

Model: AF23, FCC ID: QISAF23

## RF Exposures Evaluation for single antenna transmissions

For Maximum Permissible Exposure (MPE) evaluation of the product, the maximum power density at 20 cm from this transmitter shall be less than the General Population / Uncontrolled MPE limit in OET Bulletin 65.

For the product of tested model of AF23, the measured maximum conducted output power is 17.60dBm.

From these data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna can be calculated according to OET Bulletin 65 as follow:

Antenna Gain max = 2.1dBi

The EIRP(max) = P\*G = 19.70dBm = 93.33mW

The power density at 20 cm from the antenna

$$= \text{EIRP} / 4\pi R^2$$

$$< 0.0186 \text{ mW/cm}^2$$

where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

In the frequency range of 1,500 - 100,000MHz, the MPE limit is 1.0 mWcm<sup>-2</sup> for general population and uncontrolled exposure. As the measured power density at 20cm from the transmitter is lower than the MPE limit, the compliance to the MPE limit can be ensured by indicating the minimum 20cm separation between the transmitter's radiating structures and body of the user or nearby persons.

The following RF exposure statement is proposed to be included in the user manual:

**“FCC RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.”**

Model: AF23, FCC ID: QISAF23

## RF Exposures Evaluation for both antenna transmissions

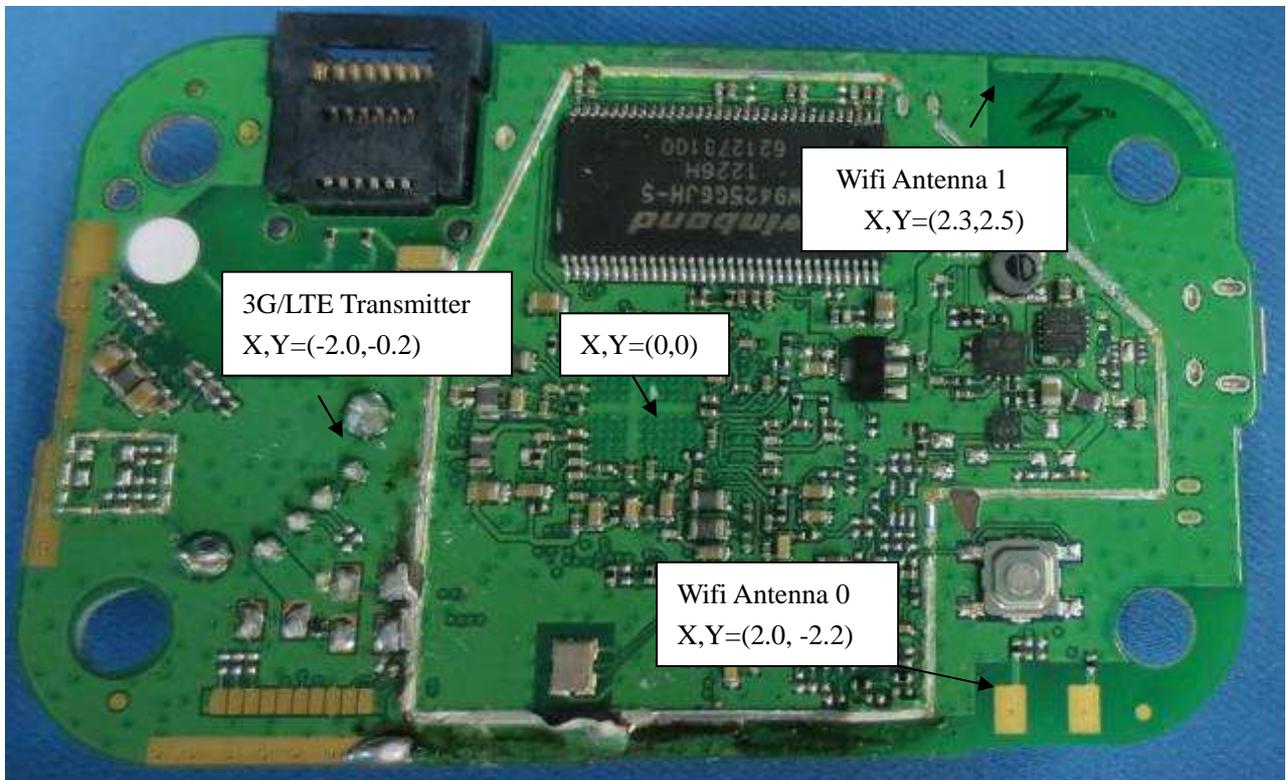
The AF23 base unit has totally 2 antennas.

