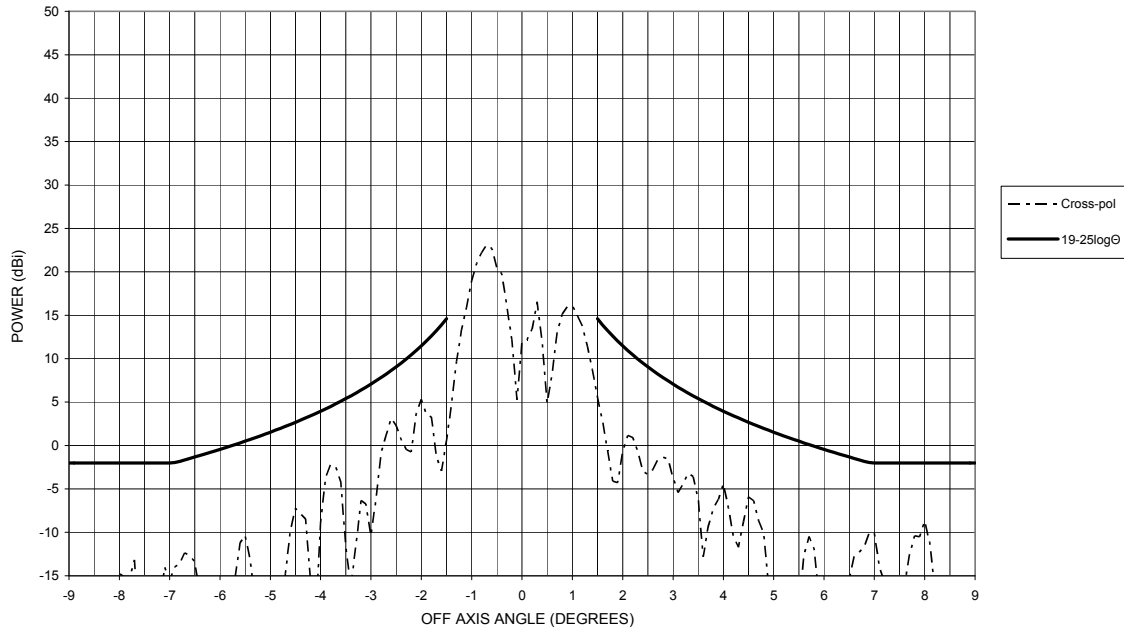


Figure 8- Cross-pol LHCP  $\pm 9^\circ$  Azimuth Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Cross-pol Pattern  
30 GHz LHCP

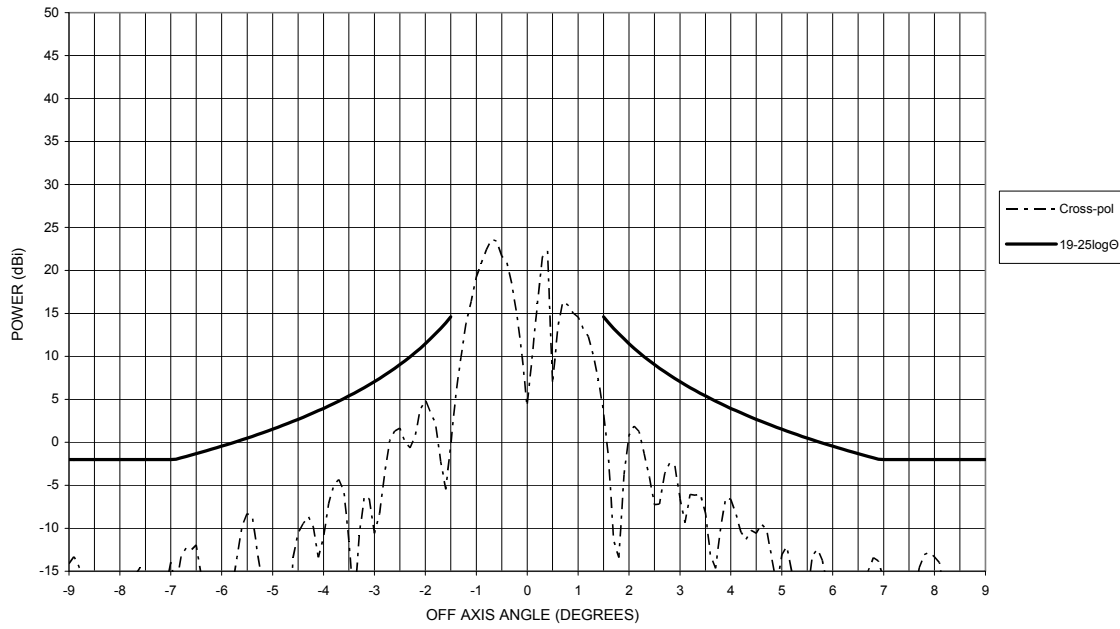


Figure 9- Cross-pol LHCP +/-9° Azimuth Pattern - 30GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Cross-pol Pattern  
29.5 GHz RHCP

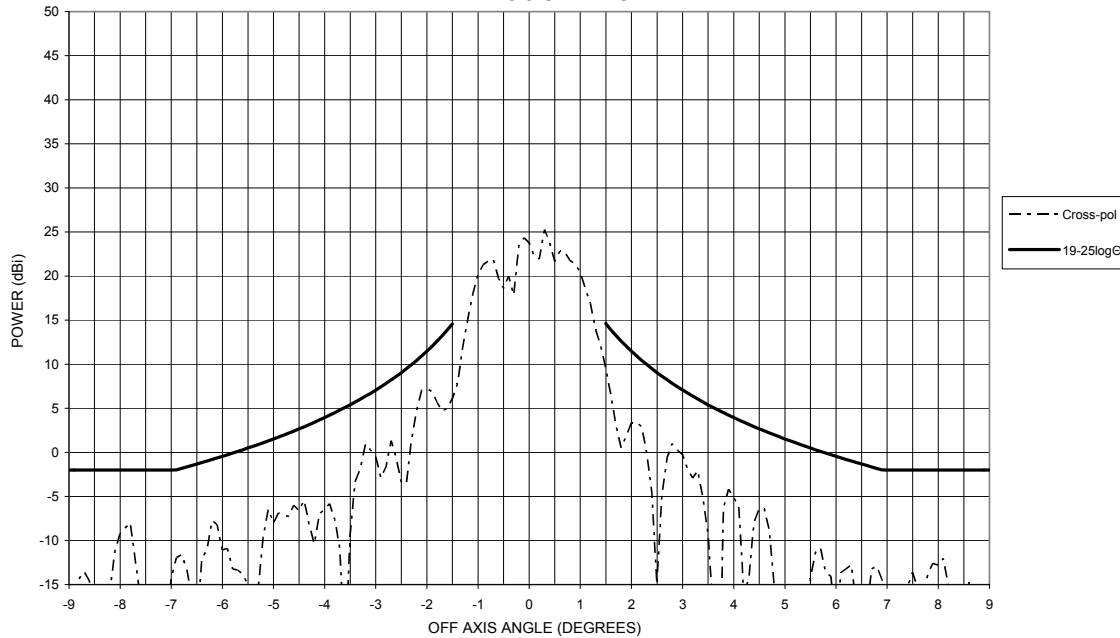


Figure 10- Cross-pol RHCP +/-9° Azimuth Pattern - 29.5GHz



AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Cross-pol Pattern  
29.75 GHz RHCP

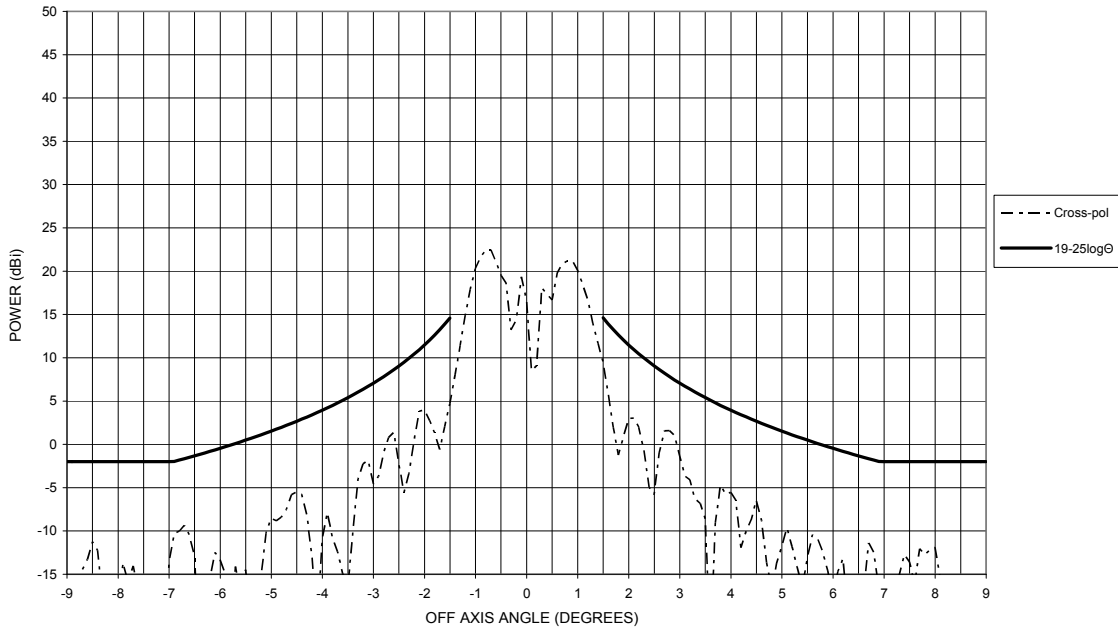


Figure 11 - Cross-pol RHCP +/-9° Azimuth Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Cross-pol Pattern  
30 GHz RHCP

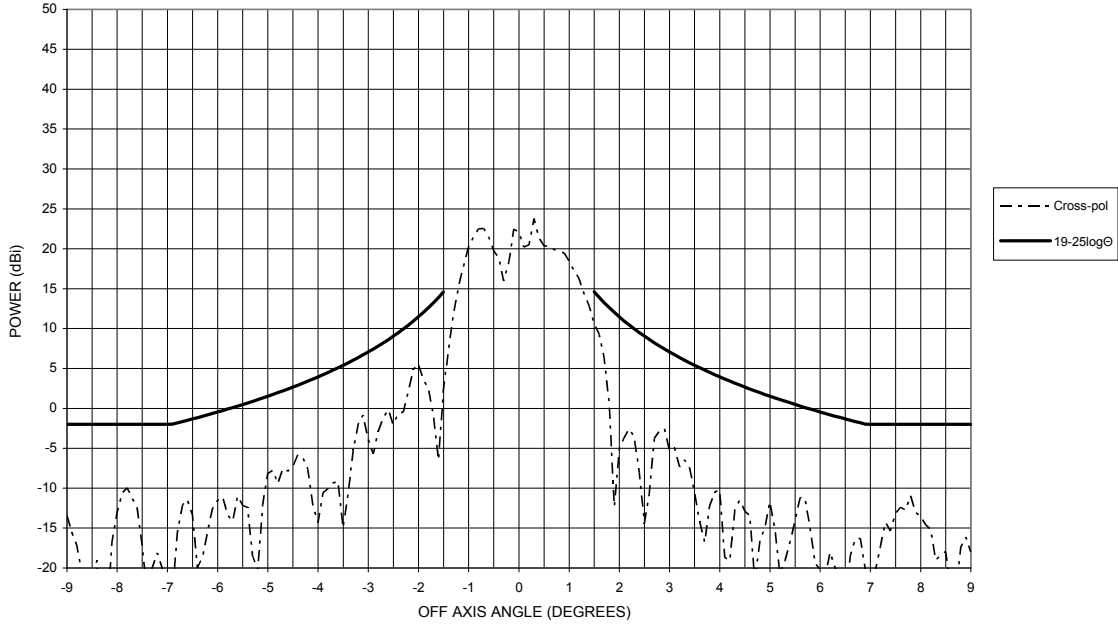


Figure 12 - Cross-pol RHCP +/-9° Azimuth Pattern - 30GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
29.5 GHz LHCP

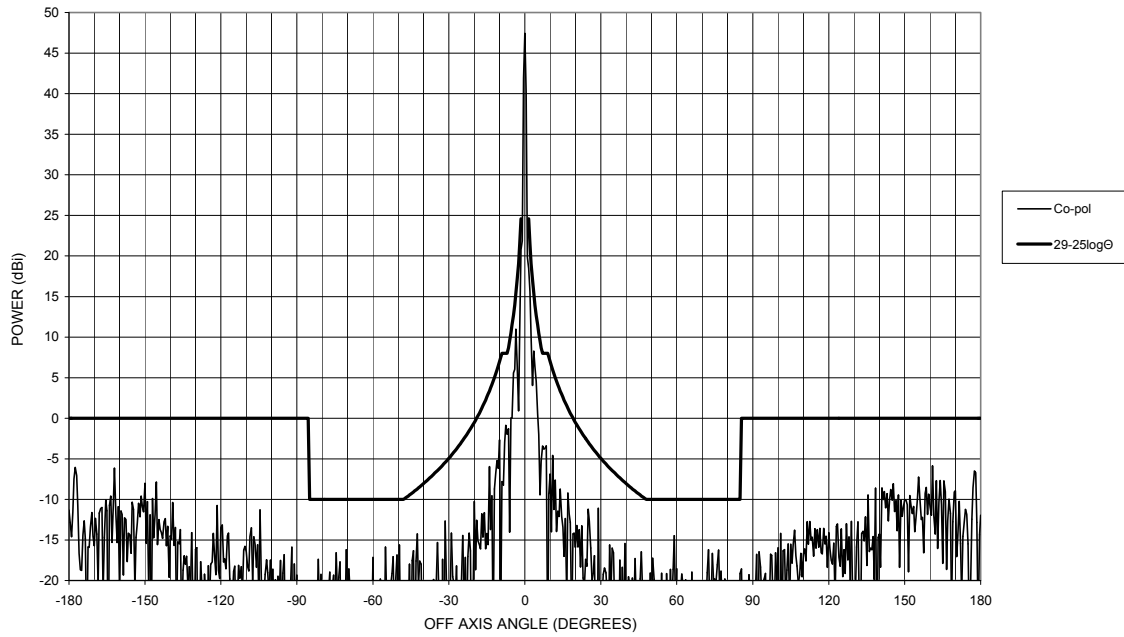


Figure 13 - Co-pol LHCP  $\pm 180^\circ$  Azimuth Pattern - 29.5GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
29.75 GHz LHCP

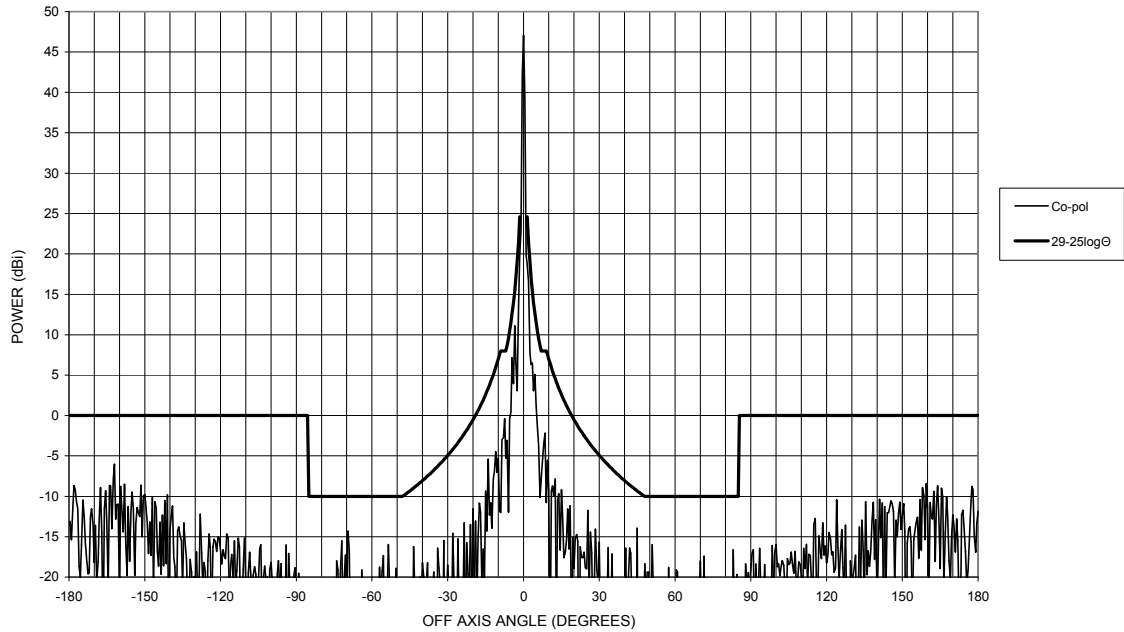


Figure 14 - Co-pol LHCP  $\pm 180^\circ$  Azimuth Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
30 GHz LHCP

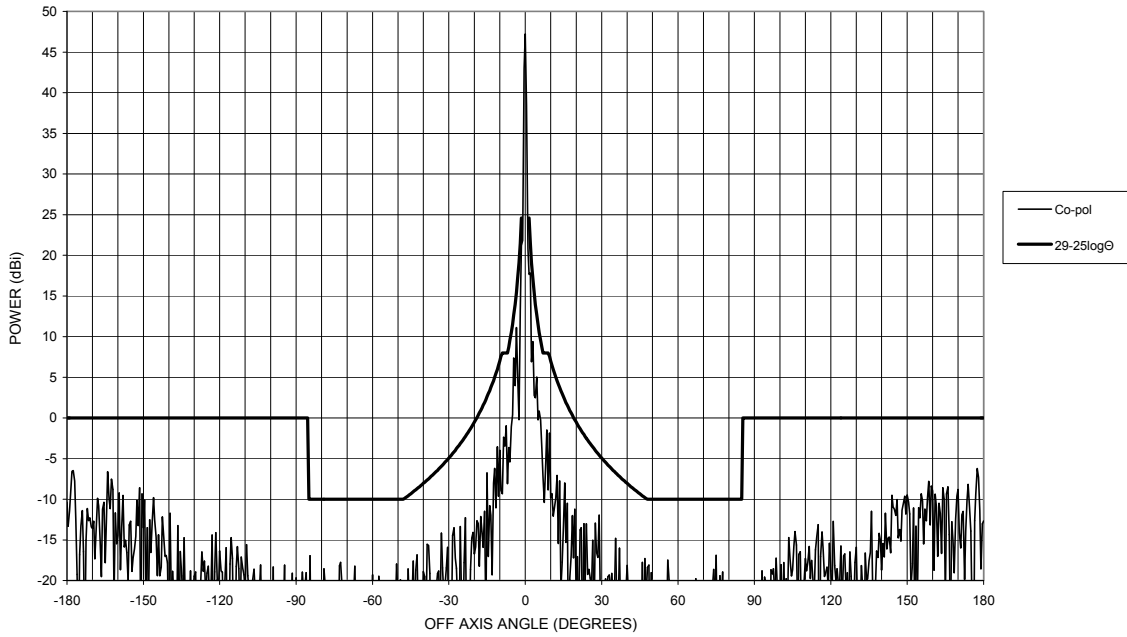


Figure 15 - Co-pol LHCP +/-180° Azimuth Pattern - 30GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
29.5 GHz RHCP

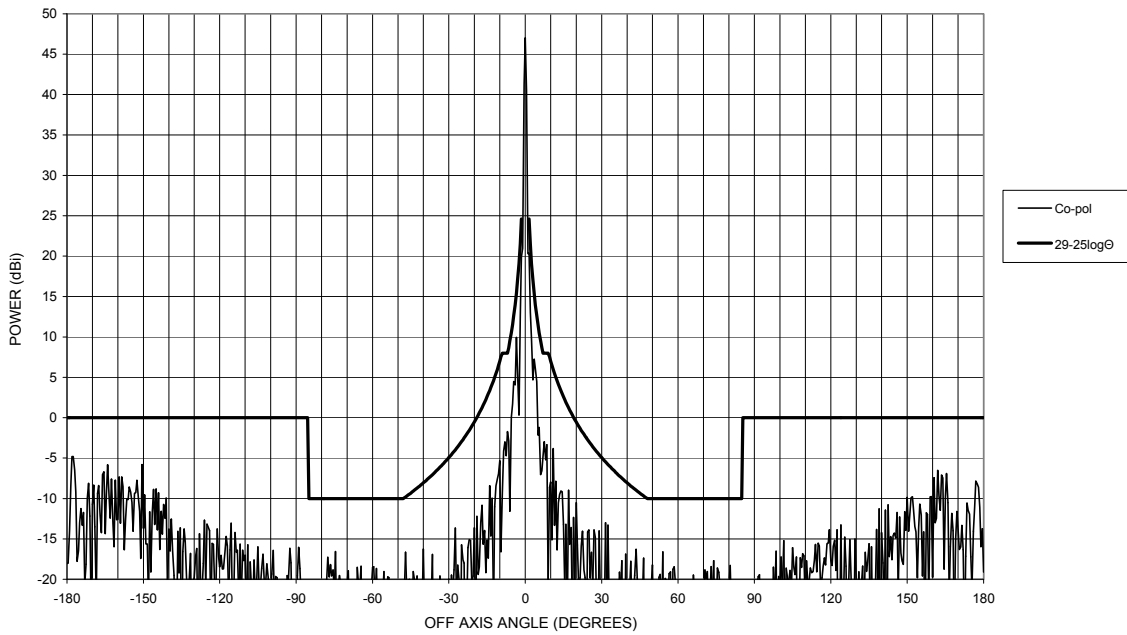


Figure 16 - Co-pol RHCP +/-180° Azimuth Pattern - 29.5GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
29.75 GHz RHCP

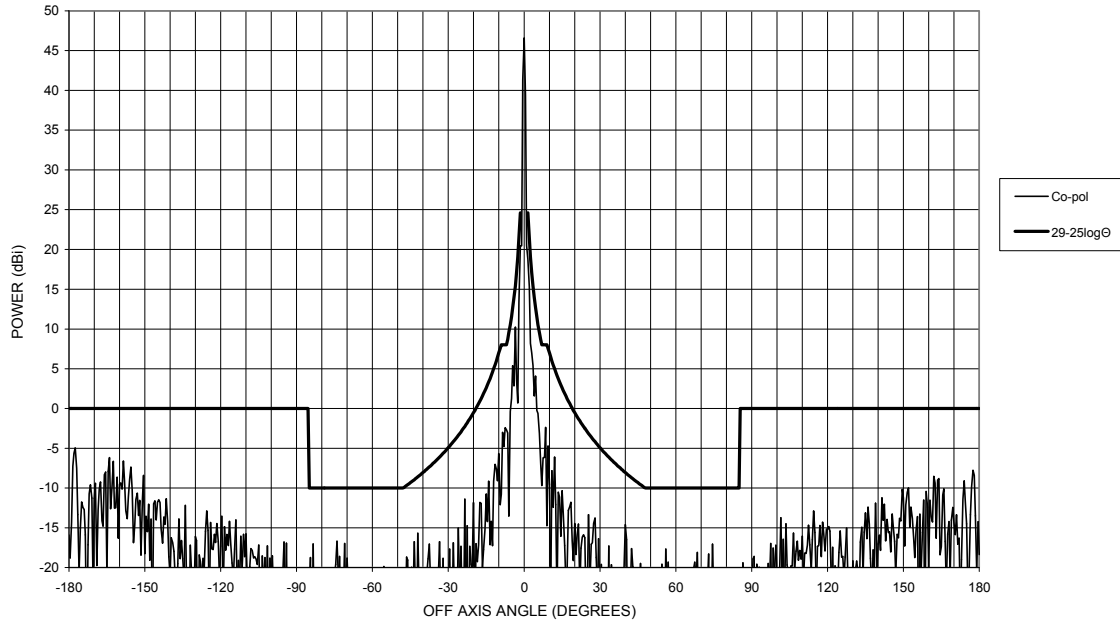


Figure 17 - Co-pol LHCP +/-180° Azimuth Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Azimuth Co-pol Pattern  
30 GHz RHCP

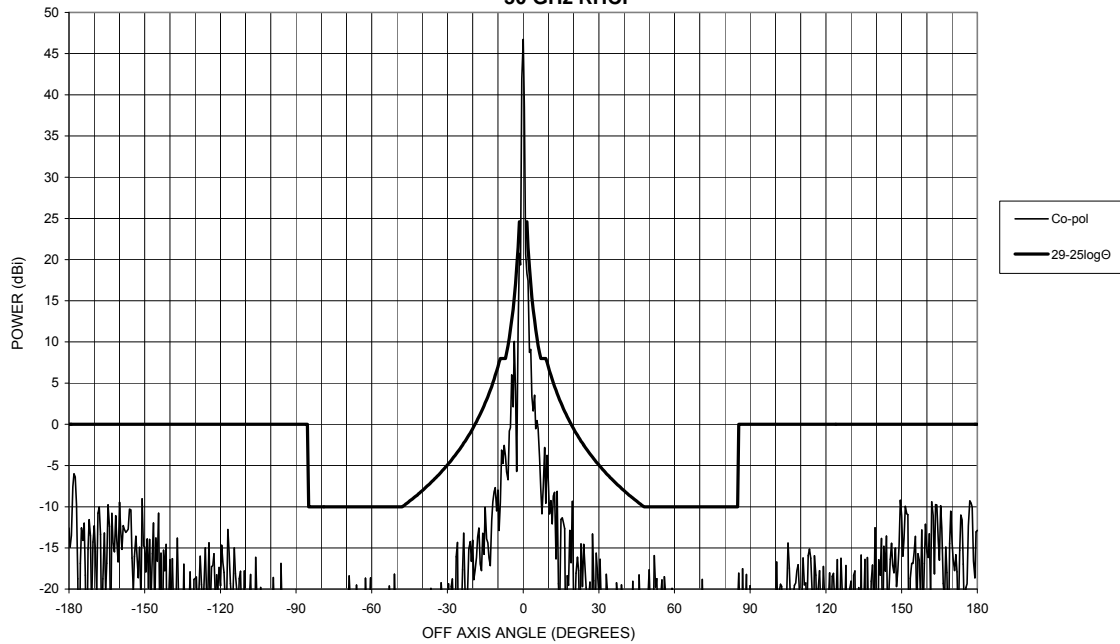


Figure 18 - Co-pol LHCP +/-180° Azimuth Pattern - 30GHz

# **AvL Technologies**

1.0m Ka Band Antenna  
Model 1010KVH

Transmit Band Elevation Patterns

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
29.5 GHz LHCP

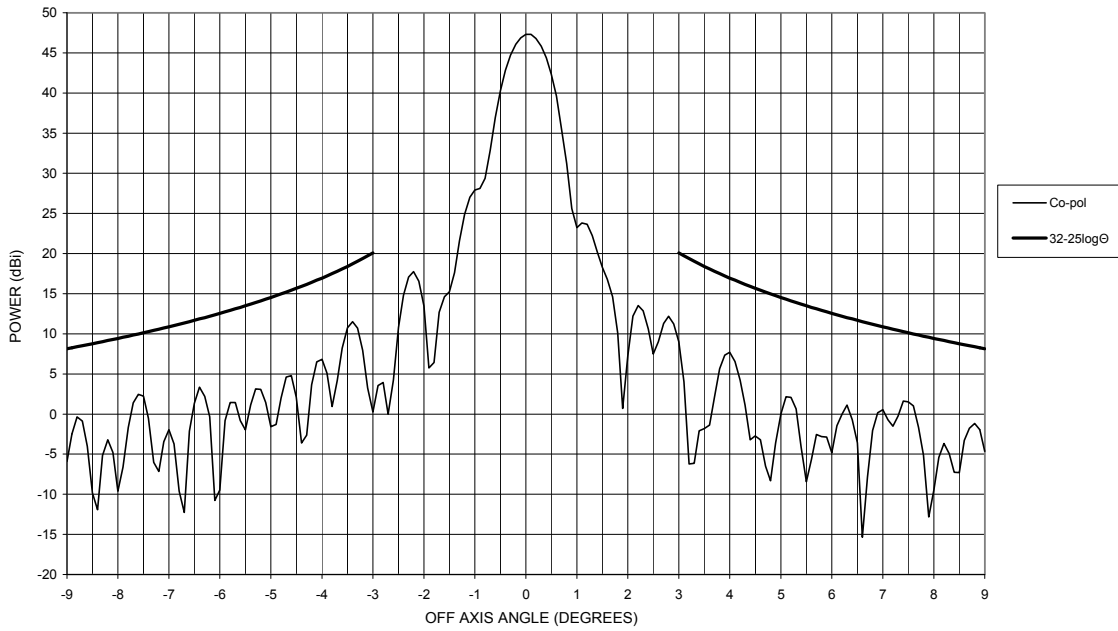


Figure 19 - Co-pol LHCP +/-9° Elevation Pattern - 29.5GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
29.75 GHz LHCP

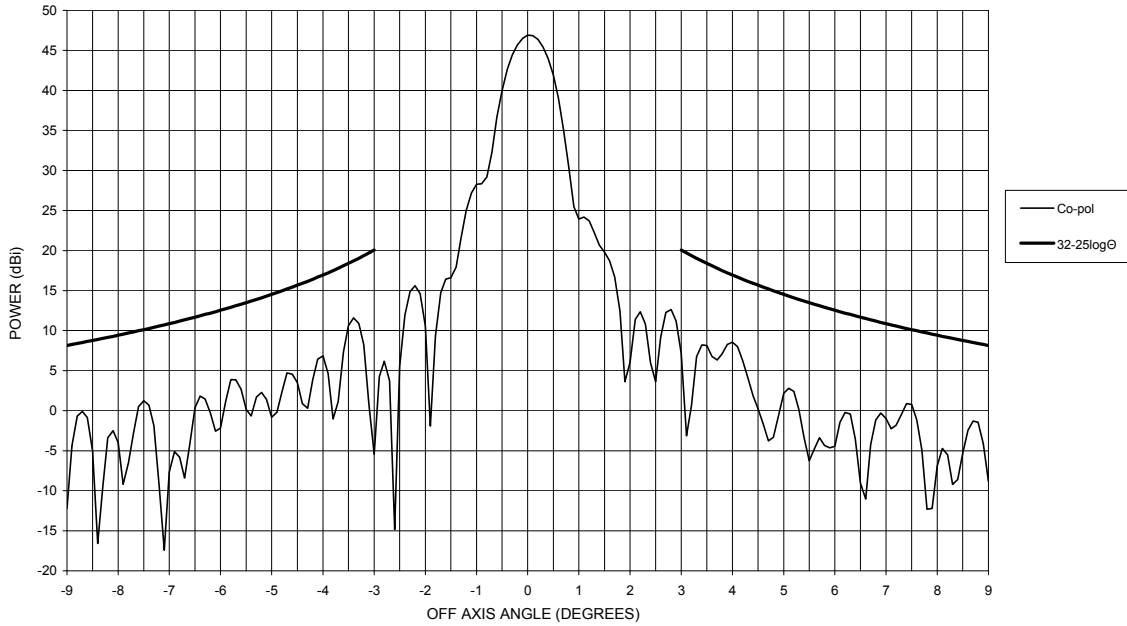


Figure 20 - Co-pol LHCP +/-9° Elevation Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
30 GHz LHCP

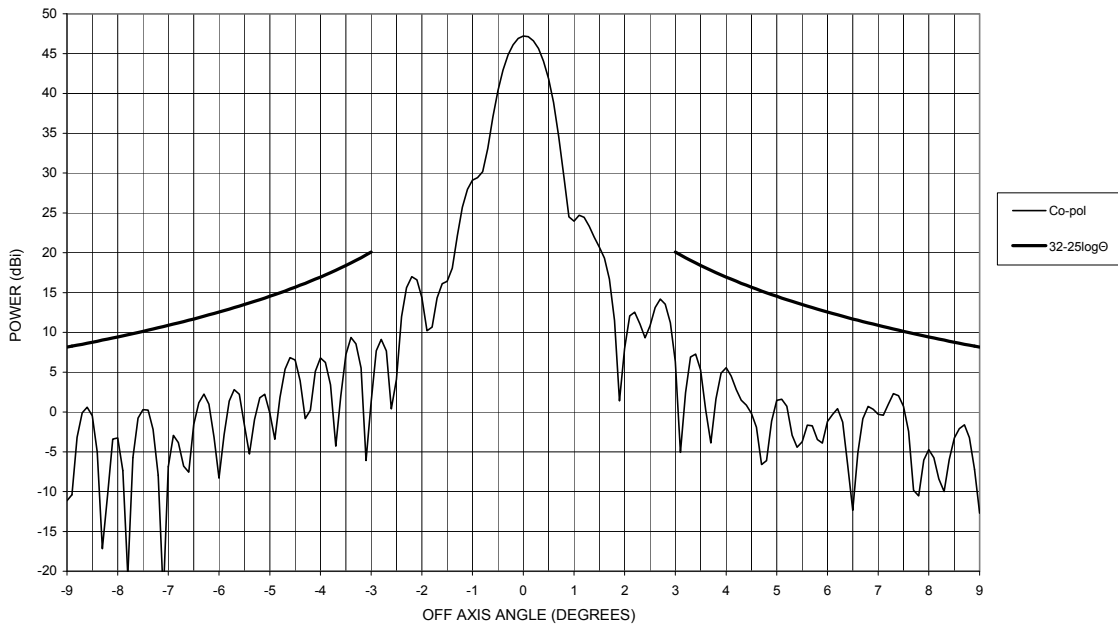


Figure 21 - Co-pol LHCP  $\pm 9^\circ$  Elevation Pattern - 30GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
29.5 GHz RHCP

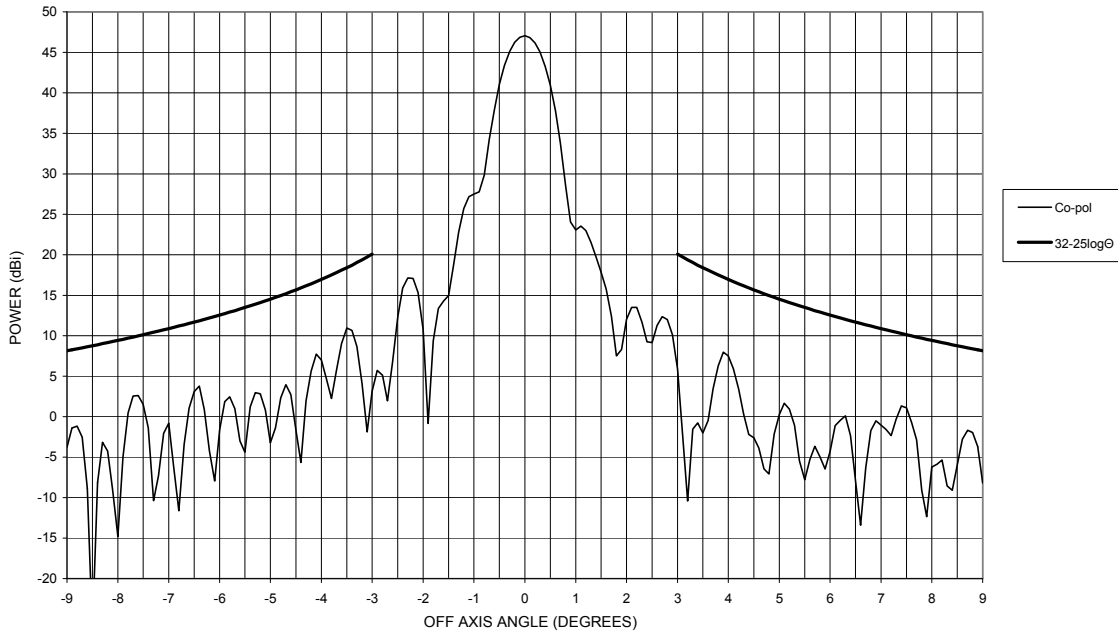


Figure 22 - Co-pol RHCP  $\pm 9^\circ$  Elevation Pattern - 29.5GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
29.75 GHz RHCP

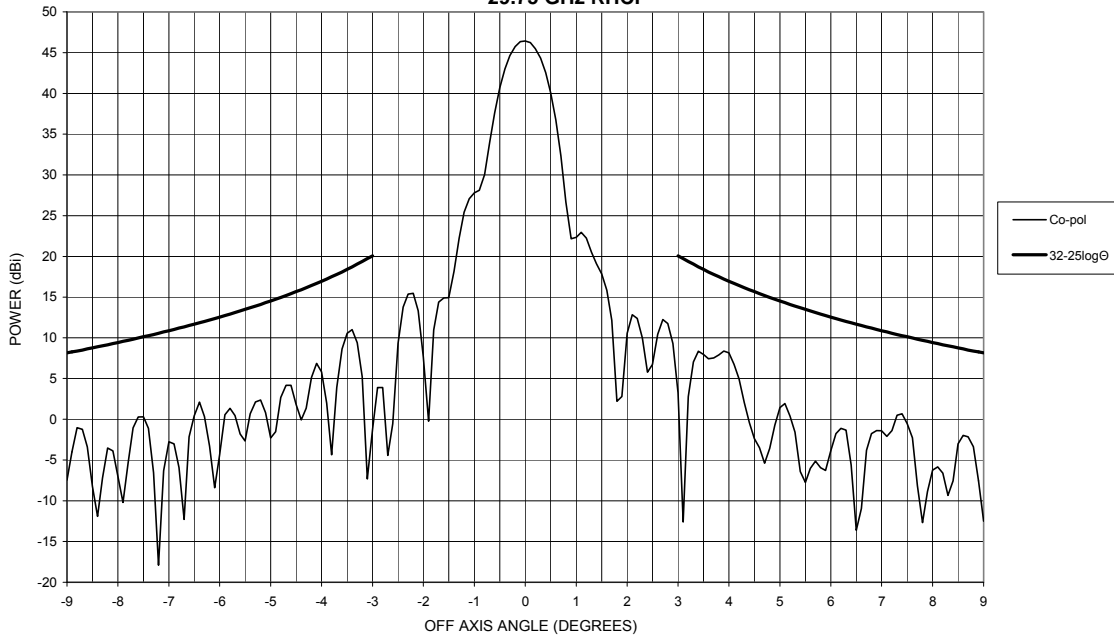


Figure 23 - Co-pol RHCP  $\pm 9^\circ$  Elevation Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
30 GHz RHCP

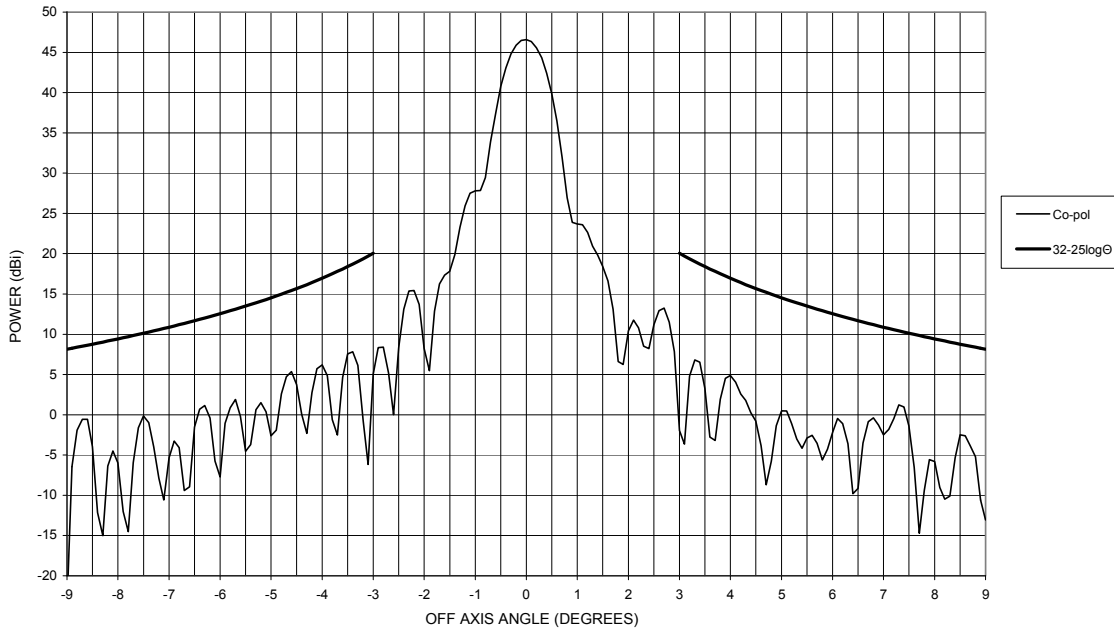


Figure 24 - Co-pol RHCP  $\pm 9^\circ$  Elevation Pattern - 30GHz



AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Cross-pol Pattern  
29.5 GHz LHCP

