STUDY | PCB DIMENSION (Length)

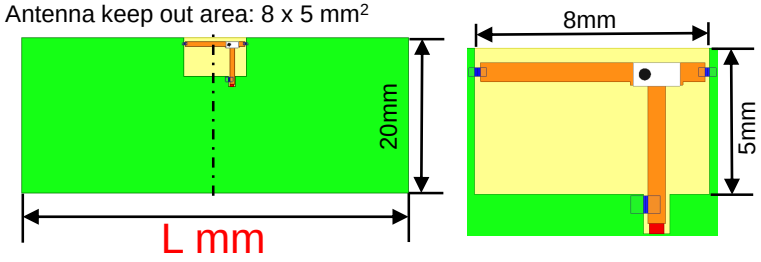
ANT162442DT-2001A2

Dimensions (mm)

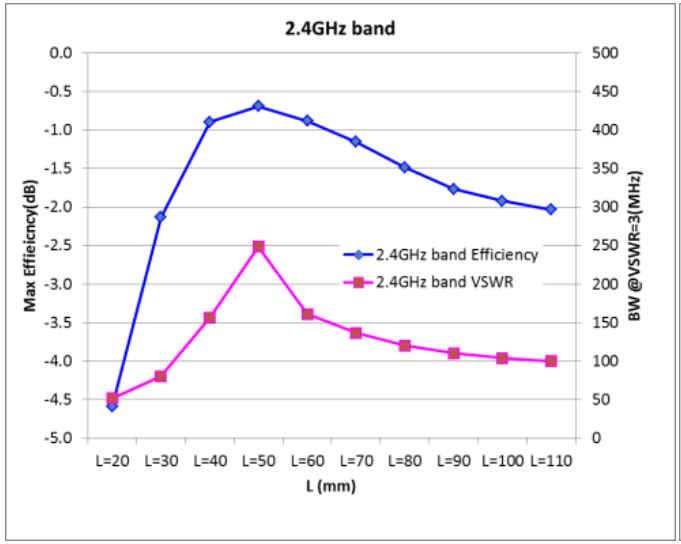
L	W	T
1.60	0.80	0.40
±0.10	±0.10	Max.

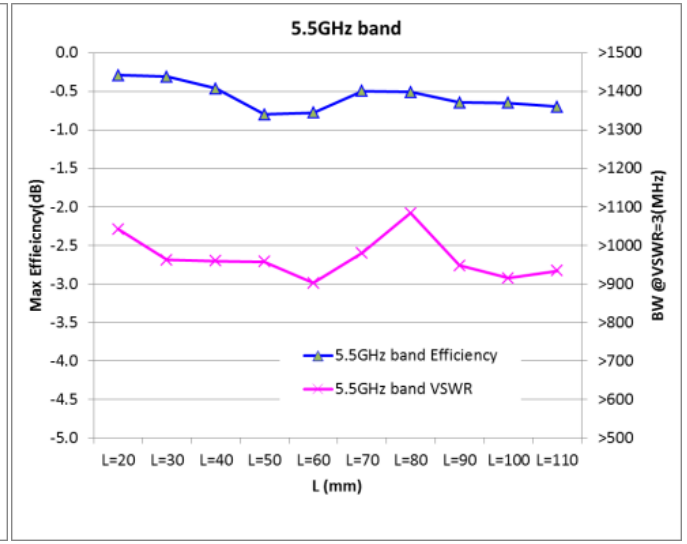
EVALUATION BOARD

Antenna Location: Center
Board size: L x 20 x 1 mm²
Antenna keep out area: 8 x 5 mm²



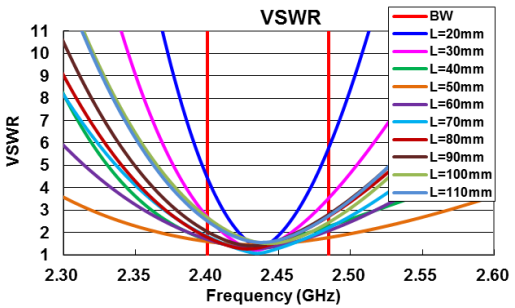
▶MAX EFFICIENCY & BANDWIDTH (SIMULATION RESULTS)

