



# SAW Components

## SAW Duplexer

Cellular / WCDMA Band 5

<b>Series/type:</b>	<b>B8576</b>
<b>Ordering code:</b>	<b>B39881B8576P810</b>
<b>Date:</b>	<b>February 9, 2015</b>
<b>Version:</b>	<b>2.1</b>

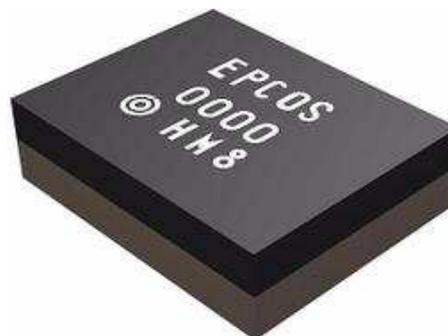
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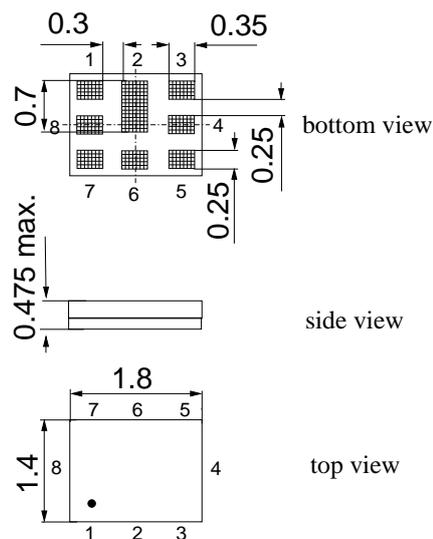
Data sheet


**Application**

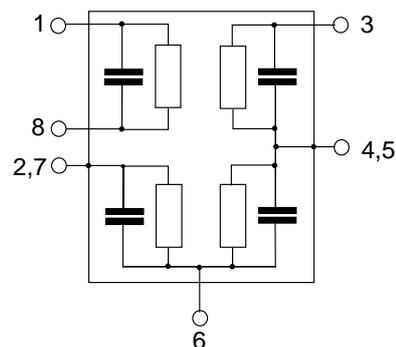
- Multimode SAW duplexer for mobile telephone Cellular / WCDMA Band 5 systems
- Low insertion attenuation
- Low amplitude ripple
- High Tx band isolation
- Single ended to balanced transformation in Antenna - Rx path
- Impedance transformation from 50 Ω to 100 Ω in Antenna - RX path


**Features**

- Package size 1.8 x 1.4 mm<sup>2</sup>
- Max. package height 0.475 mm
- RoHS compatible
- Approx. weight 0.0042g
- Package for **Surface Mount Technology (SMT)**
- Ni, Au-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- **Moisture Sensitivity Level 3**


**Pin configuration**

- 3 Tx Input
- 1,8 Rx Output (balanced)
- 6 Antenna
- 2, 4, 5, 7 To be grounded



**Data sheet**

**Characteristics**

Temperature range for specification:	T = -30 °C to + 90 °C
Antenna terminating impedance:	Z <sub>ANT</sub> = 50 Ω    8.2 nH
RX terminating impedance:	Z <sub>RX</sub> = 100 Ω (balanced)
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω

Characterisitcs TX - ANT		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>C</sub>	—	836.5	—	MHz
<b>Maximum insertion attenuation</b>	α <sub>max</sub>	—	1.5	2.3	dB
824.0 ... 849.0 MHz					
@f <sub>Carrier</sub> 826.4... 846.6 MHz	α <sub>WCDMA</sub> <sup>1)</sup>	—	1.3	2.1	dB
<b>Amplitude ripple</b>	Δα	—	0.6	1.4	dB
824.0 ... 849.0 MHz					
<b>Error Vector Magnitude</b>	EVM <sup>2)</sup>	—	2.1	4.0	%
@f <sub>Carrier</sub> 826.4... 846.6 MHz					
<b>Input VSWR (TX port)</b>		—	1.5	2.0	
824.0 ... 849.0 MHz					
<b>Output VSWR (ANT port)</b>		—	1.4	2.0	
824.0 ... 849.0 MHz					

<sup>1)</sup> Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).

<sup>2)</sup> Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.