The KDB 447498: A Mobile Multi-transmitter MPE Estimation MPE spreadsheet is used for estimating MPE limits for these 2 antennas' simultaneous transmission.

The information of operating frequency (MHz), power (W), antenna gain (dBi), location (X and Y coordinates showed on page 2) for each antenna are entered in the MPE spreadsheet.

The power densities of up to 2 antennas located within a 90 cm<sup>2</sup> region at 1cm intervals are estimated first. Then the power densities computed for each antenna are summed.

The plot “% MPE Contour” displays the result in percentages of the frequency-dependent power density limits. As the measured power density at 20cm from the transmitter is lower than the MPE limit (the compliance boundary for simultaneous transmission), the compliance to the MPE limit can be ensured by indicating the minimum 20cm separation between the transmitter's radiating structures and body of the user or nearby persons.

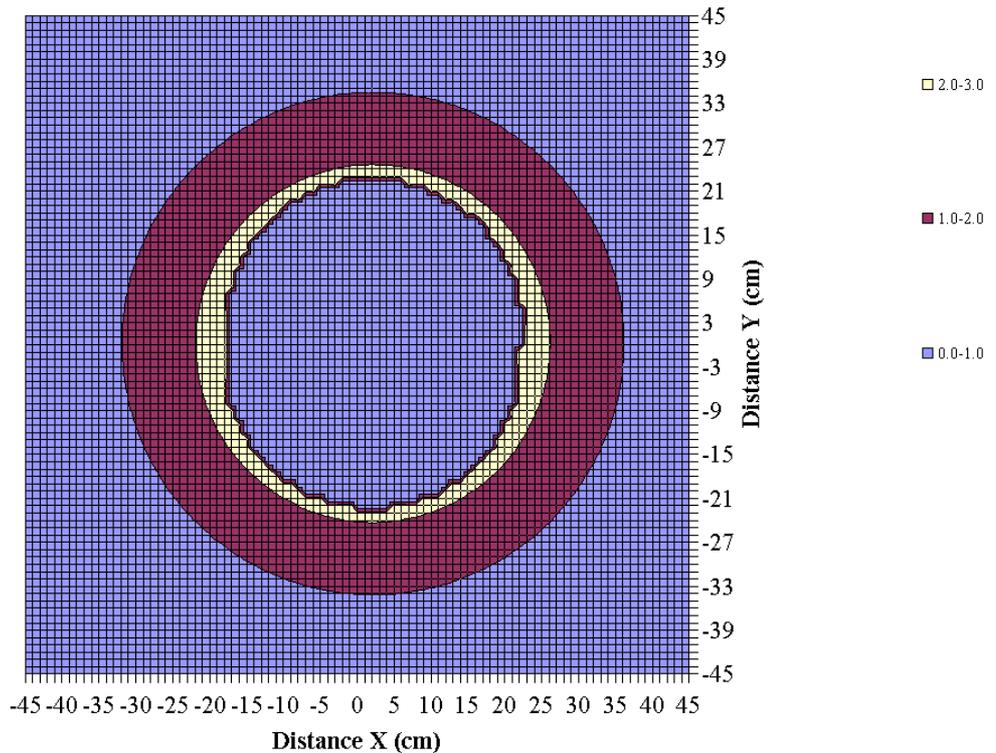


### 802.11n-HT20 (20M) MIMO

Antenna No.		Total	0	1	2	3	4	5
Tx Status			On	On	Off	Off	Off	Off
Frequency	MHz		2450	2450	1900	2450	2450	5800
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	0.00	0.00	0.00	0.00
Max % MPE	%	2.9	1.5	1.5	0.0	0.0	0.0	0.0
