

Performance

Frequency: 8~12 GHz
 Time delay error: 10 ps
 Insertion Loss: 12.6 dB
 VSWR_{IN}/VSWR_{OUT}: 1.4/1.4
 Supply voltage: ±5V
 Control voltage: 0/5V
 Package/ Size: QFN/5mm×5mm×1mm

Description

The NDAC04002-SM is a 3-bit digital time delayer module with TTL driver. It uses ±5V double power supplies, and 5x5 QFN package, can be assembled by 220°C reflow.

Absolute Max. Ratings (T_A =25°C)

Symbol	Parameter	Value		Unit
		Min	Max	
V1~V3	Control voltage	-0.5	6	V
Pin	Input power (cw)	-	25	dBm
Tstg	Storage temperature	-55	150	°C

Operation of this device outside the parameter ranges given above may cause permanent damage. These are stress ratings only, and functional operation of the device at these conditions is not implied.

Electrical Specifications (T_A =25°C)

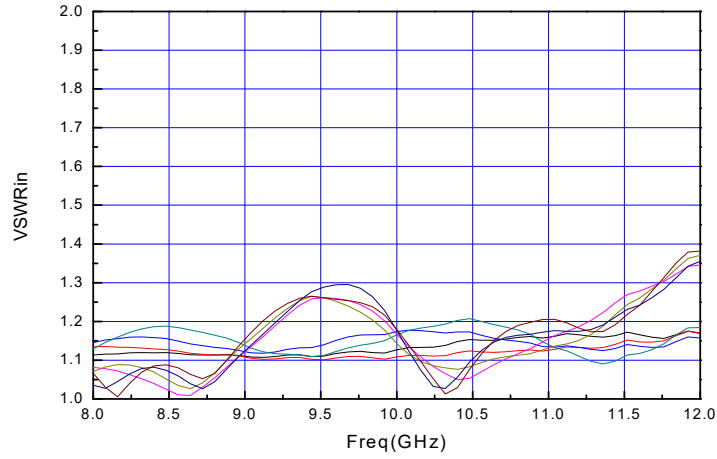
Symbol	Parameter	Test condition	Min	Typ.	Max	Unit
Li	Insertion loss	V1,2,3;0/5V F: 8~12GHz	-	14.5	15	mA
Time delay error	105ps (1λ)		-	5	10	ps
	210ps (2λ)		-	10	15	ps
	420ps (3λ)		-	15	20	ps
ΔLi	Insertion Loss Variation		-	0.5	1	dB
VSWR	Input/output VSWR		-	1.4	1.6	-

Recommended operating conditions

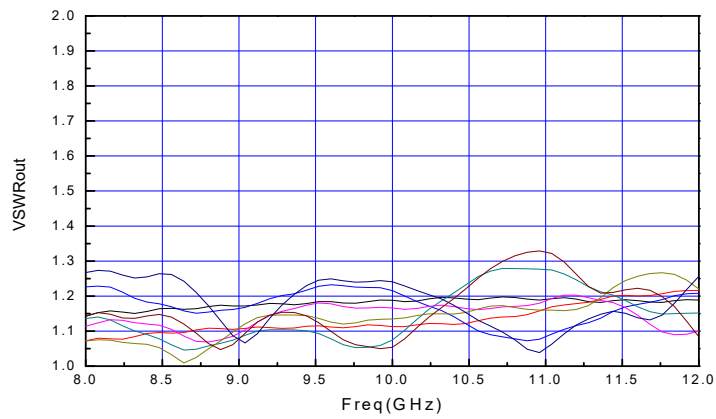
Symbol	Parameter	Value		Unit
		Min	Max	
VDD	Positive supply voltage	4.5	5.5	V
VEE	Negative supply voltage	-5.5	-4.5	V
V1~V3	Control voltage	-0.5	5	V
Freq	Operating Frequency	8	12	GHz
T _A	Operating temperature	-55	125	°C