**Data sheet**

**Characteristics**

Temperature range for specification:	T = -30 °C to + 90 °C
Antenna terminating impedance:	Z <sub>ANT</sub> = 50 Ω    8.2 nH
RX terminating impedance:	Z <sub>RX</sub> = 100 Ω (balanced)
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω

Characterisitcs TX - ANT		min.	typ. @ 25 °C	max.	
<b>Absolute attenuation</b>	$\alpha$				
10.0 ... 420.0 MHz		40	45	—	dB
420.0 ... 494.0 MHz		38	42	—	dB
494.0 ... 701.0 MHz		35	39	—	dB
701.0 ... 728.0 MHz		35	40	—	dB
728.0 ... 764.0 MHz		35	41	—	dB
764.0 ... 804.0 MHz		30	37	—	dB
860.0 ... 869.0 MHz		3	10	—	dB
869.0 ... 894.0 MHz		45	52	—	dB
@f <sub>Carrier</sub> 871.4 ... 891.6 MHz	$\alpha_{\text{WCDMA}}^{1)}$	48	53	—	dB
1236.0 ... 1341.0 MHz		40	47	—	dB
1574.0 ... 1577.0 MHz		35	39	—	dB
1638.0 ... 1708.0 MHz		33	36	—	dB
1844.9 ... 1879.9 MHz		30	34	—	dB
1884.5 ... 1919.6 MHz		30	34	—	dB
1930.0 ... 1990.0 MHz		30	33	—	dB
2110.0 ... 2170.0 MHz		28	31	—	dB
2400.0 ... 2557.0 MHz		25	28	—	dB
3286.0 ... 3406.0 MHz		20	25	—	dB
4110.0 ... 4255.0 MHz		20	24	—	dB
4934.0 ... 5350.0 MHz		10	14	—	dB
5725.0 ... 5953.0 MHz		5	10	—	dB

<sup>1)</sup> Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).

**Data sheet**

**Characteristics**

Temperature range for specification:	T = -30 °C to + 90 °C
Antenna terminating impedance:	Z <sub>ANT</sub> = 50 Ω    8.2 nH
RX terminating impedance:	Z <sub>RX</sub> = 100 Ω (balanced)
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω

Characteristics ANT - RX		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>C</sub>	—	881.5	—	MHz
<b>Maximum insertion attenuation</b>	α <sub>max</sub>				
869.0 ... 894.0 MHz		—	1.7	2.4	dB
@f <sub>Carrier</sub> 871.4 ... 891.6 MHz	α <sub>WCDMA</sub> <sup>1)</sup>	—	1.5	2.2	dB
<b>Amplitude ripple (p-p)</b>	Δα				
869.0 ... 894.0 MHz		—	0.5	1.2	dB
<b>Error Vector Magnitude</b>					
@f <sub>Carrier</sub> 871.4 ... 891.6 MHz	EVM <sup>2)</sup>	—	1.7	3.5	%
<b>Input VSWR (ANT port)</b>					
869.0 ... 894.0 MHz		—	1.7	2.0	
<b>Output VSWR (RX port)</b>					
869.0 ... 894.0 MHz		—	1.6	2.0	
<b>Common mode rejection ratio</b>					
869.0 ... 894.0 MHz	CMRR	23 <sup>3)</sup>	27	—	dB

1) Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).

2) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.

3) A combination of 10° phase balance and 1 dB amplitude balance corresponds to 19.6 dB CMRR



**Data sheet**

**Characteristics**

Temperature range for specification:	T = -30 °C to + 90 °C
Antenna terminating impedance:	Z <sub>ANT</sub> = 50 Ω    8.2 nH
RX terminating impedance:	Z <sub>RX</sub> = 100 Ω (balanced)
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω

Characterisitcs TX - RX		min.	typ. @ 25 °C	max.	
<b>Differential Mode Isolation</b>					
	824.0 ... 849.0 MHz	54	63	—	dB
@f <sub>Carrier</sub>	826.4 ... 846.6 MHz	57	63	—	dB
	869.0 ... 894.0 MHz	50	55	—	dB
@f <sub>Carrier</sub>	871.4 ... 891.6 MHz	52	56	—	dB
	1574.0 ... 1577.0 MHz	40	64	—	dB
	1638.0 ... 1708.0 MHz	40	62	—	dB
	2462.0 ... 2557.0 MHz	40	56	—	dB
<b>Common Mode Isolation</b>					
	824.0 ... 849.0 MHz	42	47	—	dB
@f <sub>Carrier</sub>	826.4 ... 846.6 MHz	42	48	—	dB

<sup>1)</sup> Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).

**Annotation for characteristics section**

Attenuation of WCDMA signal ("Powertransferfunction",  $\alpha_{\text{WCDMA}}$ ) is determined by

$$\int_{-\infty}^{\infty} |S_{\text{ds21}}(f)H_{\text{RRC}}(f - f_{\text{Carrier}})|^2 df$$

$f_{\text{Carrier}}$  according to 3GPP TS 25.101 (e.g. for WCDMA Band 5-passband,  $f_{\text{Carrier}}$  ranges from 826.4 MHz (lowest TX channel) to 846.6 MHz (highest TX channel)).  $H_{\text{RRC}}(f)$  is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

$$\int_{-\infty}^{\infty} |H_{\text{RRC}}(f)|^2 df = 1$$

**Maximum ratings**

Storage temperature range	$T_{\text{stg}}$	-40/+85	°C	Machine Model source and load impedance 50 $\Omega$ } continuous wave } $T = 50^\circ\text{C}, 5000\text{ h}$
DC voltage	$V_{\text{DC}}$	5 <sup>1)</sup>	V	
ESD voltage	$V_{\text{ESD}}$	100 <sup>2)</sup>	V	
Input power	$P_{\text{IN}}$			
824.0 ... 849.0 MHz elsewhere		29 10	dBm dBm	

