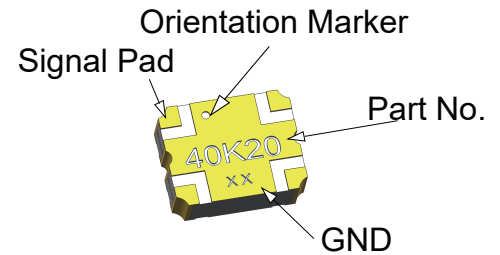


Description

The products are widely used in China and global 4G/5G base station, 5G network coverage, BeiDou navigation antenna, vehicle-mounted high-precision navigation (unmanned) antenna and other applications. The products have miniaturization, low-loss, wide-bandwidth, high power density, high reliability, high cost-effective and other competitive advantages.



Features:

- 3300-5100 MHz
- Very Low Loss
- Production Friendly
- Tight Coupling
- High Directivity
- Tape and Reel
- Lead Free

Electrical Specifications

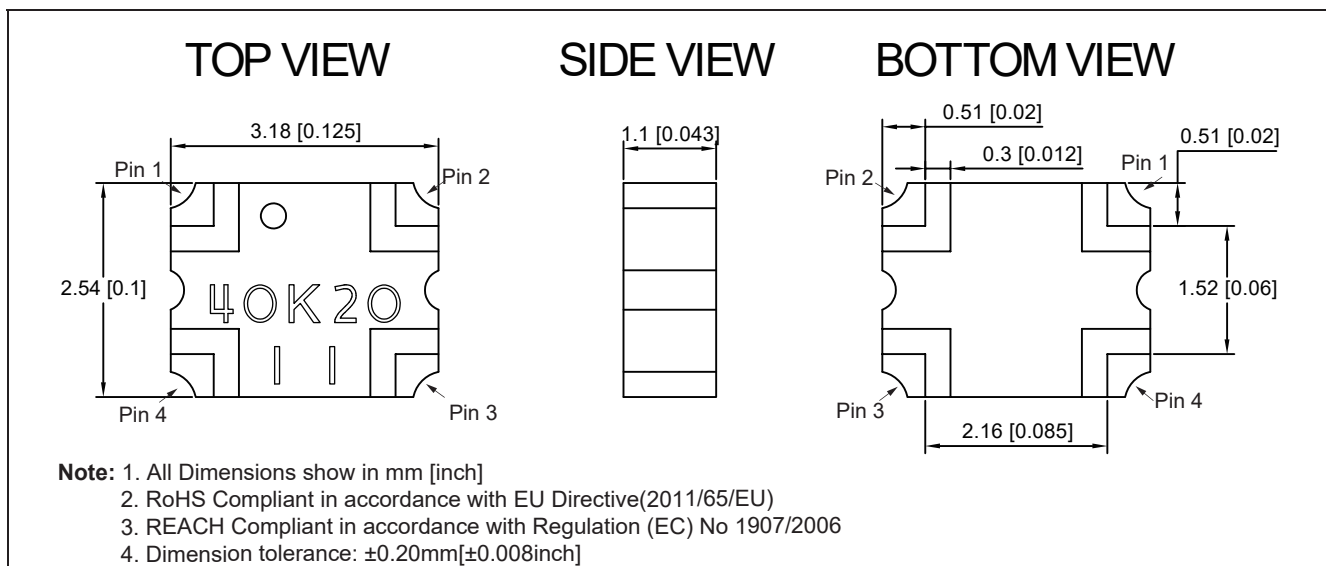
Frequency MHz	Coupling dB	Directivity dB Min	VSWR Max : 1
3300 - 4200	20.0±1.0	19.0	1.28
4200 - 4400	20.0±1.0	19.0	1.28
4400 - 5000	20.0±1.0	19.0	1.28
5000 - 5100	20.0±1.0	19.0	1.22

Insertion Loss dB Max	Frequency Sensitivity dB	Power Avg. CW Watts at 105°C	Operating Temp. °C
0.08	±0.42	25	-55 to +150
0.08	±0.03	25	-55 to +150
0.08	±0.35	25	-55 to +150
0.08	±0.085	25	-55 to +150

Notes:

1. All the above data are based on specified demo board.
2. Insertion loss: Thru board loss has been removed.

Mechanical Outline



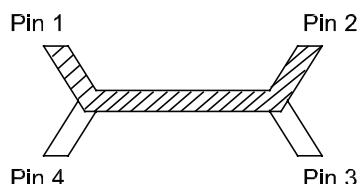
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Directional Coupler Pin Configuration

