



SAW Components

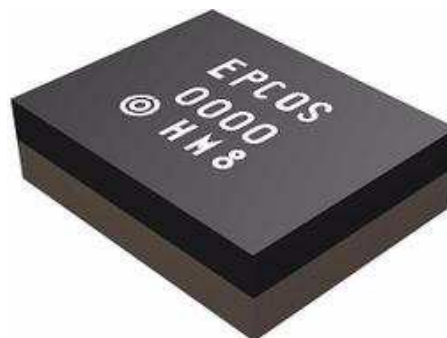
SAW Duplexer

Cellular / WCDMA Band V

Series/type:	B8577
Ordering code:	B39881B8577P810
Date:	June 4, 2013
Version:	2.0

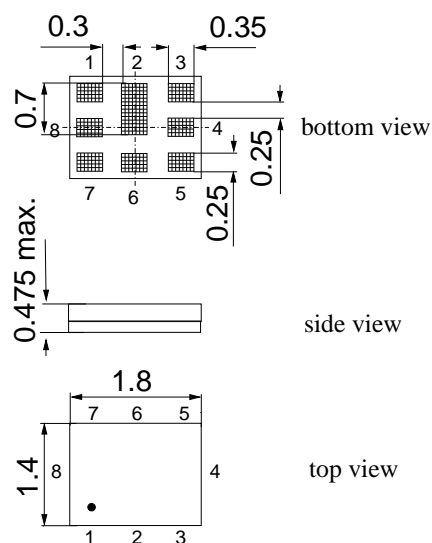
Application

- Multimode SAW duplexer for mobile telephone
Cellular / WCDMA Band V 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



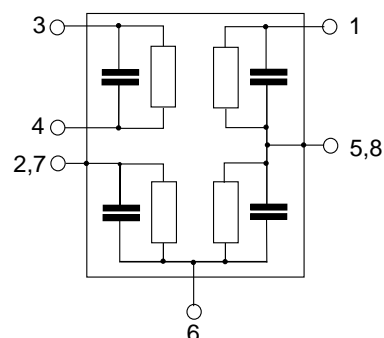
Features

- Package size 1.8 x 1.4 mm²
- Max. package height 0.475 mm
- RoHS compatible
- Package for **Surface Mount Technology (SMT)**
- Ni, Au-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- **Moisture Sensitivity Level 3**



Pin configuration

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



Data sheet

Characteristics

Temperature range for specification:	T = -30 °C to +85 °C
Antenna terminating impedance:	Z _{ANT} = 50 Ω 8.2 nH
RX terminating impedance:	Z _{RX} = 100 Ω (balanced)
TX terminating impedance:	Z _{TX} = 50 Ω

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

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.

Data sheet

Characteristics

Temperature range for specification:	T = -30 °C to +85 °C
Antenna terminating impedance:	Z _{ANT} = 50 Ω 8.2 nH
RX terminating impedance:	Z _{RX} = 100 Ω (balanced)
TX terminating impedance:	Z _{TX} = 50 Ω

Characterisitcs TX - ANT		min.	typ. @ 25 °C	max.	
Absolute attenuation	α				
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 _{Carrier} 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

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

Data sheet

Characteristics

Temperature range for specification:	T = -30 °C to +85 °C
Antenna terminating impedance:	Z _{ANT} = 50 Ω 8.2 nH
RX terminating impedance:	Z _{RX} = 100 Ω (balanced)
TX terminating impedance:	Z _{TX} = 50 Ω

Characteristics ANT - RX		min.	typ. @ 25 °C	max.	
Center frequency	f _C	—	881.5	—	MHz
Maximum insertion attenuation	α _{max}	—	1.7	2.4	dB
869.0 ... 894.0 MHz					
@f _{Carrier} 871.4 ... 891.6 MHz	α _{WCDMA} ¹⁾	—	1.5	2.2	dB
Amplitude ripple (p-p)	Δα	—	0.5	1.2	dB
869.0 ... 894.0 MHz					
Error Vector Magnitude					
@f _{Carrier} 871.4 ... 891.6 MHz	EVM ²⁾	—	1.7	3.5	%
Input VSWR (ANT port)					
869.0 ... 894.0 MHz		—	1.7	2.0	
Output VSWR (RX port)					
869.0 ... 894.0 MHz		—	1.6	2.0	
Common mode rejection ratio					
869.0 ... 894.0 MHz	CMRR	23 ³⁾	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 +85 °C
Antenna terminating impedance:	Z _{ANT} = 50 Ω 8.2 nH
RX terminating impedance:	Z _{RX} = 100 Ω (balanced)
TX terminating impedance:	Z _{TX} = 50 Ω