Power	(W)	0.090	0.042	0.048	0.000	0.000	0.000	0.000
Antenna Gain	dBi		2.10	2.10	0.00	1.50	0.50	1.00
EIRP	(W)	0.15	0.073	0.073	0.000	0.000	0.000	0.000
X	(cm)		2.0	2.3	-2.0	4.0	-8.0	8.0
Y	(cm)		-2.2	2.5	-0.2	0.0	0.0	0.0
Sector			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120	-120	-120	-120
$\theta_2$			60	60	60	60	60	60
$\theta_1$		actual	-120	-120	-120	-120	-120	-120
$\theta_2$			60	60	60	60	60	60

**% MPE Contour**

**Note: The 0% contour surrounding the antennas identifies a 20 cm perimeter surrounding all active**

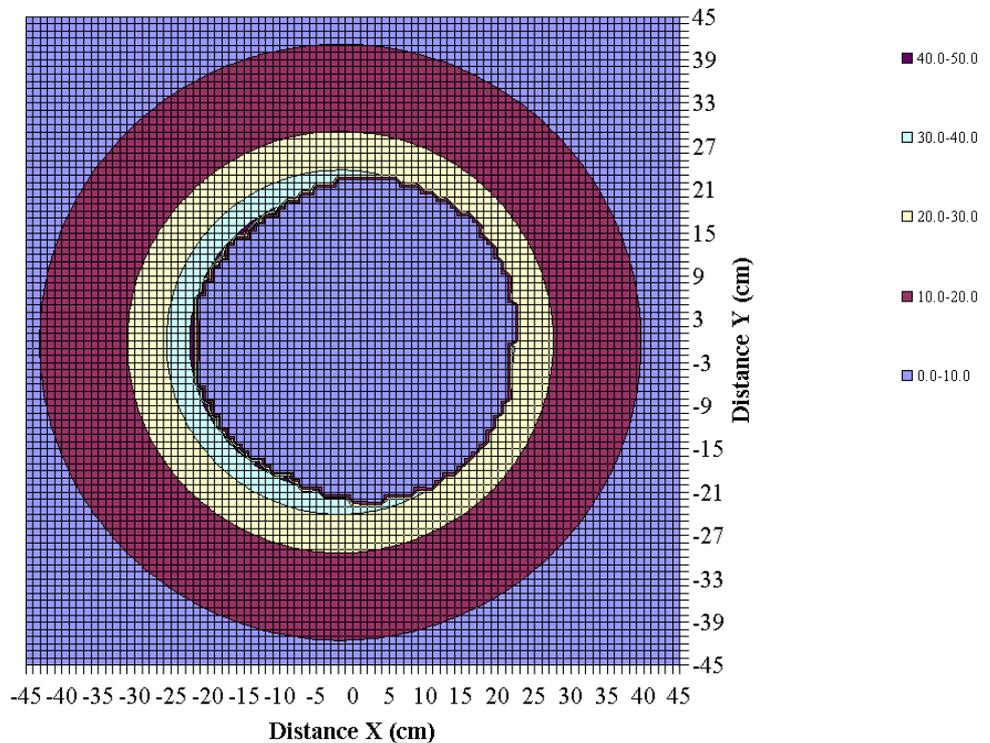


### 802.11n-HT20 (20M)+3G data card

Antenna No.		Total	0	1	2	3	4	5
Tx Status			On	On	On	Off	Off	Off
Frequency	MHz		2450	2450	1900	2450	2450	5800
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00	0.00	0.00	0.00
Max % MPE	%	42.1	1.5	1.5	39.8	0.0	0.0	0.0
Power	(W)	2.090	0.042	0.048	2.000	0.000	0.000	0.000
Antenna Gain	dBi		2.10	2.10	0.00	1.50	0.50	1.00
EIRP	(W)	2.15	0.073	0.073	2.000	0.000	0.000	0.000
X	(cm)		2.0	2.3	-2.0	4.0	-8.0	8.0
Y	(cm)		-2.2	2.5	-0.2	0.0	0.0	0.0
Sector			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120	-120	-120	-120
$\theta_2$			60	60	60	60	60	60
$\theta_1$		actual	-120	-120	-120	-120	-120	-120
$\theta_2$			60	60	60	60	60	60