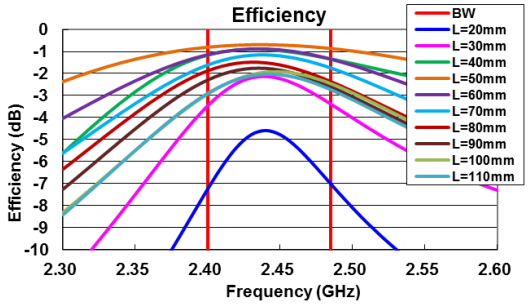


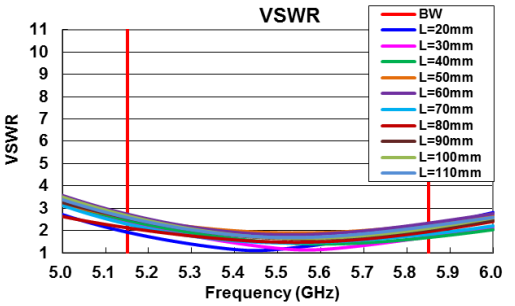


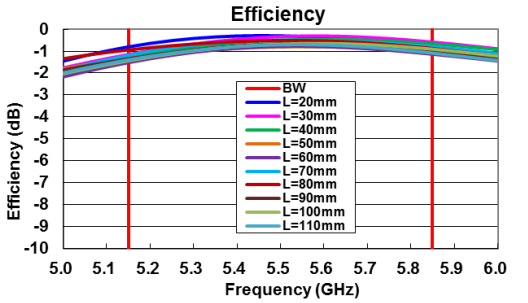
		L=20	L=30	L=40	L=50	L=60	L=70	L=80	L=90	L=100	L=110
2.4GHz band	Max Efficiency(dB)	−4.6	−2.1	−0.9	−0.7	−0.9	−1.2	−1.5	−1.8	−1.9	−2.0
	BW@VSWR=3(MHz)	52	80	156	249	161	137	120	110	104	100
5.5GHz band	Max Efficiency(dB)	−0.3	−0.3	−0.5	−0.8	−0.8	−0.5	−0.5	−0.6	−0.6	−0.7
	BW@VSWR=3(MHz)	>1043	>962	>960	>958	>902	>981	>1084	>948	>915	>934

VSWR & EFFICIENCY (SIMULATION RESULTS)









	VSWR			Efficiency(dB)			VSWR			Efficiency(dB)		
Frequency(GHz)	2.4	2.442	2.485	2.4	2.442	2.485	5.15	5.5	5.85	5.15	5.5	5.85
L=20	4.5	1.5	5.8	−7.2	−4.6	−7.0	1.9	1.2	2.2	−0.8	−0.3	−0.9
L=30	2.7	1.3	3.6	−3.5	−2.2	−3.4	2.4	1.2	1.7	−1.1	−0.3	−0.6
L=40	1.7	1.5	2.3	−1.2	−0.9	−1.3	2.5	1.5	1.7	−1.2	−0.5	−0.7
L=50	1.6	1.5	1.8	−0.8	−0.7	−0.9	2.6	1.9	2.3	−1.3	−0.8	−1.0
L=60	1.7	1.3	2.1	−1.1	−0.9	−1.4	2.7	1.8	2.3	−1.5	−0.8	−1.1
L=70	1.8	1.1	2.2	−1.6	−1.2	−1.8	2.3	1.5	1.8	−1.2	−0.5	−0.8
L=80	1.8	1.4	2.7	−1.9	−1.5	−2.4	2.1	1.5	2.0	−0.9	−0.5	−0.9
L=90	2.0	1.5	2.8	−2.3	−1.8	−2.6	2.6	1.6	2.0	−1.3	−0.7	−1.0
L=100	2.7	1.5	2.5	−2.9	−1.9	−2.5	2.7	1.7	2.1	−1.4	−0.7	−0.9
L=110	2.5	1.6	2.8	−2.9	−2.0	−2.7	2.6	1.7	2.2	−1.4	−0.7	−1.1

STUDY | PCB DIMENSION (Width)

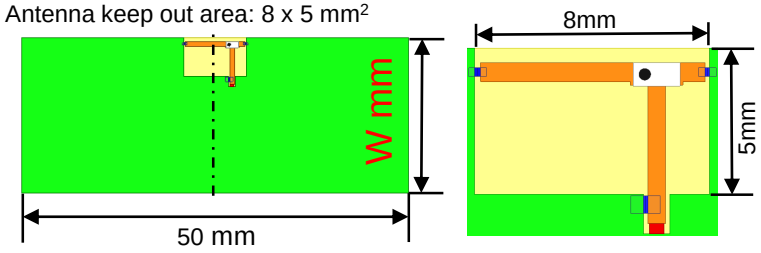
ANT162442DT-2001A2

Dimensions (mm)

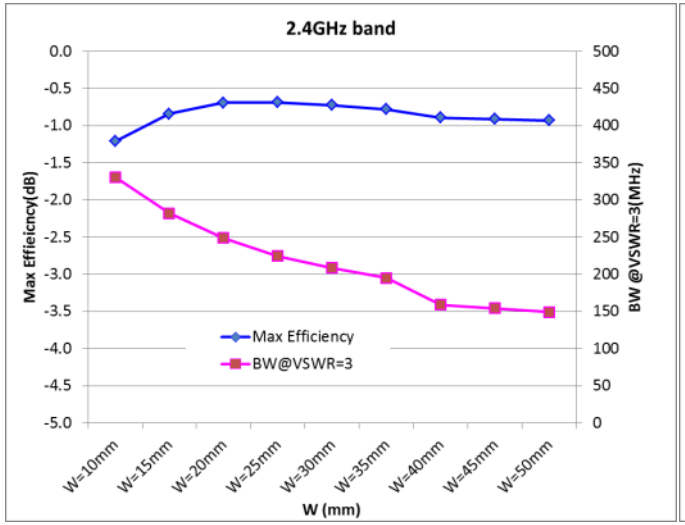
L	W	T
1.60	0.80	0.40
±0.10	±0.10	Max.

