



Internal Specification

9F, No.111-6, Shing-De Rd., San-Chung District, New Taipei City 241, Taiwan

Winmate Inc.

AntennaSpecification

(Main) Antenna

brand name:Winmate

Model name:FM07

Antenna type:PIFA

BT+BLE/Wifi2.4G Gain:0.61dBi

5G Gain:2.81dBi

(Aux) Antenna

brand name:Winmate

Model name:FM07

Antenna type:PIFA

Wifi2.4G Gain:0.02dBi

5G Gain:2.50dBi

Project :FM07 KION

Version :20250828

Issue Date : 2025/08/19



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1. Antenna Placement

Additional files provided

2. Wi-Fi Main Antenna Specification

Winmate Part Number: 90RF09000023

2.1. Electrical Characteristics

Frequency(MHz): 2400-2500 / 5150-5850

SWR: $\leq 1.59@2400-2500\text{MHz}$

$\leq 1.41@5150-5850\text{MHz}$

Return Loss: $\leq -12.7\text{dB}@2400-2500\text{MHz}$

$\leq -15.2\text{dB}@5150-5850\text{MHz}$

Peak Gain: $0.61\text{dBi}@2400-2500\text{MHz}$

$2.81\text{dBi}@5150-5850\text{MHz}$

Impedance: 50ohm

Polarization: Linear

2.2. Mechanical Characteristics

Cable: $50\Omega \phi 0.81$ RF cable

Connector: MHF4

PCB: FR4 /Thickness 0.4mm

Type:PIFA

2.3. Environmental Characteristics

Operating Temperature: -30°C to 80°C

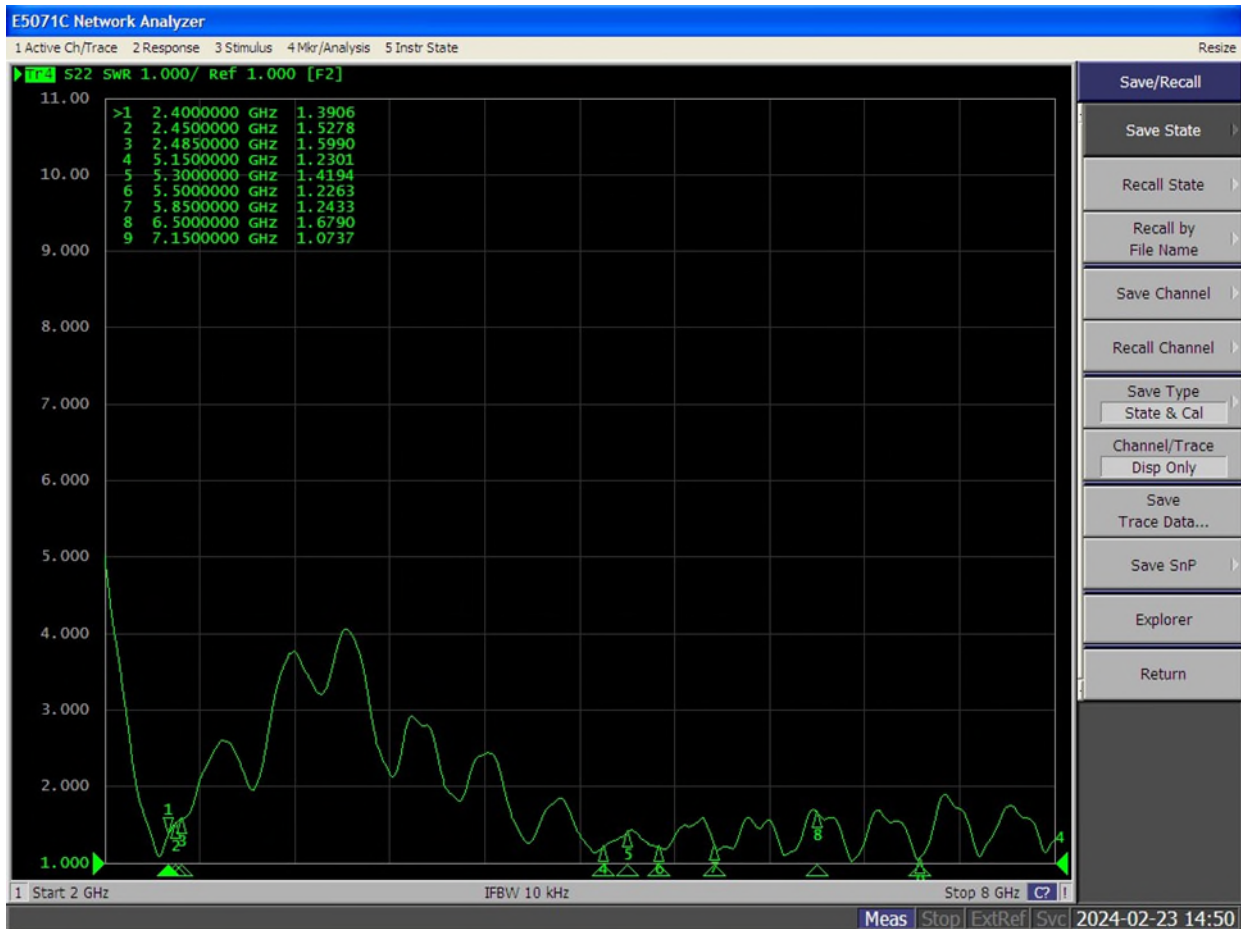


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2.4. RF Performance Characteristics