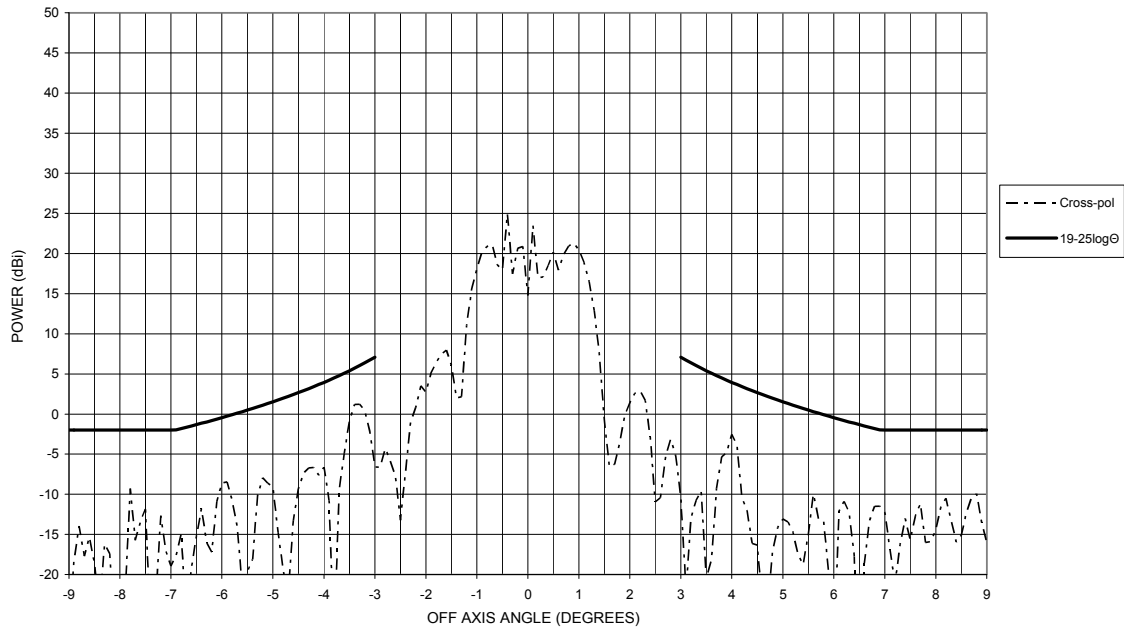


Figure 25 - Cross-pol LHCP +/-9° Elevation Pattern - 29.5GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Cross-pol Pattern  
29.75 GHz LHCP

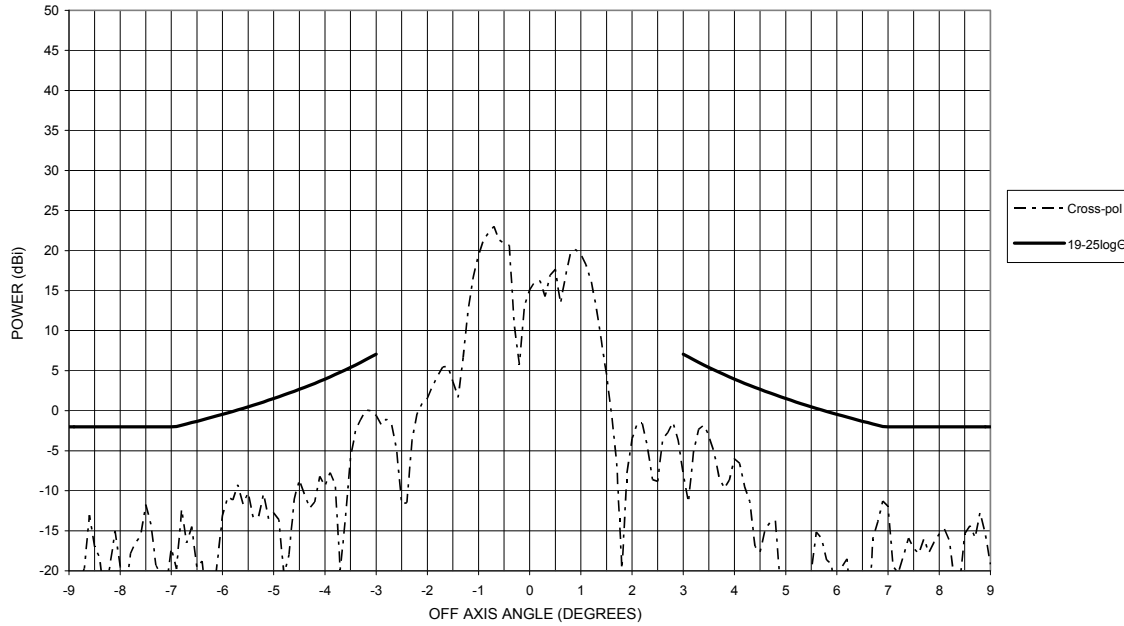


Figure 26 - Cross-pol LHCP +/-9° Elevation Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Cross-pol Pattern  
30 GHz LHCP

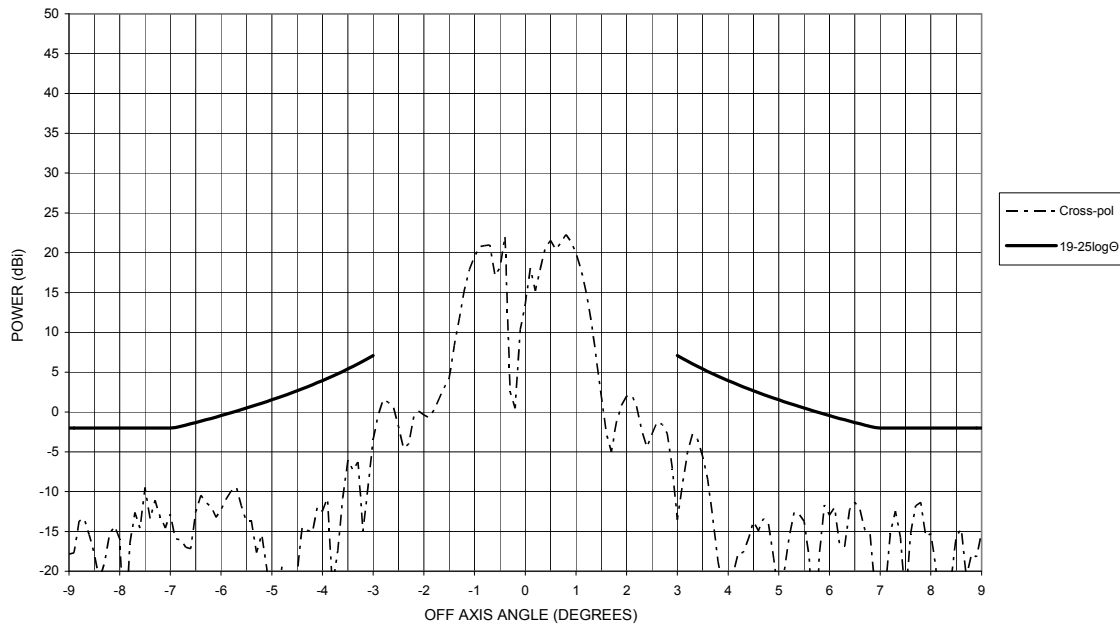


Figure 27 - Cross-pol LHCP +/-9° Elevation Pattern - 30GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Cross-pol Pattern  
29.5 GHz RHCP

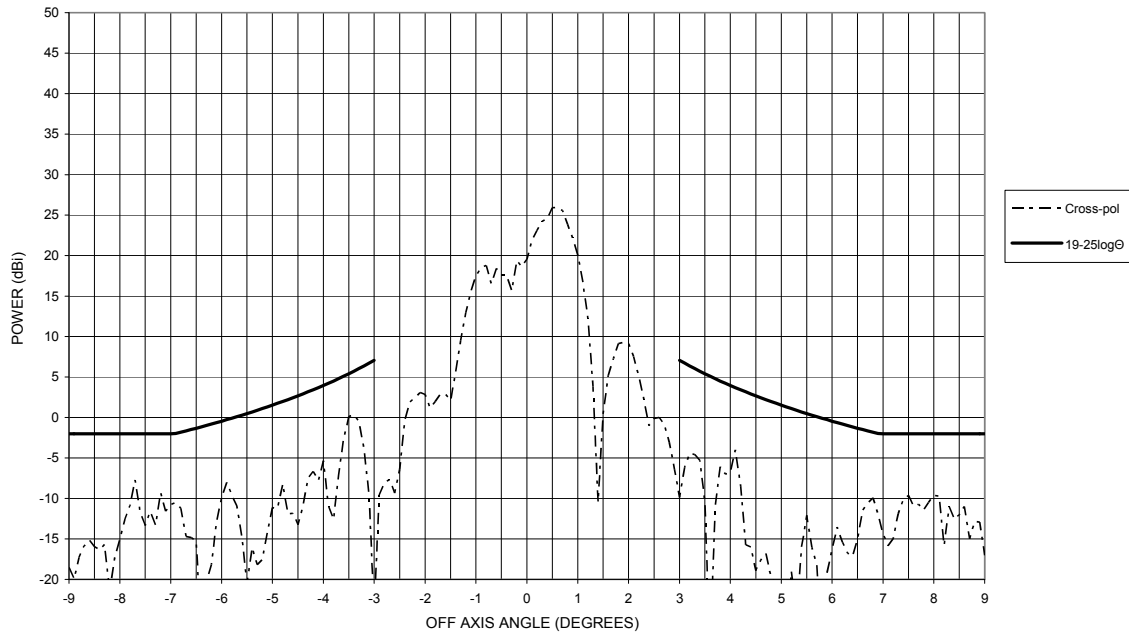


Figure 28 - Cross-pol RHCP +/-9° Elevation Pattern - 29.5GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Cross-pol Pattern  
29.75 GHz RHCP

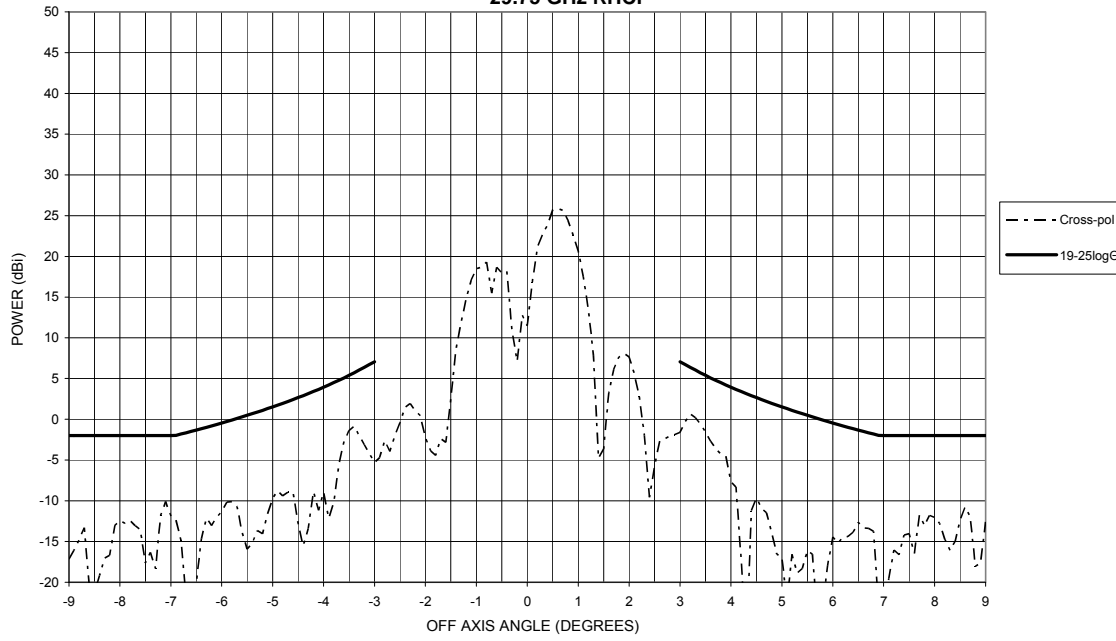


Figure 29 - Cross-pol RHCP +/-9° Elevation Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Cross-pol Pattern  
30 GHz RHCP

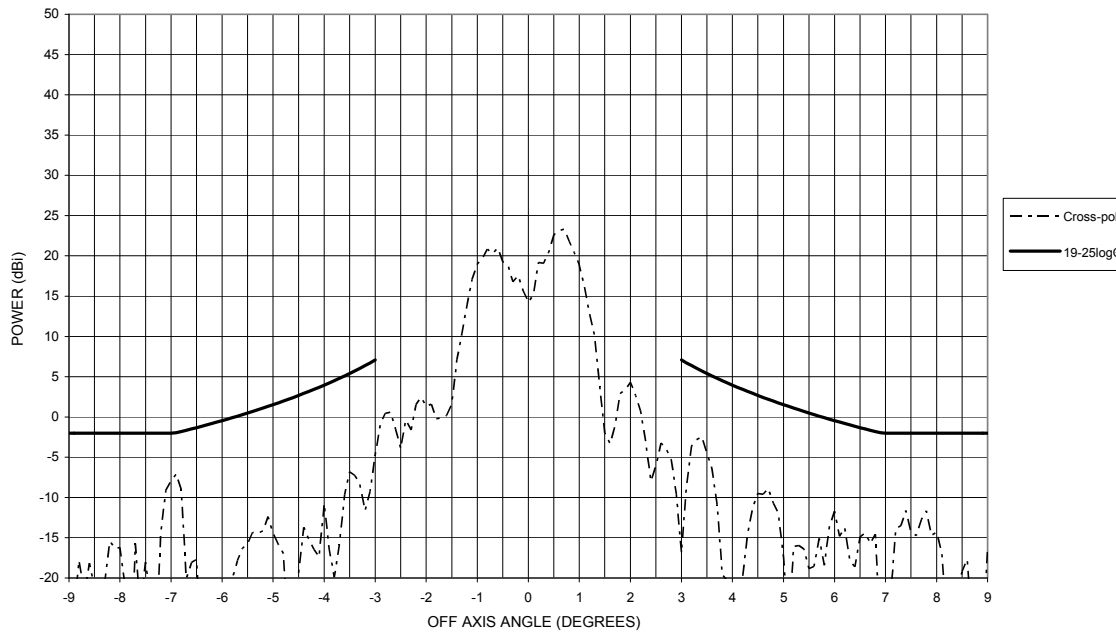


Figure 30 - Cross-pol RHCP +/-9° Elevation Pattern - 30GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
29.5 GHz LHCP

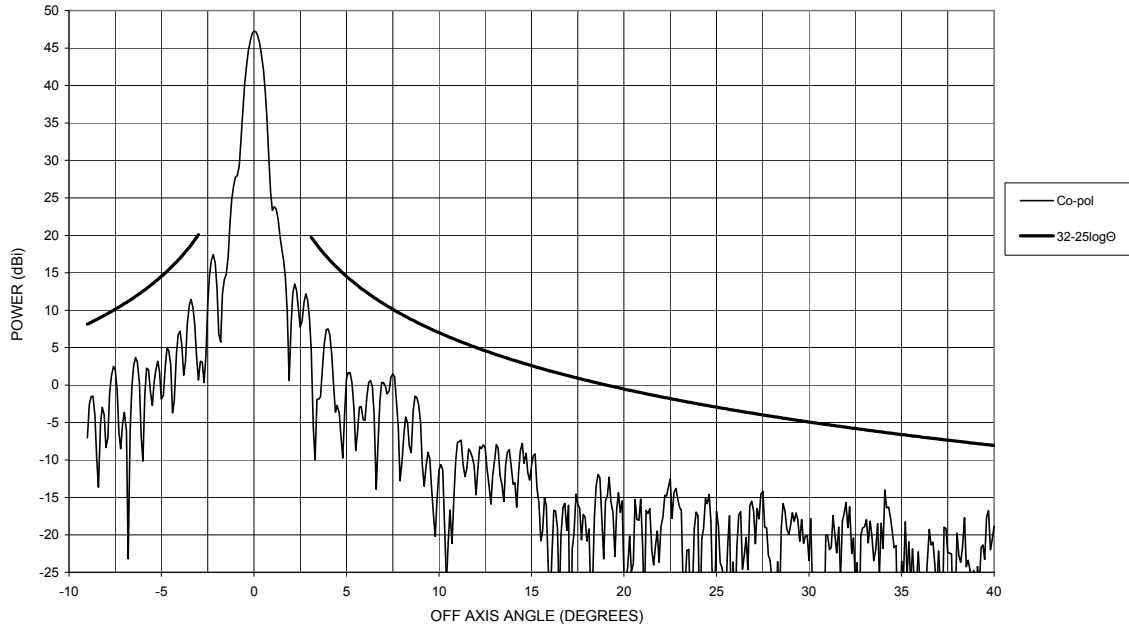


Figure 31 - Co-pol LHCP -9° - +40° Elevation Pattern - 29.5GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
29.75 GHz LHCP

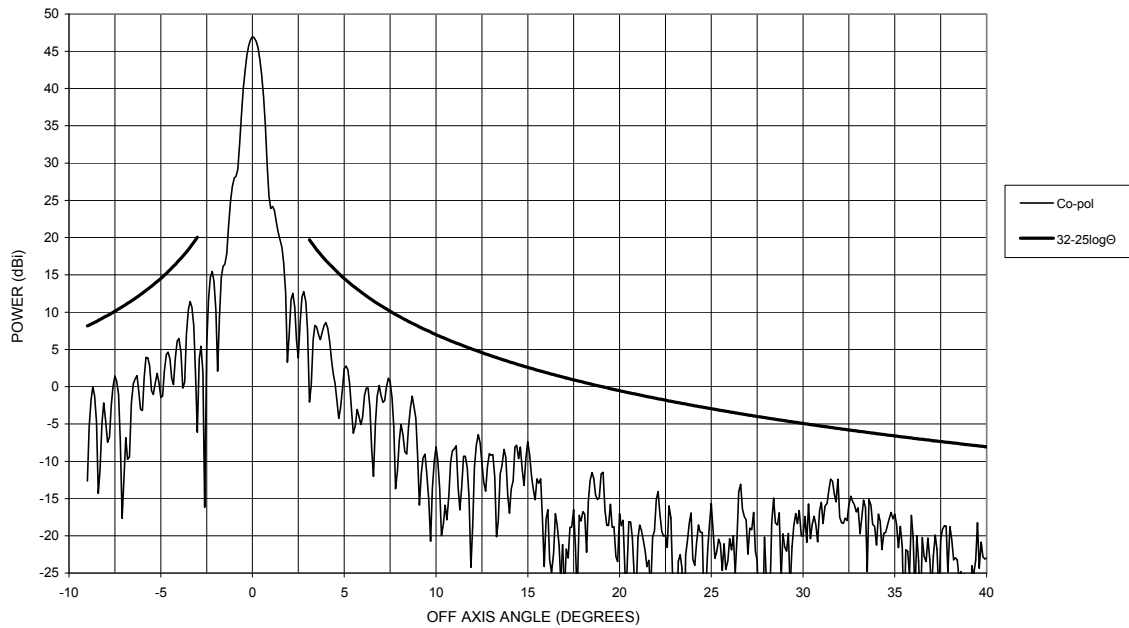


Figure 32 - Co-pol LHCP -9° - +40° Elevation Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
30 GHz LHCP

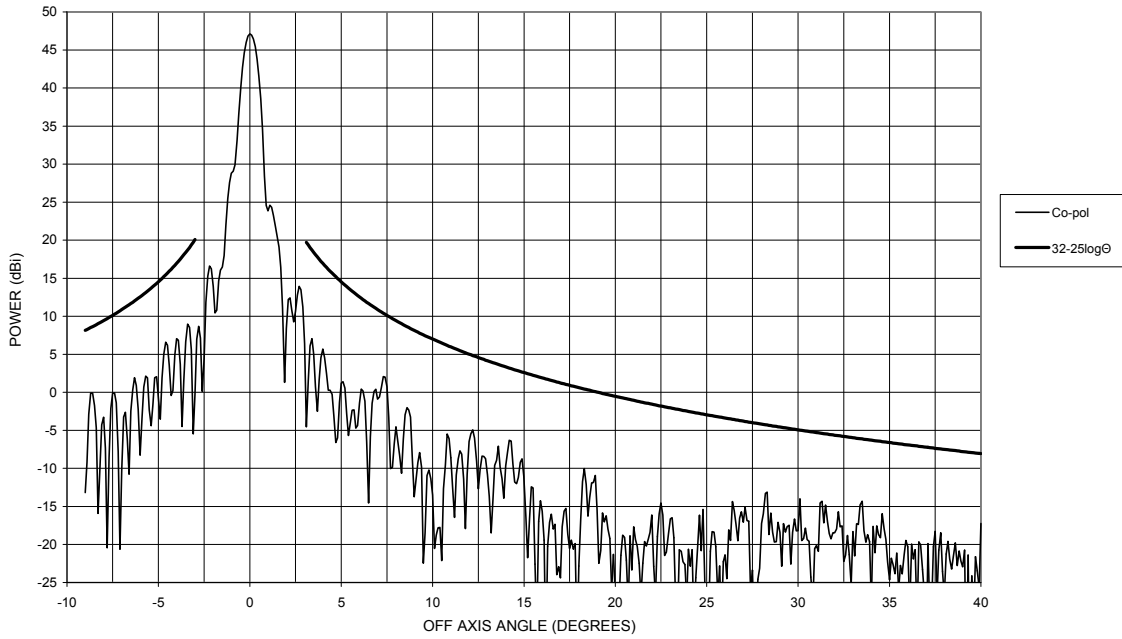


Figure 33 - Co-pol LHCP -9° - +40° Elevation Pattern - 30GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
29.5 GHz RHCP

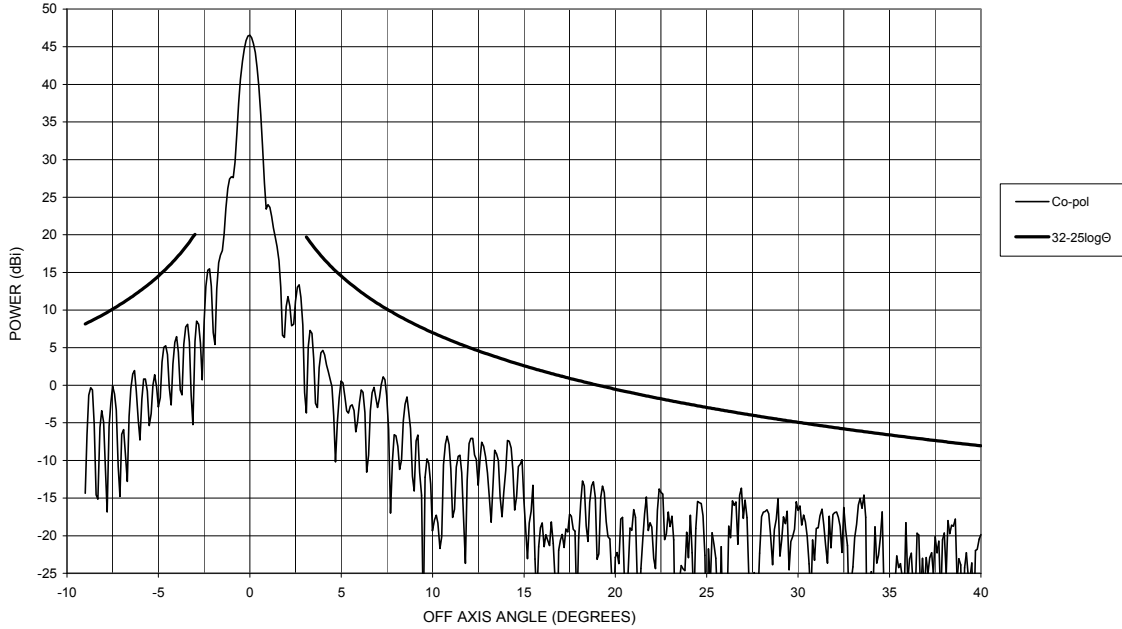


Figure 34 - Co-pol RHCP -9° - +40° Elevation Pattern - 29.5GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
29.75 GHz RHCP

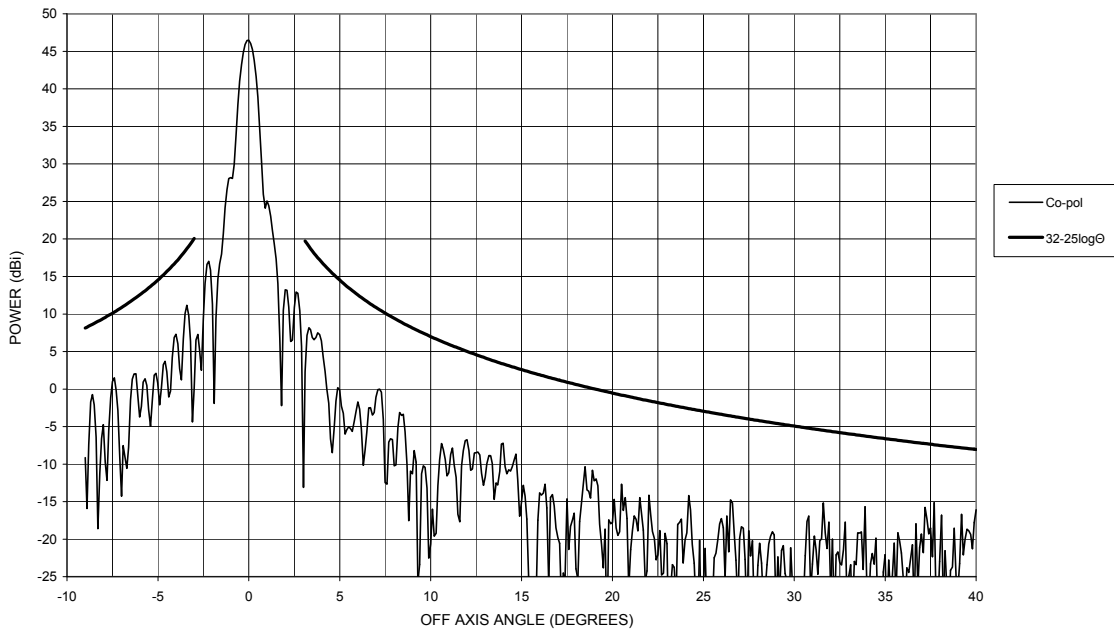


Figure 35 - Co-pol RHCP -9° - +40° Elevation Pattern - 29.75GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Transmit Band Elevation Co-pol Pattern  
30 GHz RHCP

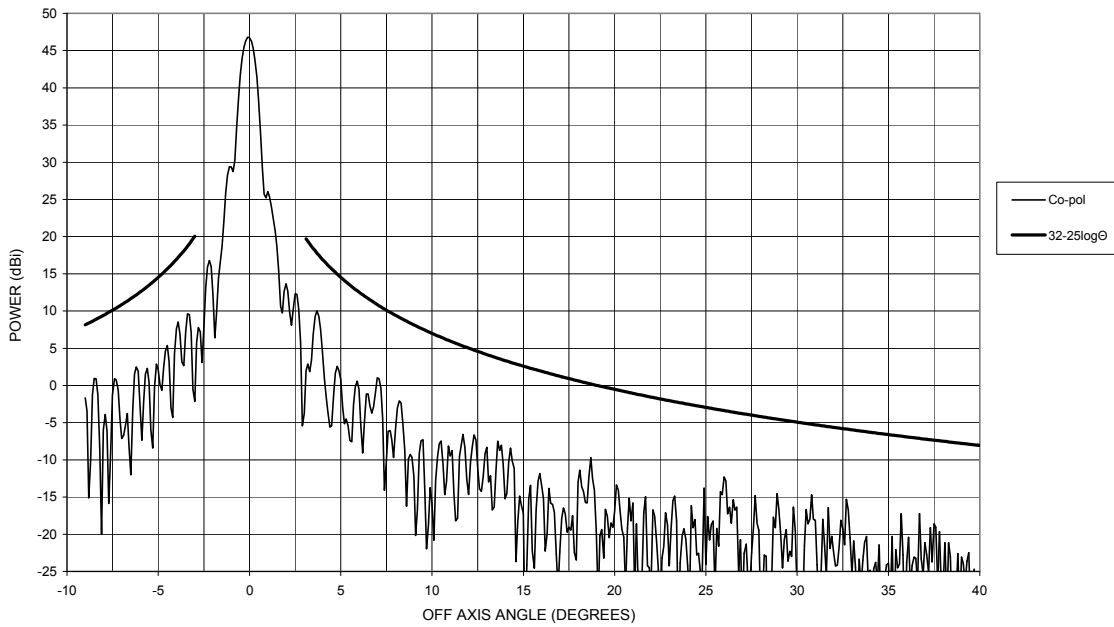


Figure 36 - Co-pol RHCP -9° - +40° Elevation Pattern - 30GHz

# **AvL Technologies**

1.0m Ka Band Antenna  
Model 1010KVH

Receive Band Azimuth Patterns

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
19.7 GHz LHCP

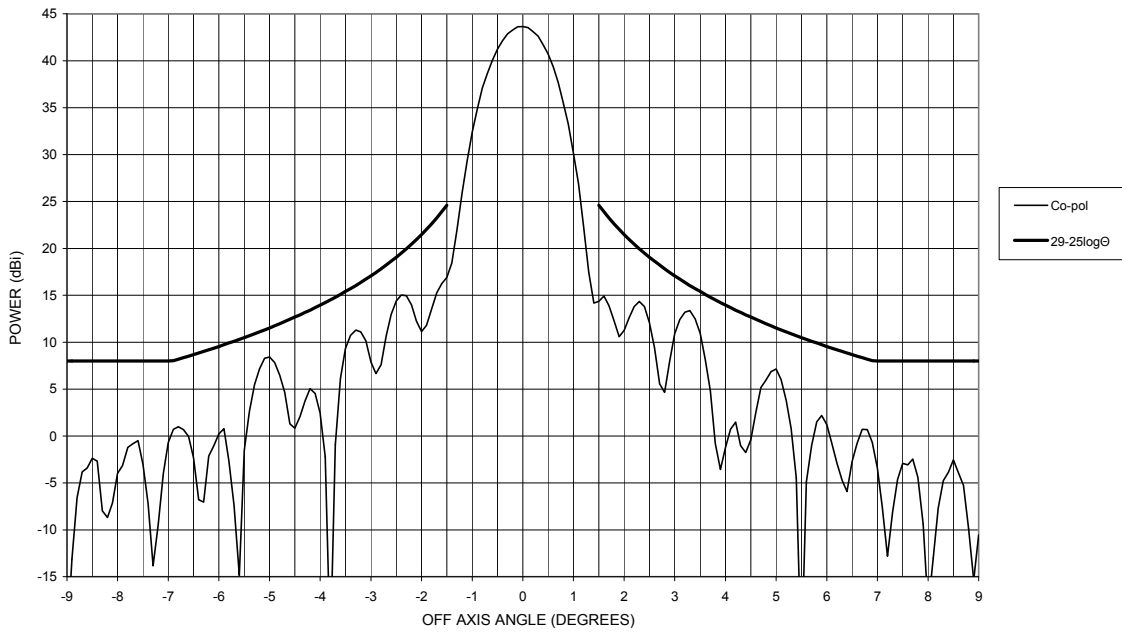


Figure 37 - Co-pol LHCP +/-9° Azimuth Pattern – 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
19.95 GHz LHCP

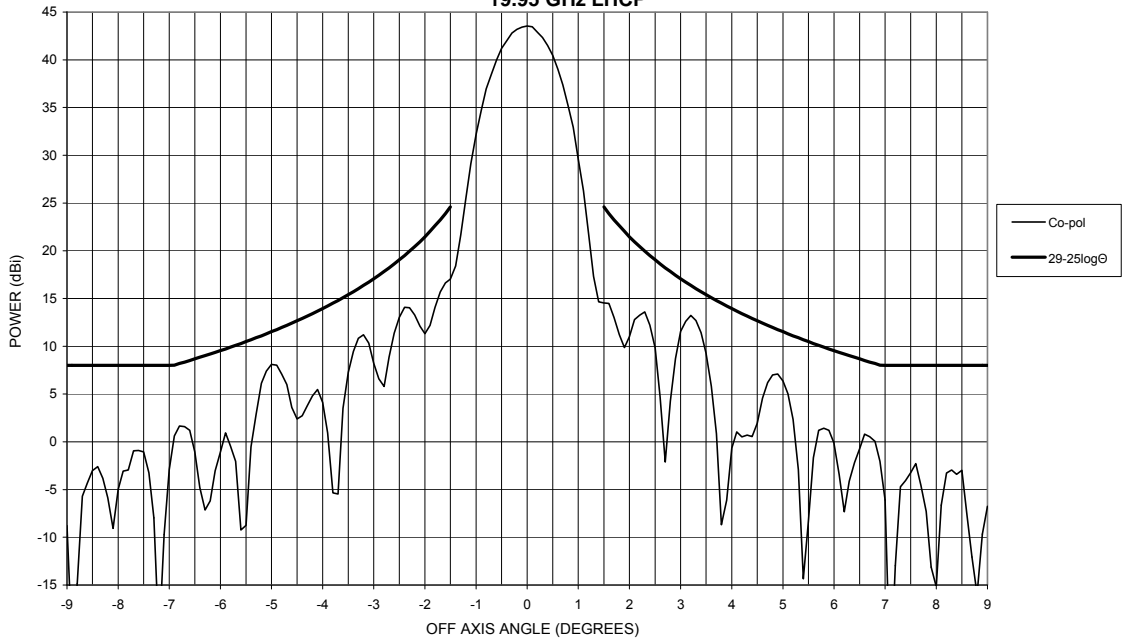


Figure 38 - Co-pol LHCP +/-9° Azimuth Pattern – 19.95GHz



AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
20.2 GHz LHCP

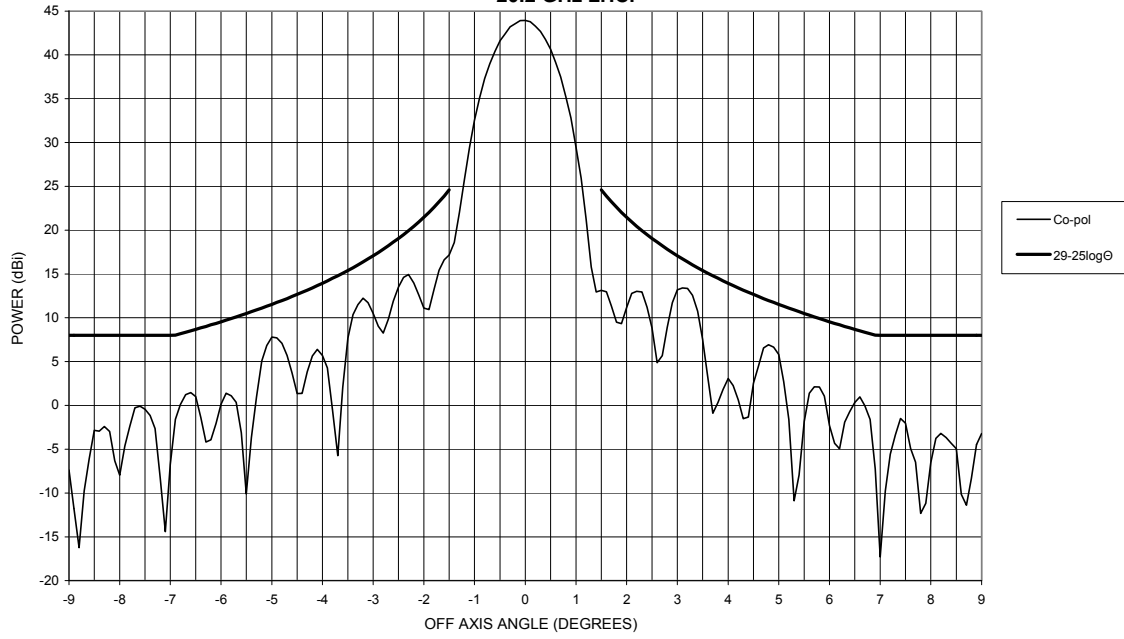


Figure 39 - Co-pol LHCP +/-9° Azimuth Pattern – 20.2GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
19.7 GHz RHCP

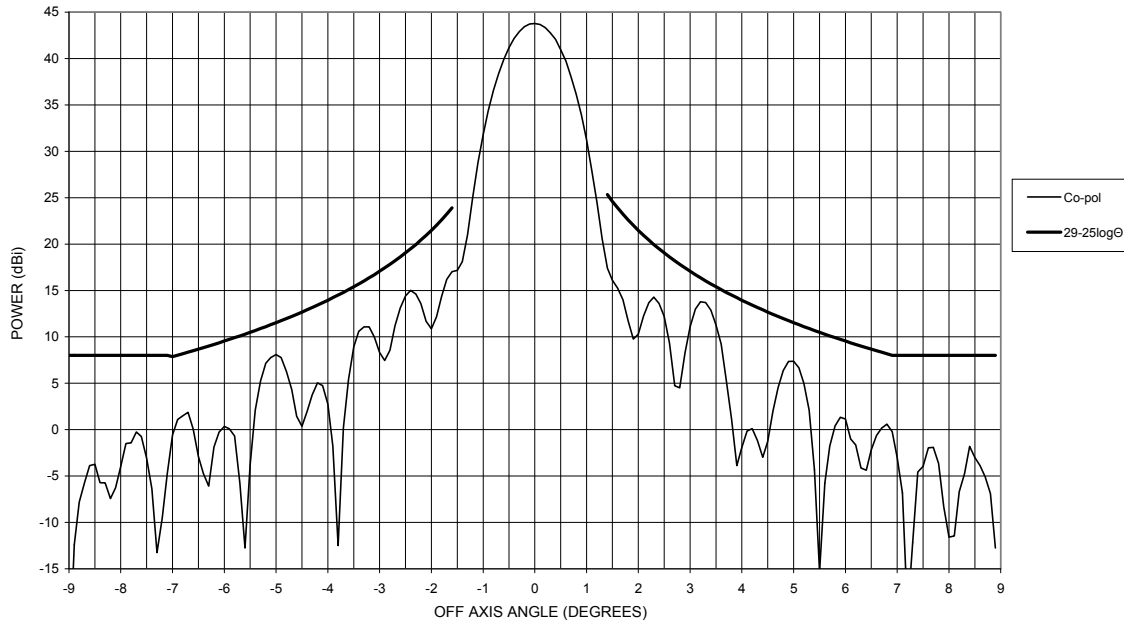


Figure 40 - Co-pol RHCP +/-9° Azimuth Pattern – 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
19.95 GHz RHCP

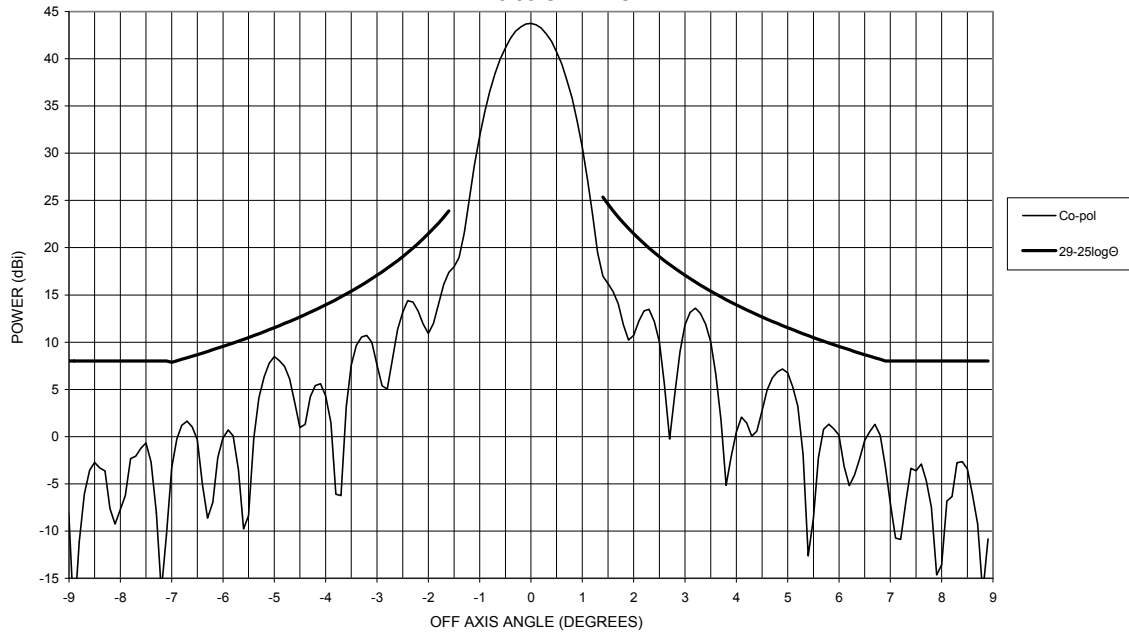


Figure 41 - Co-pol RHCP +/-9° Azimuth Pattern – 19.95GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
20.2 GHz RHCP

