



10G-PSD-7

X Band analog phase shifter
with integrated MPA

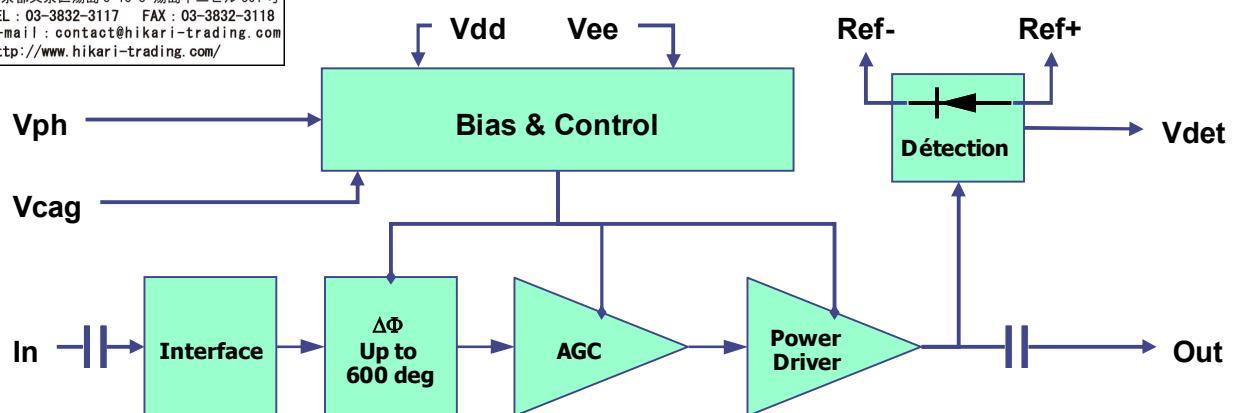
Description

The **10G-PSD-7** is an analog phase shifter with integrated variable gain amplifier and output power amplifier in SMD package.

The device is capable of more than 360° phase shift (up to 600°), and is working from 8 to 12 GHz. The output amplifier is designed to deliver 7Vpp (up to 8Vpp) with low distortion. The variable gain amplifier has a wide dynamic range, from -10dB to +30 dB gain. A power detector, with reference diode, is also included, giving a direct measurement of the output power.

Applications

- X band phase control
- Radar
- Fiber transmission
- DPSK
- 10Gps



ANALOG PHASE SHIFTER FUNCTIONNAL BLOCK DIAGRAM

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit	Comment
Positive supply voltage	VDD		7.6	8	8.4	V	
Negative supply voltage	VEE		-3.47	-3.3	-3.14	V	
Positive supply current	IDD		200	300	400	mA	
Negative supply current	IEE			6	10	mA	
Input frequency	F		9.95	10.709	11.5	GHz	Note 1
Input impedance adaptation	S11	50 Ohm		-13	-10	dB	
Output impedance adaptation	S22	50 Ohm		-11	-10	dB	
Input amplitude	Vin		300		1 000	mVpp	Note 2
Output amplitude max	Voutmax	With AGC	7			Vpp	
Output amplitude min	Voutmin	With AGC			2	Vpp	
AGC amplitude control voltage	Vagc	Vout and Vin from Min to Max	-2.0		0	V	
AGC gain slope	Sagc	Monotonic		100		mV/Vpp	
AGC input impedance	Zagc			1 000		Ohm	
Min output controlled phase delay	Ph delay	Vph from min to max	0		150	ps	Note 3
Phase delay control voltage	Vph		-2		-1.4	V	
Phase delay control slope	Sph			270		ps/V	Note 3
Vph input impedance	Zph			1 300		Ohm	
Second harmonic	H2			-30	-20	dB	
Third harmonic	H3				-30	dB	
Power detector output voltage	Vdet	Vout = Max Vout = Min	3.5		5.5	V	Note 3
Output voltage variation with phase delay control	$\Delta_{\text{ph}}V_{\text{out}}$	Vph from Min to Max			2	dBpp	
Phase delay variation with temperature	$\Delta_T \text{Ph delay}$	Input and controls = constants		0.25	0.4	ps/°C	
Phase delay variation with gain control	$\Delta_G \text{Ph delay}$	Vout from Min to Max		5		ps	