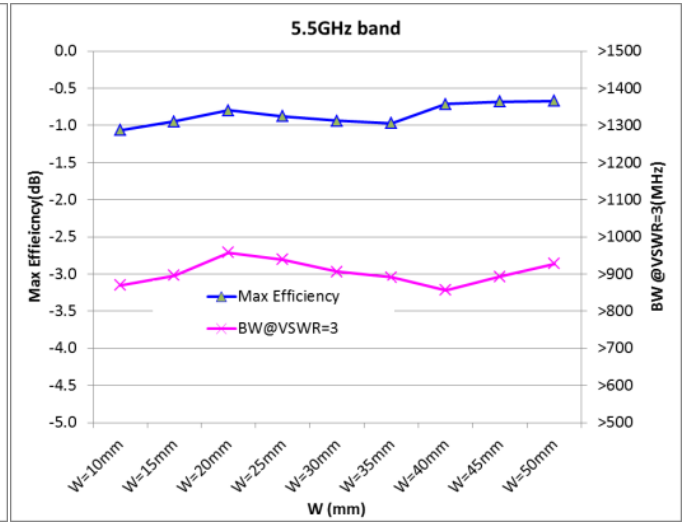
EVALUATION BOARD

Antenna Location: Center
Board size: 50 x W x 1 mm²
Antenna keep out area: 8 x 5 mm²



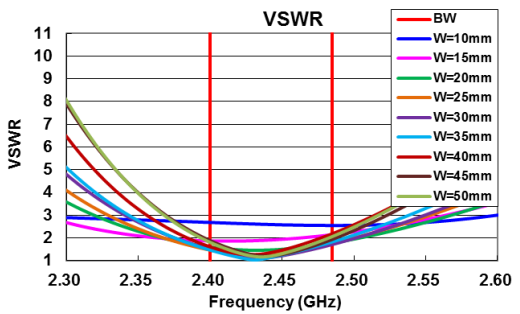
▶MAX EFFICIENCY & BANDWIDTH (SIMULATION RESULTS)

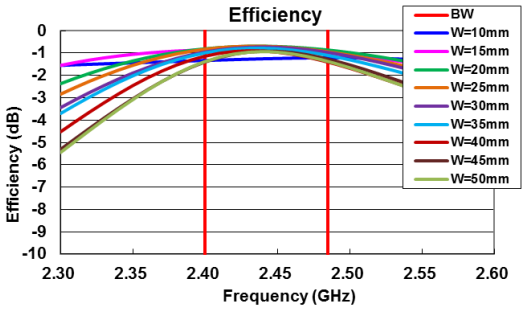


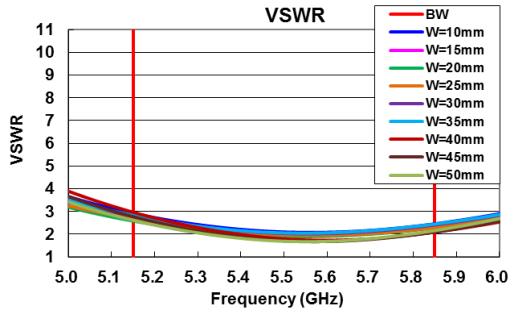


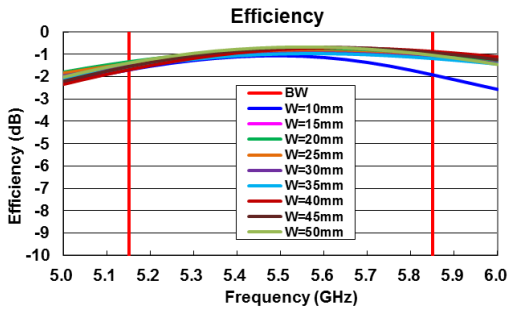
		W=10mm	W=15mm	W=20mm	W=25mm	W=30mm	W=35mm	W=40mm	W=45mm	W=50mm
2.4GHz band	Max Efficiency(dB)	−1.2	−0.8	−0.7	−0.7	−0.7	−0.8	−0.9	−0.9	−0.9
	BW@VSWR=3(MHz)	331	282	249	224	209	195	159	154	149
5.5GHz band	Max Efficiency(dB)	−1.1	−0.9	−0.8	−0.9	−0.9	−1.0	−0.7	−0.7	−0.7
	BW@VSWR=3(MHz)	>869	>896	>958	>939	>906	>891	>856	>893	>928

VSWR & EFFICIENCY (SIMULATION RESULTS)









	VSWR			Efficiency(dB)			VSWR			Efficiency(dB)		
Frequency(GHz)	2.4	2.442	2.485	2.4	2.442	2.485	5.15	5.5	5.85	5.15	5.5	5.85
W=10mm	2.7	2.6	2.5	−1.3	−1.3	−1.2	2.9	2.1	2.5	−1.7	−1.1	−1.9
W=15mm	1.9	1.9	2.1	−0.9	−0.9	−1.0	2.8	2.0	2.4	−1.6	−1.0	−1.2
W=20mm	1.6	1.5	1.8	−0.8	−0.7	−0.9	2.6	1.9	2.3	−1.3	−0.8	−1.0
W=25mm	1.5	1.3	1.8	−0.8	−0.7	−0.9	2.7	2.0	2.3	−1.4	−0.9	−1.1
W=30mm	1.5	1.1	1.7	−0.9	−0.7	−1.0	2.8	2.0	2.4	−1.5	−1.0	−1.1
W=35mm	1.5	1.1	1.8	−1.0	−0.8	−1.1	2.8	2.1	2.4	−1.6	−1.0	−1.2
W=40mm	1.6	1.4	2.2	−1.1	−0.9	−1.4	3.0	1.8	2.1	−1.7	−0.8	−0.9
W=45mm	1.9	1.2	1.9	−1.4	−0.9	−1.3	2.8	1.7	2.1	−1.5	−0.7	−0.9
W=50mm	1.8	1.2	2.1	−1.4	−0.9	−1.4	2.6	1.7	2.2	−1.4	−0.7	−1.0