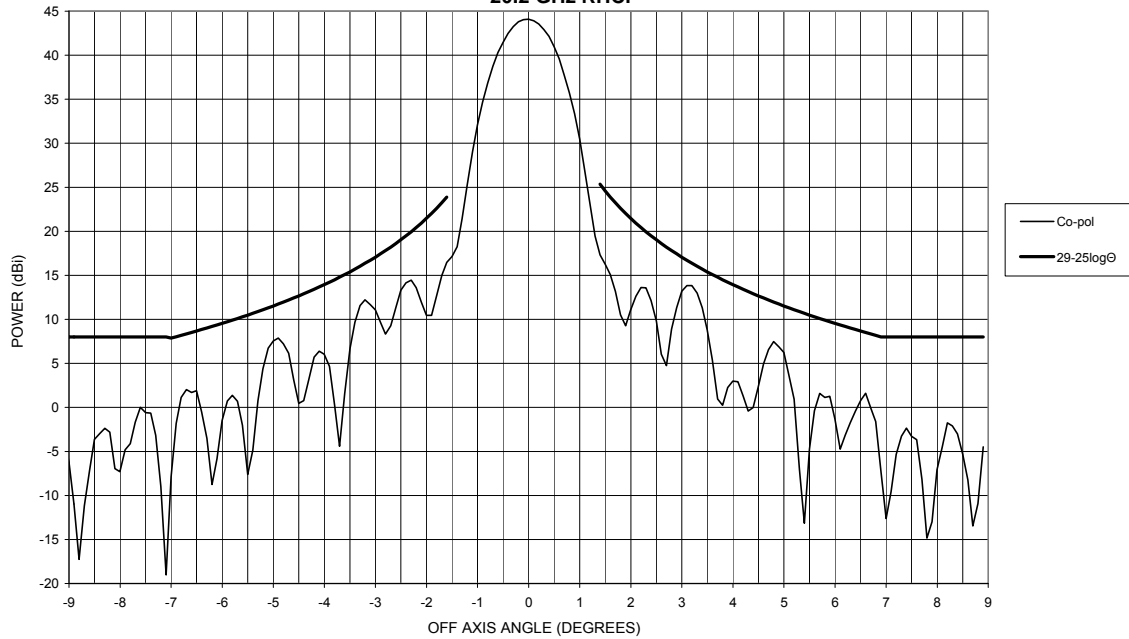


Figure 42 - Co-pol RHCP +/-9° Azimuth Pattern – 20.2GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Cross-pol Pattern  
19.7 GHz LHCP

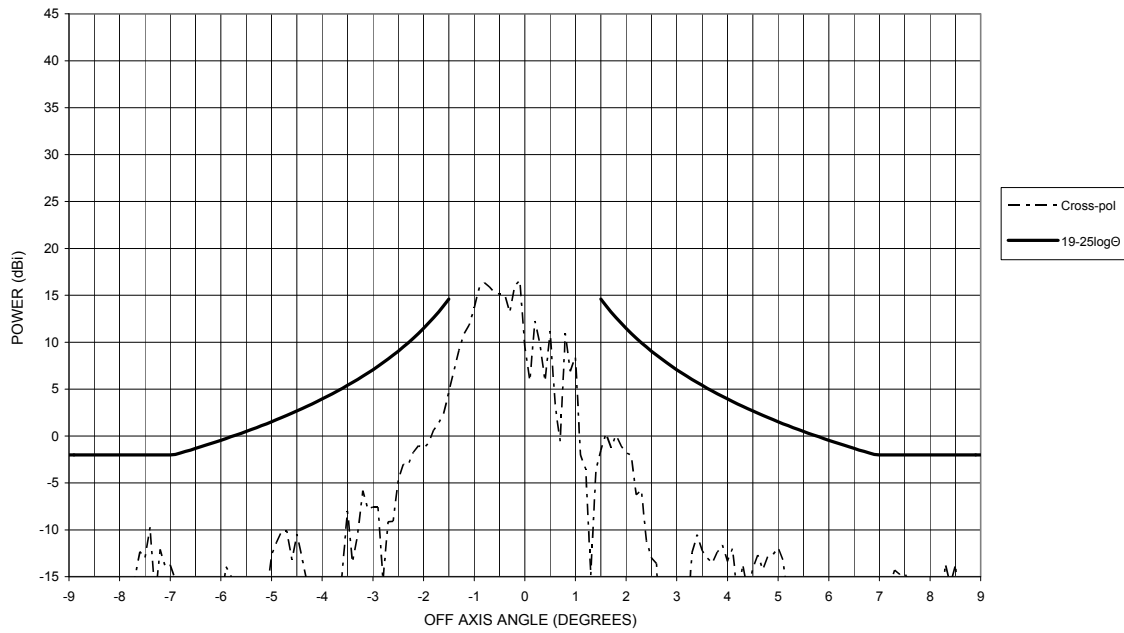


Figure 43 - Cross-pol LHCP +/-9° Azimuth Pattern – 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Cross-pol Pattern  
19.95 GHz LHCP

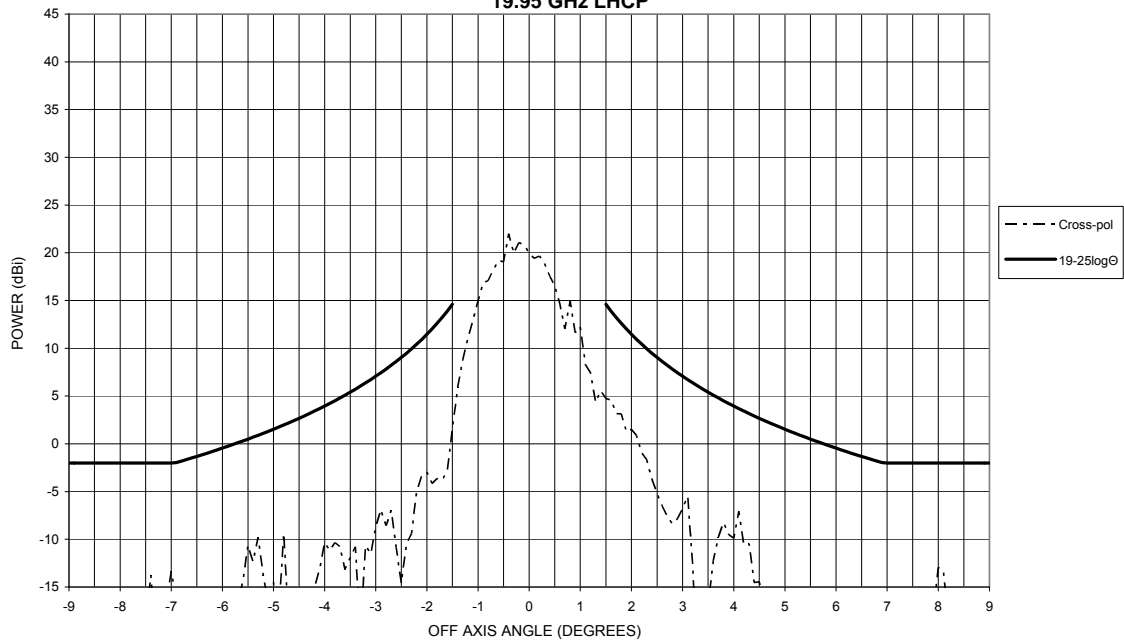


Figure 44 - Cross-pol LHCP +/-9° Azimuth Pattern – 19.95GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Cross-pol Pattern  
20.2 GHz LHCP

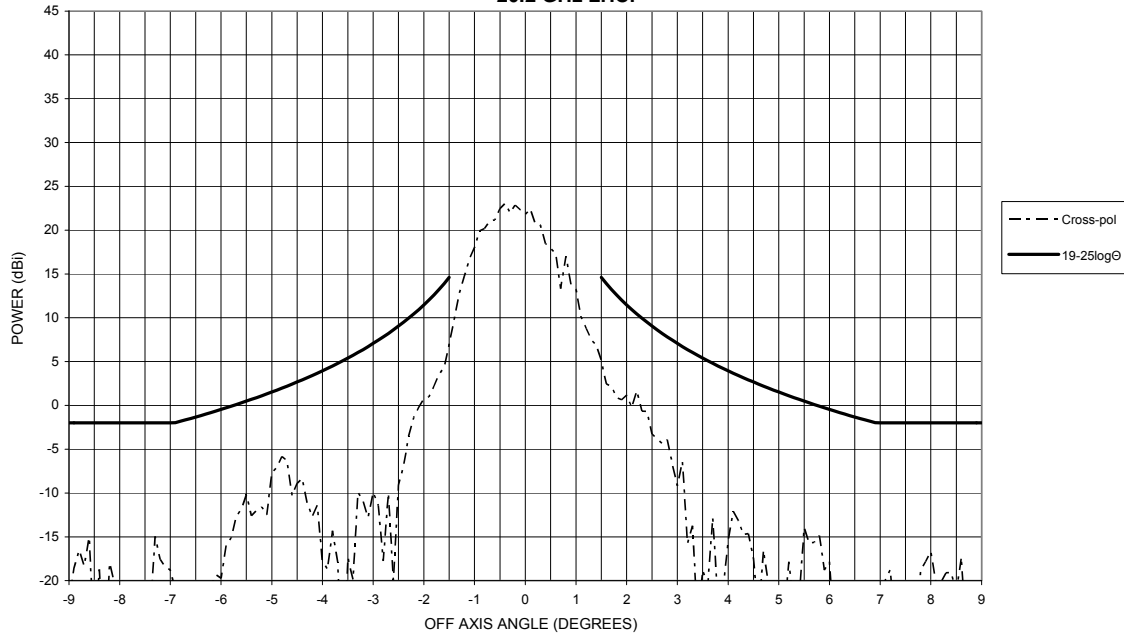


Figure 45 - Cross-pol LHCP +/-9° Azimuth Pattern – 20.2GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Cross-pol Pattern  
19.7 GHz RHCP

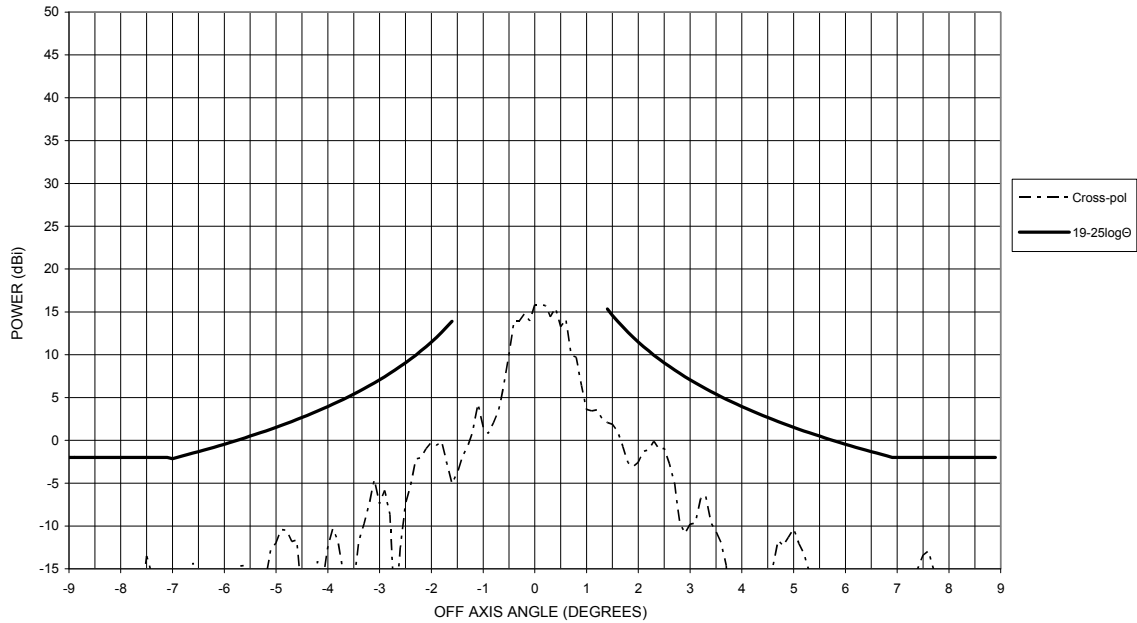


Figure 46 - Cross-pol RHCP +/-9° Azimuth Pattern – 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Cross-pol Pattern  
19.95 GHz RHCP

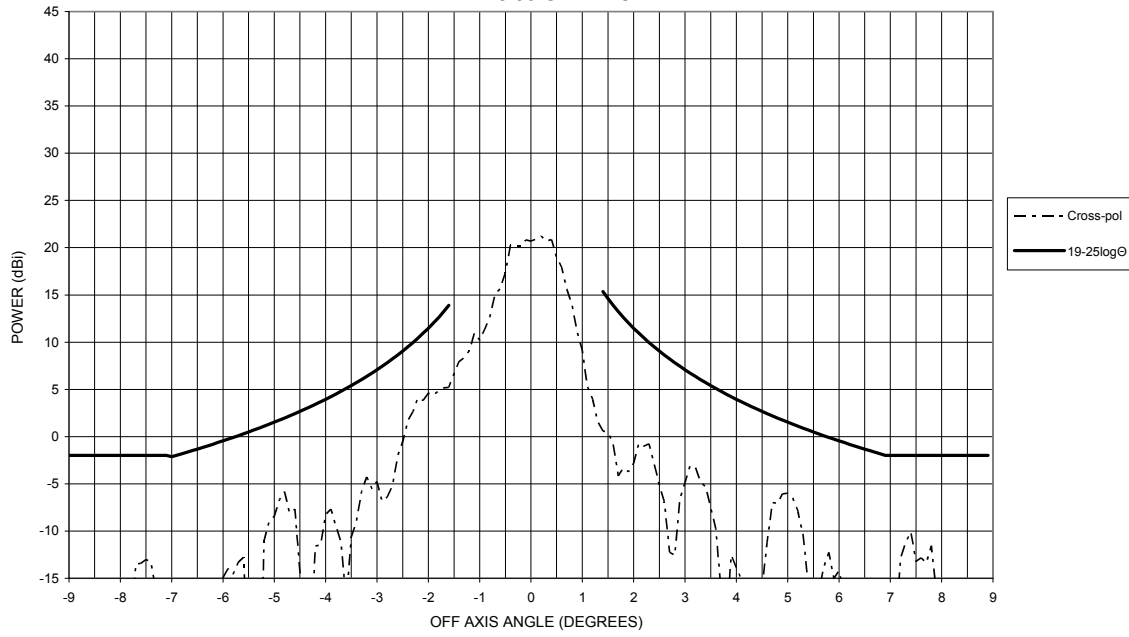


Figure 47 - Cross-pol RHCP  $\pm 9^\circ$  Azimuth Pattern – 19.95GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Cross-pol Pattern  
20.2 GHz RHCP

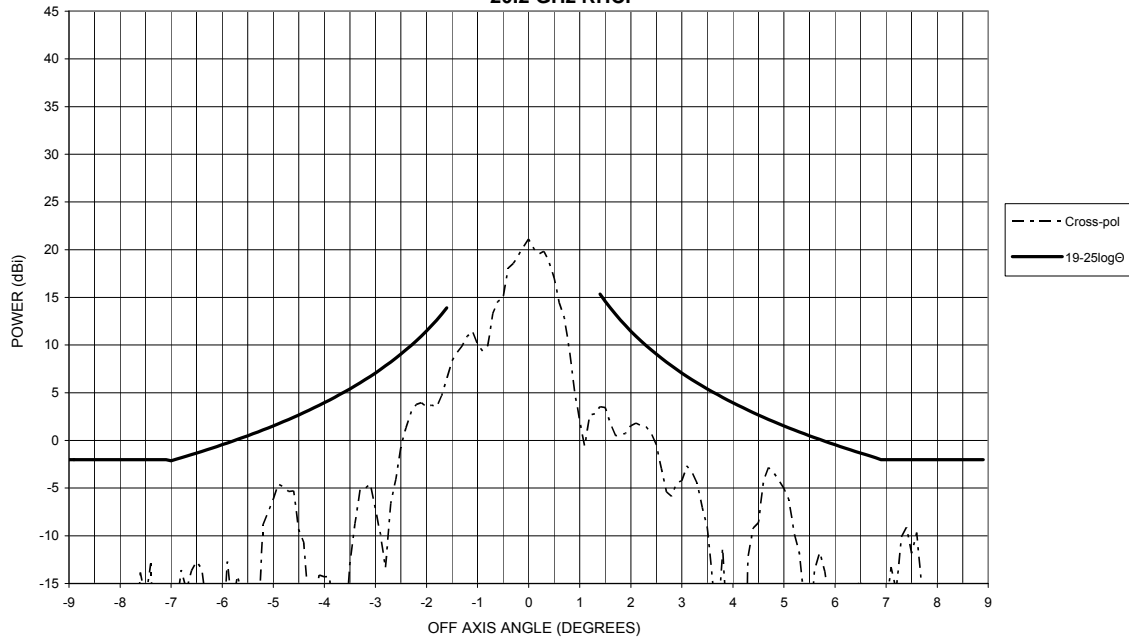


Figure 48 - Cross-pol RHCP  $\pm 9^\circ$  Azimuth Pattern – 20.2GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
19.7 GHz LHCP

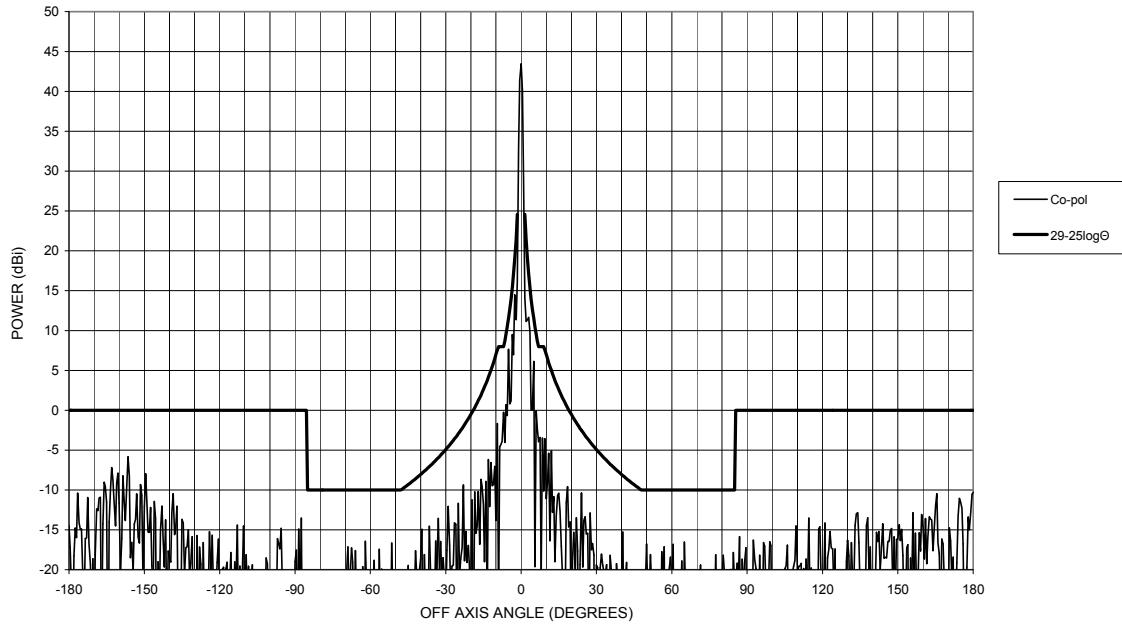


Figure 49 - Co-pol LHCP +/-180° Azimuth Pattern – 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
19.95 GHz LHCP

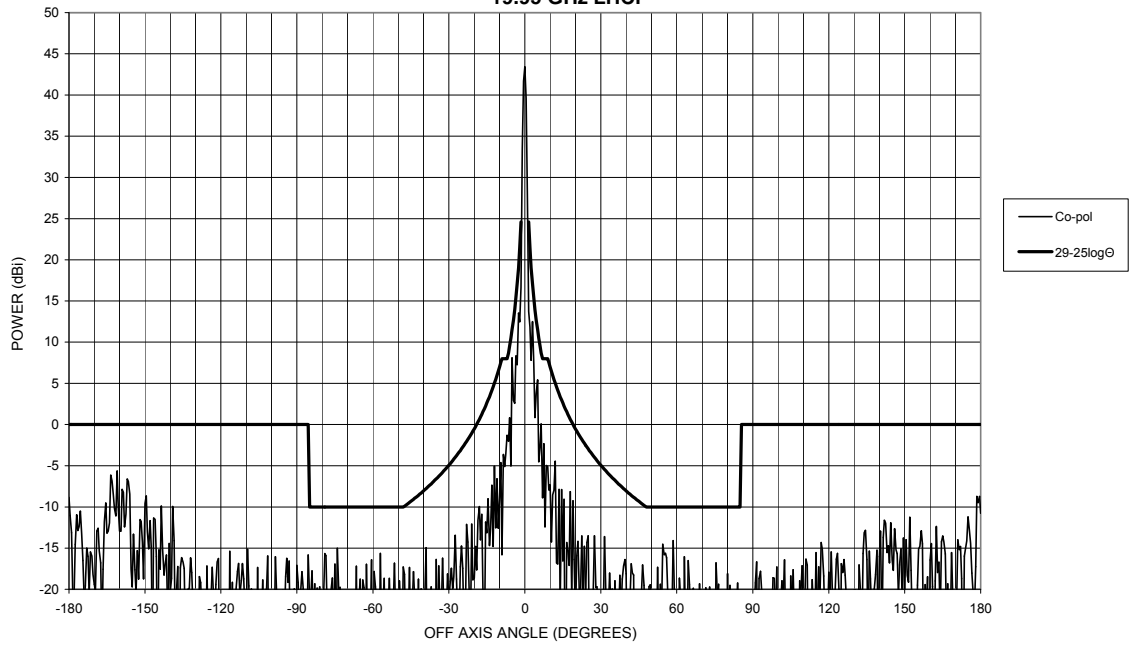


Figure 50 - Co-pol LHCP +/-180° Azimuth Pattern – 19.95GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
20.2 GHz LHCP

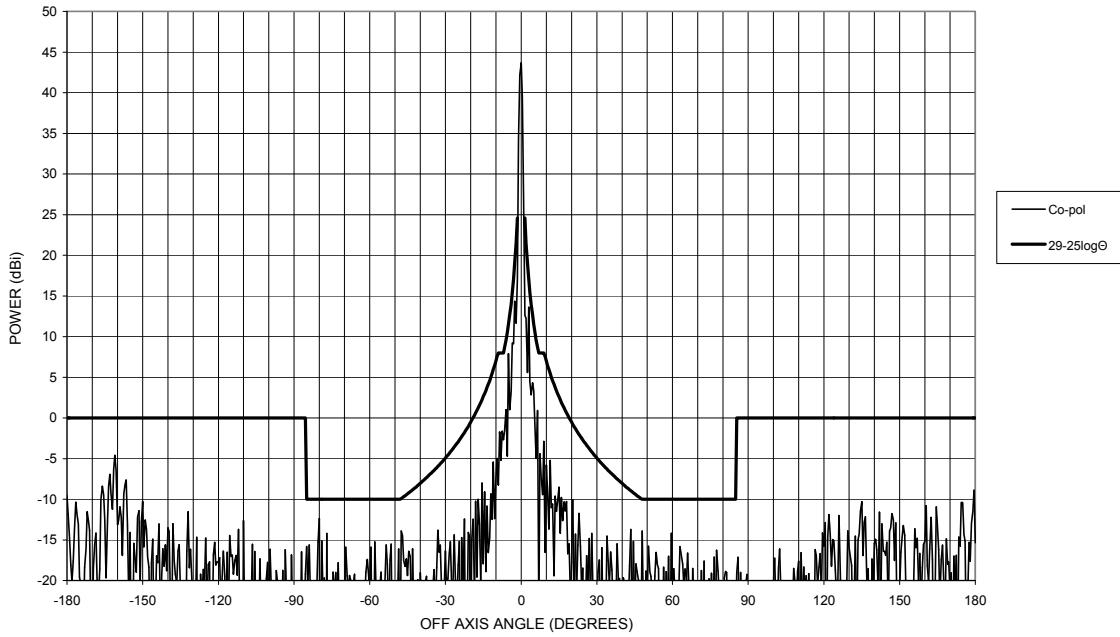


Figure 51 - Co-pol LHCP +/-180° Azimuth Pattern – 20.2GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
19.7 GHz RHCP

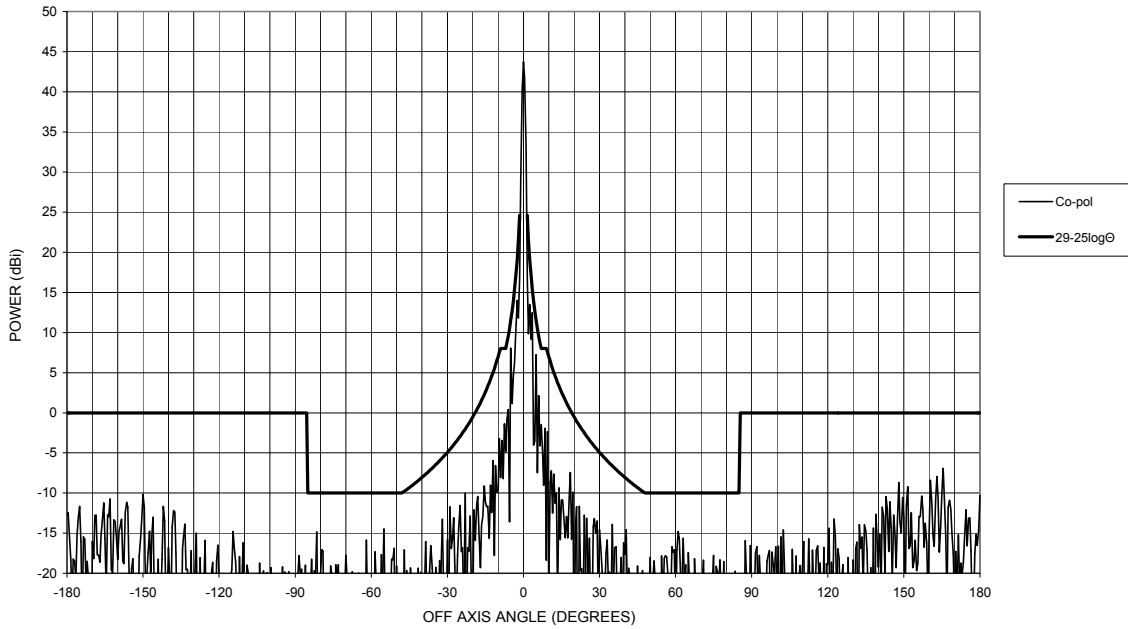


Figure 52 - Co-pol RHCP +/-180° Azimuth Pattern – 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
19.95 GHz RHCP

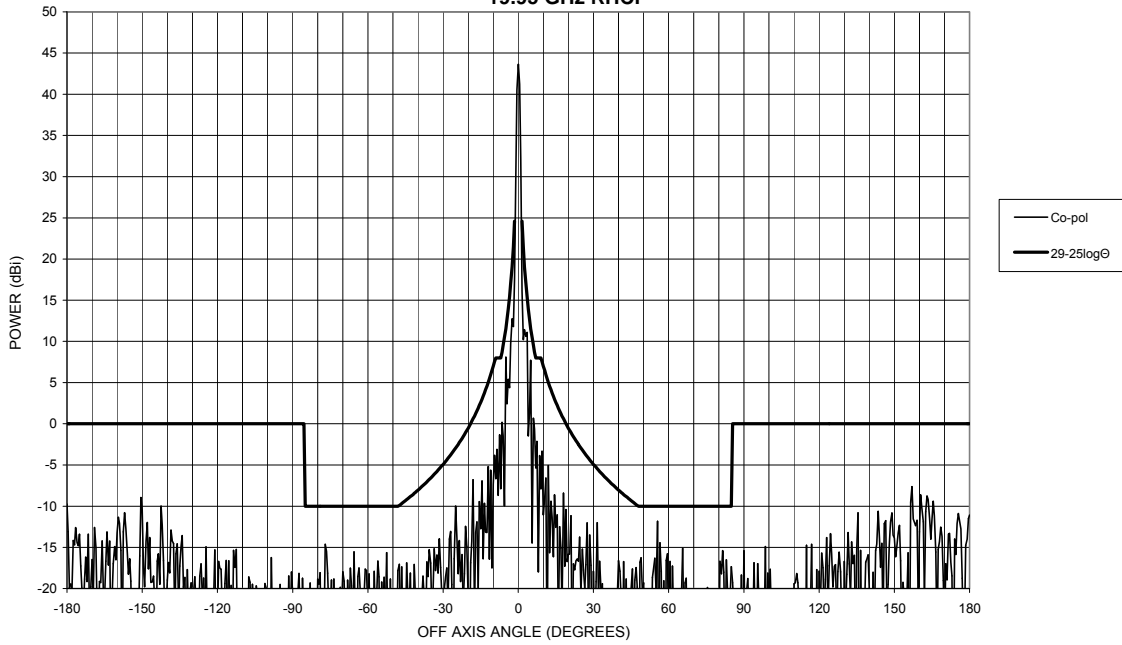


Figure 53 - Co-pol RHCP +/-180° Azimuth Pattern – 19.95GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Azimuth Co-pol Pattern  
20.2 GHz RHCP

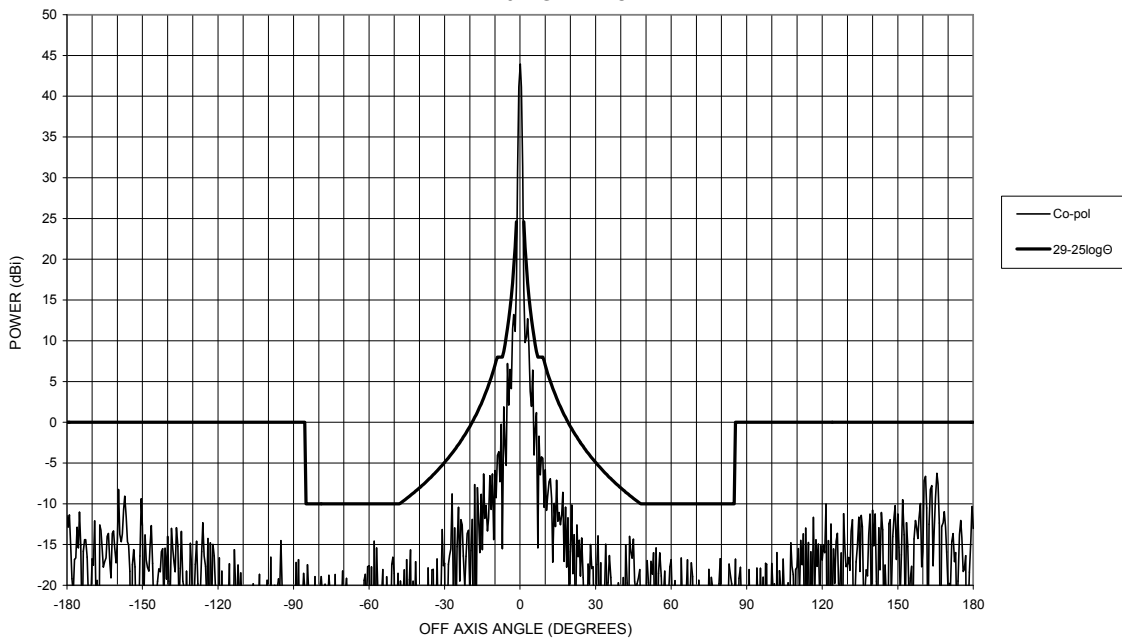


Figure 54 - Co-pol RHCP +/-180° Azimuth Pattern – 20.2GHz



# **AvL Technologies**

1.0m Ka Band Antenna  
Model 1010KVH

Receive Band Elevation Patterns

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
19.7 GHz LHCP

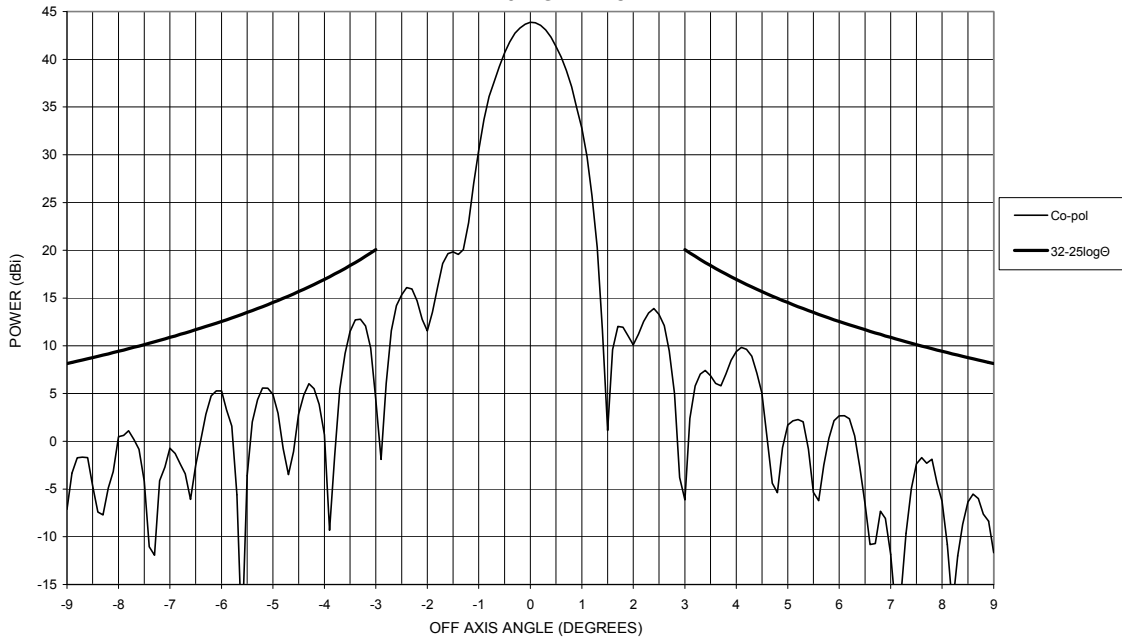


Figure 55 - Co-pol LHCP +/-9° Elevation Pattern – 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
19.95 GHz LHCP

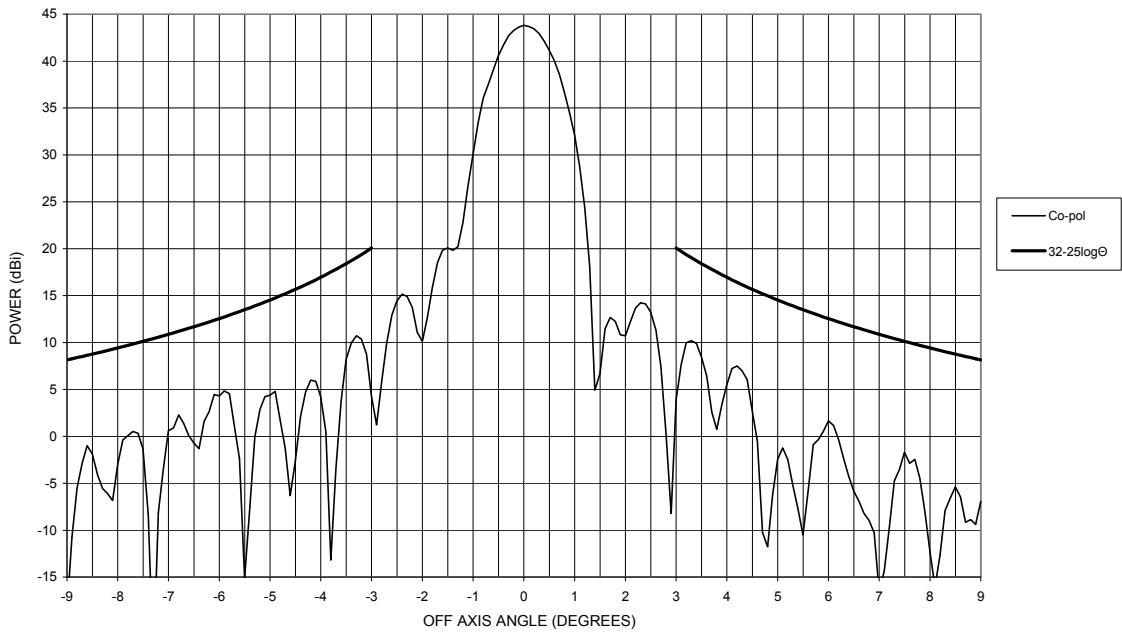


Figure 56 - Co-pol LHCP +/-9° Elevation Pattern – 19.95GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
20.2 GHz LHCP

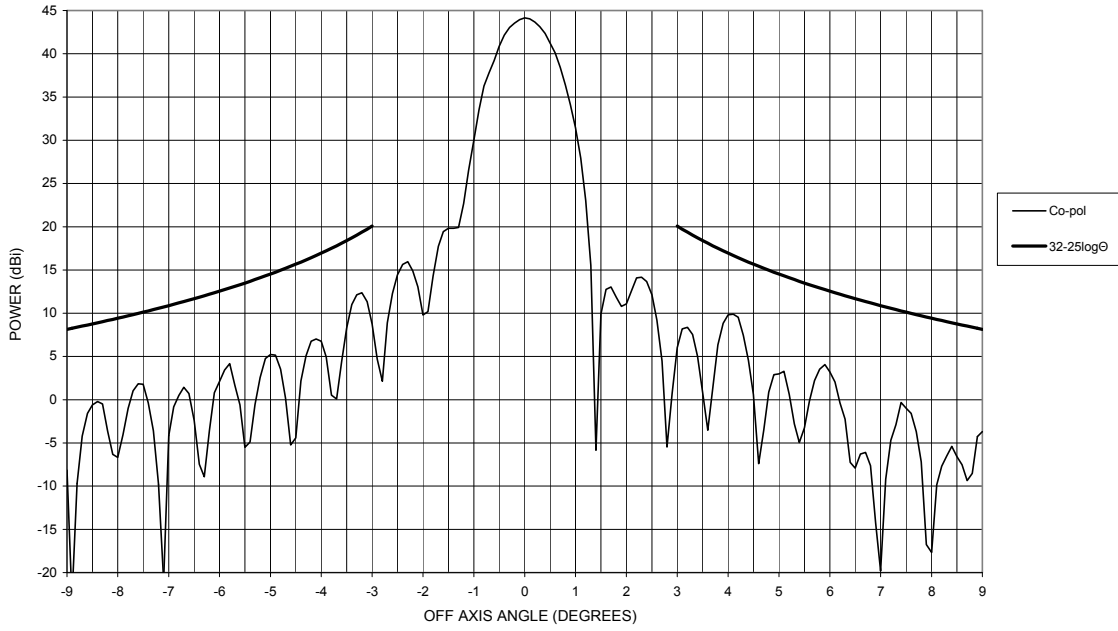


Figure 57 - Co-pol LHCP +/-9° Elevation Pattern – 20.2GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
19.7 GHz RHCP

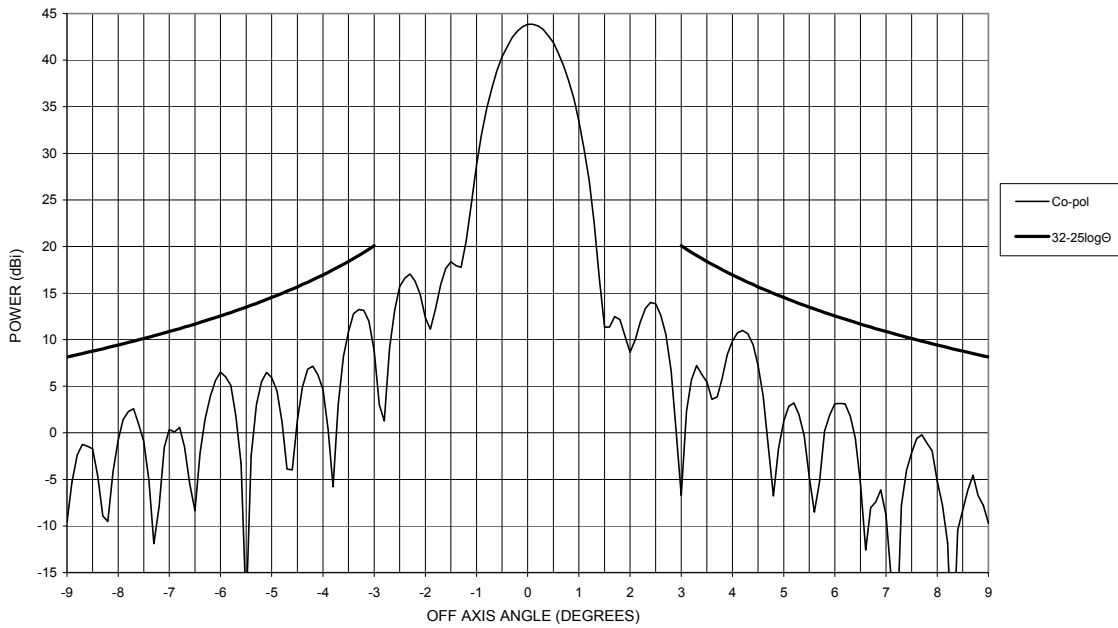


Figure 58 - Co-pol RHCP +/-9° Elevation Pattern – 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
19.95 GHz RHCP

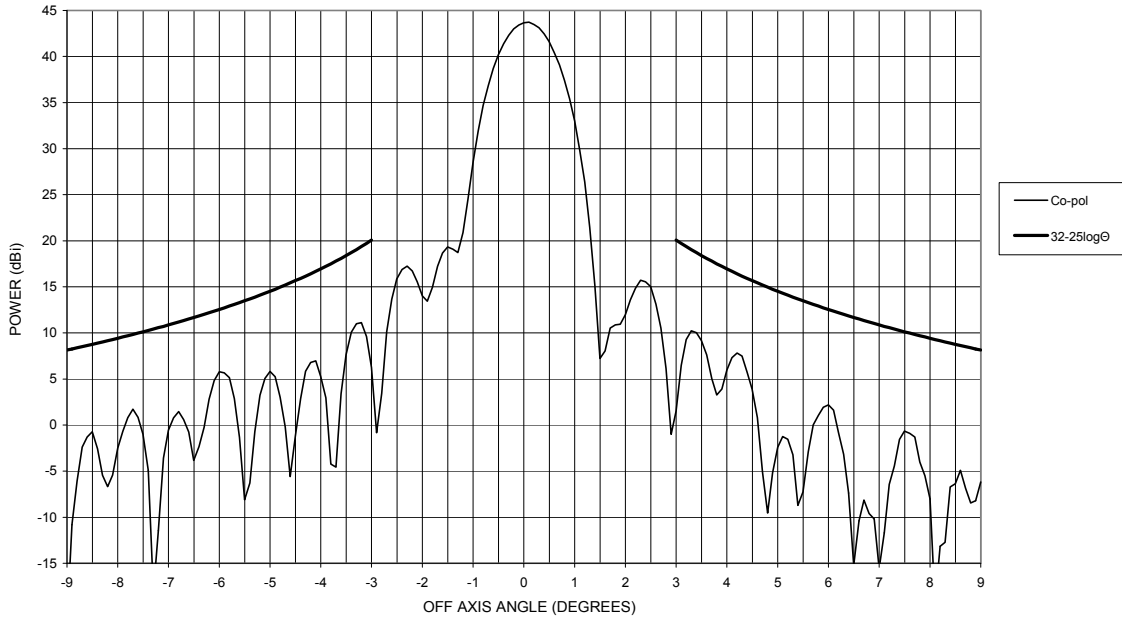


Figure 59 - Co-pol RHCP +/-9° Elevation Pattern – 19.95GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
20.2 GHz RHCP