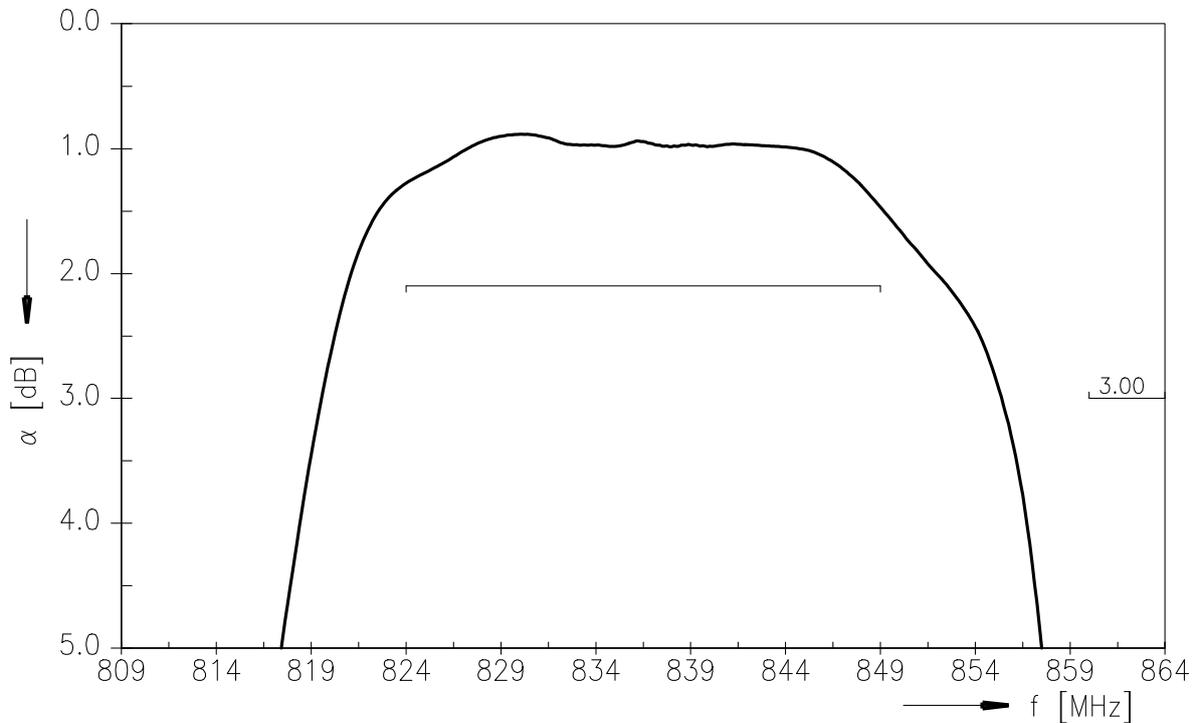
<sup>1)</sup> 168h Damp Heat Steady State acc. to IEC 60068-2-67 Cy

<sup>2)</sup> acc. to JESD22-A115B (MM - Machine Model), 10 negative and 10 positive pulses.