The DC40K20 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)	Amplitude Balance (dB)	Return Loss(dB)			
						S11	S22	S33	S44
3300	-19.89	-0.09	-0.04	-22.97	-16.84	-23.77	-23.94	-36.56	-37.67
3390	-19.80	-0.08	-0.04	-23.43	-16.75	-23.19	-23.55	-38.11	-41.91
3480	-19.72	-0.08	-0.04	-23.82	-16.68	-23.03	-23.05	-37.91	-52.84
3570	-19.68	-0.08	-0.04	-24.50	-16.63	-23.22	-23.42	-38.10	-49.37
3660	-19.60	-0.08	-0.03	-25.11	-16.56	-23.84	-24.07	-37.01	-48.41
3750	-19.54	-0.08	-0.03	-25.42	-16.50	-24.65	-25.22	-37.21	-40.80
3840	-19.53	-0.07	-0.03	-25.80	-16.49	-25.78	-25.98	-39.86	-42.63
3930	-19.50	-0.08	-0.03	-26.46	-16.46	-27.57	-28.48	-39.98	-36.66
4020	-19.47	-0.08	-0.03	-28.22	-16.43	-30.49	-31.57	-42.64	-35.62
4110	-19.49	-0.08	-0.04	-29.81	-16.45	-32.95	-34.06	-46.12	-34.21
4200	-19.51	-0.10	-0.05	-32.18	-16.46	-35.18	-37.47	-43.85	-32.32
4290	-19.52	-0.10	-0.05	-33.63	-16.46	-34.07	-35.77	-44.26	-30.81
4380	-19.58	-0.10	-0.05	-37.70	-16.52	-31.74	-32.36	-43.35	-30.48
4470	-19.62	-0.10	-0.05	-36.74	-16.55	-29.36	-29.83	-43.46	-29.91
4560	-19.69	-0.11	-0.06	-37.53	-16.62	-27.68	-28.13	-49.81	-30.17
4650	-19.75	-0.11	-0.06	-34.28	-16.67	-26.37	-26.43	-45.86	-30.53
4740	-19.79	-0.10	-0.06	-32.29	-16.72	-25.22	-25.41	-39.11	-30.74
4830	-19.86	-0.08	-0.04	-30.41	-16.81	-25.16	-24.66	-35.29	-31.20
4920	-19.97	-0.08	-0.04	-27.69	-16.92	-24.76	-24.72	-31.99	-29.67
5010	-20.10	-0.07	-0.03	-26.04	-17.06	-25.34	-25.05	-29.74	-27.68
5100	-20.21	-0.06	-0.02	-25.70	-17.18	-25.88	-26.25	-27.66	-27.04

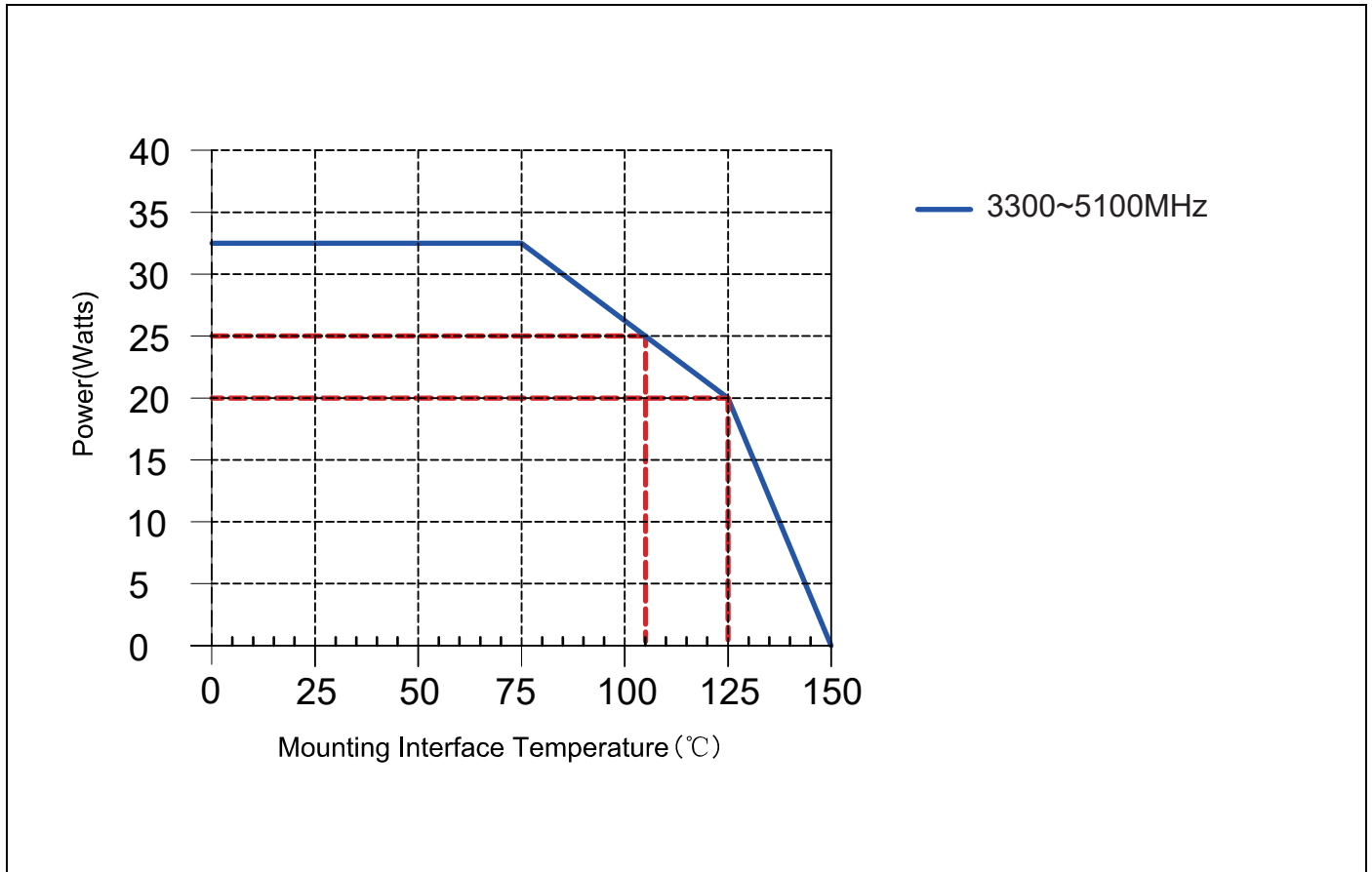
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Power Derating Curves



