

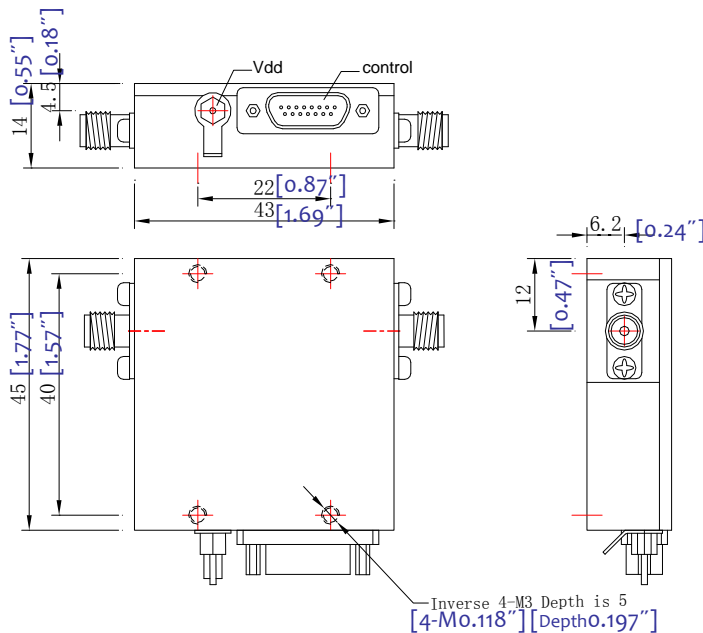
# 18-26GHz Digital 6 Bits 360° Step Phase Shifter



### Features

- Wide Band Operation with full 18-26GHz bandwidth.
- High linearity up to 5W upon request.
- TTL compatible driver include
- Fast Switching Speed
- Flat phase shifting response, low phase error.
- Low Insertion Loss and High Isolation
- Temperature Range -40°C~+85°C
- Customization available upon request

Parameter	Min.	Parameter	Max.	Units
Frequency Range	18	-	26	GHz
Insertion Loss	-	-	16.0	dB
Input VSWR	-	2.5	3.5	:1
Output VSWR	-	2.5	3.5	:1
Phase Error*	-	+/- 5.0	+15/-25.0	deg
RMS Phase Error	-	-	10.0	deg
Input Power for 1 dB Compression	-	10	-	dBm
Control Voltage	0	-	5	V
Bias Voltage Current (12V)	-	-	20	mA



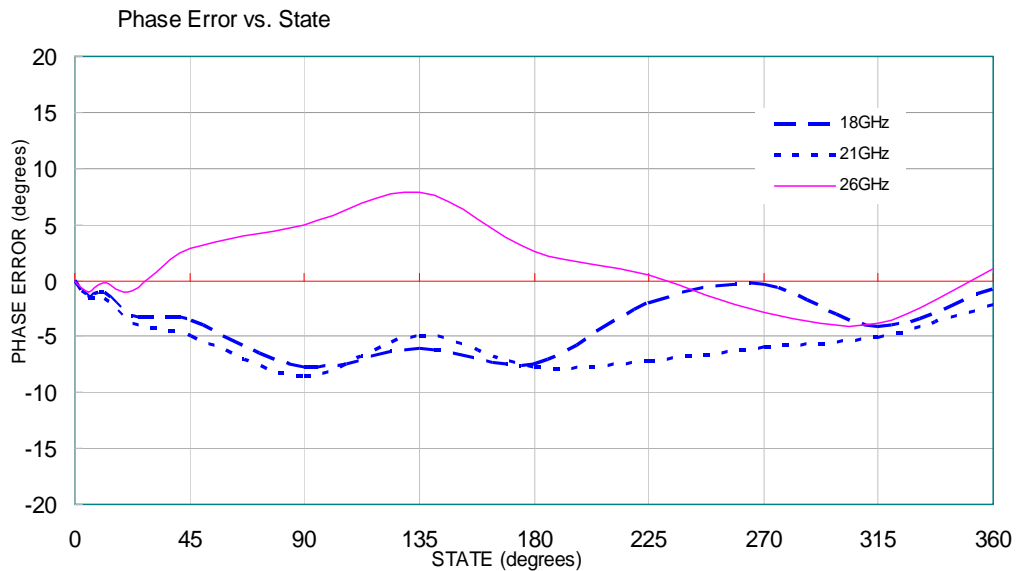
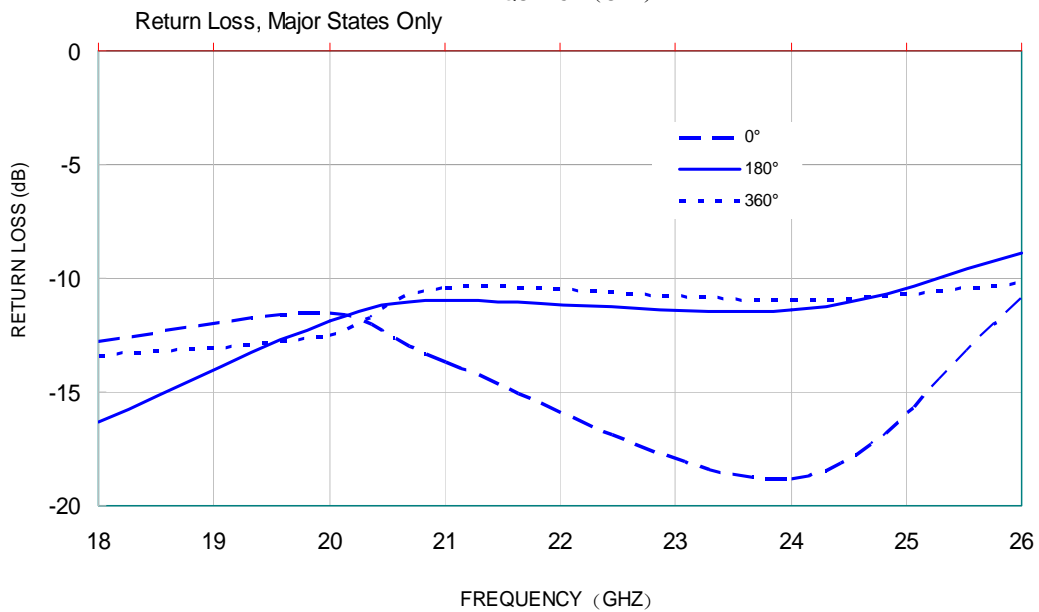
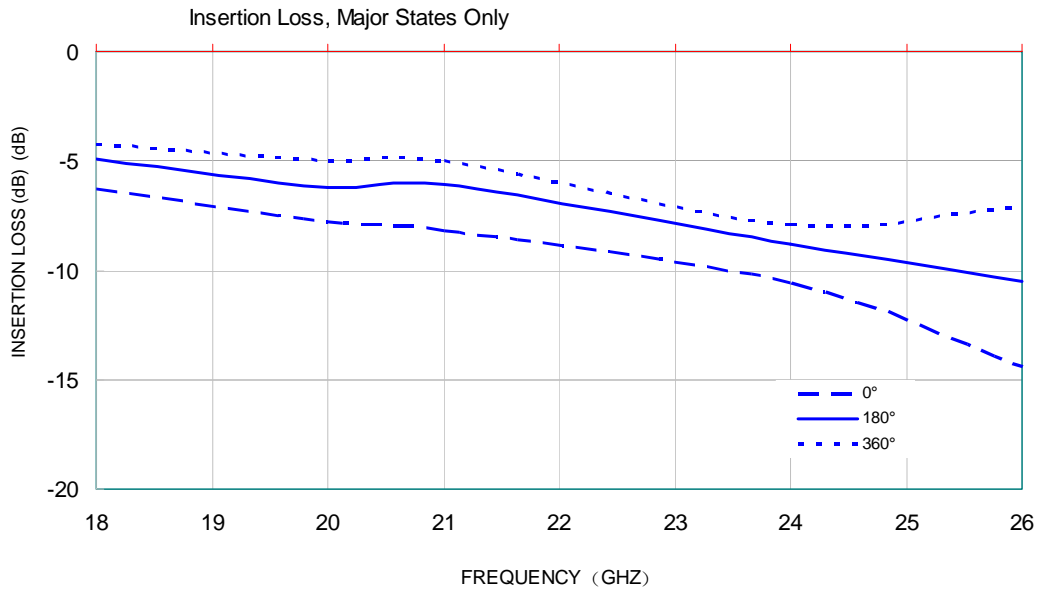
### Control Voltage:

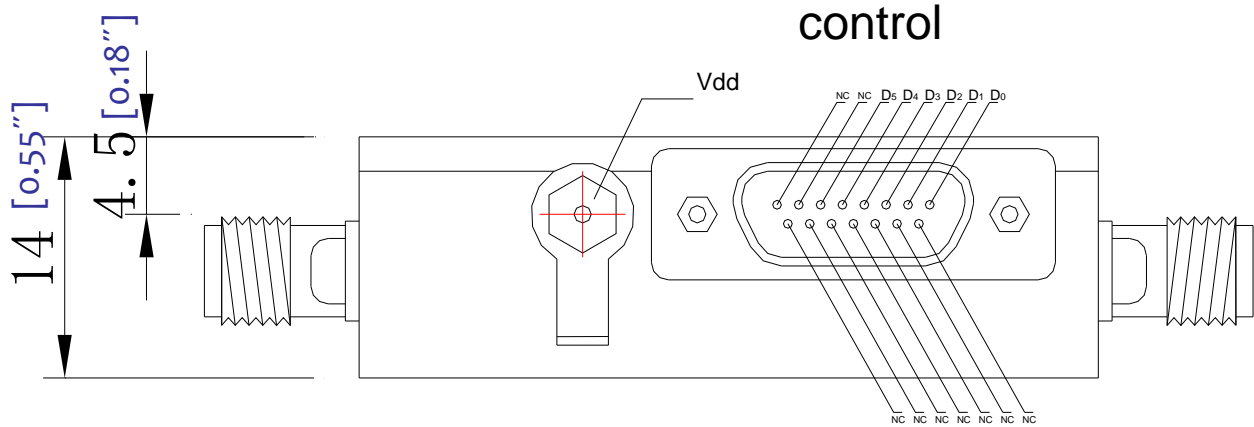
State	Voltage
Low(0)	0 to +0.5V
High(1)	+3 to +5V(Note 5)

### Absolute Maximum Ratings:

Operating Temperature	-40° C to 85° C
Storage Temperature	-55° C to 100° C
(Vdd) Max!	15V
(Vc):	5.0 V
Input Power (RFI N) Max!	23 dBm

18-26GHz Full Band Digital Step 360° 6 Bits Phase Shifter





Control Voltage Input						Phase Shift (Degrees) RFIN - RFout
D5	D4	D3	D2	D1	D0	
1	1	1	1	1	1	Reference*
1	1	1	1	1	0	5.625
1	1	1	1	0	1	11.25
1	1	1	0	1	1	22.5
1	1	0	1	1	1	45.0
1	0	1	1	1	1	90.0
0	1	1	1	1	1	180.0
0	0	0	0	0	0	354.375



18-26GHz Full Band Digital Step 360° 6 Bits Phase Shifter

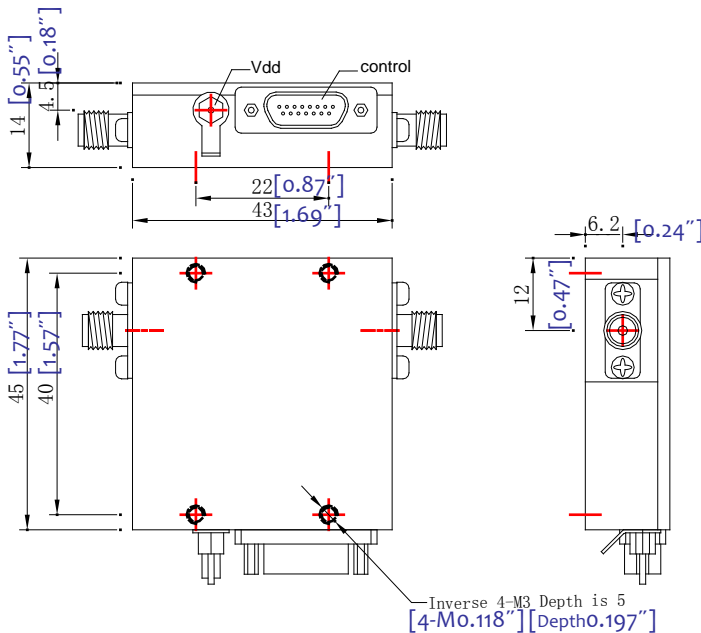
# 12-18GHz Digital 6 Bits 360° Step Phase Shifter



### Features

- Wide Band Operation with full 12-18GHz bandwidth.
- High linearity up to 5W upon request.
- TTL compatible driver include
- Fast Switching Speed
- Flat phase shifting response, low phase error.
- Low Insertion Loss and High Isolation
- Temperature Range -40°C~+85°C
- Customization available upon request

Parameter	Min.	Typ.	Max.	Units
Frequency Range	12	-	18	GHz
Insertion Loss*	-	6.0	10.0	dB
Input Return Loss*	-	2.5	3.5	dB
Output Return Loss*	-	2.5	3.5	dB
Phase Error*	-	+/- 5.0	+20/-10.0	deg
RMS Phase Error	-		10.0	deg
Input Power for 1 dB Compression		10		dBm
Control Voltage	0	-	5	V
Bias Voltage Current 12V	-	-	20	mA



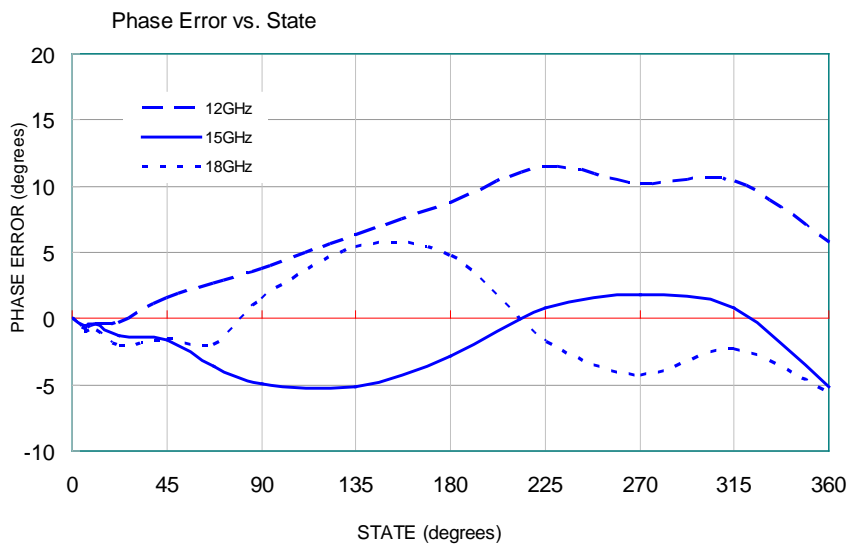
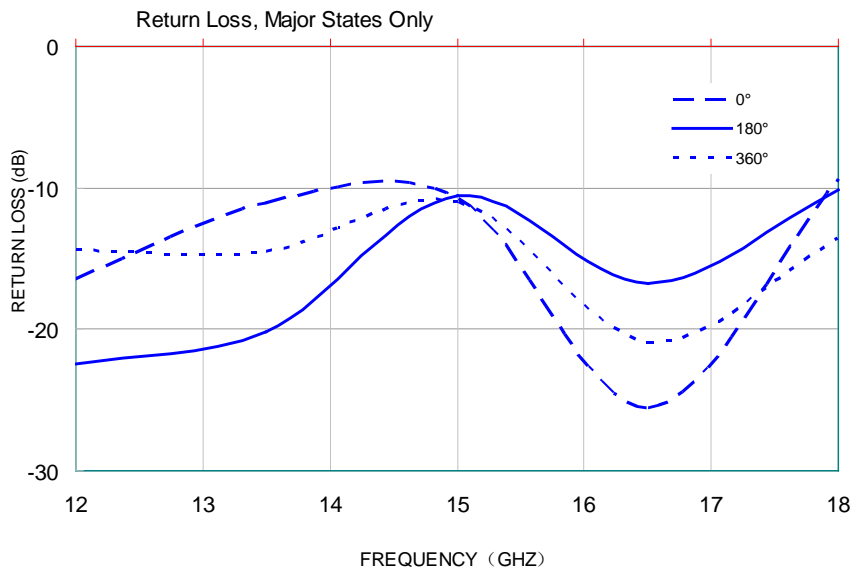
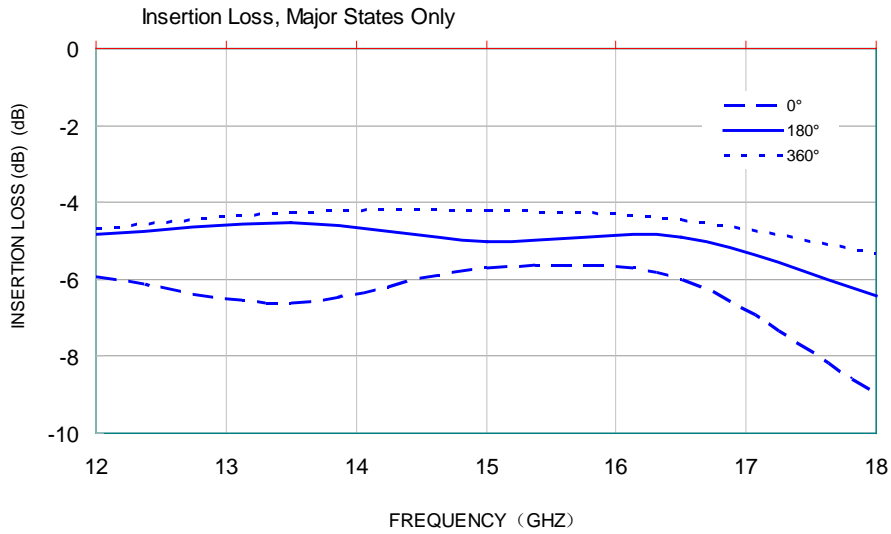
### Control Voltage:

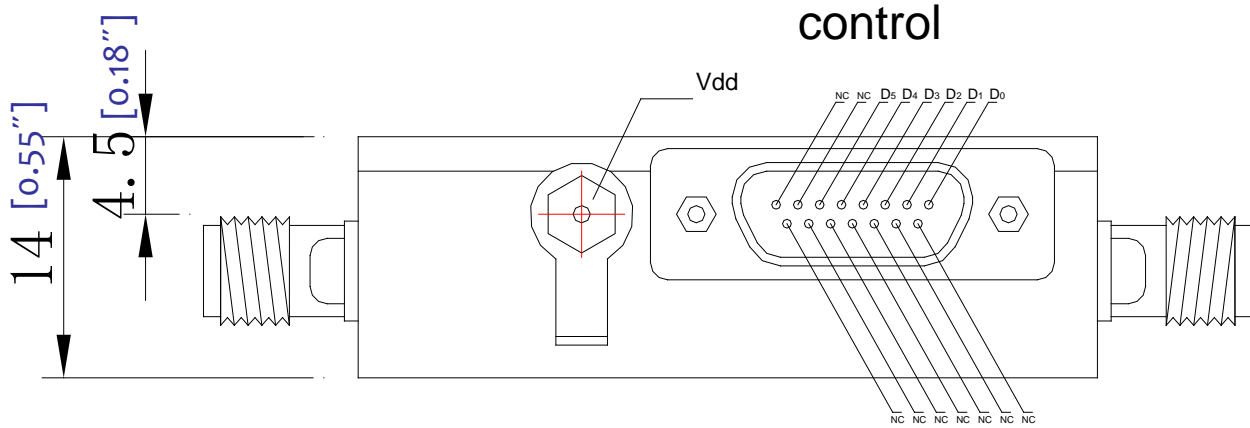
State	Voltage
Low(0)	0 to +0.5V
High(1)	+3 to +5V(Note 5)

### Absolute Maximum Ratings:

Operating Temperature	20° C to 70° C
Storage Temperature	-55° C to 100° C
(Vdd) Max!	15V
(Vc):	5.0 V
Input Power (RFI N) Max!	10 dBm

12-18GHz FullBand Digital Step 360° 6 Bits Phase Shifter





Control Voltage Input						Phase Shift (Degrees) RFIN - RFout
D5	D4	D3	D2	D1	D0	
1	1	1	1	1	1	Reference*
1	1	1	1	1	0	5.625
1	1	1	1	0	1	11.25
1	1	1	0	1	1	22.5
1	1	0	1	1	1	45.0
1	0	1	1	1	1	90.0
0	1	1	1	1	1	180.0
0	0	0	0	0	0	354.375



8-12GHz Full Band Digital Step 360° 6 Bits Phase Shifter

## 6Bit Digital Non-Dispersive Phase Shifter 8-12GHz



### Features

- Wide Band Operation 8-12GHz
- 360° Phase Shift, LSB = 5.625°
- Fast Switching Speed
- Temperature Range -45°C~+85°C
- Customization available upon request
- Hermetically sealed package up to 60,000 ft available upon request.



Electrical Specifications, TA = +25° C, With Vss = -5V & VCTL = 0/ +5V

Description	PN: RFPST0812N6			
	6Bit Digital Phase Shifter			
Parameters	Min	Typ.	Max	Units
Frequency Range	8		12	GHz
Phase Range			360	°
Insertion Loss		9	10	dB
Insertion Loss Temperature Coefficient		0.008		dB/°C
Phase Flatness		±4		°
Input VSWR		1.6	2	
Output VSWR		1.6	2	
Input Power for 1 dB Compression		28		dBm
Input IP3		50		dBm
Weight		1.7		ounces
Impedance		50		Ω
Biasing (+5V)		25		mA
Input /Output Connector	SMA-Female			
Control PIN	MICRO-D9			
Finishing	Gold Plating			
Material	Aluminum			
Seal	Hermetically Sealed ( optional )			

Digital Non-Dispersive Phase Shifter 8-12GHz

**Absolute Maximum Ratings**

Biassing	-5V±5%
TTL Control Voltage	+5V/0V
RF Input power	30dBm
Operating Temperature(C°)	-45 ~ +85
Storage Temperature(C°)	-50 ~ +125

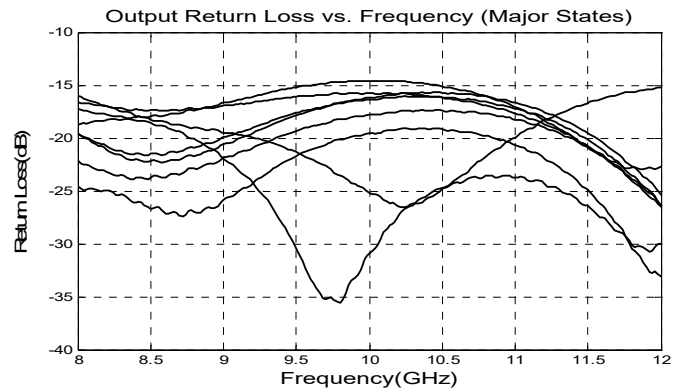
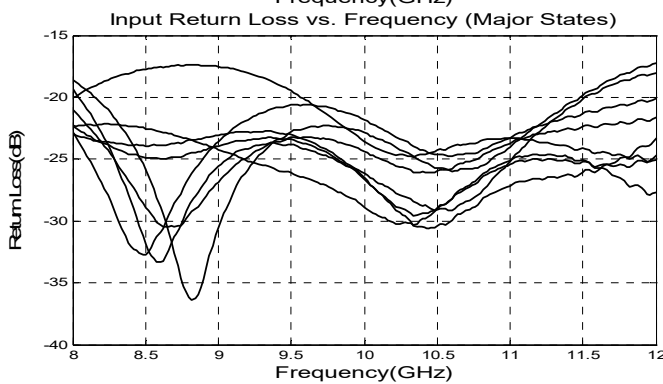
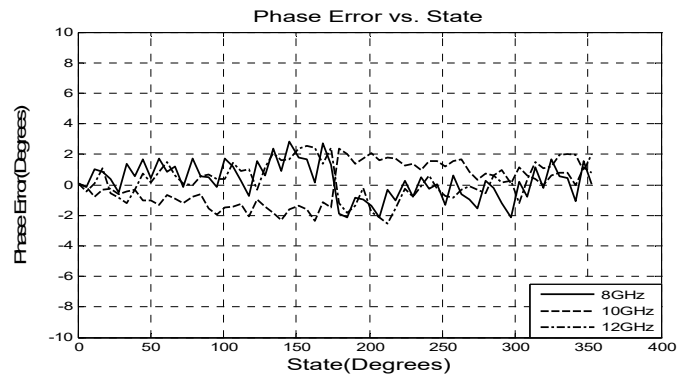
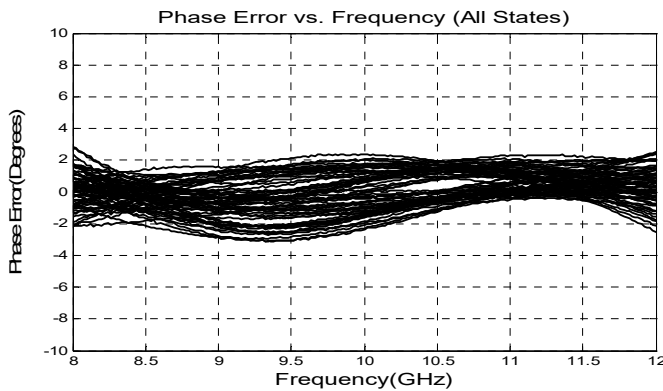
**Ordering Information**

