



# Pulse

a YAGEO company

RoHS & Halogen Free & REACH Compliance

## 產 品 規 格 承 認 書

### SPECIFICATION FOR APPROVAL

**Customer :** Sysgration

**Vendor code :** 100947(臺鑫)

**MACHINERY:** Swallowtail

**PART NAME :** WWAN AUX+WIFI AUX

**Customer P/N :** 354-0000511

**Manufacturer P/N :** TZ29770      **Date :** 250331

CUSTOMER			
ACCEPTED BY :			
核    准	審    核	承    認    者	承認單位
<input type="checkbox"/> APPROVED			
<input type="checkbox"/> REJECTED			

審    核 by	作    成 by	RF by
CHEN/YY	KEN	Charles

## Series: Swallowtail

**Customer P/N: 354-0000511**

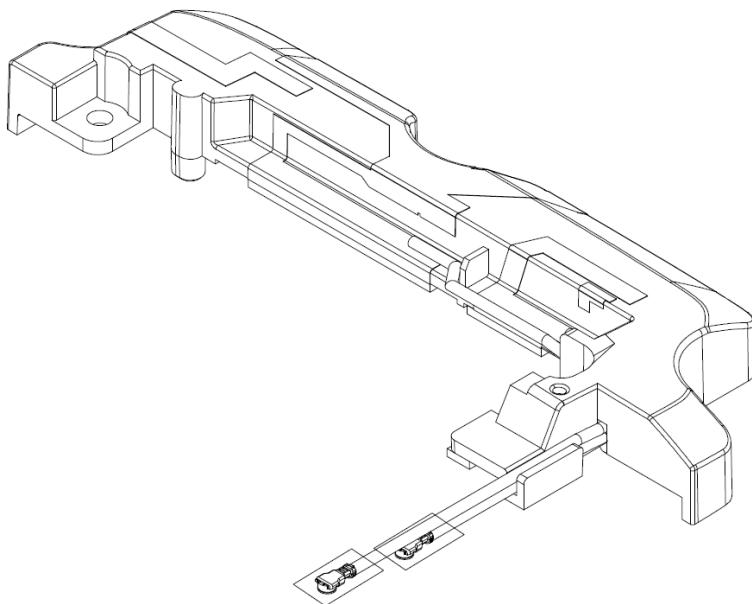
**Manufacturer P/N: TZ29770**

## Revisions

**Series: Swallowtail**

**Customer P/N: 354-0000511**

**Manufacturer P/N: TZ29770**



**Features:**

- WWAN+WIFI Antenna
- LDS
- 1.13 cable LL
- RoHS

**Applications:**

- IOT

All dimensions are in mm / inches

**Series: Swallowtail**
**Customer P/N: 354-0000511**  
**Manufacturer P/N: TZ29770**
**ELECTRICAL SPECIFICATIONS**

Antenna Type	PIFA
Frequency (WWAN_AUX)	698~960MHz
Frequency (WWAN_AUX)	1805~2690MHz
Frequency (WWAN_AUX)	3300~3800MHz
Frequency (WIFI_AUX)	2.4~2.5GHz / 5.15~5.85GHz

**MECHANICAL SPECIFICATIONS**

Overall Length	See table, P5
Antenna Color / Material	See table, P5
Connector type	See table, P5
Cable type	See table, P5
Cable length	See table, P5
Adhesive tape	See table, P5

**ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature	-40 ~ +85°C
Storage Temperature	-40 ~ +85°C
RoHS Compliant	Yes

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

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Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

MECHANICAL DRAWING

A	B	C	D	E	F	G	
MUR	Description	Please follow Pulse Limits for the hazardous substances (RoHS, halogens) in the document "Pulse Hazardous Substances (HS) Limits (RPGEO04)"	Reliability Test Spec according to W17.1.9 (Reliability Test Working Instruction)				
P1	New Realcase						
P2	改Holder pattern, gasket,增加sponge,改線長						
P3	改pattern						
P4	改pattern & Holder修模 & gasket長度13.5>24.5						
P5	改pattern & 增加一條CABLE端子						
P6	改pattern & 減少一條CABLE端子						
P7	修正公差						
1							
2							
3							
4							
5							
7	HEAT SHRINK TUBE	規格Ø1.5	2	▲▲			
6	WIFI MAIN CABLE	Ø1.13/LLS/WHITE/ 57mm	1	▲			
5	WWAN AUX CABLE	Ø1.13/LLS/BLACK/ 34mm	1	▲			
4	CONNECTOR	IPEX4代	2	▲▲▲			
3	GASKET	10x4x1mm(全方位導電泡棉)	1	▲			
2	GASKET	24.5x4x1mm(全方位導電泡棉)	1	▲			
1	Holder	92.45x35.45x10.35mm	1	▲			
No.	Description	REMARK	Q'ty				
Confidential This is a proprietary information of Pulse Suzhou. No reproduction/copying is allowed without permission.							
				Functional Characteristics Key (CPK requirement : CPK>3) ◆ Process Capability Studies required (total : 100) ◆ Ongoing Statistical Process Control Required (total : 100) * Critical dimension need to be measured as CPK requirement (total : 100)			
A	B	C	D	E	F	G	

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Series: Swallowtail

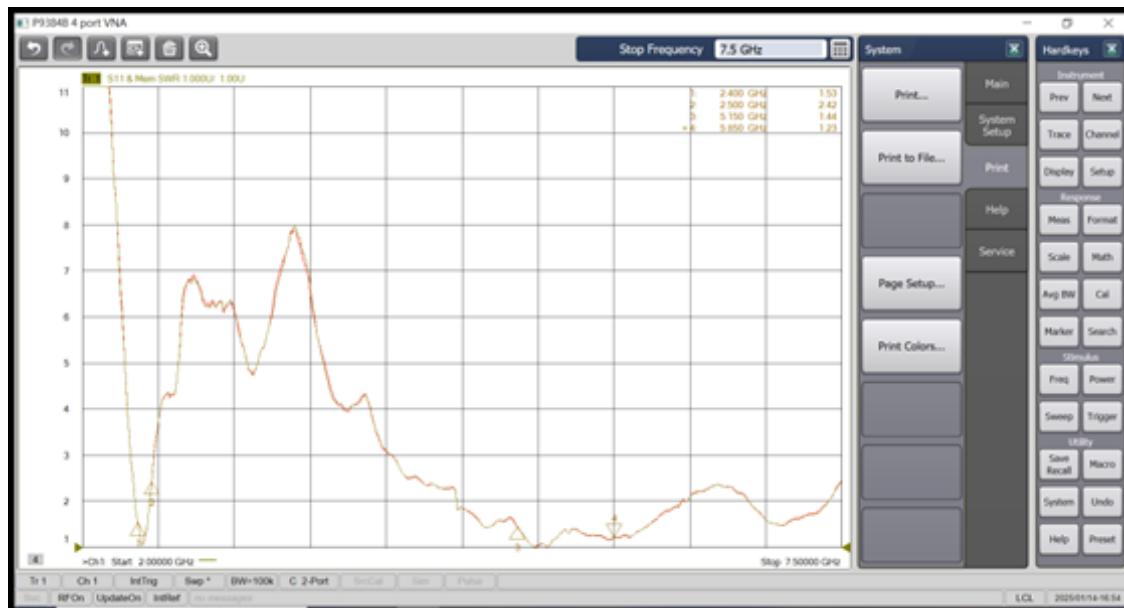
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

### Electrical test\_VSWR

#### WWAN\_AUX



#### WIFI\_AUX



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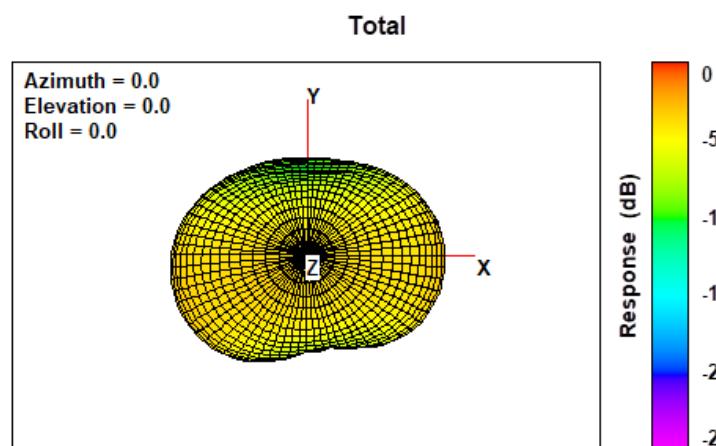
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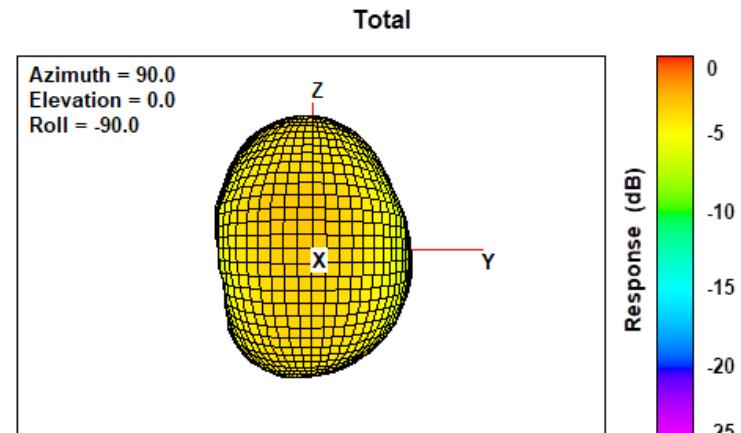
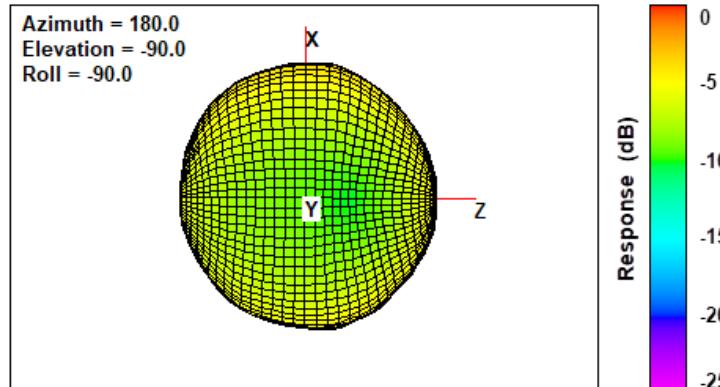
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

3D Radiation\_698MHz [WWAN AUX]



**Total**      **Total**



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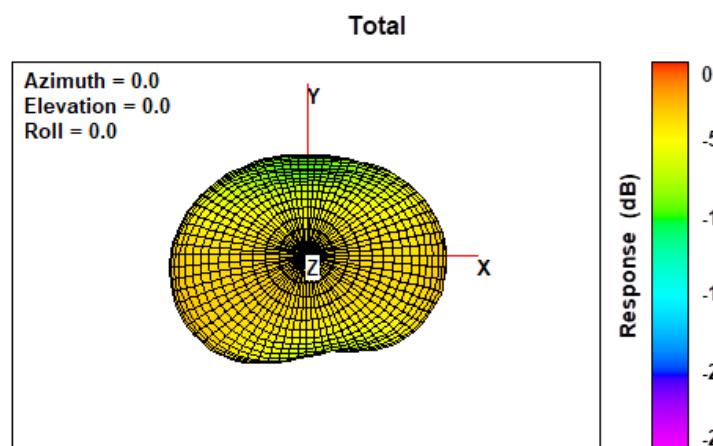
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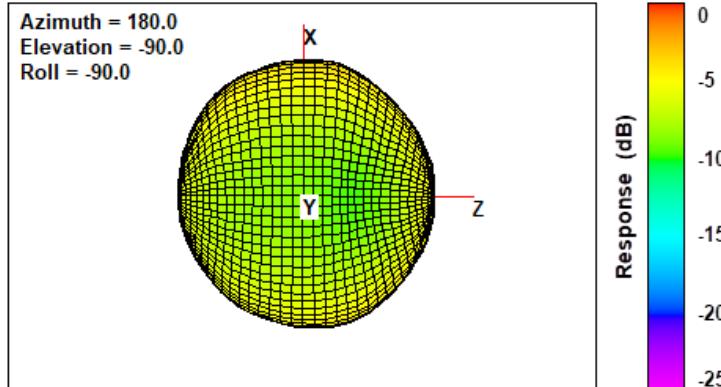
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Manufacturer P/N: TZ29770

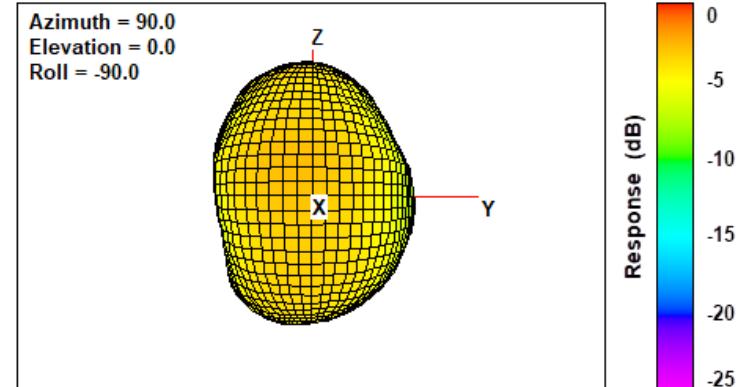
3D Radiation\_708MHz [WWAN AUX]



**Total**



**Total**



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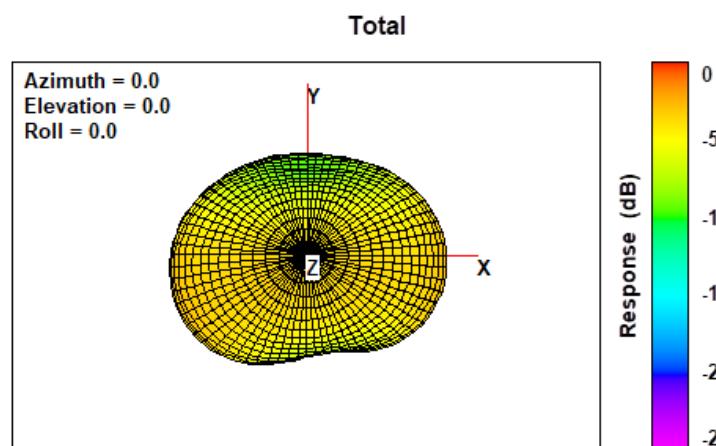
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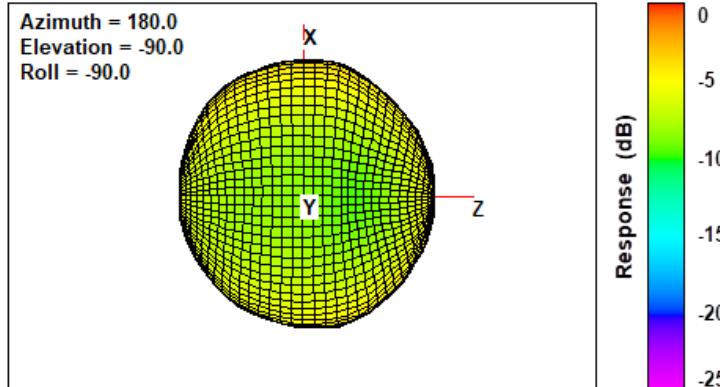
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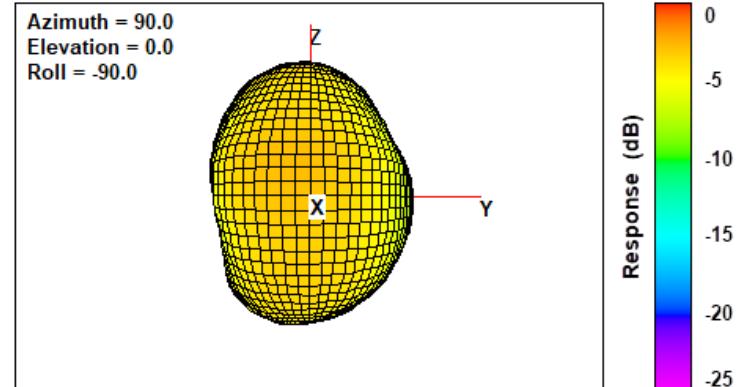
3D Radiation\_710MHz [WWAN AUX]



**Total**



**Total**



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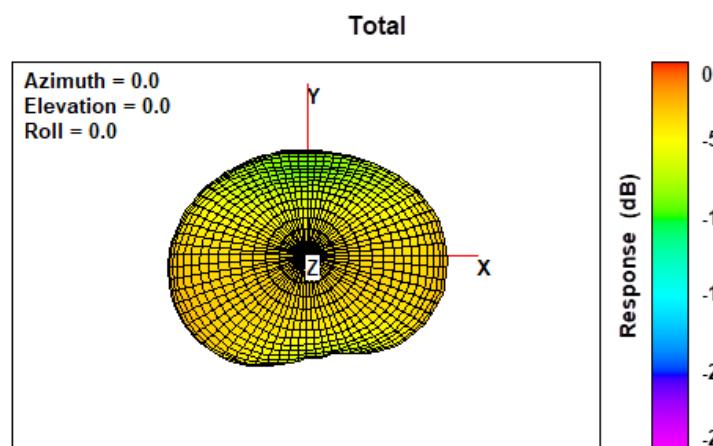
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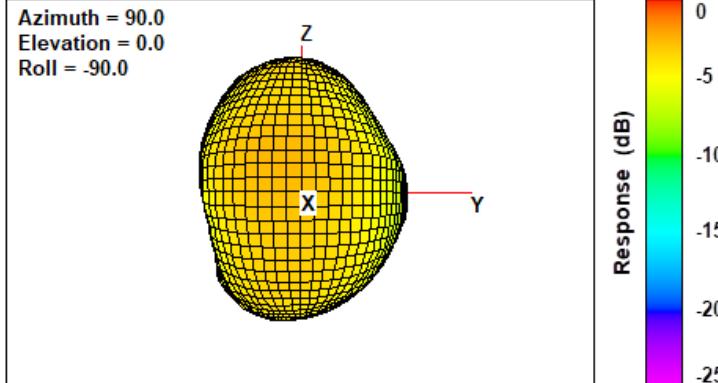
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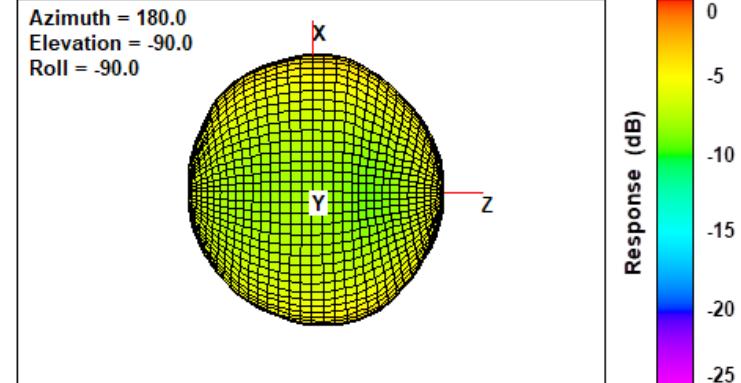
3D Radiation\_717MHz [WWAN AUX]



**Total**



**Total**



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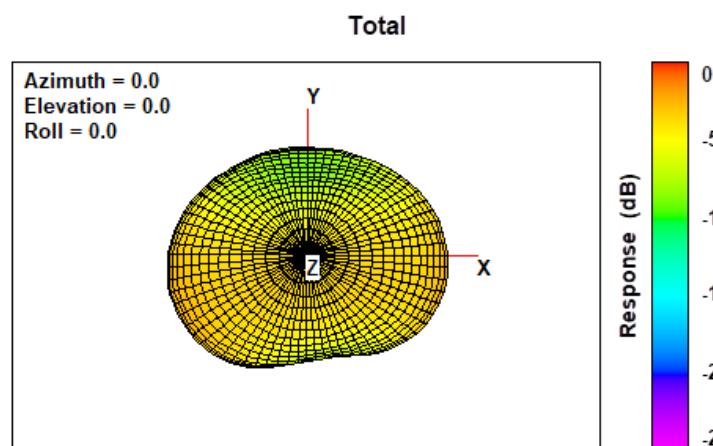
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Series: Swallowtail

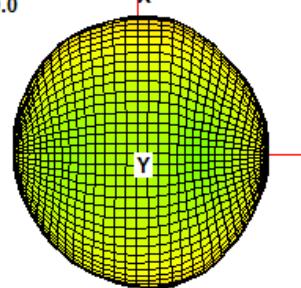
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Manufacturer P/N: TZ29770

3D Radiation\_723MHz [WWAN AUX]



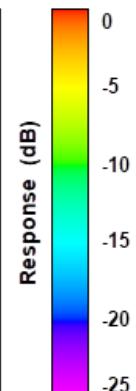
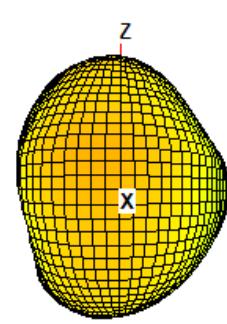
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Roll = -90.0



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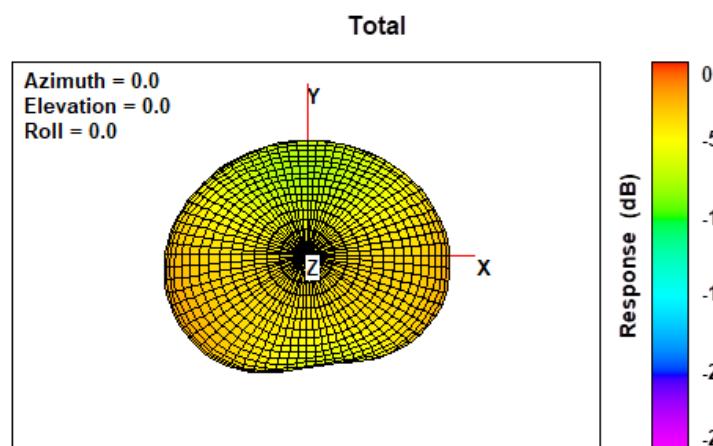
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Series: Swallowtail

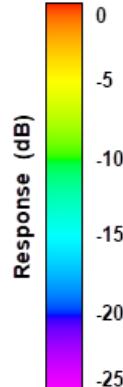
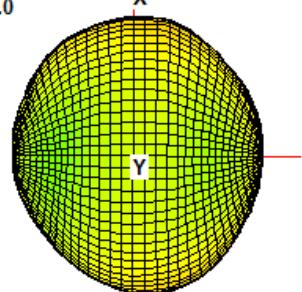
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Manufacturer P/N: TZ29770

3D Radiation\_738MHz [WWAN AUX]



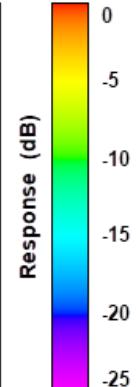
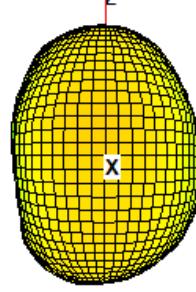
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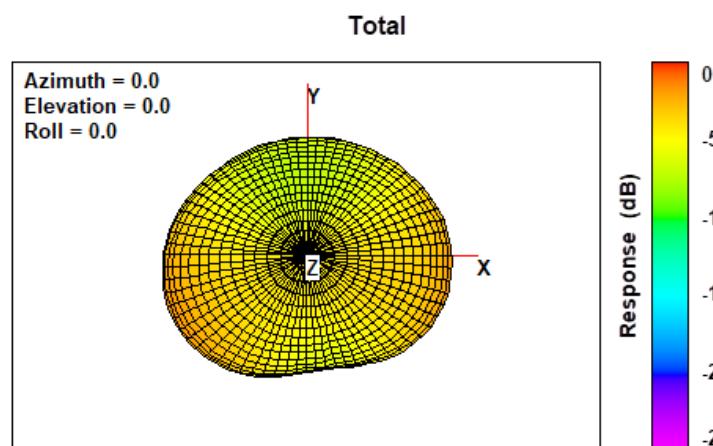
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Series: Swallowtail

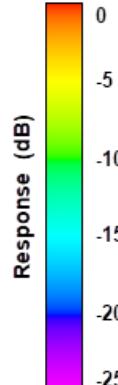
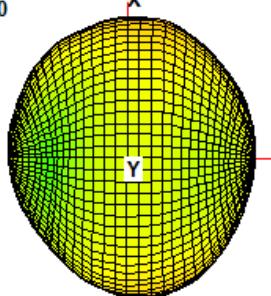
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Manufacturer P/N: TZ29770

3D Radiation\_746MHz [WWAN AUX]



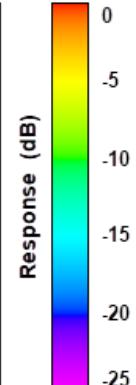
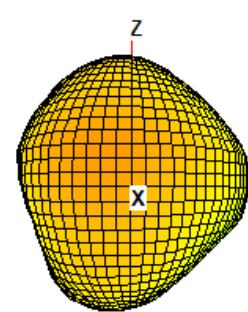
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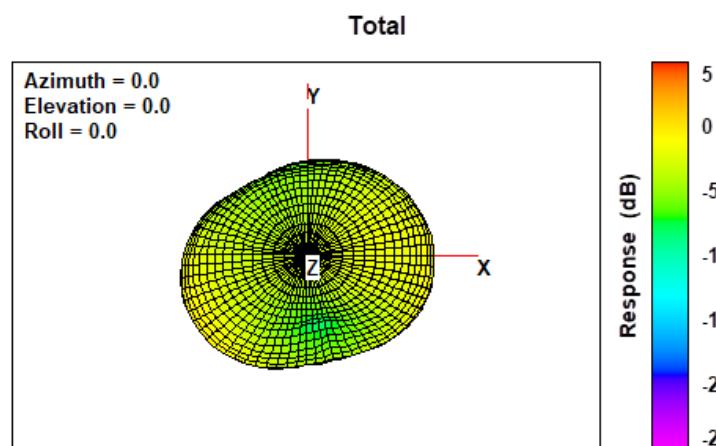
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Series: Swallowtail

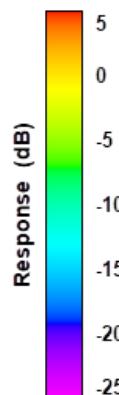
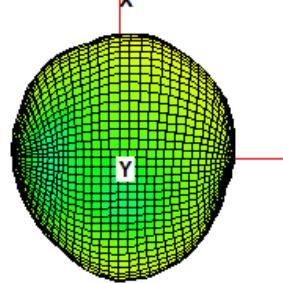
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Manufacturer P/N: TZ29770

3D Radiation\_777MHz [WWAN AUX]