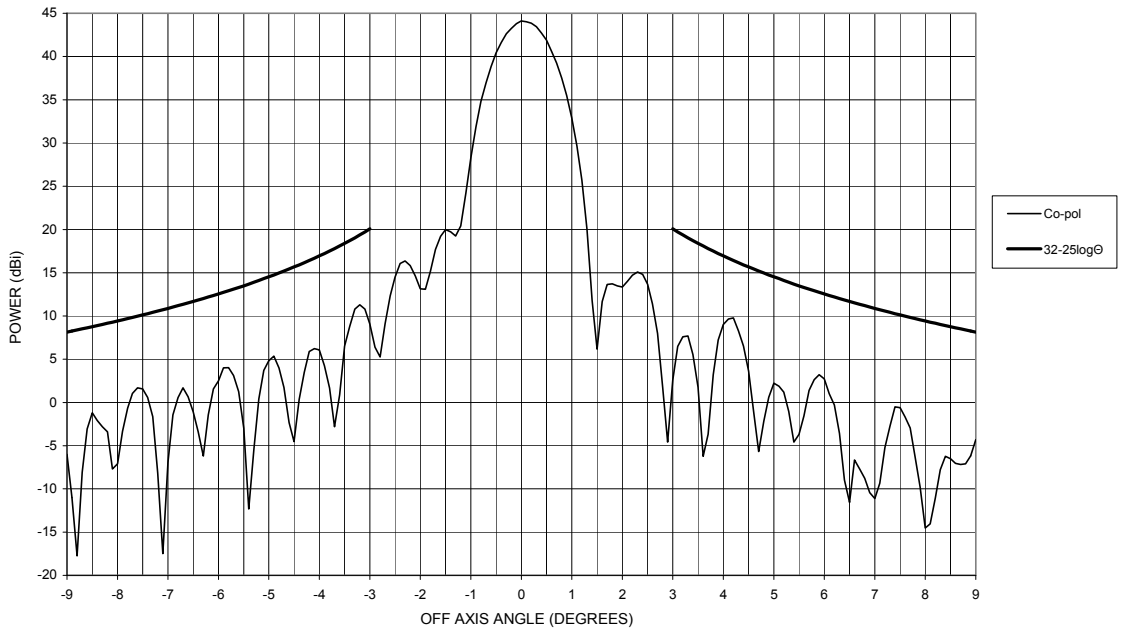


Figure 60 - Co-pol RHCP +/-9° Elevation Pattern – 20.2GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Cross-pol Pattern  
19.7 GHz LHCP

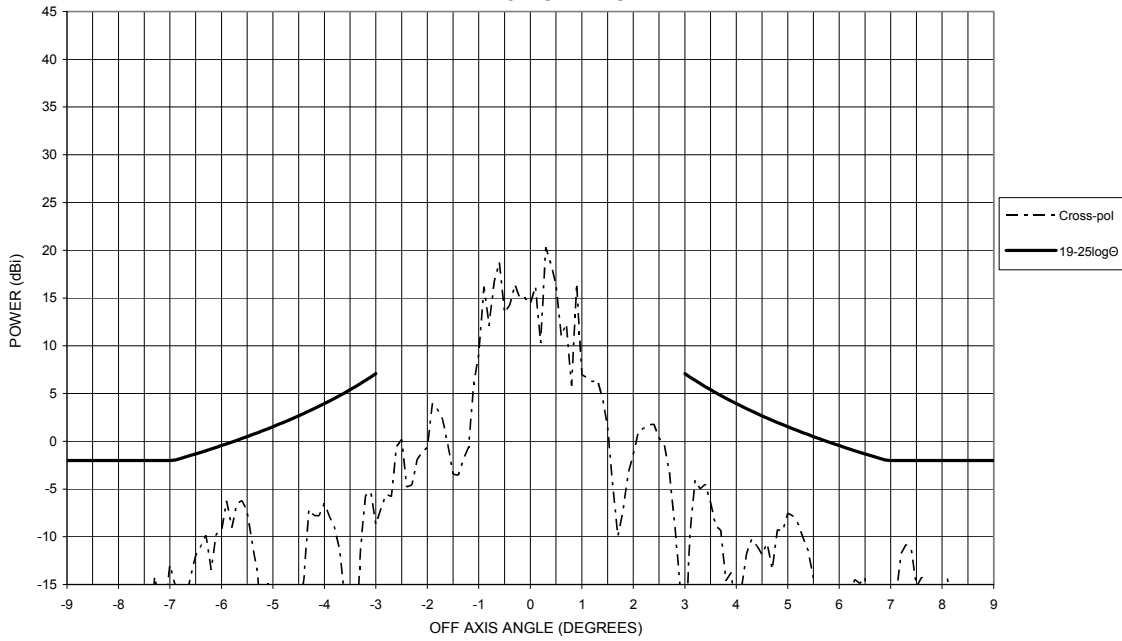


Figure 61 - Cross-pol LHCP +/-9° Elevation Pattern – 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Cross-pol Pattern  
19.95 GHz LHCP

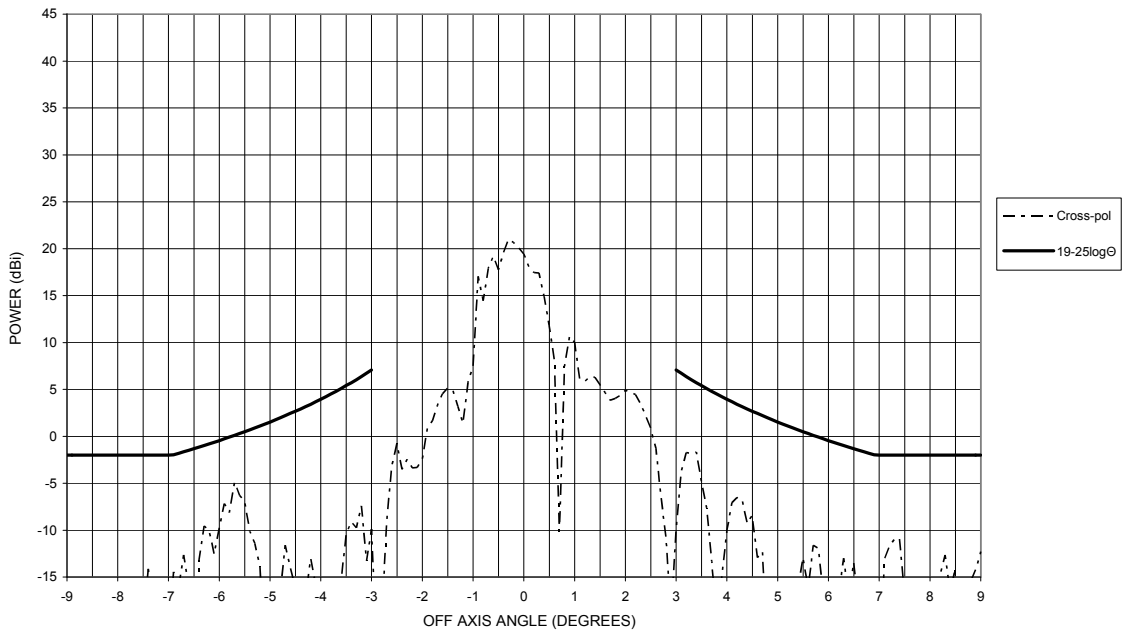


Figure 62 - Cross-pol LHCP +/-9° Elevation Pattern – 19.95GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Cross-pol Pattern  
20.2 GHz LHCP

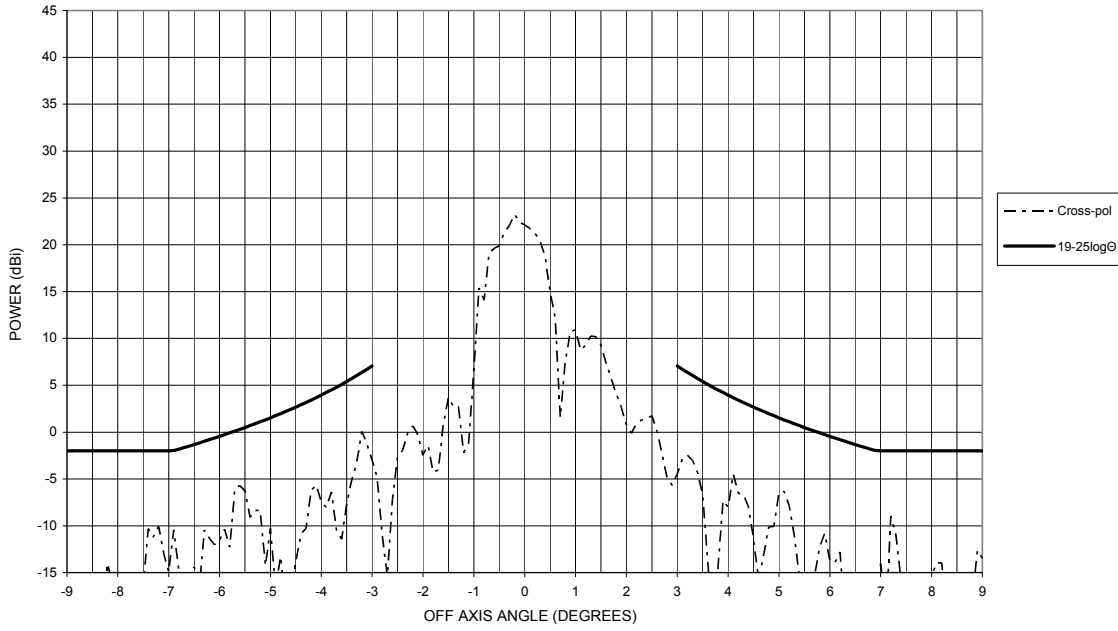


Figure 63 - Cross-pol LHCP +/-9° Elevation Pattern – 20.2GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Cross-pol Pattern  
19.7 GHz RHCP

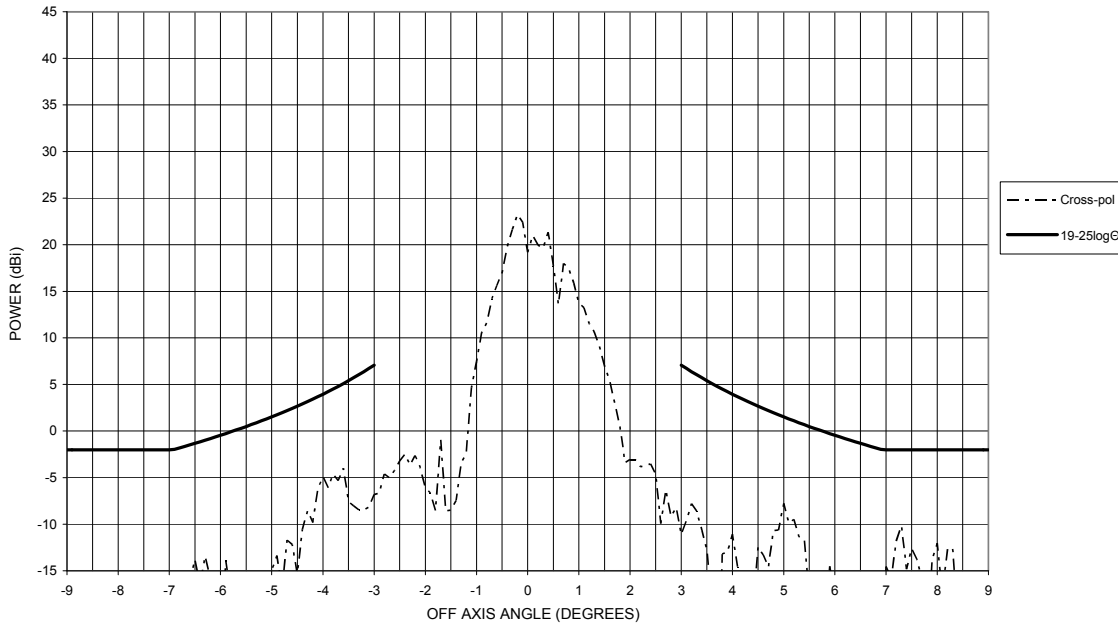


Figure 64 - Cross-pol RHCP +/-9° Elevation Pattern – 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Cross-pol Pattern  
19.95 GHz RHCP

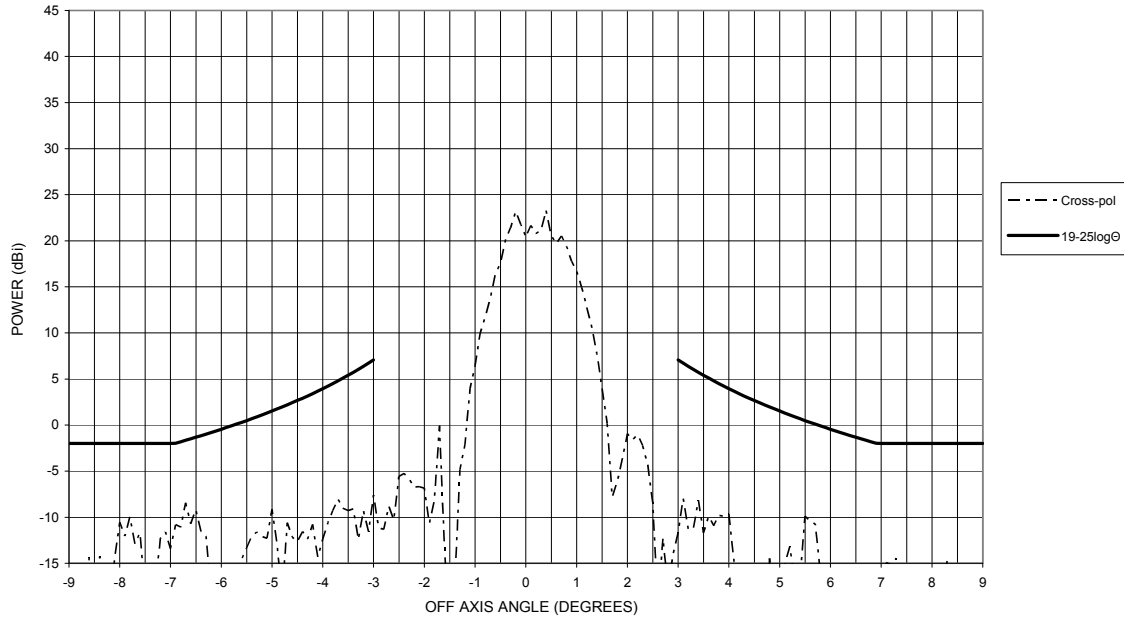


Figure 65 - Cross-pol RHCP +/-9° Elevation Pattern – 19.95GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Cross-pol Pattern  
20.2 GHz RHCP

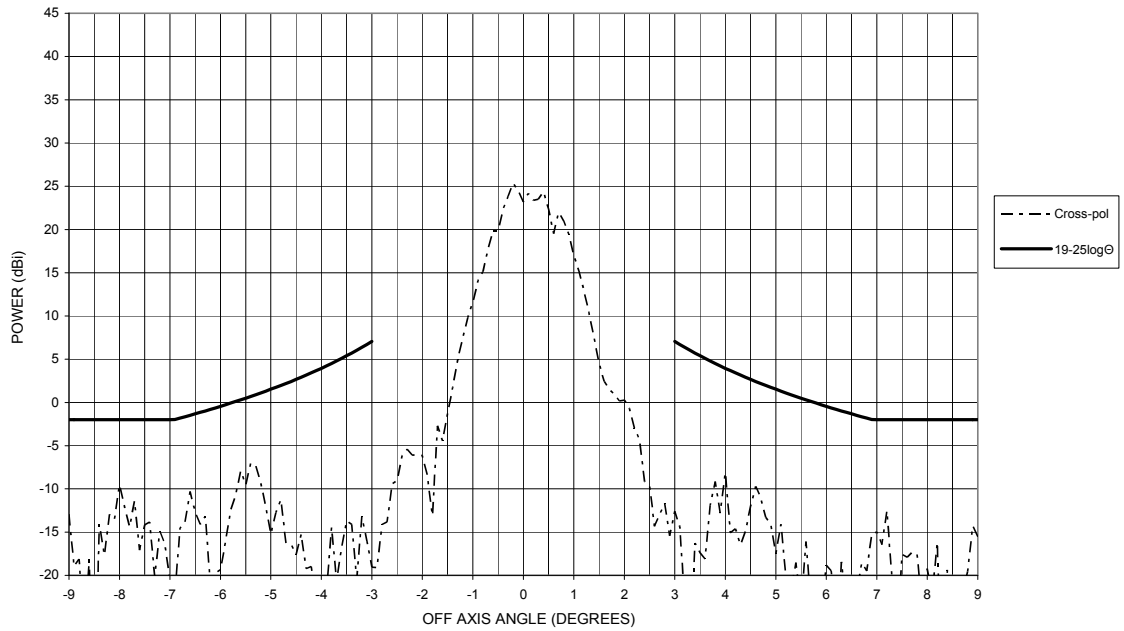


Figure 66 - Cross-pol RHCP +/-9° Elevation Pattern – 20.2GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
19.7 GHz LHCP

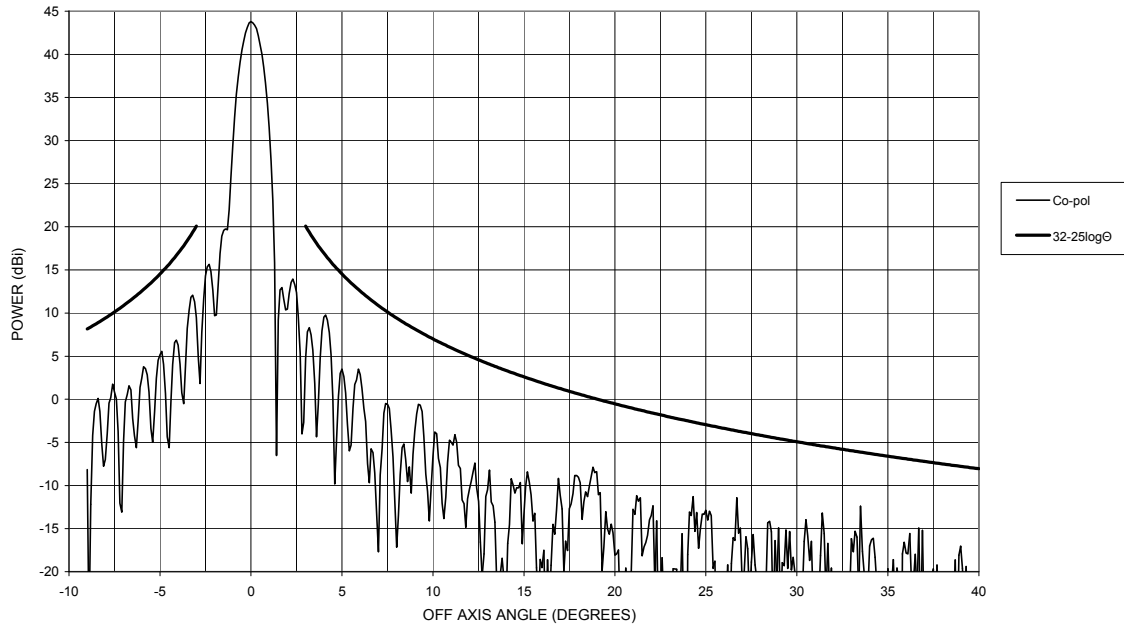


Figure 67 - Co-pol LHCP -9° - +40° Elevation Pattern - 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
19.95 GHz LHCP

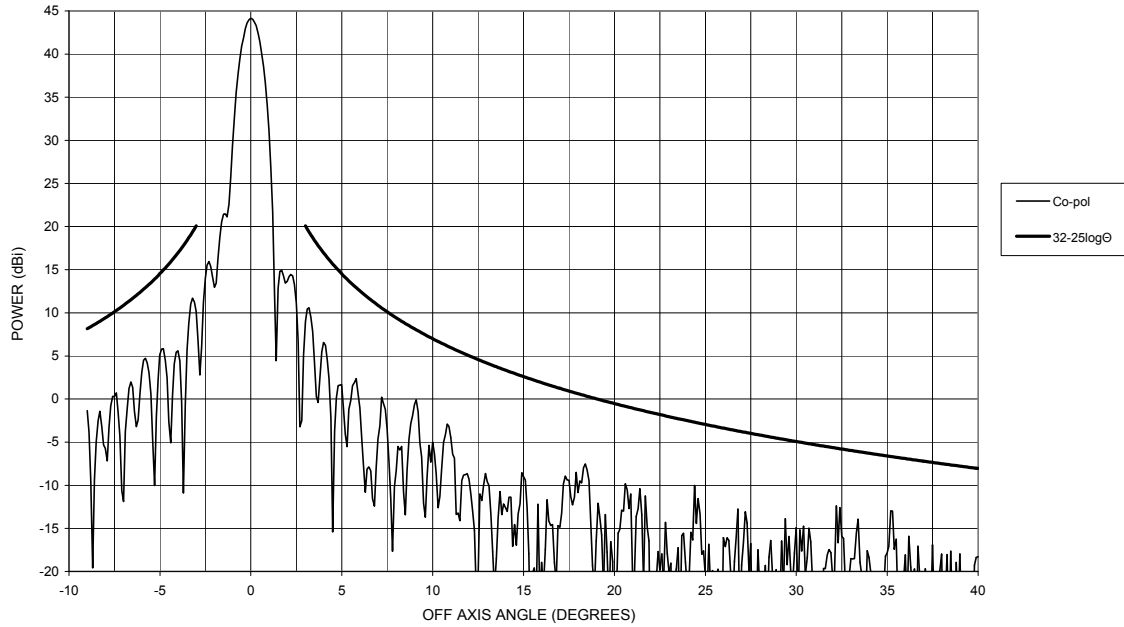


Figure 68 - Co-pol LHCP -9° - +40° Elevation Pattern - 19.95GHz



AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
20.2 GHz LHCP

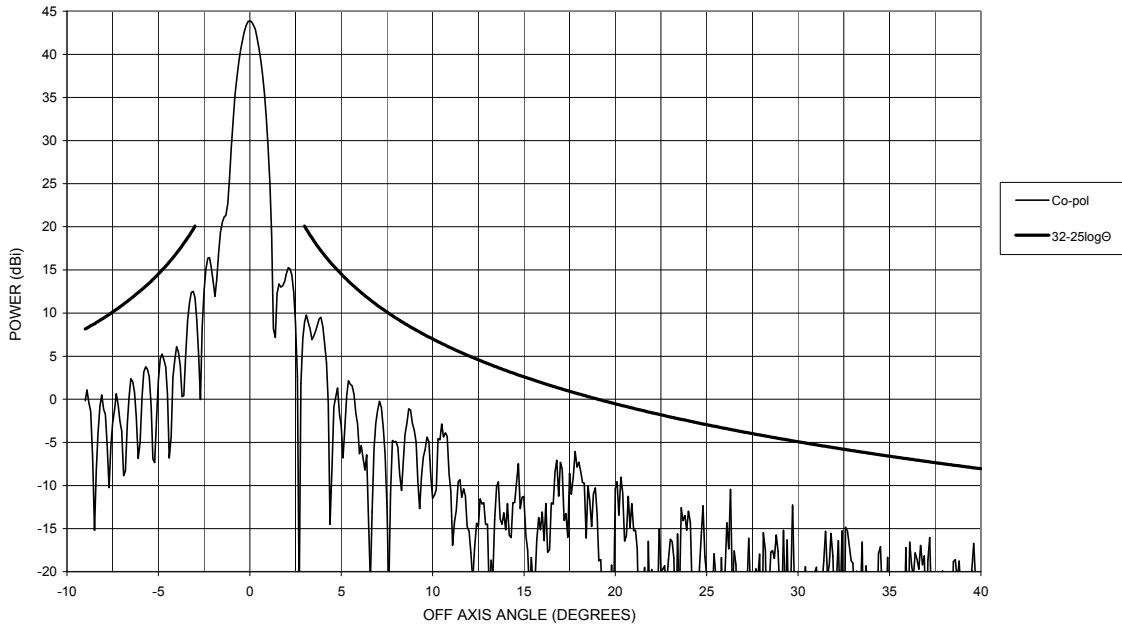


Figure 69 - Co-pol LHCP -9° - +40° Elevation Pattern - 20.2GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
19.7 GHz RHCP

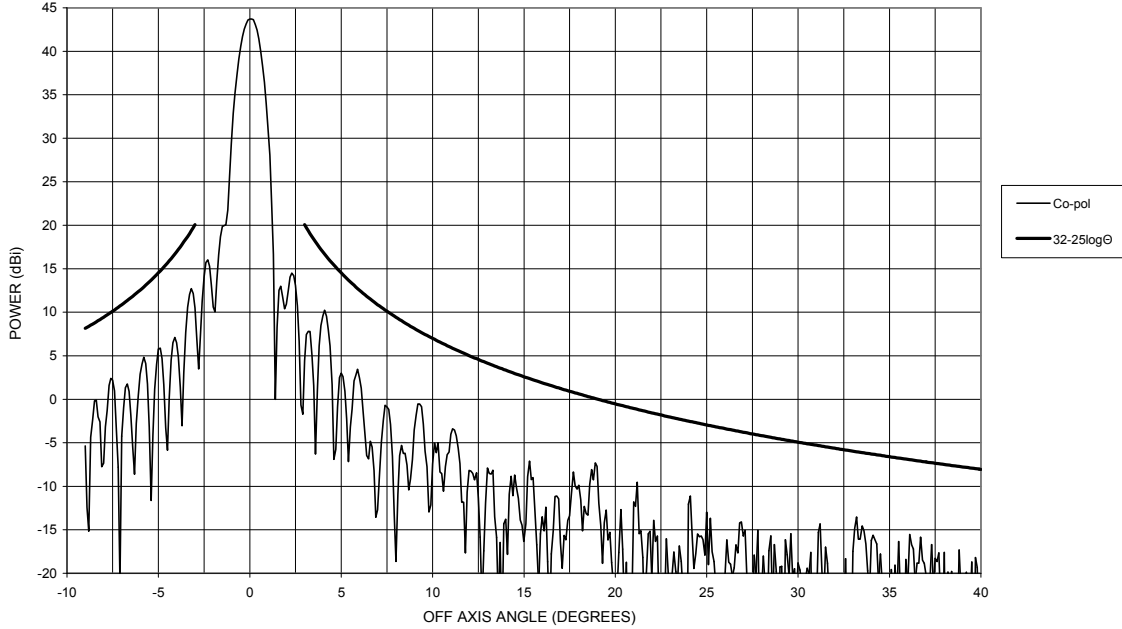


Figure 70 - Co-pol RHCP -9° - +40° Elevation Pattern - 19.7GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
19.95 GHz RHCP

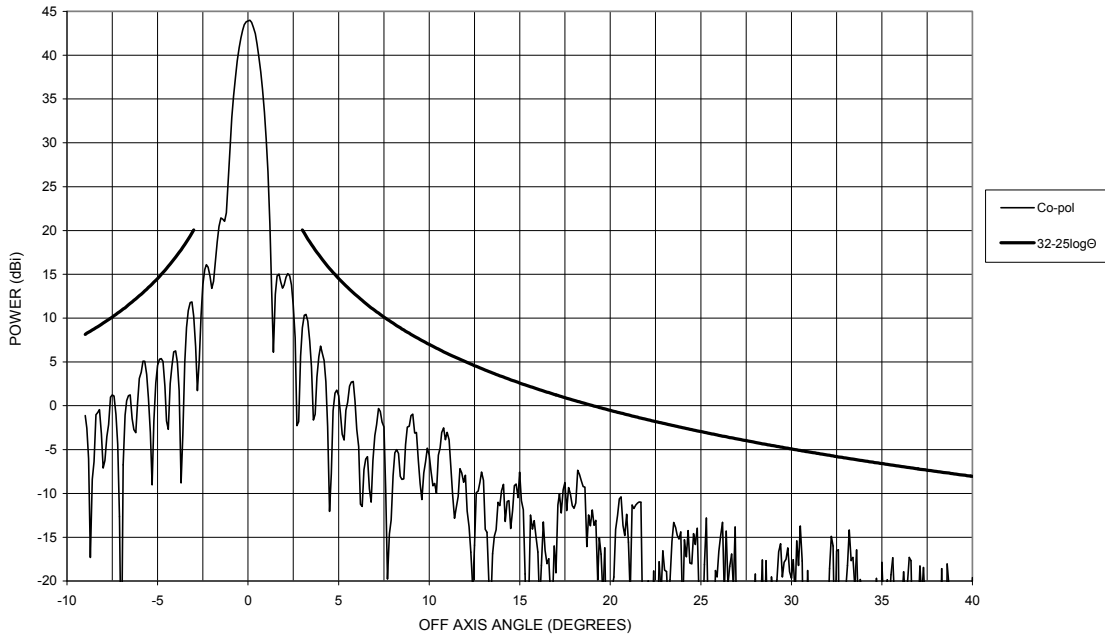


Figure 71 - Co-pol RHCP -9° - +40° Elevation Pattern – 19.95GHz

AvL 1.0m Ka-Band Antenna  
Model 1010KVH  
Receive Band Elevation Co-pol Pattern  
20.2 GHz RHCP

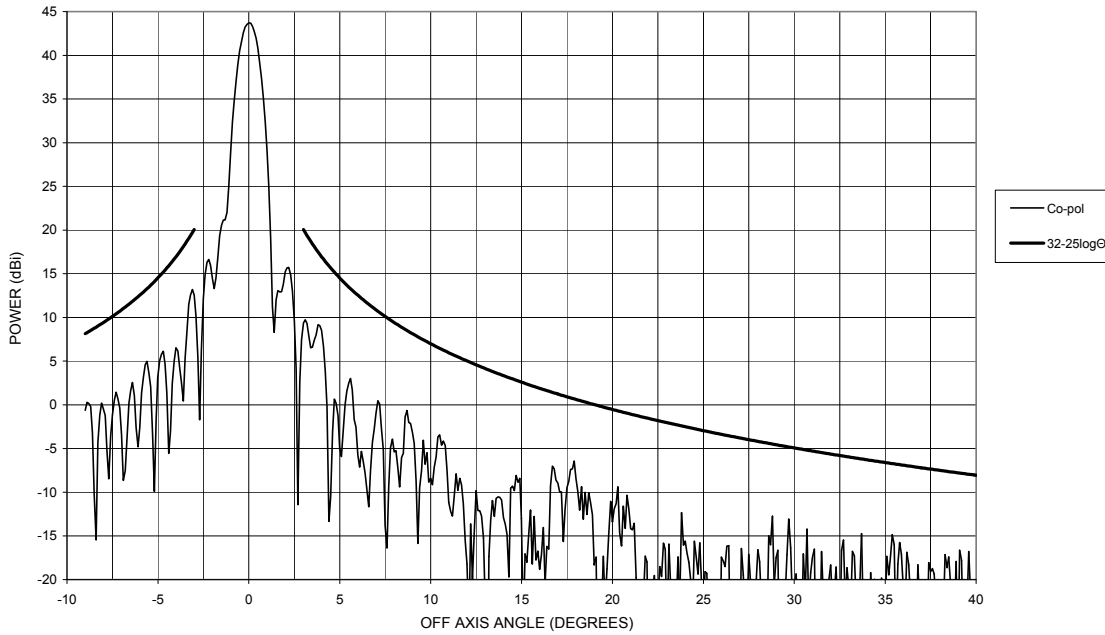


Figure 72 - Co-pol RHCP -9° - +40° Elevation Pattern - 20.2GHz

**AvL Technologies**  
1.2m Ka Band Antenna  
Model 1210KVH

Table 1 - Transmit Band Gain

Polarization	29.5 GHz	29.75 GHz	30 GHz
RHCP	49.2 dBi	49.3 dBi	49.3 dBi
LHCP	49.5 dBi	49.6 dBi	49.7 dBi

Table 2 – Receive Band Gain

Polarization	19.7 GHz	19.95 GHz	20.2 GHz
RHCP	45.6 dBi	45.8 dBi	45.9 dBi
LHCP	45.7 dBi	45.9 dBi	46.0 dBi

# **AvL Technologies**

1.2m Ka Band Antenna  
Model 1210KVH

Transmit Band Azimuth Patterns

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
29.5 GHz LHCP

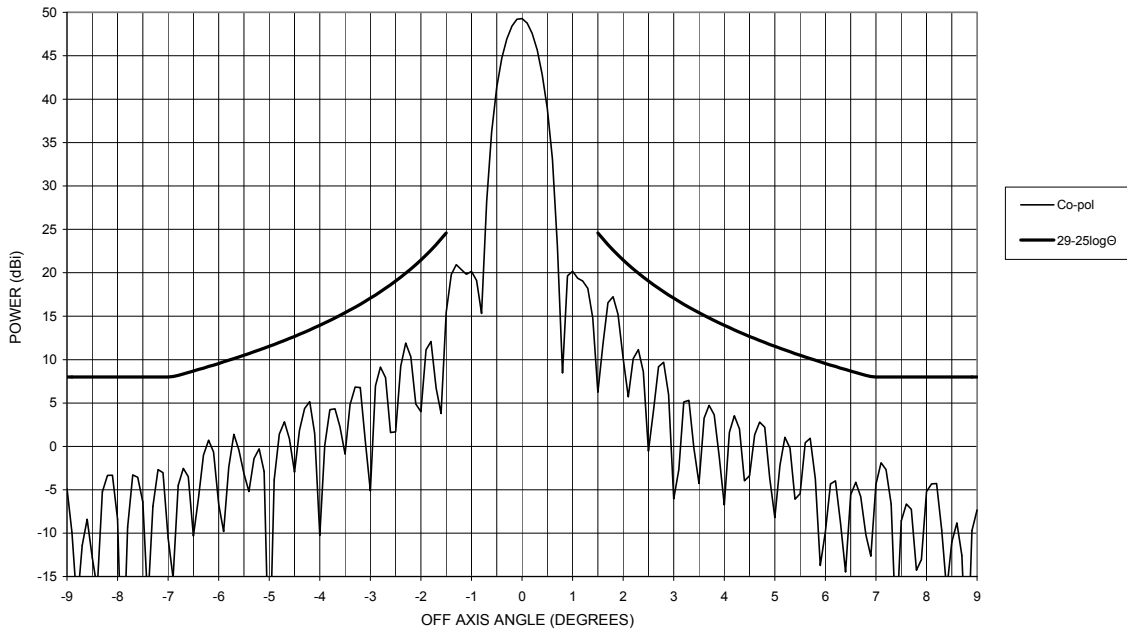


Figure 1 - Co-pol LHCP +/-9° Azimuth Pattern - 29.5GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
29.75 GHz LHCP

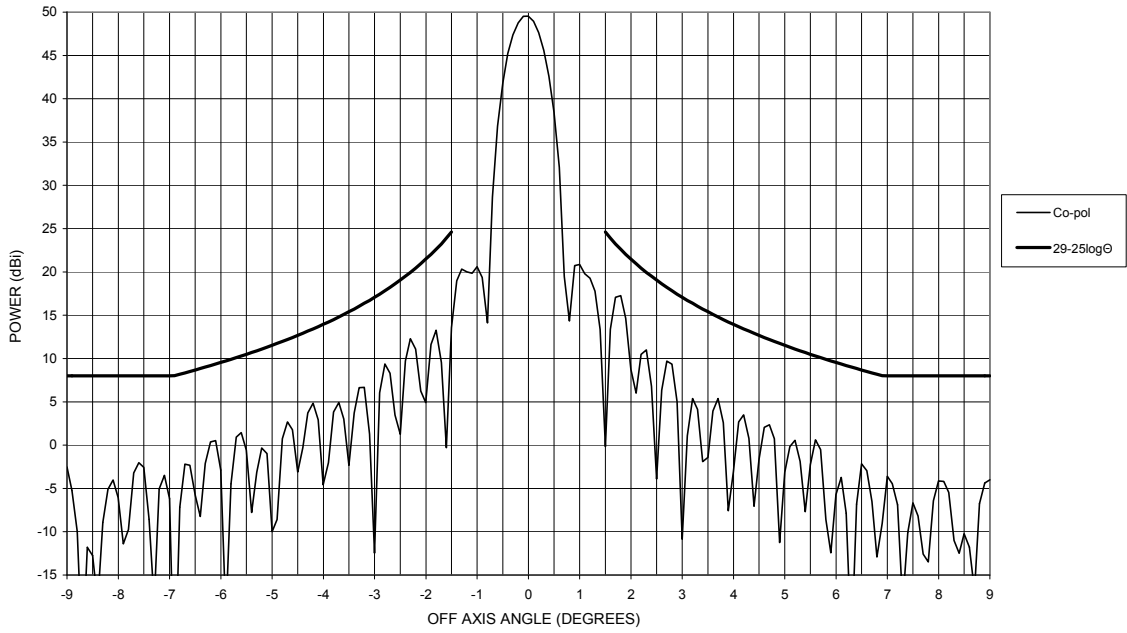


Figure 2 - Co-pol LHCP +/-9° Azimuth Pattern - 29.75GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
30 GHz LHCP

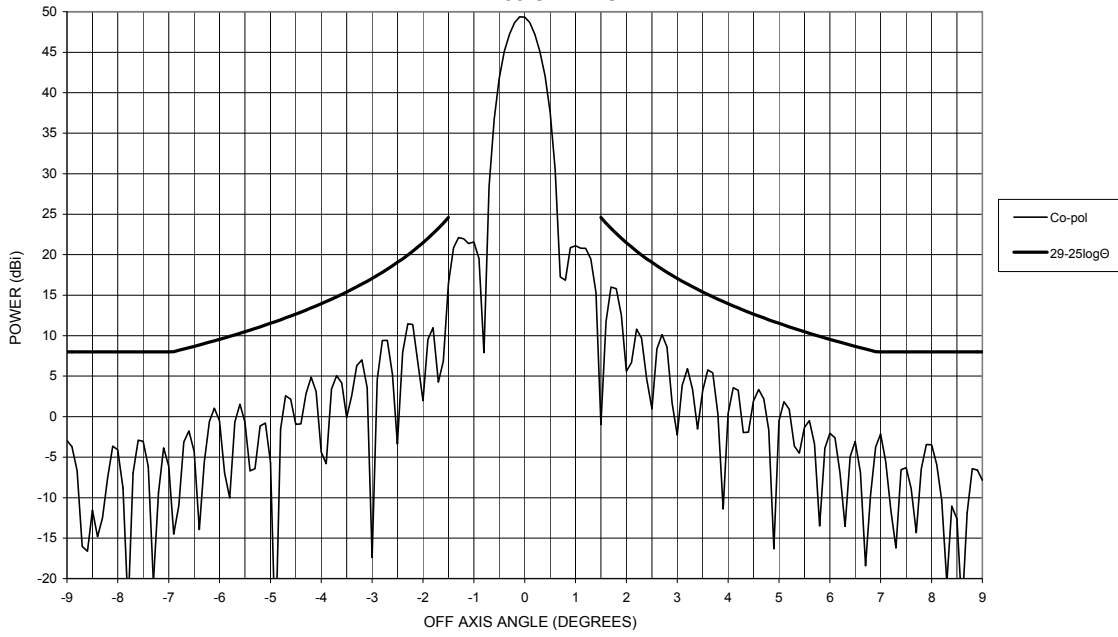


Figure 3 - Co-pol LHCP +/-9° Azimuth Pattern - 30GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
29.5 GHz RHCP

