



SAW Components

SAW Duplexer

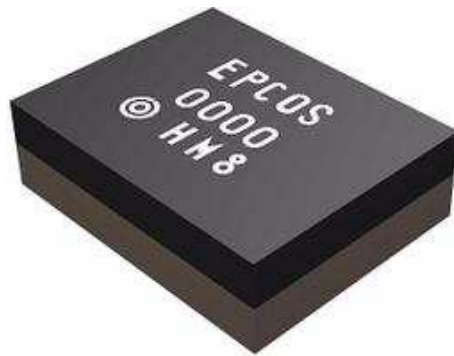
Cellular / WCDMA Band V

Series/type:	B8568
Ordering code:	B39881B8568P810
Date:	May 13, 2013
Version:	2.0



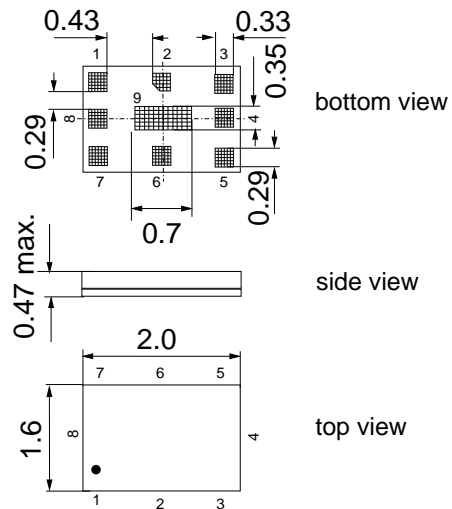
Application

- Multimode SAW duplexer for mobile telephone Cellular/WCDMA Band V, Band VI (830-840 MHz) and Band IXX (830-845 MHz) systems
- Low insertion attenuation
- Low amplitude ripple
- High Tx band isolation
- Single ended to balanced transformation in Antenna - Rx path
- Impedance transformation 50Ω to 100Ω in Antenna - Rx path



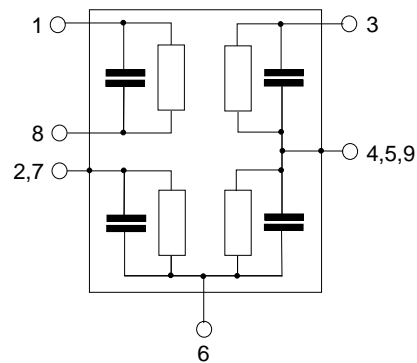
Features

- Component size 2.0 x 1.6 mm²
- Component height 0.47 mm max.
- RoHS compatible
- Approximate weight: 0.005g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-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, 9 To be grounded





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Preliminary Data



Characteristics

Temperature range for specification: $T = -30\text{ °C to }+85\text{ °C}$
 Antenna terminating impedance: $Z_{ANT} = 50\ \Omega \parallel 8.2\text{ nH}$
 RX terminating impedance: $Z_{RX} = 100\ \Omega$ (balanced)
 TX terminating impedance: $Z_{TX} = 50\ \Omega$

Characteristics TX - ANT		min.	typ. @ 25 °C	max.	
Center frequency	f_C		836.5		MHz
Maximum insertion attenuation	α_{max}				
824.0 ... 849.0 MHz			1.4	2.4	dB
@ $f_{Carrier}$ 826.4 ... 846.6 MHz	$\alpha_{WCDMA}^{1)}$		1.2	2.1 ²⁾	dB
Amplitude ripple	$\Delta\alpha$				
824.0 ... 849.0 MHz			0.6	1.6	dB
@ $f_{Carrier}$ 826.4 ... 846.6 MHz	$\alpha_{WCDMA}^{1)}$		0.4	1.3 ²⁾	dB
Error Vector Magnitude					
@ $f_{Carrier}$ 826.4 ... 846.6 MHz	EVM ³⁾		1.7	3.5 ²⁾	%
Input VSWR (TX port)					
824.0 ... 849.0 MHz			1.4	2.1	
Output VSWR (ANT port)					
824.0 ... 849.0 MHz			1.4	2.1	

1) Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).
 2) Temperature range for this parameter is -20°C to +85°C.
 3) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.