STUDY | GND CLEARANCE (Center of PCB)

ANT162442DT-2001A2

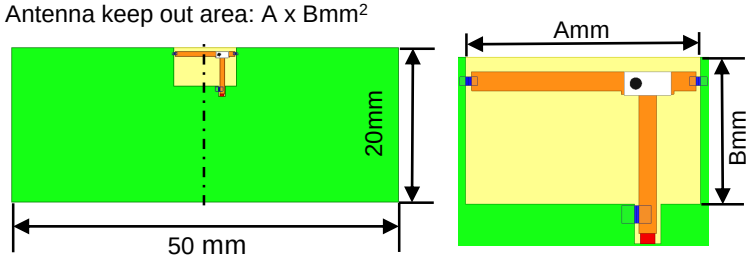
Dimensions (mm)

L	W	T
1.60	0.80	0.40
±0.10	±0.10	Max.

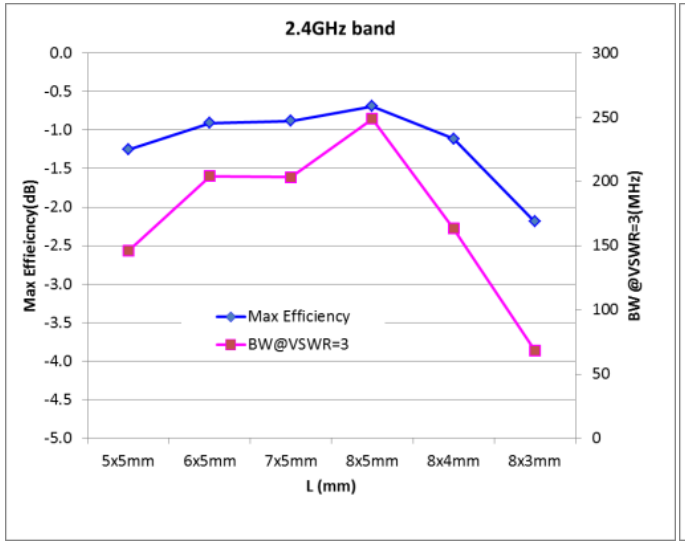
EVALUATION BOARD

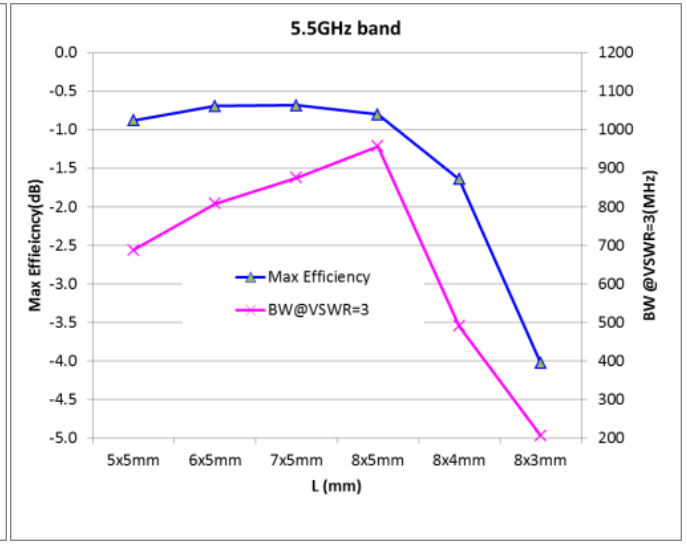
Antenna Location: Center
Board size: 50 x 20 x 1mm²
Antenna keep out area: A x Bmm²

A =5,6,7,8mm
B =3,4,5mm



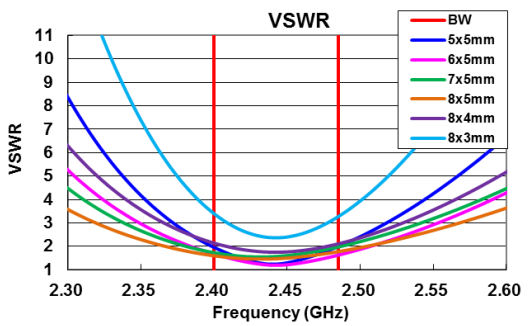
▶MAX EFFICIENCY & BANDWIDTH (SIMULATION RESULTS)