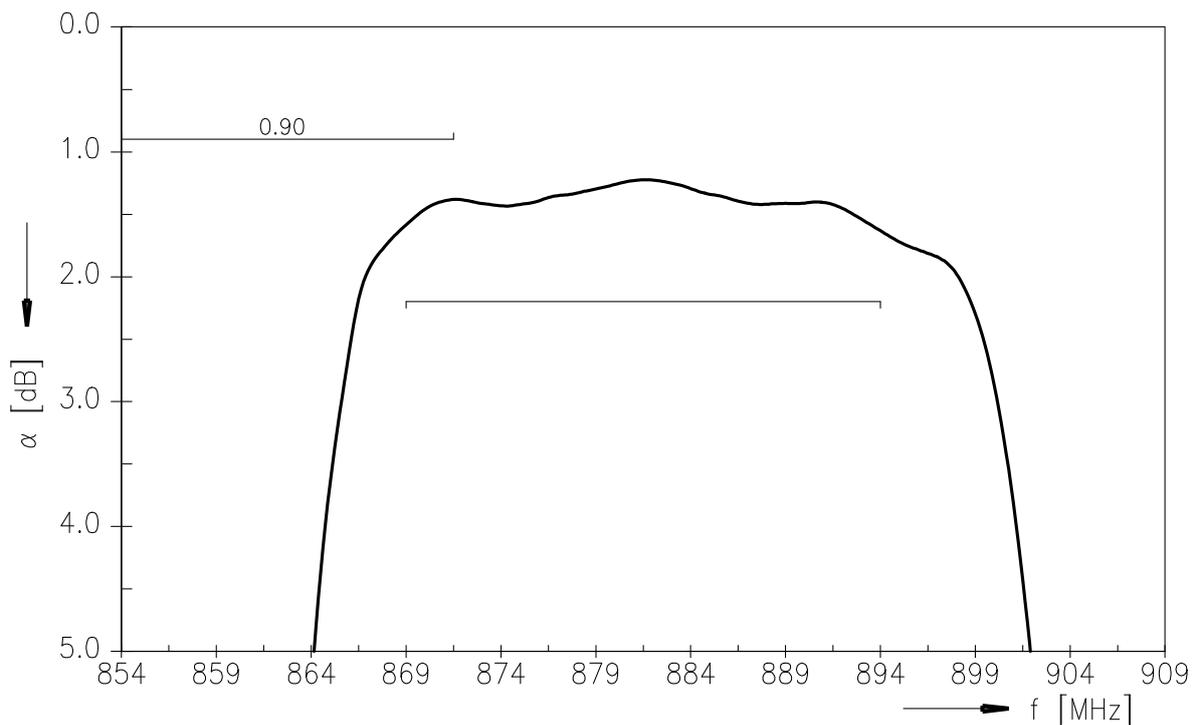
Data sheet



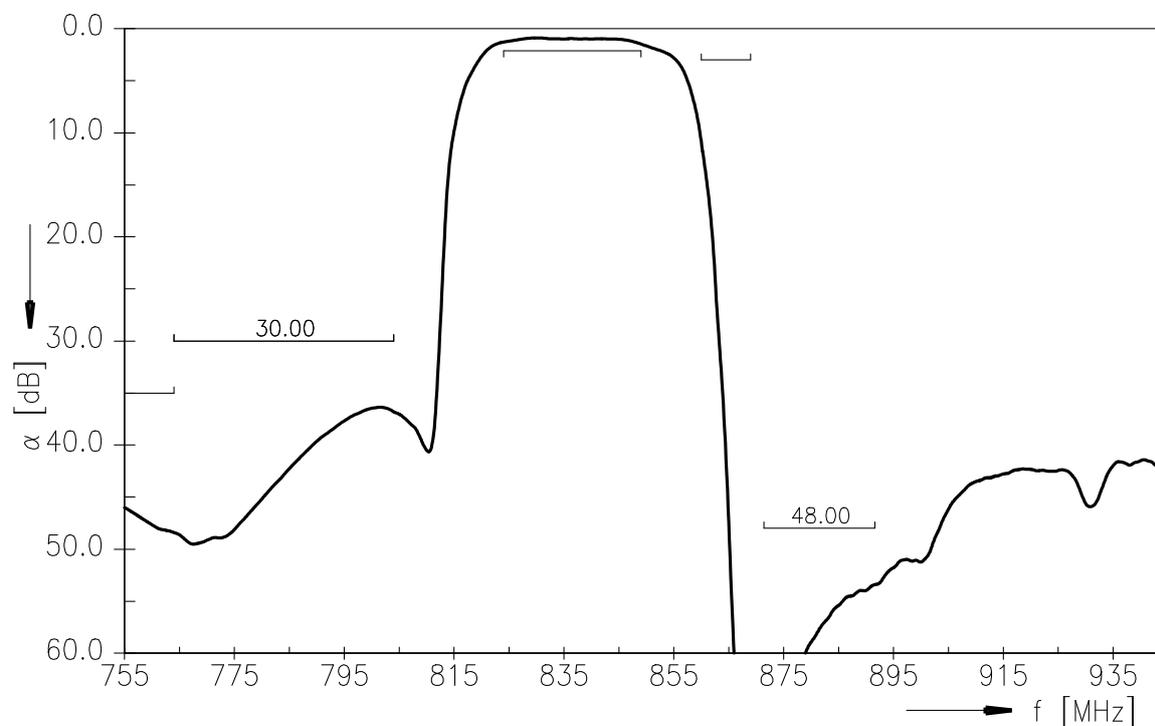