Power Derating:

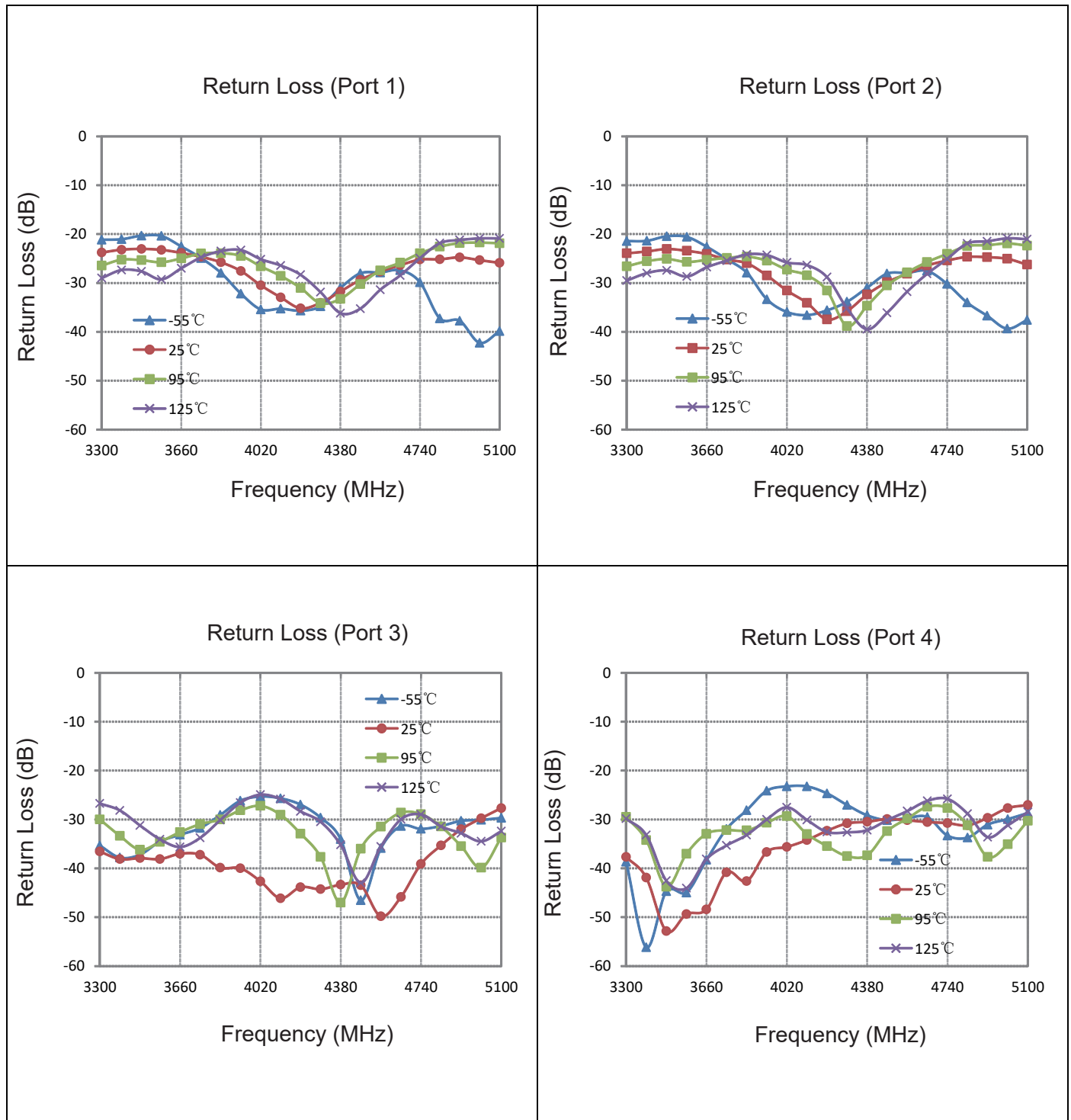
As the mounting interface temperature approaches the maximum continuous operating temperature, the power handling decreases to zero.

