

Description

High-power broadband surface-mounted and embedded coupler series, realizing the power synthesis and distribution of microwave high-power amplifier system, signal acquisition and other functions. Used in active phased array radar, microwave transceiver components, microwave amplifiers, radio stations, satellite communications and other projects, to provide standardized and customized high-quality and reliable products.

The performance and reliability indexes are in line with international products, and the pin definition and package size are compatible with international products, realizing 100% in-situ replacement.



Features:

- 475-620 MHz
- DCS & PCS
- Low Insetion Loss
- High Directivity
- Low VSWR
- Good Repeatability
- CTE compatible with FR4, G-10, RF-35, RO4350B and polyimide
- Immersion gold, prevent surface oxidation & scratch
- RoHS Compliant
- Tape & Reel Package available

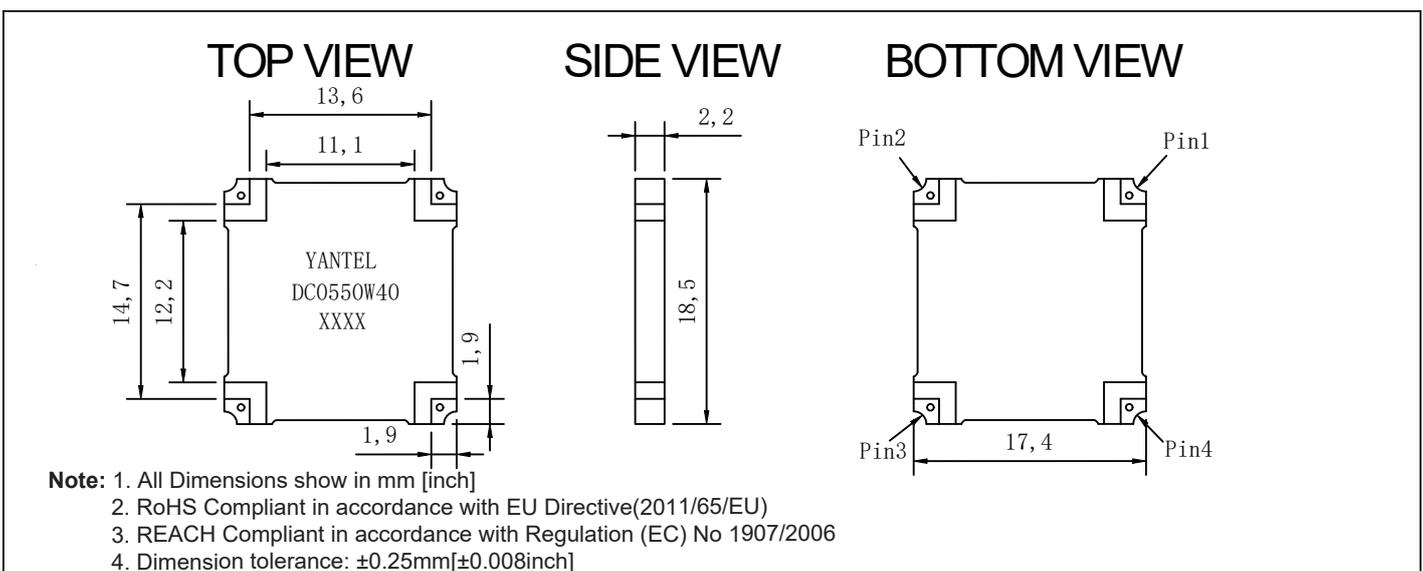
Electrical Specifications (typical)

Frequency MHz	Forward Coupled dB	Directivity dB Min	Return Loss dB Min
475-620	40±2	15	19
Insertion Loss dB Max	Power Avg. CW Watts	Operating Temp. °C	
0.2	600	-55 to +85	

Note:

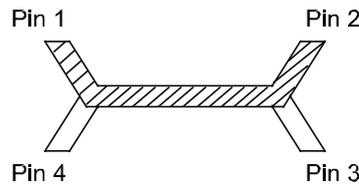
1. All above test data resulting from specify demo board.
2. Insertion loss has removed the thru board loss.