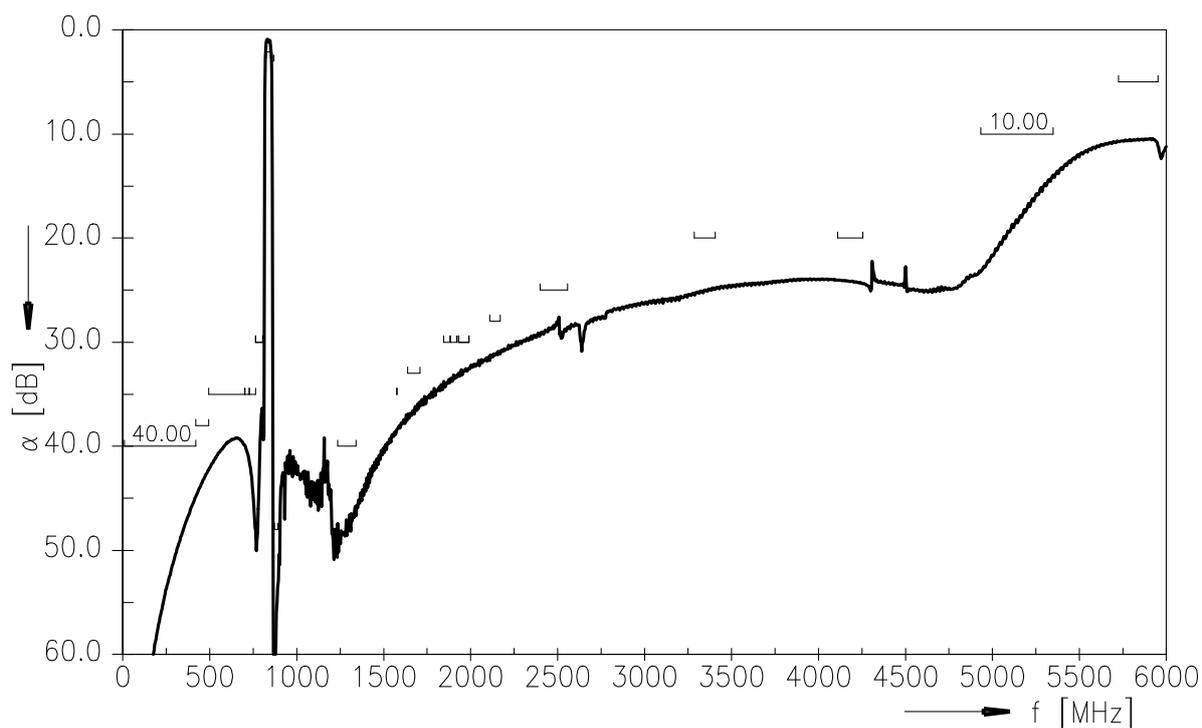
Frequency Response TX-ANT (Power transfer function)



