

Waveguide Power Dividers & Combiners Overview —

Sylatech are specialists in the design and manufacture of Power Dividers & Combiners suitable for use in many high-power applications. Our capability extends to the design and manufacture of a wide range of passive microwave components to 40 GHz, typically used in the manufacture of sub-systems for defence, aerospace, and space applications.

We have a team of dedicated specialist microwave engineers, who work with our customers to undertake co-engineering, and provide their expertise to optimise all solution requirements.

Sylatech Power Dividers & Combiners Waveguide Offering:

- Custom design Power Combiners
- Ideal for use in TWT replacement applications
- Available in configurations 1:2 to 1:128
- Designs to suit end-fed slotted waveguide arrays
- Tee designs are optimised to eliminate the need for fitment of extra irises or complicated shorts.



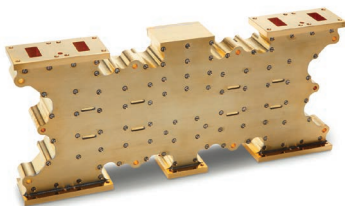
Wideband Power Combiners for use with SSPAs —

Sylatech specialises in the design of Double-Ridge Waveguide (WRD) Magic Tees and uses this technology as the basic element in the design of wideband Power Combiners used when combining power from Solid State Power Amplifiers (SSPAs). Sylatech utilises WRD Tees in different sizes and frequencies.

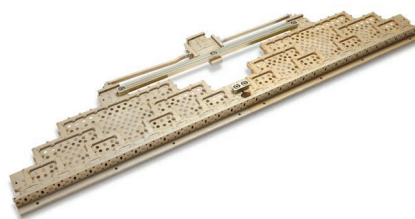
We have successfully optimised our double-ridge waveguide combiners to enable them to operate over a full octave bandwidth. These Power Combiners are available in frequency ranges of 2 to 4 GHz, 4 to 8 GHz, 6 to 12 GHz, 8 to 12 GHz, 8 to 16 GHz, and 12 to 18 GHz. Other frequency bands are available upon request.

They are also available as 4:1, 8:1, and 16:1 combiner topologies. Other topologies are also available upon request.

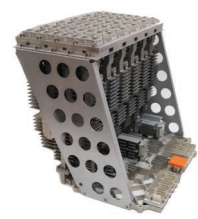
With our extensive electrical and mechanical design experience, Sylatech can design waveguide combiners that fit within the space constraints of rack mounted cabinets with associated cooling if required.



8:1 Power Combiner



32:1 Power Combiner



48:1 Power Combiner

Un-Equal Power

e.g. 3:1, 6:1, 12:1, 24:1, and 28:1
Configurations use magic tees and hybrid couplers with fixed waveguide phase filters to provide internal path corrections.

Equal Power

2:1, 4:1, 8:1, 16:1, 32:1, and 64:1
Configurations use magic tees as simple building blocks. Parallel ports are used as inputs with E or H ports as outputs.

Typical specification for a WRD650 8:1 Power Combiner used in a Power Amplifier —

Electrical Specification

Frequency Range	8 GHz to 12 GHz	Amplitude Unbalance	0.4 dB max.
Input Ports Return Loss	16 dB min.	Input Ports Phase	"In-Phase", 0° difference
Output Ports Return Loss	14 dB min.	Phase Unbalance	4° max.
Insertion Loss (Combined)	0.35 dB max.	Input Power	190W max.
Input Port Isolation	17 dB min.	Output Power	1500W max.

Mechanical Specification

Material	Aluminium
Input Ports	TNC Coaxial Connectors
Output Port	Waveguide: WRD650

Typical specification for an 8 to 16GHz, 8:1 Power Combiner —

Electrical Specification

Frequency Range	8 GHz to 16 GHz	Amplitude Unbalance	0.4 dB max.
Input Ports Return Loss	16 dB min.	Input Ports Phase*	*
Output Ports Return Loss	15 dB min.	Phase Unbalance	4° max.
Insertion Loss (Combined)	0.5 dB max.	Input Power*	*
Input Port Isolation*	*	Output Power*	*

Mechanical Specification

Material	Aluminium
Input Ports	Coaxial/Waveguide
Output Port	Waveguide

*Subject to customer specification.

Single & Double-Ridge Waveguide Magic Tees —

They are suitable for use as Power Combiners in either solid state or travelling tube power amplifiers. Sylatech's magic tees are optimised for high-power and versions are available in copper for low loss and in oxygen-free, high-thermal conductivity copper for ultra-high vacuum requirements.

Typical Power Combiner Specifications —

Part #	Frequency	Waveguide Size	Description	VSWR All Ports	Insertion Loss ^{dB}	Isolation Between Output Ports ^{dB}
PDC10001	2.85 - 2.86	WR284 / WG10	2:1 Variable Power Combiner	1.20:1	0.10	25
PDC10002	2.70 - 2.90	WR284 / WG10	8:1 Power Combiner	1.16:1	0.25	22
PDC10003	2.70 - 2.90	WR284 / WG10	4:1 Power Combiner	1.20:1	0.40	25
THAL515	4.40 - 5.00	WR187 / WG12	8:1 Power Combiner	1.45:1	0.40	15
PDC15001	7.25 - 7.37	WR112 / WG15	4:1 Power Combiner	1.20:1	0.15	3
PDC15002	7.25 - 7.75	WR112 / WG15	2:1 Power Combiner	1.15:1	0.15	5
SNEC501	7.90 - 8.40	WR112 / WG15	8:1 Power Combiner	1.15:1	0.30	15
PDC16001	9.40 - 9.50	WR90 / WG16	4:1 Power Combiner	1.15:1	0.50	30
PDC16002	9.38 - 9.44	WR90 / WG16	10:1 Power Combiner	1.30:1	0.20	20
PDC16003	9.38 - 9.44	WR90 / WG16	18:1 Power Combiner	1.30:1	0.30	20
PDC16004	9.60 - 10.40	WR90 / WG16	48:1 Power Combiner	1.22:1	0.40	20
THAL520	8.50 - 9.60	WR90 / WG16	8:1 Power Combiner	1.30:1	0.30	17
PDC16006	8.50 - 9.60	WR90 / WG16	8:1 Power Combiner	1.20:1	0.50	20
PDC19001	18.00 - 18.70	WR51 / WG19	Adjustable Power Combiner	1.15:1	0.20	28
PDC19002	19.50 - 20.30	WR51 / WG19	Adjustable Power Combiner	1.15:1	0.20	28
PDC19004	17.70 - 21.20	WR51 / WG19	2:1 Power Combiner	1.15:1	0.10	5
SAC511	20.00 - 21.50	WR51 / WG19	Variable Power Combiner	1.15:1	0.10	5
TEL501	30.00 - 31.00	WR28 / WG22	8:1 Power Combiner	1.25:1	0.30	23
THAL521	34.50 - 35.60	WR28 / WG22	4:1 Power Combiner	1.25:1	0.30	20
NEC501	35.00 - 36.00	WR28 / WG22	32:1 Power Combiner / Divider	1.50:1	0.80	15
PBN502	40.50 - 42.50	WR19 / WG24	Power Divider	1.20:1	0.20	25