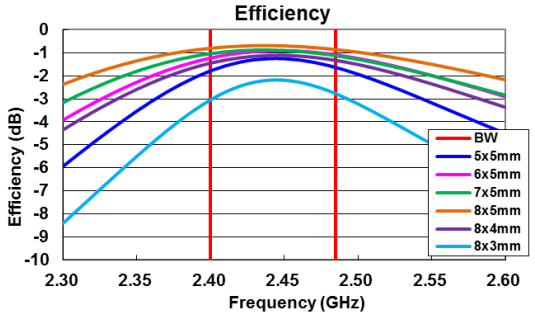


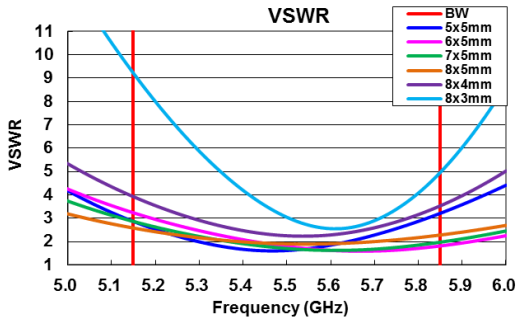


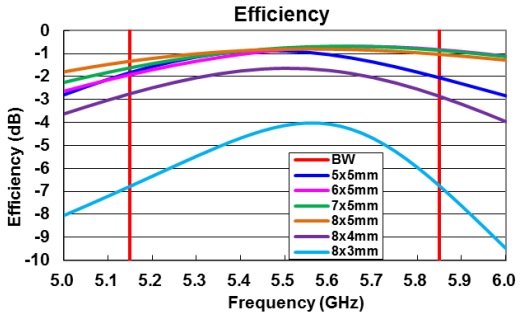
		5x5mm	6x5mm	7x5mm	8x5mm	8x4mm	8x3mm
2.4GHz band	Max Efficiency(dB)	−1.3	−0.9	−0.9	−0.7	−1.1	−2.2
	BW@VSWR=3(MHz)	146	204	203	249	163	68
5.5GHz band	Max Efficiency(dB)	−0.9	−0.7	−0.7	−0.8	−1.6	−4.0
	BW@VSWR=3(MHz)	688	>808	>876	>958	491	206

VSWR & EFFICIENCY (SIMULATION RESULTS)









	VSWR			Efficiency(dB)			VSWR			Efficiency(dB)		
Frequency(GHz)	2.4	2.442	2.485	2.4	2.442	2.485	5.15	5.5	5.85	5.15	5.5	5.85
5x5mm	2.0	1.2	2.0	−1.8	−1.3	−1.6	2.9	1.6	3.2	−1.8	−0.9	−2.1
6x5mm	1.7	1.2	1.6	−1.2	−0.9	−1.1	3.2	1.8	1.8	−1.9	−0.8	−0.8
7x5mm	1.7	1.6	2.0	−1.0	−0.9	−1.1	2.9	1.7	2.0	−1.6	−0.7	−0.9
8x5mm	1.6	1.5	1.8	−0.8	−0.7	−0.9	2.6	1.9	2.3	−1.3	−0.8	−1.0
8x4mm	2.1	1.8	2.1	−1.4	−1.1	−1.3	3.9	2.3	3.5	−2.7	−1.6	−2.9
8x3mm	3.4	2.4	3.3	−3.0	−2.2	−2.8	9.2	3.0	5.0	−6.8	−4.1	−6.8

STUDY | ANTENNA LOCATION (110mm PCB)

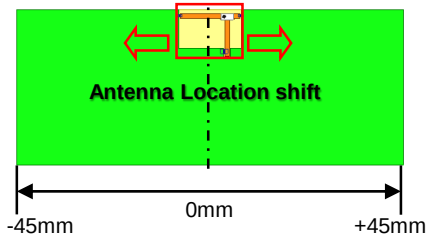
ANT162442DT-2001A2

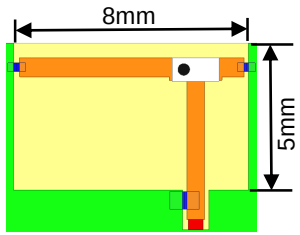
Dimensions (mm)

L	W	T
1.60	0.80	0.40
±0.10	±0.10	Max.