Part No	ECCN	Description
RFPSHT0812N6	EAR99	8-12GHz Digital Digital Phase Shifter

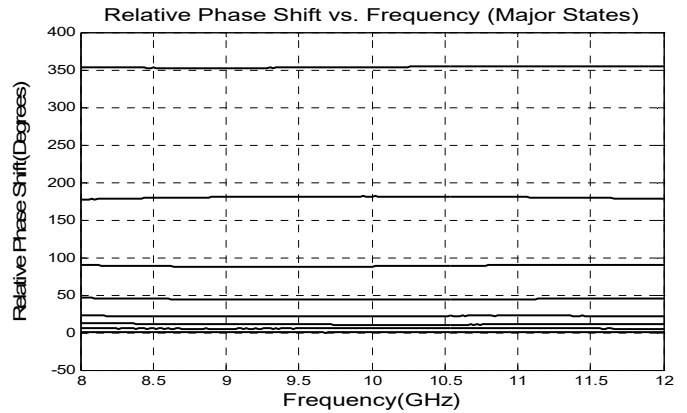
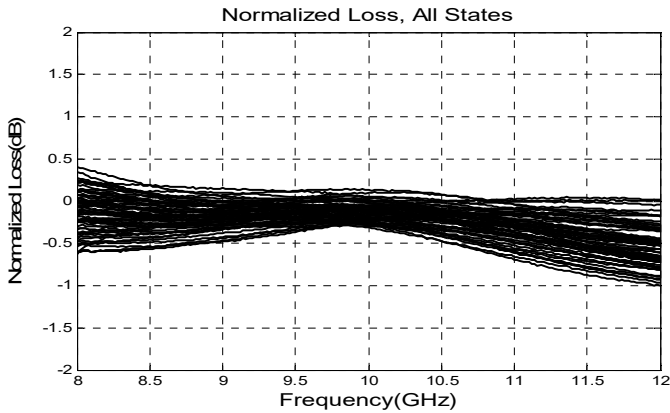
**Environment specifications**

Operational Temperature (C°)	-45 ~ +85
Storage Temperature (C°)	-50 ~ +125
Altitude	30,000 ft. (Epoxy Seal Controlled environment) 60,000 ft 1.0psi min (Hermetically Seal Un-controlled environment) ( Optional )
Vibration	25g rms (15 degree 2KHz) endurance, 1 hour per axis
Humidity	100% RH at 35c, 95%RH at 40 deg c
Shock	20G for 11msc half sin wave,3 axis both directions

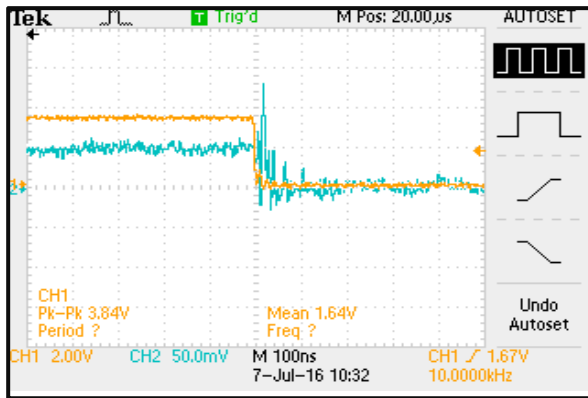
Digital Non-Dispersive Phase Shifter 8-12GHz



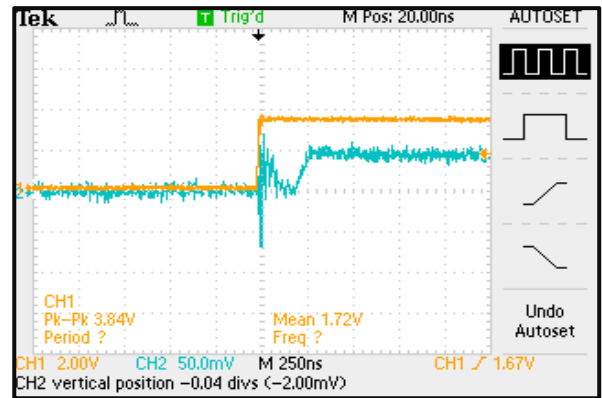




Switching Speed



Switching Speed



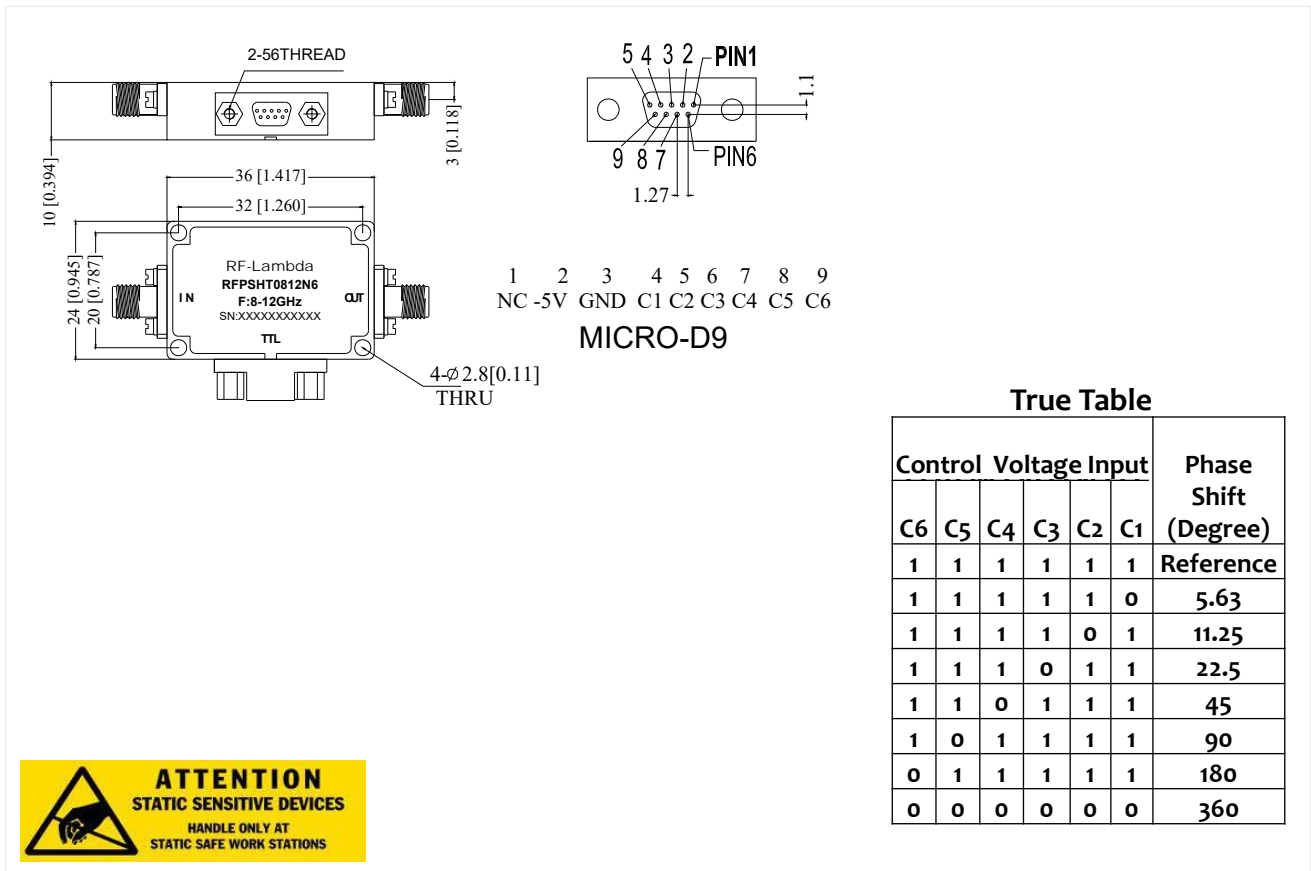
Digital Non-Dispersive Phase Shifter 8-12GHz