Characterisitcs ANT - RX		min.	typ. @ 25 °C	max.	
IMD product level limits¹⁾					
at f_{TX} = 836.5 MHz f_{RX} = 881.5 MHz					
Blocker 1	45.0 MHz	—	-125	—	dBm
Blocker 2	791.5 MHz	—	-106	—	dBm
Blocker 3	1718.0 MHz	—	-106	—	dBm
Blocker 4	2554.5 MHz	—	-115	—	dBm
Attenuation					
		α			
10.0 ... 447.0 MHz		45	75	—	dB
447.0 ... 824.0 MHz		45	61	—	dB
824.0 ... 849.0 MHz		50	60	—	dB
@f _{Carrier}	826.4 ... 846.6 MHz	$\alpha_{\text{WCDMA}}^{2)}$			
	849.0 ... 854.0 MHz	10	56	—	dB
	854.0 ... 871.5 MHz	0.9	1.3	—	dB
	909.0 ... 914.0 MHz	10	20	—	dB
	914.0 ... 940.0 MHz	20	27	—	dB
	940.0 ... 1000.0 MHz	40	49	—	dB
	1000.0 ... 1693.0 MHz	40	53	—	dB
	1693.0 ... 1850.0 MHz	45	54	—	dB
	1850.0 ... 1920.0 MHz	40	54	—	dB
	1920.0 ... 5000.0 MHz	40	46	—	dB
	5000.0 ... 6000.0 MHz	30	41	—	dB

¹⁾ Power levels: 21.5 dBm Tx signal, -15dBm blocker at antenna port.

²⁾ Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).

Data sheet

Characteristics

Temperature range for specification:	T = -30 °C to +85 °C
Antenna terminating impedance:	Z _{ANT} = 50 Ω 8.2 nH
RX terminating impedance:	Z _{RX} = 100 Ω (balanced)
TX terminating impedance:	Z _{TX} = 50 Ω

Characterisitcs TX - RX				min.	typ. @ 25 °C	max.	
Isolation		α					
	824.0 ... 849.0 MHz			54	63	—	dB
@f _{Carrier}	826.4 ... 846.6 MHz	$\alpha_{\text{WCDMA}}^{3)}$		57	64	—	dB
	869.0 ... 894.0 MHz			50	55	—	dB
@f _{Carrier}	871.4 ... 891.6 MHz	$\alpha_{\text{WCDMA}}^{1)}$		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
Common Mode Isolation							
	824.0 ... 849.0 MHz			42	47	—	dB
@f _{Carrier}	826.4 ... 846.6 MHz	$\alpha_{\text{WCDMA}}^{3)}$		42	48	—	dB

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

Annotation for characteristics section

Attenuation of WCDMA signal ("Powertransferfunction", α_{WCDMA}) is determined by

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

f_{Carrier} according to 3GPP TS 25.101 (e.g. for WCDMA Band 5-Passband, f_{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:

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

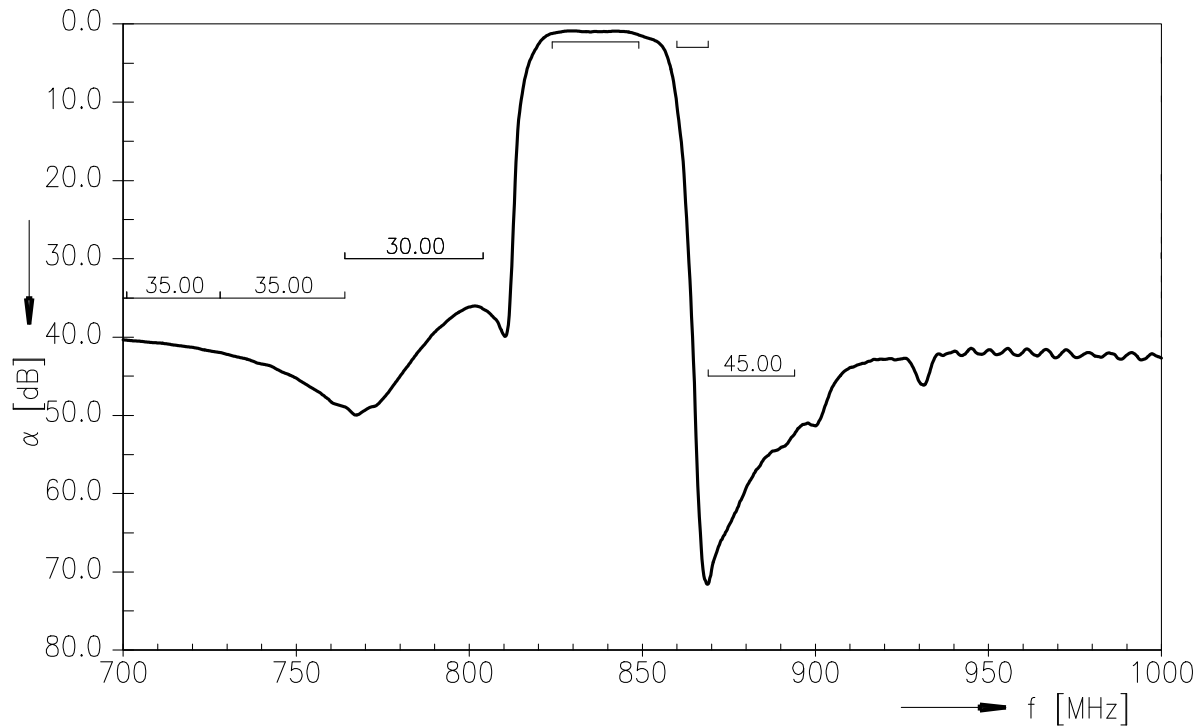
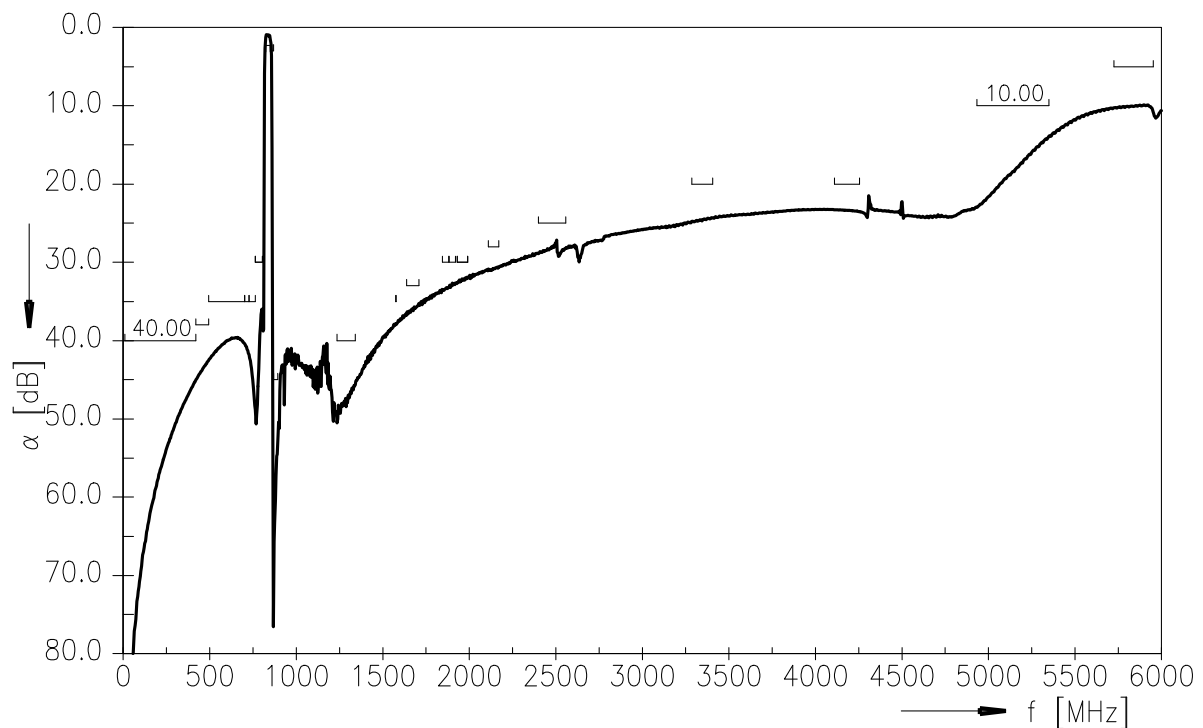
Maximum ratings