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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.	
Absolute attenuation	α				
10.0 ... 420.0 MHz		30	40		dB
420.0 ... 494.0 MHz		35	37		dB
494.0 ... 701.0 MHz		30	33		dB
701.0 ... 728.0 MHz		30	33		dB
728.0 ... 768.0 MHz		31	34		dB
768.0 ... 804.0 MHz		28	31		dB
860.0 ... 869.0 MHz		3	27		dB
869.0 ... 894.0 MHz		45	51		dB
1565.42 ... 1573.374 MHz		36	42		dB
1573.374 ... 1577.466 MHz		36	42		dB
1577.466 ... 1585.42 MHz		36	42		dB
1597.5515 ... 1605.886 MHz		36	41		dB
1605.886 ... 1610.0 MHz		36	41		dB
1638.0 ... 1708.0 MHz		25	38		dB
1708.0 ... 1743.0 MHz		25	38		dB
1844.9 ... 1879.9 MHz		30	35		dB
1884.5 ... 1919.6 MHz		30	35		dB
1930.0 ... 1990.0 MHz		30	34		dB
2110.0 ... 2170.0 MHz		28	32		dB
2400.0 ... 2557.0 MHz		24	27		dB
2557.0 ... 2592.0 MHz		23	29		dB
3286.0 ... 3406.0 MHz		20	24		dB
4110.0 ... 4255.0 MHz		18	21		dB
4934.0 ... 5350.0 MHz		10	19		dB
5725.0 ... 5953.0 MHz		10	17		dB



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 RX terminating impedance: $Z_{RX} = 100\ \Omega$ (balanced)
 TX terminating impedance: $Z_{TX} = 50\ \Omega$

Characteristics ANT - RX		min.	typ. @ 25 °C	max.	
Center frequency	f_C		881.5		MHz
Maximum insertion attenuation	α_{max}				
869.0 ... 894.0 MHz			2.2	2.7	dB
@ $f_{Carrier}$ 871.4 ... 891.6 MHz	$\alpha_{WCDMA}^{1)}$		1.9	2.5 ²⁾	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
869.0 ... 894.0 MHz			0.8	1.2	dB
@ $f_{Carrier}$ 871.4 ... 891.6 MHz	$\alpha_{WCDMA}^{1)}$		0.5	1.0 ²⁾	dB
Error Vector Magnitude					
@ $f_{Carrier}$ 871.4 ... 891.6 MHz	EVM ³⁾		1.5	3.2 ²⁾	%
Input VSWR (ANT port)					
869.0 ... 894.0 MHz			1.8	2.1	
Output VSWR (RX port)					
869.0 ... 894.0 MHz			1.7	2.2	
Common mode rejection ratio					
869.0 ... 894.0 MHz	CMRR	23 ⁴⁾	32 ⁴⁾		dB

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

²⁾ Temperature range for this parameter is -20°C to +85°C.

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

⁴⁾ A combination of 10° phase balance and 1 dB amplitude balance corresponds to 19.6 dB CMRR



SAW Components	B8568
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Preliminary Data **SMD**

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.			
IMD product level limits¹⁾						
at f_{TX} = 836.5 MHz f_{RX} = 881.5 MHz						
Blocker 1	45.0	MHz	-135	-110	dBm	
Blocker 2	791.5	MHz	-103	-93	dBm	
Blocker 3	1718.0	MHz	-109	-99	dBm	
Blocker 4	2554.5	MHz	-116	-106	dBm	
Attenuation						
		α				
10.0	...	447.0	MHz	45	85	dB
447.0	...	779.0	MHz	30	68	dB
779.0	...	784.0	MHz	45	67	dB
784.0	...	804.0	MHz	35	66	dB
804.0	...	824.0	MHz	30	64	dB
824.0	...	849.0	MHz	55	70	dB
849.0	...	854.0	MHz	10	61	dB
909.0	...	1000.0	MHz	15	19	dB
1000.0	...	1850.0	MHz	40	60	dB
1850.0	...	1920.0	MHz	40	60	dB
1920.0	...	2607.0	MHz	35	57	dB
2607.0	...	2682.0	MHz	50	56	dB
2682.0	...	6000.0	MHz	35	52	dB

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



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 RX terminating impedance: Z_{RX} = 100 Ω (balanced)
 TX terminating impedance: Z_{TX} = 50 Ω

Characteristics TX - RX				min.	typ. @ 25 °C	max.	
Isolation							
	824.0	...	849.0 MHz	60	67		dB
	869.0	...	894.0 MHz	50	54		dB
@f _{Carrier}	871.4	...	891.6 MHz α _{WCDMA} ¹⁾	50 ²⁾	54		dB
	1574.0	...	1577.0 MHz	40	72		dB
	1638.0	...	1708.0 MHz	20	70		dB
	2462.0	...	2557.0 MHz	20	63		dB
Common Mode Isolation							
	824.0	...	849.0 MHz	55	63		dB

1) Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (8).
 2) Temperature range for this parameter is -20°C to +85°C.