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RF-Lambda products are not warranted or authorized for use as critical components in medical, life-saving, or life sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.

**Outline Drawing:**

All Dimensions in mm (inches)



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## Digital Non-Dispersive 360° Phase Shifter 4-8GHz



### Features

- Wide Band Operation 4-8GHz
- 360° Phase Shift
- Fast Switching Speed
- Temperature Range -45°C~+85°C
- Customization available upon request
- Hermetically sealed package up to 60,000 ft available upon request.

Electrical Specifications, TA = +25° C, With V<sub>SS</sub> = -5V & V<sub>CTL</sub> = 0/ +5V

Description	PN:RFPST0408N6			
	Digital Phase Shifter			
Parameters	Min	Typ.	Max	Units
Frequency Range	4		8	GHz
Phase Range		360		°
Insertion Loss		6	8.5	dB
Insertion Loss Temperature Coefficient		0.008		dB/°C
Phase Flatness		±5	±10	°
Input VSWR		1.5	2	
Output VSWR		1.5	2	
Input Power for 0.1 dB Compression		27		dBm
1p3		45		dBm
Weight	1.41			ounces
Impedance	50			Ω
Biassing (-5v)	8			mA
Input /Output Connector	SMA-Female (Standard)			
Control PIN	MICRO-D9			
Finishing	Gold Plating			
Material	Aluminum			
Seal	Hermetically Sealed ( optional )			

Digital Non-Dispersive Phase Shifter 4-8GHz

**Absolute Maximum Ratings**

Biasing	-5V±10%
TTL Control Voltage	0~0.8V/2~5V
RF Input power	+30dBm
Storage Temperature(C°)	-45 ~ +85
Operating Temperature(C°)	-50 ~ +125

**Environment specifications**

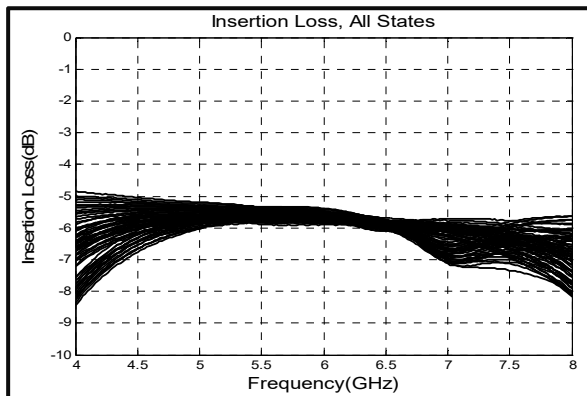
Operational Temperature (C°)	-45 ~ +85
Storage Temperature (C°)	-50 ~ +125
Altitude	30,000 ft. (Epoxy Seal Controlled environment) 60,000 ft 1.0psi min (Hermetically Seal Un-controlled environment) ( Optional )
Vibration	25g rms (15 degree 2KHz) endurance, 1 hour per axis
Humidity	100% RH at 35c, 95%RH at 40 deg c
Shock	20G for 11msc half sin wave,3 axis both directions

**Ordering Information**

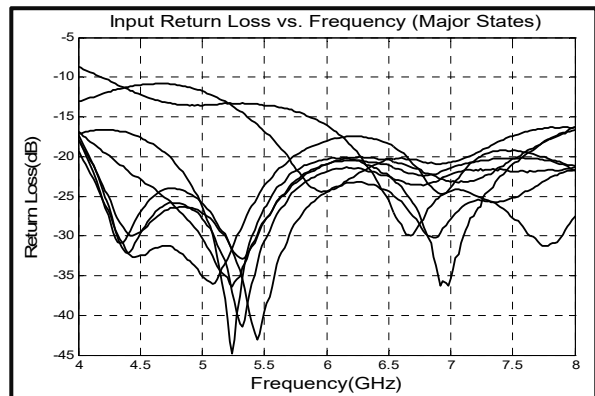
Part No	ECCN	Description
RFPST0408N6	EAR99	4-8GHz Digital Digital Phase Shifter