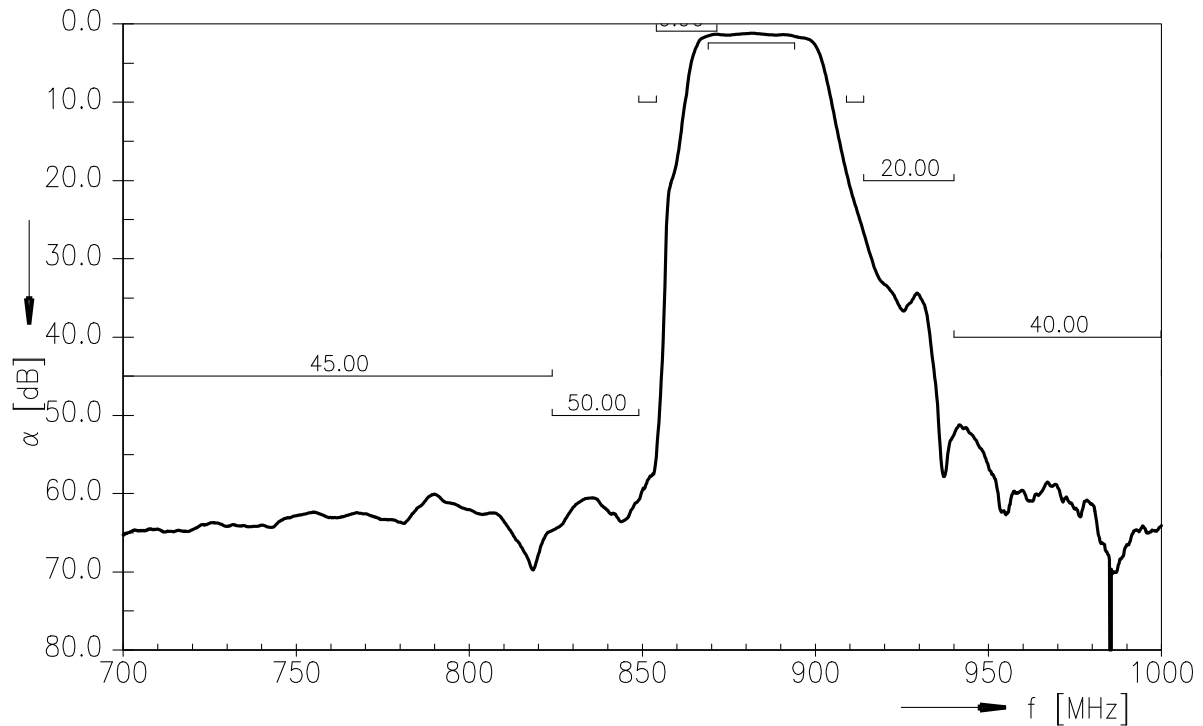
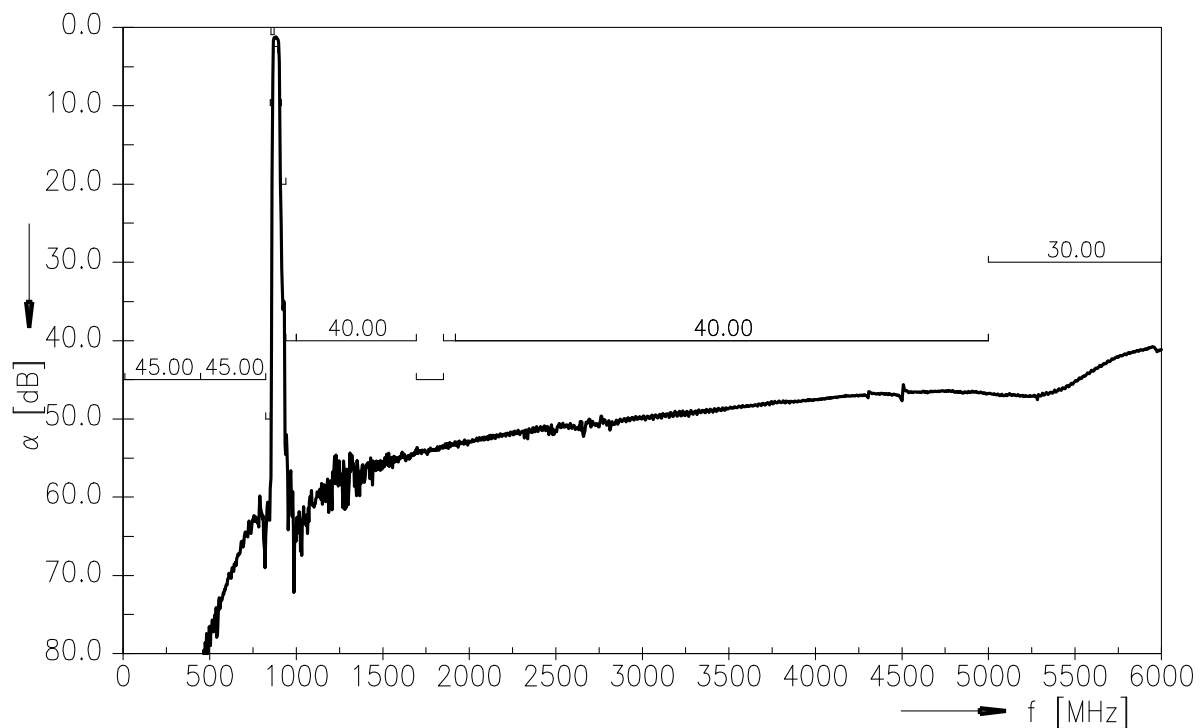
Storage temperature range	T_{stg}	-40/+85 ¹⁾	°C	Machine Model source and load impedance 50 Ω } continuous wave } $T = 50^\circ\text{C}, 3000\text{ h}$
DC voltage	V_{DC}	5 ²⁾	V	
ESD voltage	V_{ESD}	100 ³⁾	V	
Input power	P_{IN}			
824.0 ... 849.0 MHz		28	dBm	
elsewhere		10	dBm	