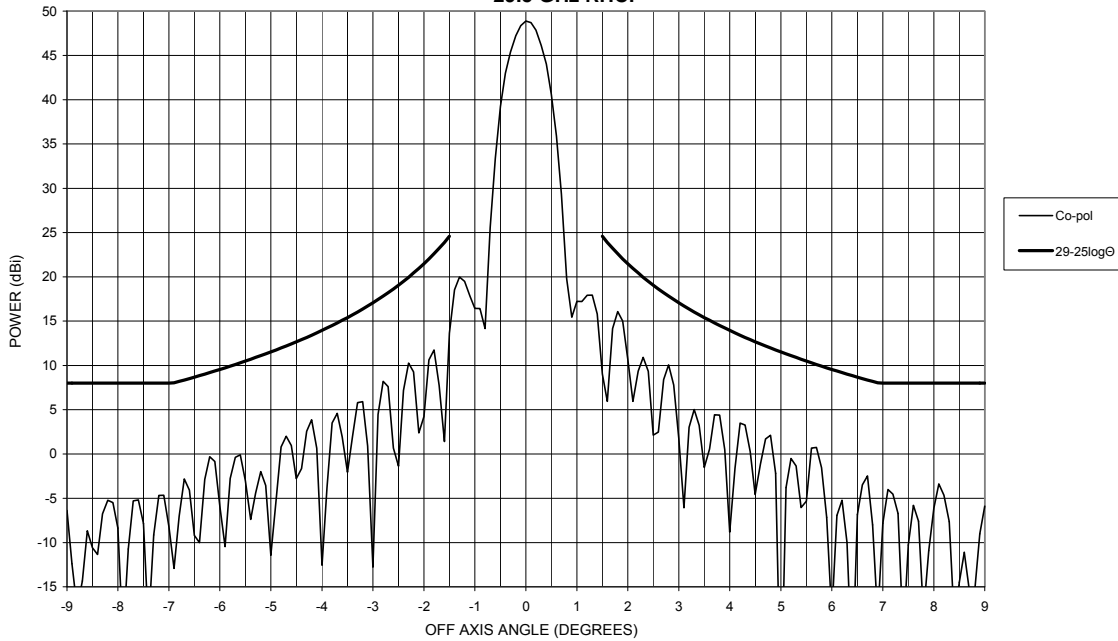


Figure 4 - Co-pol RHCP +/-9° Azimuth Pattern - 29.5GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
29.75 GHz RHCP

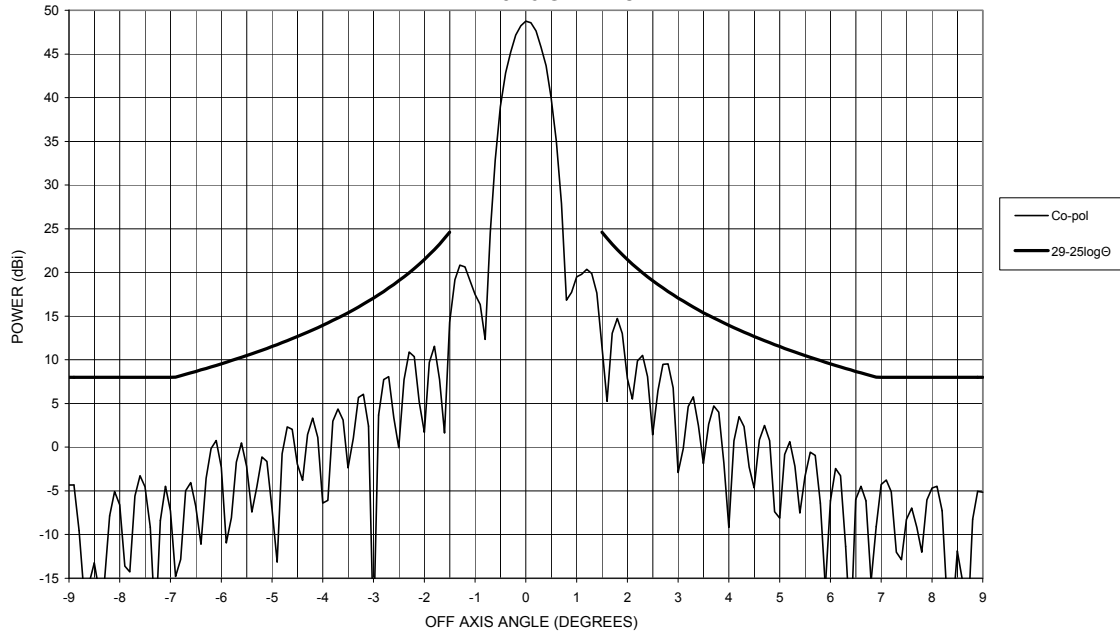


Figure 5 - Co-pol RHCP  $\pm 9^\circ$  Azimuth Pattern - 29.75GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
30 GHz RHCP

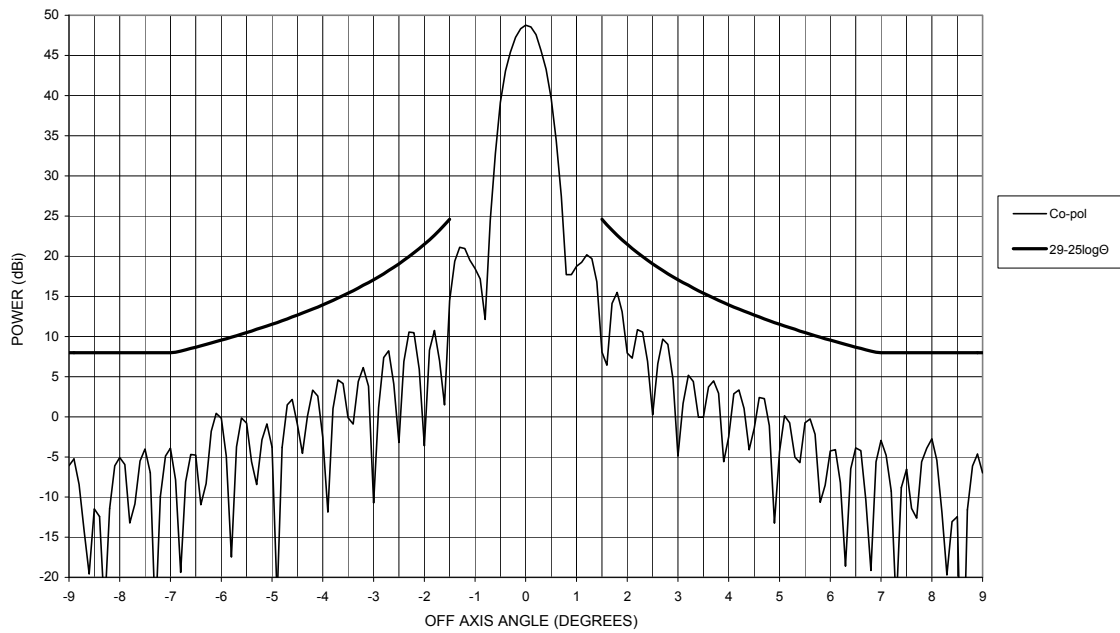


Figure 6 - Co-pol RHCP  $\pm 9^\circ$  Azimuth Pattern - 30GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Cross-pol Pattern  
29.5 GHz LHCP

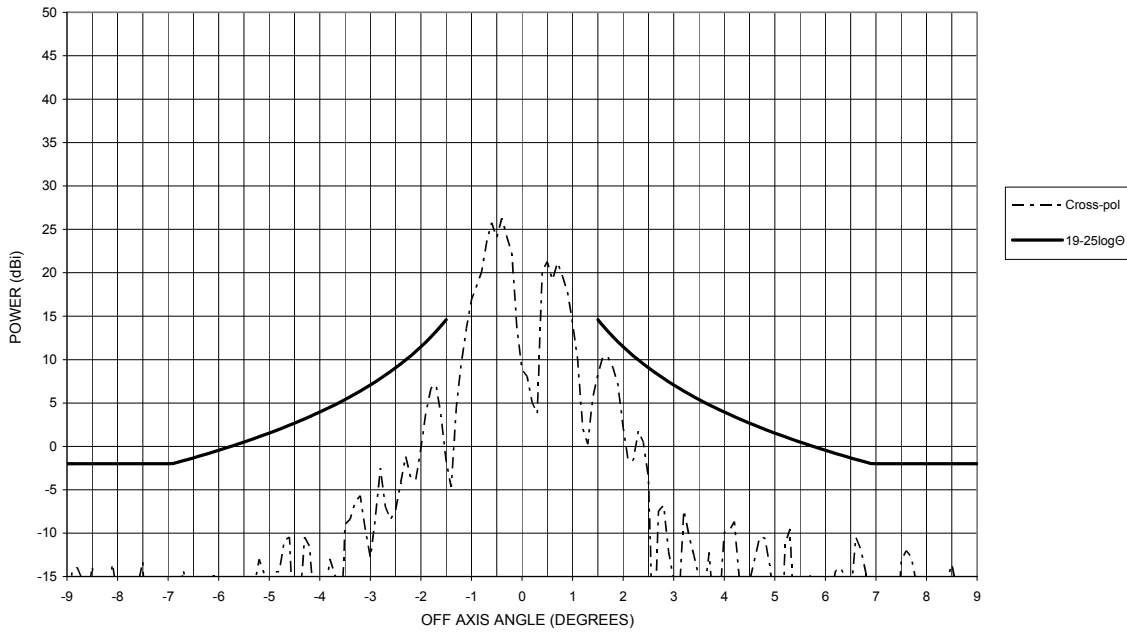


Figure 7 - Cross-pol LHCP +/-9° Azimuth Pattern - 29.5GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Cross-pol Pattern  
29.75 GHz LHCP

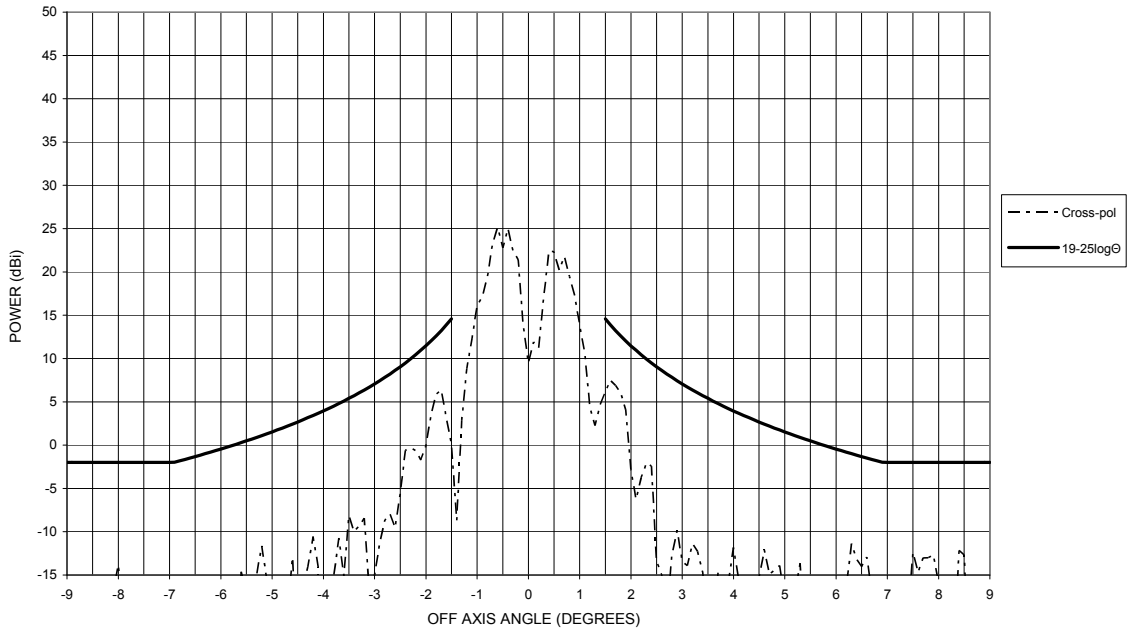


Figure 8 - Cross-pol LHCP +/-9° Azimuth Pattern - 29.75GHz



AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Cross-pol Pattern  
30 GHz LHCP

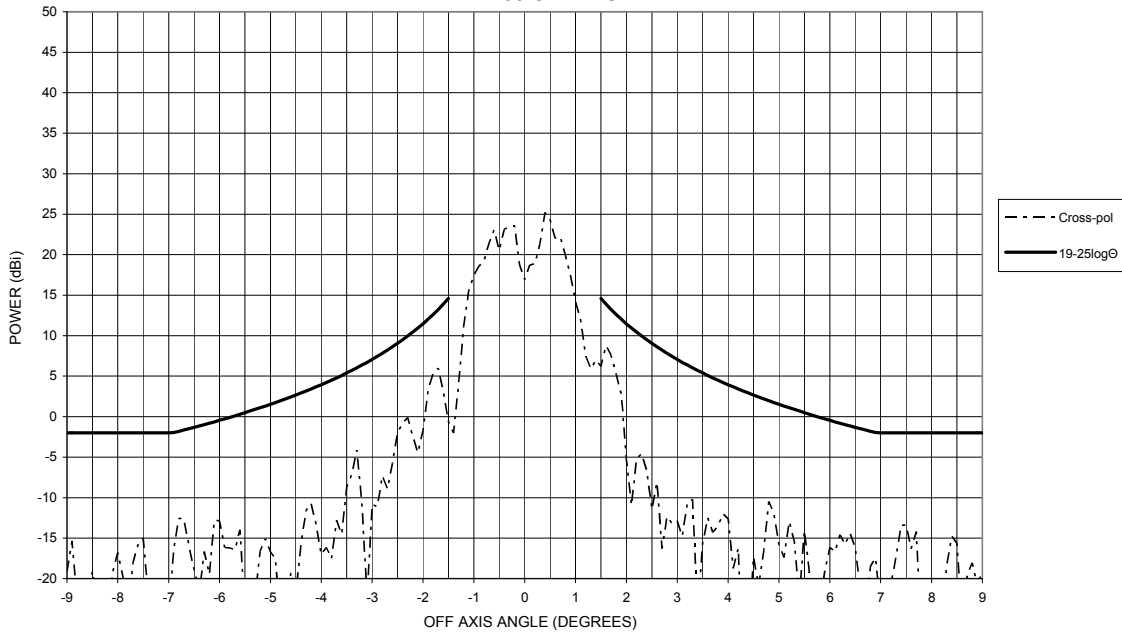


Figure 9 - Cross-pol LHCP +/-9° Azimuth Pattern - 30GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Cross-pol Pattern  
29.5 GHz RHCP

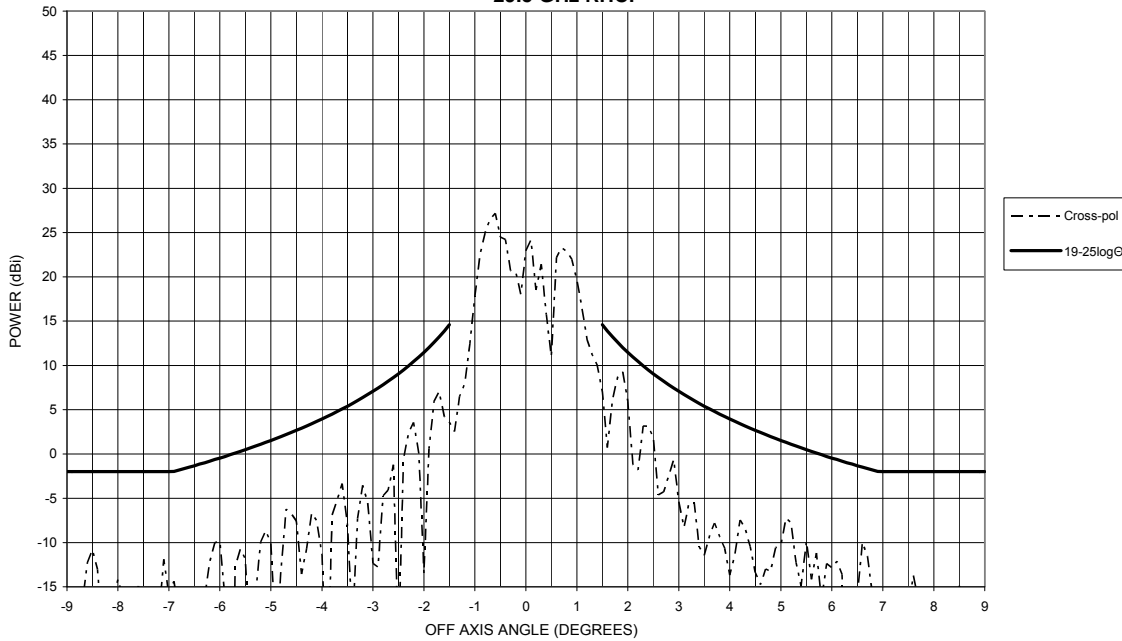


Figure 10 - Cross-pol RHCP +/-9° Azimuth Pattern - 29.5GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Cross-pol Pattern  
29.75 GHz RHCP

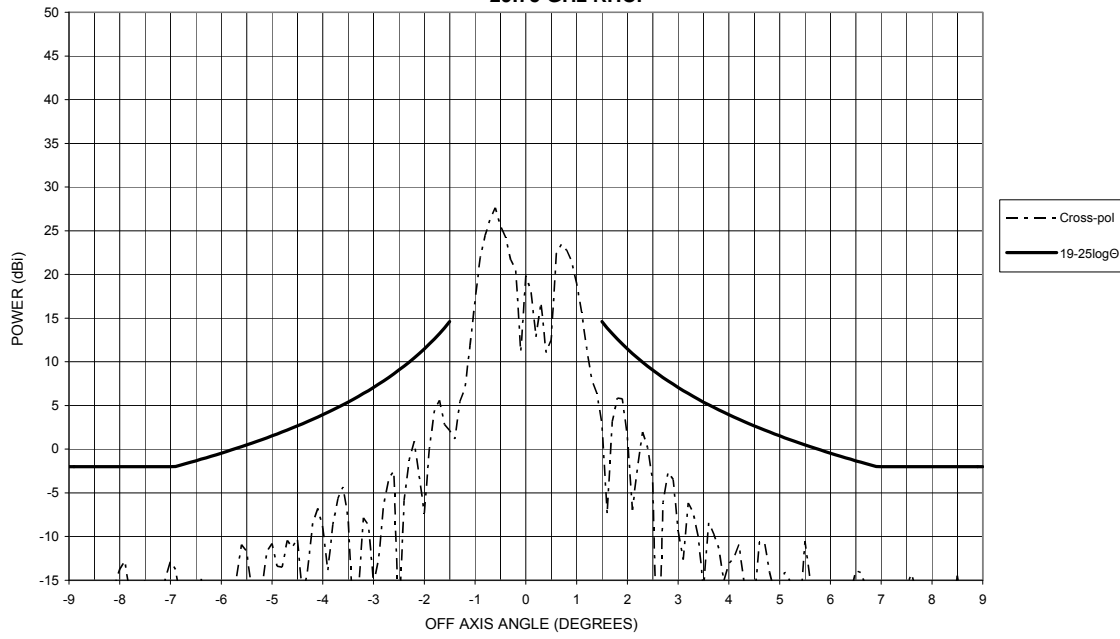


Figure 11 - Cross-pol RHCP +/-9° Azimuth Pattern - 29.75GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Cross-pol Pattern  
30 GHz RHCP

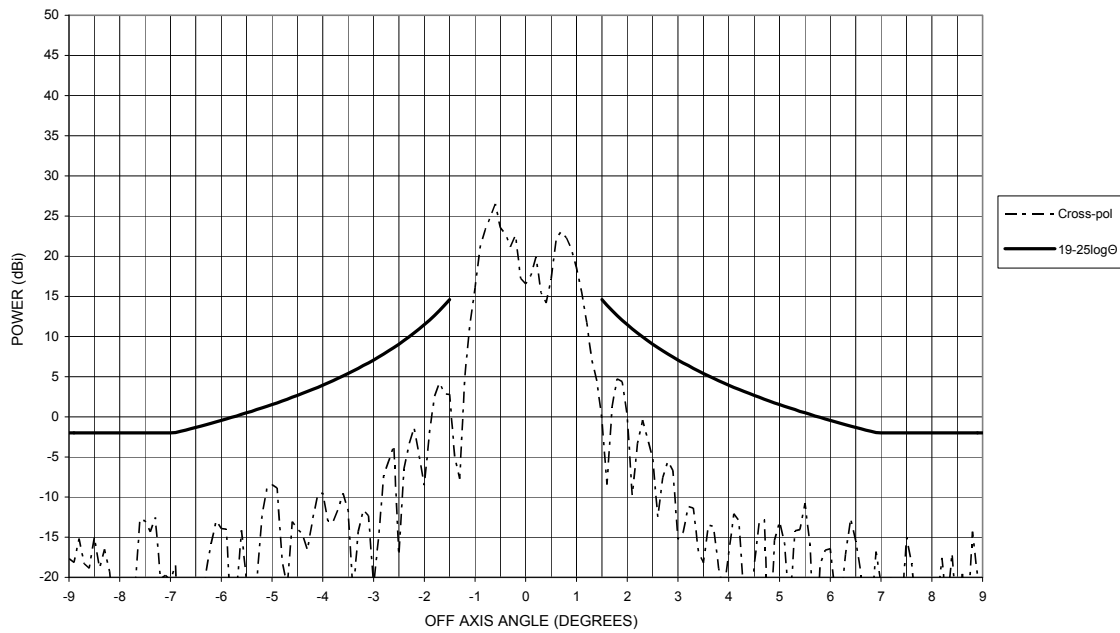


Figure 12 - Cross-pol RHCP +/-9° Azimuth Pattern - 30GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
29.5 GHz LHCP

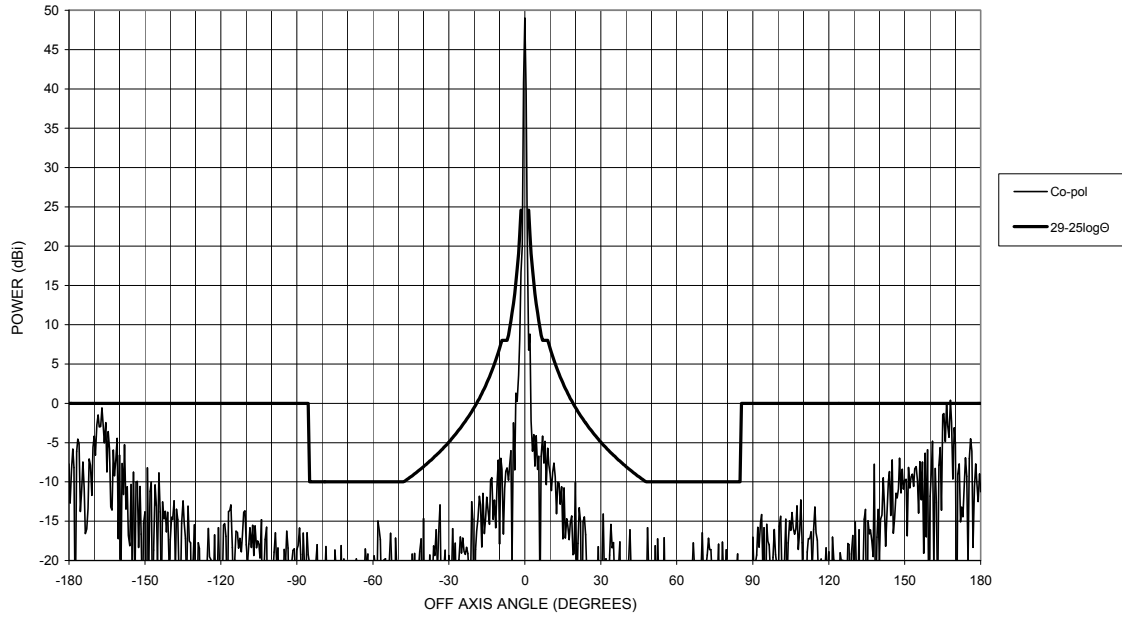


Figure 13 - Co-pol LHCP  $\pm 180^\circ$  Azimuth Pattern - 29.5GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
29.75 GHz LHCP

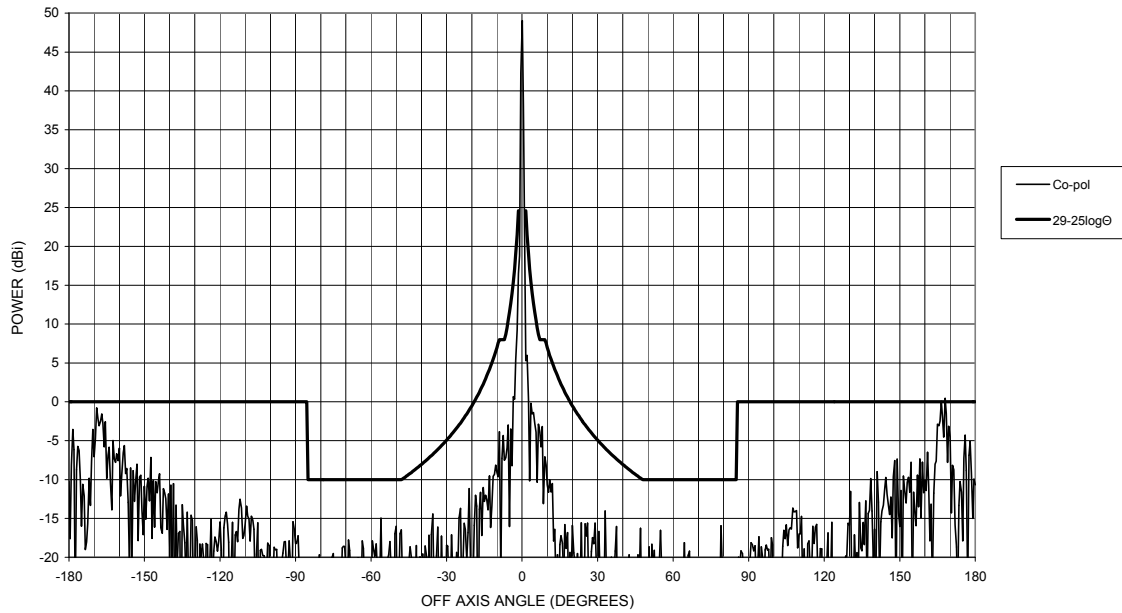


Figure 14 - Co-pol LHCP  $\pm 180^\circ$  Azimuth Pattern - 29.75GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
30 GHz LHCP

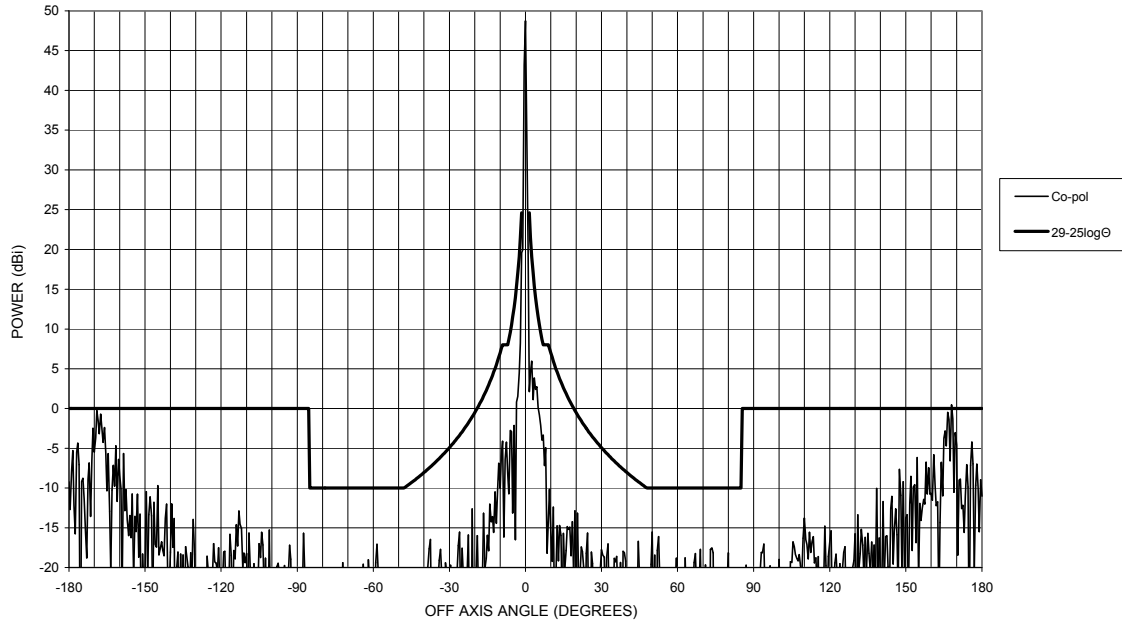


Figure 15 - Co-pol LHCP +/-180° Azimuth Pattern - 30GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
29.5 GHz RHCP

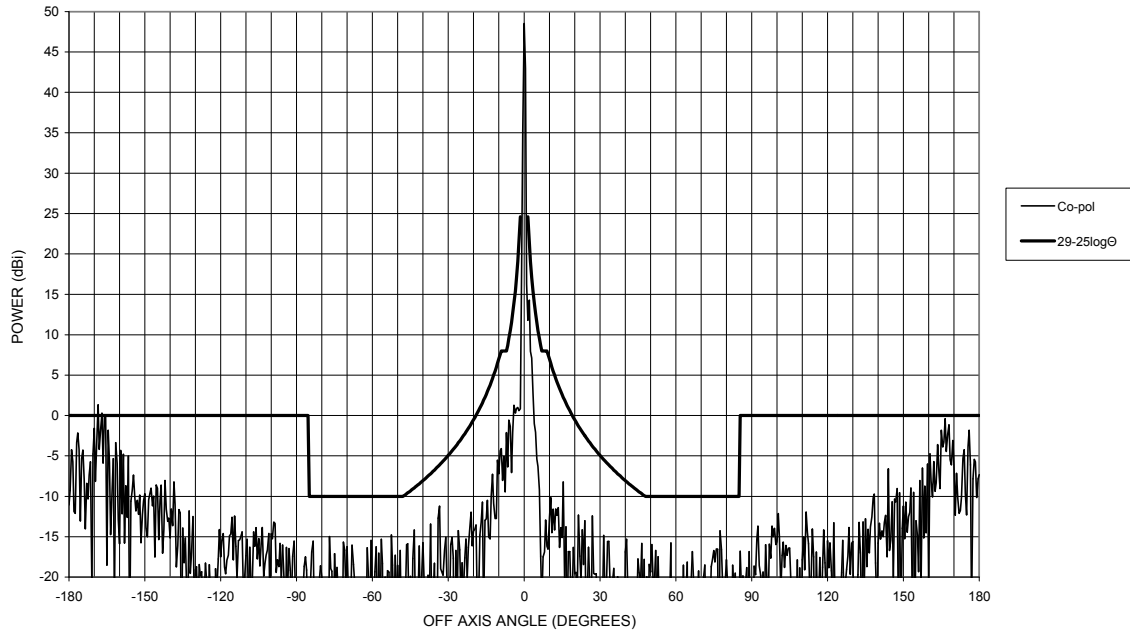


Figure 16 - Co-pol RHCP +/-180° Azimuth Pattern - 29.5GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
29.75 GHz RHCP

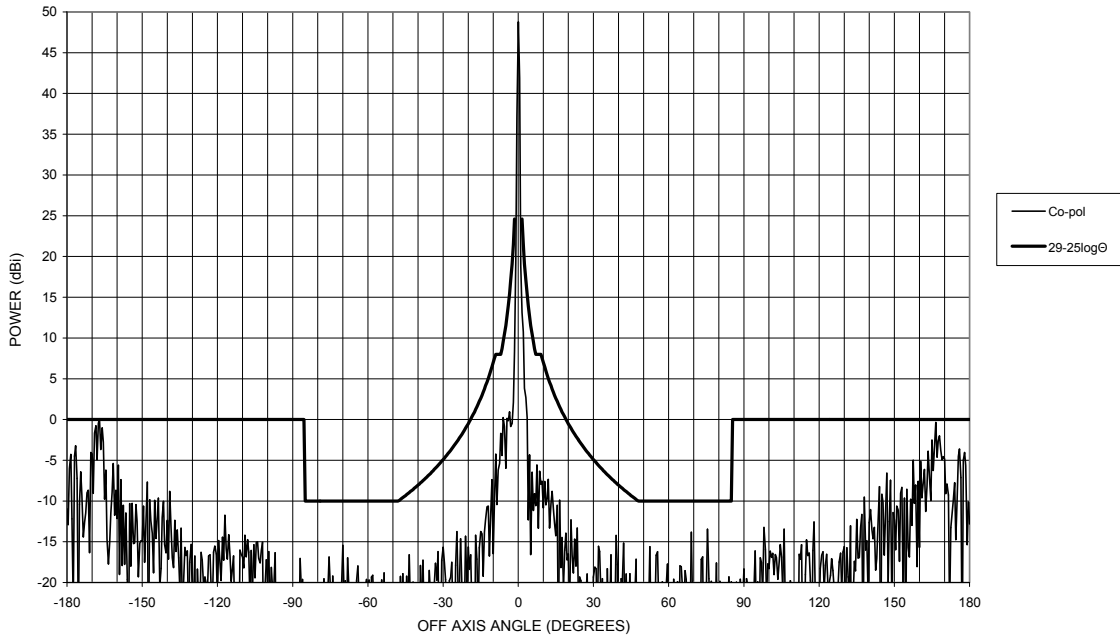


Figure 17 - Co-pol RHCP +/-180° Azimuth Pattern - 29.75GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Azimuth Co-pol Pattern  
30 GHz RHCP

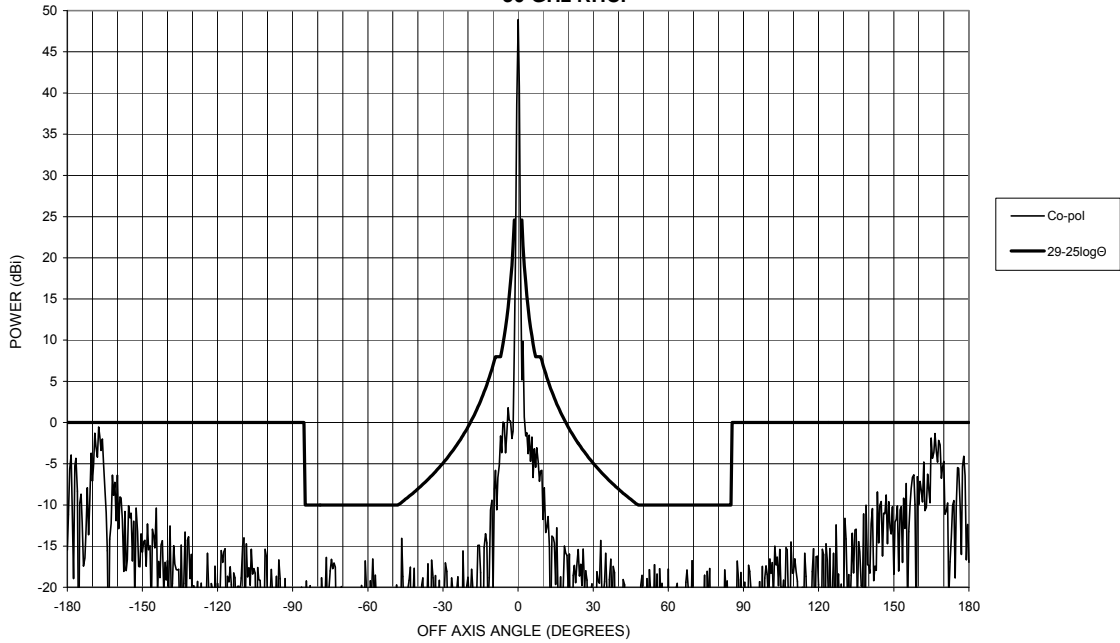


Figure 18 - Co-pol RHCP +/-180° Azimuth Pattern - 30GHz

# **AvL Technologies**

1.2m Ka Band Antenna  
Model 1210KVH

Transmit Band Elevation Patterns

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
29.5 GHz LHCP

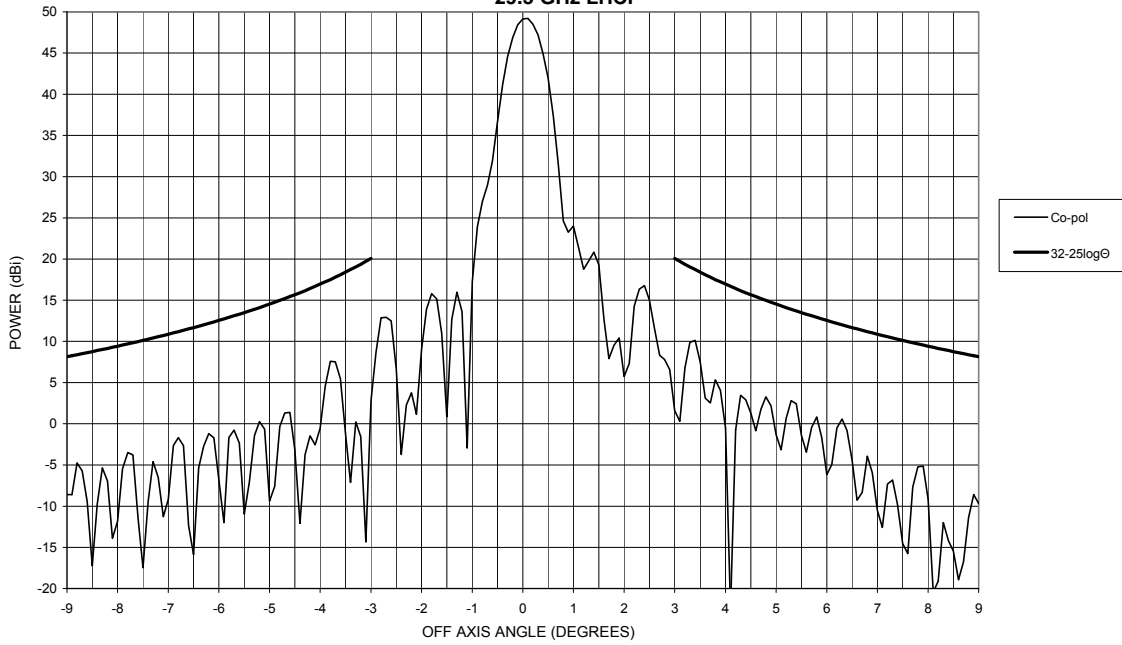


Figure 19 - Co-pol LHCP +/-9° Elevation Pattern - 29.5GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
29.75 GHz LHCP

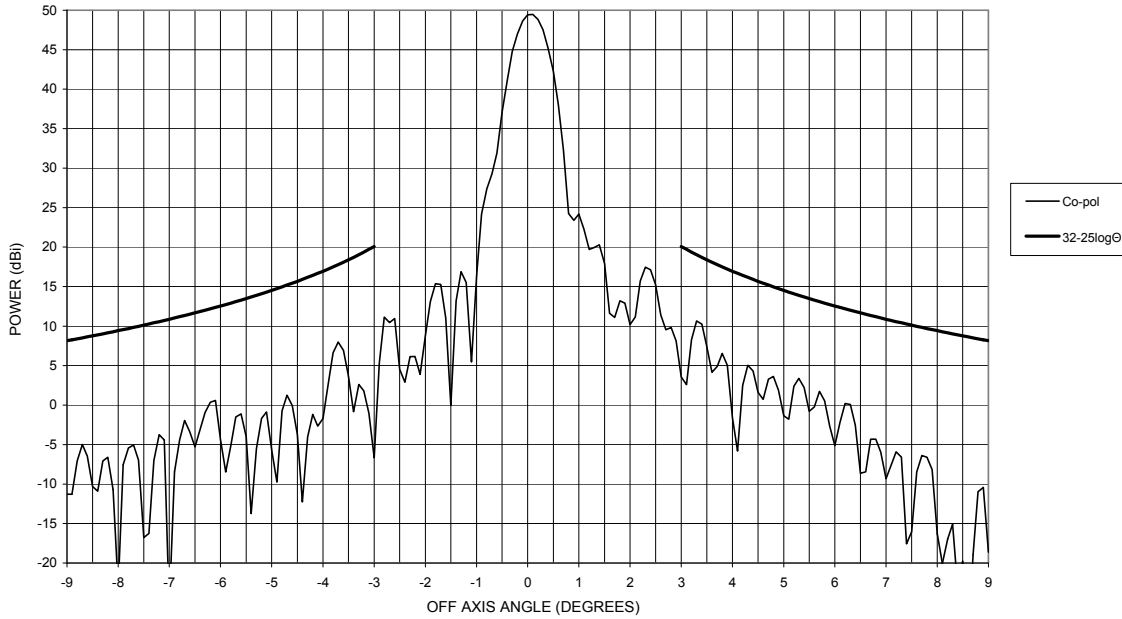


Figure 20 - Co-pol LHCP +/-9° Elevation Pattern - 29.75GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
30 GHz LHCP

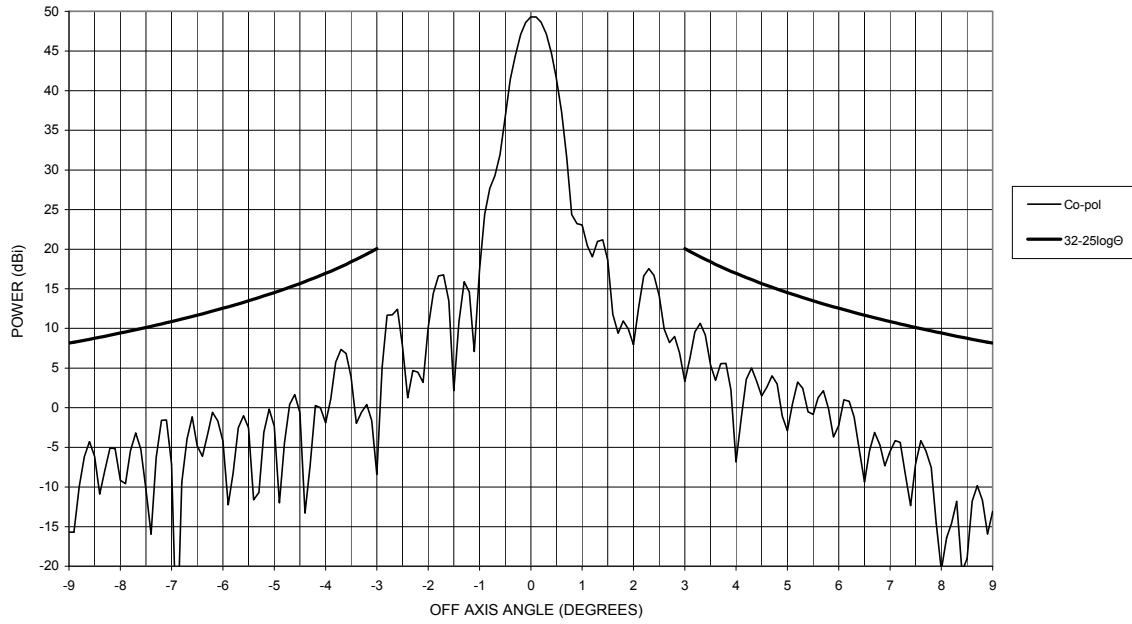


Figure 21 - Co-pol LHCP +/-9° Elevation Pattern - 30GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
29.5 GHz RHCP