Typical performance plots

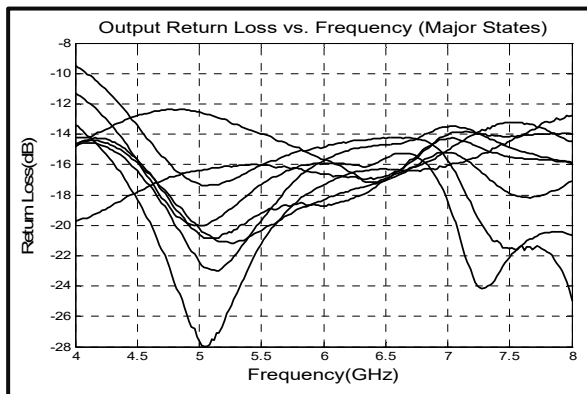
**Insertion Loss**



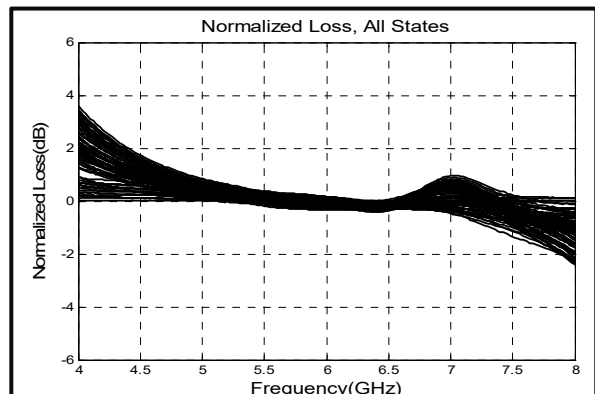
**Input Return Loss vs. Frequency**



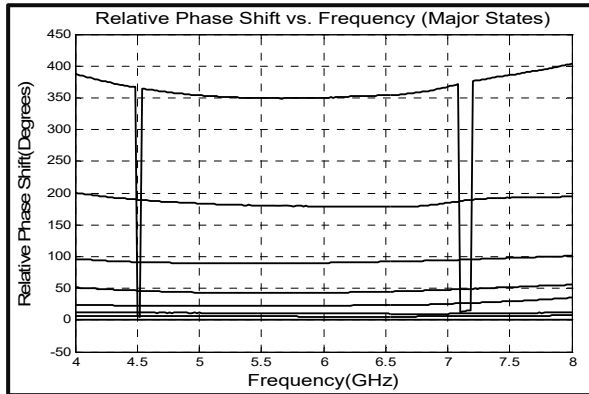
**Output Return Loss vs. Frequency**



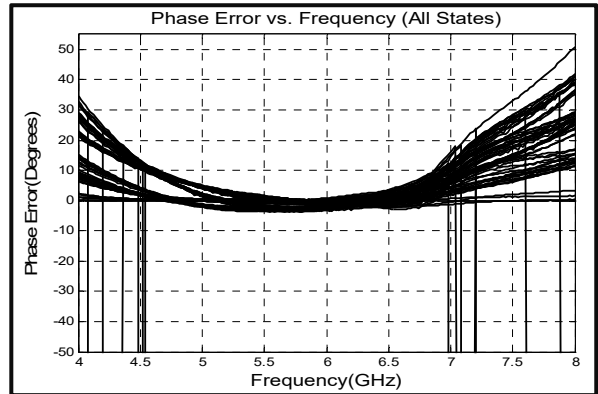
**Normalized Loss . All States**



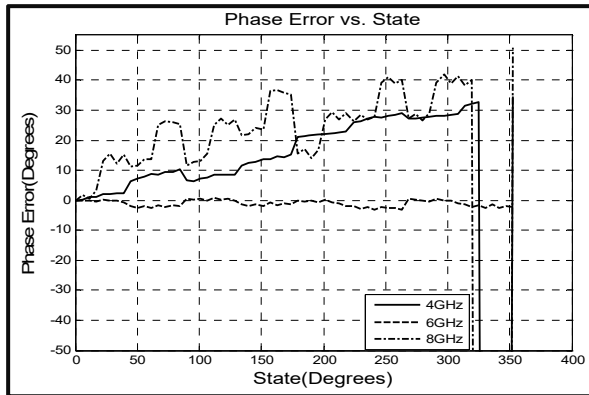
Relative Phase Shift vs. Frequency



Phase Error vs. Frequency



Phase Error vs. State



**Outline Drawing:**

All Dimensions in mm ( inches )

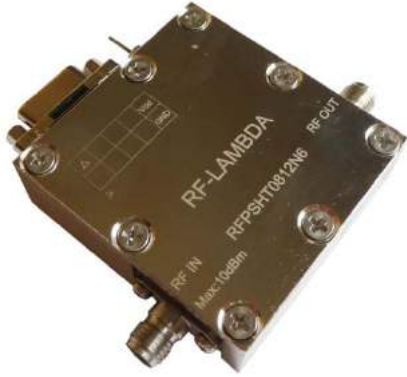
Control Voltage Input						Phase Shift (Degree)
C6	C5	C4	C3	C2	C1	
0	0	0	0	0	0	Reference
0	0	0	0	0	1	-5.6
0	0	0	0	1	0	-11.25
0	0	0	1	0	0	-22.5
0	0	1	0	0	0	-45
0	1	0	0	0	0	-90
1	0	0	0	0	0	-180
1	1	1	1	1	1	-354

**ATTENTION**  
 STATIC SENSITIVE DEVICES  
 HANDLE ONLY AT  
 STATIC SAFE WORK STATIONS

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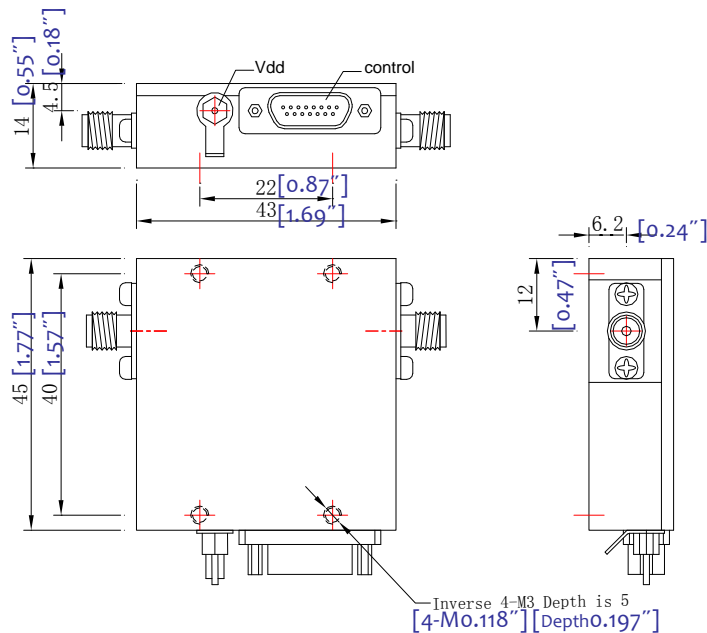
## 2-4GHz Digital 6 Bits 360° Step Phase Shifter



### Features

- Wide Band Operation with full 2-4GHz bandwidth.
- High linearity up to 5W upon request.
- TTL compatible driver include
- Fast Switching Speed
- Flat phase shifting response, low phase error.
- Low Insertion Loss and High Isolation
- Temperature Range -40°C~+85°C
- Customization available upon request

Parameter	Min.	Parameter	Max.	Units
Frequency Range	2	-	4	GHz
Insertion Loss*	-	5.0	-	dB
Input Return Loss*	-	2.5	3.0	dB
Output Return Loss*	-	2.5	3.0	dB
Phase Error*	-	+/- 5.0	+20/-5.0	deg
RMS Phase Error	-	-	5.0	deg
Input Power for 1 dB Compression	-	10	-	dBm
Control Voltage	0	-	5	V
Bias Voltage Current (+12V)	-	-	20	mA

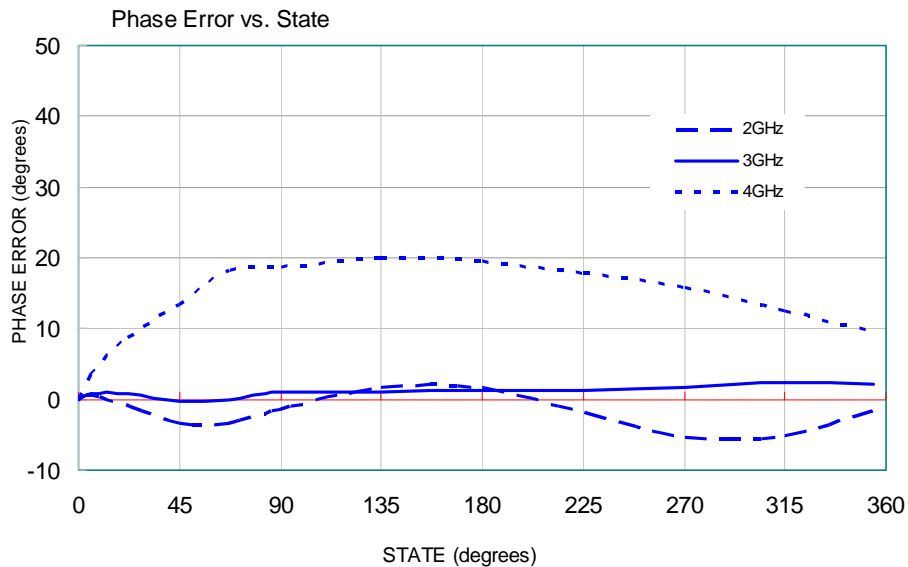
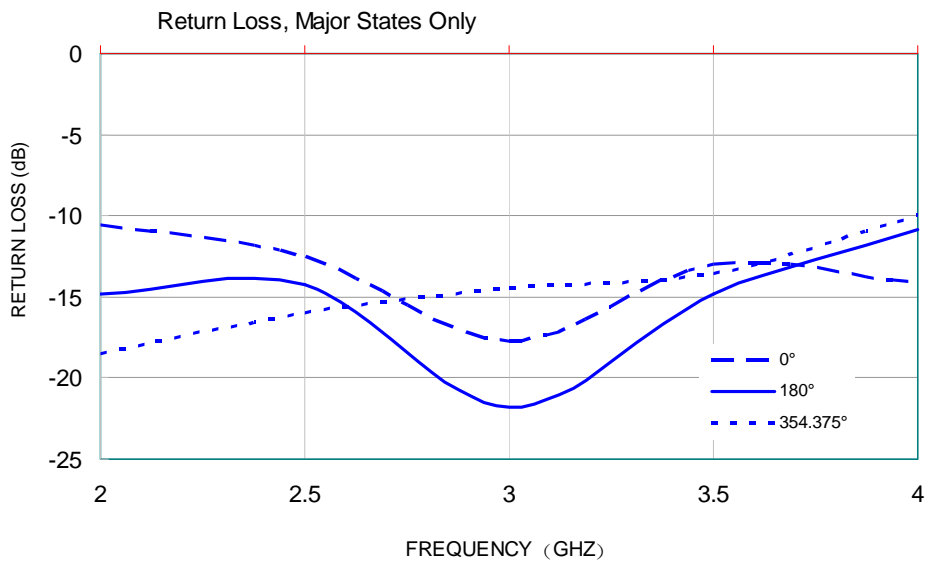
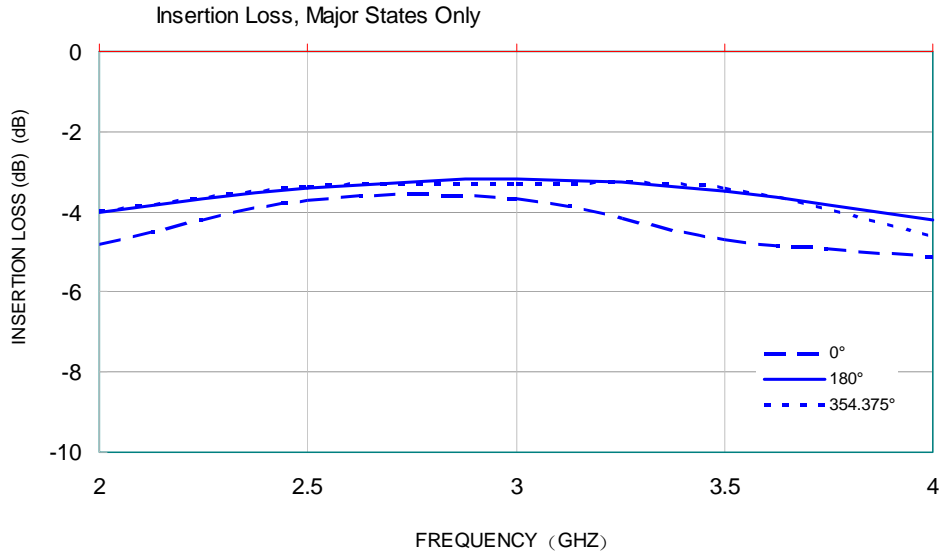