Typical test curve

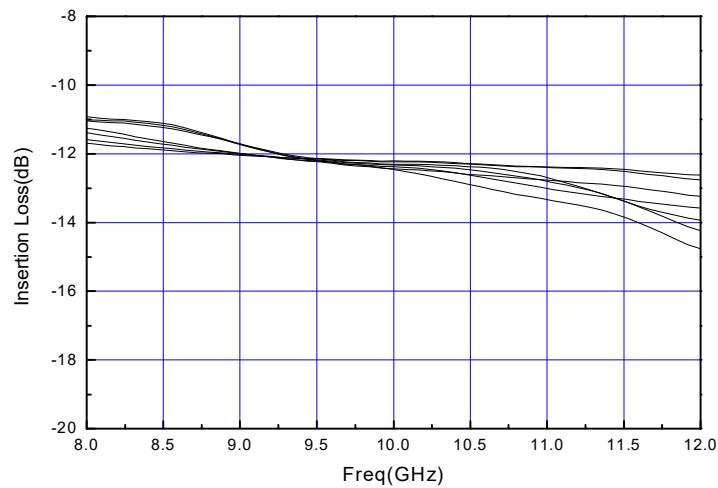
VSWRin



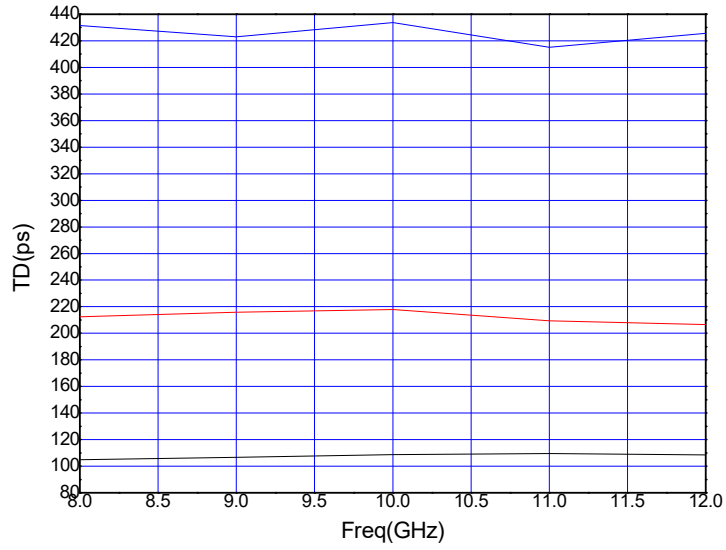
VSWRout



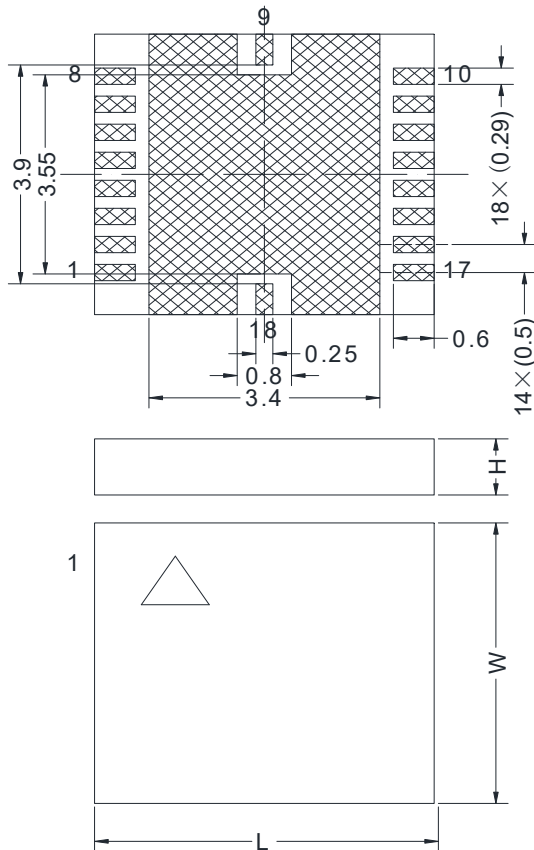
Major state insertion loss curve



Major state time delay error



Outline Size



Symbol	Value (Unit: mm)	
	Value	tolerance
<i>H</i>	1	-
<i>L</i>	5	±0.2
<i>W</i>	5	±0.2

Pin Description

Pin Number	Symbol	Function	Pin Number	Symbol	Function
1	NC	Not connected	10	NC	Not connected
2	VDD	Positive power supply	11	NC	Not connected
3	VEE	Negative power supply	12	NC	Not connected
4	NC	Not connected	13	NC	Not connected
5	V3	420ps delay control	14	NC	Not connected
6	V2	210ps delay control	15	NC	Not connected
7	V1	105ps delay control	16	NC	Not connected
8	1N	1 channel reverse output	17	NC	Not connected
9	RFin	RF In	18	RFout	RF Out

Note: 1、 The center soldering pad at bottom should be grounded.
2、 NC is suggested to grounded.

Truth table:

Control port Major delay state	V1	V2	V3
Basic state	0V	0V	0V
105ps	5V	0V	0V
210ps	0V	5V	0V
420ps	0V	0V	5V

Other instructions:

- 1) The product is an electrostatic sensitive device. Anti-static measures should be taken throughout the production, packaging, storage, transportation and use, such as wearing anti-static wrist protector.
- 2) It can withstand 220°C reflow welding and installation.