



10G-PSD-7

**X Band analog phase shifter
with integrated MPA**

Description

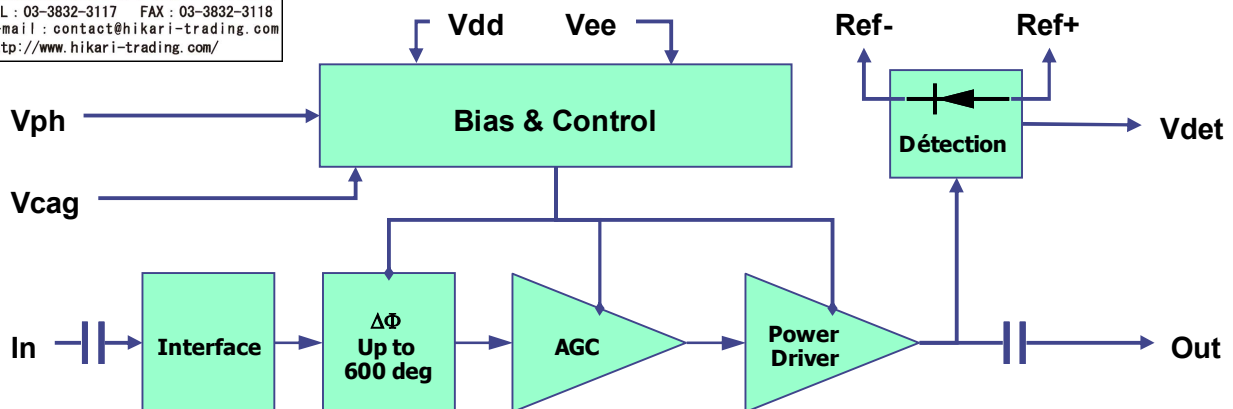
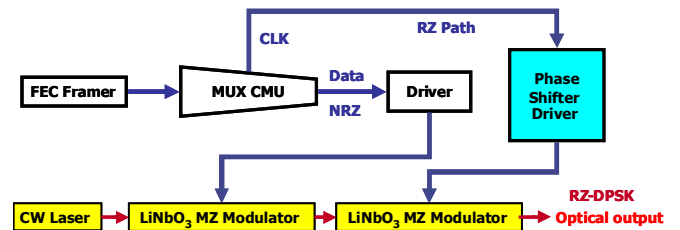
The **10G-PSD-7** is an analog phase shifter with integrated variable gain amplifier and output power amplifier in SMD package. The device is capable of more than 360° phase shift (up to 600°), and is working from 8 to 12 GHz. The output amplifier is designed to deliver 7Vpp (up to 8Vpp) with low distortion. 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

Features

- 16x16 mm² SMD
- 48 pins w/1mm pitch
- 50Ω RF Single ended input and output
- AC coupled
- Wide band : 8 – 12 GHz
- Wide phase shift from 0 to >360°
- Low power <4W @ 7Vpp
- +8V and -3.3V voltage supply
- High output level, up to 8Vpp
- Wide dynamic gain control -10dB to +30dB
- Phase shift command
- Gain command
- Output level detection
- Ref diode output



ANALOG PHASE SHIFTER FUNCTIONAL BLOCK DIAGRAM

Typical Characteristics (ambient 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	$\Delta_{ph}V_{out}$	Vph from Min to Max			2	dBpp	
Phase delay variation with temperature	$\Delta_T Ph$ delay	Input and controls = constants		0.25	0.4	ps/°C	
Phase delay variation with gain control	$\Delta_G Ph$ 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