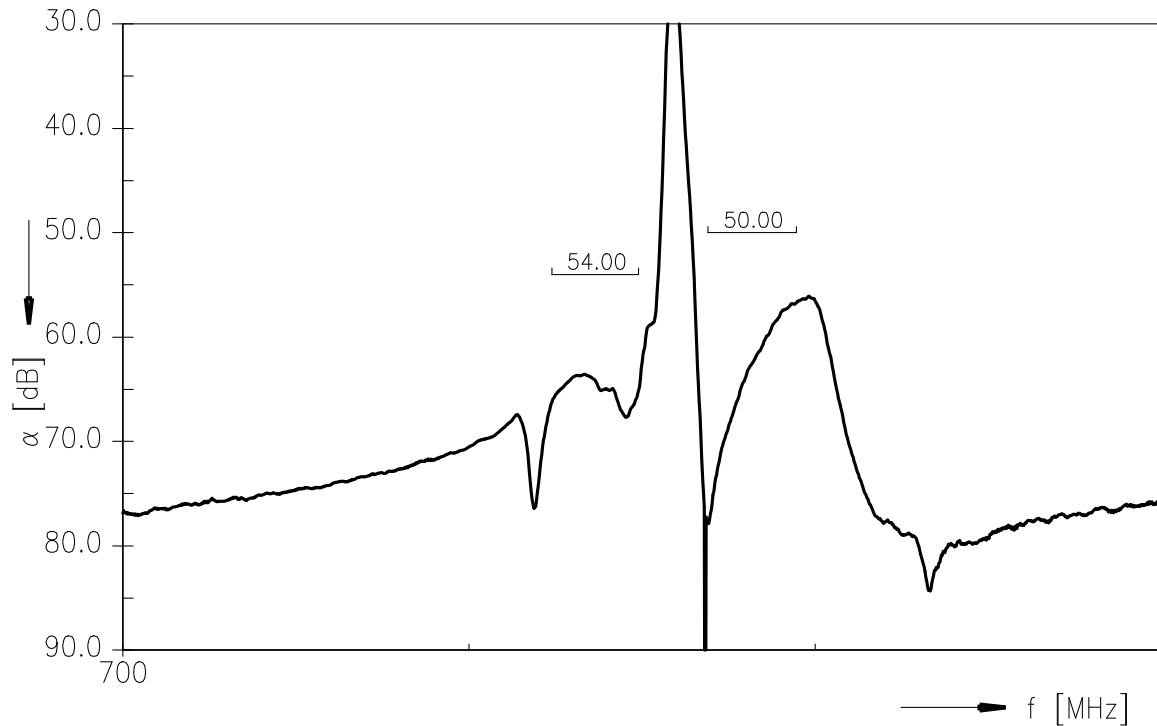
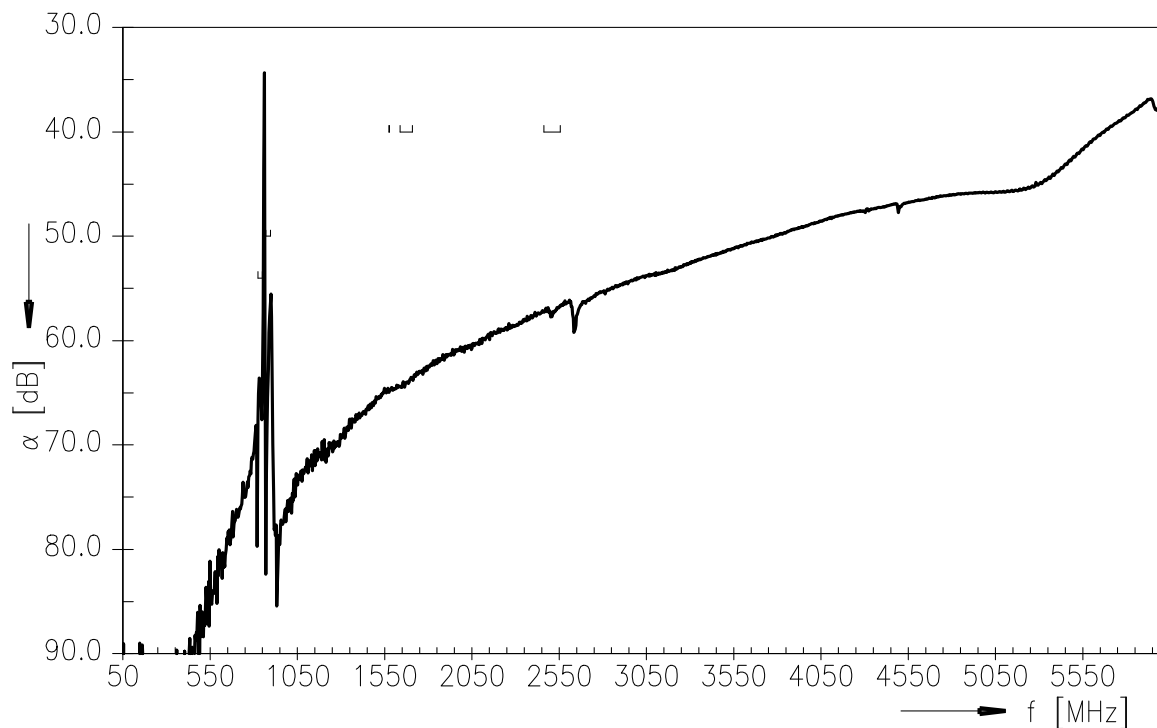
1) extended upperlimit: 168h@125°C acc. to IEC 60068-2-2 Bb