% MPE Contour

**Note: The 0% contour surrounding the antennas identifies a 20 cm perimeter surrounding all active**



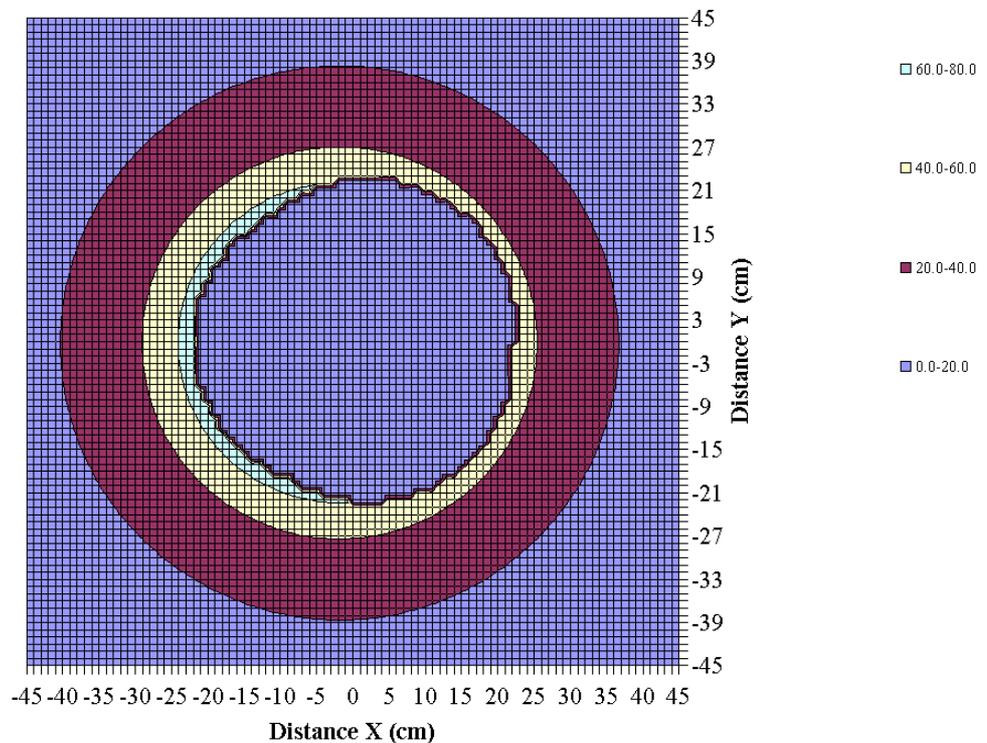
**Note: The EIRP of the data card used must less than 33dBm.**

### 802.11n-HT20 (20M)+3G data card

Antenna No.		Total	0	1	2	3	4	5
Tx Status			On	On	On	Off	Off	Off
Frequency	MHz		2450	2450	840	2450	2450	5800
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	0.56	0.00	0.00	0.00
Max % MPE	%	73.3	1.5	1.5	71.0	0.0	0.0	0.0
Power	(W)	2.090	0.042	0.048	2.000	0.000	0.000	0.000
Antenna Gain	dBi		2.10	2.10	0.00	1.50	0.50	1.00
EIRP	(W)	2.15	0.073	0.073	2.000	0.000	0.000	0.000
X	(cm)		2.0	2.3	-2.0	4.0	-8.0	8.0
Y	(cm)		-2.2	2.5	-0.2	0.0	0.0	0.0
Sector			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120	-120	-120	-120
$\theta_2$			60	60	60	60	60	60
$\theta_1$		actual	-120	-120	-120	-120	-120	-120
$\theta_2$			60	60	60	60	60	60