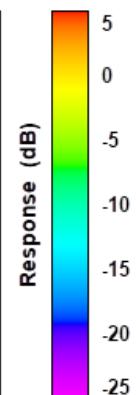
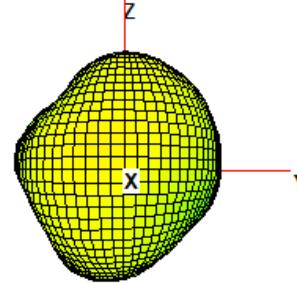
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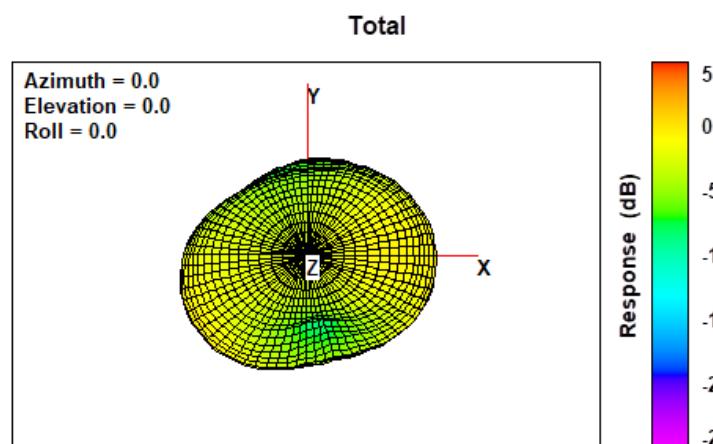
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Series: Swallowtail

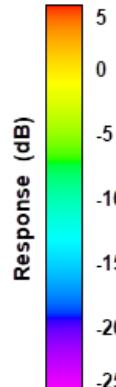
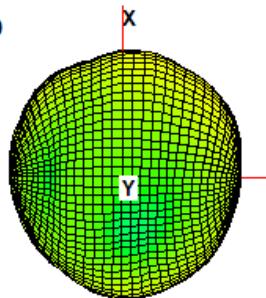
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Manufacturer P/N: TZ29770

3D Radiation\_787MHz [WWAN AUX]



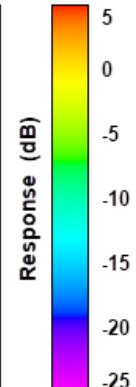
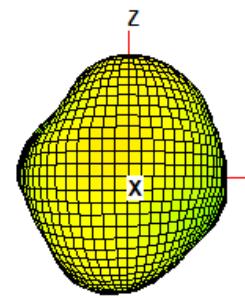
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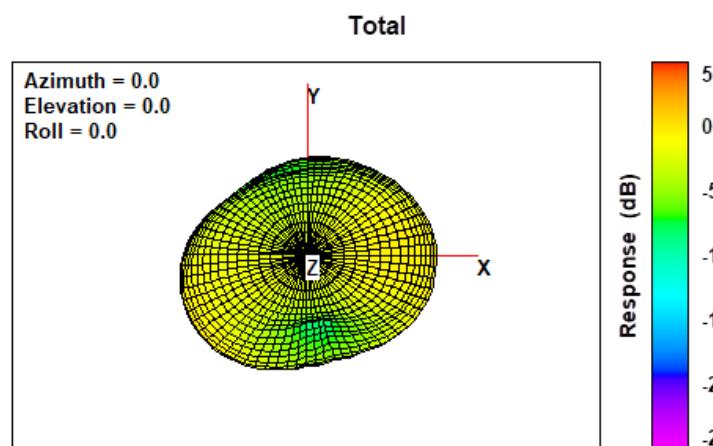
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Series: Swallowtail

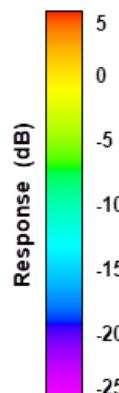
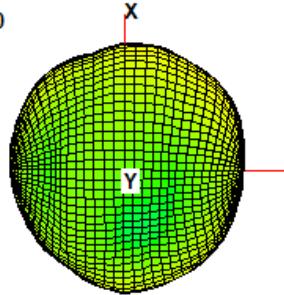
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Manufacturer P/N: TZ29770

3D Radiation\_791MHz [WWAN AUX]



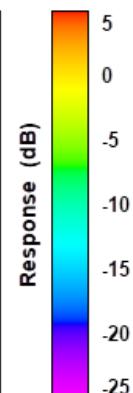
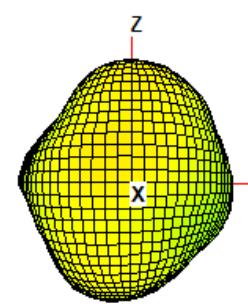
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**Total**

Azimuth = 90.0  
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Roll = -90.0



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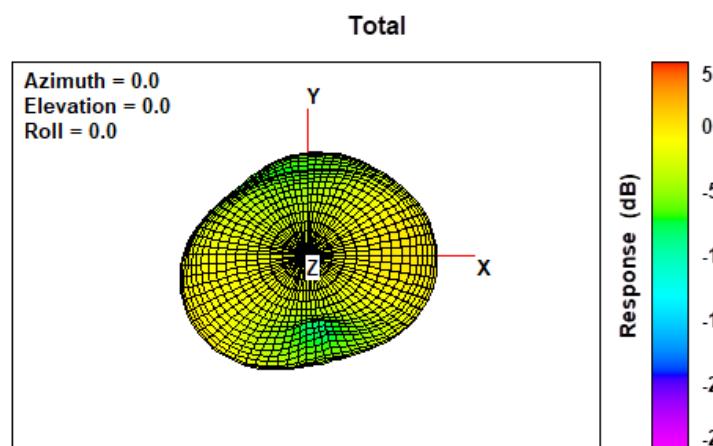
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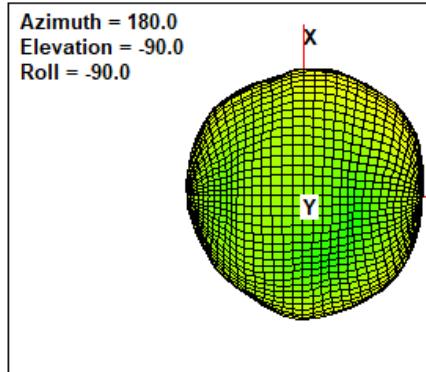
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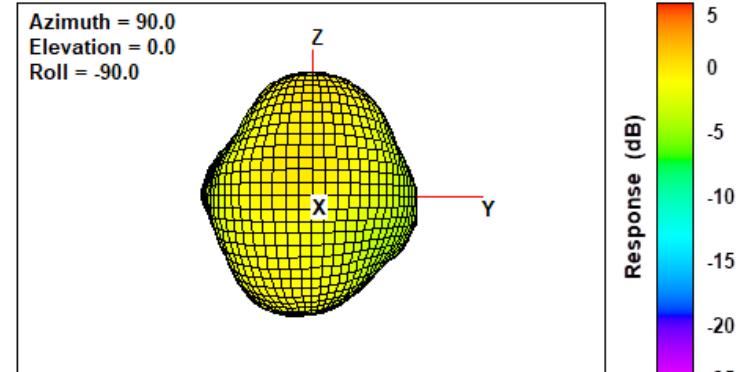
3D Radiation\_798MHz [WWAN AUX]



**Total**



**Total**



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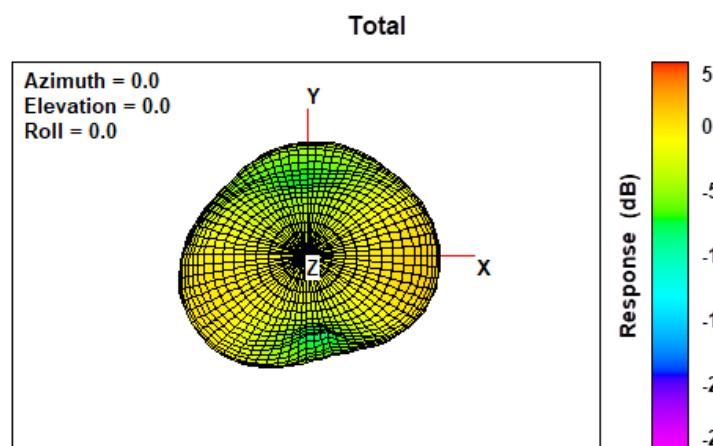
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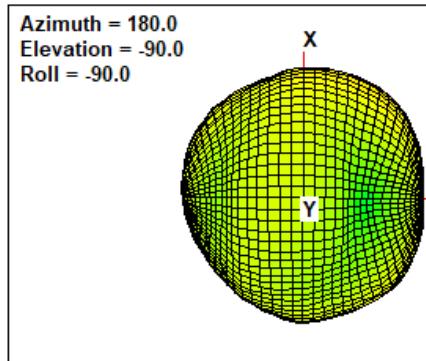
Series: Swallowtail

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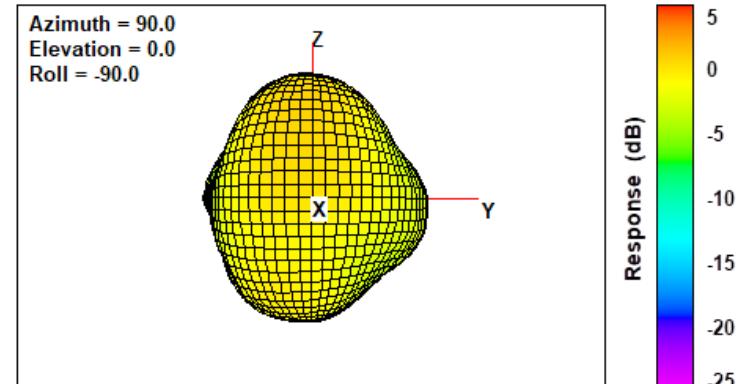
3D Radiation\_824MHz [WWAN AUX]



**Total**



**Total**



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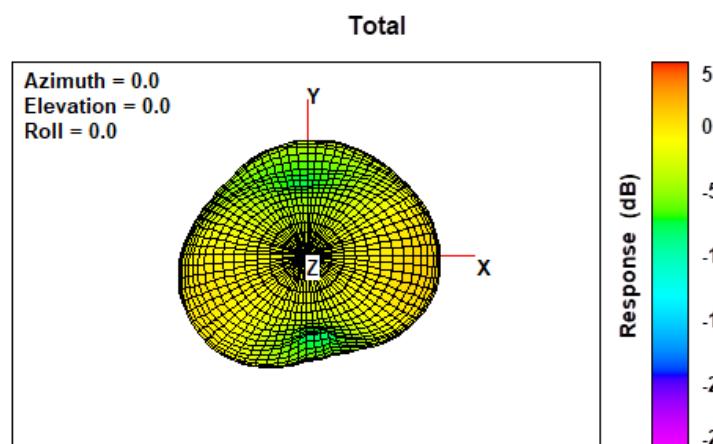
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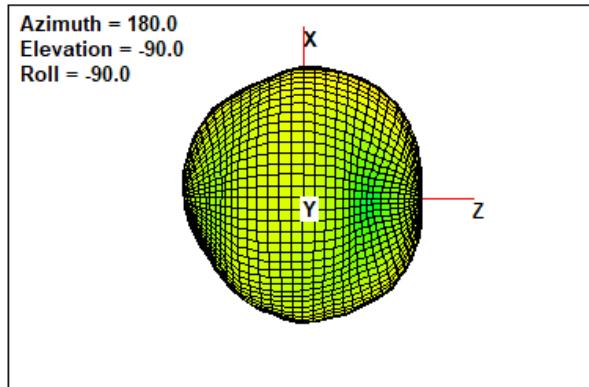
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

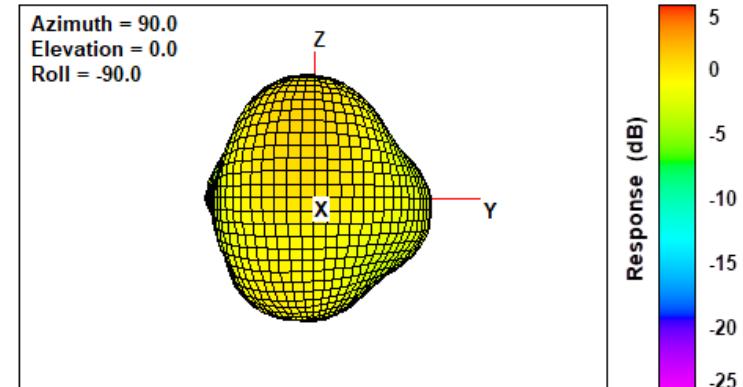
3D Radiation\_830MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

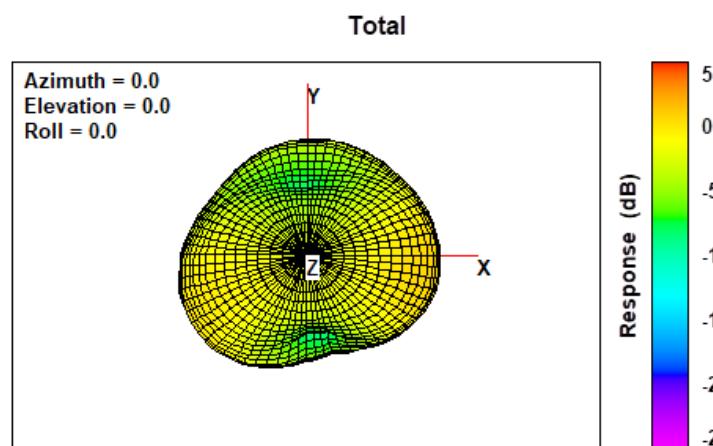
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Series: Swallowtail

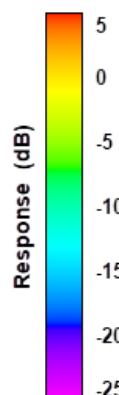
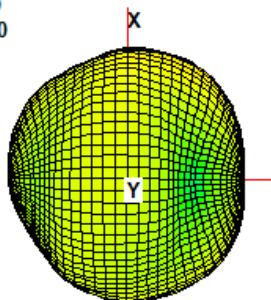
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

3D Radiation\_837MHz [WWAN AUX]



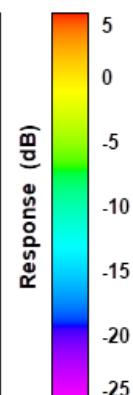
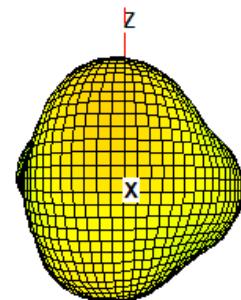
**Total**

Azimuth = 180.0  
Elevation = -90.0  
Roll = -90.0



**Total**

Azimuth = 90.0  
Elevation = 0.0  
Roll = -90.0



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

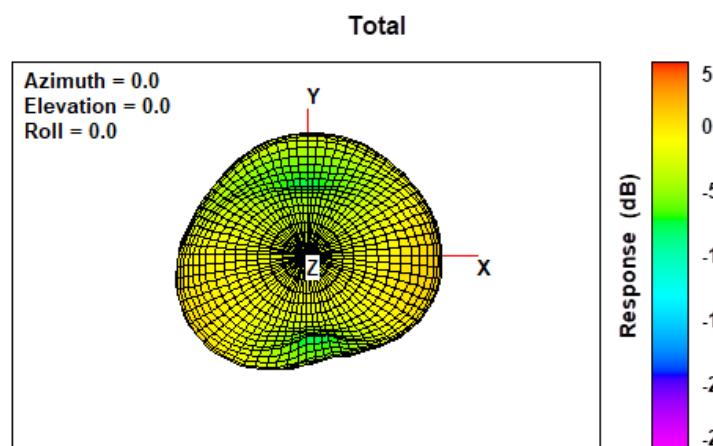
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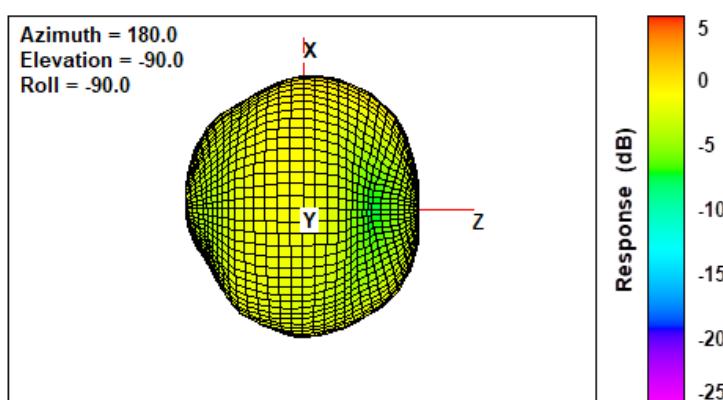
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

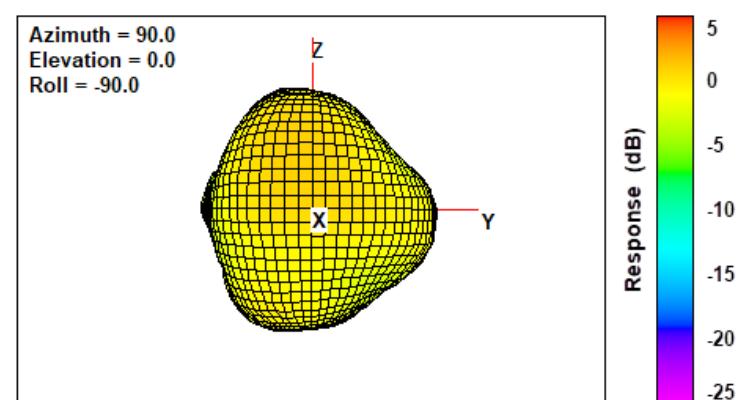
3D Radiation\_845MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

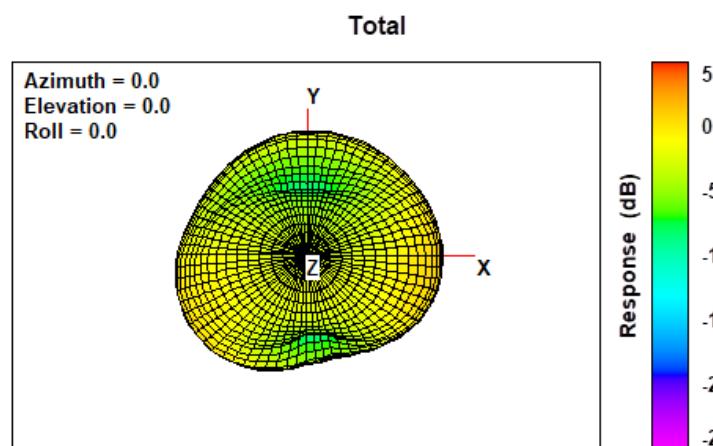
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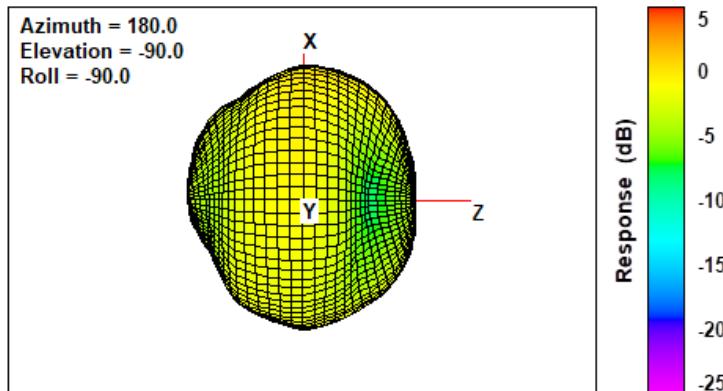
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

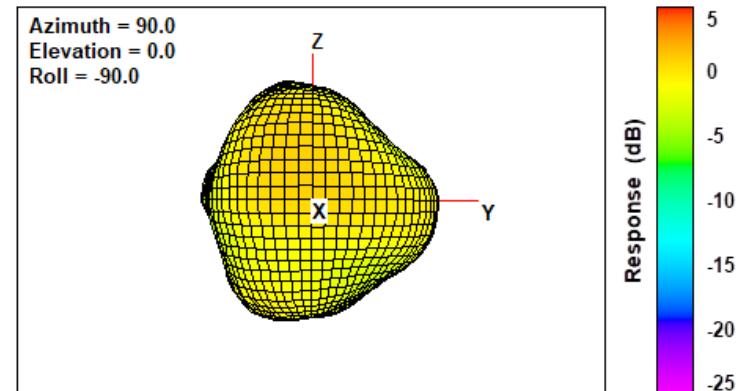
3D Radiation\_859MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

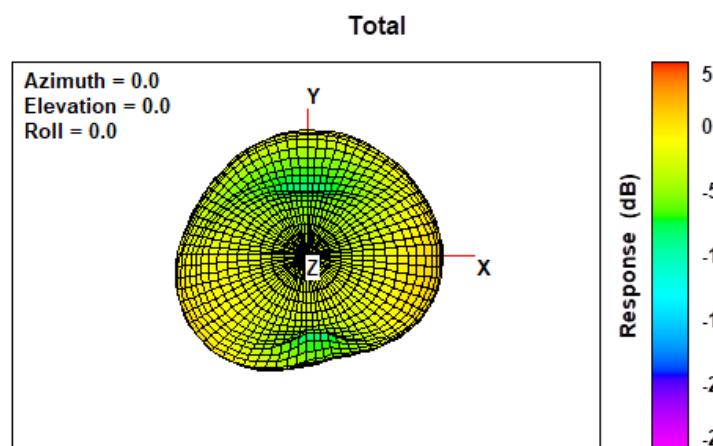
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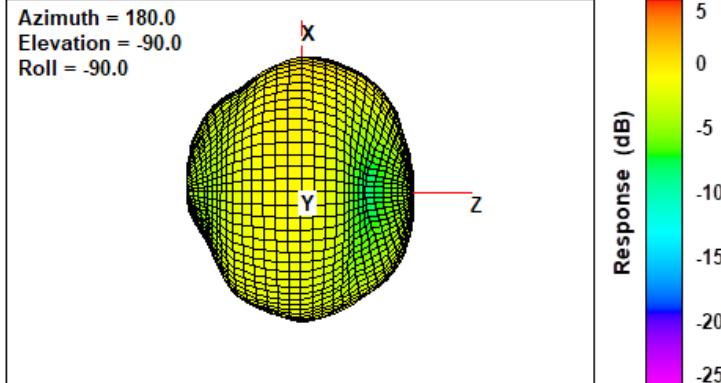
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

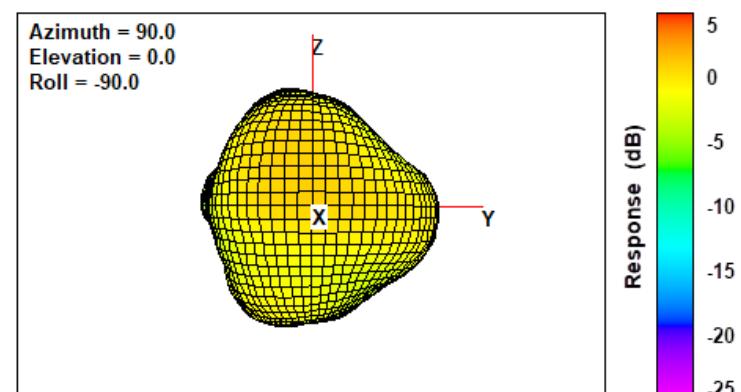
3D Radiation\_862MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

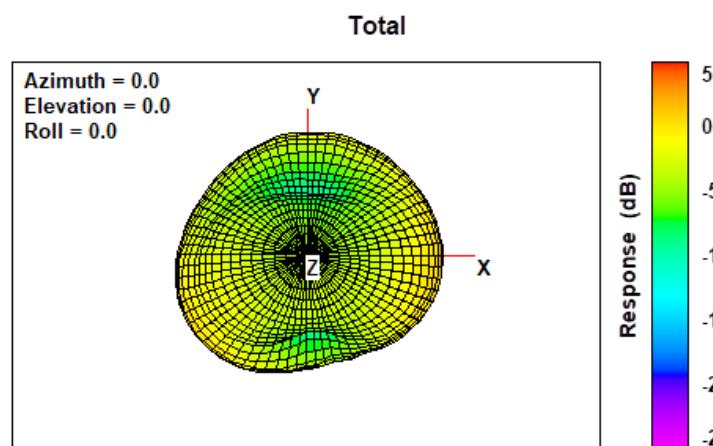
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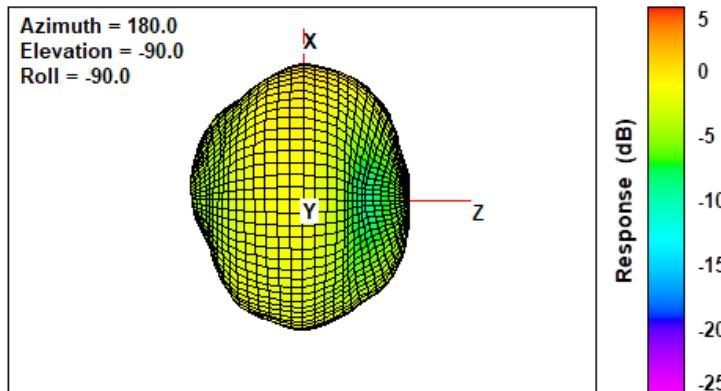
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

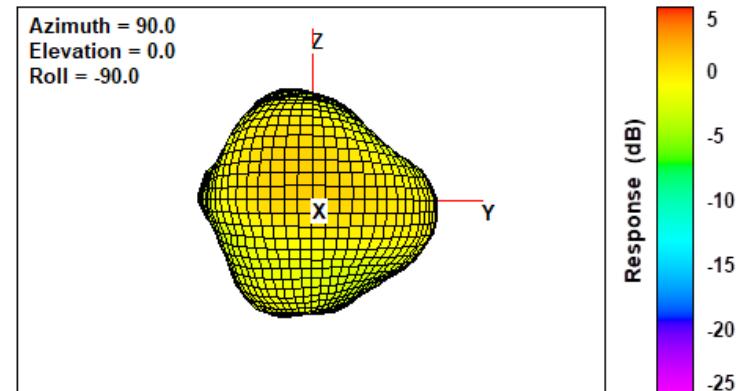
3D Radiation\_880MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

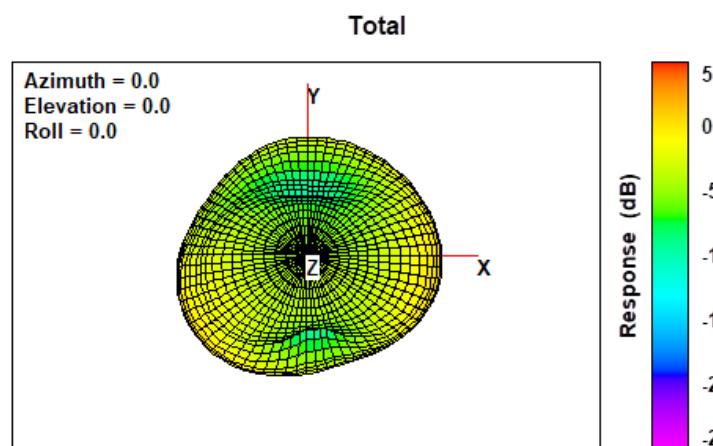
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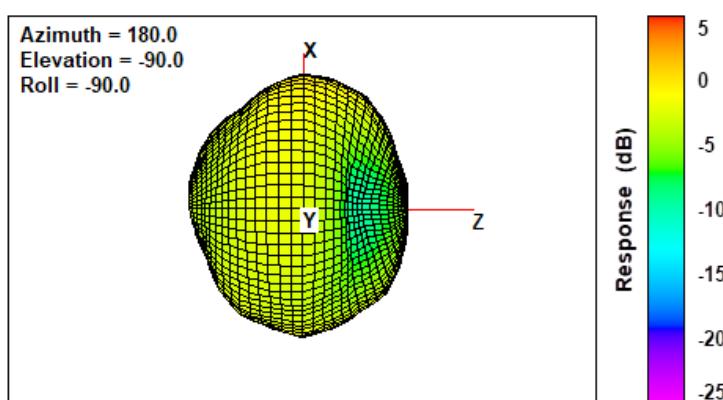
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Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

