20G-PSDD-4

20G phase shifter with integrated Doubler & Driver

Description

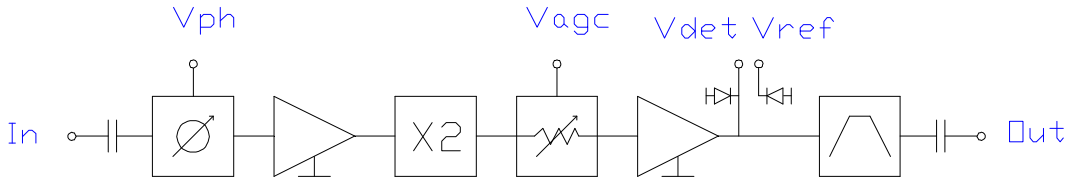
The **20G-PSDD-4** is an analog phase shifter with integrated frequency doubler and variable gain stage with output power amplifier in SMD package.
For an input frequency of 10,7GHz the device delivers an output signal at 21,4 GHz.
The device is capable of up to 800° phase shift. The output amplifier is designed to deliver 4Vpp with low distortion (also included output a filter). The variable gain stage has a wide dynamic range of 18dB.
A power detector, with reference diode, is also included, giving a direct measurement of the output power.

Features

- 16x16 mm² SMD
- 48 pins w/1mm pitch
- 50Ω RF Single ended input and output
- RF input and output are AC coupled
- Input frequency band : 9.9 – 11.5 GHz
- Output frequency band : 19.8 – 23 GHz
- Wide phase shift from 0 to >540°(up to 800°)
- Low power
- +9V and 5V voltage supply
- Output level, up to 4Vpp
- Wide dynamic gain control 18dB
- Phase shift command
- Gain command
- Output level detection
- Ref diode output

Applications

- Phase control
- Radar
- Fiber transmission
- DPSK
- 20GBps, 40GBps



ANALOG PHASE SHIFTER DOUBLER FUNCTIONNAL BLOCK DIAGRAM

Typical Characteristics (ambiant 25°C on heat sink otherwise stated)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit	Comment
Positive supply voltage 1	VDD1		8.55	9	9.45	V	
Positive supply voltage 2	VDD2		8.55	9	9.45	V	
Positive supply voltage 3	Vcc		4.75	5	5.25	V	
Positive supply current 1	IDD1	VDD1	150	200	250	mA	
Positive supply current 2	IDD2	VDD2	150	200	250	mA	
Positive supply current 3	Icc	Vcc		100	120	mA	
Input frequency	F		9.95	10.709	11.5	GHz	
Input impedance adaptation	S11	50 Ohm			-10	dB	
Output impedance adaptation	S22	50 Ohm			-8	dB	
Input amplitude	Vin		300		1 000	mVpp	
Output amplitude max	Voutmax	With AGC	4			Vpp	
AGC amplitude control voltage	Vagc	Vout and Vin from Min to Max	-4		4	V	
AGC gain slope	Sagc	Monotonic				Vpp/V	TBD
AGC input impedance	Zagc					Ohm	TBD
Min Max output controlled phase delay	Ph delay Max	Vph=10V @ 21.4 GHz	60	90		ps	
Phase delay control voltage	Vph		0		10	V	
Phase delay control slope	Sph			9		ps/V	
Vph input impedance	Zph					Ohm	TBD
Input signal at output	H0	10.7 GHz		-30	-20	dB	
Third harmonic	H3	32.1 GHz		-30	-20	dB	
Power detector output voltage	Vdet	Vout = Max		500		mV	TBC
Output voltage variation with phase delay control	ΔVout(Δ_{ph})	Vph from Min to Max				dBpp	TBD
Phase delay variation with temperature	ΔPh delay(Δ_T)	Input and controls = constants				ps/°C	TBD
Phase delay variation with gain control	ΔPhdelay(Δ_G)	Vout from Min to Max				ps	TBD