2.4.1. SWR

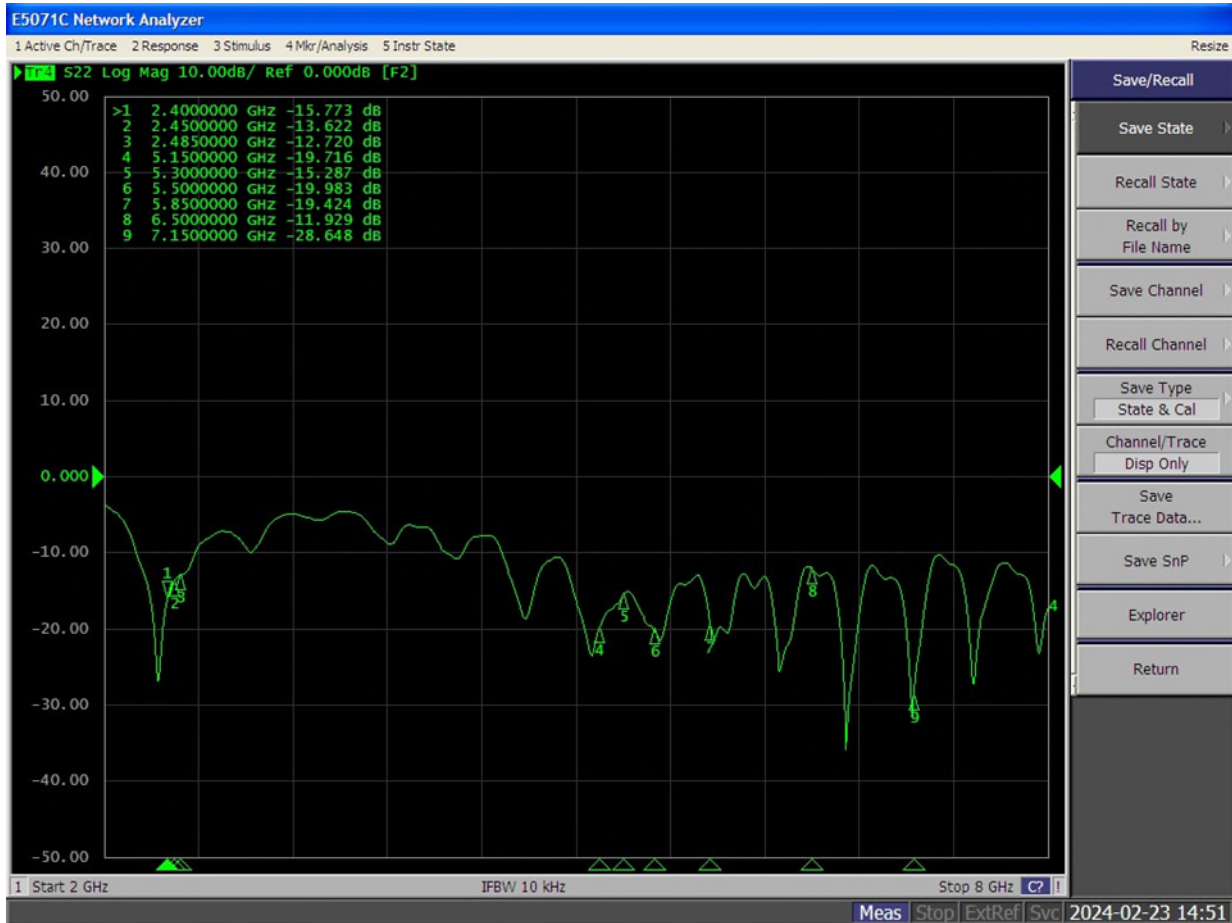




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2.4.2. Return Loss

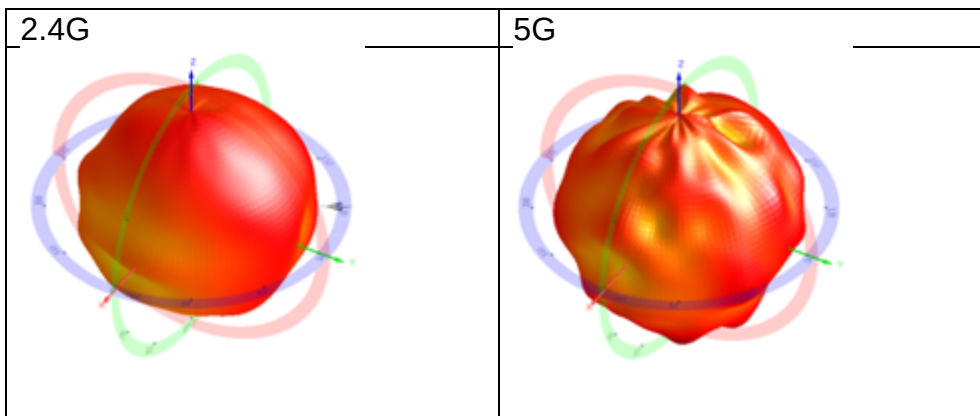


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2.4.3. Gain / Efficiency

Frequency	2400	2450	2484	2500	5150	5250	5350	5470	5600	5725
Directivity (dBi)	4.80	5.03	5.16	5.61	9.15	9.04	9.42	8.74	8.99	8.51
Efficiency (dB)	-4.45	-4.75	-4.54	-4.61	-3.93	-3.83	-3.79	-3.39	-3.30	-3.56
Efficiency (%)	35.90	33.52	35.12	34.57	40.42	41.41	41.79	45.79	46.75	44.10
Peak Gain (dBi)	0.35	0.29	0.61	1.00	2.21	2.21	2.63	2.34	2.69	2.75

Frequency	5785	5850								
Directivity (dBi)	8.60	8.50								
Efficiency (dB)	-3.79	-3.50								
Efficiency (%)	41.81	44.63								
Peak Gain (dBi)	2.81	2.00								





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3. WiFi Aux Antenna Specification