Mechanical Outline



Directional Coupler Pin Configuration

The DC0550W40 has an orientation marker to denote Pin1. Once port one has been identified the other ports are known automatically. Please see the chart below for clarification:

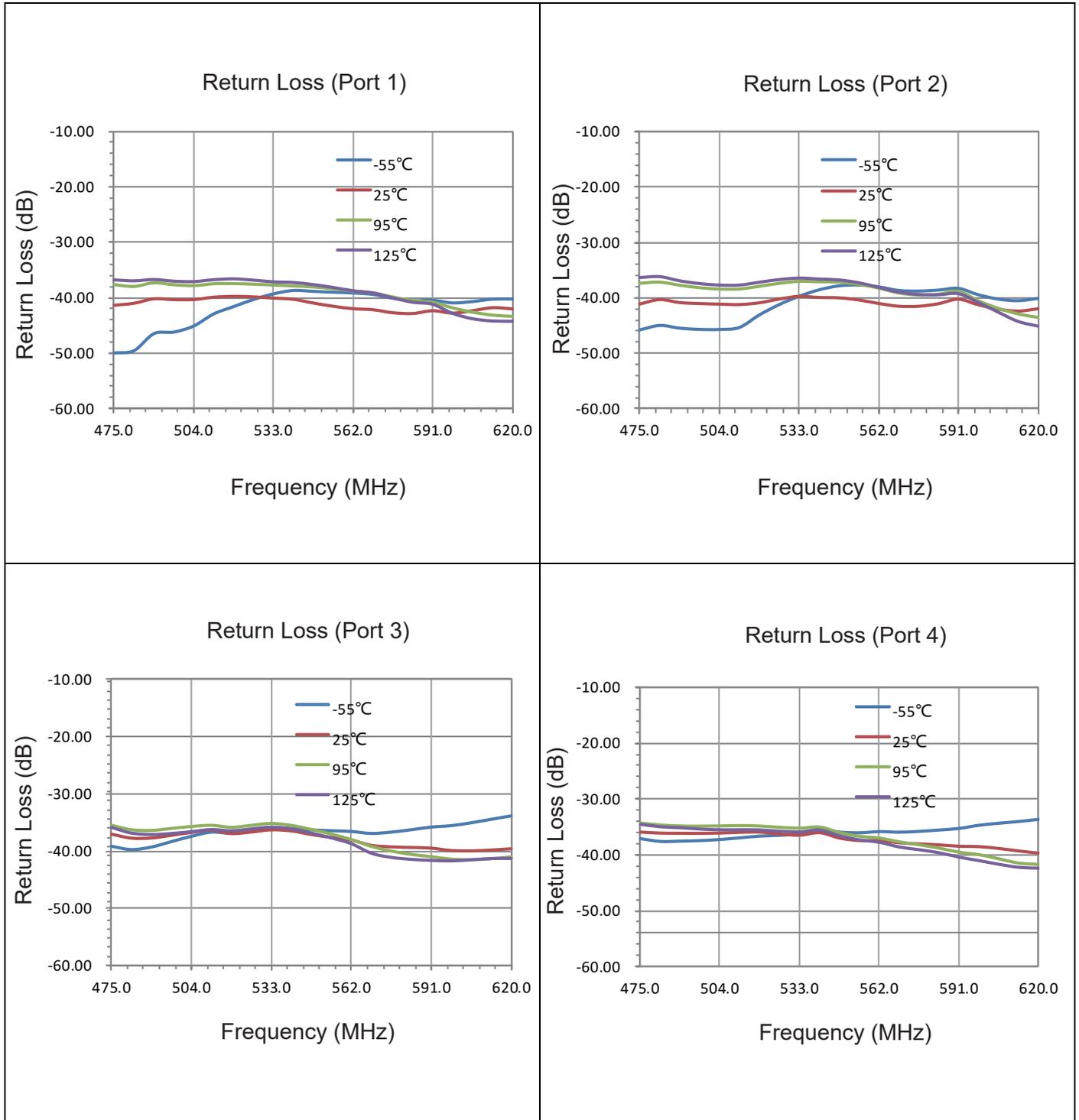


Pin 1	Pin 2	Pin 3	Pin 4
Input	Transmission	Isolate	Coupling
Transmission	Input	Coupling	Isolate