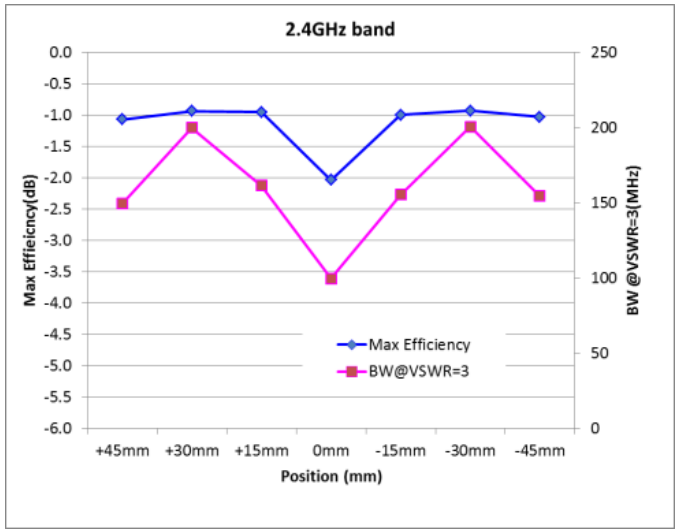
EVALUATION BOARD

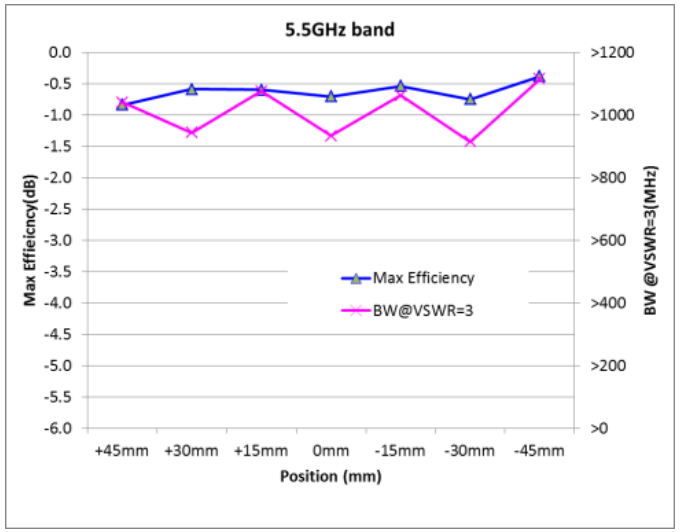
Antenna Location: Center
Board size: 110 x 20 x 1 mm²
Antenna keep out area: 8 x 5 mm²





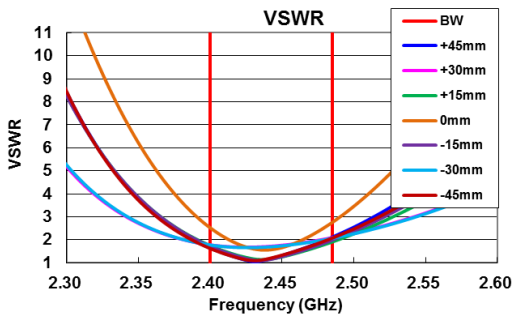
▶MAX EFFICIENCY & BANDWIDTH (SIMULATION RESULTS)

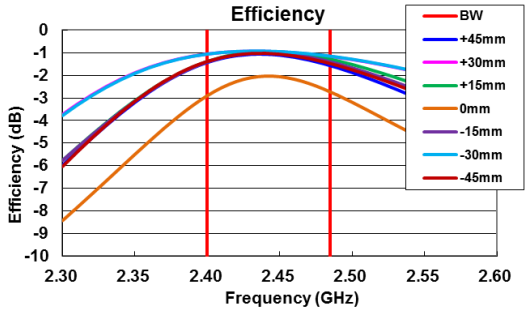


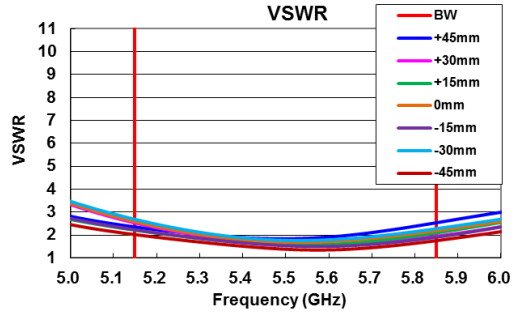


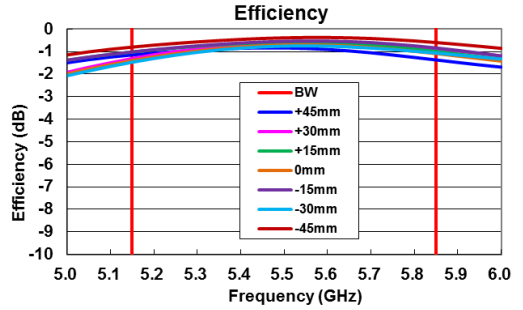
		+45mm	+30mm	+15mm	0mm	−15mm	−30mm	−45mm
2.4GHz band	Max Efficiency(dB)	−1.1	−0.9	−0.9	−2.0	−1.0	−0.9	−1.0
	BW@VSWR=3(MHz)	150	200	162	100	156	201	155
5.5GHz band	Max Efficiency(dB)	−0.8	−0.6	−0.6	−0.7	−0.5	−0.7	−0.4
	BW@VSWR=3(MHz)	>1042	>944	>1077	>934	>1063	>915	>1116

VSWR & EFFICIENCY (SIMULATION RESULTS)









	VSWR			Efficiency(dB)			VSWR			Efficiency(dB)		
Frequency(GHz)	2.4	2.442	2.485	2.4	2.442	2.485	5.15	5.5	5.85	5.15	5.5	5.85
+45mm	1.6	1.2	2.1	−1.4	−1.1	−1.6	2.4	1.8	2.5	−1.1	−0.8	−1.4
+30mm	1.8	1.7	2.1	−1.1	−0.9	−1.2	2.5	1.6	2.0	−1.3	−0.6	−0.9
+15mm	1.7	1.2	1.9	−1.4	−0.9	−1.3	2.2	1.6	2.1	−1.0	−0.6	−1.0
0mm	2.5	1.6	2.8	−2.9	−2.0	−2.7	2.6	1.7	2.2	−1.4	−0.7	−1.1
−15mm	1.7	1.2	2.0	−1.4	−1.0	−1.4	2.2	1.5	1.9	−1.0	−0.5	−0.8
−15mm	1.8	1.7	2.1	−1.1	−0.9	−1.2	2.7	1.8	2.3	−1.5	−0.8	−1.1
−30mm	1.6	1.2	2.1	−1.4	−1.0	−1.5	2.0	1.4	1.8	−0.8	−0.4	−0.6

