BBox 8×8 Duo 28 GHz

BEE-2880-G-45

Feature

- **8×8 Dual-Polarized AiP Module:** Integrated dual-orthogonal polarization per element enables full polarization diversity.
- **Sub-Microsecond Beam Switching:** <1 µs beam switch latency for time-critical applications.
- **Beam Control Interface:** GUI and API ready with Python, Matlab and LabVIEW.
- **Wide Beam Steering Range:** ±60° azimuth and ±30° elevation, optimized for MIMO and tracking.
- **Synchronization-Optimized Design:** Supports tight clock synchronization for scalable multi-device MIMO configurations.
- **FR2 Band Support (26–29 GHz) :** Covers key 5G/6G mmWave bands for industry and academia.

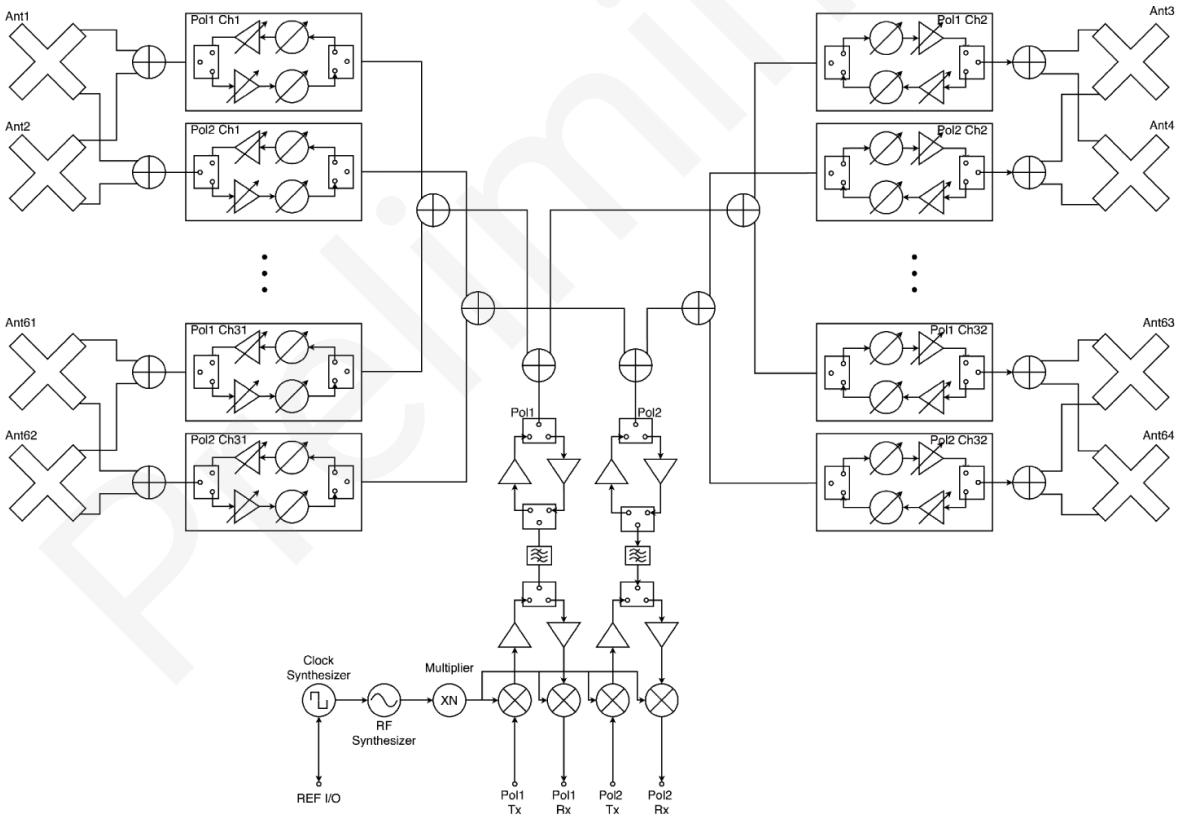

Fig 1. BBox 8×8 Duo RF Block Diagram

Single Channel RF Specifications

Parameter	Unit	Min.	Typ.	Max.	Conditions
RF Frequency	GHz	26		29	
IF Frequency	GHz	5		8	
Phase Shifting Range	deg		360		
Phase Shifting Resolution	deg/step		5.625		6-bit
Gain Control Range	dB		7		
Gain Control Resolution	dB/step		1		
RMS Phase Error	deg		3		
RMS Gain Error	dB		0.5		
Tx RF OP1dB	dBm		15		
Rx IF OP1dB	dBm		-10		
IF Return Loss	dB		10		

System RF Specifications

Parameter	**Unit**	**Min.**	**Typ.**	**Max.**	**Conditions**
Operating Frequency	GHz	26		29	
IF Frequency	GHz	5		8	
Array Dimension			8×8		
No. of Controllable Channels			32/32		for Pol1/Pol2
Tx Gain	dB	20		60	
Tx Element Gain Control Range	dB		7		
Tx System Gain Control Range	dB		40		
Tx EIRP @OP1dB	dBm		52		continuous wave
Tx IP1dB	dBm		-10		
Rx Gain	dB			60	
Rx Element Gain Control Range	dB		7		

Rx System Gain Control Range	dB		40		
Rx OP1dB	dBm		-10		
Rx Coherent NF	dB		5		
Beam Steering Range	deg		+/- 30		Elevation
	deg		+/- 60		Azimuth
3-dB Beamwidth	deg		15		

Power Supply Specifications

Parameter	Unit	Min.	Typ.	Max.	Conditions
DC Supply Voltage	V		24		
DV Power Consumption	W			50	
Adapter Input AC Voltage	V	100		240	

Software and Control Specifications

Parameter	Unit	Min.	Typ.	Max.	Conditions
T/R Switching Time via Ethernet Control	ms		10		
Beam Steering Time via Ethernet Control	ms			10	
Channel ON/OFF Time via Ethernet Control	V	100		240	
SPI Clock	MHz			33	
T/R Switching Time via Ethernet Control	us			1	
Beam Steering Time via Ethernet Control	us			3	
Freq. Lock Time	ms		10		

Connector and Interfaces

Port	Location	Interface	Usage	Amount
Tx 1/Rx 1/Rx 2/Tx 2	Right side	SMA	IF input/output	4
REF	Right side	MCX	Reference clock input/output	1
AUX	Left side	HDMI	SPI, GPIO, Trigger	1
LAN	Left side	RJ-45	Ethernet connection	1
DC IN	Left side	Φ2.0 Jack	DC power input	1
Power	Left side	Switch buttom	Power ON/OFF with blue LED	1

Dimension

Parameter	Unit	Min.	Typ.	Max.	Conditions
Length	mm		120.0		With connector
Width	mm		53.3		
Height	mm		183.0		
Weight	g		950		Device only