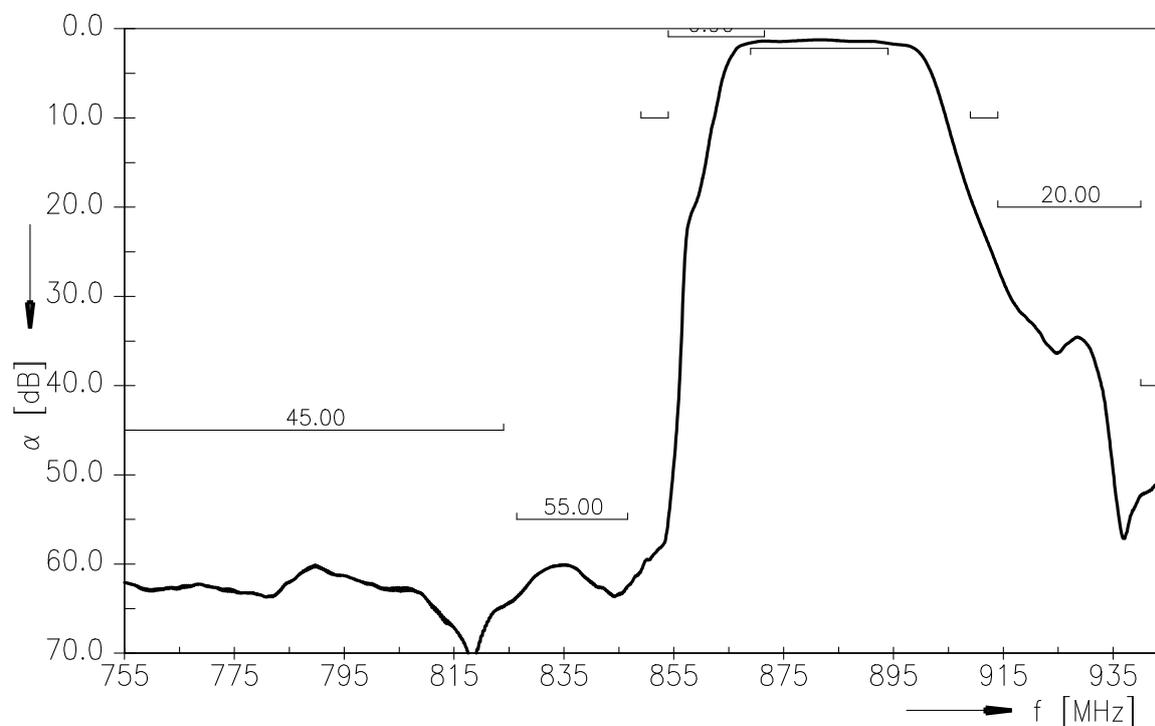
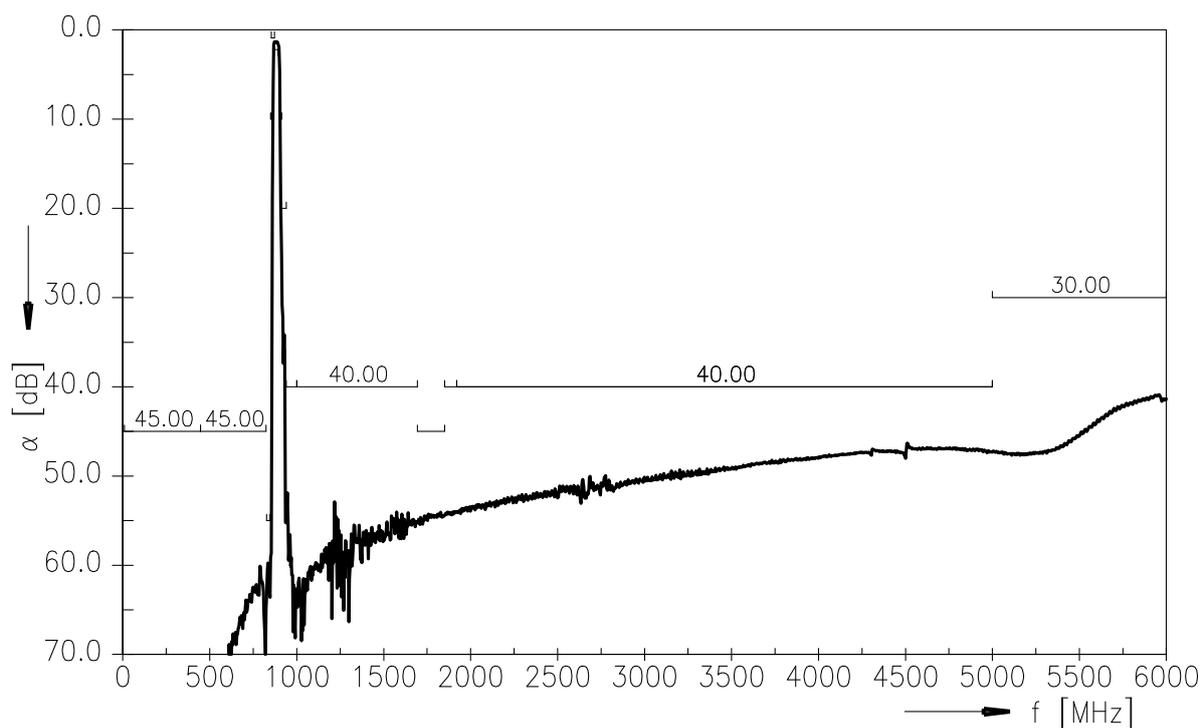
Frequency Response ANT-RX (Power transfer function)