Note 1 : phase shift frequency range is from 8GHz to 12GHz

Note 2 : input dynamic range to get output dynamic range from 2 to 7 Vpp

Note 3 : 11.1 GHz

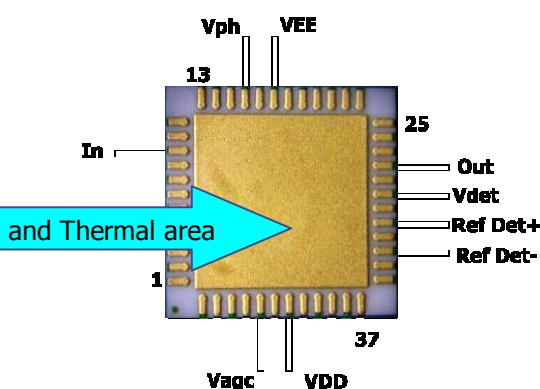
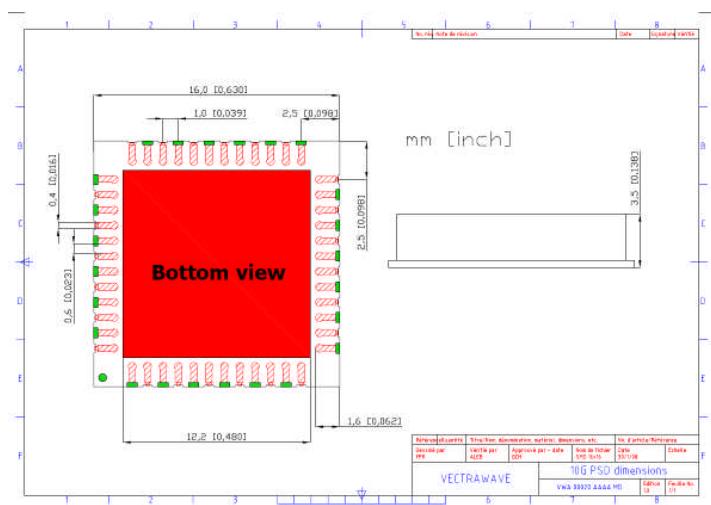
Environment Parameters		Symbols	Min	Max	Units
Operating temperature	Case (bottom)	T _{op}	-5	+75	°C
Storage temperature	Case (bottom)	T _{stg}	- 40	+85	°C

Absolute maximum ratings

Maximum ratings	Symbols	Min	Max	Units
Positive supply voltage	VDD _{max}	0	+9	V
Negative supply voltage	VEE _{max}	-3.5	0	V
Storage temperature - Case (bottom)-	T _{st}		125	°C
Output controlled phase delay voltage command	Ph delay	VEE	VDD	V
Phase delay control voltage command	Vph	VEE	VDD	V

Pin out and pin description

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	Ground	16	Vph	28	Output	40	Ground
5	Ground	17	Ground	29	Ground	41	Ground
6	Ground	18	Vee	30	Vdet	42	Vdd
7	Ground	19	Ground	31	Ground	43	Ground
8	Ground	20	NC	32	Ref Det +	44	Vagc
9	Ground	21	Ground	33	Ground	45	Ground
10	Input	22	Ground	34	Ref Det -	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 **10G-PSD-7** module.



Ordering information

Product code	Name
VWA 00020 AB	10G-PSD-7 7V SMD Phase shifter
VWA 00039 AB	Demonstration board equipped w/phase shifter VWA 00020 AB
Other product variants are existing → contact us	

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.

Bias On/Off procedures

Bias On	Bias Off
RF	Vdd
Vph	Vagc
Vee	Vee
Vagc	Vph
Vdd	RF