% MPE Contour

**Note: The 0% contour surrounding the antennas identifies a 20 cm perimeter surrounding all active**



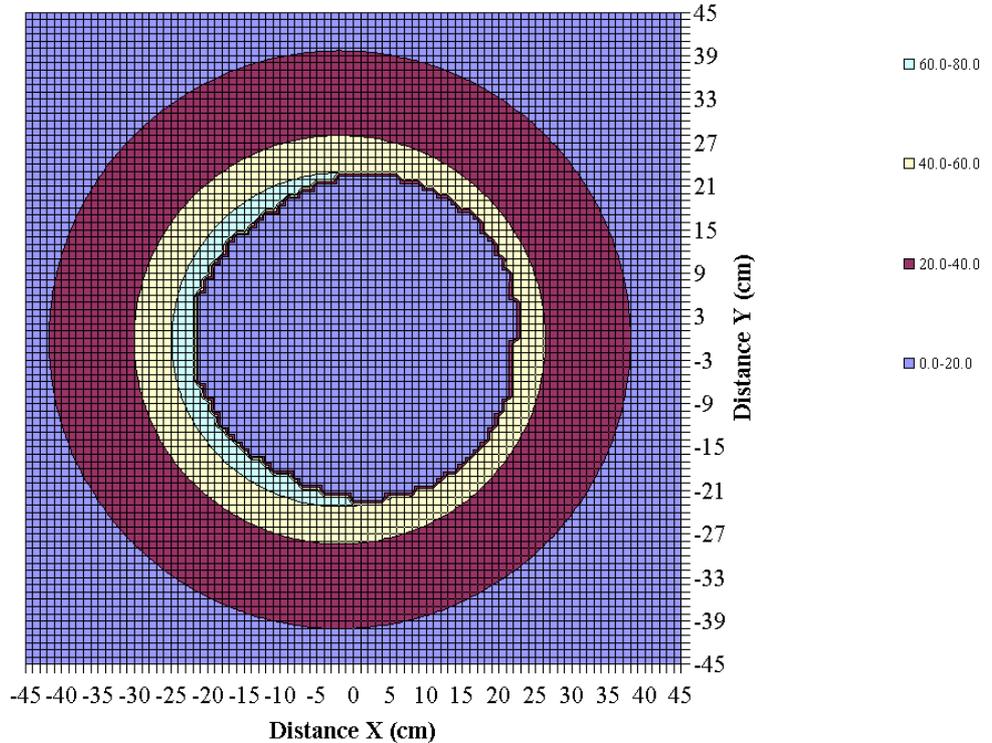
**Note: The ERP of the data card used must less than 33dBm.**

### 802.11n-HT20 (20M)+LTE data card

Antenna No.		Total	0	1	2	3	4	5
Tx Status			On	On	On	Off	Off	Off
Frequency	MHz		2450	2450	780	2450	2450	5800
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	0.52	0.00	0.00	0.00
Max % MPE	%	78.8	1.5	1.5	76.5	0.0	0.0	0.0
Power	(W)	2.090	0.042	0.048	2.000	0.000	0.000	0.000
Antenna Gain	dBi		2.10	2.10	0.00	1.50	0.50	1.00
EIRP	(W)	2.15	0.073	0.073	2.000	0.000	0.000	0.000
X	(cm)		2.0	2.3	-2.0	4.0	-8.0	8.0
Y	(cm)		-2.2	2.5	-0.2	0.0	0.0	0.0
Sector			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120	-120	-120	-120
$\theta_2$			60	60	60	60	60	60
$\theta_1$		actual	-120	-120	-120	-120	-120	-120
$\theta_2$			60	60	60	60	60	60