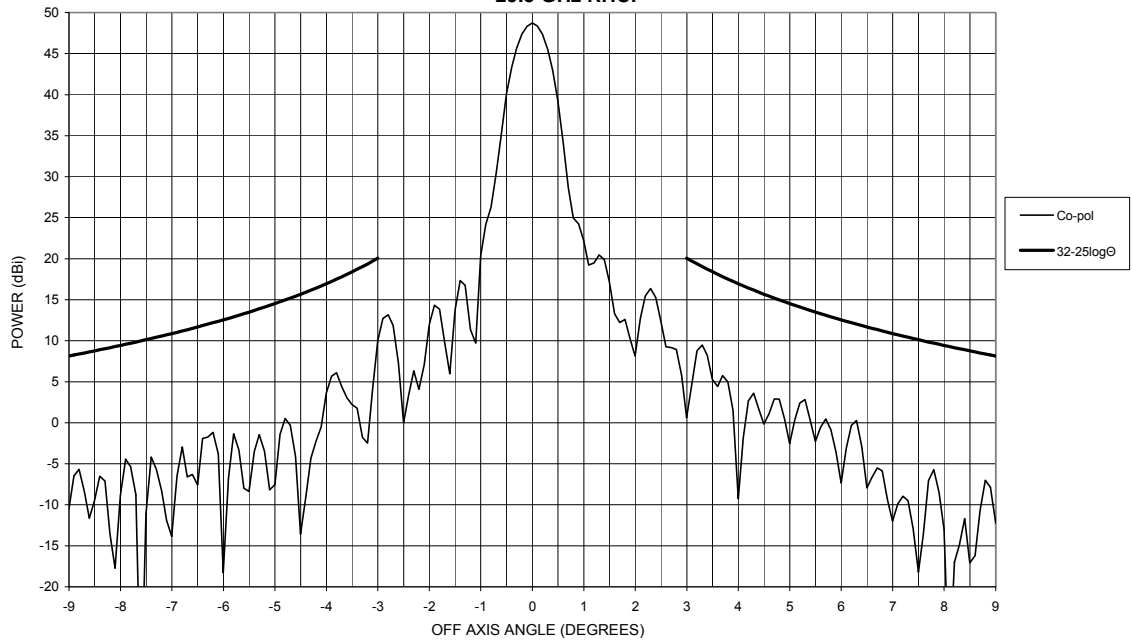


Figure 22 - Co-pol RHCP +/-9° Elevation Pattern - 29.5GHz



AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
29.75 GHz RHCP

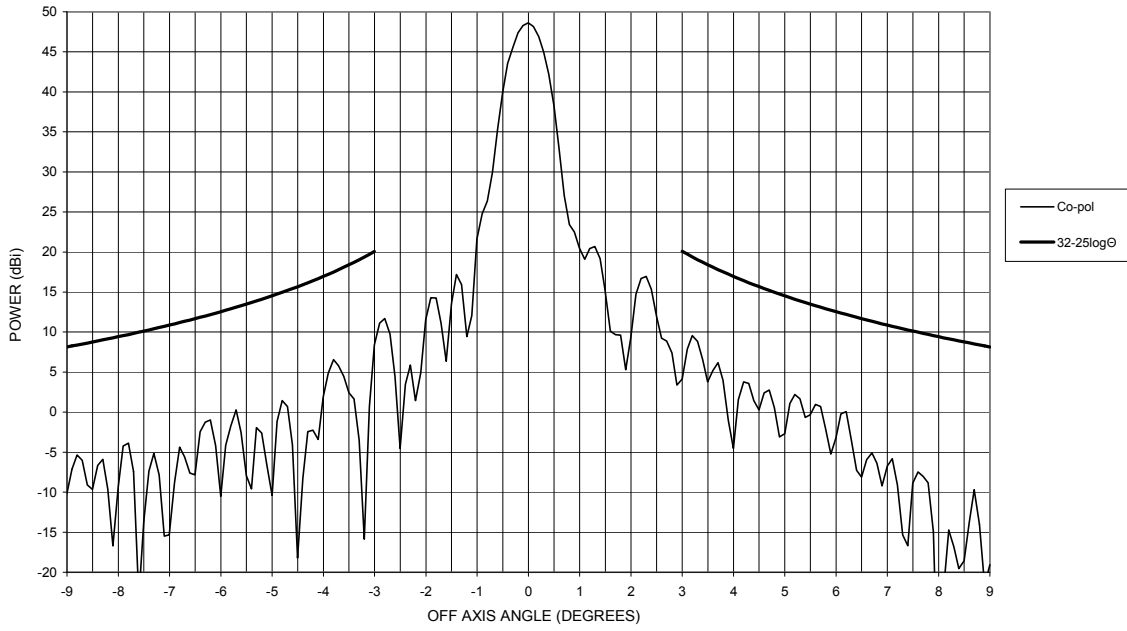


Figure 23 - Co-pol RHCP  $\pm 9^\circ$  Elevation Pattern - 29.75GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
30 GHz RHCP

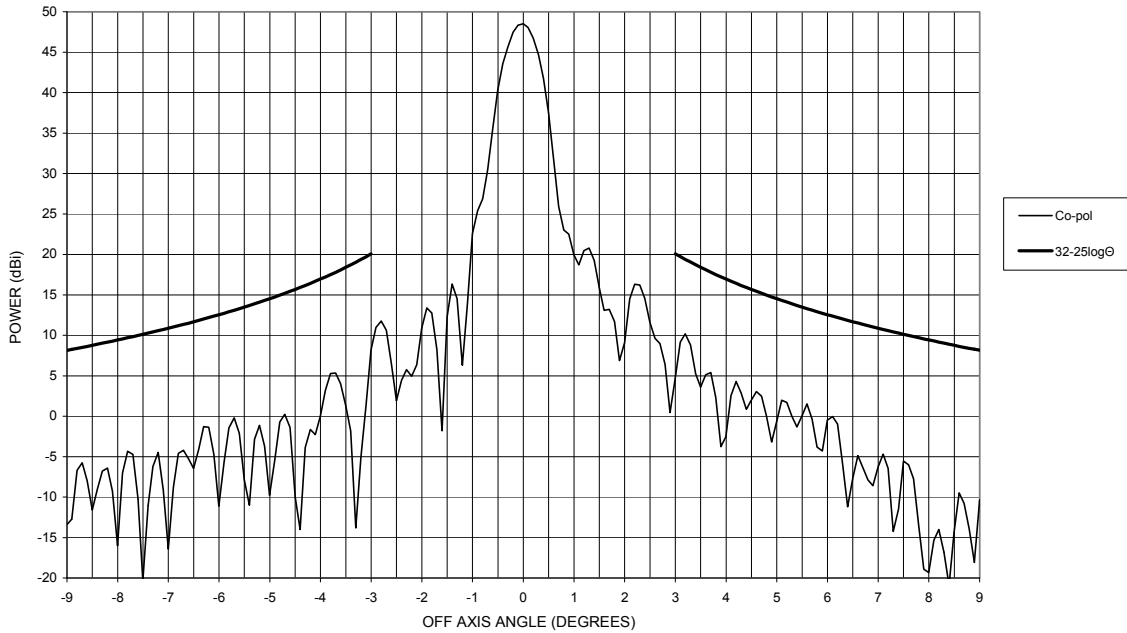


Figure 24 - Co-pol RHCP  $\pm 9^\circ$  Elevation Pattern - 30GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Cross-pol Pattern  
29.5 GHz LHCP

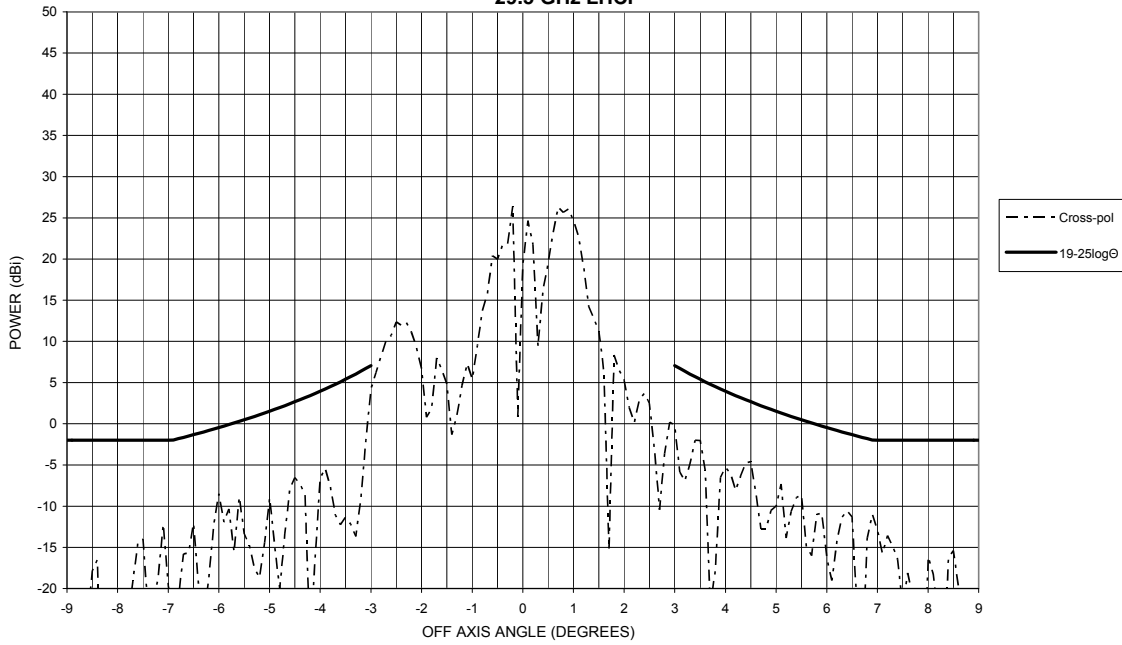


Figure 25 - Cross-pol LHCP +/-9° Elevation Pattern - 29.5GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Cross-pol Pattern  
29.75 GHz LHCP

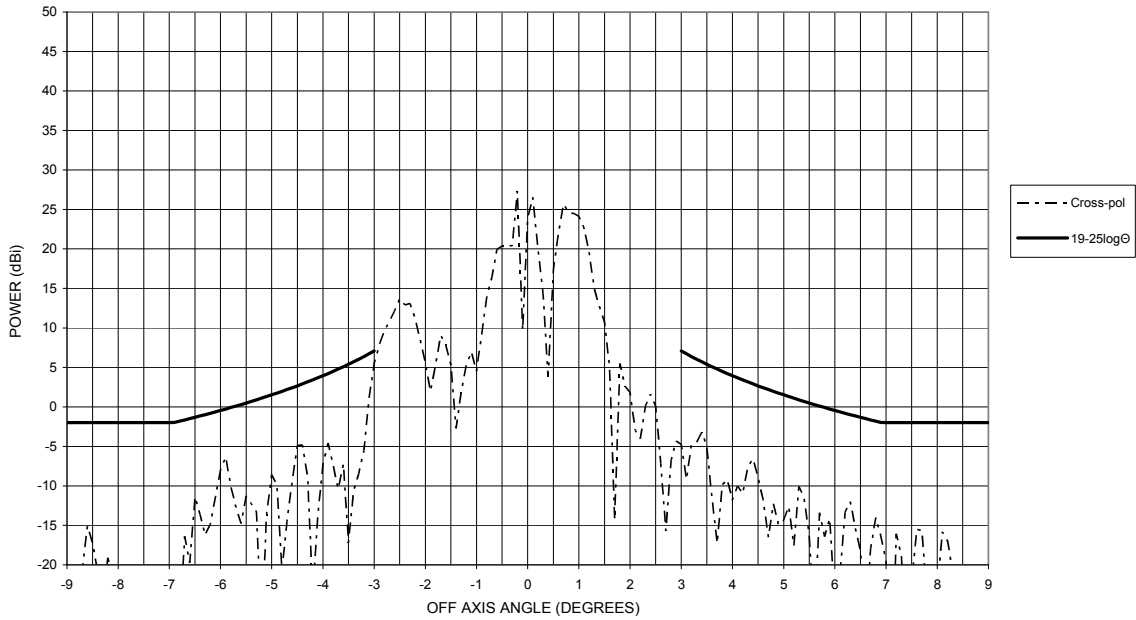


Figure 26 - Cross-pol LHCP +/-9° Elevation Pattern - 29.75GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Cross-pol Pattern  
30 GHz LHCP

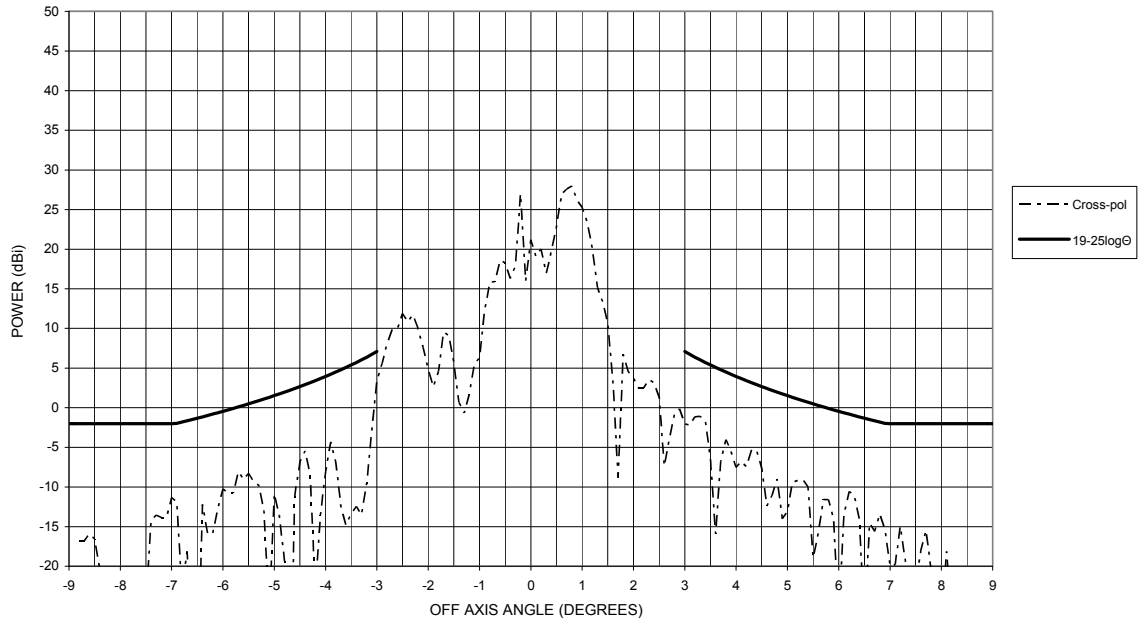


Figure 27 - Cross-pol LHCP +/-9° Elevation Pattern - 30GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Cross-pol Pattern  
29.5 GHz RHCP

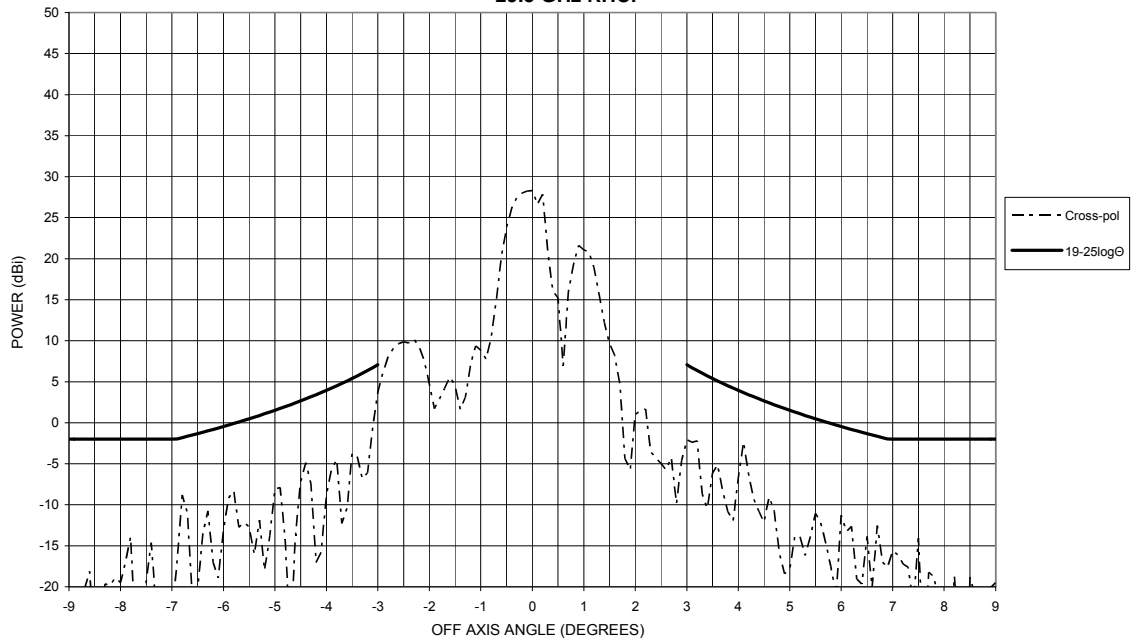


Figure 28 - Cross-pol RHCP +/-9° Elevation Pattern - 29.5GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Cross-pol Pattern  
29.75 GHz RHCP

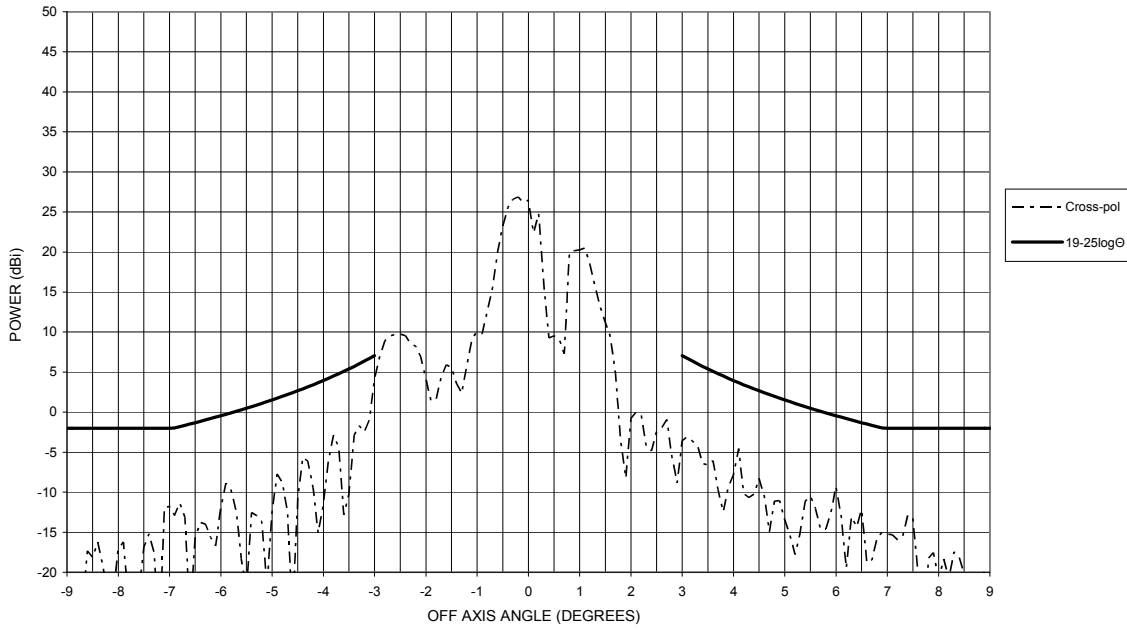


Figure 29 - Cross-pol RHCP +/-9° Elevation Pattern - 29.75GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Cross-pol Pattern  
30 GHz RHCP

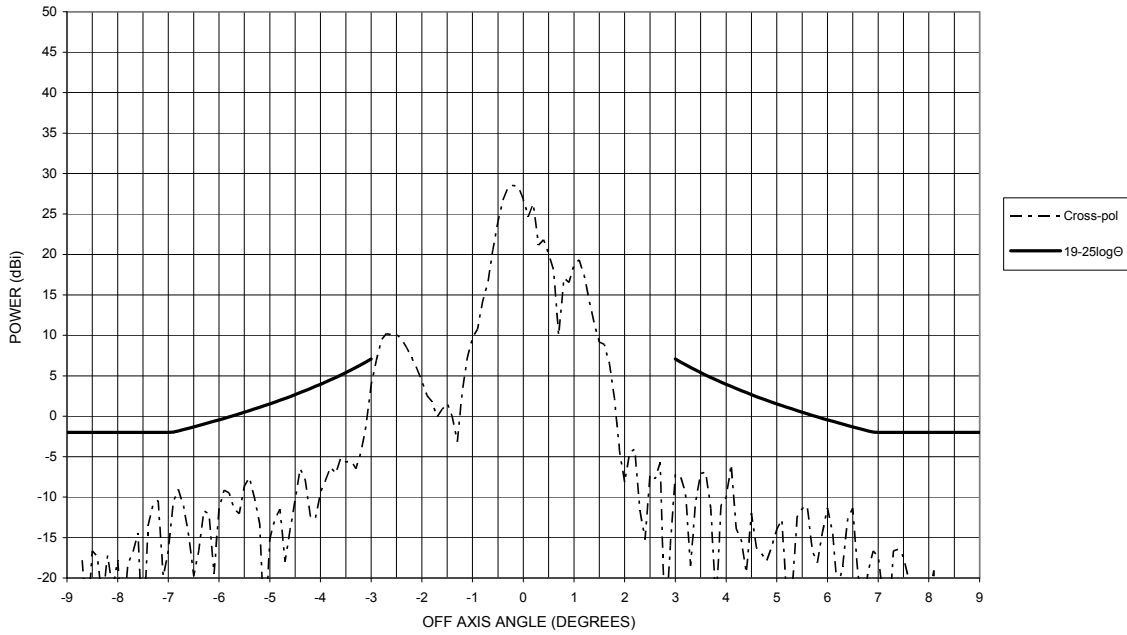


Figure 30 - Cross-pol RHCP +/-9° Elevation Pattern - 30GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
29.5 GHz LHCP

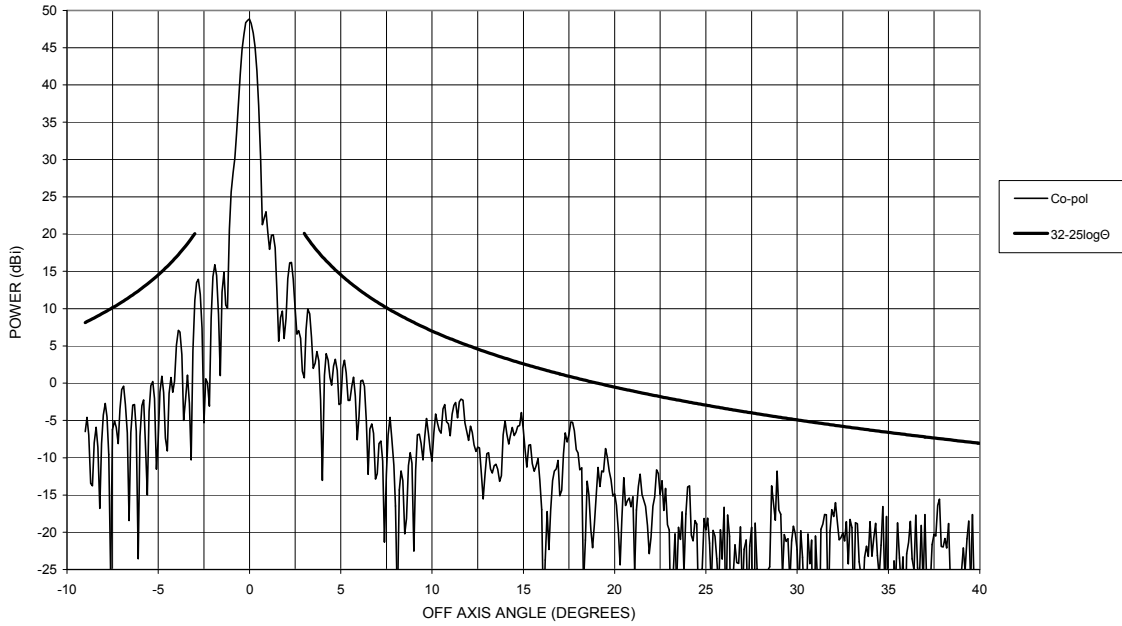


Figure 31 - Co-pol LHCP -9° - +40° Elevation Pattern - 29.5GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
29.75 GHz LHCP

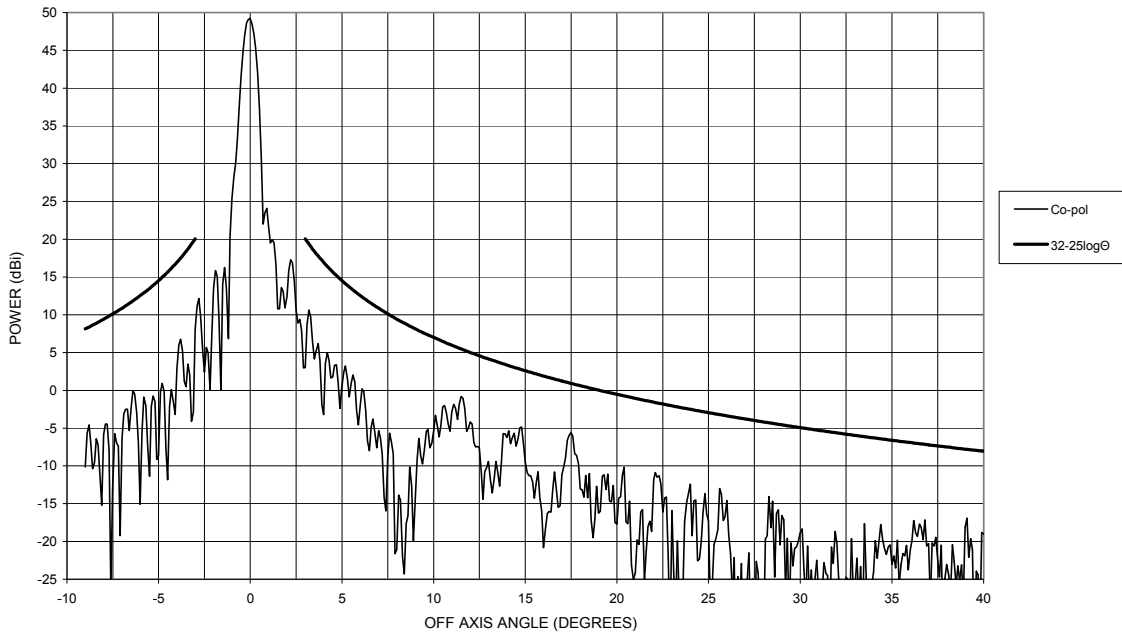


Figure 32 - Co-pol LHCP -9° - +40° Elevation Pattern - 29.75GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
30 GHz LHCP

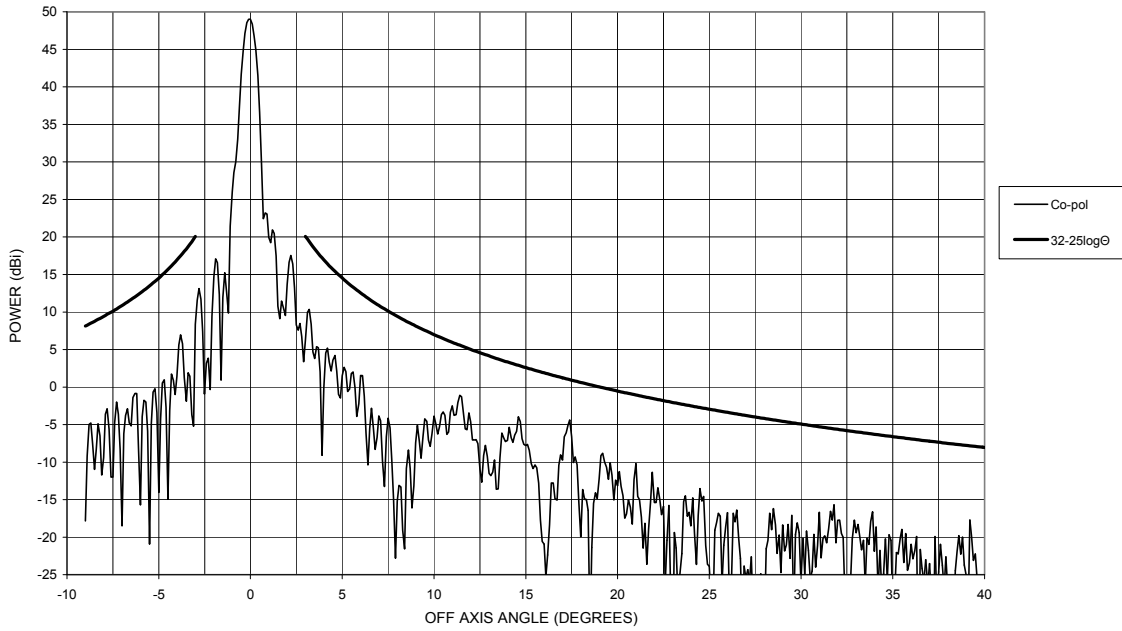


Figure 33 - Co-pol LHCP -9° - +40° Elevation Pattern - 30GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
29.5 GHz RHCP

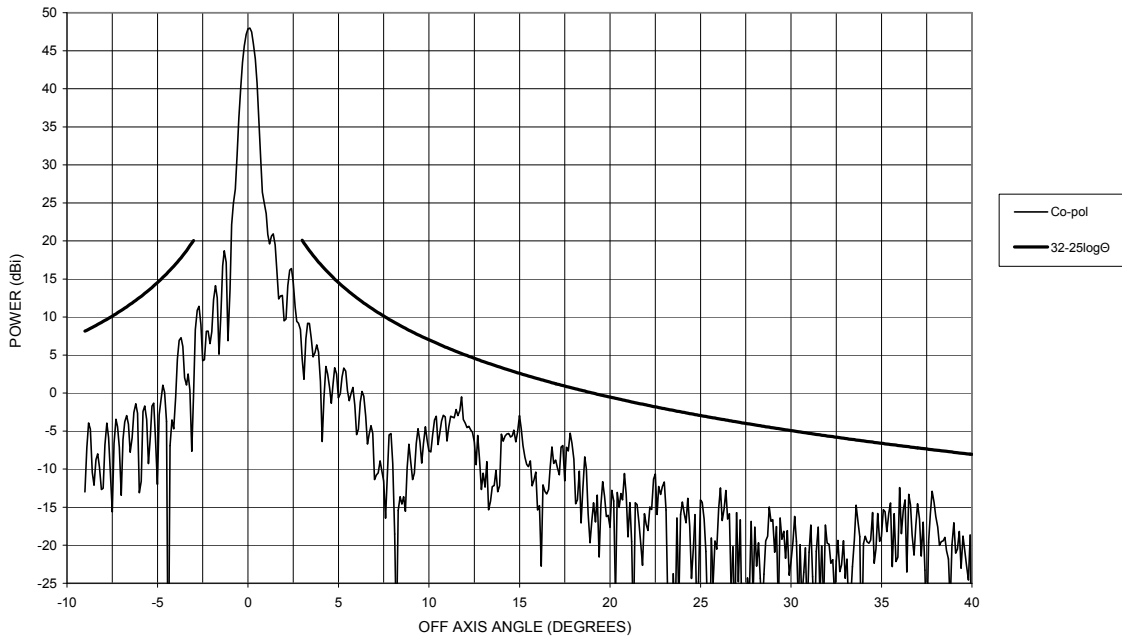


Figure 34 - Co-pol RHCP -9° - +40° Elevation Pattern - 29.5GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
29.75 GHz RHCP

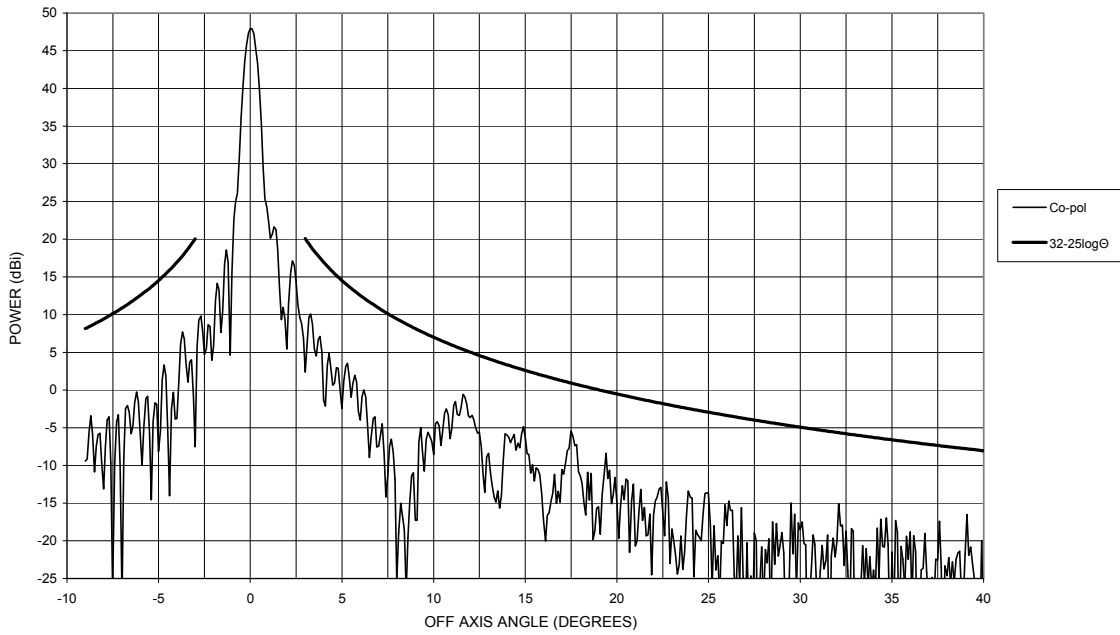


Figure 35 - Co-pol RHCP -9° - +40° Elevation Pattern - 29.75GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Transmit Band Elevation Co-pol Pattern  
30 GHz RHCP

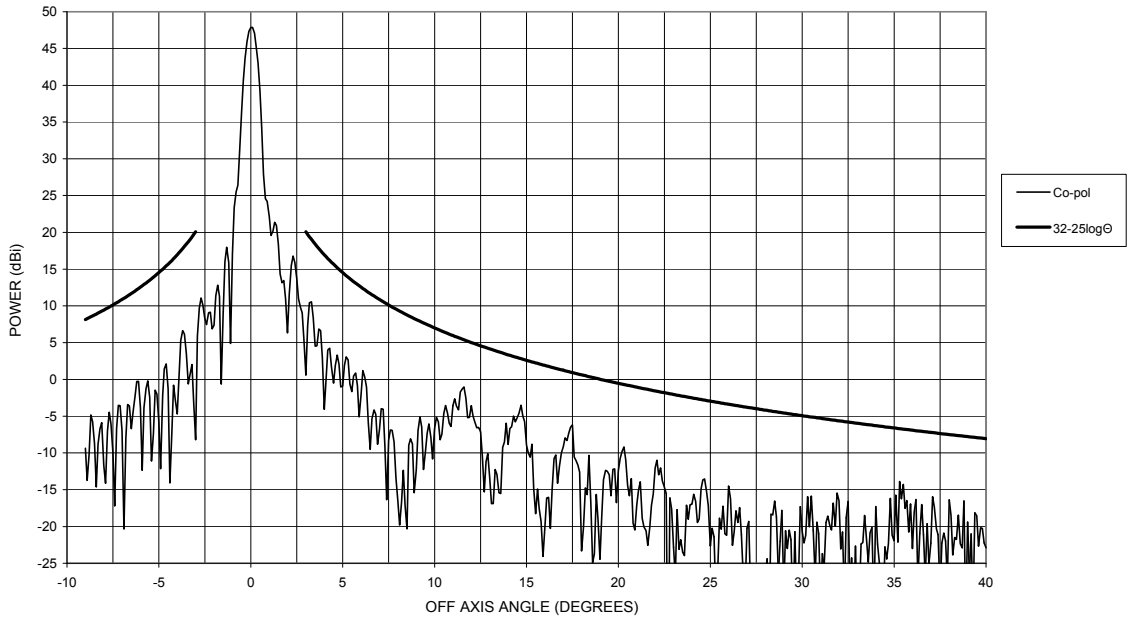


Figure 36 - Co-pol RHCP -9° - +40° Elevation Pattern - 30GHz

# **AvL Technologies**

1.2m Ka Band Antenna  
Model 1210KVH

Receive Band Azimuth Patterns



AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
19.7 GHz LHCP

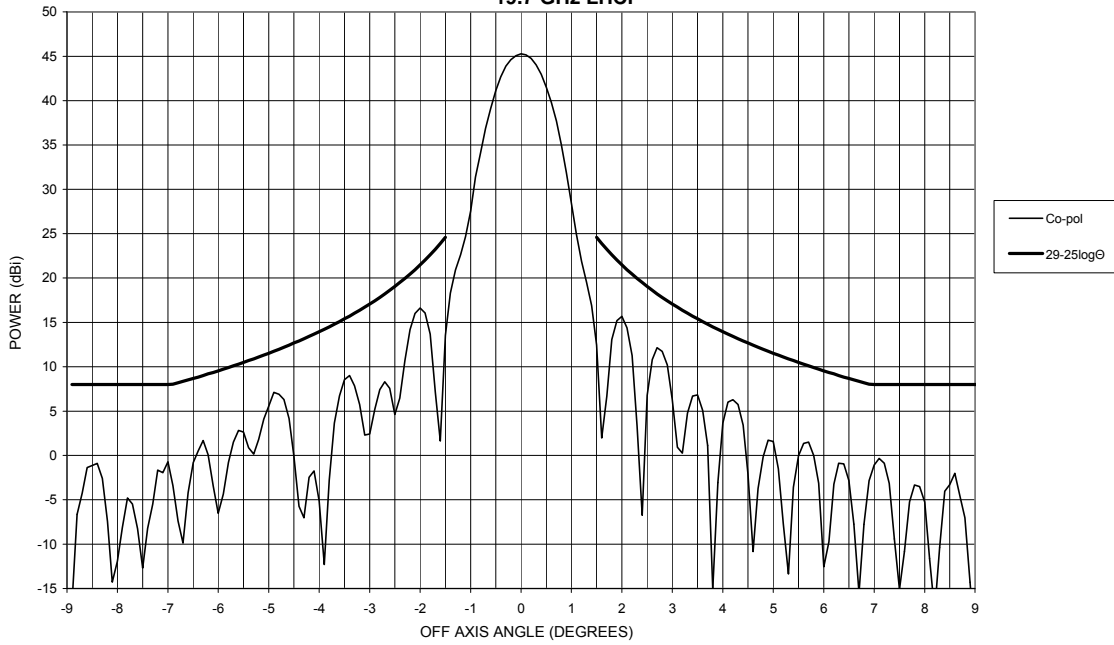


Figure 37 - Co-pol LHCP +/-9° Azimuth Pattern - 19.7GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
19.95 GHz LHCP

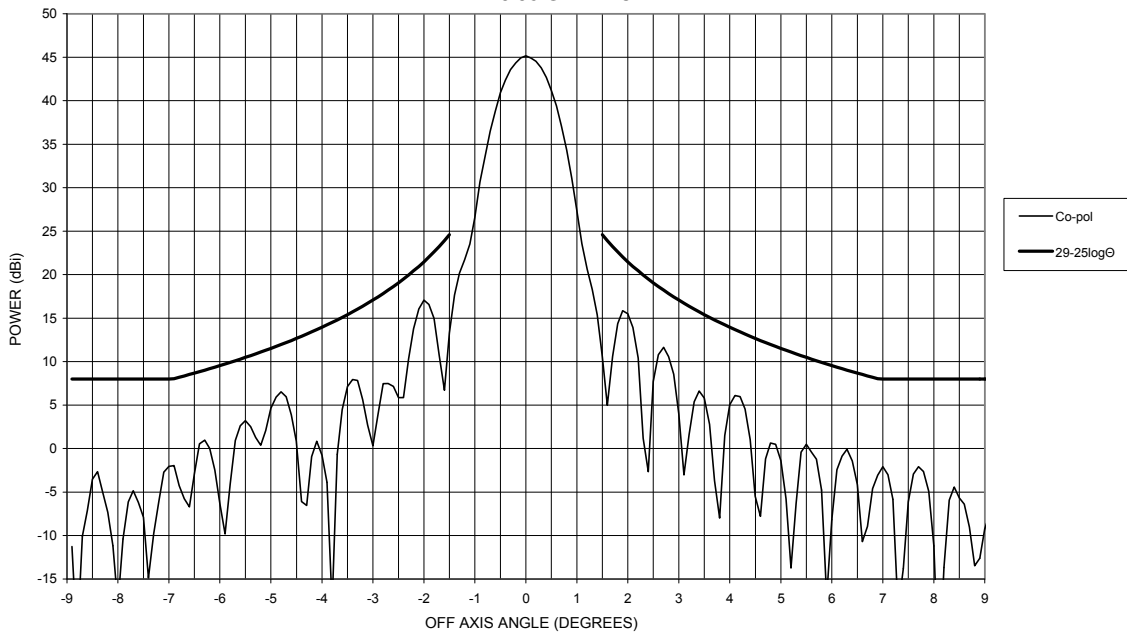


Figure 38 - Co-pol LHCP +/-9° Azimuth Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
20.2 GHz LHCP