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Preliminary Data **SMD**

Maximum ratings

Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5	V	
ESD voltage	V _{ESD}	250 ¹⁾	V	human body model, 1 pulse charged device model, 3 pulses machine model, 10 pulses source and load impedance 50 Ω } WCDMA UP wave } T = 55° C, 1000 h
		300 ²⁾	V	
		100 ³⁾	V	
Input power at 824.0 ... 849.0 MHz elsewhere	P _{IN}	29	dBm	}
		10	dBm	

- 1) acc. to JESD22-A114F (human body model), 1 negative & 1 positive pulse.
- 2) acc. to JESD22-C101E (charged device model), 3 negative & 3 positive pulses.
- 3) acc. to JESD22-A115C (machine model), 10 negative & 10 positive pulses.

Annotation for characteristics section

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

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

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_{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:

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



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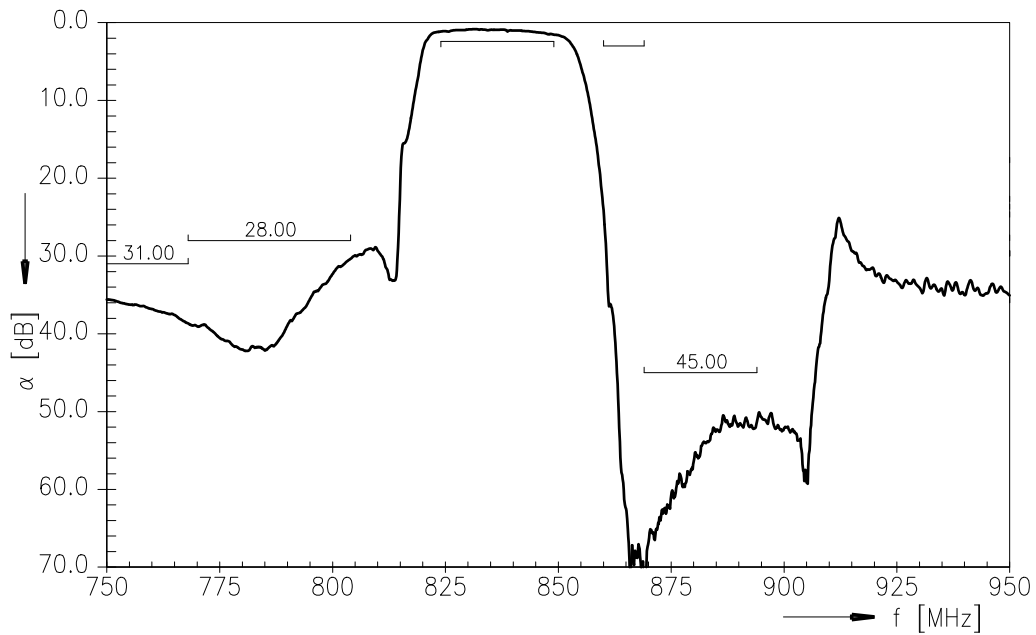
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836.50 / 881.50 MHz

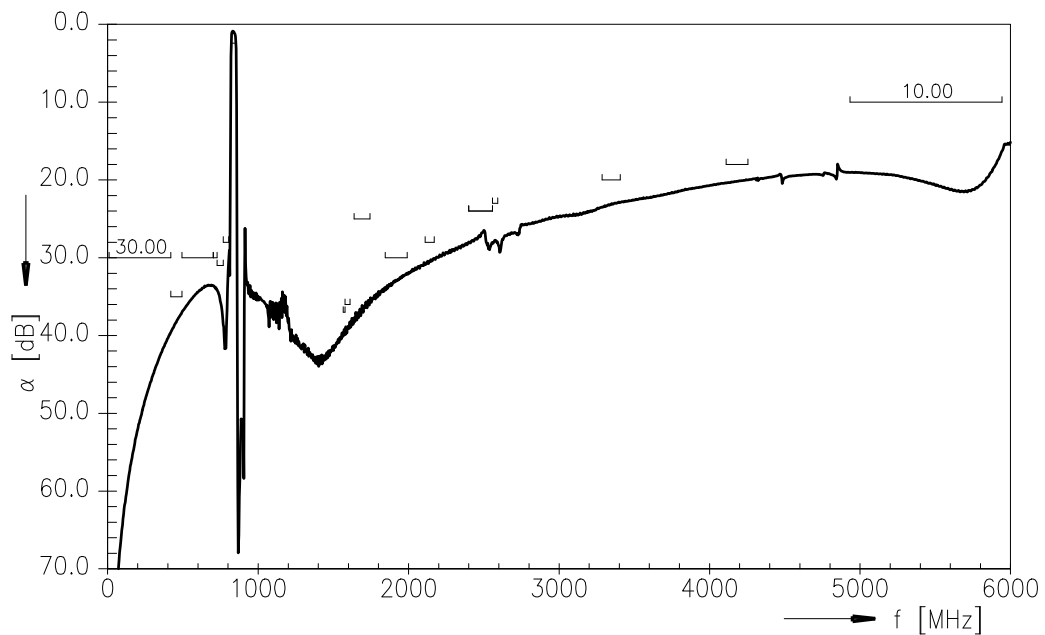
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Frequency Response TX-ANT (Passband)



Frequency Response TX-ANT (Wideband)



Please read *cautions and warnings* and *important notes* at the end of this document.