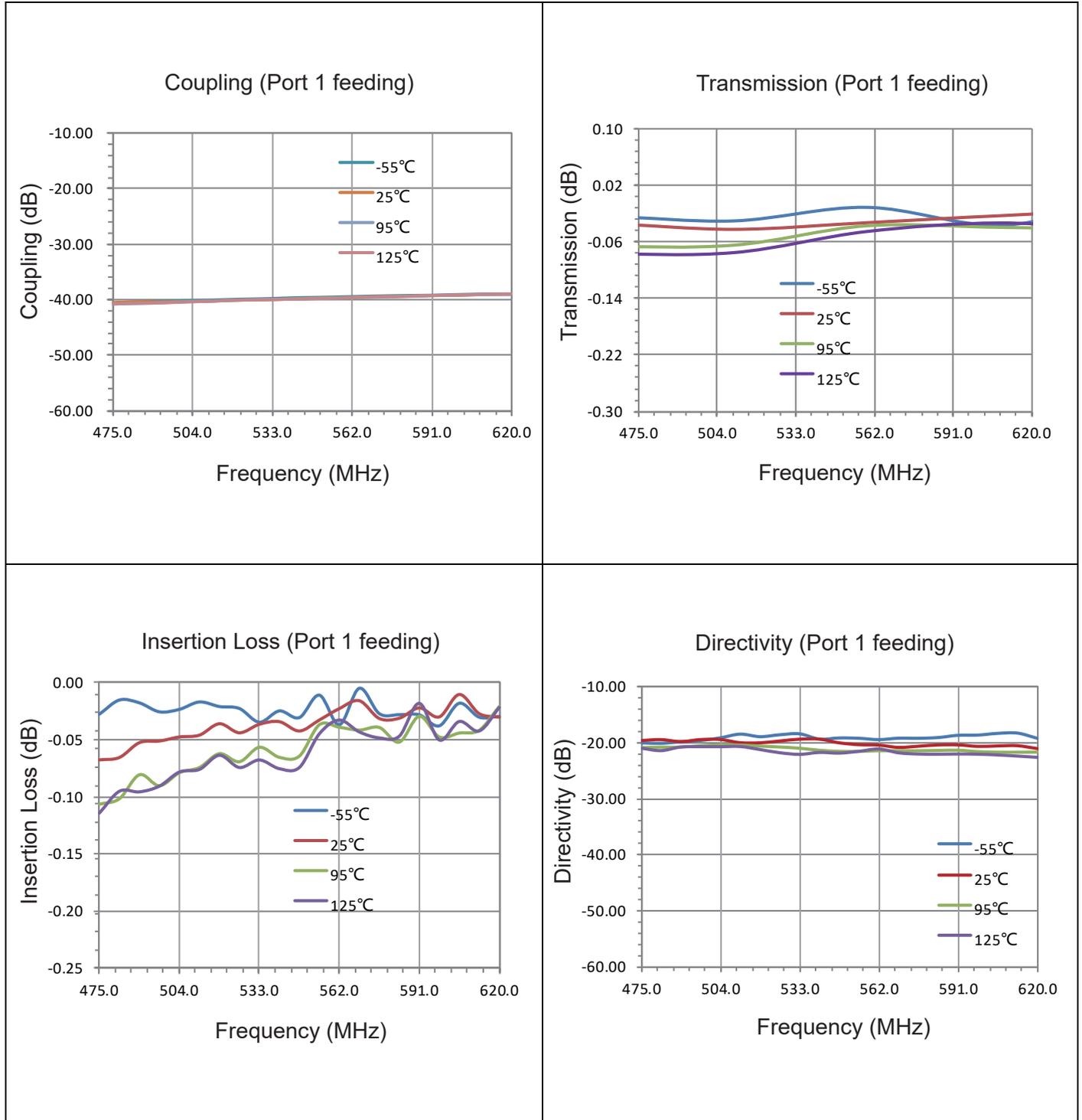
Typical Performance Data (@25°C)