2) 168h Damp Heat Steady State acc. to IEC 60068-2-67 Cy

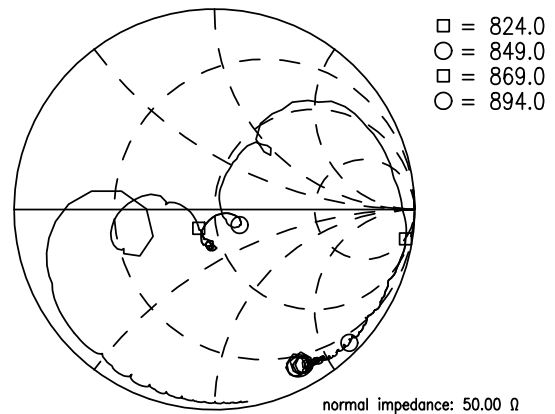
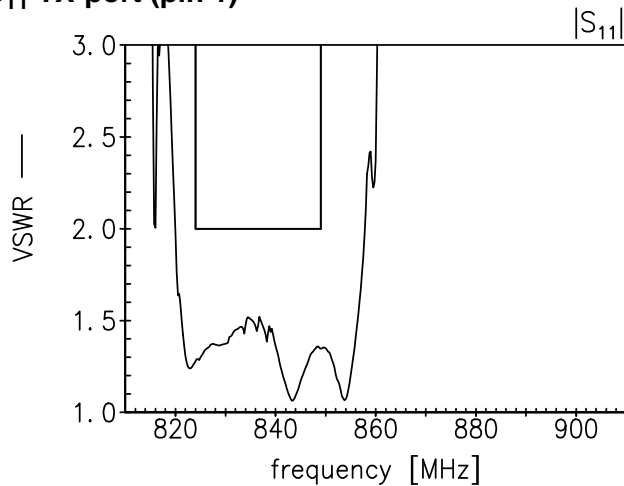
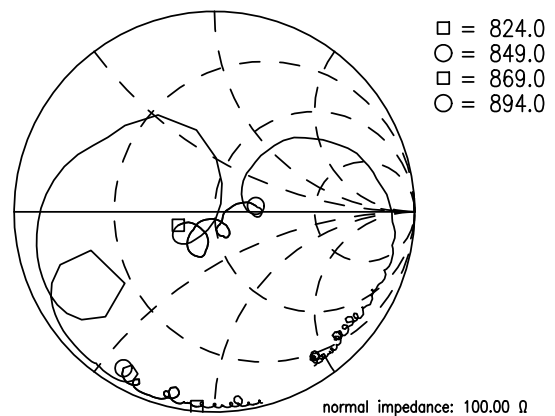
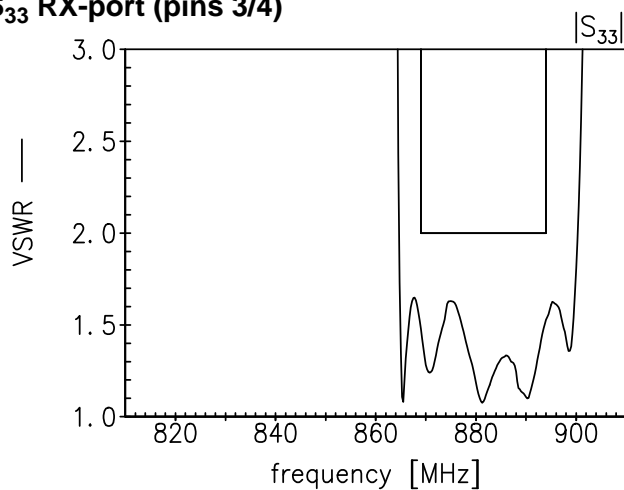
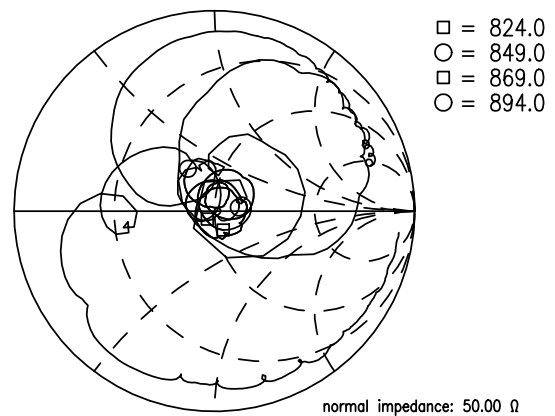
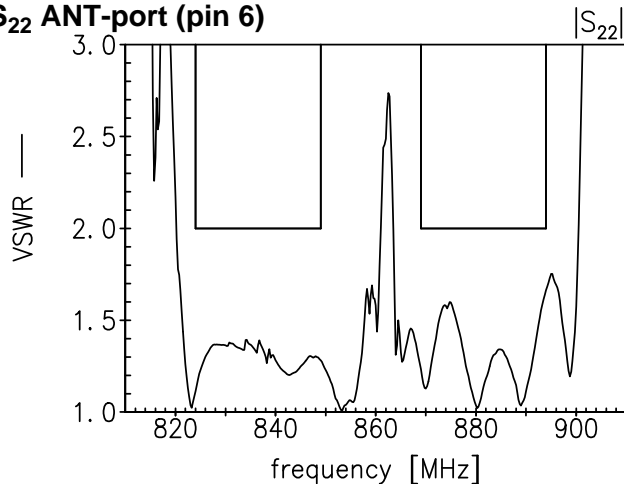
3) acc. to JESD22-A115B (MM - Machine Model), 10 negative and 10 positive pulses.