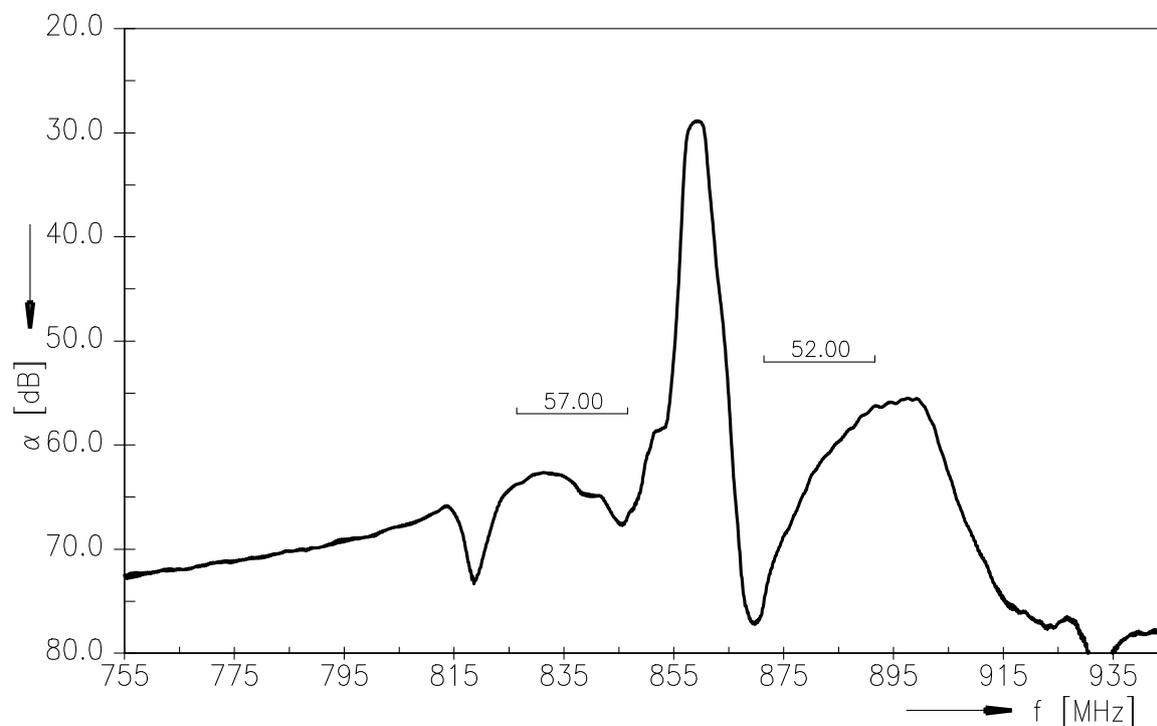
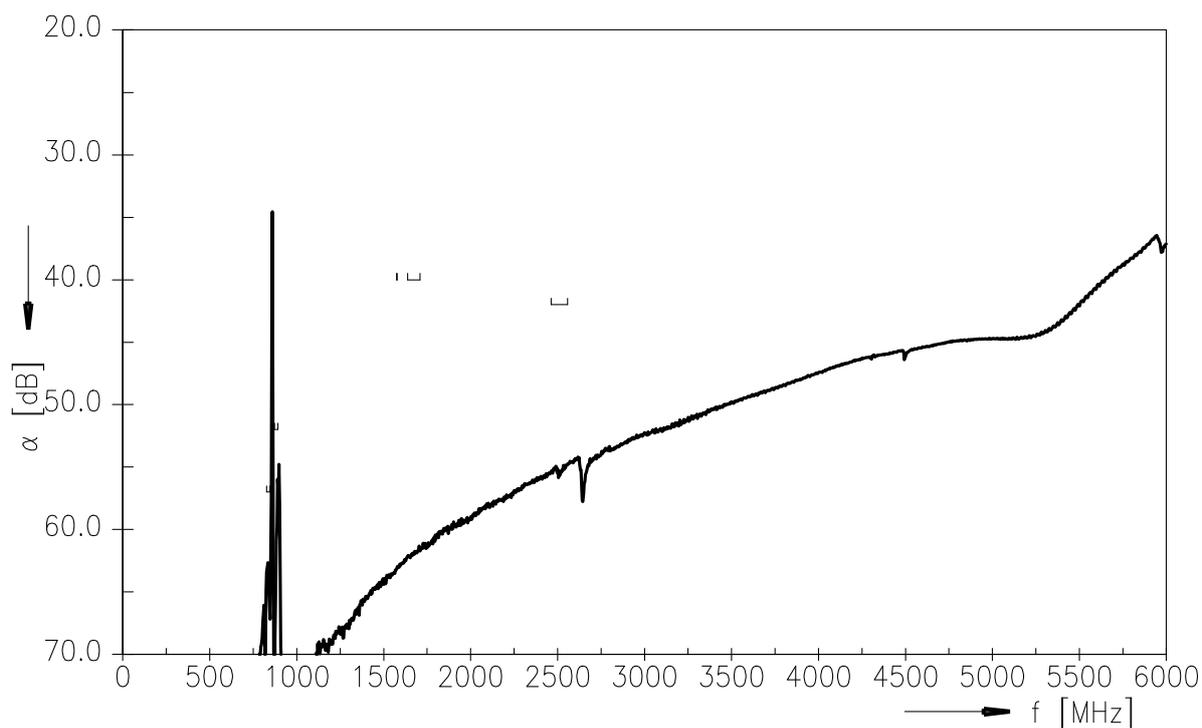
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**Frequency Response TX-ANT (Power transfer function)**