Frequency (MHz)	Coupling (dB)	Transmission (dB)	Insertion Loss (dB)	Directivity (dB)	Return Loss(dB)			
					S11	S22	S33	S44
475.0	-40.51	-0.07	-0.07	-19.63	-41.40	-41.14	-37.07	-35.85
482.3	-40.33	-0.07	-0.07	-19.46	-41.03	-40.33	-37.76	-36.03
489.5	-40.32	-0.05	-0.05	-19.83	-40.24	-40.87	-37.73	-36.06
496.8	-40.29	-0.05	-0.05	-19.46	-40.39	-41.06	-37.27	-36.07
504.0	-40.24	-0.05	-0.05	-19.45	-40.38	-41.16	-36.77	-36.02
511.3	-40.17	-0.05	-0.05	-20.04	-39.96	-41.24	-36.39	-35.89
518.5	-39.98	-0.04	-0.04	-20.07	-39.81	-40.92	-36.96	-35.86
525.8	-39.94	-0.04	-0.04	-19.72	-39.90	-40.23	-36.70	-36.20
533.0	-39.89	-0.04	-0.04	-19.38	-40.11	-39.74	-36.32	-36.41
540.3	-39.77	-0.03	-0.03	-19.37	-40.33	-39.94	-36.51	-35.96
547.5	-39.71	-0.04	-0.04	-20.07	-40.99	-40.01	-37.13	-36.93
554.8	-39.59	-0.03	-0.03	-20.42	-41.57	-40.40	-37.63	-37.39
562.0	-39.45	-0.02	-0.02	-20.50	-42.00	-41.04	-38.08	-37.37
569.3	-39.33	-0.02	-0.02	-20.94	-42.20	-41.54	-38.99	-37.79
576.5	-39.28	-0.03	-0.03	-20.71	-42.73	-41.55	-39.26	-37.98
583.8	-39.22	-0.03	-0.03	-20.47	-42.87	-41.08	-39.36	-38.16
591.0	-39.12	-0.02	-0.02	-20.46	-42.37	-40.26	-39.48	-38.41
598.3	-39.09	-0.03	-0.03	-20.74	-42.80	-41.28	-39.89	-38.48
605.5	-38.97	-0.01	-0.01	-20.65	-42.36	-42.07	-39.95	-38.82
612.8	-38.88	-0.03	-0.03	-20.61	-41.83	-42.43	-39.80	-39.27
620.0	-38.81	0.00	0.00	-21.15	-42.03	-42.01	-39.59	-39.65

Typical Performance (-55°C, 25°C, 95°C, 125°C: 475-620MHz)



Typical Performance (-55°C, 25°C, 95°C, 125°C: 475-620MHz)



Description of Measured Specifications

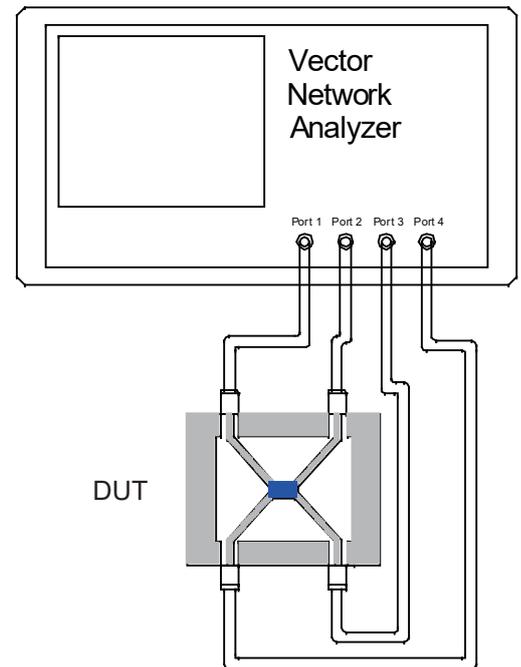
Parameter	Description
VSWR	Voltage standing wave ratio, the impedance match to $50\ \Omega$, the ideal value is 1:1.
Return Loss	Loss of signal power resulting from the reflection caused by discontinuity of transmission line.
Insertion Loss	The input power divided by sum of power at the Forward Coupled port & transmission port
Forward Coupled	The input power divided by the power at coupling port.
Transmission	The input power divided by the power at transmission port.
Directivity	The power at the Forward Coupled port divided by the power at the Reflected Coupled port