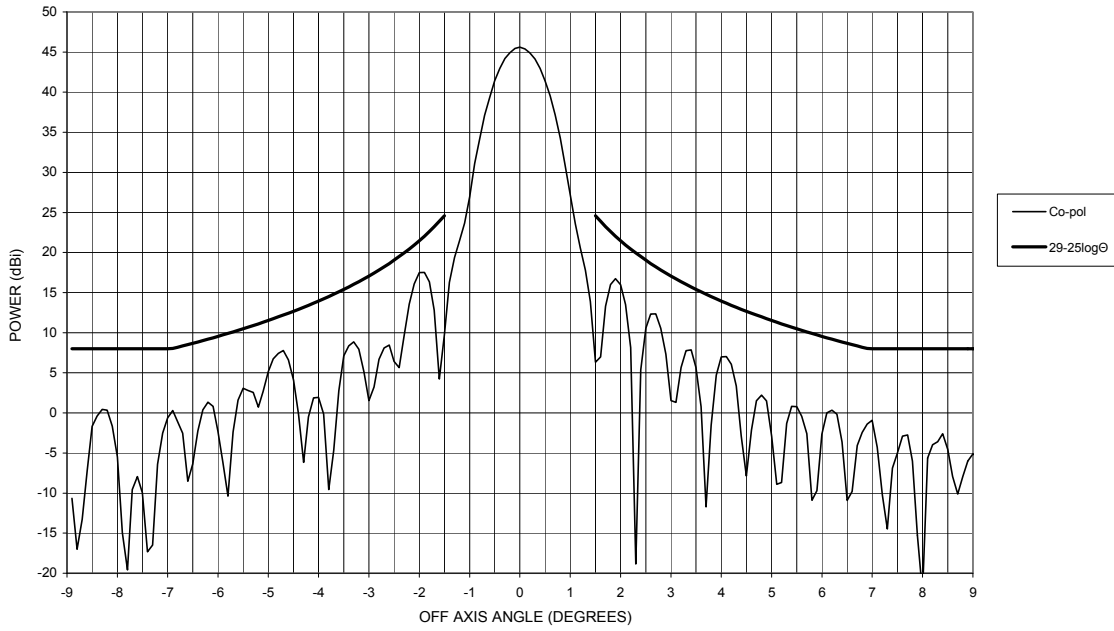


Figure 39 - Co-pol LHCP +/-9° Azimuth Pattern - 20.2GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
19.7 GHz RHCP

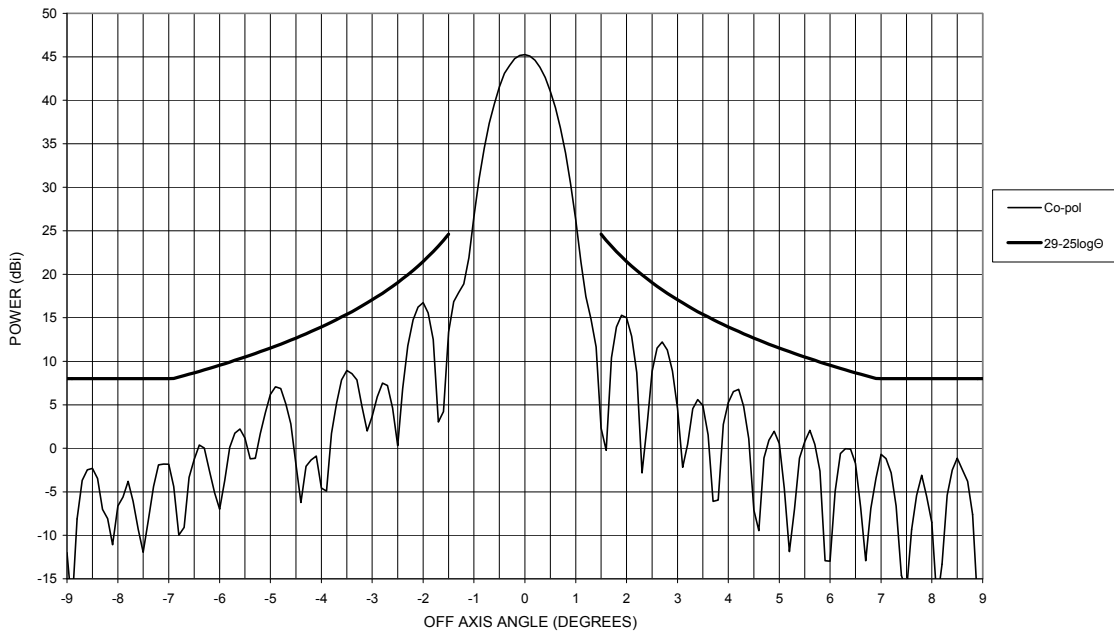


Figure 40 - Co-pol RHCP +/-9° Azimuth Pattern - 19.7GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
19.95 GHz RHCP

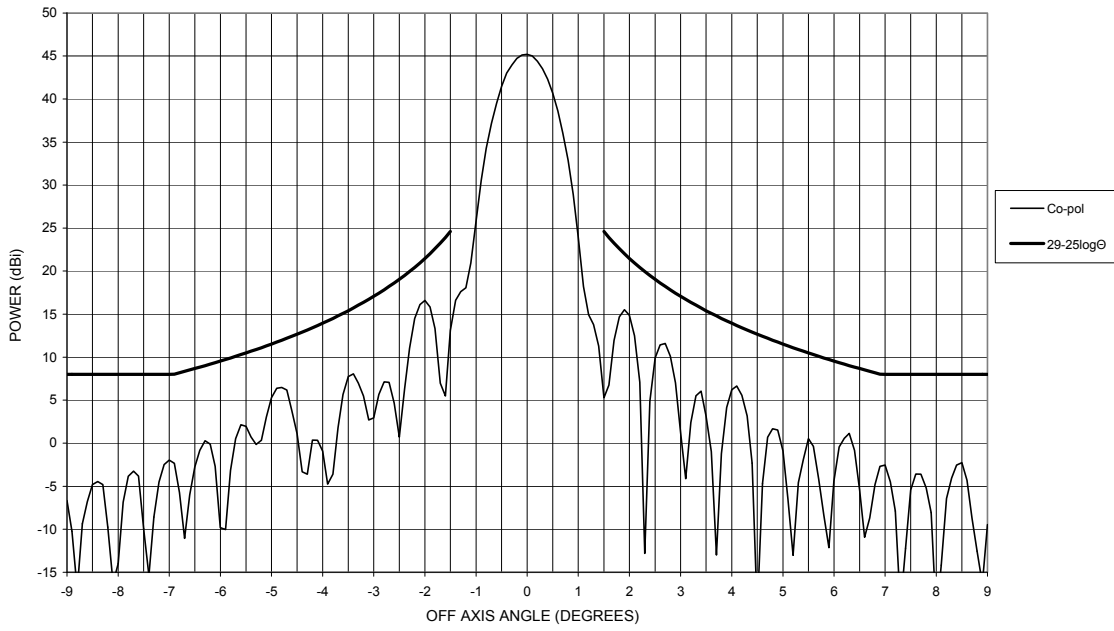


Figure 41 - Co-pol RHCP  $\pm 9^\circ$  Azimuth Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
20.2 GHz RHCP

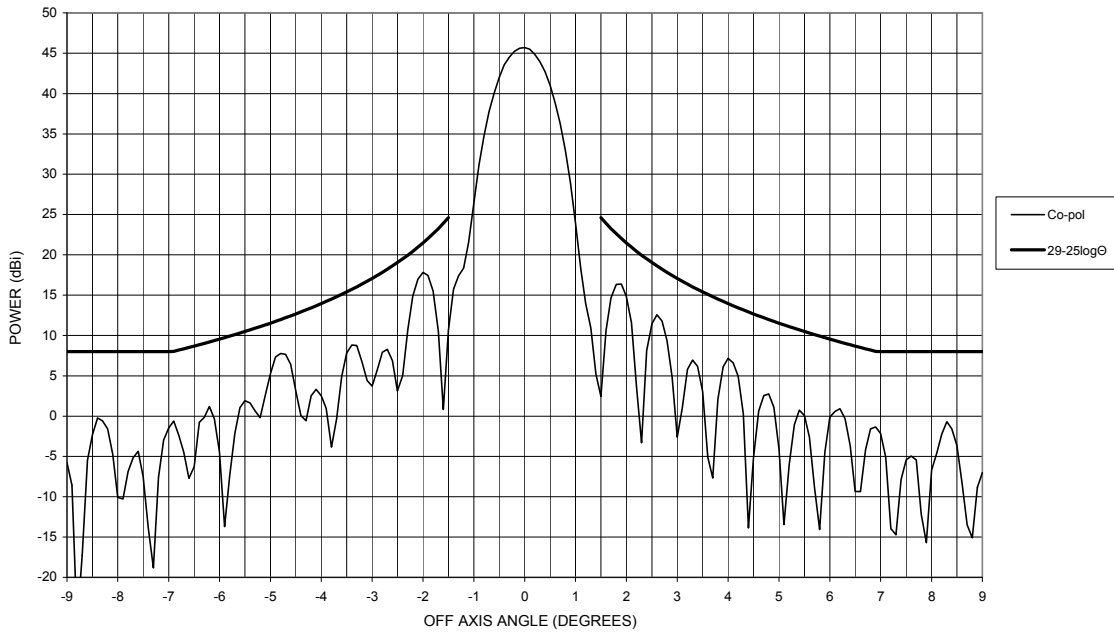


Figure 42 - Co-pol RHCP  $\pm 9^\circ$  Azimuth Pattern - 20.2GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Cross-pol Pattern  
19.7 GHz LHCP

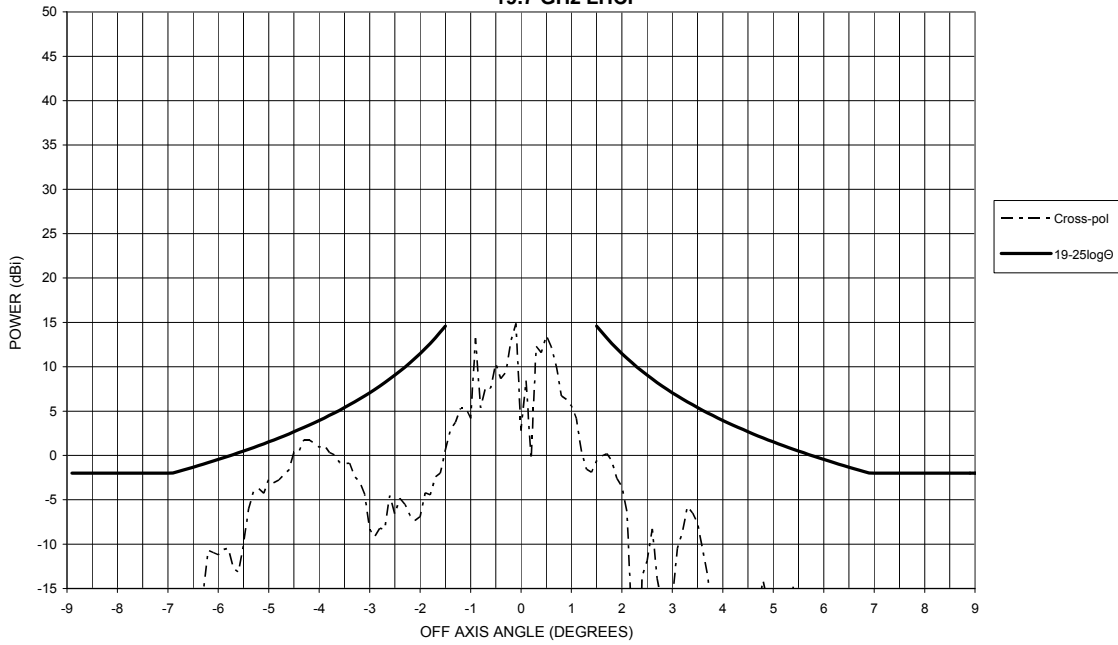


Figure 43 - Cross-pol LHCP +/-9° Azimuth Pattern - 19.7GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Cross-pol Pattern  
19.95 GHz LHCP

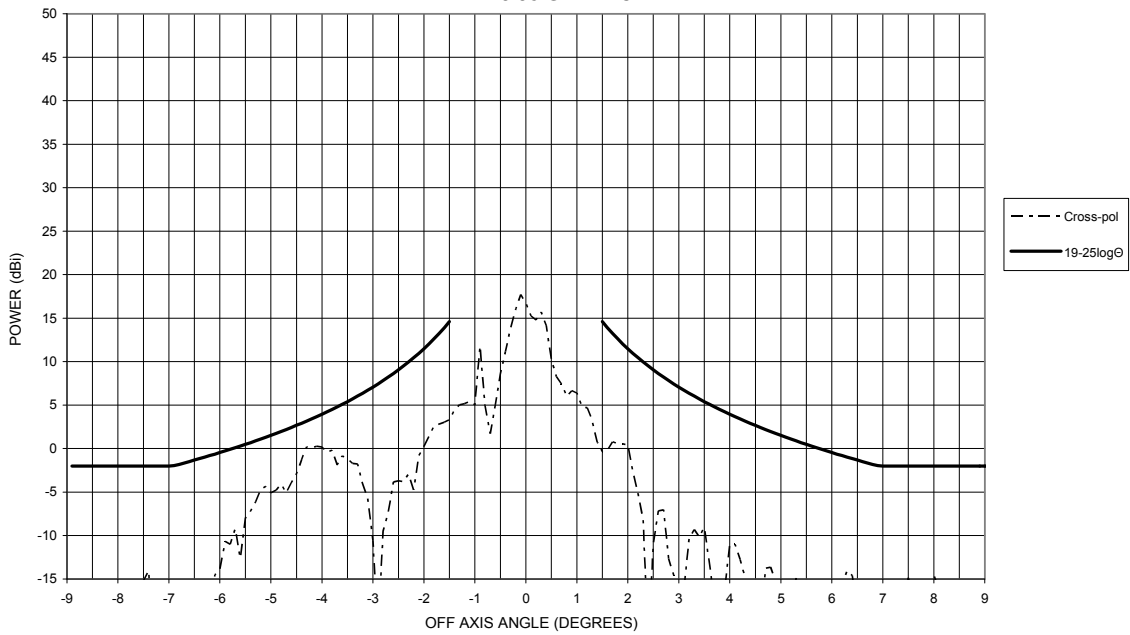


Figure 44 - Cross-pol LHCP +/-9° Azimuth Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Cross-pol Pattern  
20.2 GHz LHCP

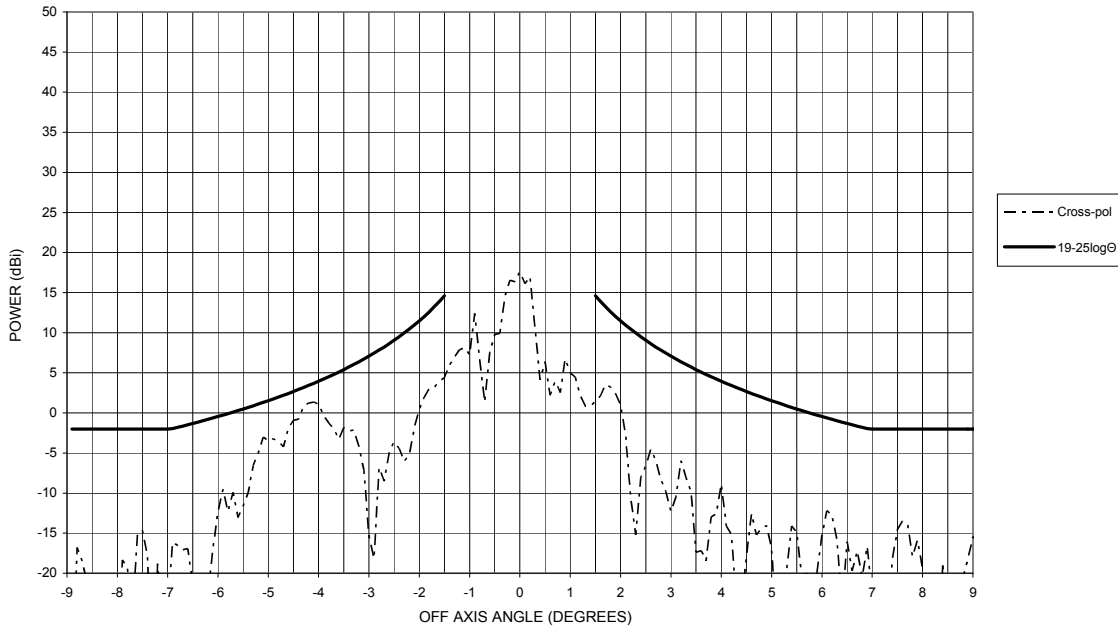


Figure 45 - Cross-pol LHCP  $\pm 9^\circ$  Azimuth Pattern - 20.2GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Cross-pol Pattern  
19.7 GHz RHCP

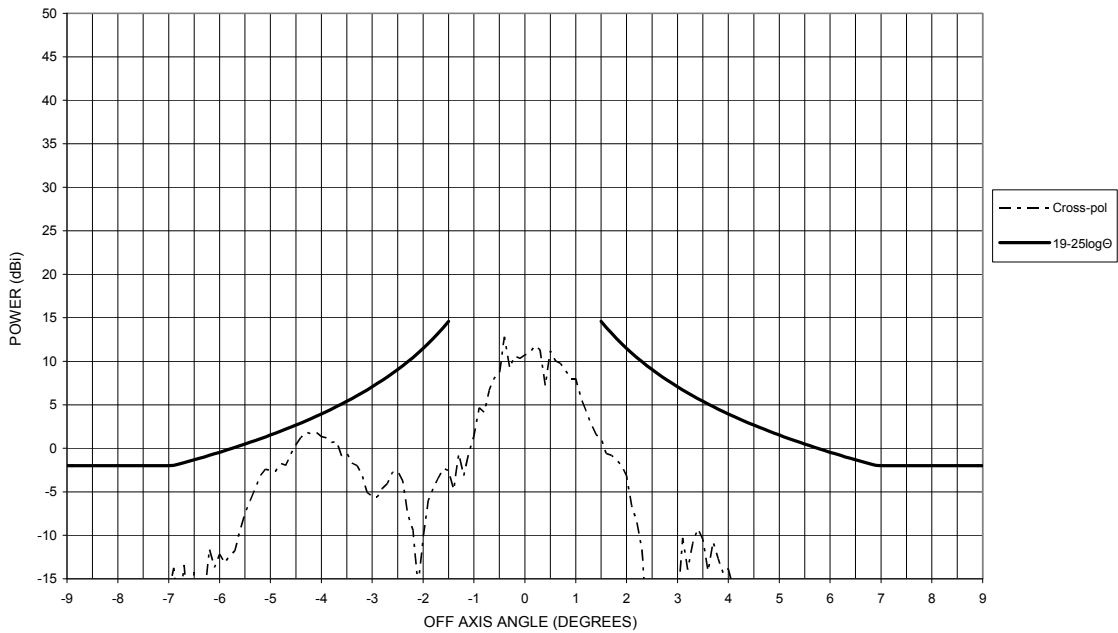


Figure 46 - Cross-pol RHCP  $\pm 9^\circ$  Azimuth Pattern - 19.7GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Cross-pol Pattern  
19.95 GHz RHCP

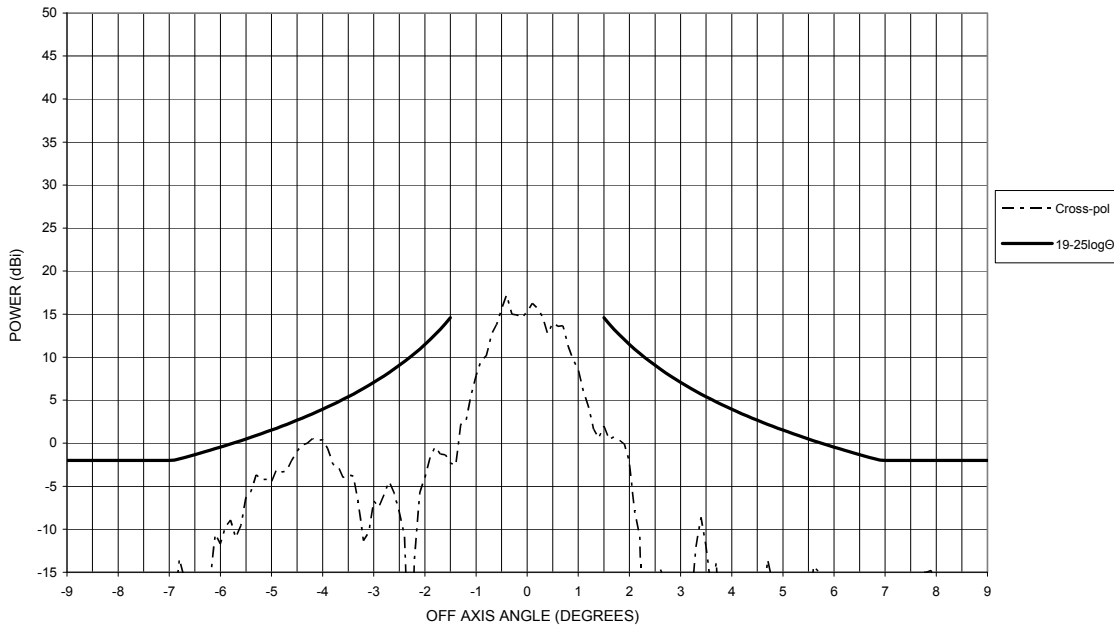


Figure 47 - Cross-pol RHCP +/-9° Azimuth Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Cross-pol Pattern  
20.2 GHz RHCP

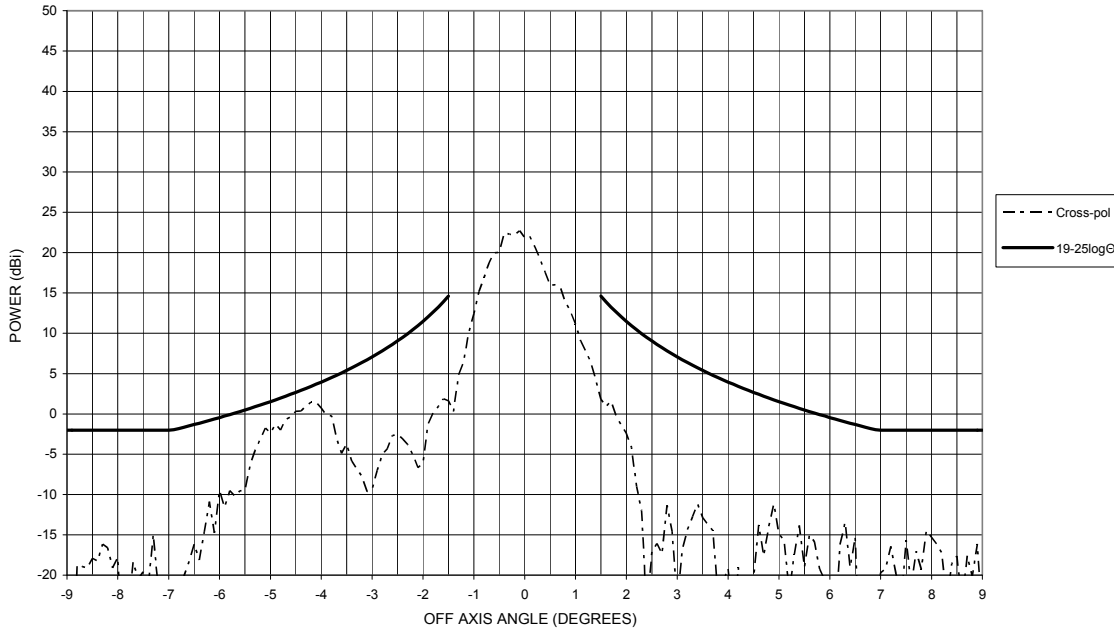


Figure 48 - Cross-pol RHCP +/-9° Azimuth Pattern - 20.2GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
19.7 GHz LHCP

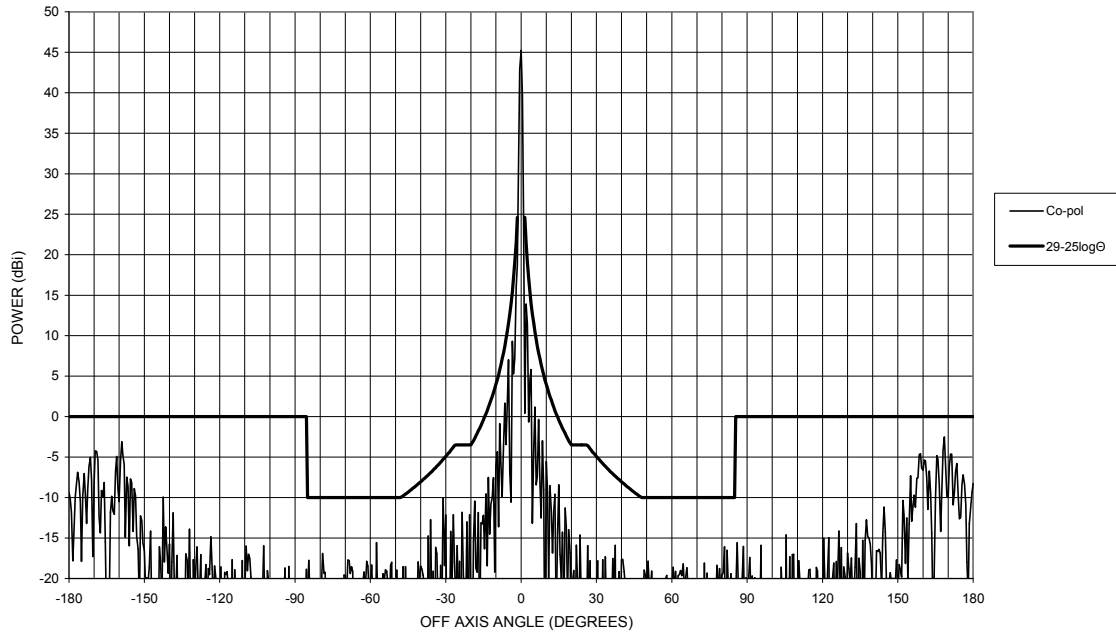


Figure 49 - Co-pol LHCP +/-180° Azimuth Pattern - 19.7GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
19.95 GHz LHCP

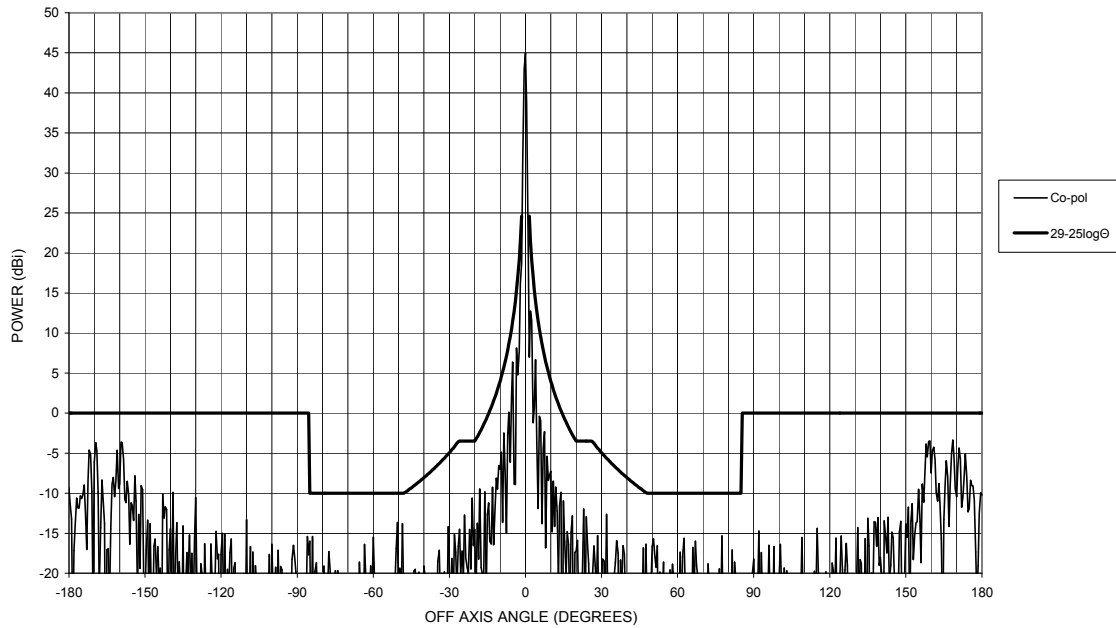


Figure 50 - Co-pol LHCP +/-180° Azimuth Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
20.2 GHz LHCP

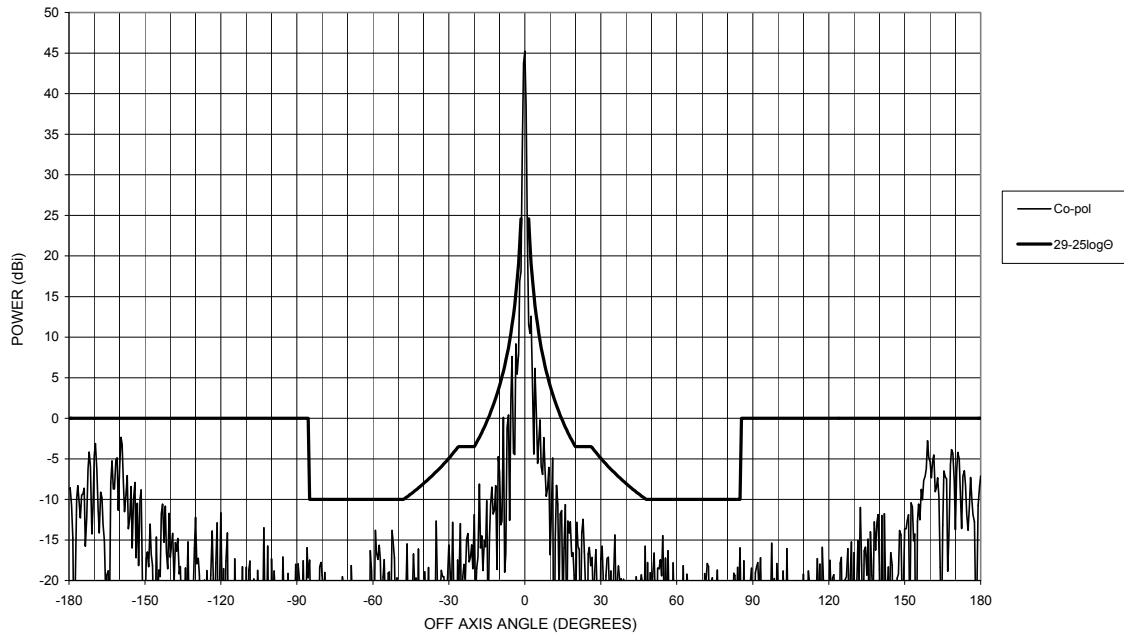


Figure 51 - Co-pol LHCP +/-180° Azimuth Pattern - 20.2GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
19.7 GHz RHCP

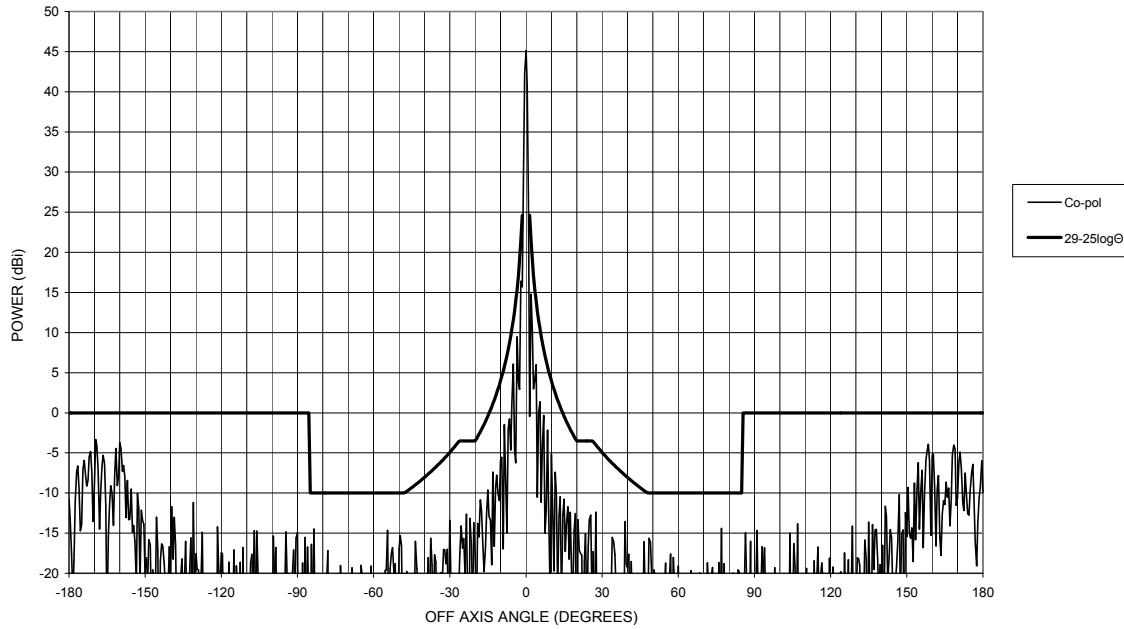


Figure 52 - Co-pol RHCP +/-180° Azimuth Pattern - 19.7GHz



AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
19.95 GHz RHCP

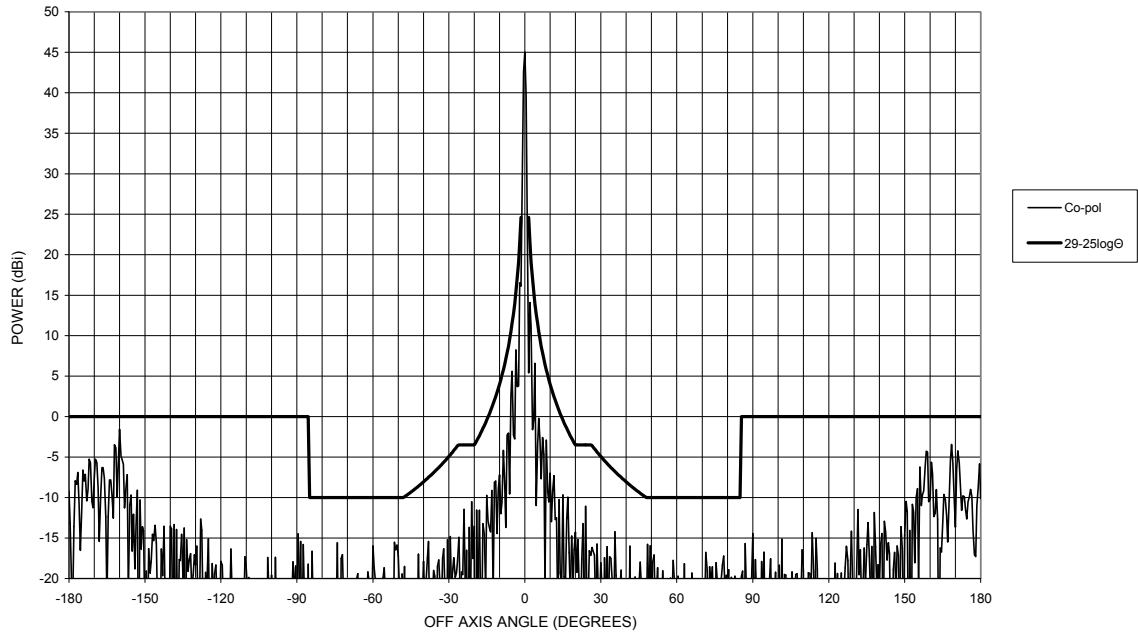


Figure 53 - Co-pol RHCP +/-180° Azimuth Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Azimuth Co-pol Pattern  
20.2 GHz RHCP

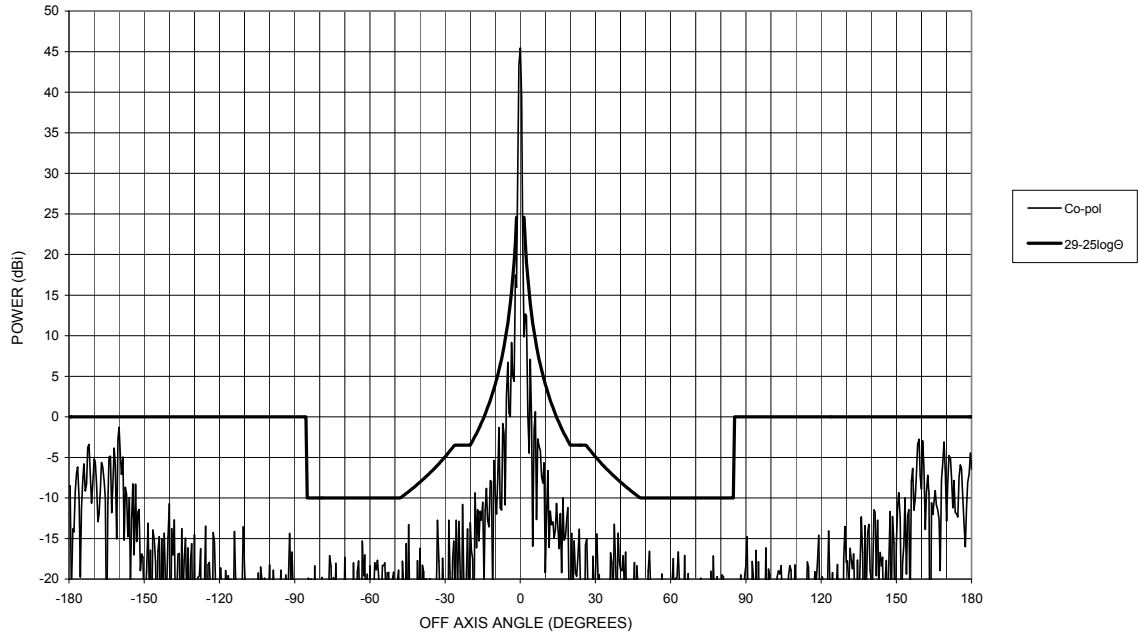


Figure 54 - Co-pol RHCP +/-180° Azimuth Pattern - 20.2GHz

# **AvL Technologies**

1.2m Ka Band Antenna  
Spaceway Feed

Receive Band Elevation Patterns

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
19.7 GHz LHCP

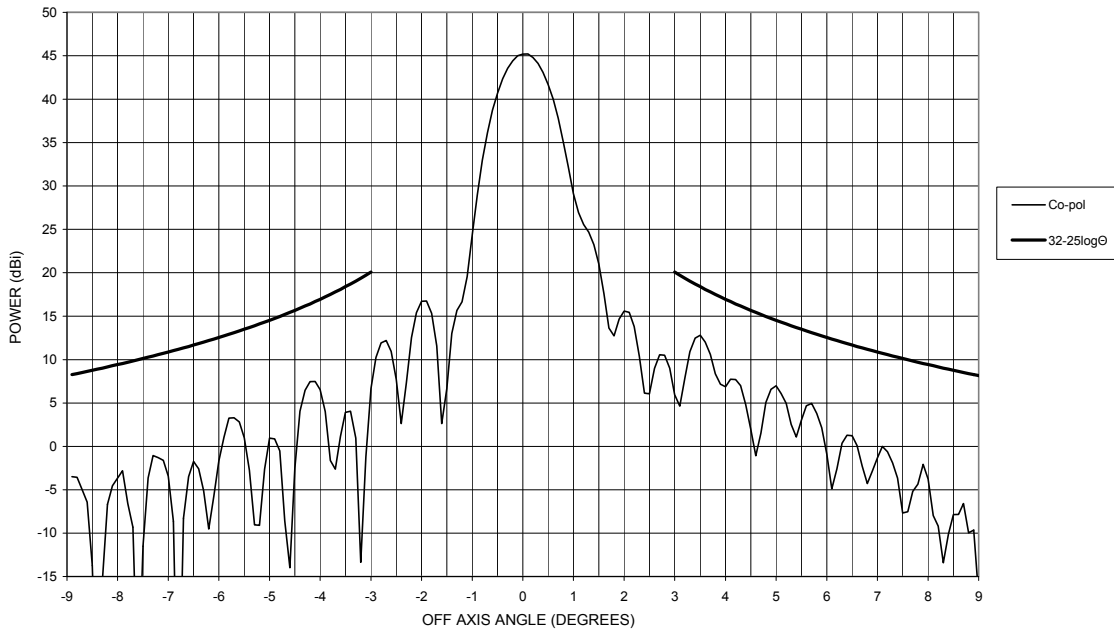


Figure 55 - Co-pol LHCP +/-9° Elevation Pattern - 19.7GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
19.95 GHz LHCP