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Typical Performance (-55°C, 25°C, 95°C, 125°C:3300-5100 MHz)



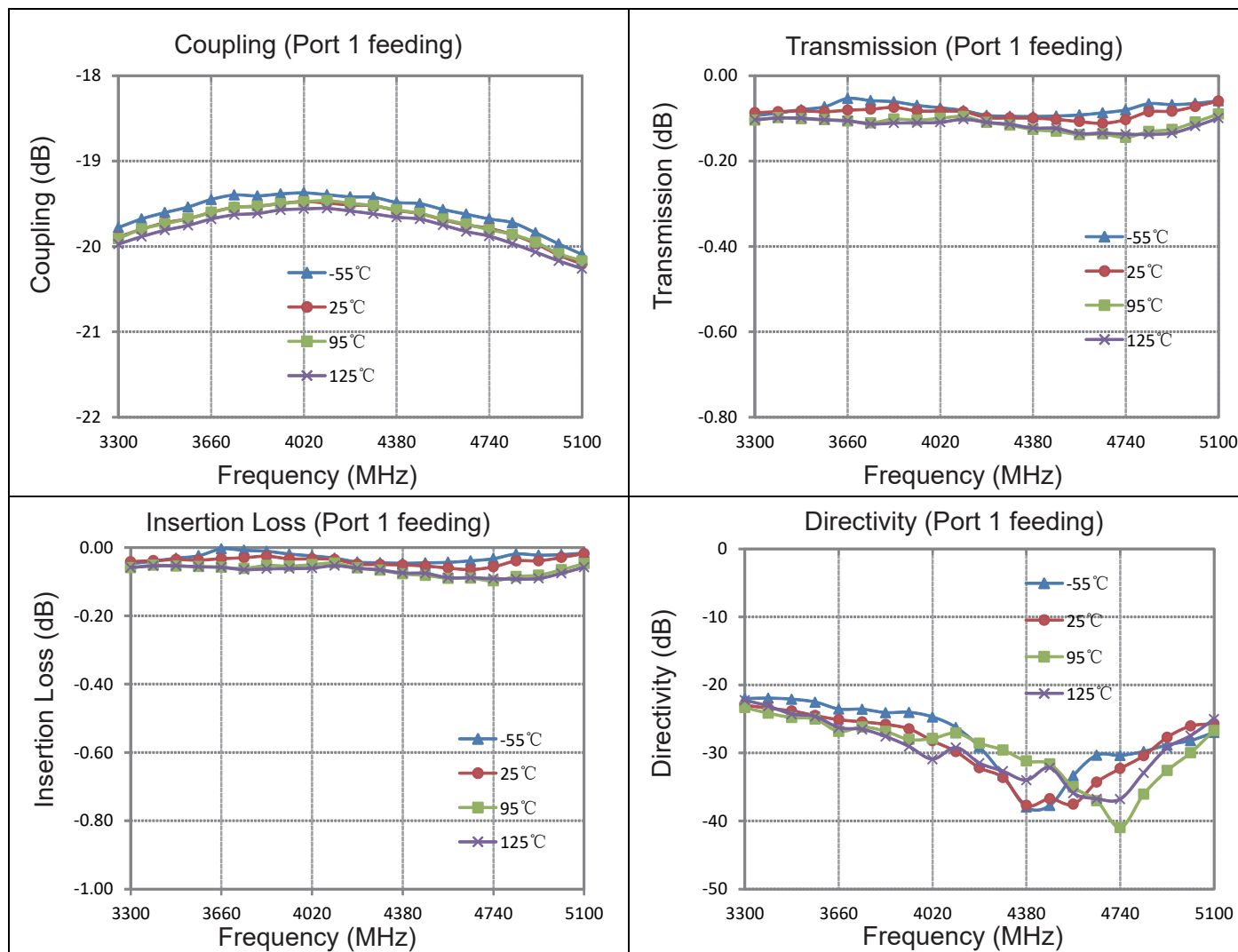
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Typical Performance (-55°C, 25°C, 95°C&125°C: 3300-5100 MHz)



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Description of Measured Specifications

Parameter	Description
VSWR	Voltage standing wave ratio, the impedance match to 50 Ω , 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 coupling port & transmission port.
Coupling	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 coupling port divided by the power at the isolated.