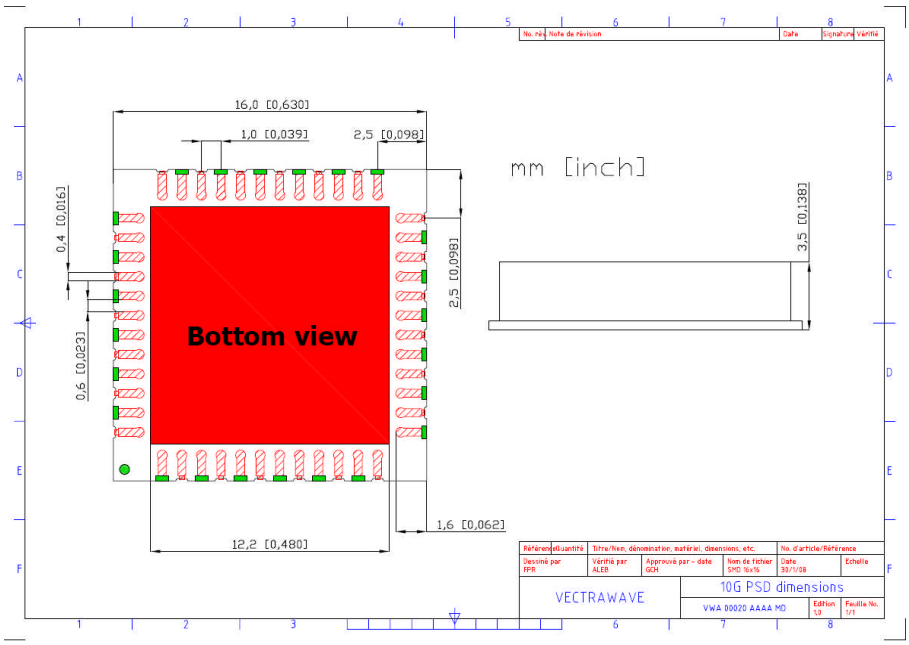
Environment Parameters		Symbols	Min	Max	Units
Operating temperature	Case (bottom)	T_{op}	-5	+75	°C
Storage temperature	Case (bottom)	T_{stg}	- 40	+85	°C

Absolute maximum ratings

Maximum ratings	Symbols	Min	Max	Units
Positive supply voltage 1,2	VDD_{max}		+10	V
Positive supply voltage 3	Vcc_{max}		+6	V
Storage temperature - Case (bottom)-	Tst_{max}		125	°C
Phase delay control voltage command	Vph_{max}		+11	V
AGC amplitude control voltage	$Vagc_{max}$	-6	+6	V

Pin out and pin description

Pad #	Function	Pad #	Function	Pad #	Function	Pad #	Function
1	Ground	13	Ground	25	Ground	37	Ground
2	Ground	14	Ground	26	Ground	38	Ground
3	Ground	15	Ground	27	Ground	39	Ground
4	Vdd1	16	Vph	28	Output	40	Ground
5	Ground	17	Ground	29	Ground	41	Ground
6	Ground	18	NC	30	Vdd2	42	Vagc
7	Ground	19	Ground	31	Ground	43	Ground
8	Ground	20	NC	32	Vdet	44	Vcc
9	Ground	21	Ground	33	Ground	45	Ground
10	Input	22	Ground	34	Vref	46	Ground
11	Ground	23	Ground	35	Ground	47	Ground
12	Ground	24	Ground	36	Ground	48	Ground



Handling

This product is sensitive to electrostatic discharge and should not be handled except at a static free workstation. Take precautions to prevent ESD; use wrist straps, grounded work surfaces and recognized anti-static techniques when handling the **20G-PSDD-4** modules.

Care should be taken to avoid supply transient and over voltage. Over voltage above the maximum specified in absolute maximum rating section may cause permanent damage to the device.

Ordering information

Product code	Name
VWA 00060 AB	20G-PSDD-4 SMD 540°Phase shifter
VWA 00061 AB	Demonstration board equipped w/phase shifter VWA 00060 AA