Test Method

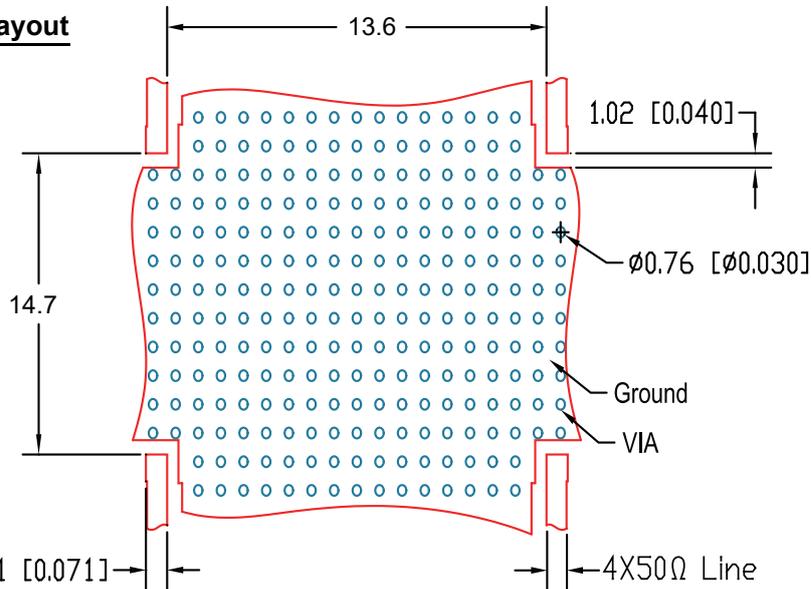
1. Calibrating your vector network analyzer.
2. Connect the VNA 4 Port to DUT respectively.
3. Measure the data of Forward coupled through port 1 to port 4(S41).
4. Measure the data of transmission through port 1 to port 3(S31).
5. Measure the data of Reflected Coupled through port 1 to port 2(S21).
6. Measure the data of return loss port 1, port 3.
7. According to the above data to calculate insertion loss, directivity.

Note:

1. When calculating insertion loss at room temperature, coupling & transmission data both need remove demo board loss. Please see demo board loss data below the table :