**Frequency Response TX-ANT (wideband)**


Data sheet


**Frequency Response ANT-RX (Power transfer function)**

**Frequency Response ANT-RX (wideband)**


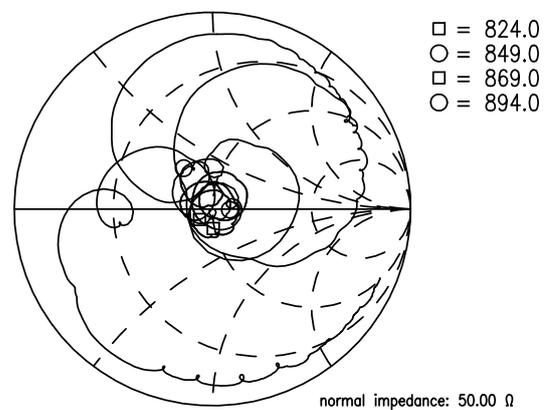
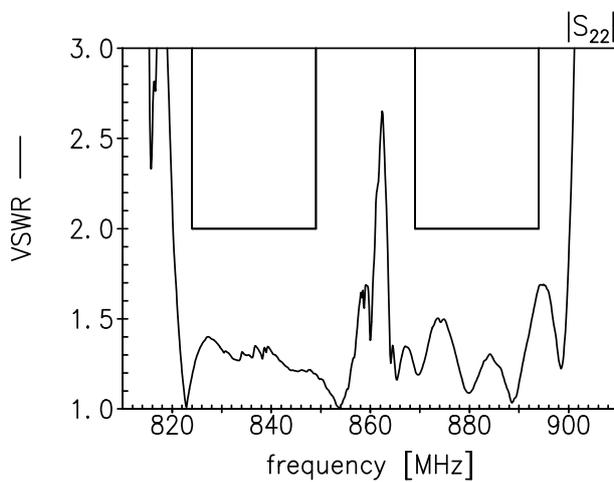
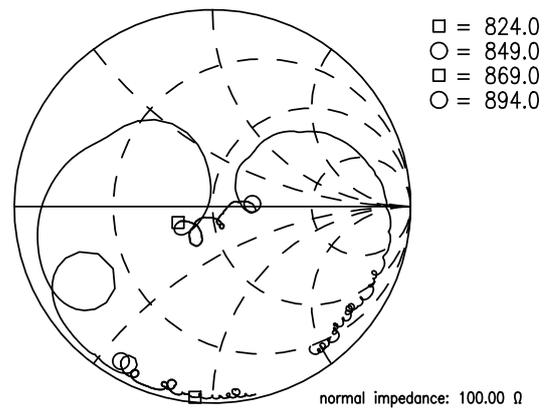
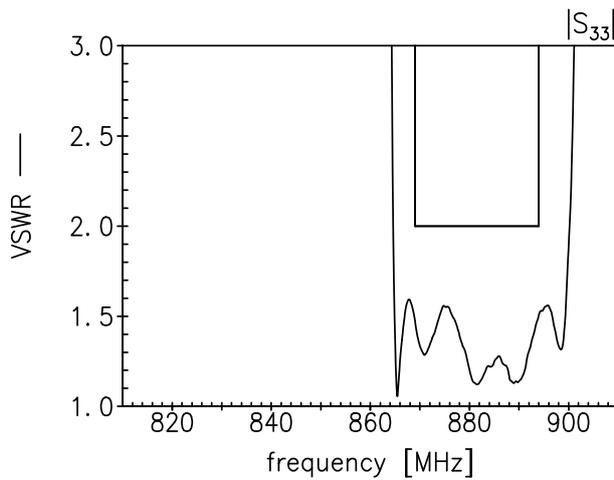
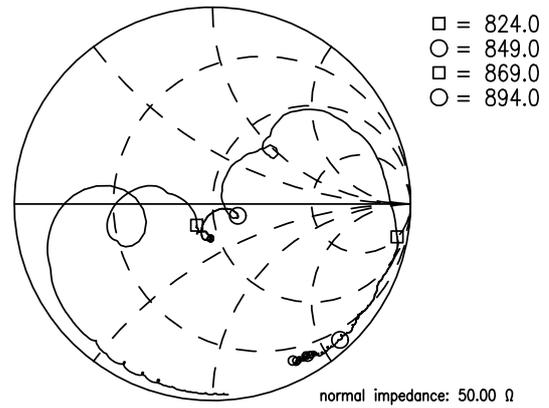
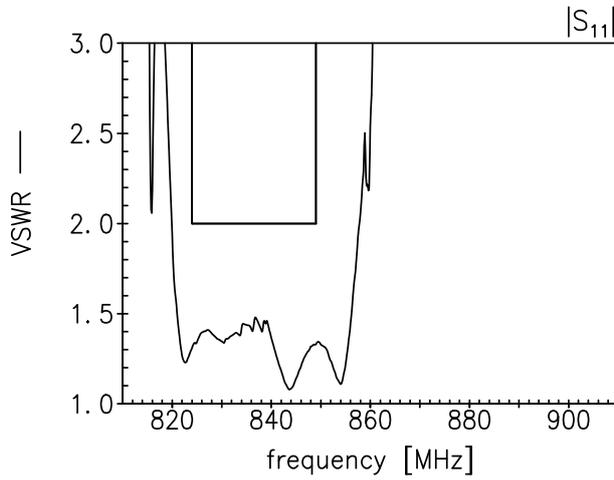
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**Differential Mode Isolation TX-RX (Power transfer function)**

**Differential Mode Isolation TX-RX (wideband)**


Data sheet



**VSWR**    **S<sub>11</sub> TX- port**    **S<sub>22</sub> ANT-port**    **S<sub>33</sub> RX-port**



**References**

<b>Type</b>	B8576
<b>Ordering code</b>	B39881B8576P810
<b>Marking and package</b>	C61157-A8-A68
<b>Packaging</b>	F61074-V8259-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B8576_NB_UN.s4p, B8576_WB_UN.s4p see file header for port/pin assignment table
<b>Soldering profile</b>	S_6001
<b>RoHS compatible</b>	RoHS-compatible means that products are compatible with the requirements according to Art. 4 (substance restrictions) of Directive 2011/65/EU of the European Parliament and of the Council of June 8 <sup>th</sup> , 2011, on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("Directive") with due regard to the application of exemptions as per Annex III of the Directive in certain cases.
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