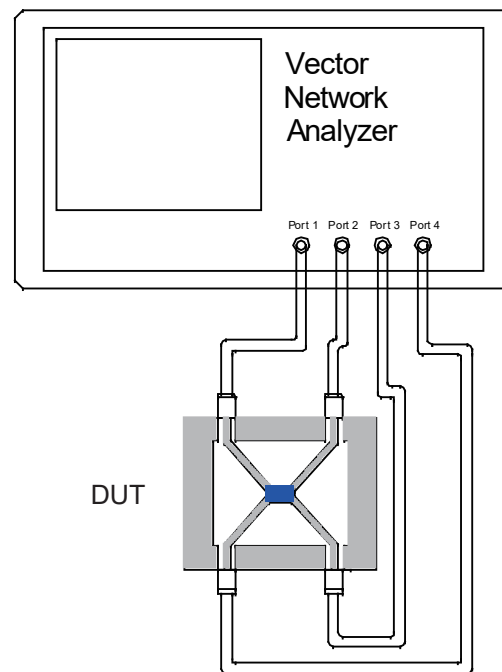
Test Method

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

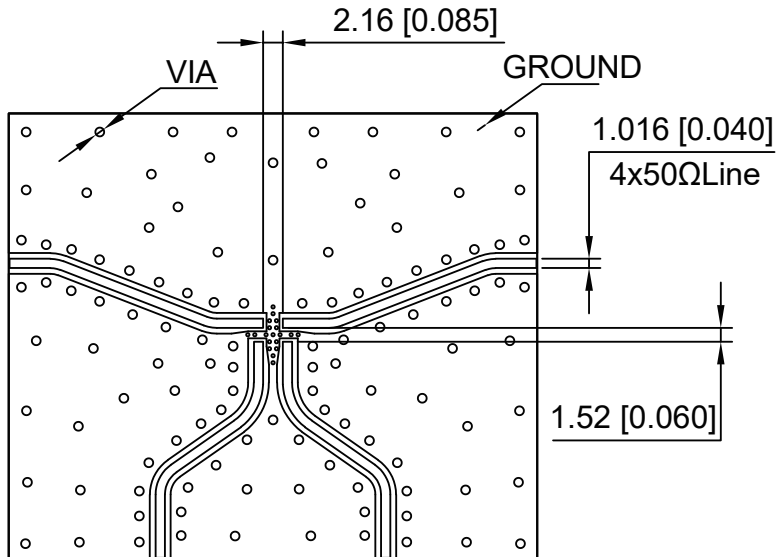
Note:

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 :

Frequency Range(MHz)	Demo Board Loss (dB) @25°C
470-860	0.06~0.10
800-1000	0.10~0.15
1200-1700	0.15~0.20
1700-2000	0.20~0.25
2000-2300	0.20~0.25
2300-2700	0.25~0.30