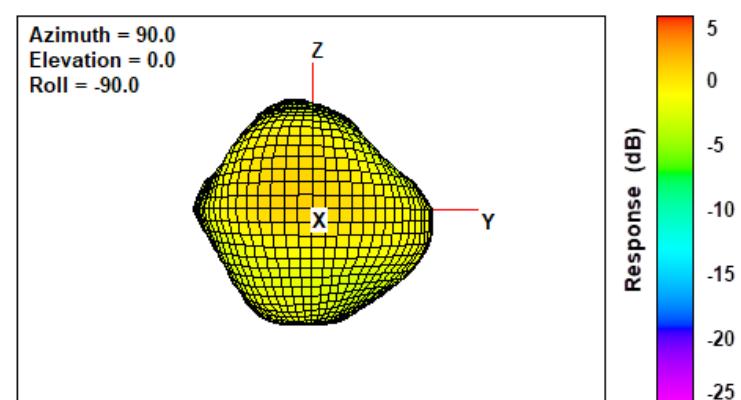
3D Radiation\_894MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

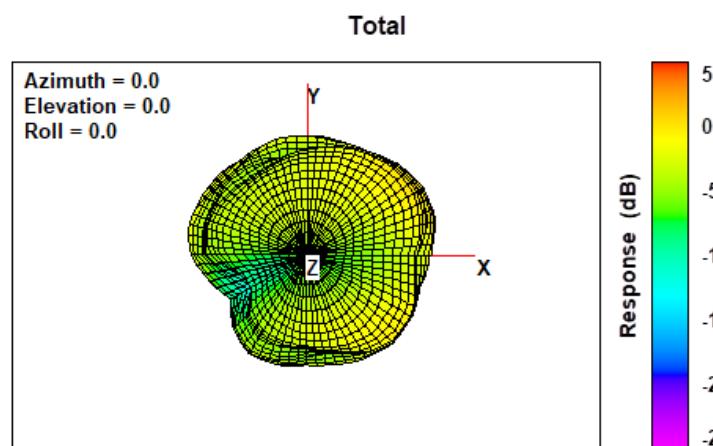
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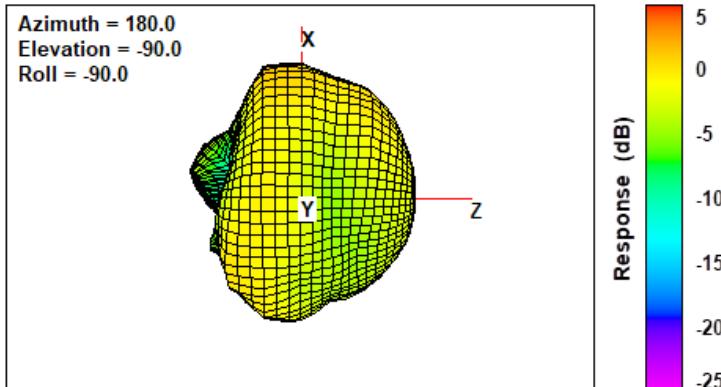
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Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

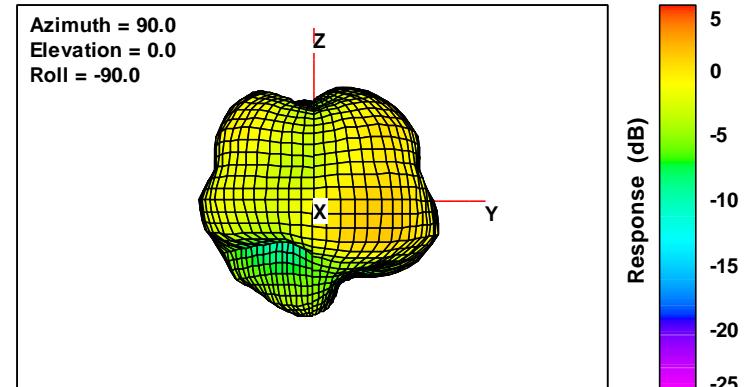
3D Radiation\_1710MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

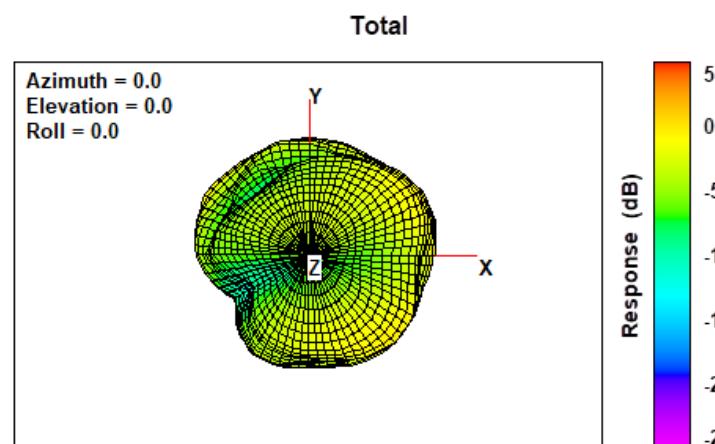
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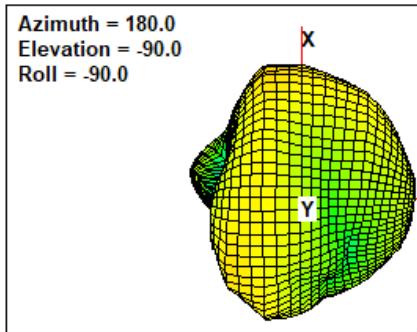
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

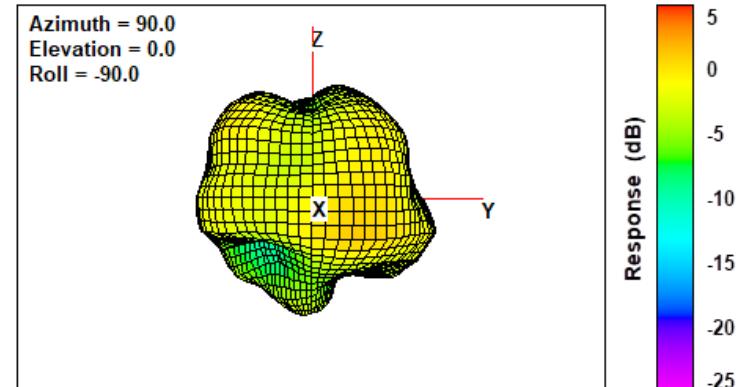
3D Radiation\_1750MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

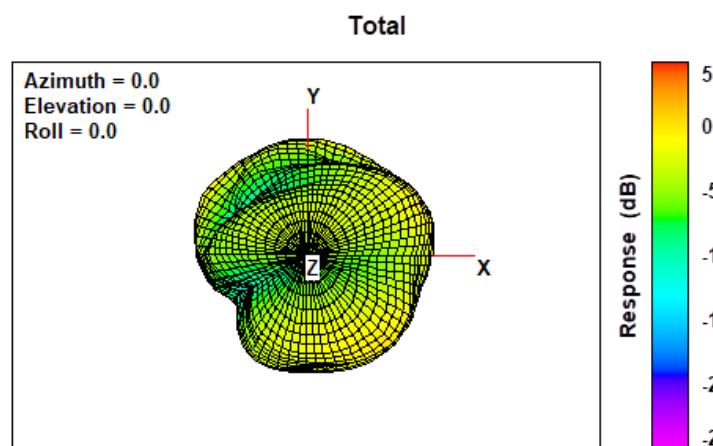
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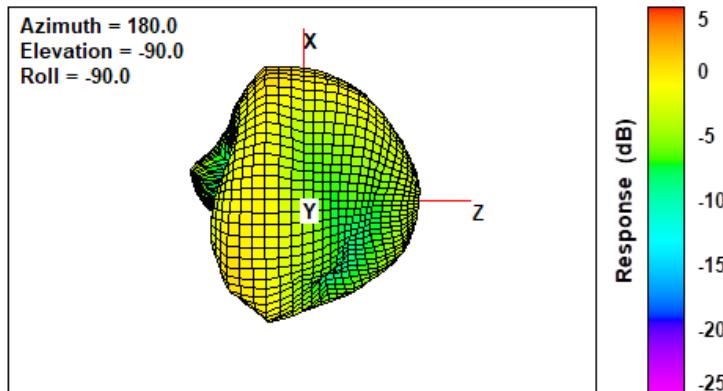
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

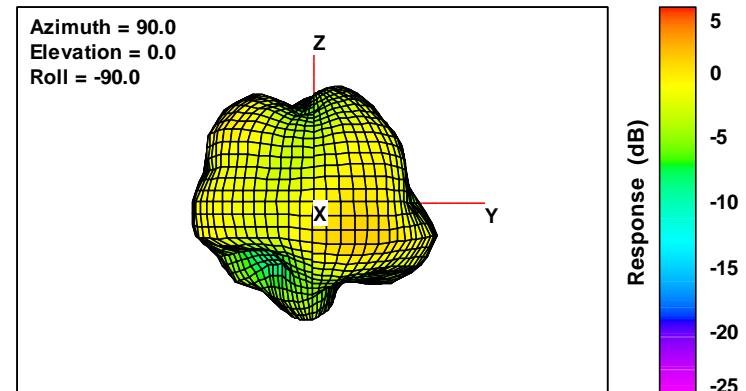
3D Radiation\_1780MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

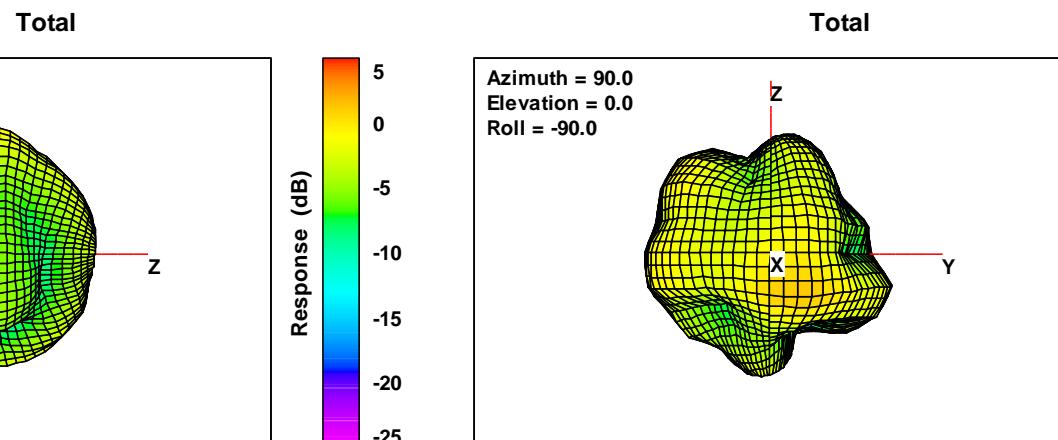
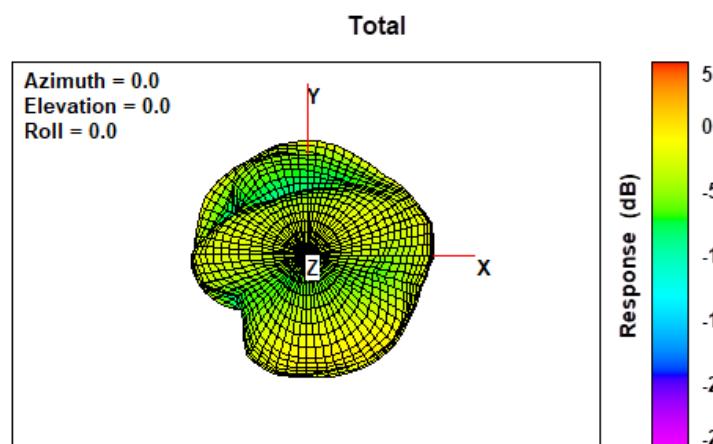
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Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

3D Radiation\_1850MHz [WWAN AUX]



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

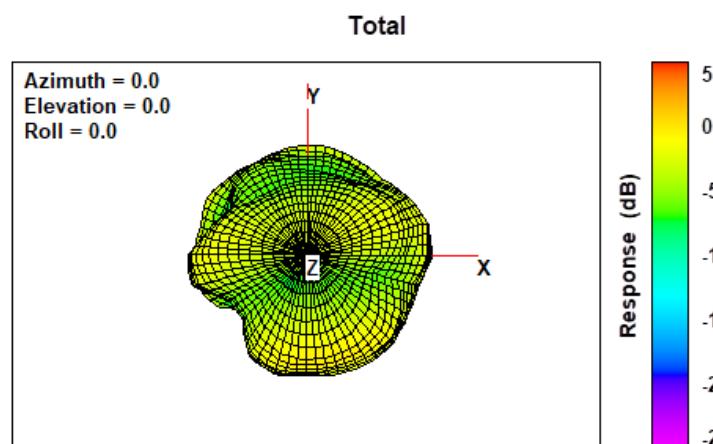
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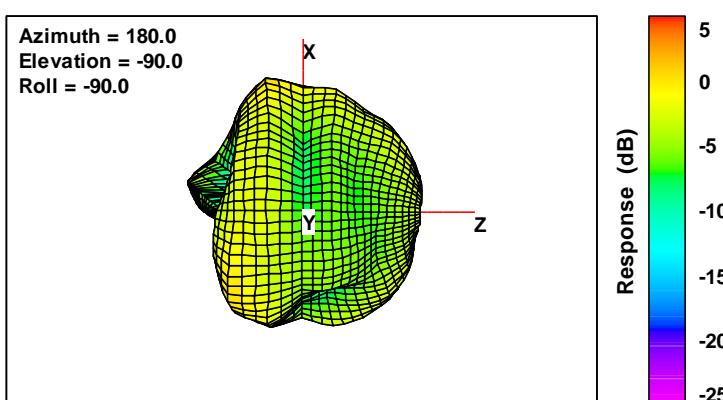
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

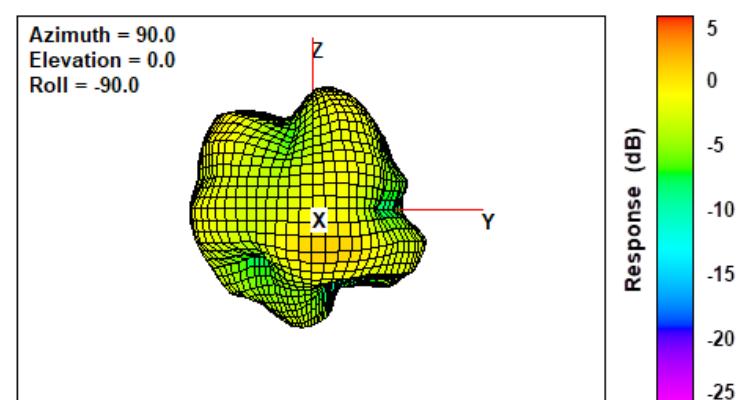
3D Radiation\_1880MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

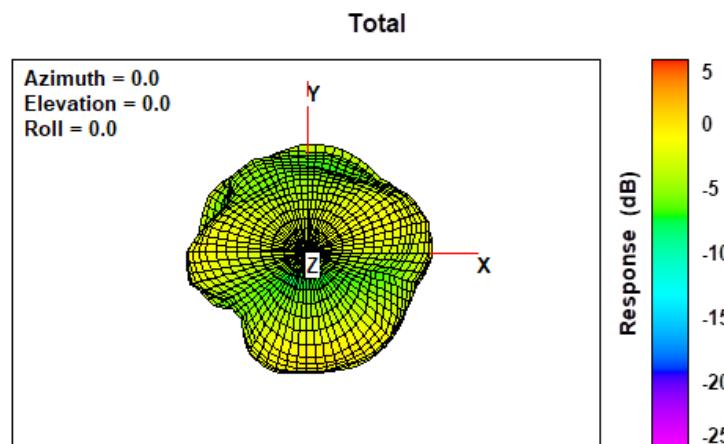
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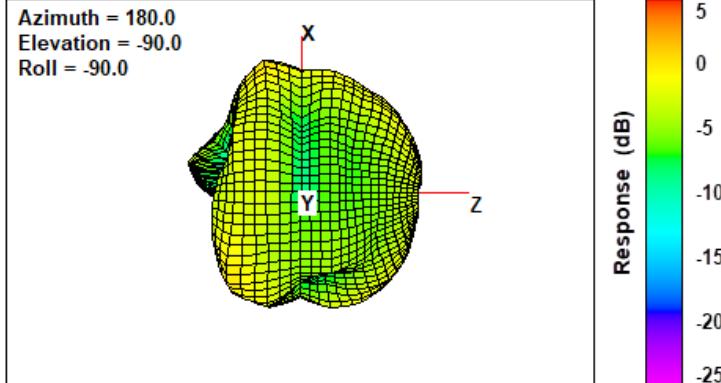
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

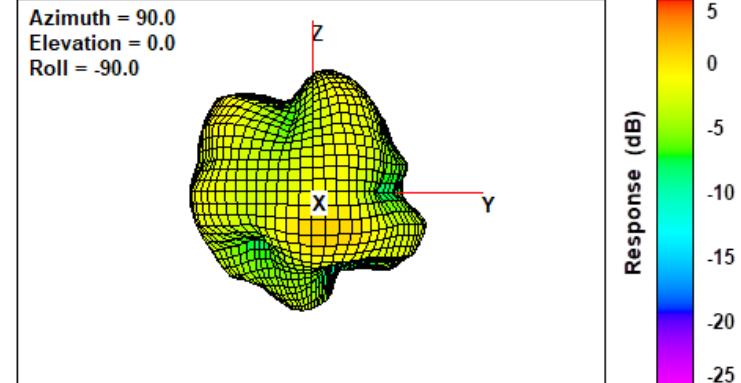
3D Radiation\_1900MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

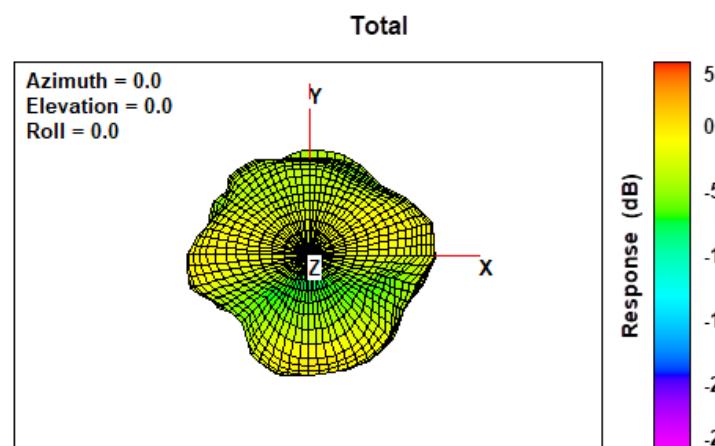
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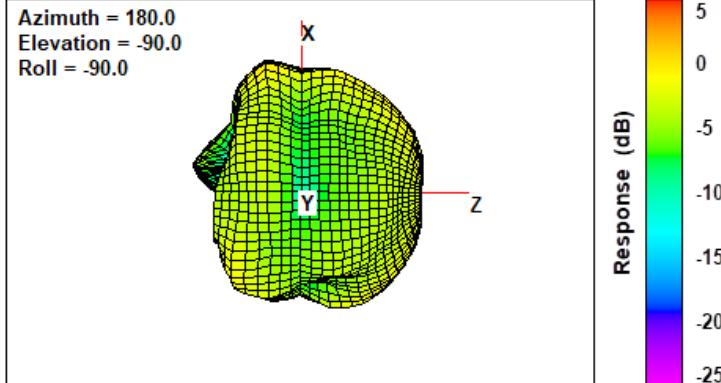
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

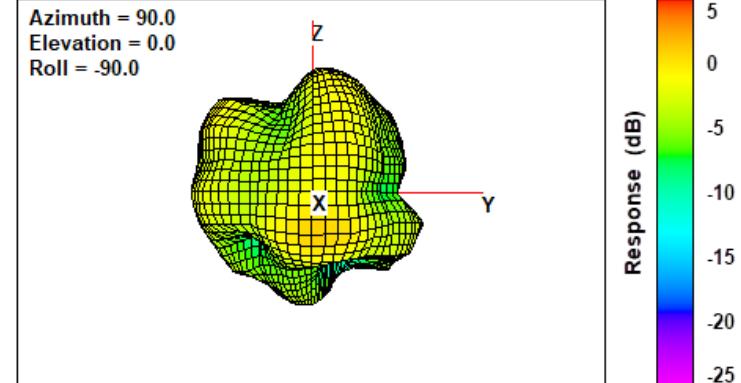
3D Radiation\_1930MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

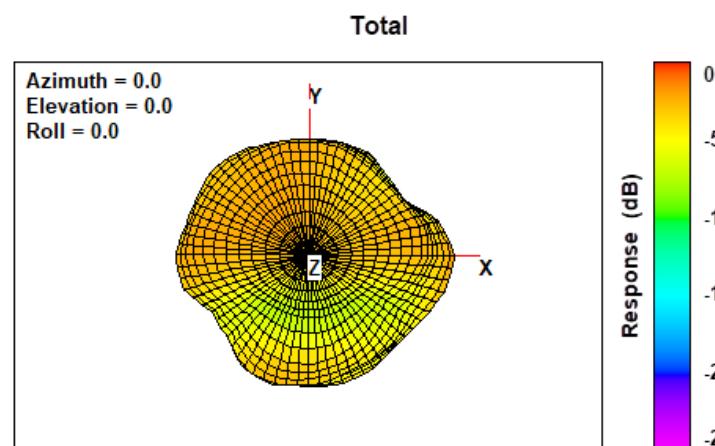
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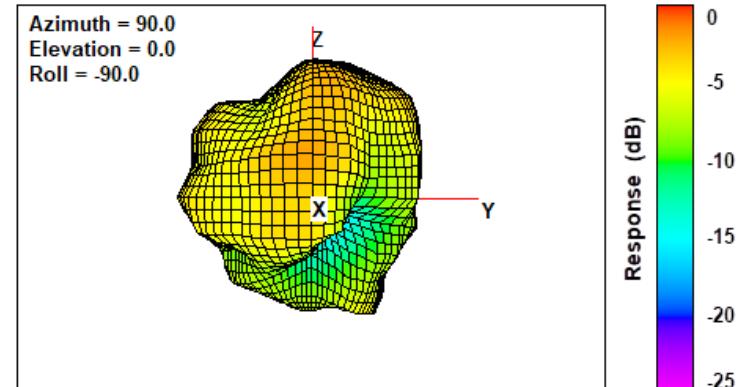
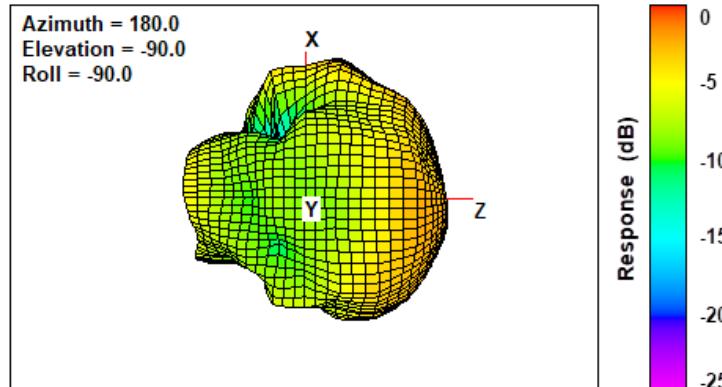
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

3D Radiation\_2010MHz [WWAN AUX]



**Total**      **Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

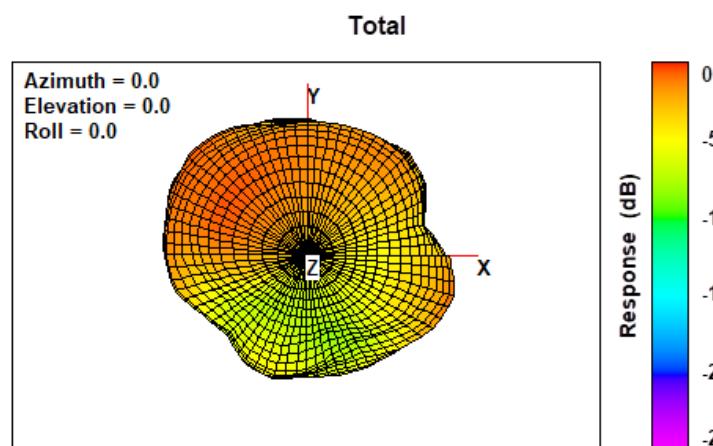
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Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

3D Radiation\_2140MHz [WWAN AUX]



**Total**

Azimuth = 180.0  
Elevation = -90.0  
Roll = -90.0

**Total**

Azimuth = 90.0  
Elevation = 0.0  
Roll = -90.0

Response (dB)

0  
-5  
-10  
-15  
-20  
-25

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

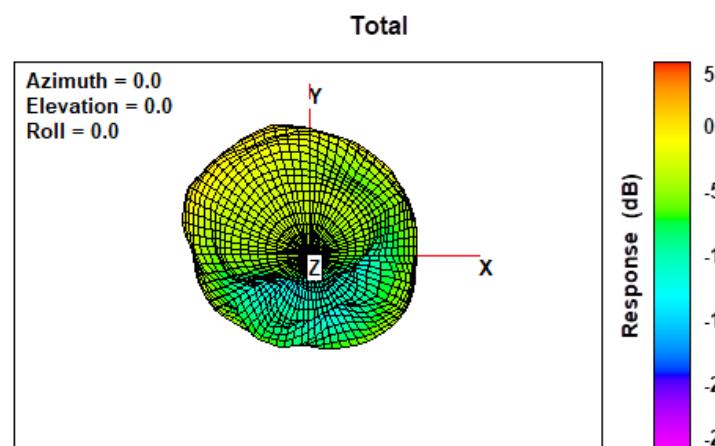
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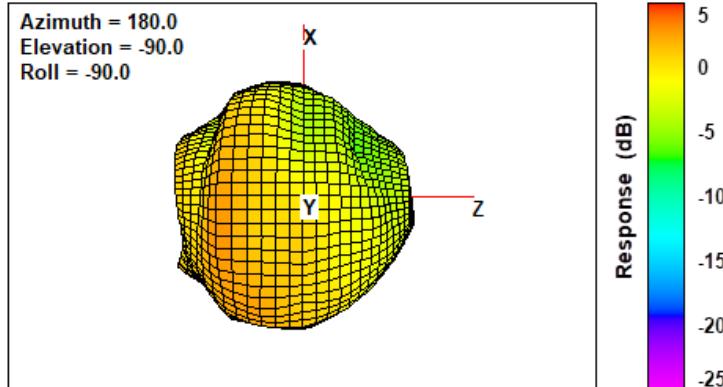
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