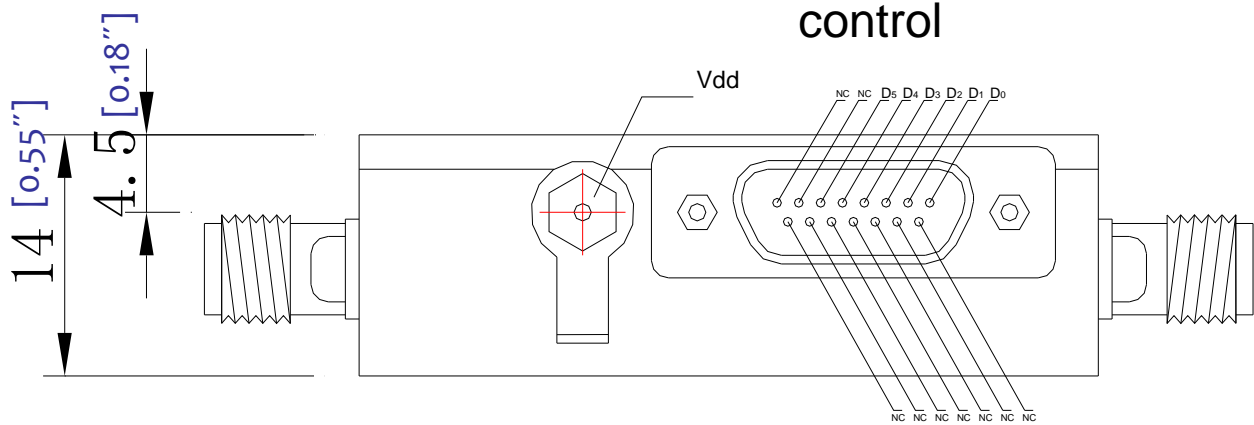
### Control Voltage:

State	Voltage
Low(0)	0 to +0.5V
High(1)	+3 to +5V(Note 5)

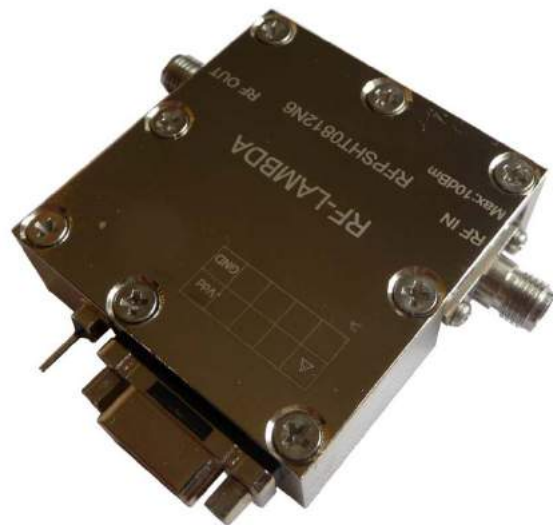
### Absolute Maximum Ratings:

Operating Temperature	20° C to 70° C
Storage Temperature	-55° C to 100° C
(Vdd) Max!	15V
(Vc):	5.0 V
Input Power (RFI N) Max!	27 dBm





Control Voltage Input						Phase Shift (Degrees) RFIN - RFout
D5	D4	D3	D2	D1	D0	
1	1	1	1	1	1	Reference*
1	1	1	1	1	0	5.625
1	1	1	1	0	1	11.25
1	1	1	0	1	1	22.5
1	1	0	1	1	1	45.0
1	0	1	1	1	1	90.0
0	1	1	1	1	1	180.0
0	0	0	0	0	0	354.375



2-4GHz Full Band Digital Step 360° 6 Bits Phase Shifter



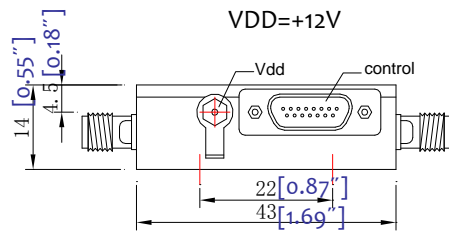
# 1-2GHz Digital 6 Bits 360° Step Phase Shifter



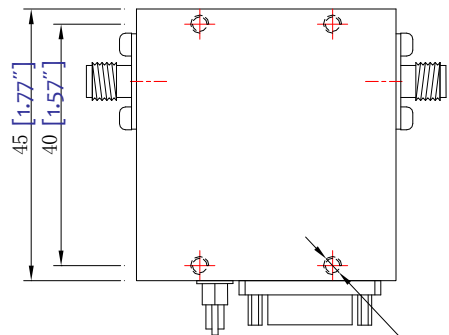
### Features

- Wide Band Operation with full 1-2GHz bandwidth.
- High linearity up to 5W upon request.
- TTL compatible driver include
- Fast Switching Speed
- Flat phase shifting response, low phase error.
- Low Insertion Loss and High Isolation
- Temperature Range -40°C~+85°C
- Customization available upon request

360° Digital Phase Shifter 4/5/6 bits (Wide Band Absorptive)							
Frequency (GHz)	Bandwidth	Insertion Loss (dB)	VSWR	Opt Power	Step	Phase Range	Phase Slope
1-2GHz	FULL	4dB typ. 6dB max.	2.00	10dBm	5.625°	360°	±5.6°



State	Voltage
Low(0)	0 to +0.5V
High(1)	+3 to +5V(Note 5)