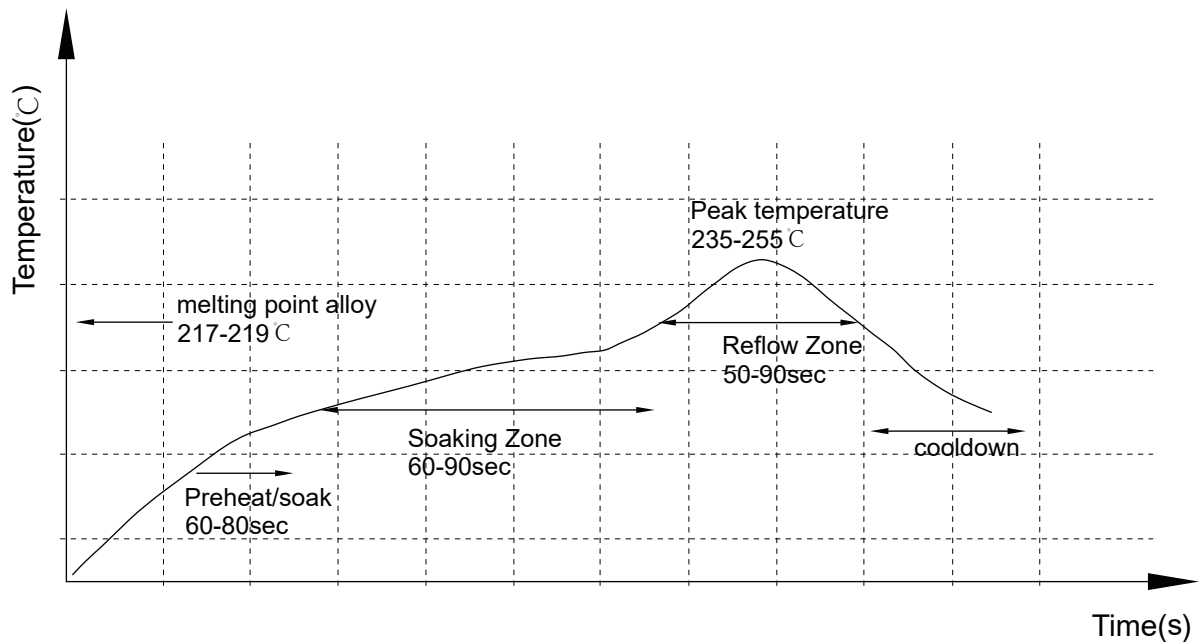
Recommended PCB Layout



NOTE:

1. 50Ω line width is shown above designing from $\epsilon_r=3.66$ THK=20mil copper 1 OZ
2. Bottom side of the PCB is continuous ground plane.
3. All dimensions shown in mm [inch].

Reflow Profile



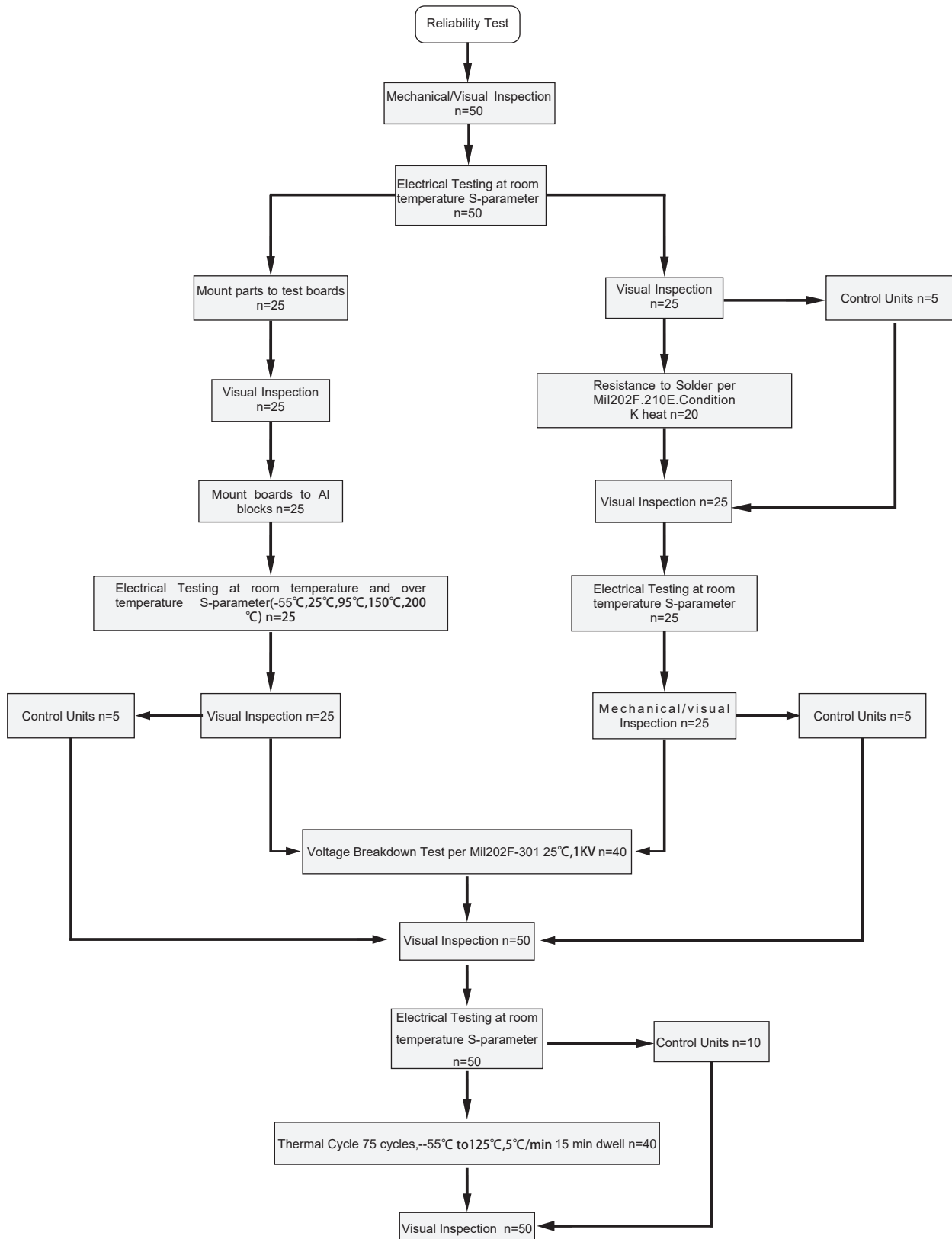
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Reliability Test Flow