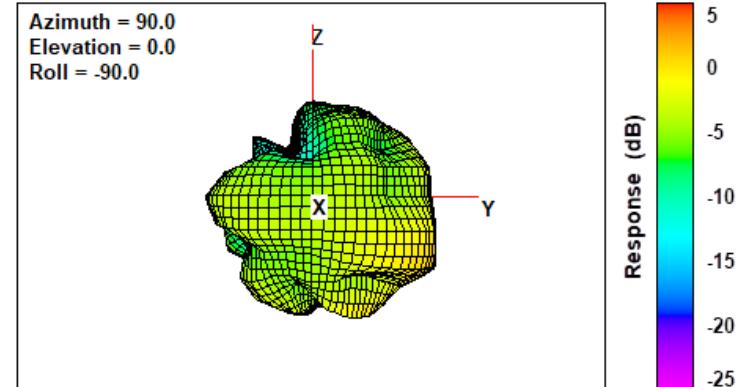
3D Radiation\_2300MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

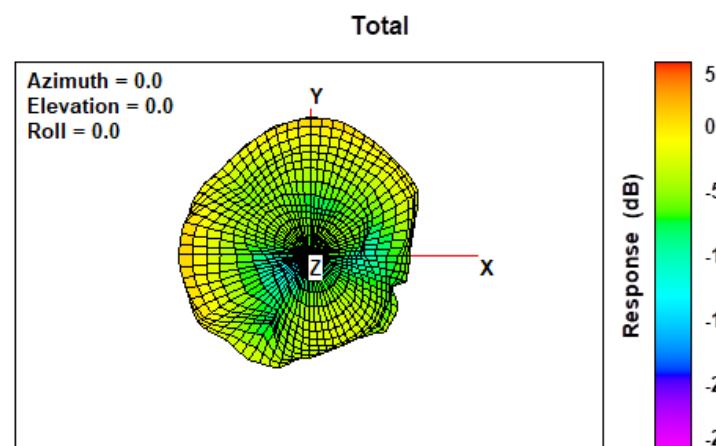
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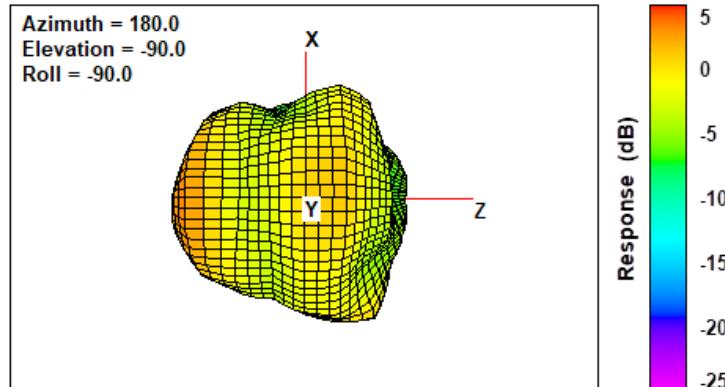
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

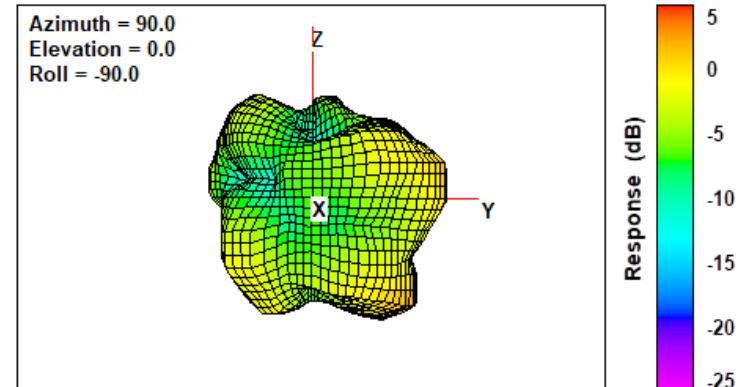
3D Radiation\_3500MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

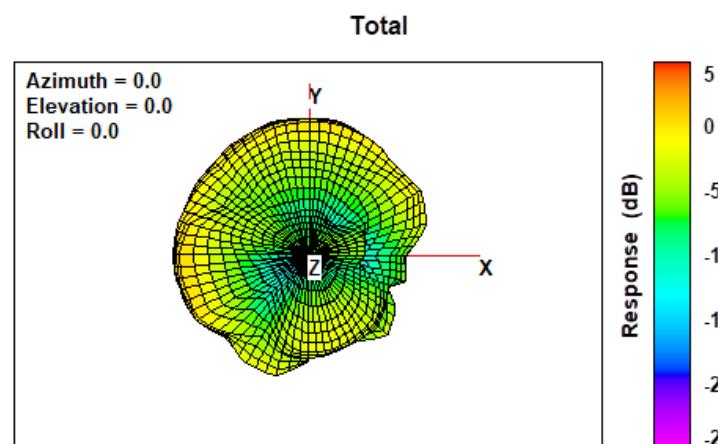
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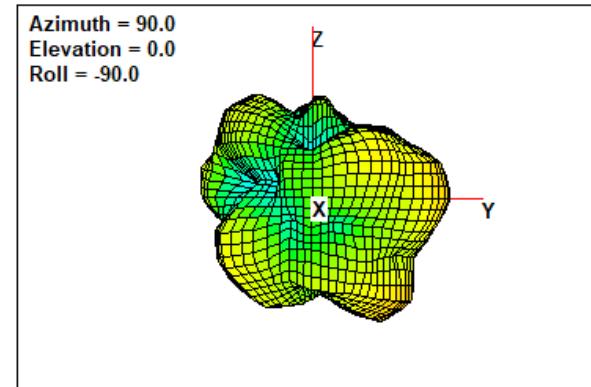
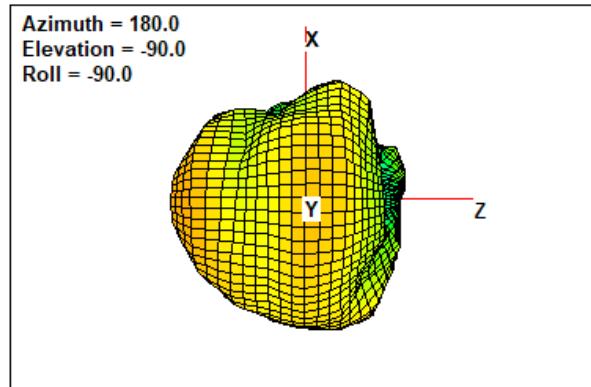
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

3D Radiation\_3600MHz [WWAN AUX]



**Total**      **Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

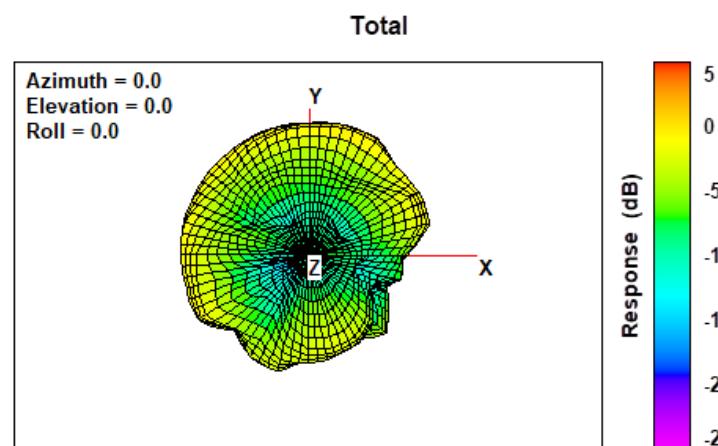
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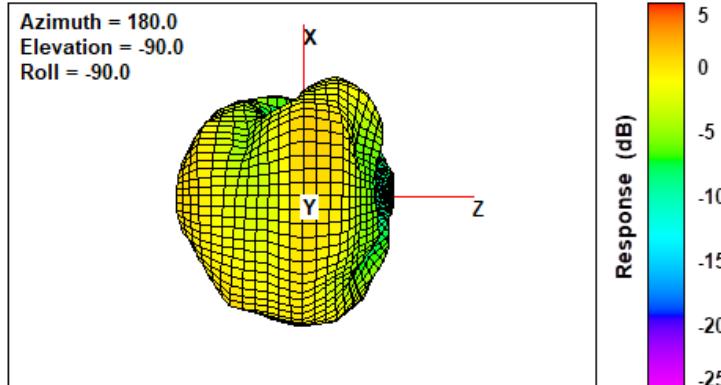
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

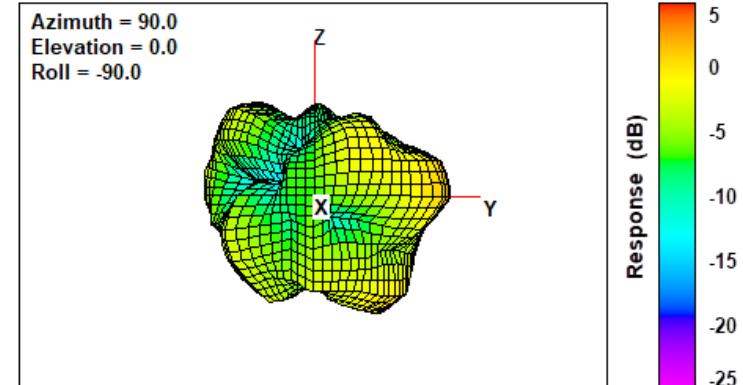
3D Radiation\_3700MHz [WWAN AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

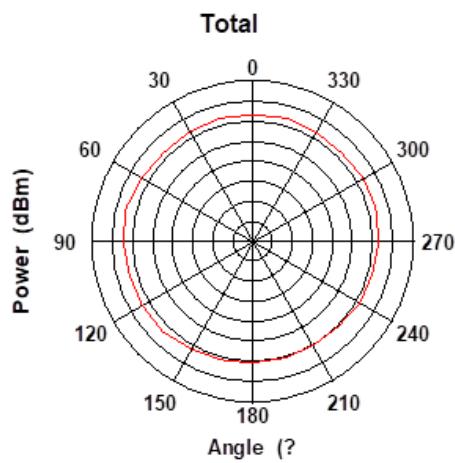
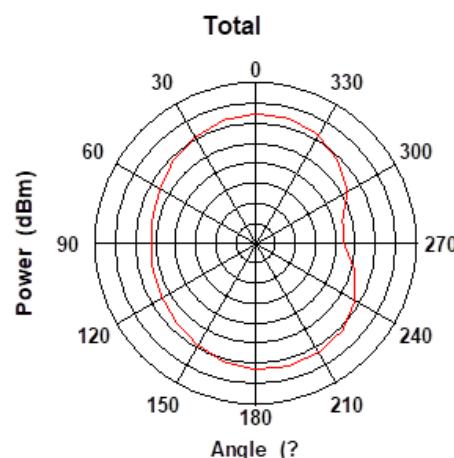
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Series: Swallowtail

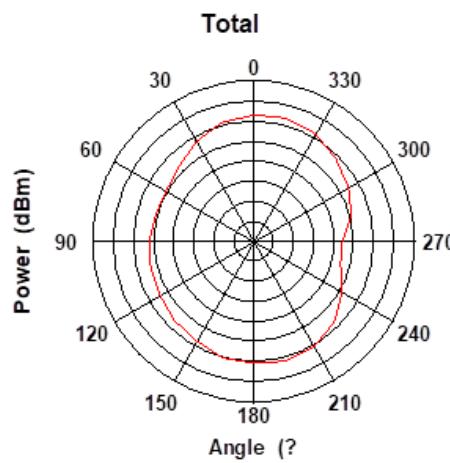
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_698MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

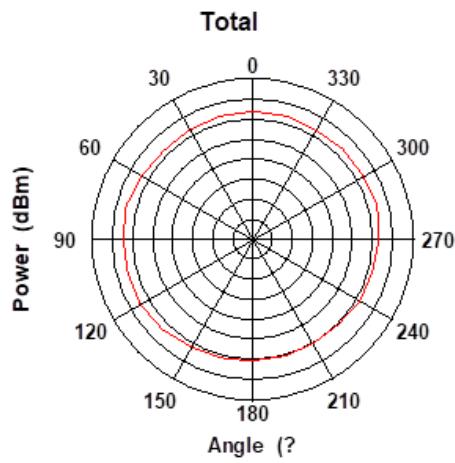
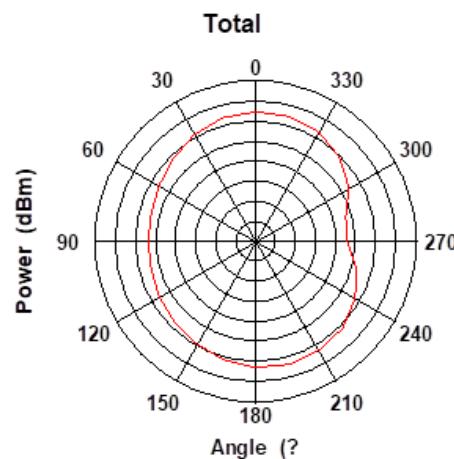
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Series: Swallowtail

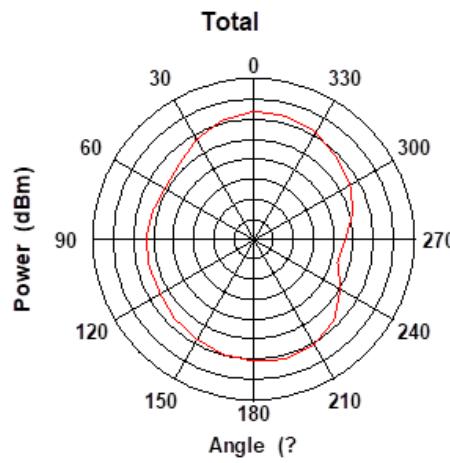
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_708MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

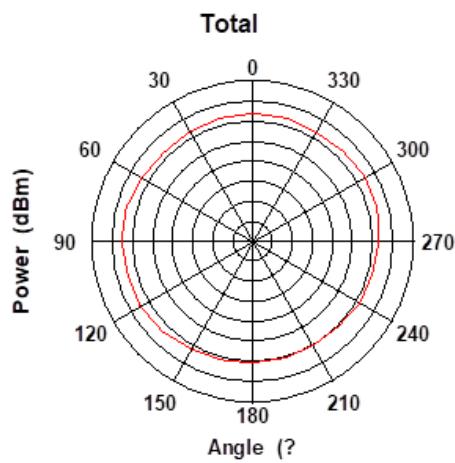
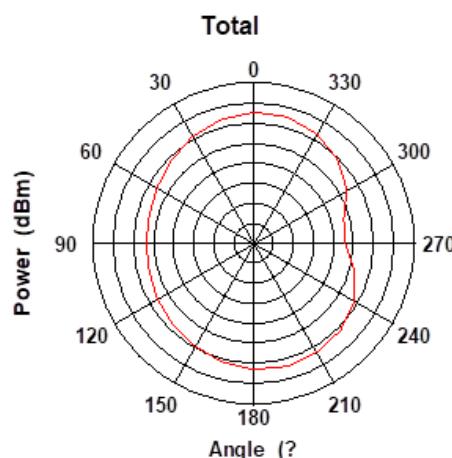
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Series: Swallowtail

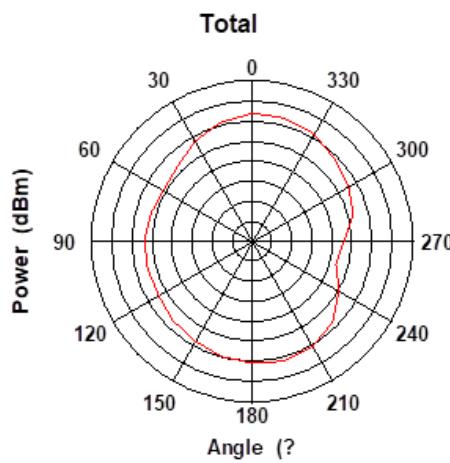
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_710MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

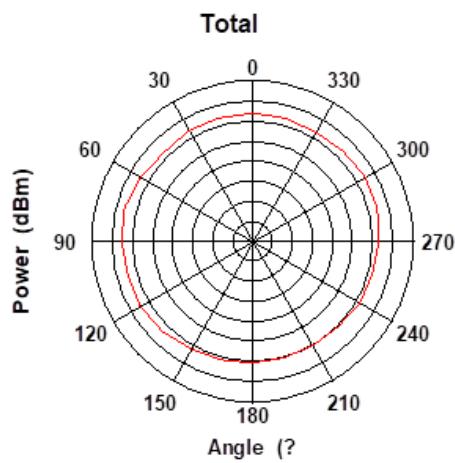
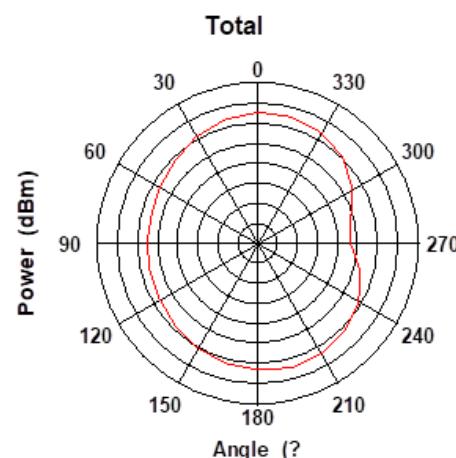
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Series: Swallowtail

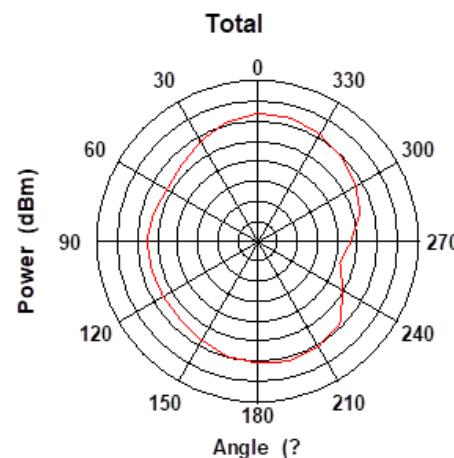
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_717MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

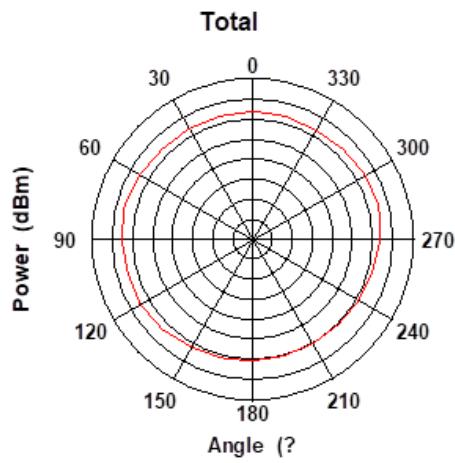
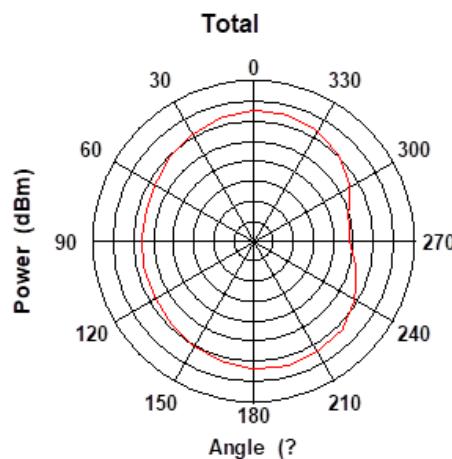
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Series: Swallowtail

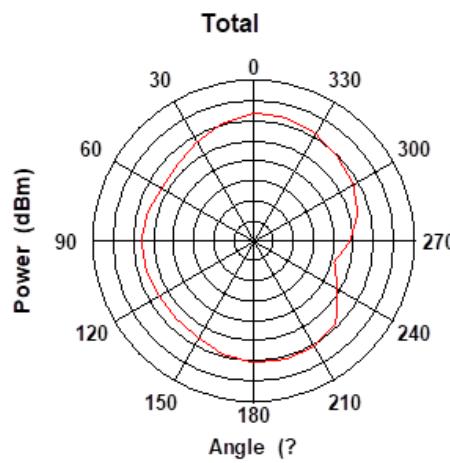
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_723MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

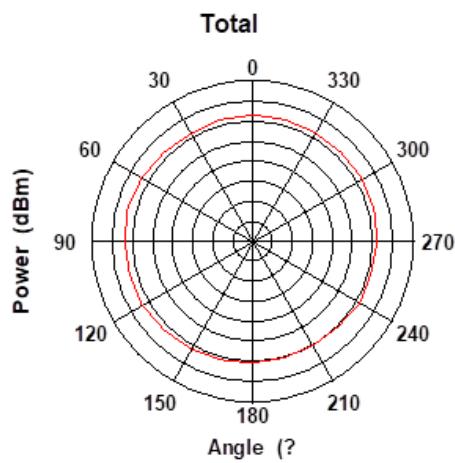
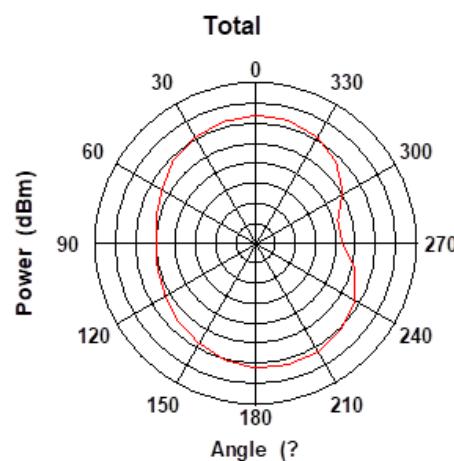
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Series: Swallowtail

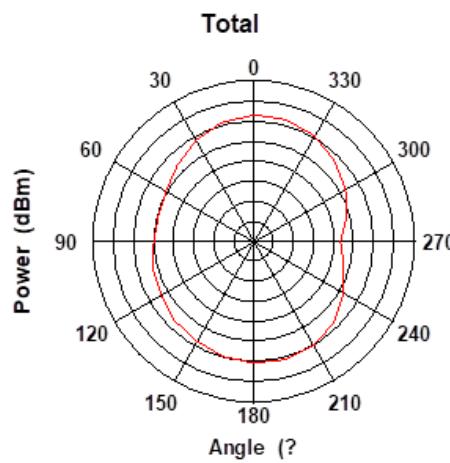
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_738MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

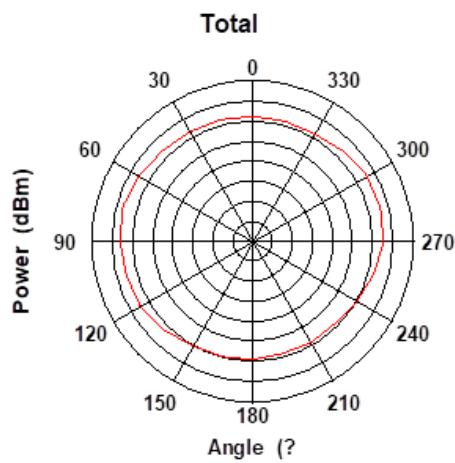
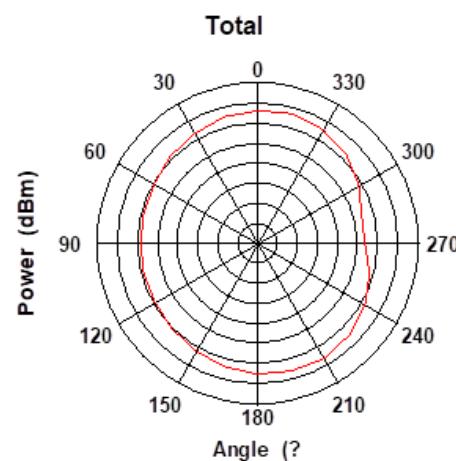
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Series: Swallowtail

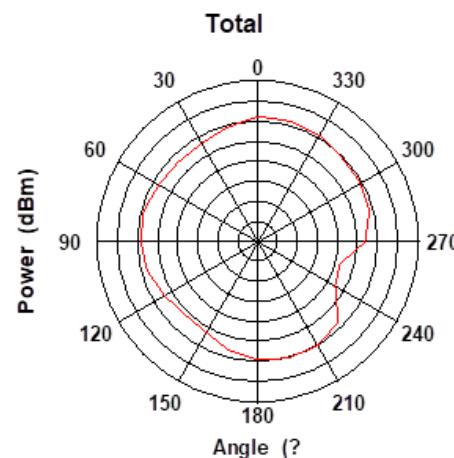
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_746MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

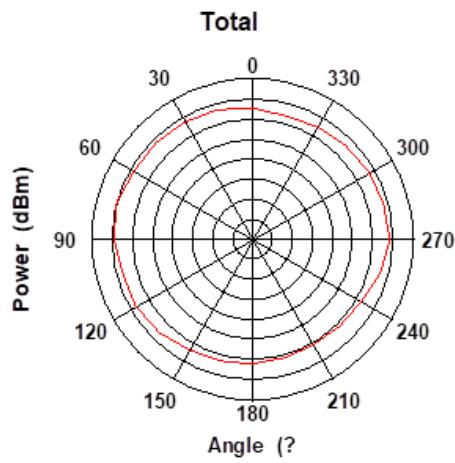
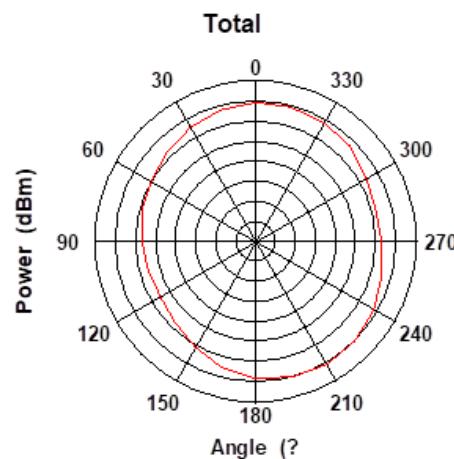
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Series: Swallowtail

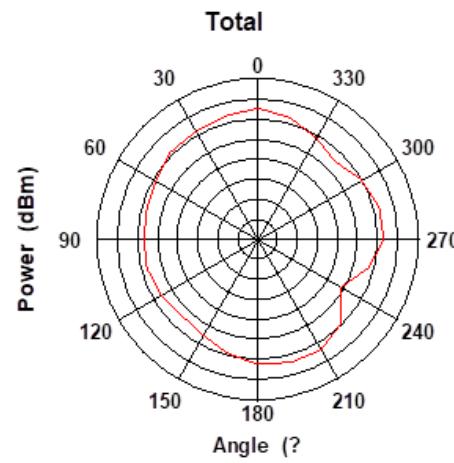
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_777MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