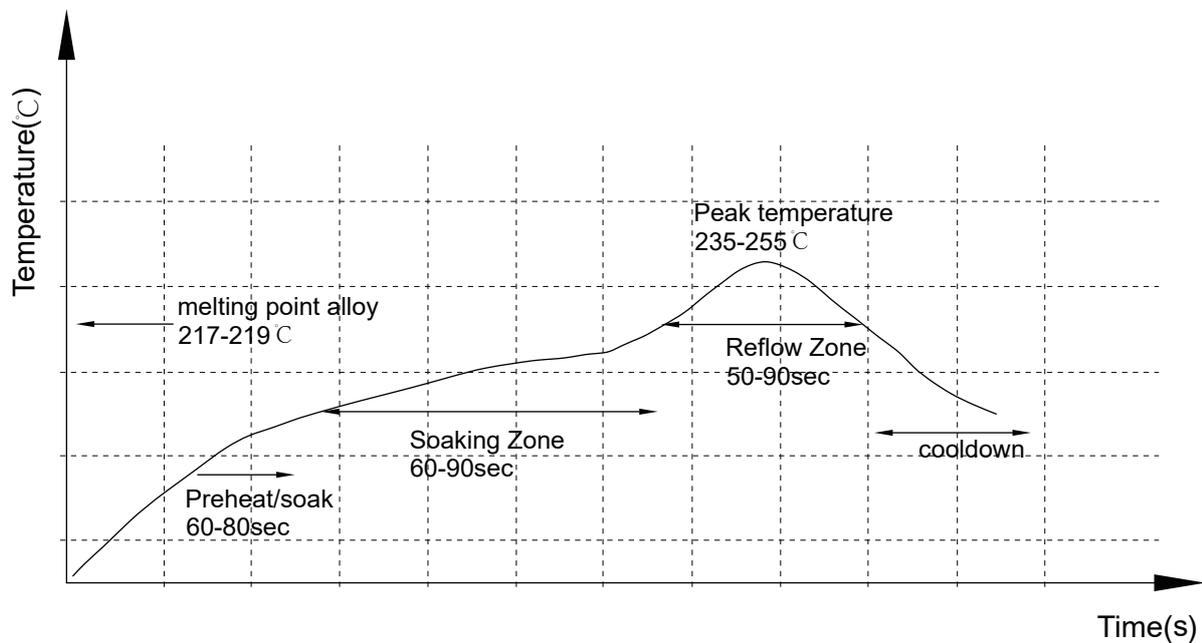
Recommended PCB Layout



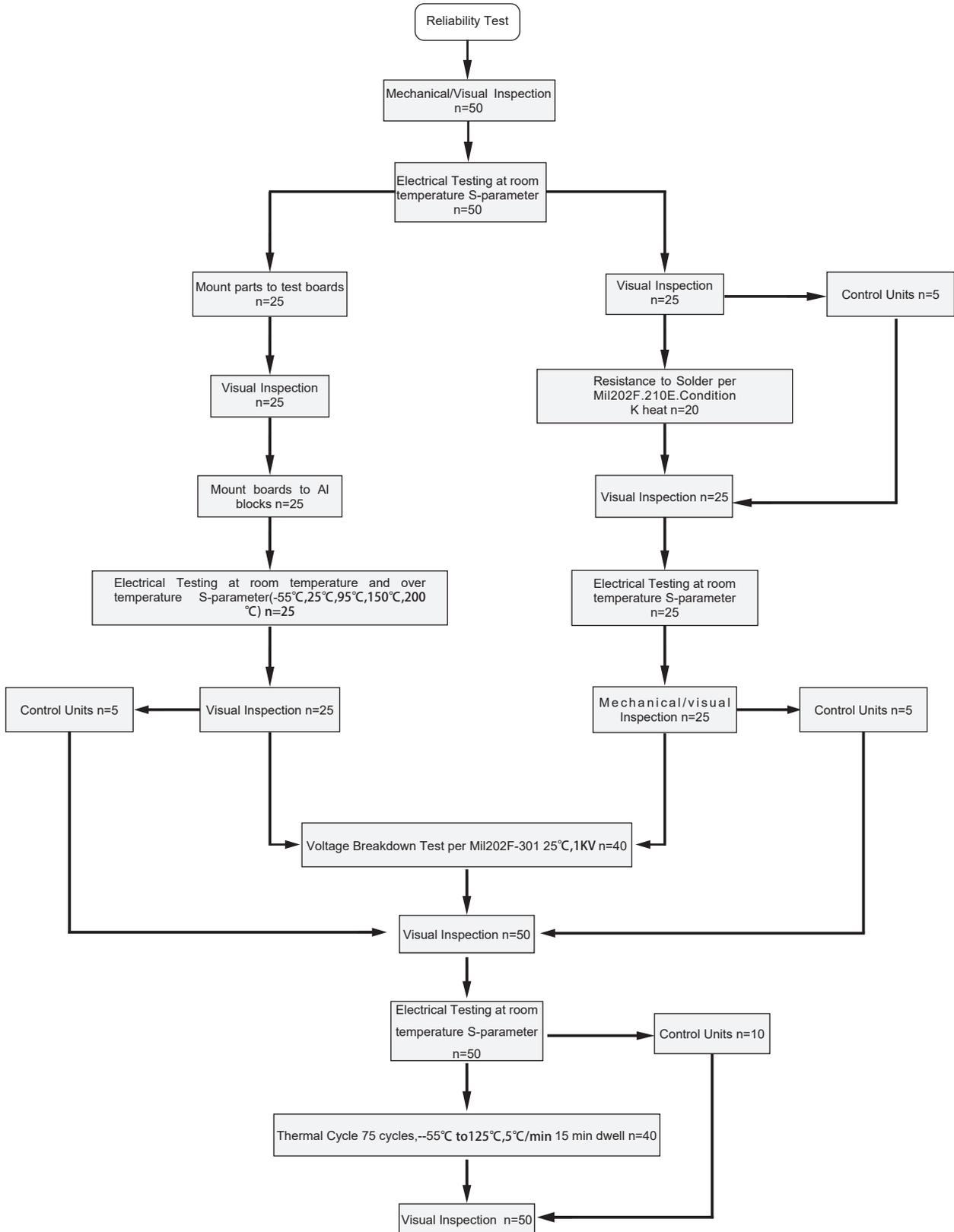
NOTE:

- 50 Ω line width is shown above designing from RO4003 dielectric thickness 0.81mm; copper 1 OZ
- Bottom side of the PCB is continuous ground plane.
- All dimensions shown in mm [inch].

Reflow Profile



Reliability Test Flow



Reliability Test Flow