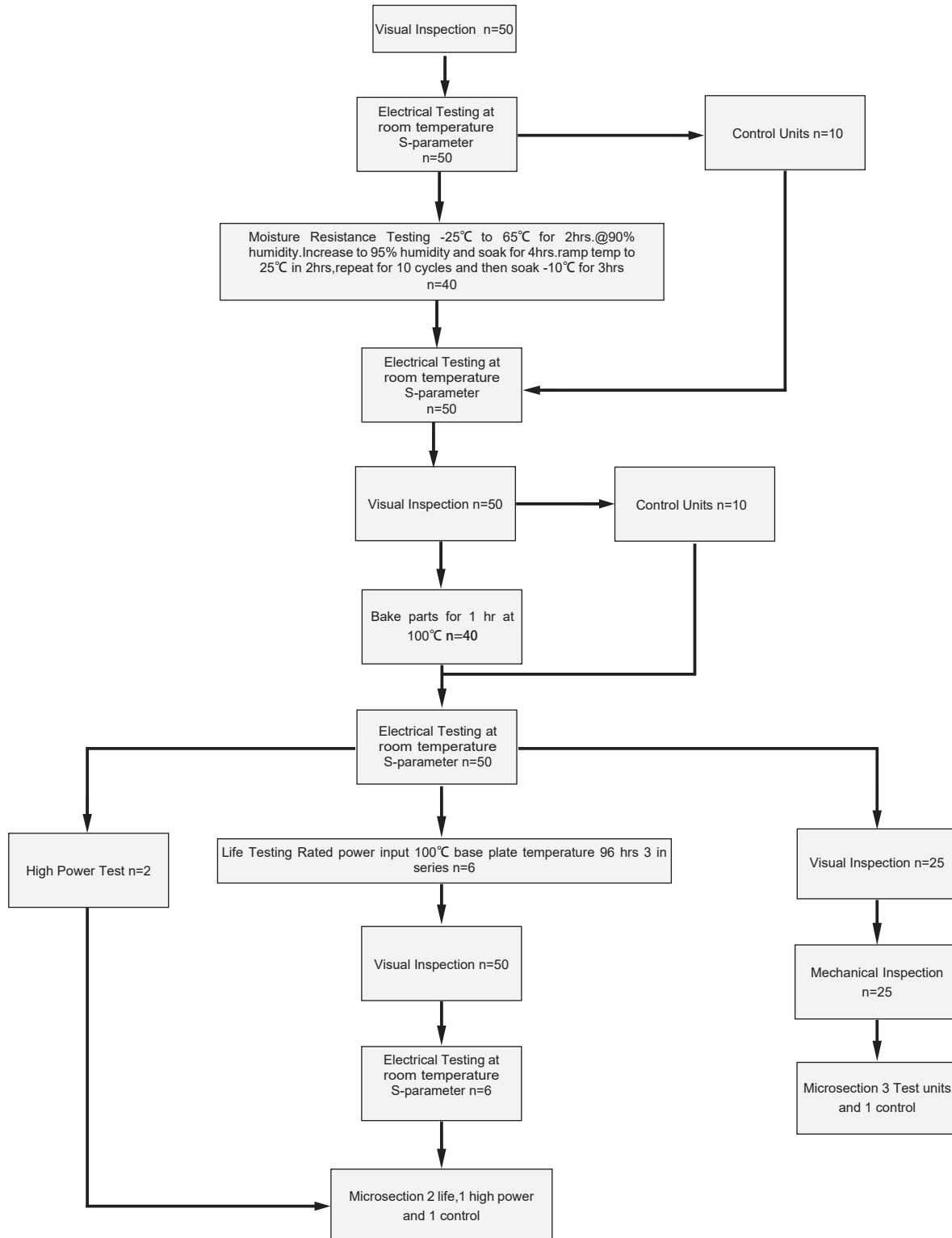
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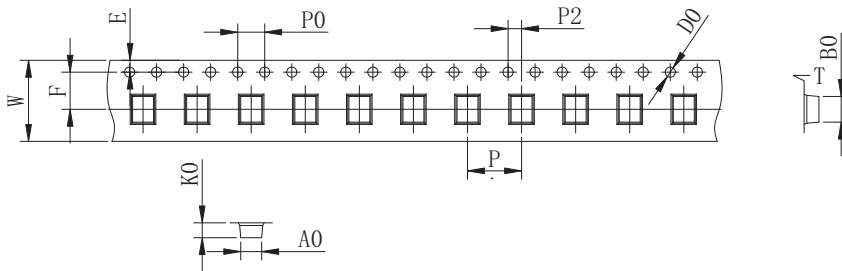
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Reliability Test Flow