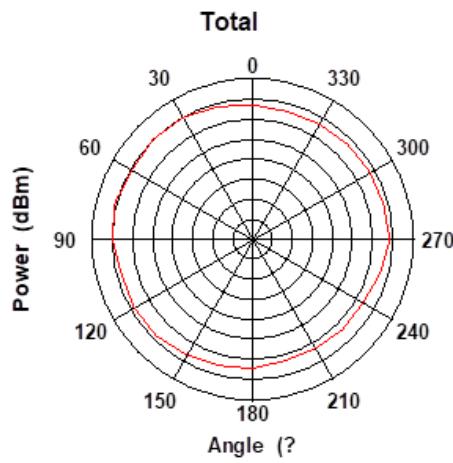
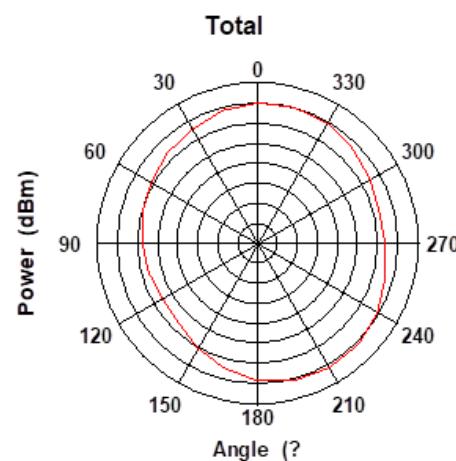
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Series: Swallowtail

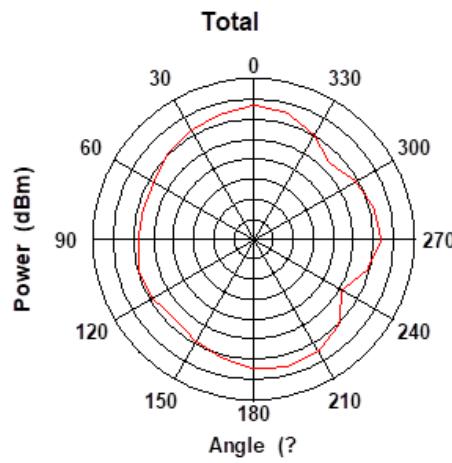
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_787MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

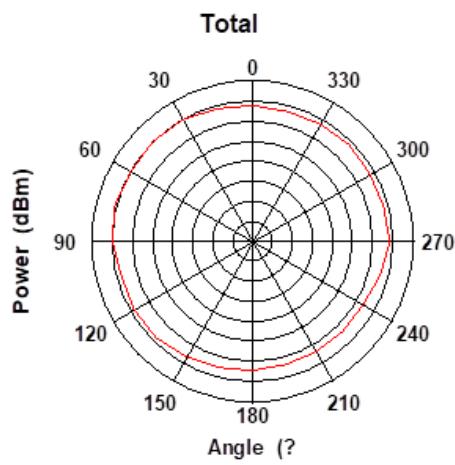
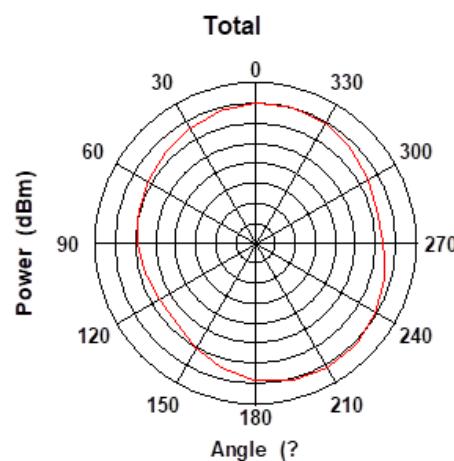
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Series: Swallowtail

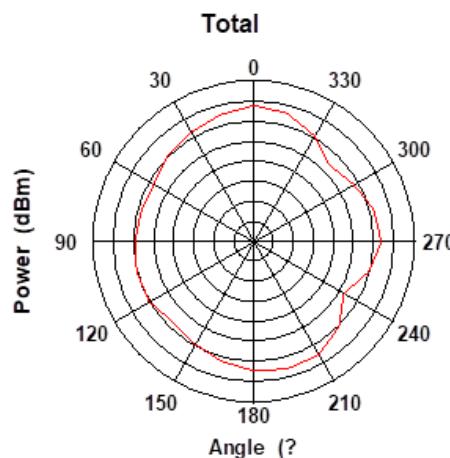
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_791MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

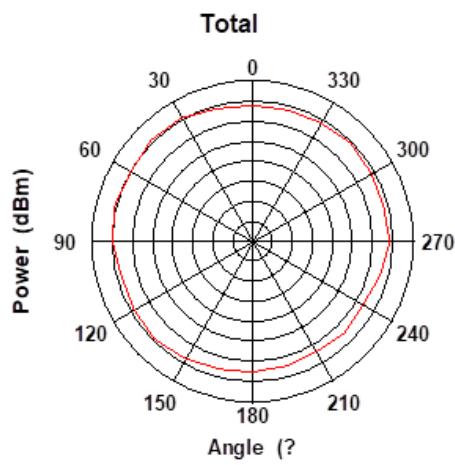
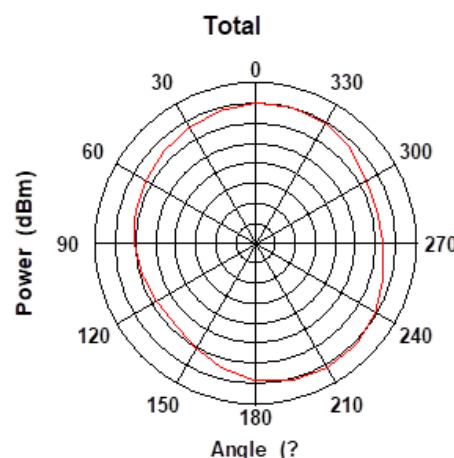
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Series: Swallowtail

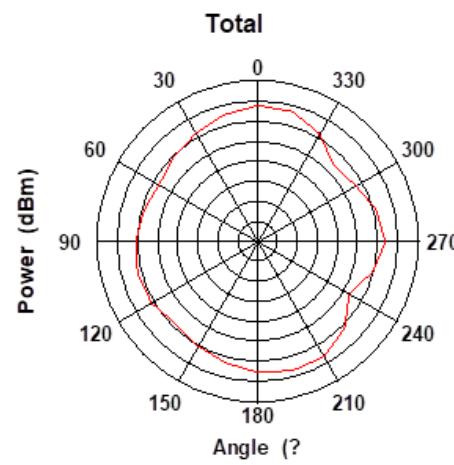
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_798MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

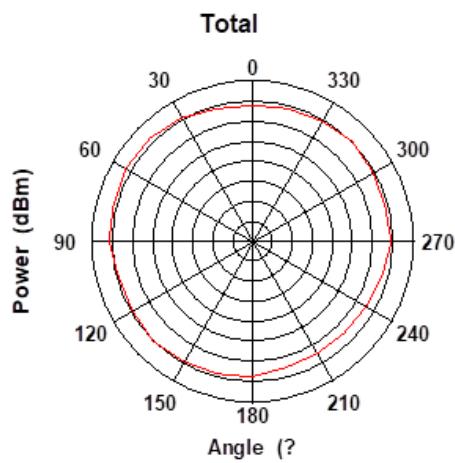
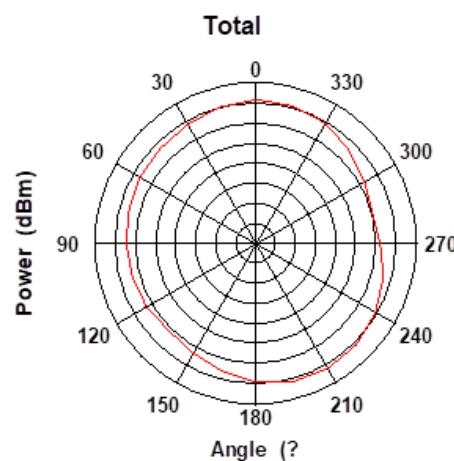
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Series: Swallowtail

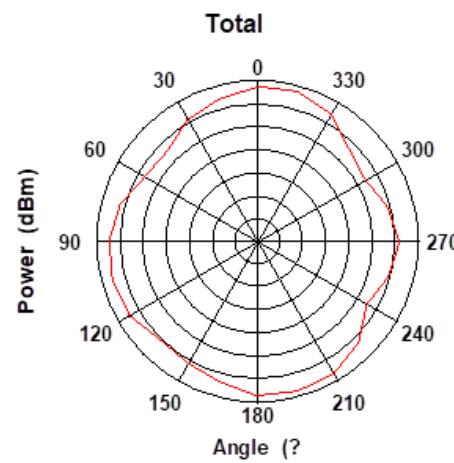
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_824MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

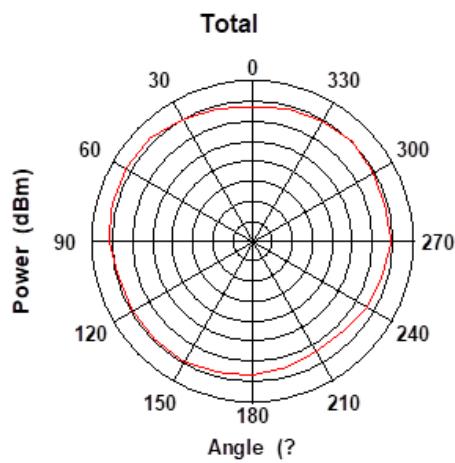
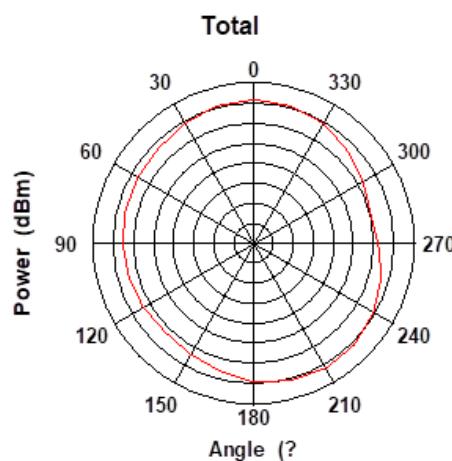
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Series: Swallowtail

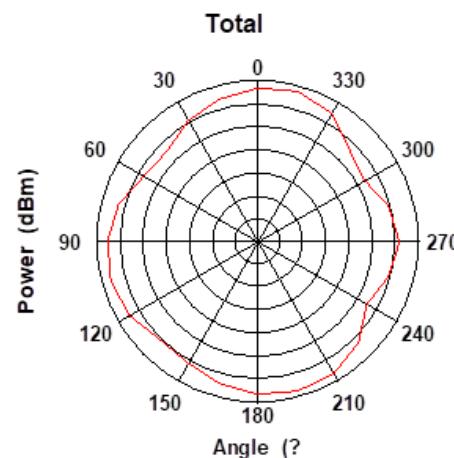
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_830MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

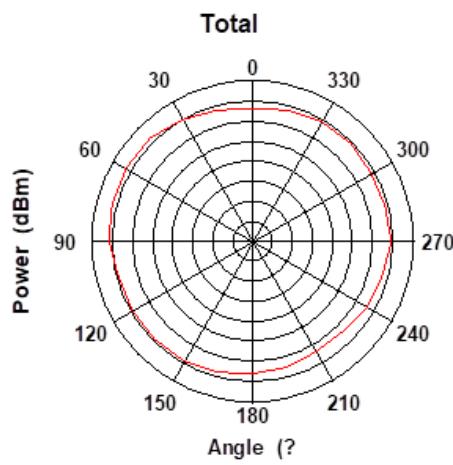
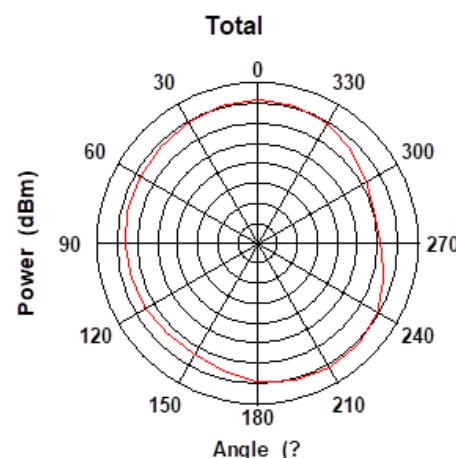
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Series: Swallowtail

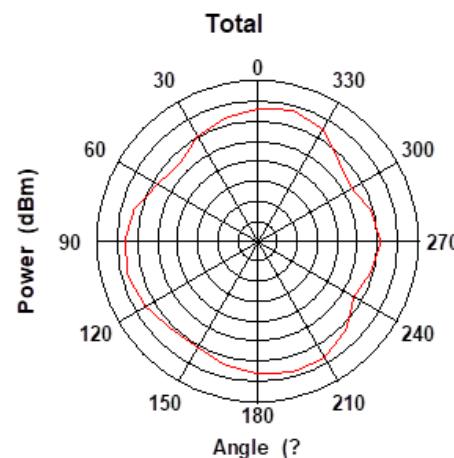
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_837MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

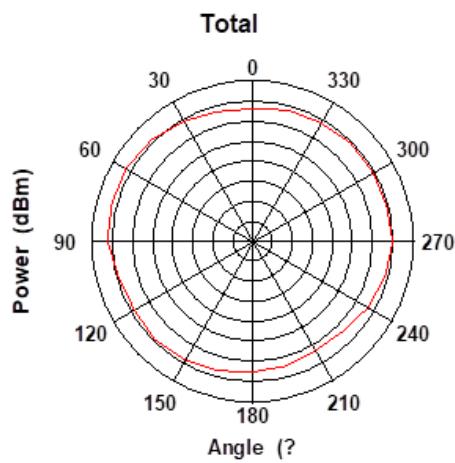
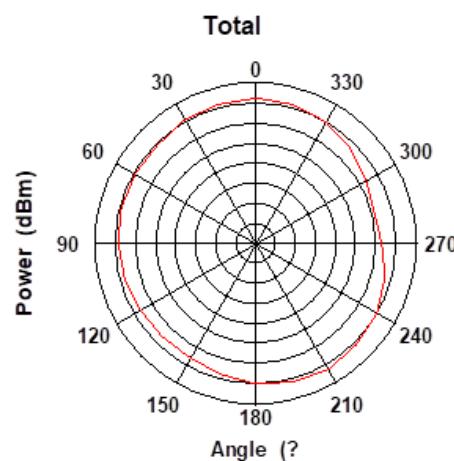
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Series: Swallowtail

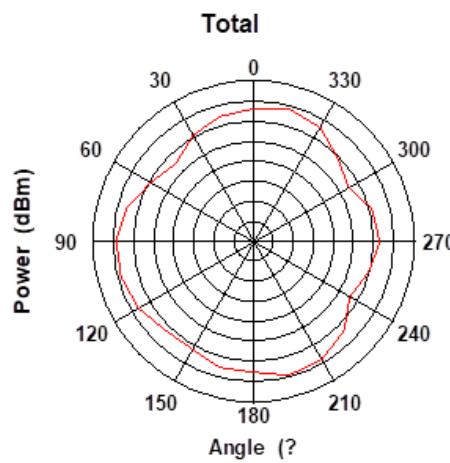
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_845MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

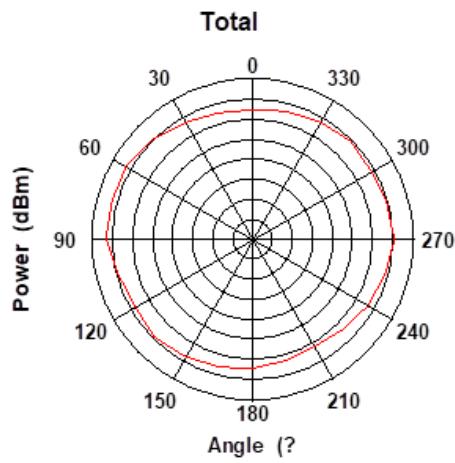
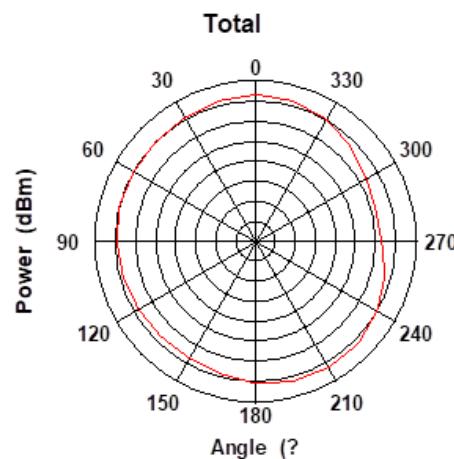
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Series: Swallowtail

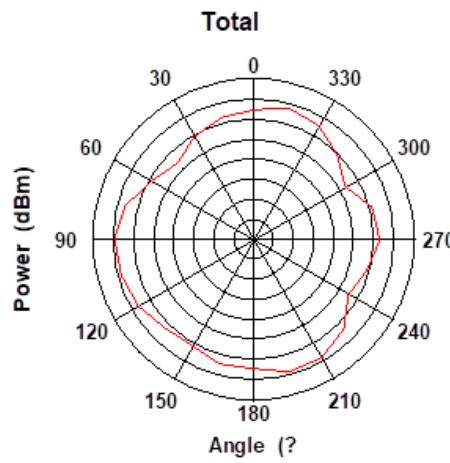
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_859MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

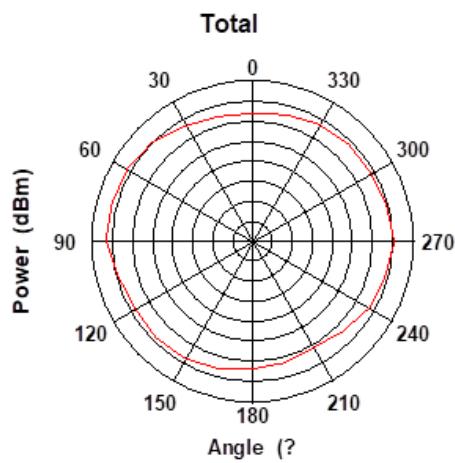
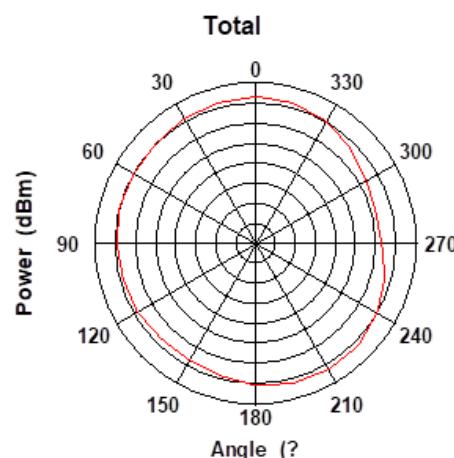
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Series: Swallowtail

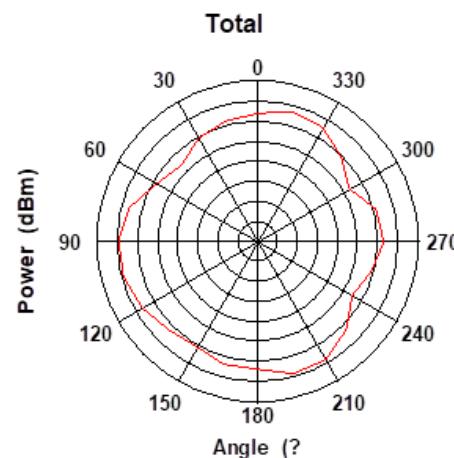
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_862MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

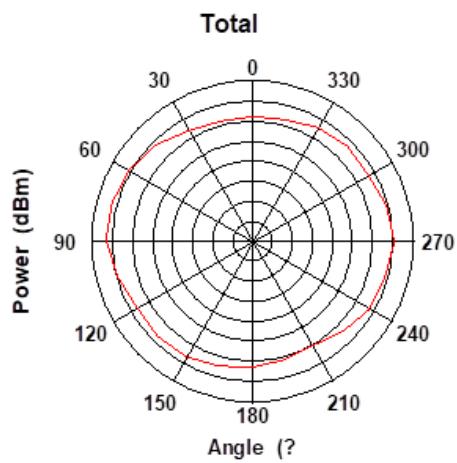
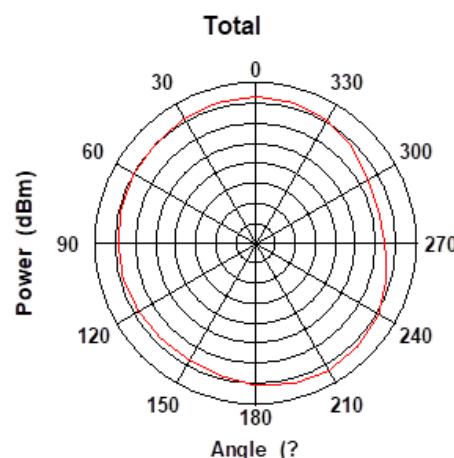
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Series: Swallowtail

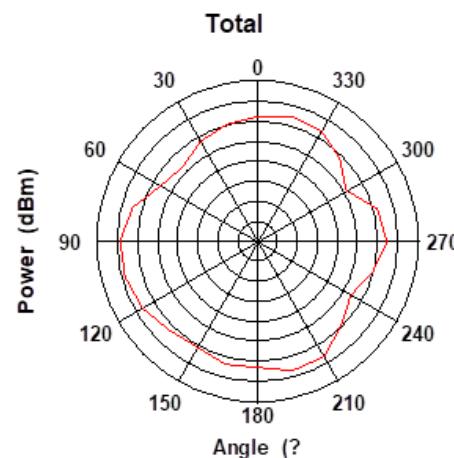
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_880MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

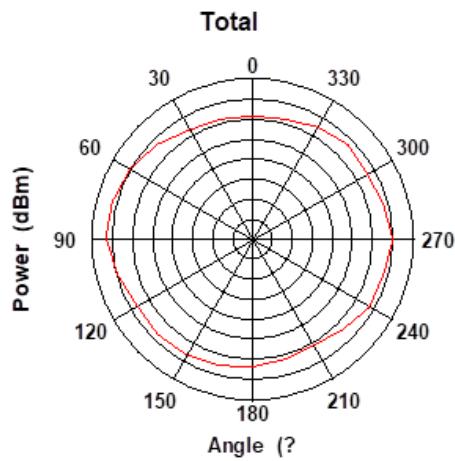
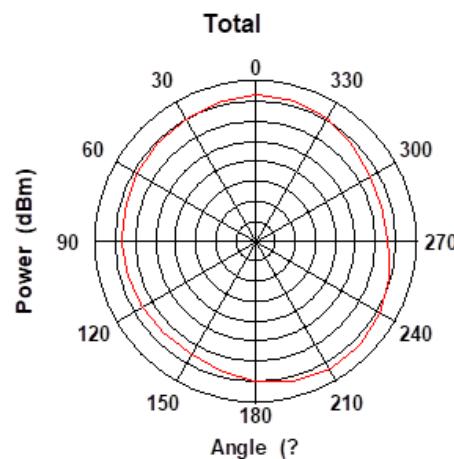
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Series: Swallowtail

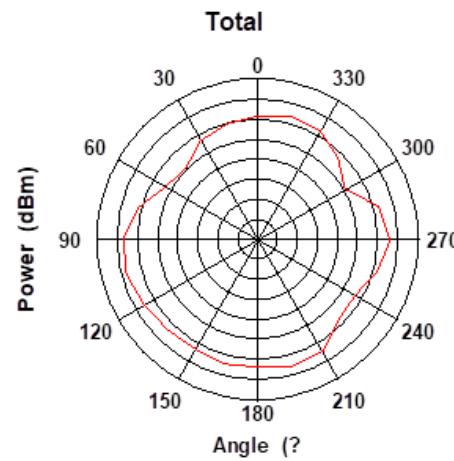
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_894MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

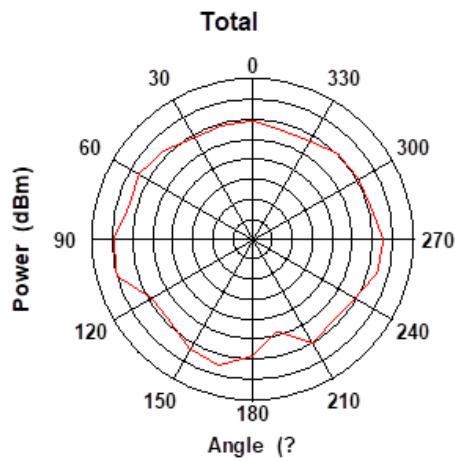
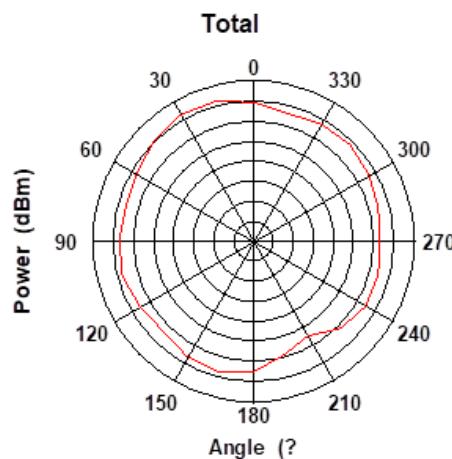
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Series: Swallowtail

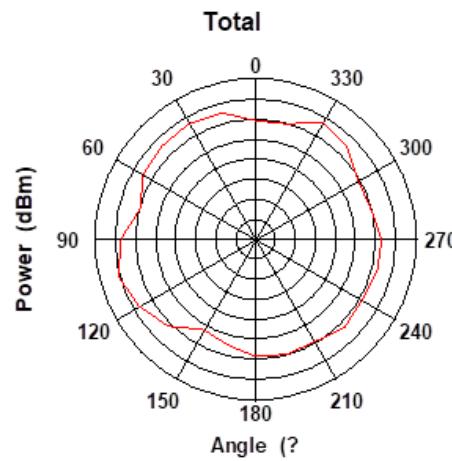
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_1710MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

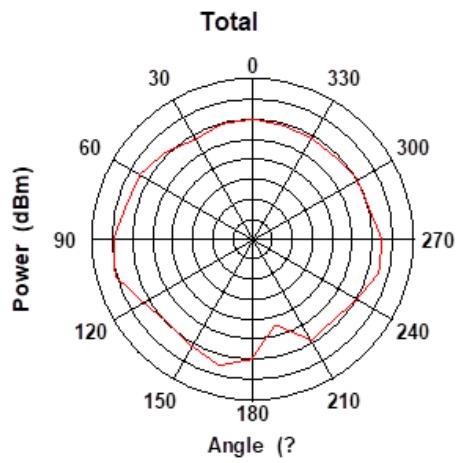
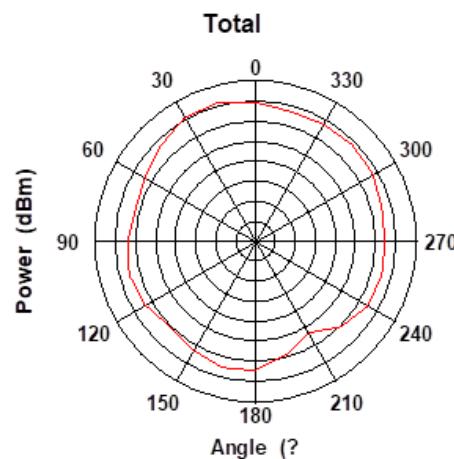
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Series: Swallowtail