Winmate Part Number: 90RF0600002T

3.1. Electrical Characteristics

Frequency(MHz): 2400-2500 / 5150-5850

SWR: $\leq 1.93@2400-2500\text{MHz}$

$\leq 2.24@5150-5850\text{MHz}$

Return Loss: $\leq -9.65\text{dB}@2400-2500\text{MHz}$

$\leq -8.50\text{dB}@5150-5850\text{MHz}$

Peak Gain: $0.02\text{dBi}@2400-2500\text{MHz}$

$2.50\text{dBi}@5150-5850\text{MHz}$

Impedance: 50ohm

Polarization: Linear

3.2. Mechanical Characteristics

Cable: $50\Omega \phi 0.81$ RF cable

Connector: MHF4

PCB: FR4 /Thickness 1.0mm

Type:PIFA

3.3. Environmental Characteristics

Operating Temperature: -30°C to 80°C

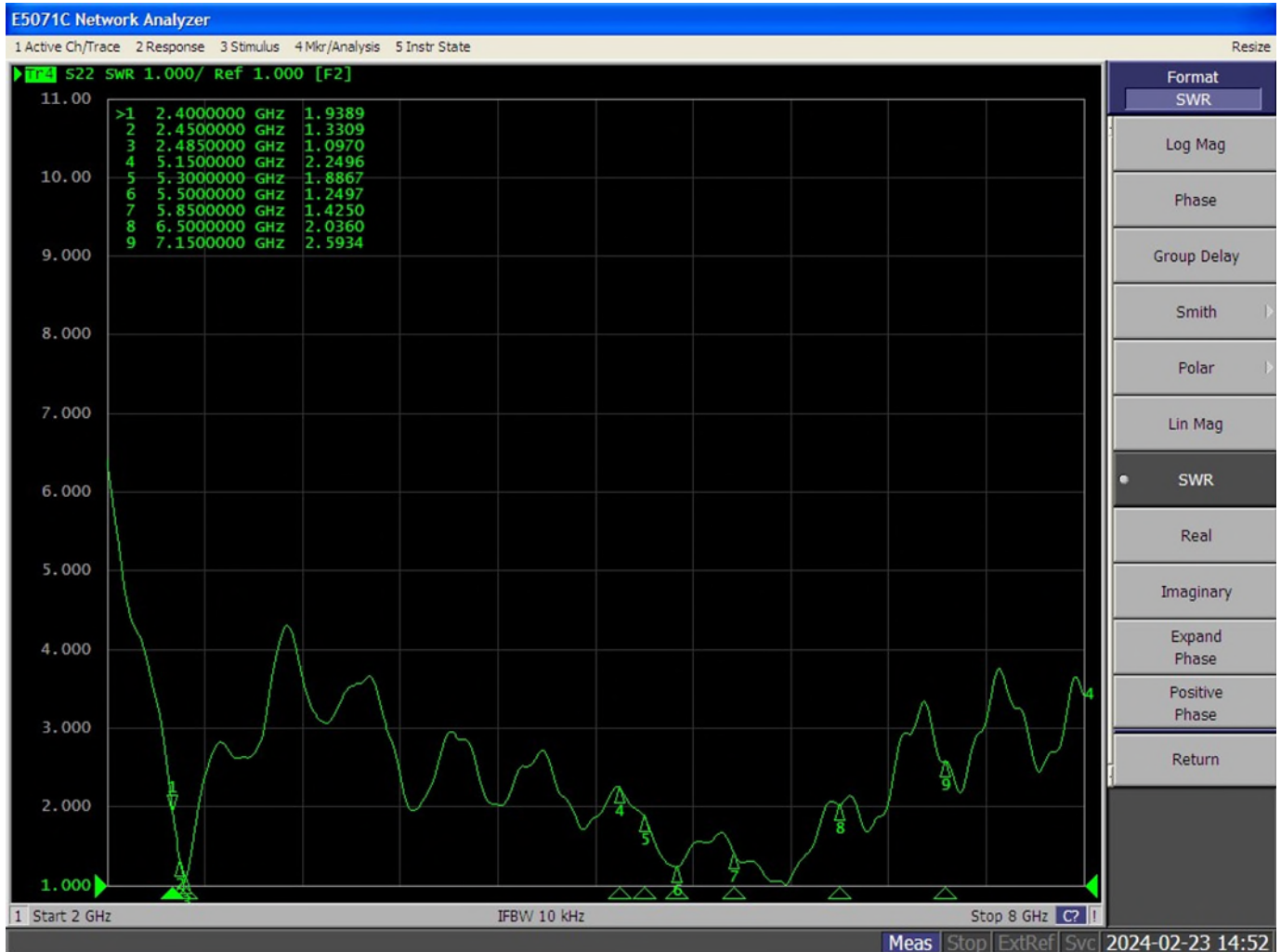


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3.4. RF Performance Characteristics

3.4.1 SWR