% MPE Contour

**Note: The 0% contour surrounding the antennas identifies a 20 cm perimeter surrounding all active**

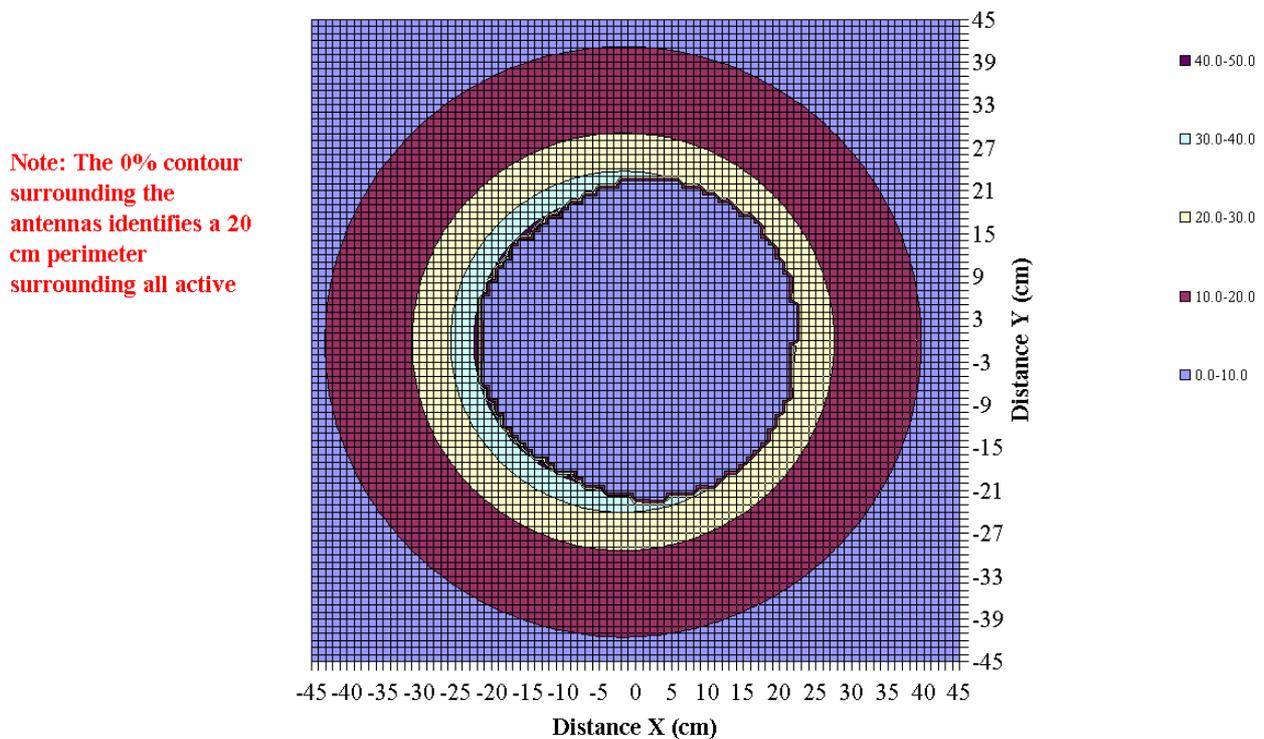


**Note: The ERP of the data card used must less than 33dBm.**

### 802.11n-HT20 (20M)+LTE data card

Antenna No.		Total	0	1	2	3	4	5
Tx Status			On	On	On	Off	Off	Off
Frequency	MHz		2450	2450	2500	2450	2450	5800
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00	0.00	0.00	0.00
Max % MPE	%	42.1	1.5	1.5	39.8	0.0	0.0	0.0
Power	(W)	2.090	0.042	0.048	2.000	0.000	0.000	0.000
Antenna Gain	dBi		2.10	2.10	0.00	1.50	0.50	1.00
EIRP	(W)	2.15	0.073	0.073	2.000	0.000	0.000	0.000
X	(cm)		2.0	2.3	-2.0	4.0	-8.0	8.0
Y	(cm)		-2.2	2.5	-0.2	0.0	0.0	0.0
Sector			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60	60	60
θ <sub>1</sub>		actual	-120	-120	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60	60	60

% MPE Contour



**Note: The EIRP of the data card used must less than 33dBm.**