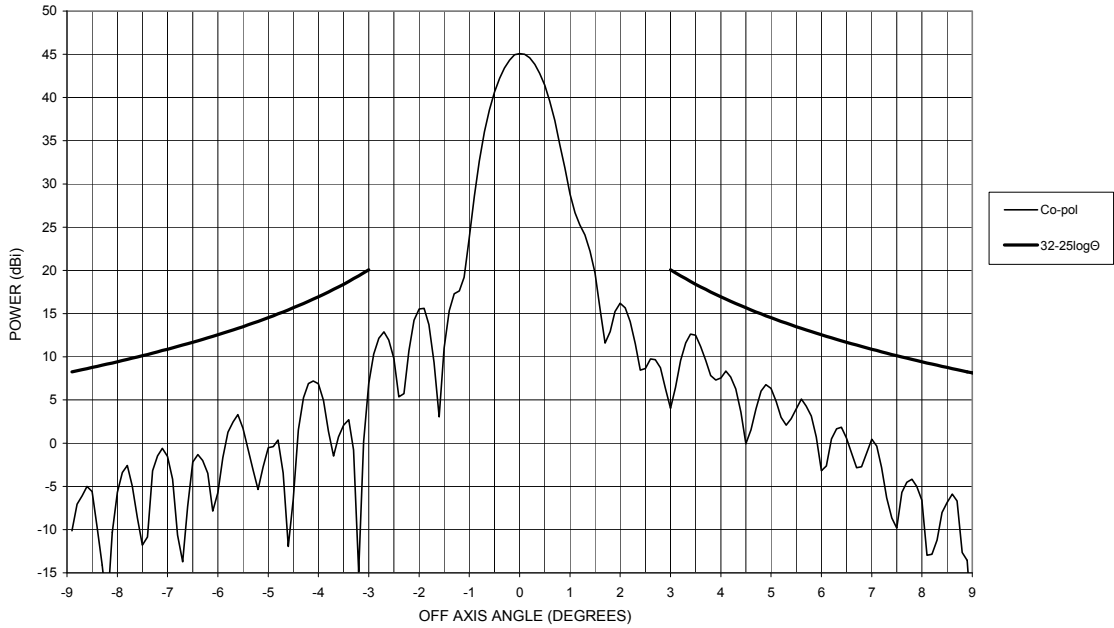


Figure 56 - Co-pol LHCP +/-9° Elevation Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
20.2 GHz LHCP

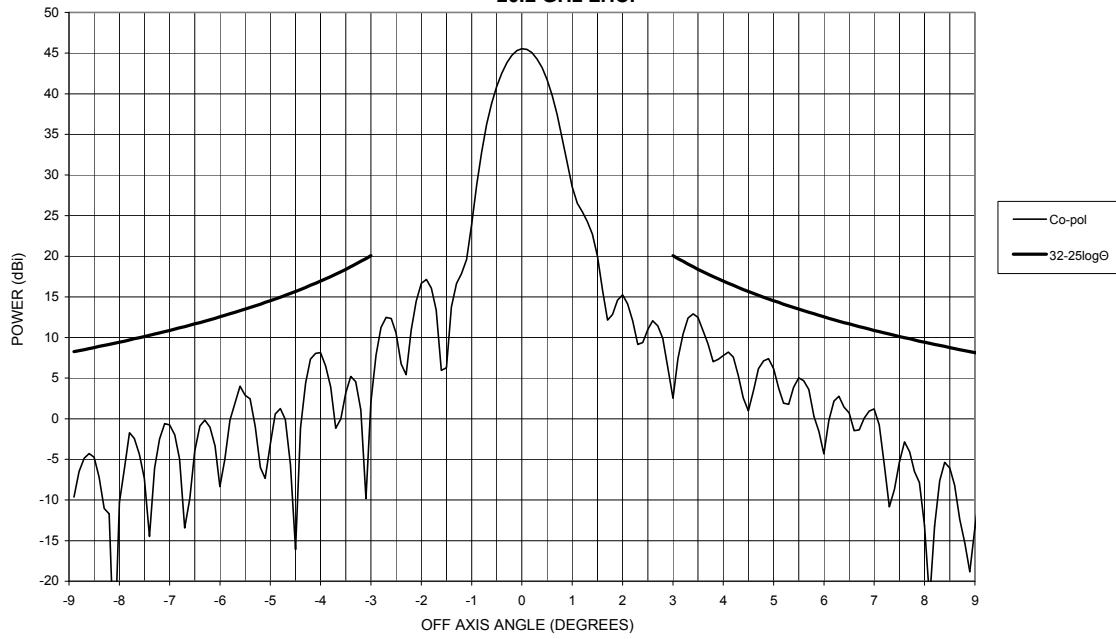


Figure 57 - Co-pol LHCP +/-9° Elevation Pattern - 20.2GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
19.7 GHz RHCP

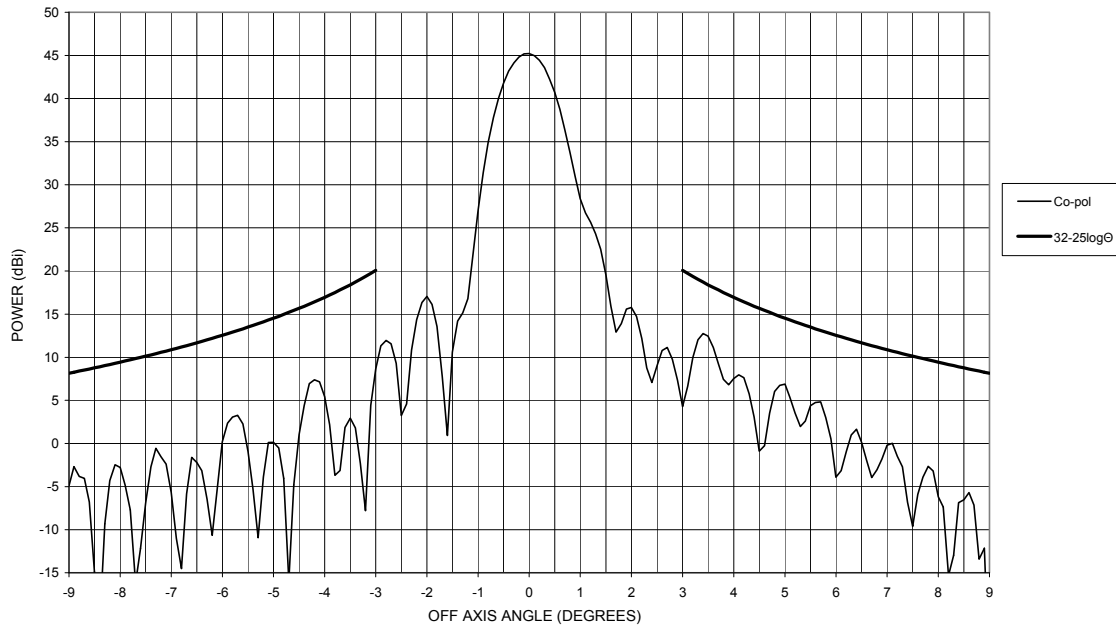


Figure 58 - Co-pol RHCP +/-9° Elevation Pattern - 19.7GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
19.95 GHz RHCP

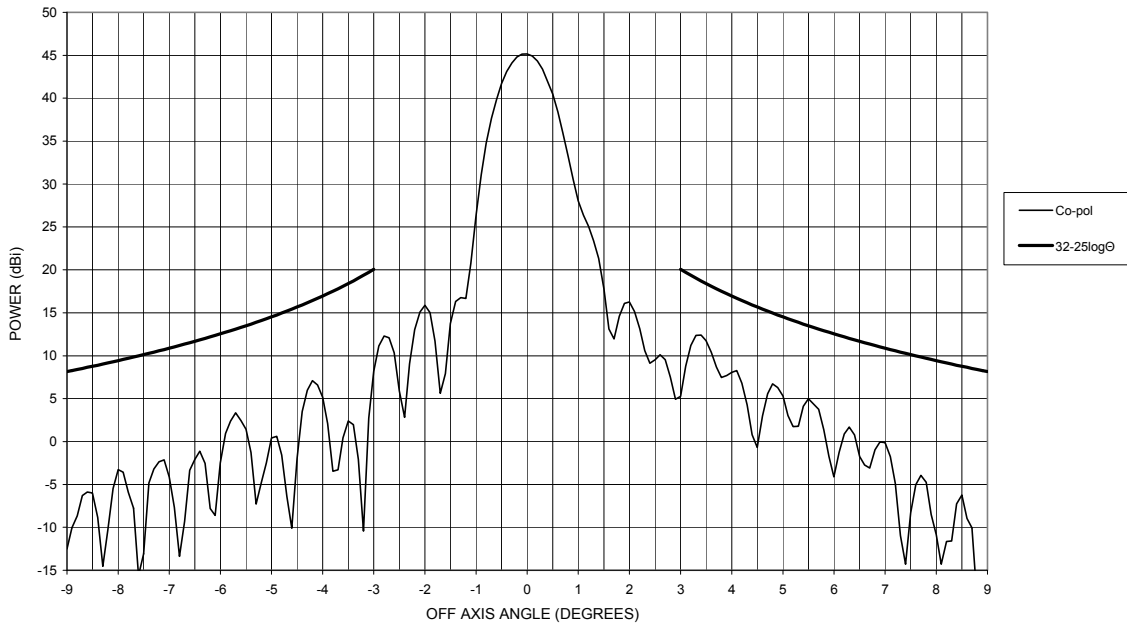


Figure 59 - Co-pol RHCP  $\pm 9^\circ$  Elevation Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
20.2 GHz RHCP

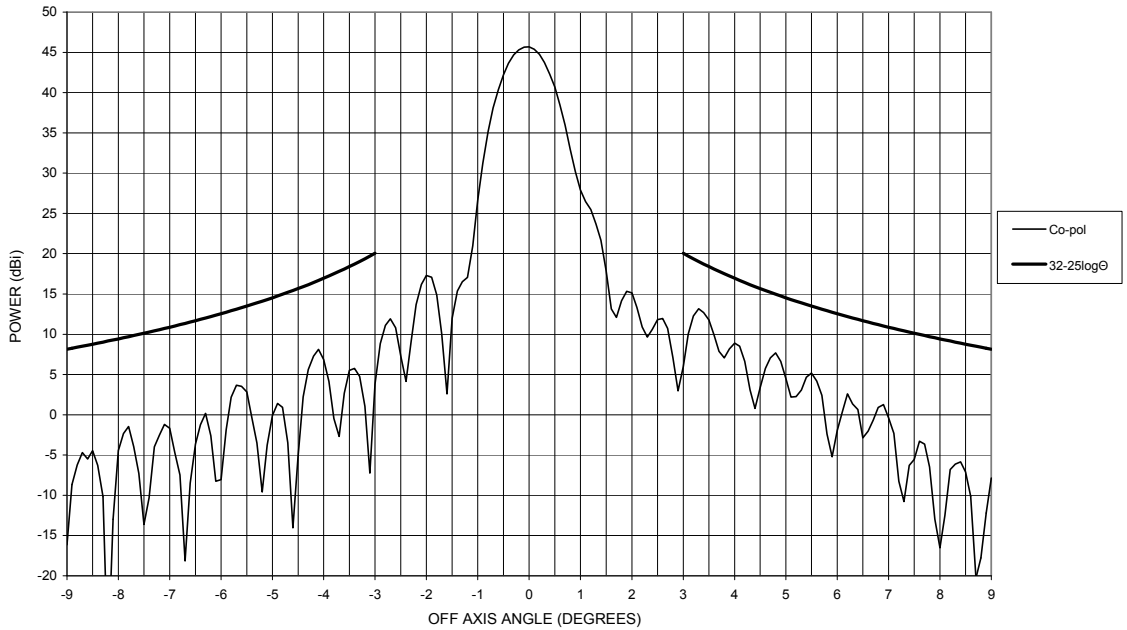


Figure 60 - Co-pol RHCP  $\pm 9^\circ$  Elevation Pattern - 20.2GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Cross-pol Pattern  
19.7 GHz LHCP

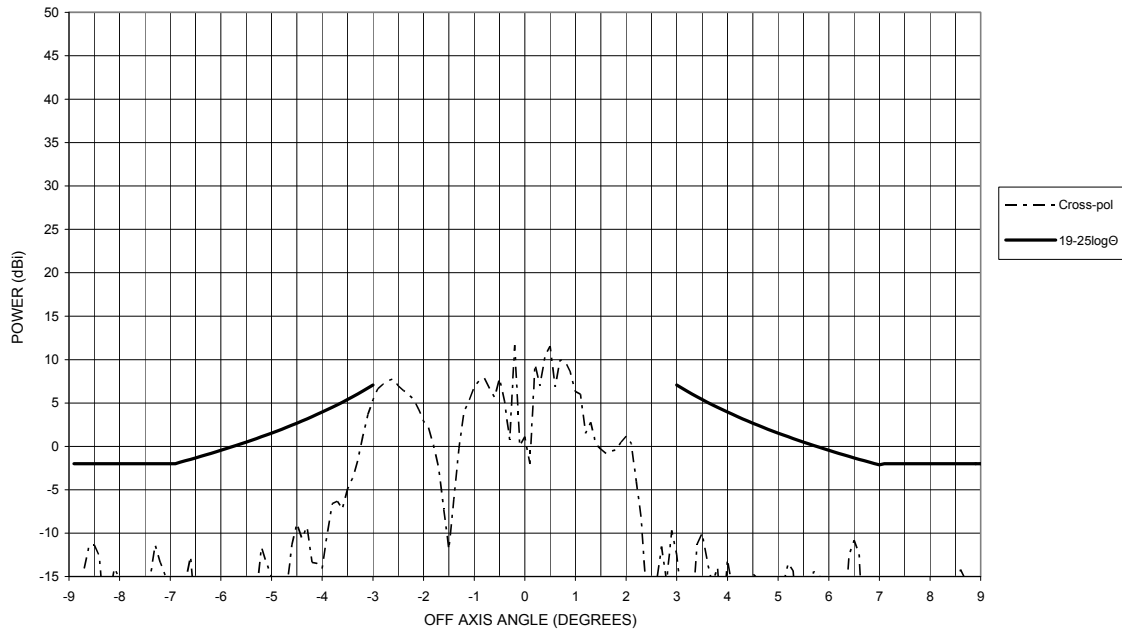


Figure 61 - Cross-pol LHCP +/-9° Elevation Pattern - 19.7GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Cross-pol Pattern  
19.95 GHz LHCP

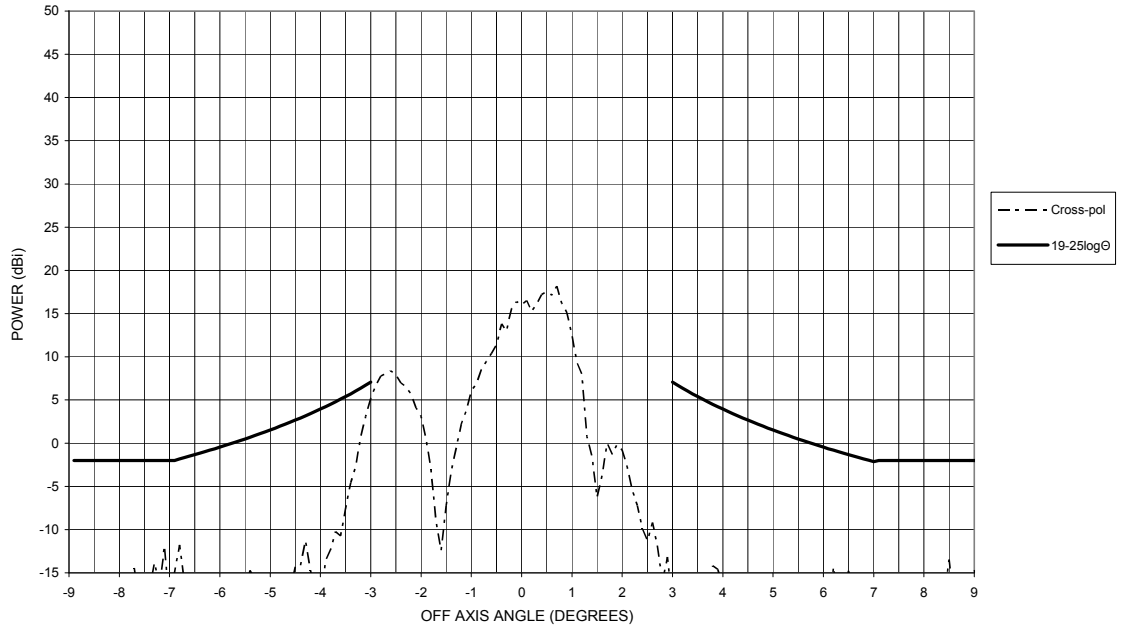


Figure 62 - Cross-pol LHCP +/-9° Elevation Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Cross-pol Pattern  
20.2 GHz LHCP

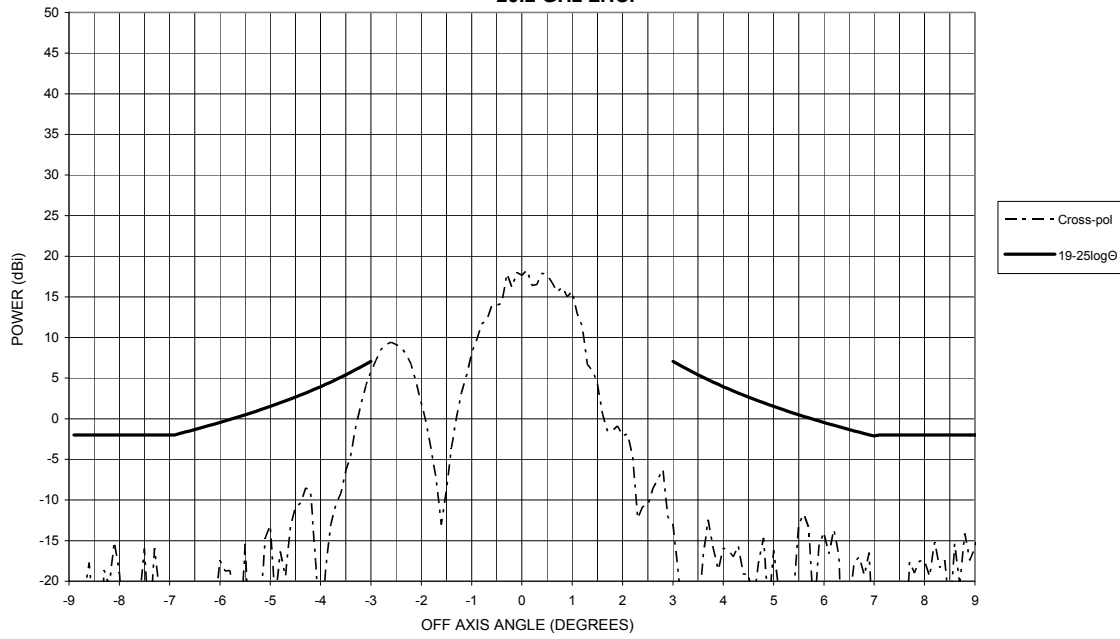


Figure 63 - Cross-pol LHCP +/-9° Elevation Pattern - 20.2GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Cross-pol Pattern  
19.7 GHz RHCP

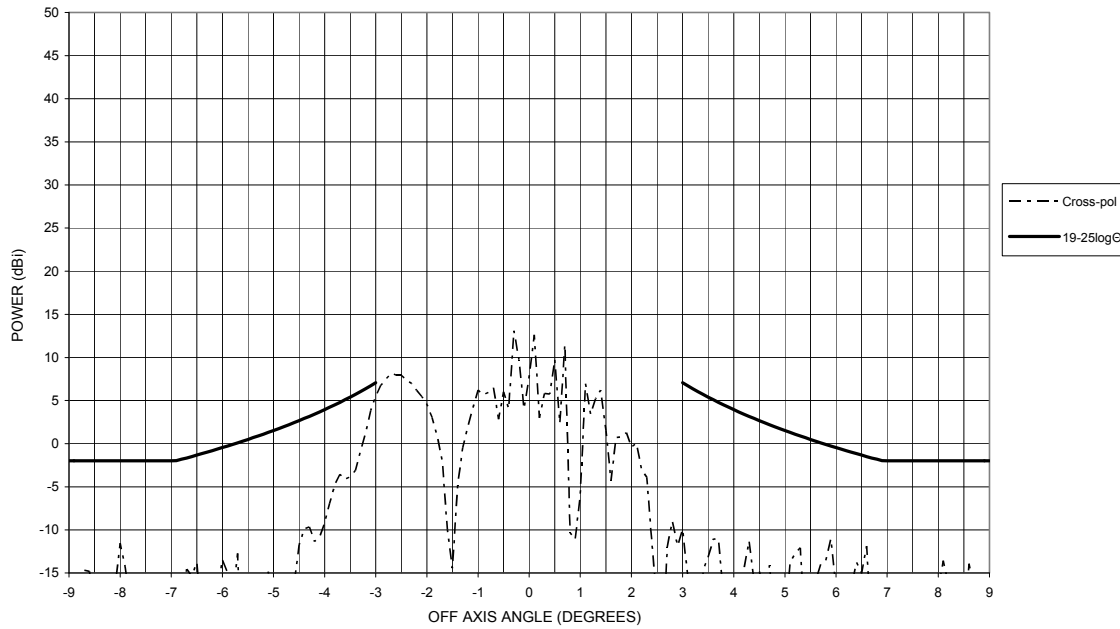


Figure 64 - Cross-pol RHCP +/-9° Elevation Pattern - 19.7GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Cross-pol Pattern  
19.95 GHz RHCP

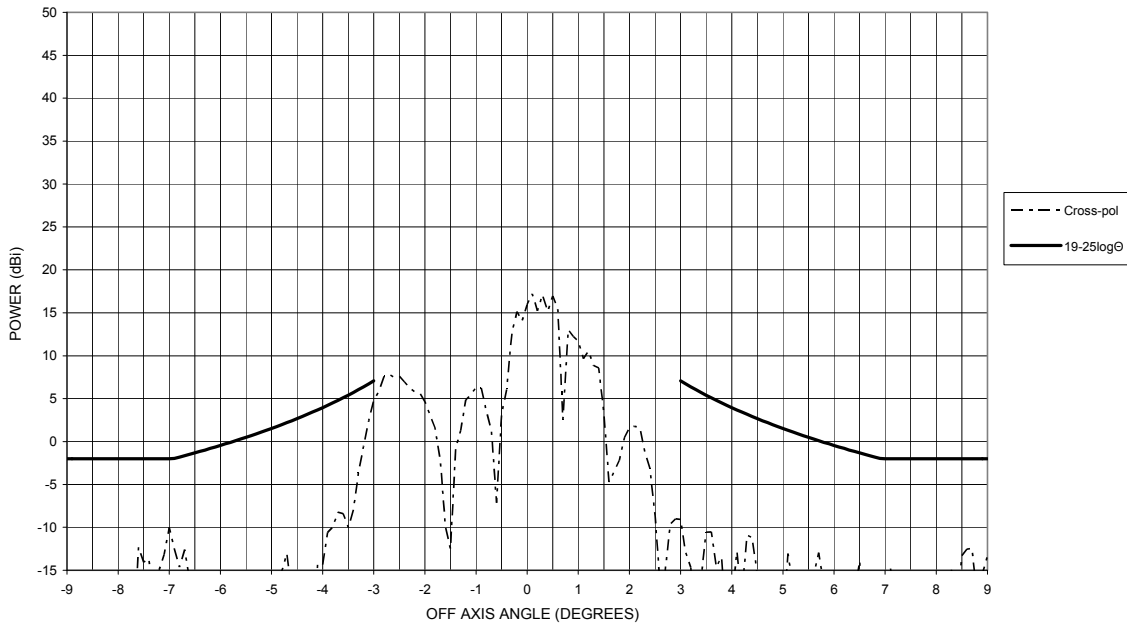


Figure 65 - Cross-pol RHCP +/-9° Elevation Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Cross-pol Pattern  
20.2 GHz RHCP

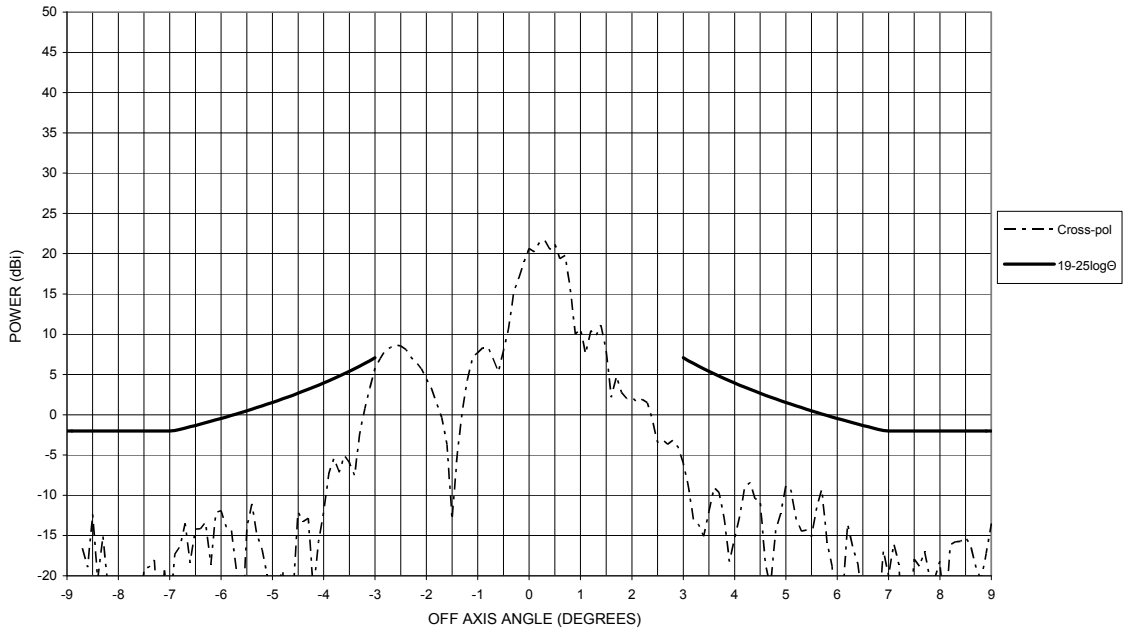


Figure 66 - Cross-pol RHCP +/-9° Elevation Pattern - 20.2GHz



AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
19.7 GHz LHCP

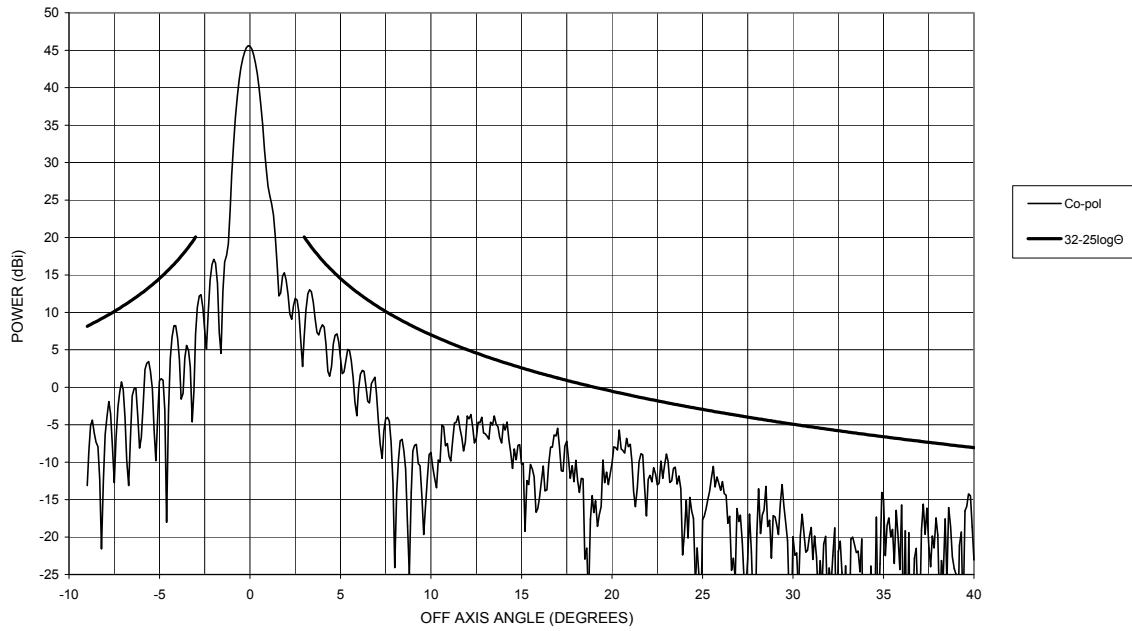


Figure 67 - Cross-pol LHCP -9° - +40° Elevation Pattern - 19.7GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
19.95 GHz LHCP

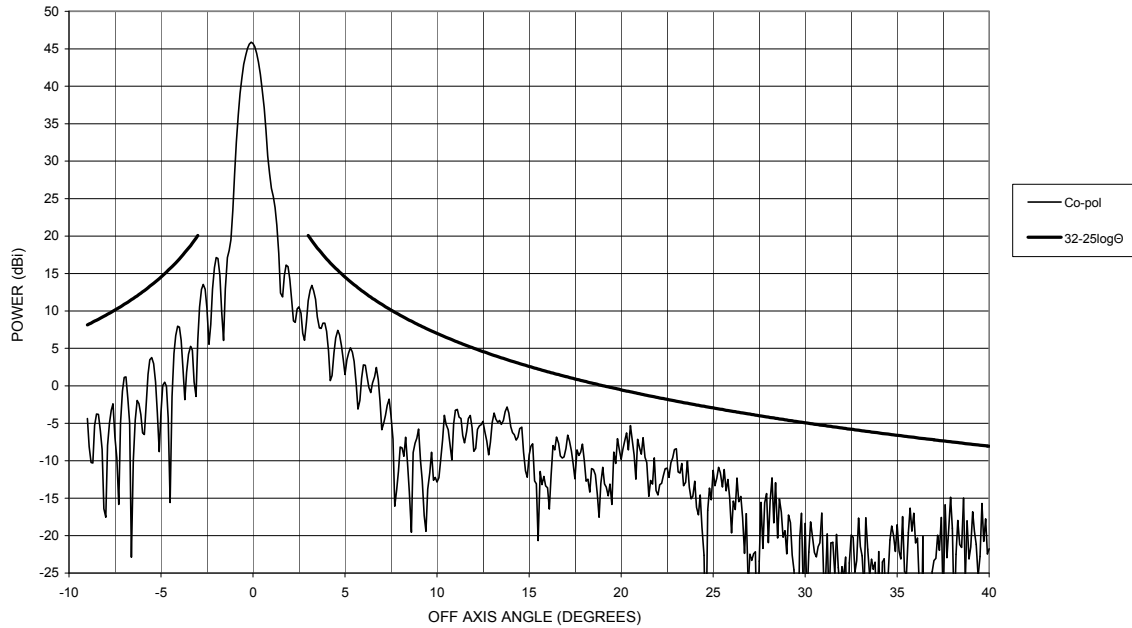


Figure 68 - Cross-pol LHCP -9° - +40° Elevation Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
20.2 GHz LHCP

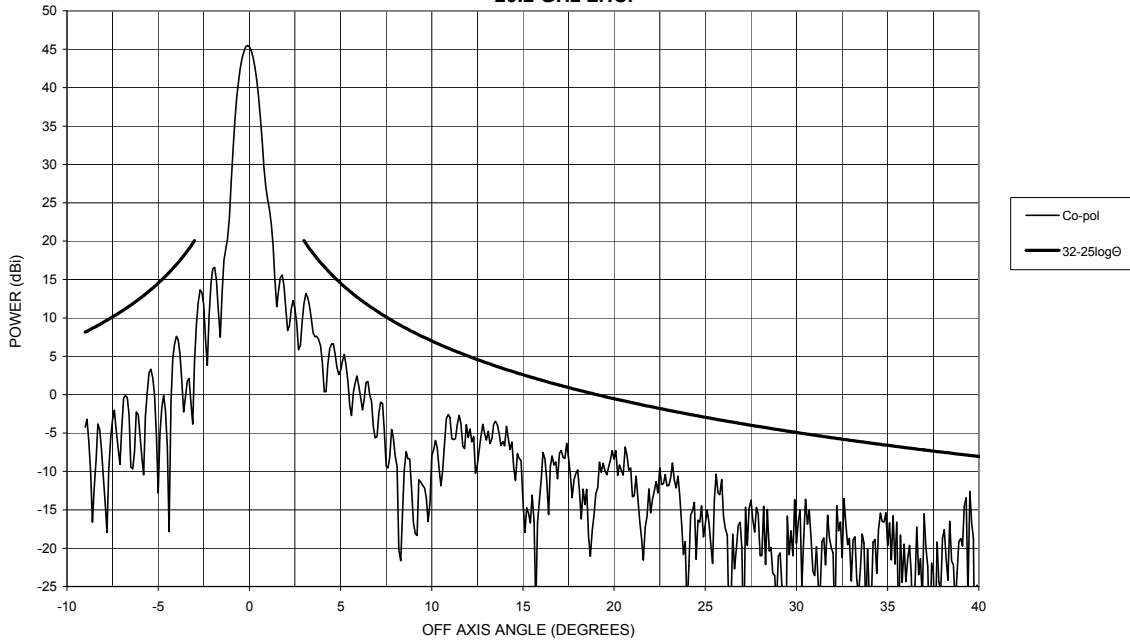


Figure 69 - Cross-pol LHCP -9° - +40° Elevation Pattern - 20.2GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
19.7 GHz RHCP

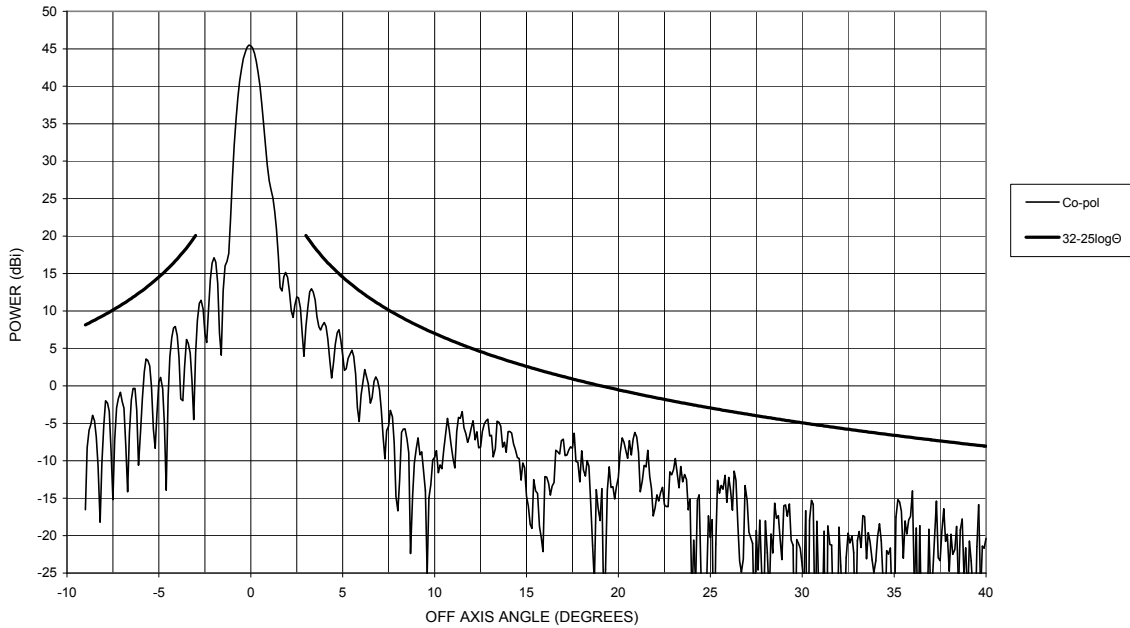


Figure 70 - Cross-pol RHCP -9° - +40° Elevation Pattern - 19.7GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
19.95 GHz RHCP

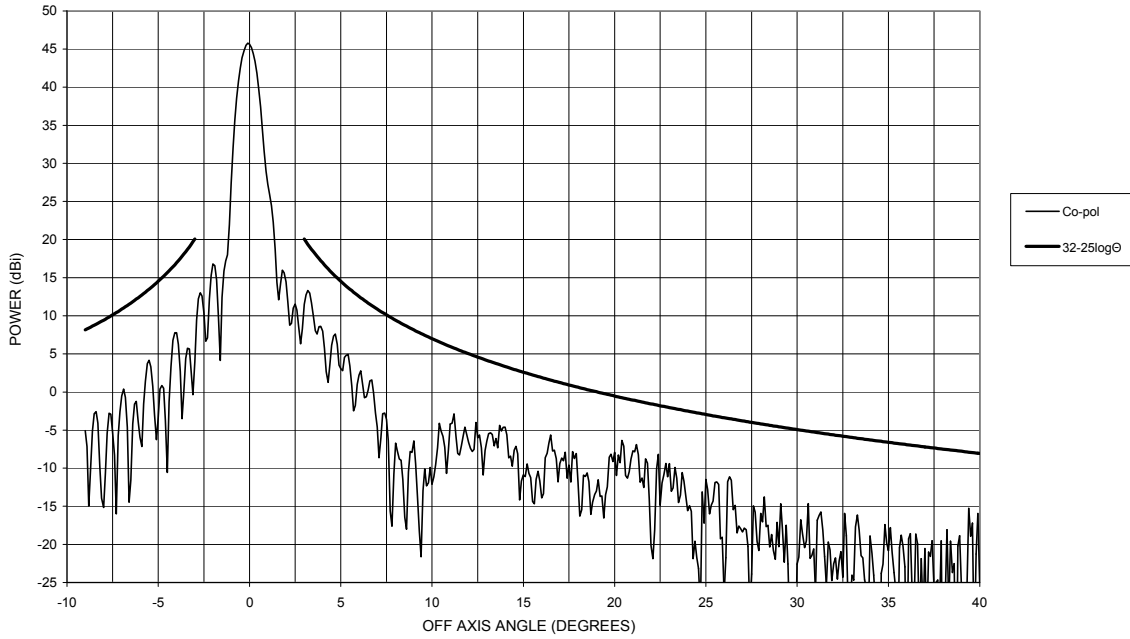


Figure 71 - Cross-pol RHCP -9° - +40° Elevation Pattern - 19.95GHz

AvL 1.2m Ka-Band Antenna  
Model 1210KVH  
Receive Band Elevation Co-pol Pattern  
20.2 GHz RHCP

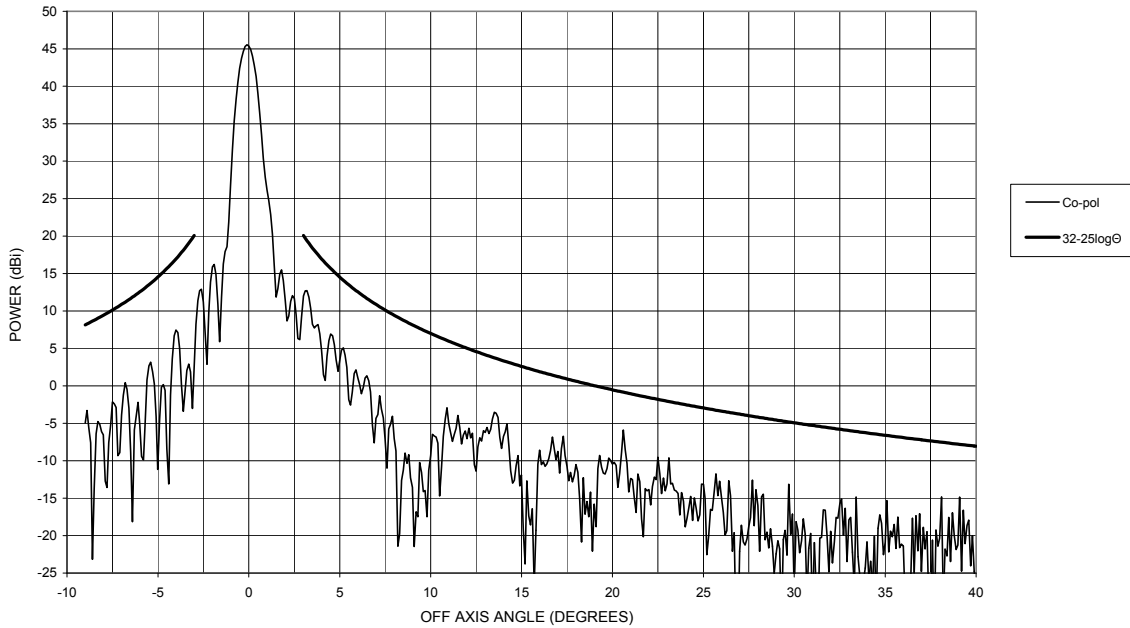


Figure 72 - Cross-pol RHCP -9° - +40° Elevation Pattern - 20.2GHz