Transfer function TX (Power transfer function)

Transfer function TX (wideband)


Transfer function RX (Power transfer function)

Transfer function RX (wideband)


Isolation TX-RX (Power transfer function)

Isolation TX-RX (wideband)


Data sheet

Smith charts
S₁₁ TX-port (pin 1)

S₃₃ RX-port (pins 3/4)

S₂₂ ANT-port (pin 6)


Type	B8577
Ordering code	B39881B8577P810
Marking and package	C61157-A8-A69
Packaging	F61074-V8259-Z000
Date codes	L_1126
S-parameters	B8577_NB_UN.s4p; B8577_WB_UN.s4p See file header for port/pin assignment table
Soldering profile	S_6001
RoHS compatible	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 th , 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.
Moldability	Before using in overmolding environment, please contact your EPCOS sales office.
Matching coils	See Inductor pdf-catalog http://www.tdk.co.jp/tefe02/coil.htm#aname1 and Data Library for circuit simulation http://www.tdk.co.jp/etvcl/index.htm

For further information please contact your local EPCOS sales office or visit our webpage at www.epcos.com .

**Published by EPCOS AG
Systems, Acoustics, Waves Business Group
P.O. Box 80 17 09, 81617 Munich, GERMANY**

© EPCOS AG 2013. This brochure replaces the previous edition.

For questions on technology, prices and delivery please contact the Sales Offices of EPCOS AG or the international Representatives.

Due to technical requirements components may contain dangerous substances. For information on the type in question please also contact one of our Sales Offices.

Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet (www.epcos.com/material). Should you have any more detailed questions, please contact our sales offices.
5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order.
We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available. The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.
6. Unless otherwise agreed in individual contracts, **all orders are subject to the current version of the "General Terms of Delivery for Products and Services in the Electrical Industry" published by the German Electrical and Electronics Industry Association (ZVEI)**.
7. The trade names EPCOS, BAOKE, Alu-X, CeraDiode, CeraLink, CSMP, CSSP, CTVS, DeltaCap, DigiSiMic, DSSP, FilterCap, FormFit, MiniBlue, MiniCell, MKD, MKK, MLSC, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, SIP5D, SIP5K, ThermoFuse, WindCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at www.epcos.com/trademarks.