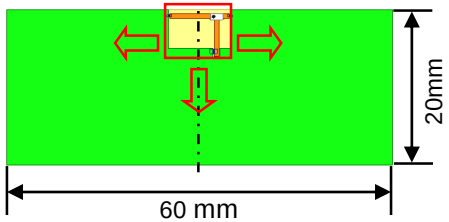
ANT162442DT-2001A2

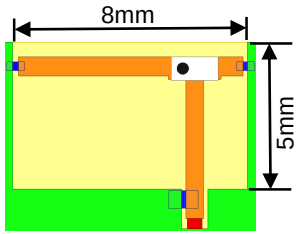
Dimensions (mm)

L	W	T
1.60	0.80	0.40
±0.10	±0.10	Max.

EVALUATION BOARD

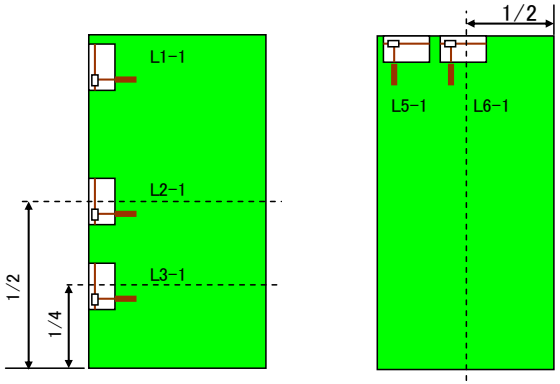
Antenna Location: Center
Board size: 60 x 20 x 1 mm^2
Antenna keep out area: 8 x 5 mm^2



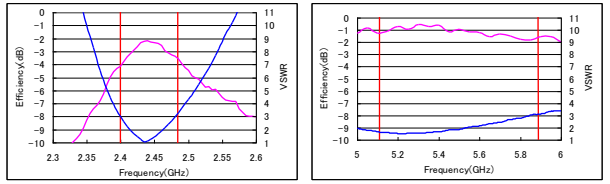


▶MEASUREMENT RESULTS

Antenna Locations

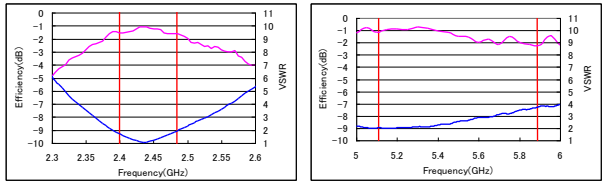


L1-1



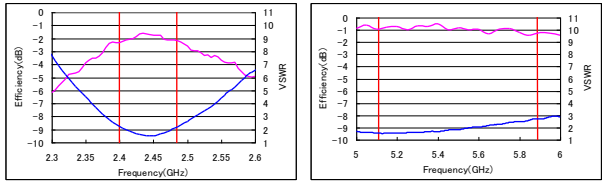
Ft 2.4GHz :2.8pF
Ft 5.5GHz : 0.2pF
Mt : 1.5nH

L2-1(Recommend)



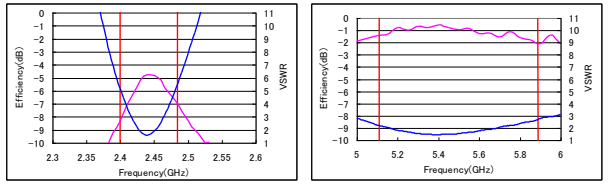
Ft 2.4GHz :3.2pF
Ft 5.5GHz : 0.2pF
Mt : 1.8nH

L3-1(Recommend)



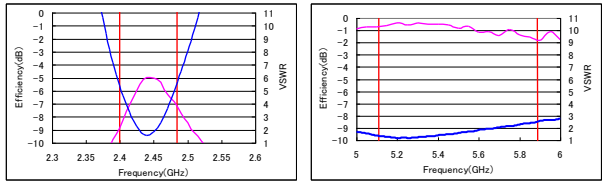
Ft 2.4GHz :2.8pF
Ft 5.5GHz : 0.3pF
Mt : 1.8nH

L5-1



Ft 2.4GHz : 3.2pF
Ft 5.5GHz : 0.3pF
Mt : 1.2nH

L6-1



Ft 2.4GHz : 3.2pF
Ft 5.5GHz : 0.3pF
Mt : 1.2nH

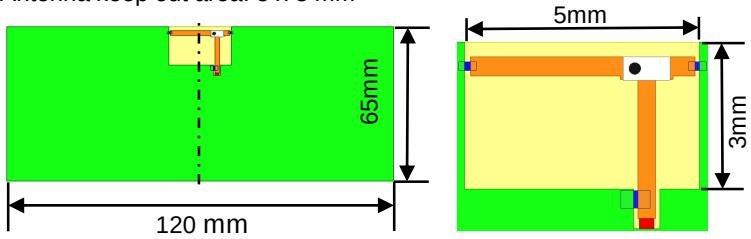
ANT162442DT-2001A2

Dimensions (mm)

L	W	T
1.60	0.80	0.40
±0.10	±0.10	Max.

