

NXBM-4P28

BUTLER MATRIX

4x4 Butler Matrix
2.4 to 8 GHz



sample image of Butler matrix

OVERVIEW

The **4×4 Butler Matrix** is a passive RF network designed to generate multiple fixed beam states when used with a four-element antenna array. By applying a signal to one of the beam ports, the network produces equal-amplitude outputs with defined phase progression across the antenna ports, enabling directional radiation without active phase control.

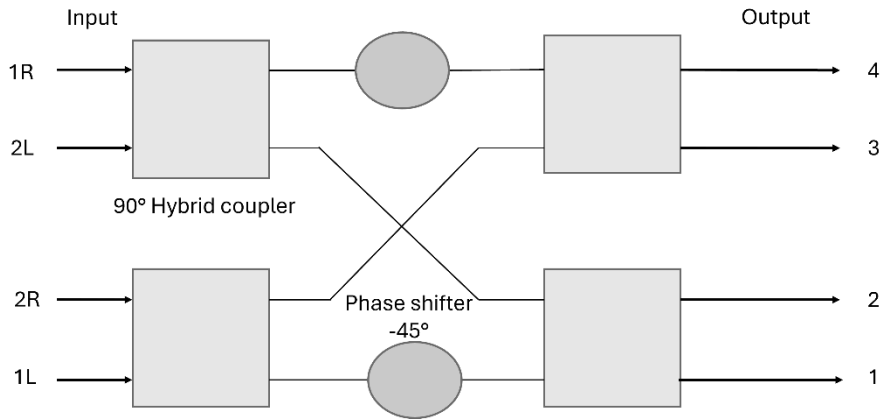
FEATURES

- ✚ Passive 4×4 Beamforming
- ✚ Accurate Phase & Amplitude Balance
- ✚ Instant Beam Selection
- ✚ High Reliability & Low Noise
- ✚ Wide frequency coverage

APPLICATION

- ✚ Switched beam smart antennas
- ✚ MIMO system test & simulation
- ✚ Wireless standards test environments (5G, Wi-Fi)
- ✚ Multipath Simulation
- ✚ Switched beam smart antennas
- ✚ Phased array beamforming and pattern generation

FUNCTIONAL BLOCK DIAGRAM



PHASE MAPPING TABLE

Output port	Expected phase values at Input ports (in degrees)			
	1L	2L	2R	1R
1	225°	90°	135°	0°
2	135°	180°	45°	90°
3	90°	45°	180°	135°
4	0°	135°	90°	225°

KEY SPECIFICATIONS

Parameter	Min	Typ	Max
Frequency Range (GHz)	2.4		8
Impedance (Ω)		50	
Number of RF Ports	8 (4 beam input ports, 4 antenna output ports)		
Insertion loss (in dB)			9
VSWR		1.5	
Phase Balance (in degrees)	$\pm 9^\circ$		
Amplitude balance (in dB)	3		
Isolation between ports (in dB)	>20		
Maximum RF input power (in dBm)	+30		
Temperature	5 °C to 40 °C		
RF connectors	SMA Female		
Form factor	Compact and rugged Fits lab racks and field systems easily		
Dimensions (approx. in mm)	110 x 85 x 10		