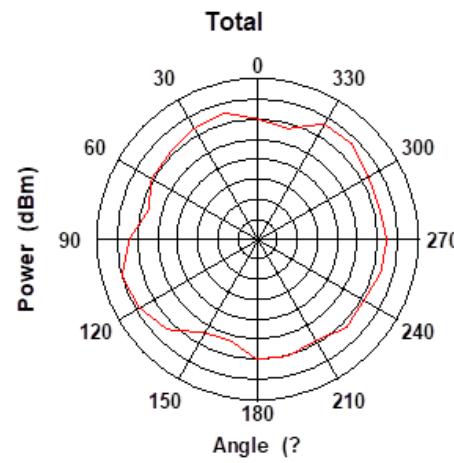
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_1750MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

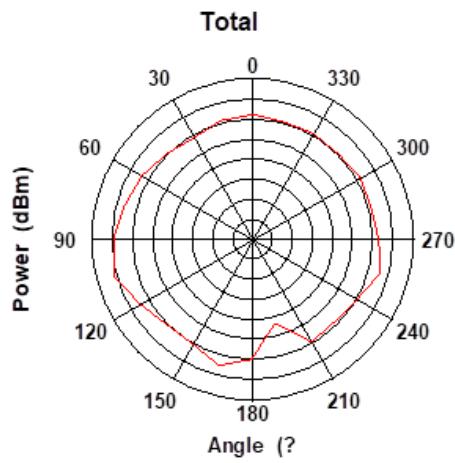
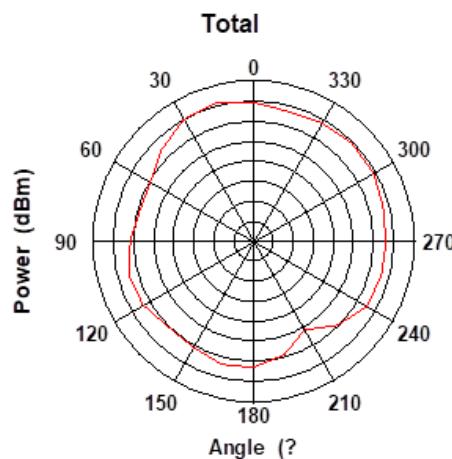
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Series: Swallowtail

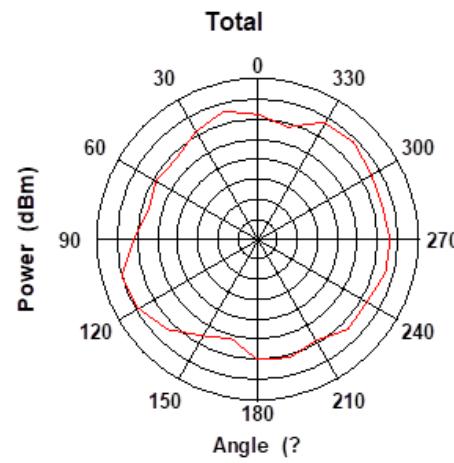
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_1780MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

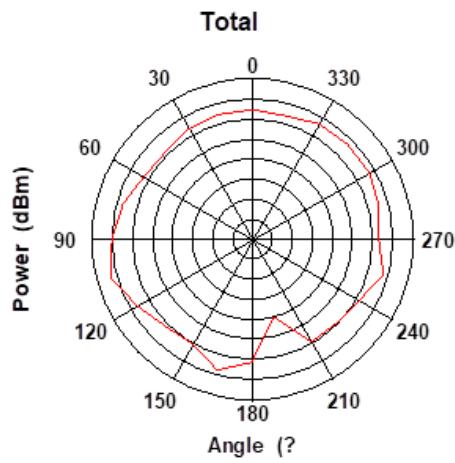
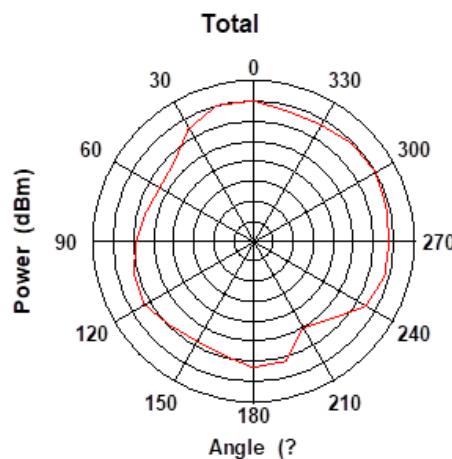
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Series: Swallowtail

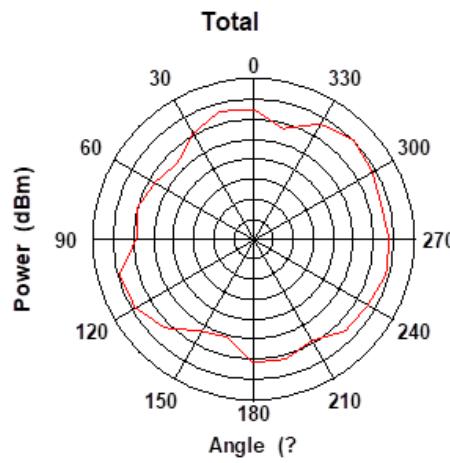
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_1850MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

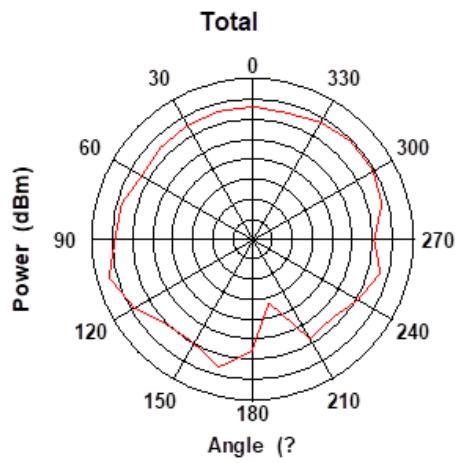
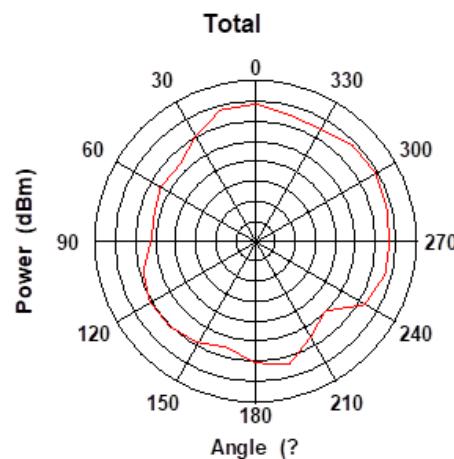
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Series: Swallowtail

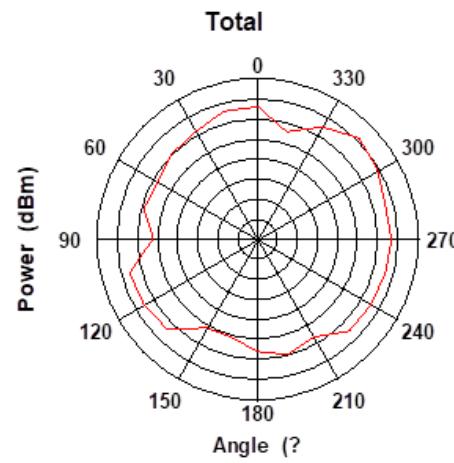
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_1880MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

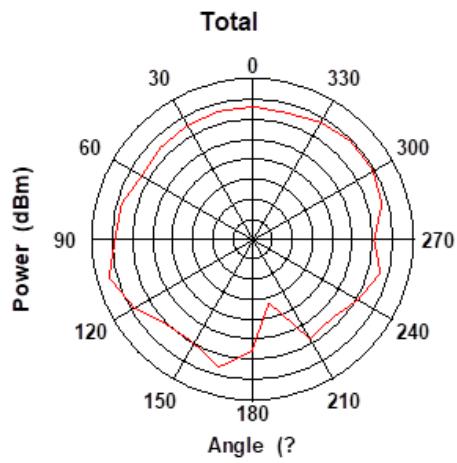
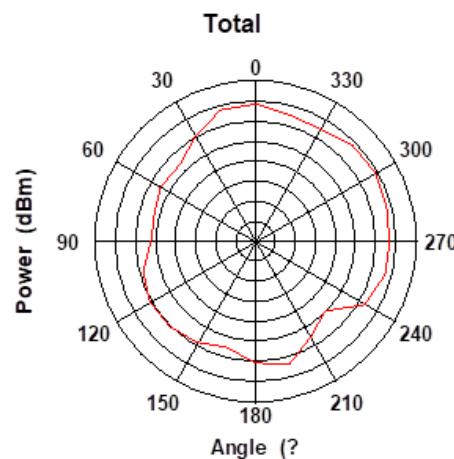
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Series: Swallowtail

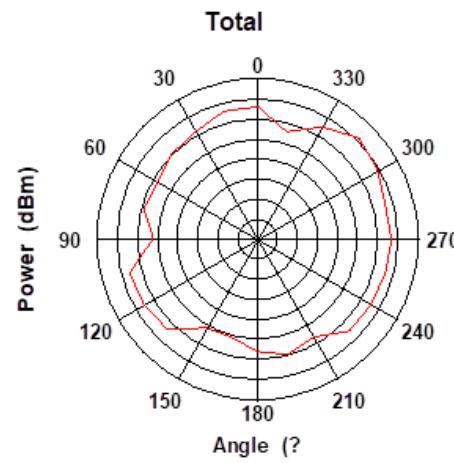
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_1900MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

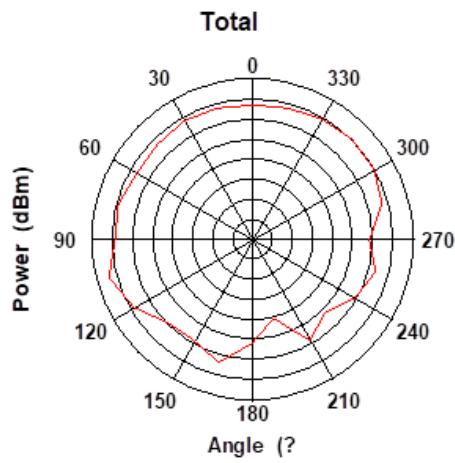
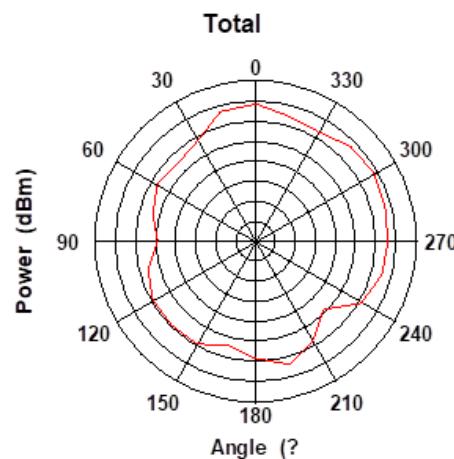
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Series: Swallowtail

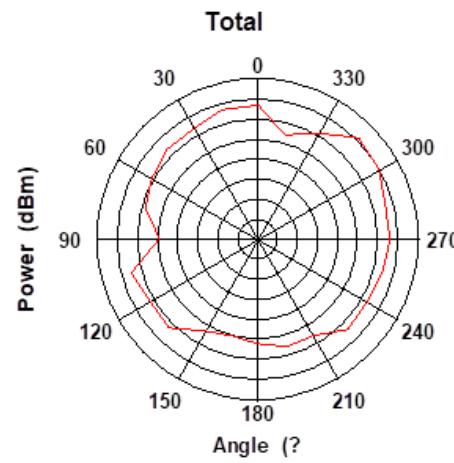
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_1930MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

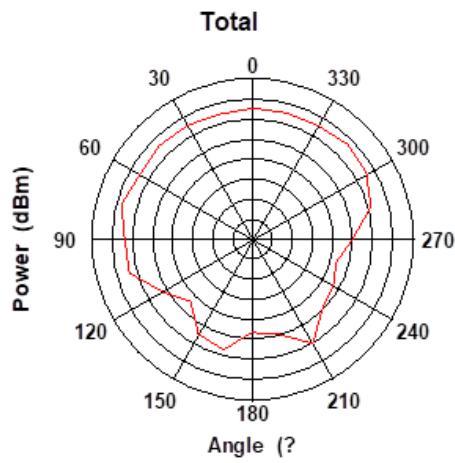
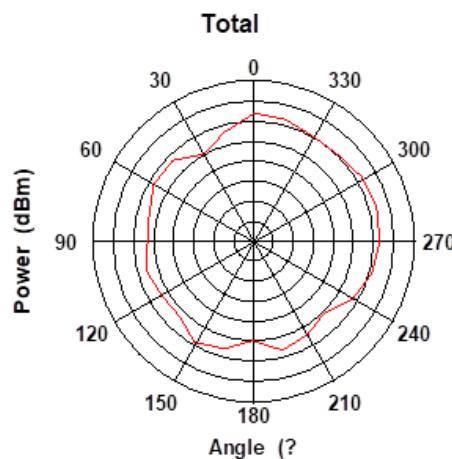
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Series: Swallowtail

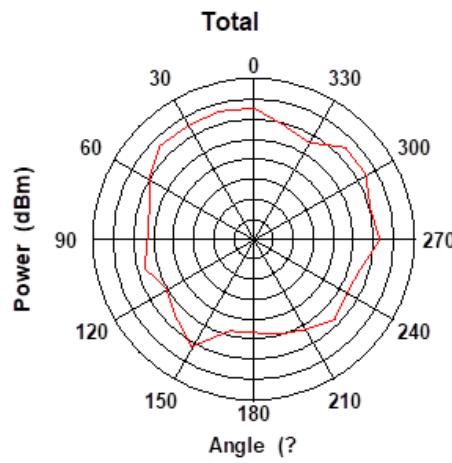
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_2010MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

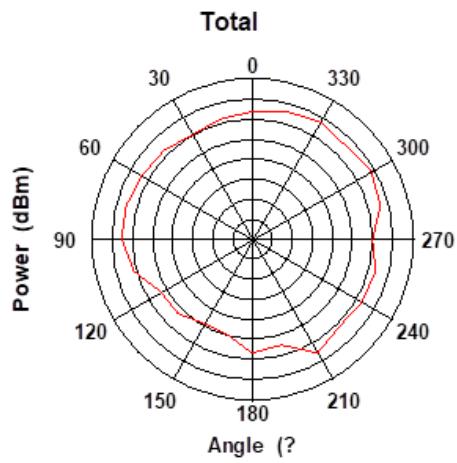
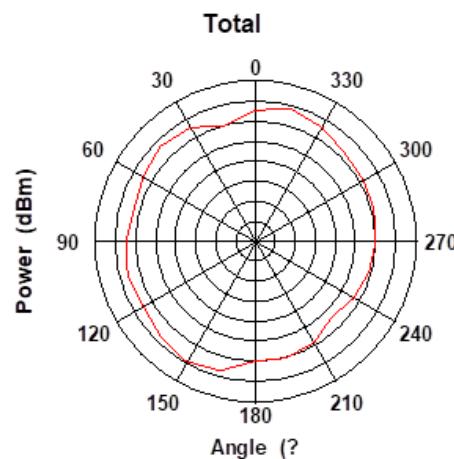
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Series: Swallowtail

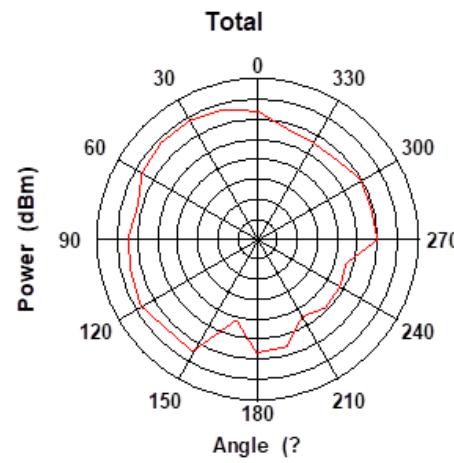
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_2140MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

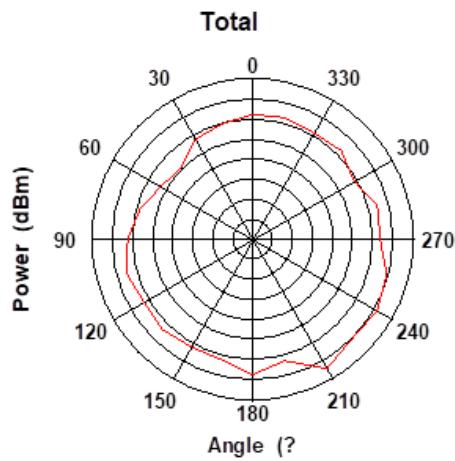
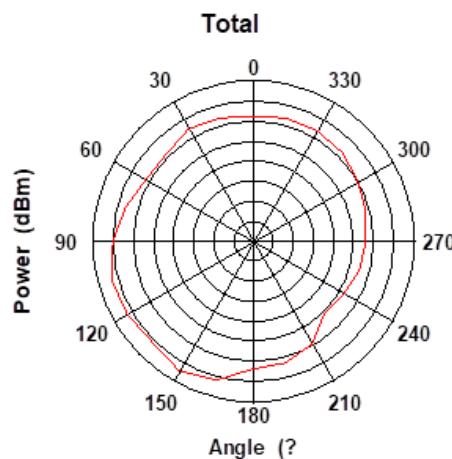
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Series: Swallowtail

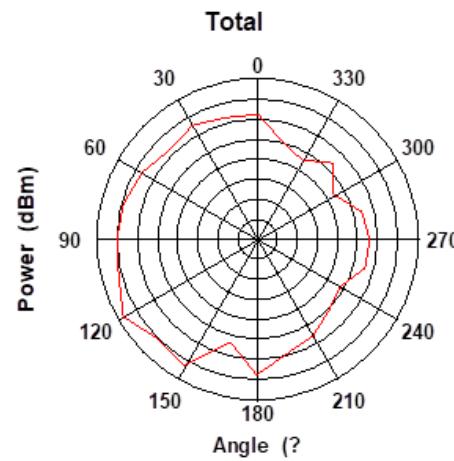
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_2300MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

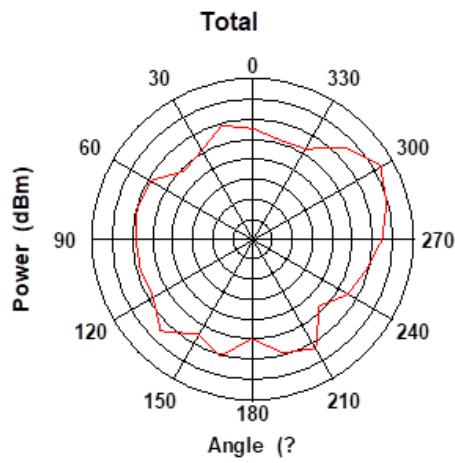
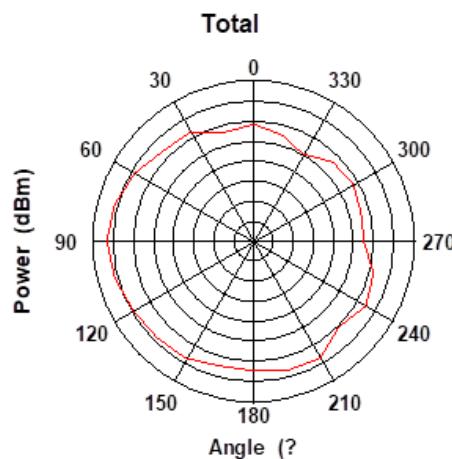
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Series: Swallowtail

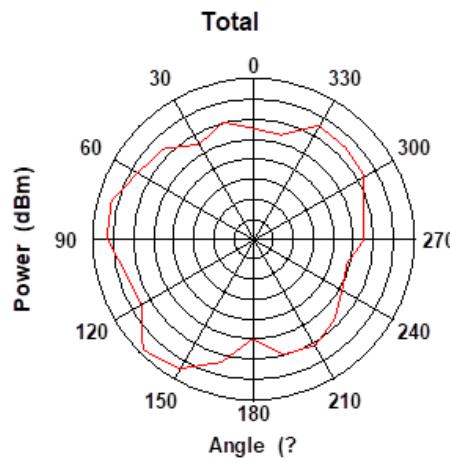
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_3500MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

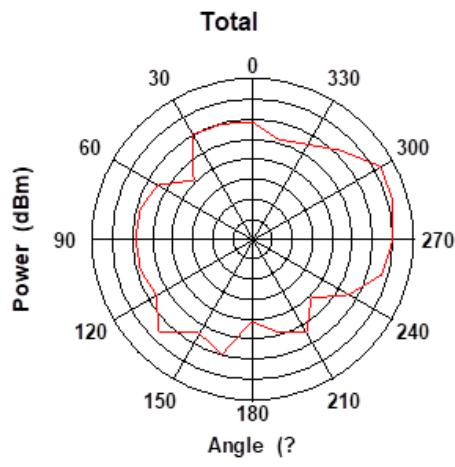
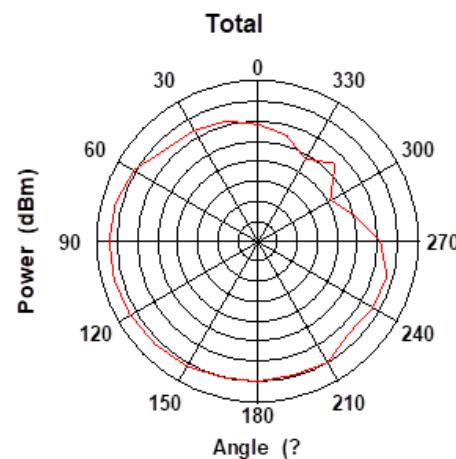
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Series: Swallowtail

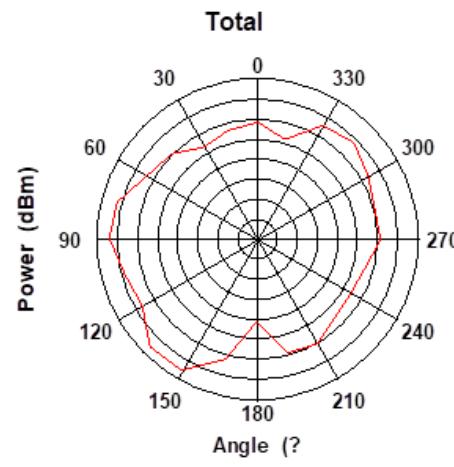
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_3600MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

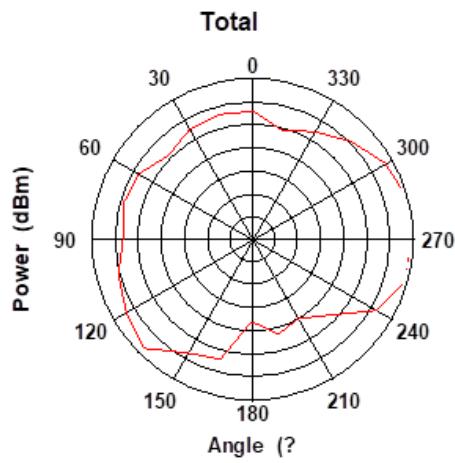
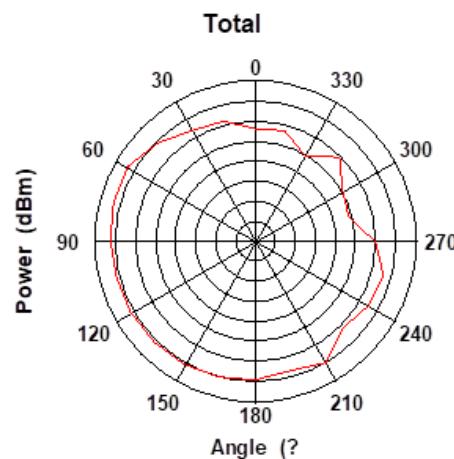
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Series: Swallowtail

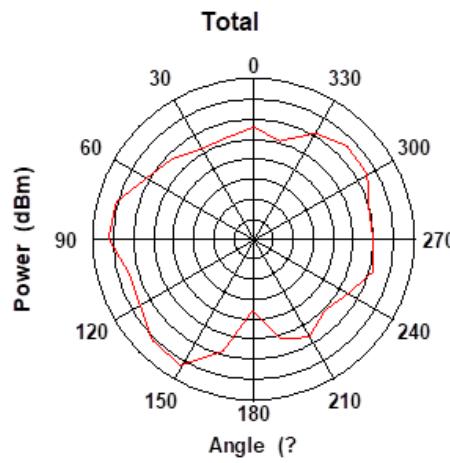
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_3700MHz [WWAN AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

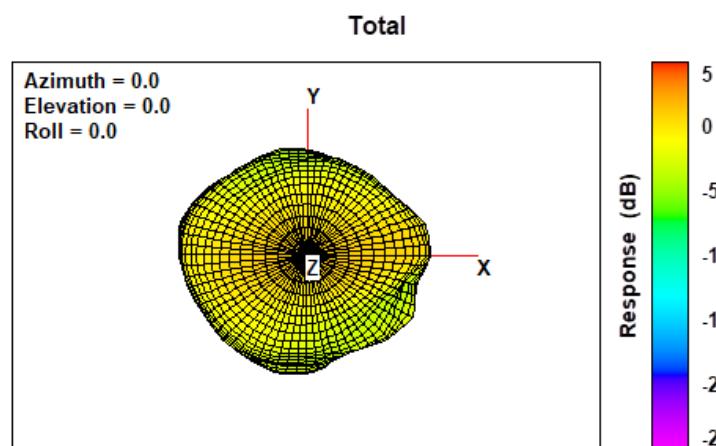
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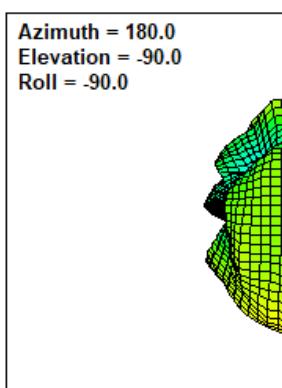
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

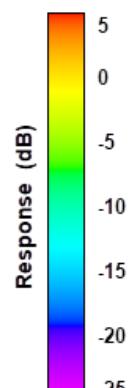
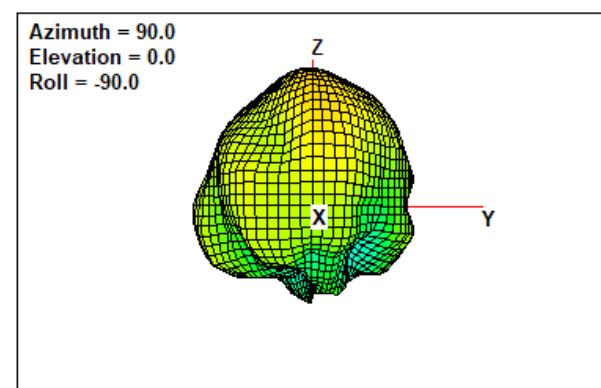
3D Radiation\_2400MHz [WIFI AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