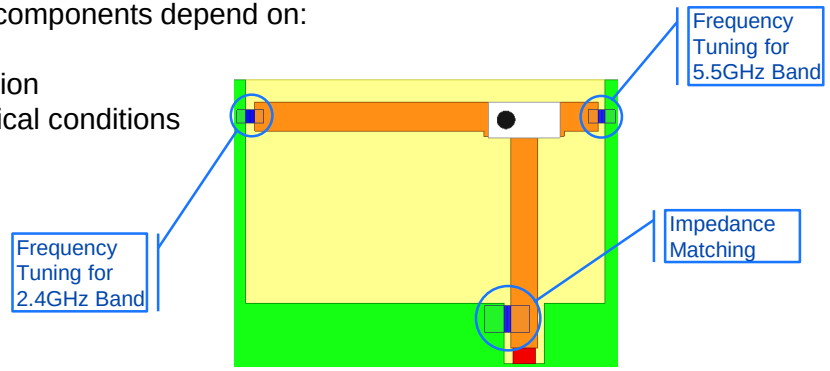
EVALUATION BOARD

Antenna Location: Center
Board size: 120 x 65 x 1 mm²
Antenna keep out area: 5 x 3 mm²



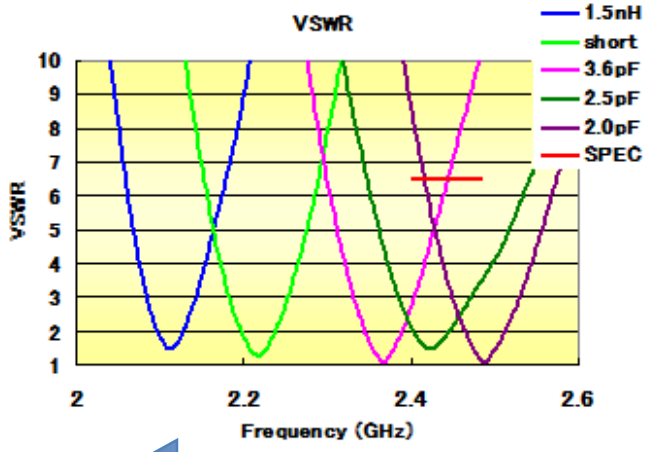
TECHNICAL REMARKS

Value of tuning components depend on:
- PCB Size
- Antenna Location
- Other mechanical conditions

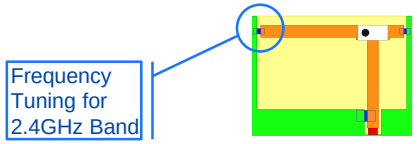


▶FREQUENCY TUNING(MEASUREMENT RESULTS)

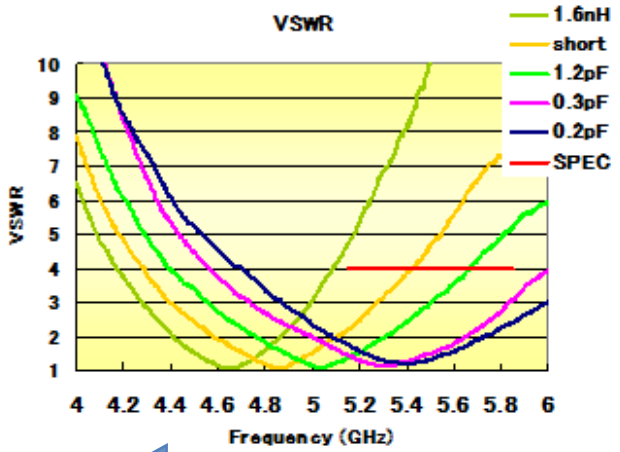
2.4GHz Band



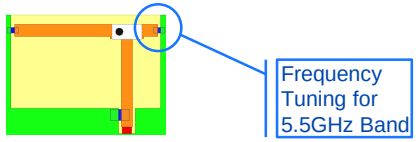
1.5nH ← 2pF



5GHz Band

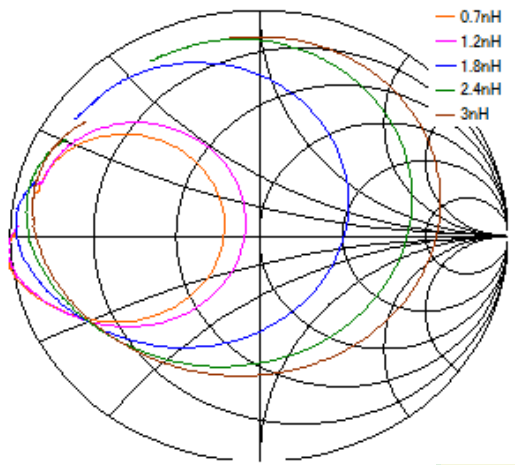


1.6nH ← 0.2pF



IMPEDANCE MATCHING (MEASUREMENT RESULTS)

2.4GHz Band



5GHz Band