Tape and Reel Drawing

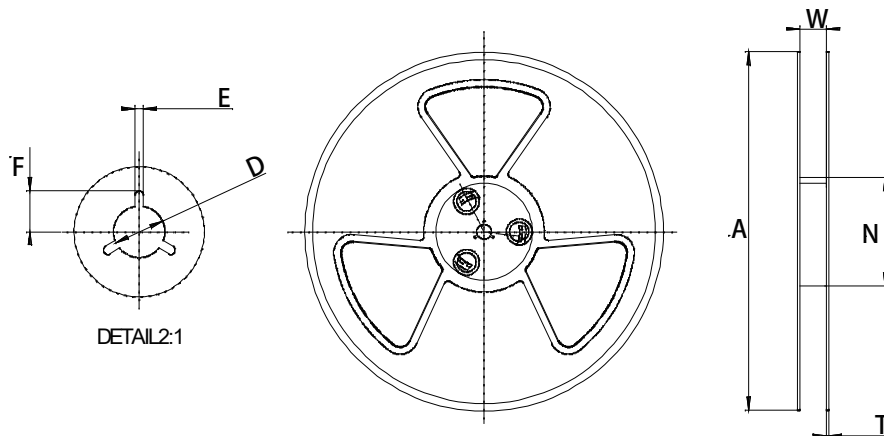
Feeding Direction



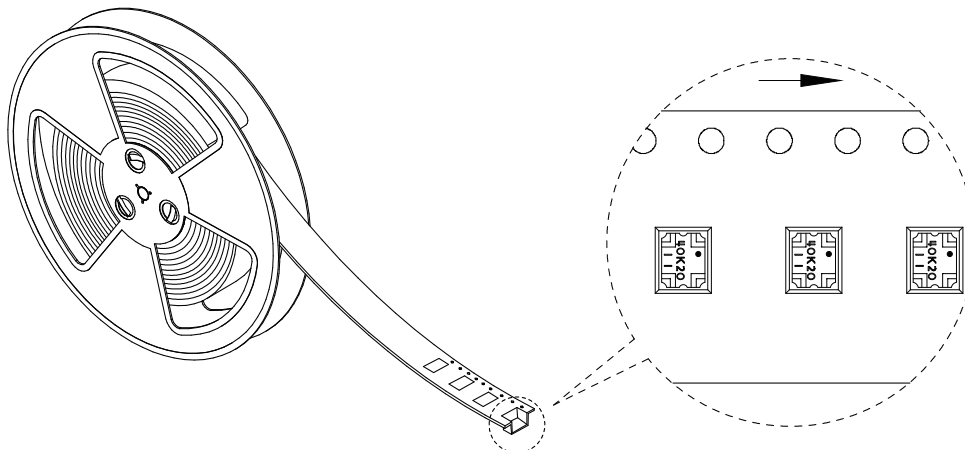
ITEM	W	A0	B0	K0	K1	P	F	E	D	P0	P2	t	7°
DIM(mm)	16.0	2.80	3.40	1.3		8	7.5	1.75	1.50	4.0	2.0	0.3	P/R
TOLE	+0.30 -0.30	+0.10 -0.10	+0.10 -0.10	+0.10 -0.10	+0.10 -0.10	+0.10 -0.10	+0.10 -0.10	+0.10 -0.10	+0.10 -0.00	+0.10 -0.10	+0.10 -0.10	+0.05 -0.05	1500pcs

Notice:

- A. 10 Sprocket hole pitch cumulative tolerance is 0.2mm.
- B. Carrier camber shall be not more than 1mm per 100mm through a length of 250mm.
- C. All dimensions meet EIA-418-B requirements.
- D. A0 & B0 measured as indicated.
- E. K0 measured from a place on the inside bottom of the pocket to top surface of carrier.
- F. Material: PE 100
- G. Thickness: 0.30 ± 0.05 mm
- H. 1500 units (maximum) / T&R



Symbol	Dimensions(mm)
W	16.5 ± 0.4
A	177 ± 0.5
N	63 ± 0.3
T	1.8 ± 0.2
E	2.1 ± 0.3
F	10.75 ± 0.3
D	$13.5 + 0.5 / - 0.2$



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