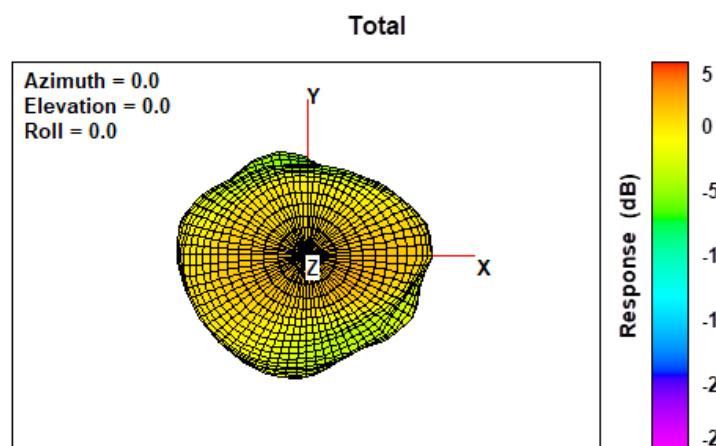
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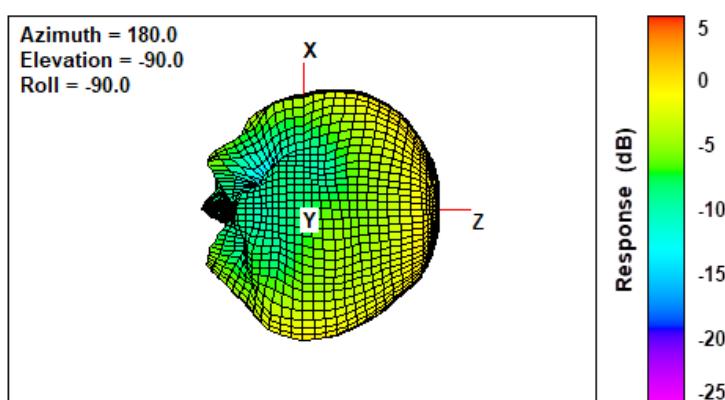
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

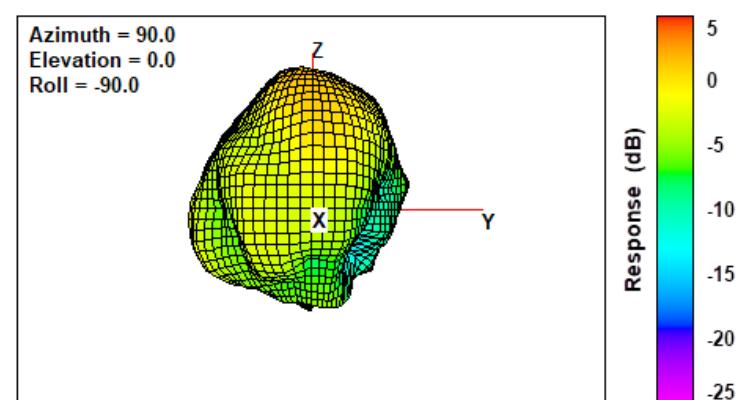
3D Radiation\_2450MHz [WIFI AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

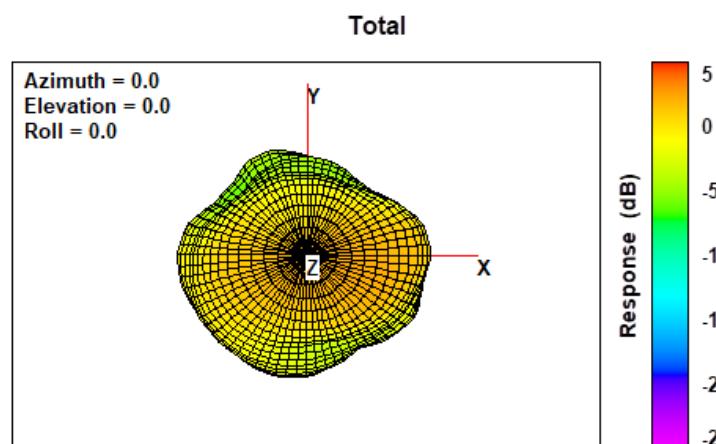
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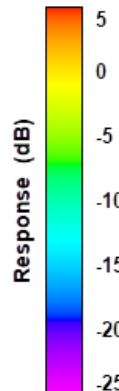
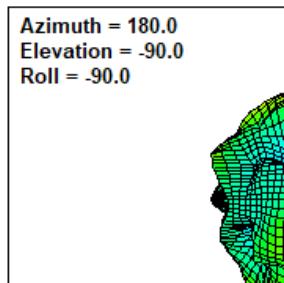
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

3D Radiation\_2500MHz [WIFI AUX]

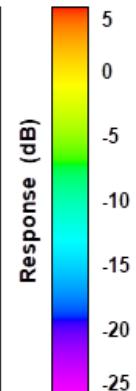


**Total**



**Total**

Azimuth = 90.0  
Elevation = 0.0  
Roll = -90.0



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

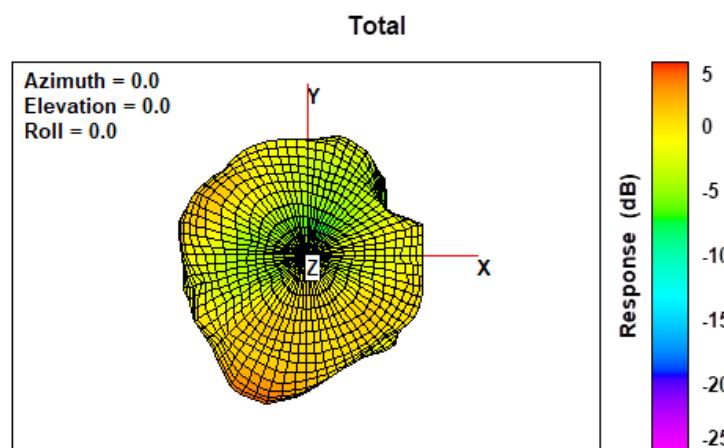
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Series: Swallowtail

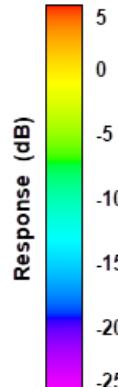
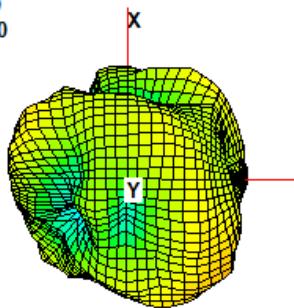
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

3D Radiation\_5150MHz [WIFI AUX]



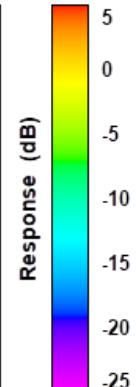
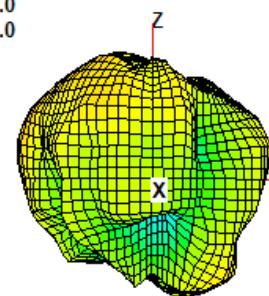
**Total**

Azimuth = 180.0  
Elevation = -90.0  
Roll = -90.0



**Total**

Azimuth = 90.0  
Elevation = 0.0  
Roll = -90.0



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

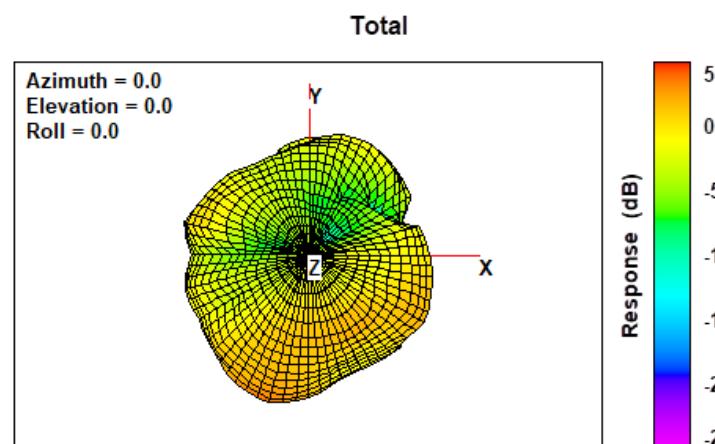
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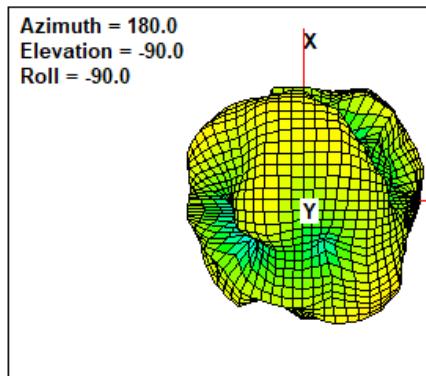
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Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

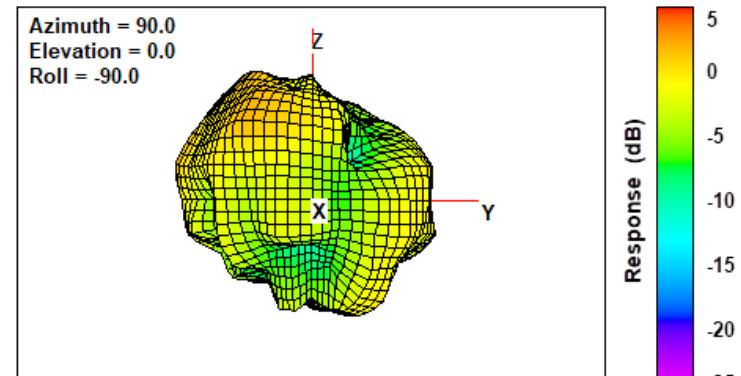
3D Radiation\_5250MHz [WIFI AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

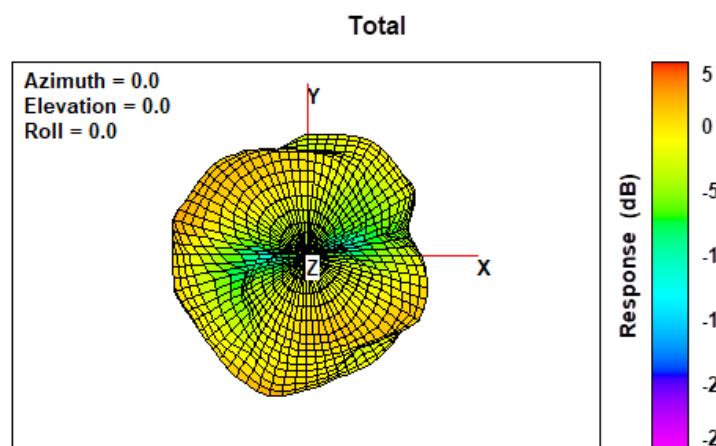
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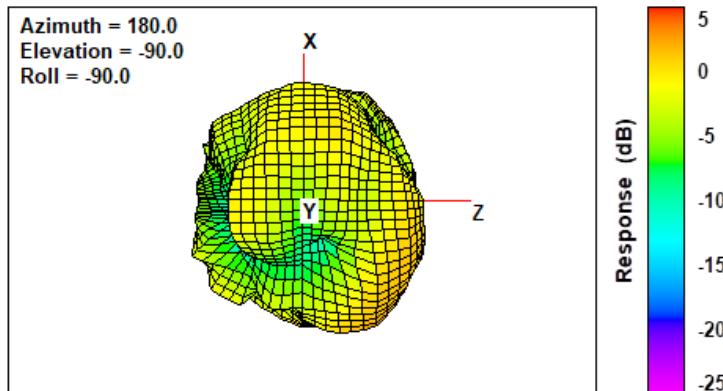
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Manufacturer P/N: TZ29770

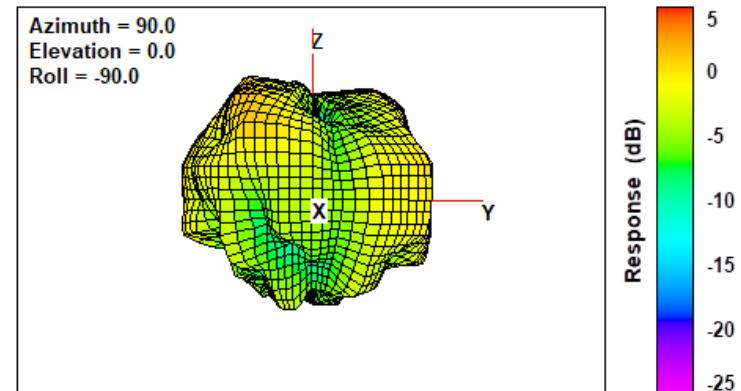
3D Radiation\_5350MHz [WIFI AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

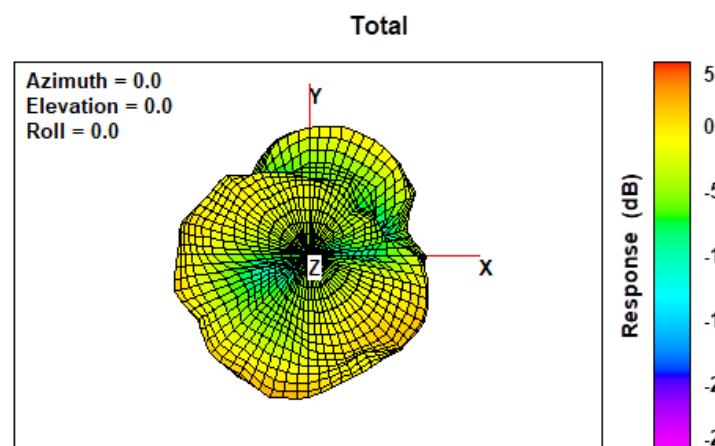
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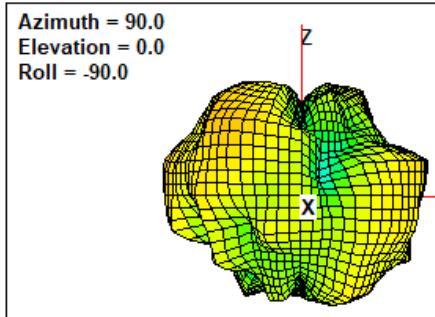
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Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

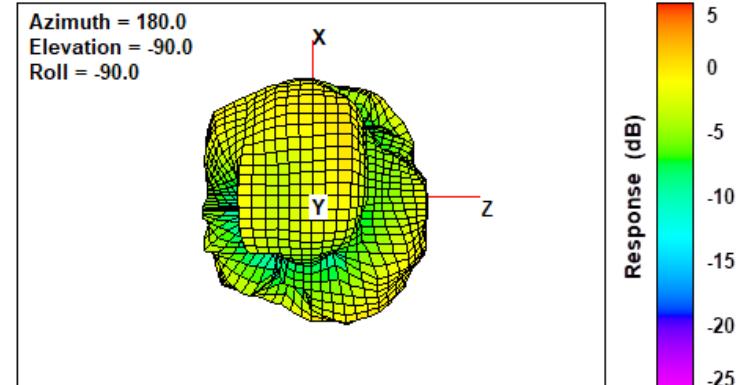
3D Radiation\_5470MHz [WIFI AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

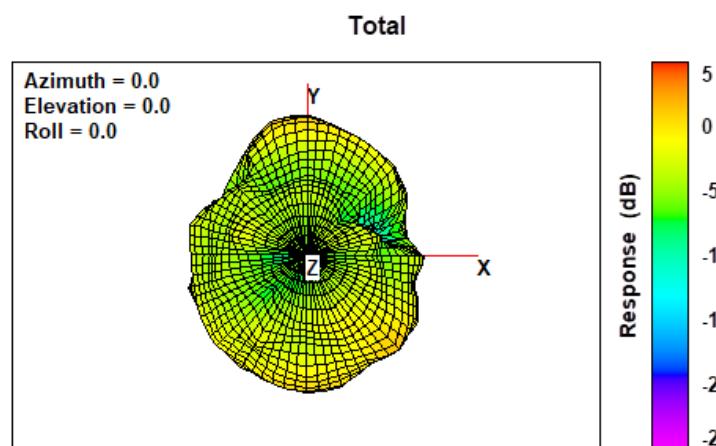
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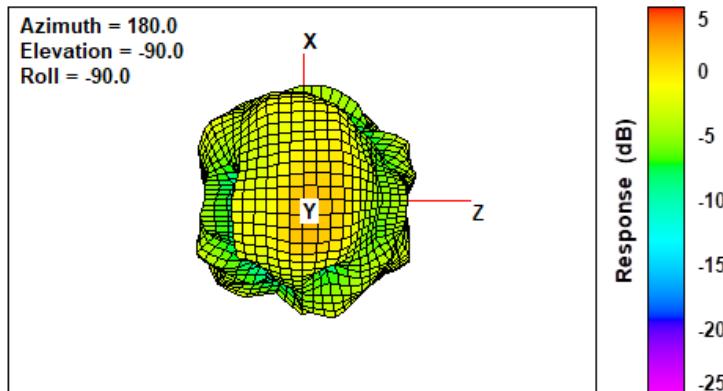
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Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

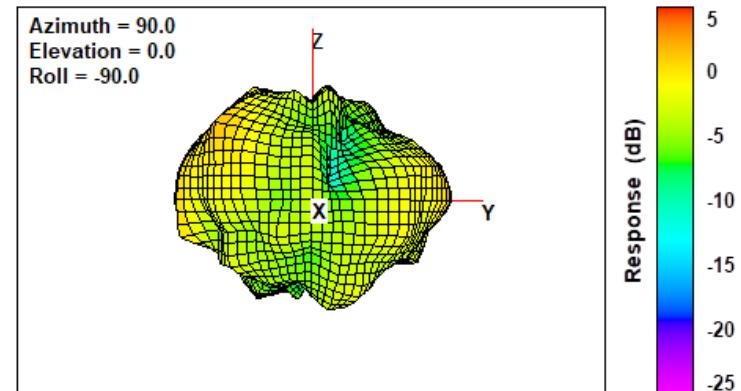
3D Radiation\_5600MHz [WIFI AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

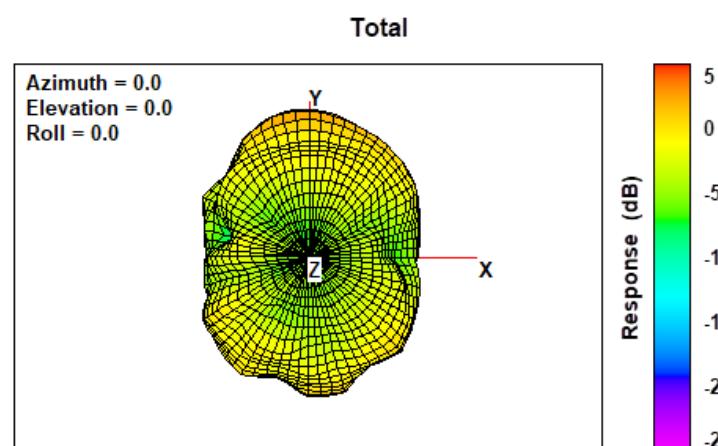
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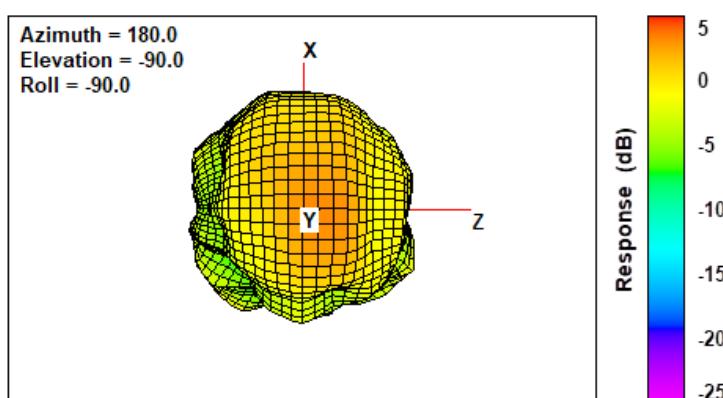
Series: Swallowtail

Customer P/N: 354-0000511  
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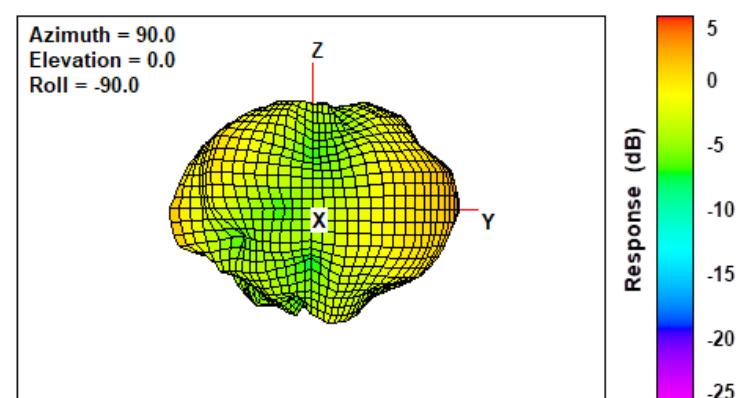
3D Radiation\_5725MHz [WIFI AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

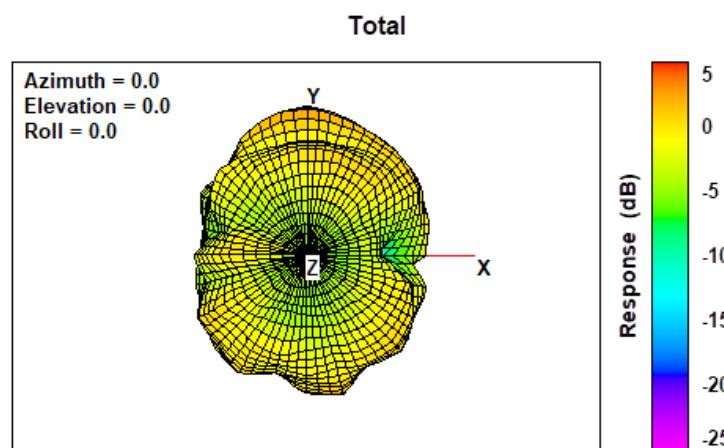
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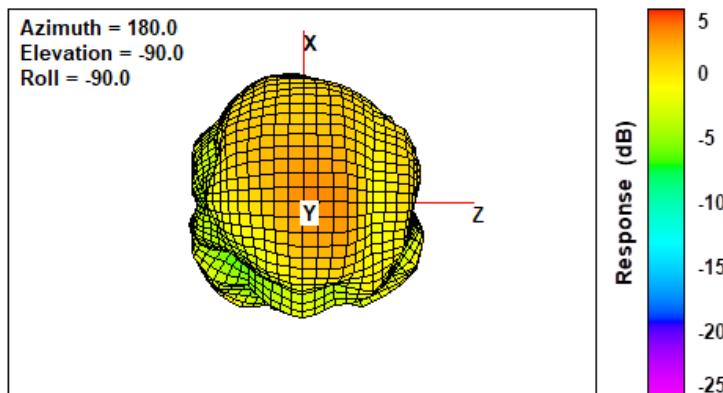
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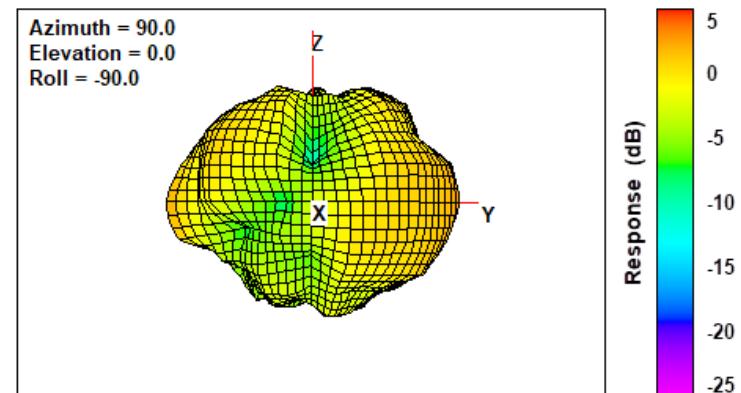
3D Radiation\_5785MHz [WIFI AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

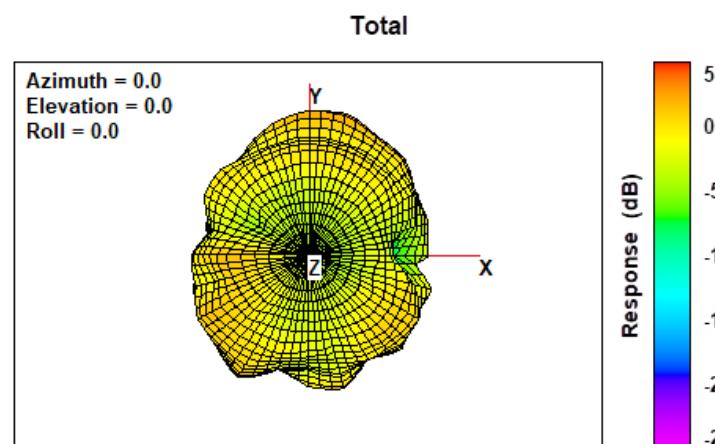
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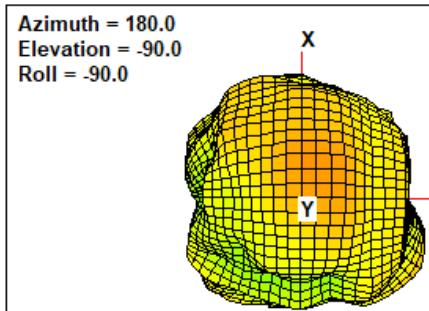
Series: Swallowtail

Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

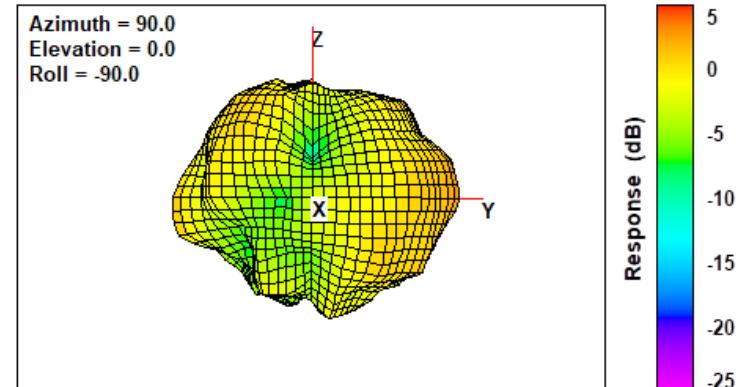
3D Radiation\_5850MHz [WIFI AUX]



**Total**



**Total**



In the effort to improve our products, we reserve the right to make changes judged to be necessary.