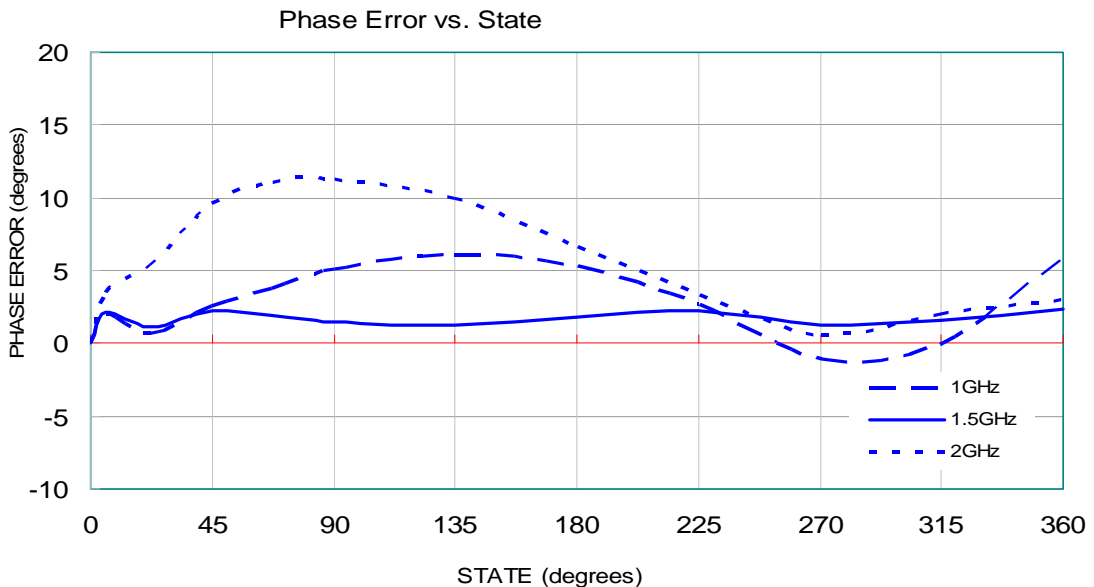
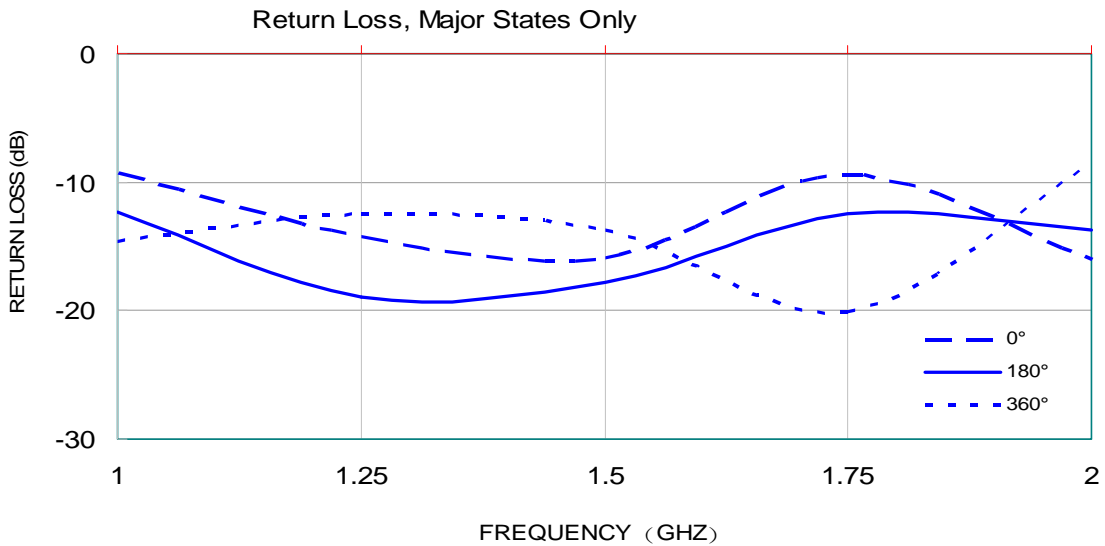
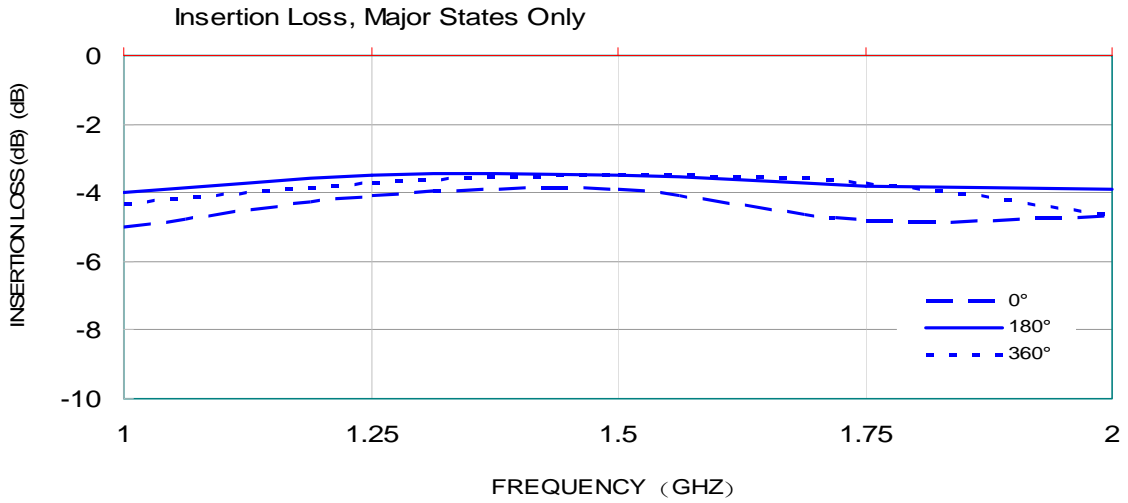


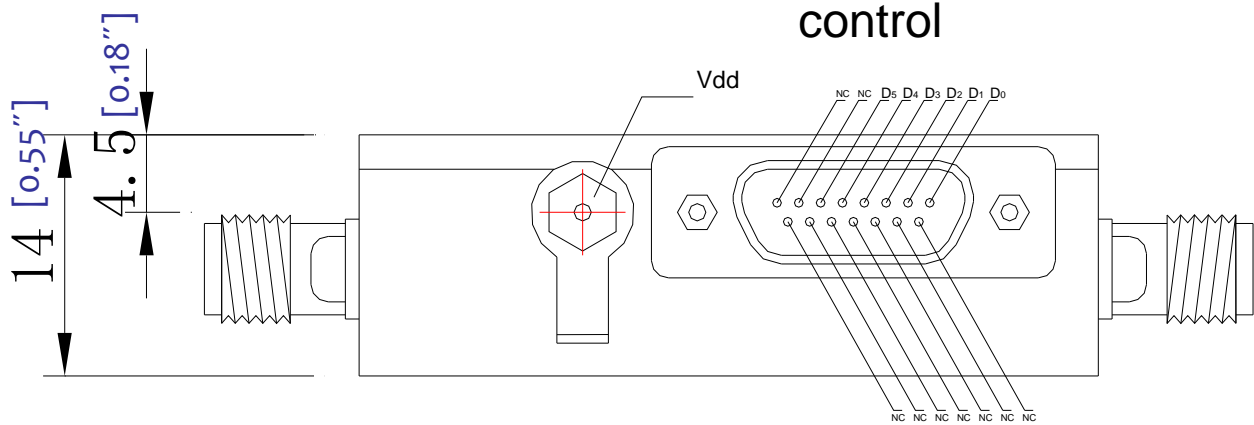
Inverse 4-M3 Depth is 5  
[4-M0.118"] [Depth 0.197"]

### Absolute Maximum Ratings

Operating Temperature	20° C to 70° C
Storage Temperature	-55° C to 100° C
(Vdd) Max!	15V
(Vc)	5.0 V
Input Power (RFI N) Max!	15 dBm

1-2GHz Full Band Digital Step 360° 6 Bits Phase Shifter





Control Voltage Input						Phase Shift (Degrees) RFIN - RFout
D5	D4	D3	D2	D1	D0	
1	1	1	1	1	1	Reference*
1	1	1	1	1	0	5.625
1	1	1	1	0	1	11.25
1	1	1	0	1	1	22.5
1	1	0	1	1	1	45.0
1	0	1	1	1	1	90.0
0	1	1	1	1	1	180.0
0	0	0	0	0	0	354.375



1-2GHz Full Band Digital Step 360° 6 Bits Phase Shifter