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3.4.2 Return Loss

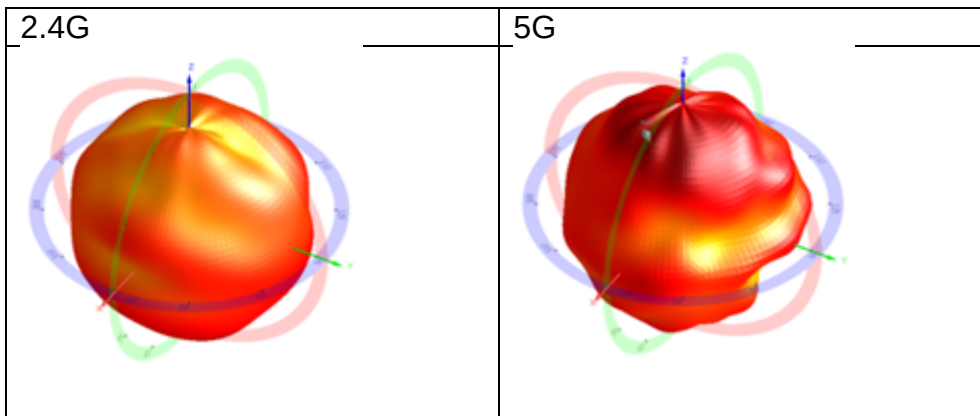


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3.4.3. Gain / Efficiency

Frequency	2400	2450	2484	2500	5150	5250	5350	5470	5600	5725
Directivity (dBi)	6.16	5.58	5.56	5.02	7.97	6.63	7.13	7.20	7.60	7.08
Efficiency (dB)	-6.46	-6.10	-5.54	-5.59	-5.19	-4.83	-4.86	-4.84	-5.10	-5.25
Efficiency (%)	22.61	24.54	27.93	27.58	30.30	32.91	32.67	32.84	30.92	29.84
Peak Gain (dBi)	-0.30	-0.52	0.02	-0.57	2.79	1.81	2.27	2.36	2.50	1.83

Frequency	5785	5850								
Directivity (dBi)	7.16	7.78								
Efficiency (dB)	-5.29	-5.34								
Efficiency (%)	29.55	29.23								
Peak Gain (dBi)	1.86	2.44								





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