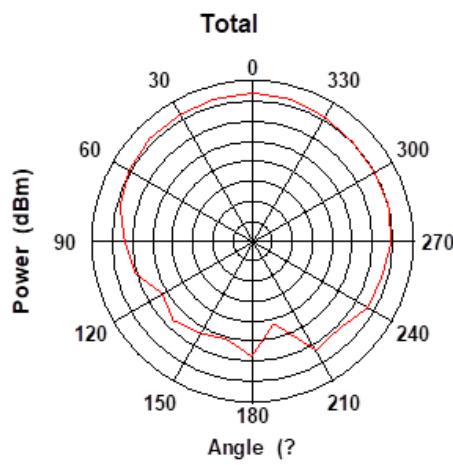
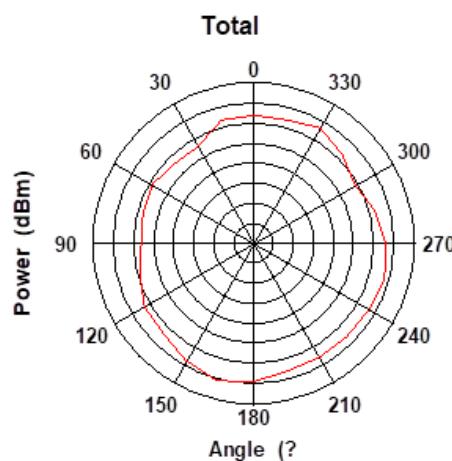
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Series: Swallowtail

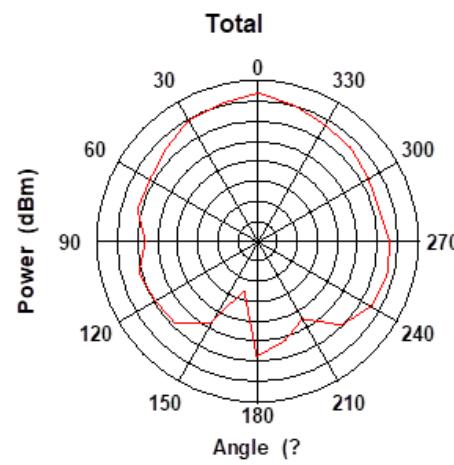
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_2400MHz [WIFI AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

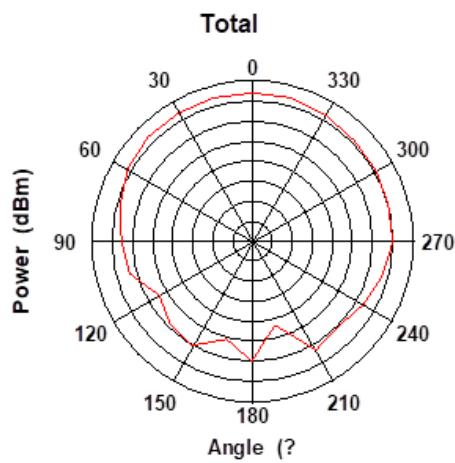
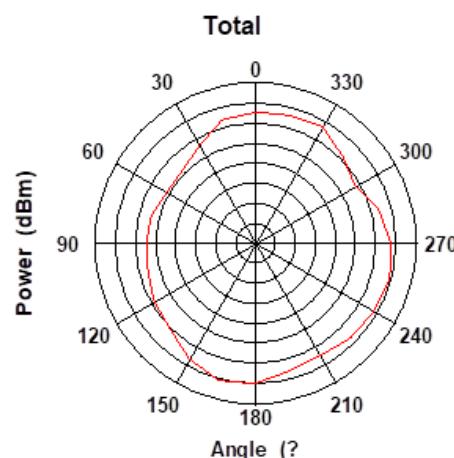
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Series: Swallowtail

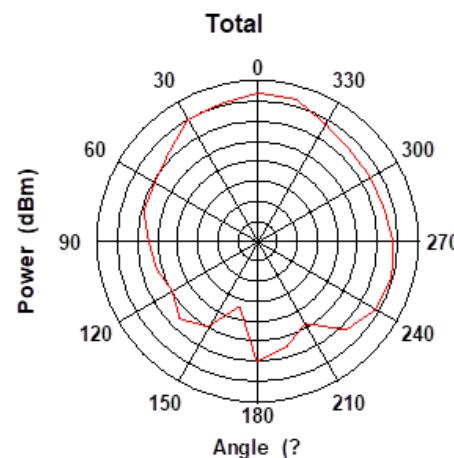
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_2450MHz [WIFI AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

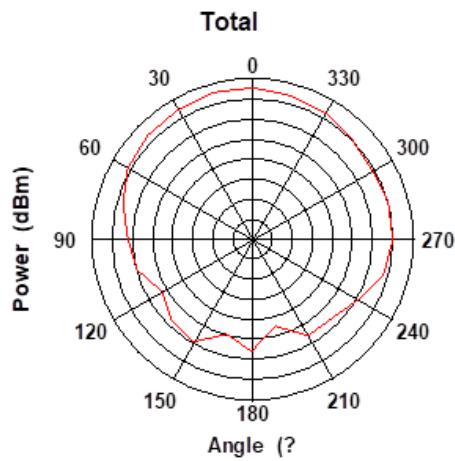
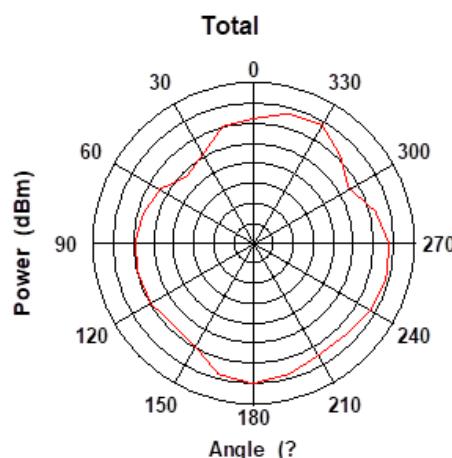
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Series: Swallowtail

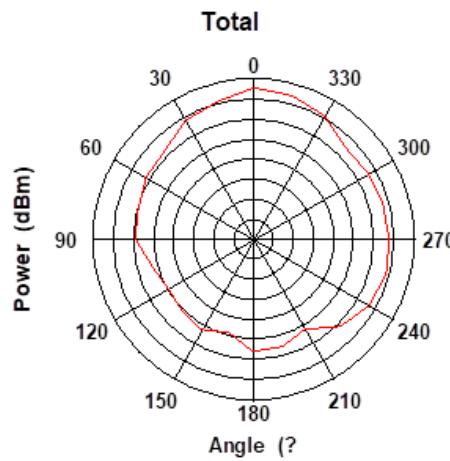
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_2500MHz [WIFI AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

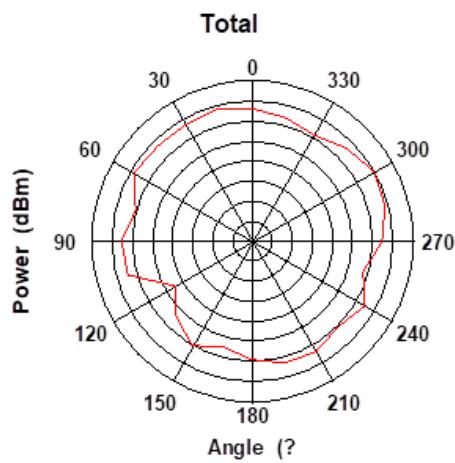
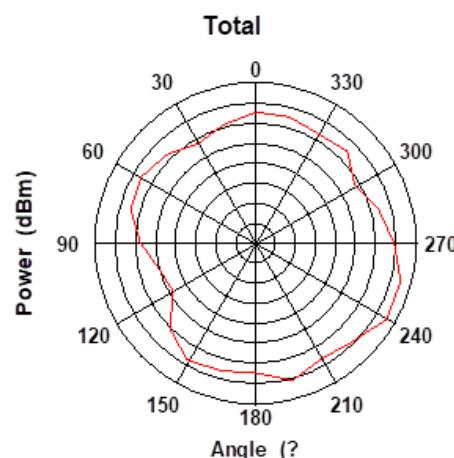
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Series: Swallowtail

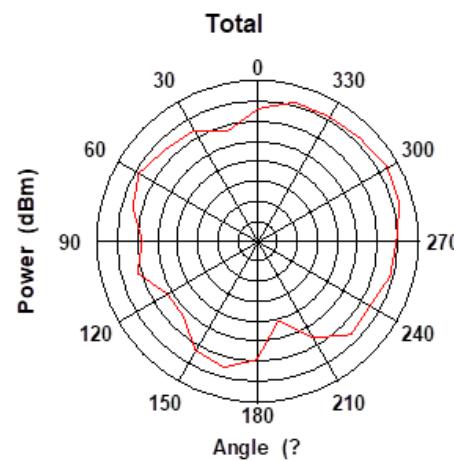
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_5150MHz [WIFI AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

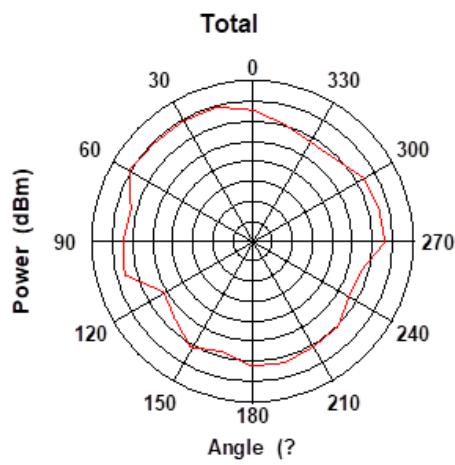
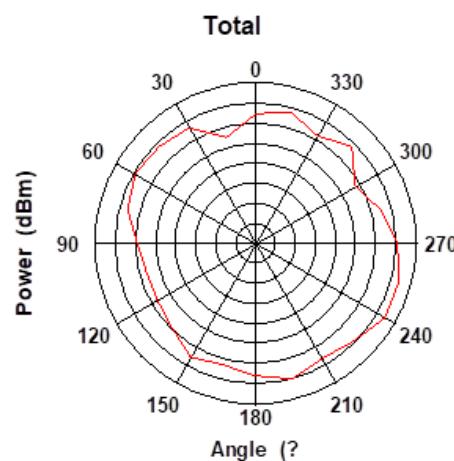
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Series: Swallowtail

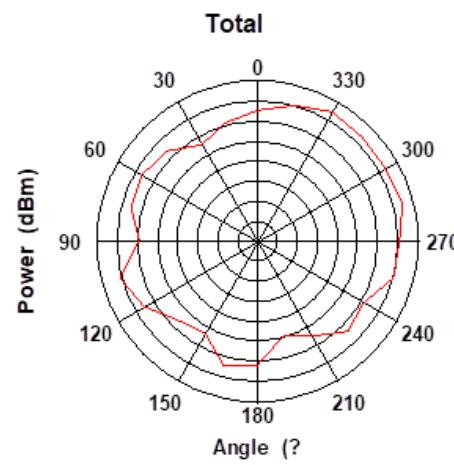
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_5250MHz [WIFI AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

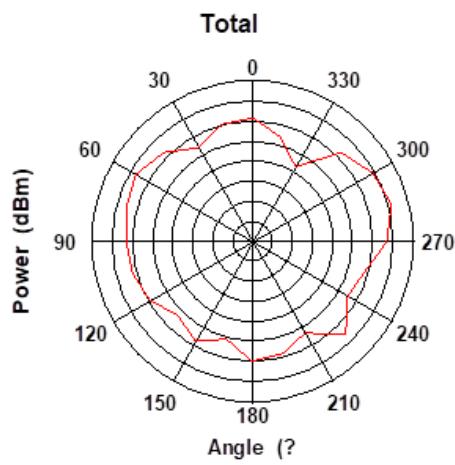
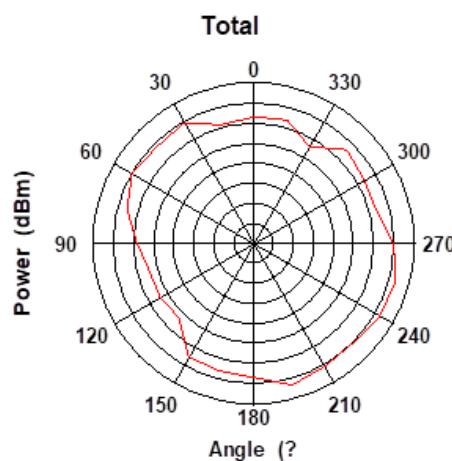
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Series: Swallowtail

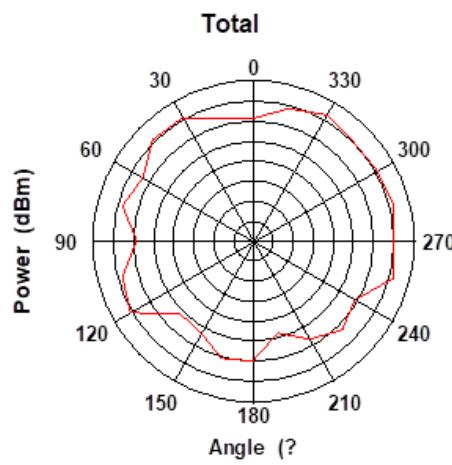
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_5350MHz [WIFI AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

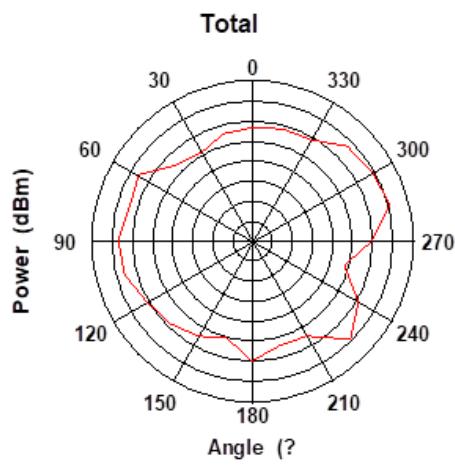
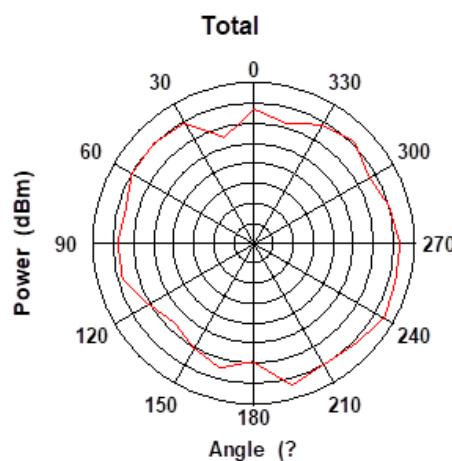
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Series: Swallowtail

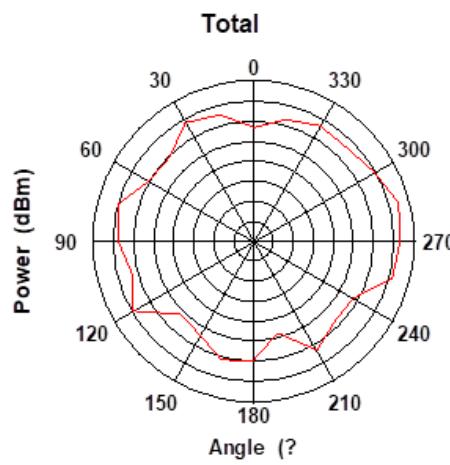
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_5470MHz [WIFI AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

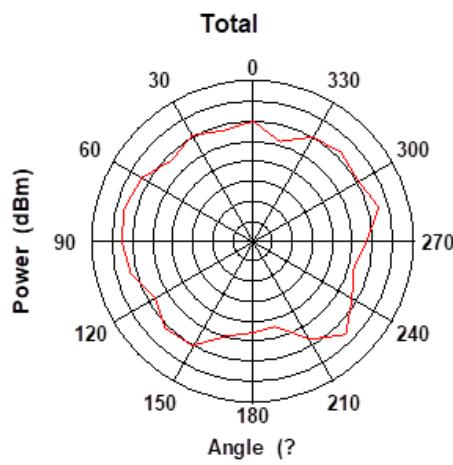
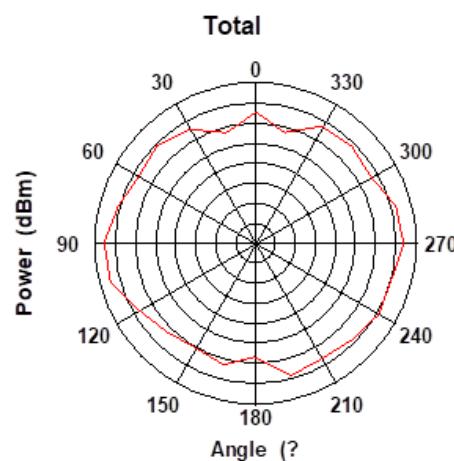
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Series: Swallowtail

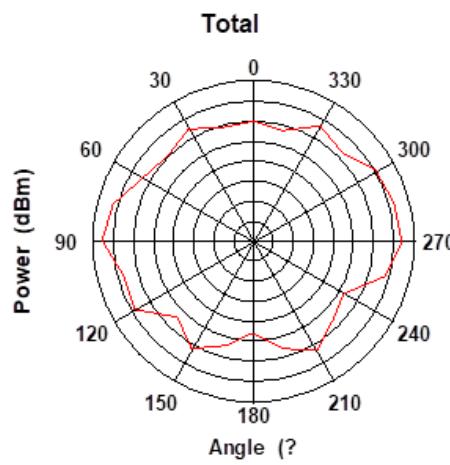
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_5600MHz [WIFI AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

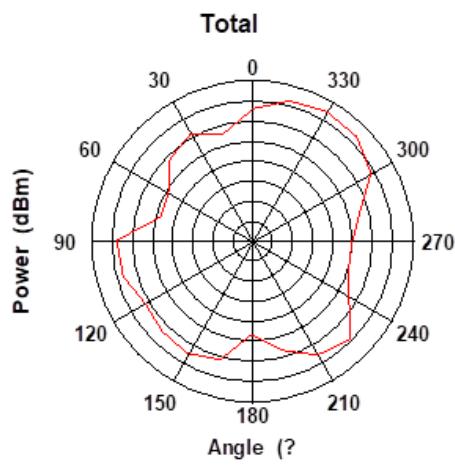
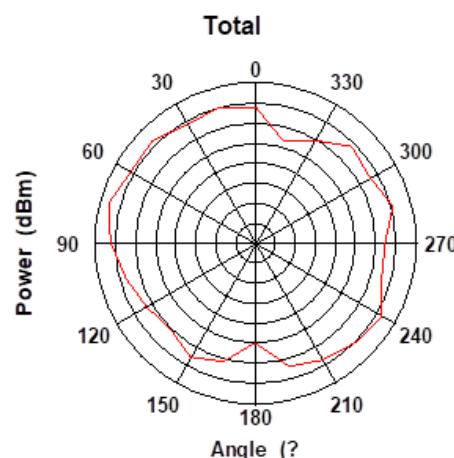
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Series: Swallowtail

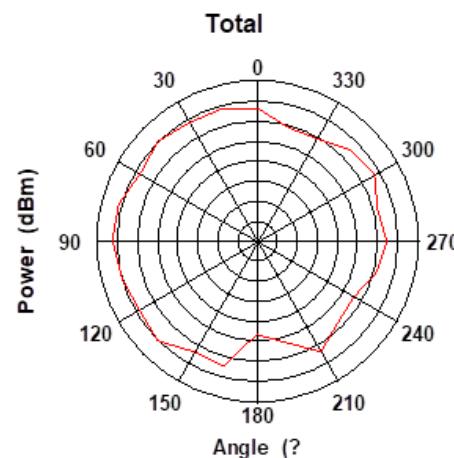
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_5725MHz [WIFI AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

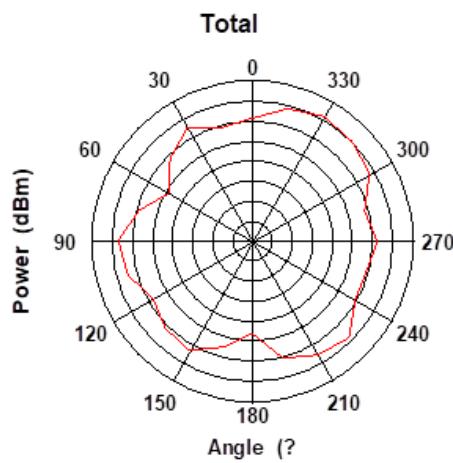
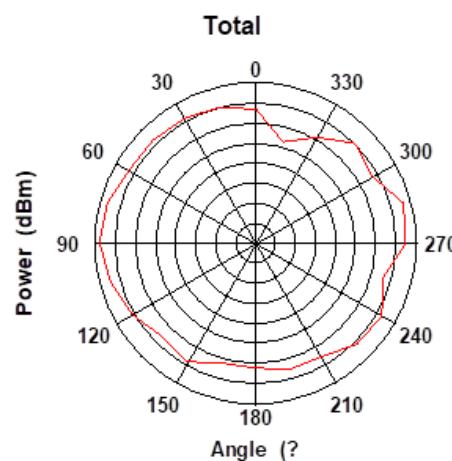
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Series: Swallowtail

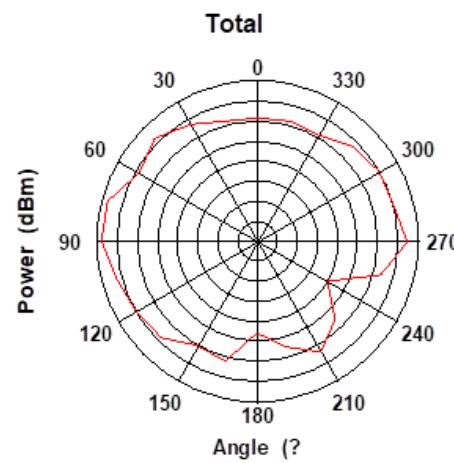
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_5785MHz [WIFI AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

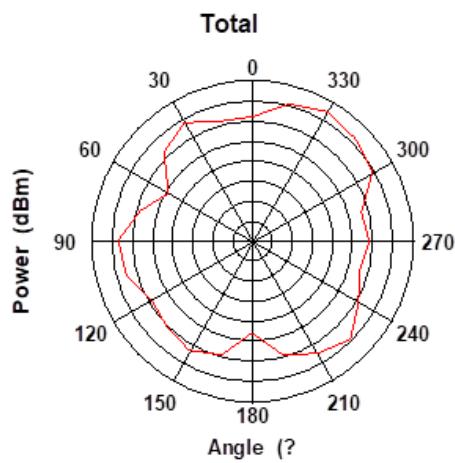
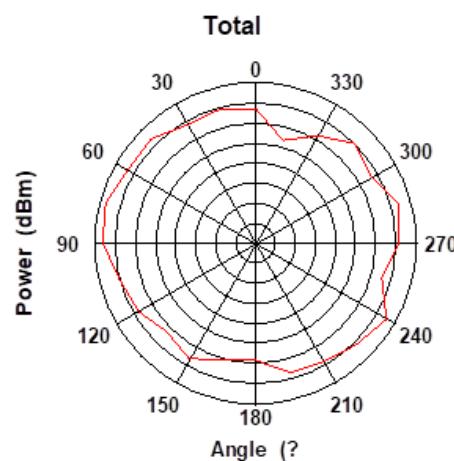
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Series: Swallowtail

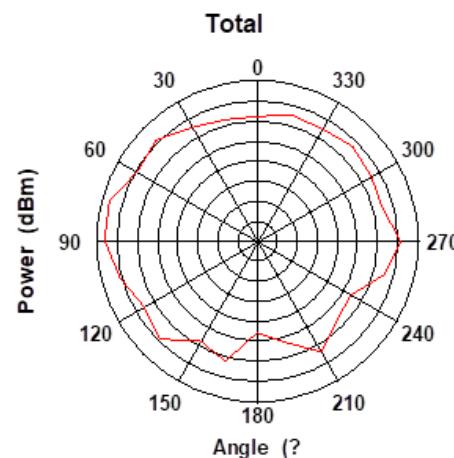
Customer P/N: 354-0000511  
Manufacturer P/N: TZ29770

2D Radiation\_5850MHz [WIFI AUX]



Cut-2 XZ Plane

Cut-1 XY Plane



Cut-3 YZ Plane

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

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**Series: Swallowtail**
**Customer P/N: 354-0000511**
**Manufacturer P/N: TZ29770**
**Electrical test\_Passive data**
**WWAN\_AUX**

Frequency	VzW & ATT										VzW & ATT											
	698	708	710	717	723	738	746	777	787	791	798	814	824	830	837	845	859	862	880	894	925	960
Tot. Rad. Pwr. (dBm)	-5.51	-5.39	-5.39	-5.28	-5.26	-5.07	-4.94	-3.65	-3.15	-3.02	-2.84	-2.30	-2.27	-2.27	-2.32	-1.97	-2.10	-2.14	-2.44	-2.67	-3.08	-4.27
Gain (dBi)	-2.95	-2.75	-2.72	-2.56	-2.44	-2.02	-1.67	0.04	0.28	0.37	0.41	1.10	0.96	0.89	0.89	0.98	1.00	1.06	1.23	1.31	0.72	-0.02
Directivity (dBi)	2.57	2.65	2.66	2.72	2.81	3.05	3.27	3.69	3.43	3.39	3.24	3.40	3.23	3.15	3.21	2.95	3.10	3.20	3.67	3.99	3.80	4.24
Efficiency (%)	28.10	28.89	28.94	29.66	29.84	31.10	32.10	43.15	48.39	49.90	52.06	58.92	59.27	59.36	58.64	63.58	61.64	61.09	56.97	54.03	49.16	37.43

Frequency	VzW & ATT										VzW											
	1710	1750	1780	1805	1850	1880	1900	1930	1960	2010	2140	2300	2355	2500	2595	2690	3300	3400	3500	3600	3700	3800
Tot. Rad. Pwr. (dBm)	-3.30	-3.55	-3.50	-3.26	-3.37	-3.52	-3.47	-3.66	-3.88	-5.79	-4.03	-2.83	-3.37	-3.18	-2.89	-3.06	-3.68	-3.44	-3.13	-2.88	-3.58	-3.61
Gain (dBi)	1.31	1.32	1.43	1.80	1.66	1.21	1.46	1.54	1.22	-1.72	-0.44	3.45	3.01	2.50	2.31	2.60	3.45	4.05	3.59	2.28	1.31	1.29
Directivity (dBi)	4.62	4.87	4.93	5.06	5.04	4.73	4.93	5.20	5.09	4.08	3.59	6.28	6.37	5.68	5.20	5.66	7.12	7.49	6.72	5.16	4.89	4.90
Efficiency (%)	46.76	44.19	44.71	47.25	46.02	44.46	44.95	43.04	40.94	26.34	39.53	52.12	46.08	48.07	51.38	49.40	42.90	45.27	48.61	51.51	43.88	43.54

**WIFI\_AUX / BT**

Frequency	2400	2450	2500	5150	5250	5350	5470	5600	5725	5785	5850
Tot. Rad. Pwr. (dBm)	-3.17	-2.97	-3.23	-2.32	-2.26	-2.29	-2.45	-3.06	-2.16	-1.60	-1.55
Gain (dBi)	1.55	2.23	2.47	4.20	3.91	2.86	2.92	2.27	3.54	3.60	3.19
Directivity (dBi)	4.72	5.20	5.70	6.52	6.18	5.15	5.37	5.33	5.70	5.20	4.75
Efficiency (%)	48.19	50.52	47.57	58.57	59.36	58.99	56.94	49.48	60.82	69.16	69.90

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