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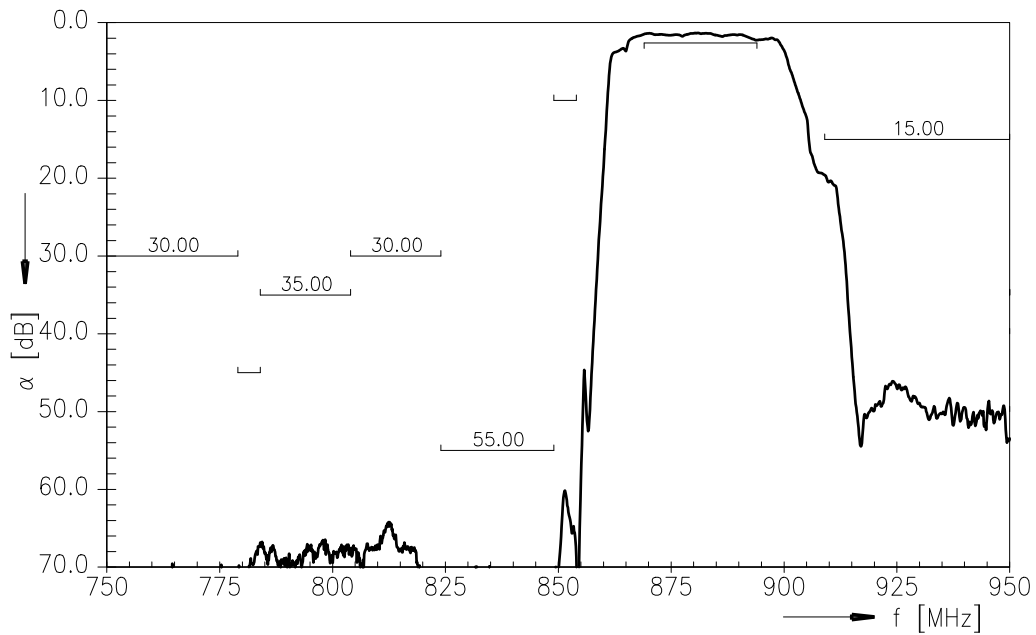
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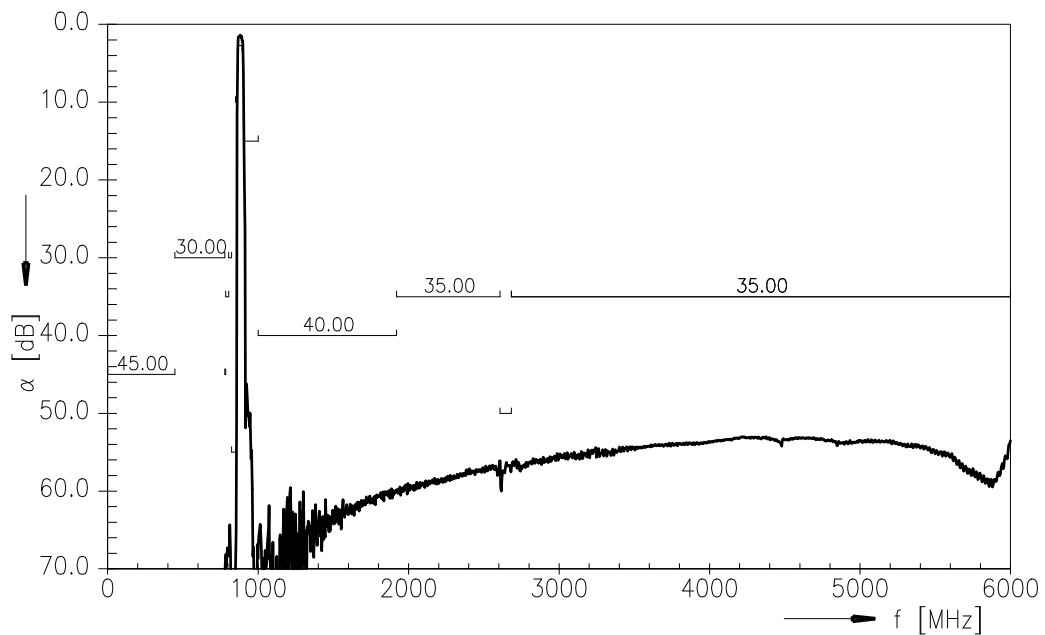
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Frequency Response RX-ANT (Passband)



Frequency Response RX-ANT (Wideband)



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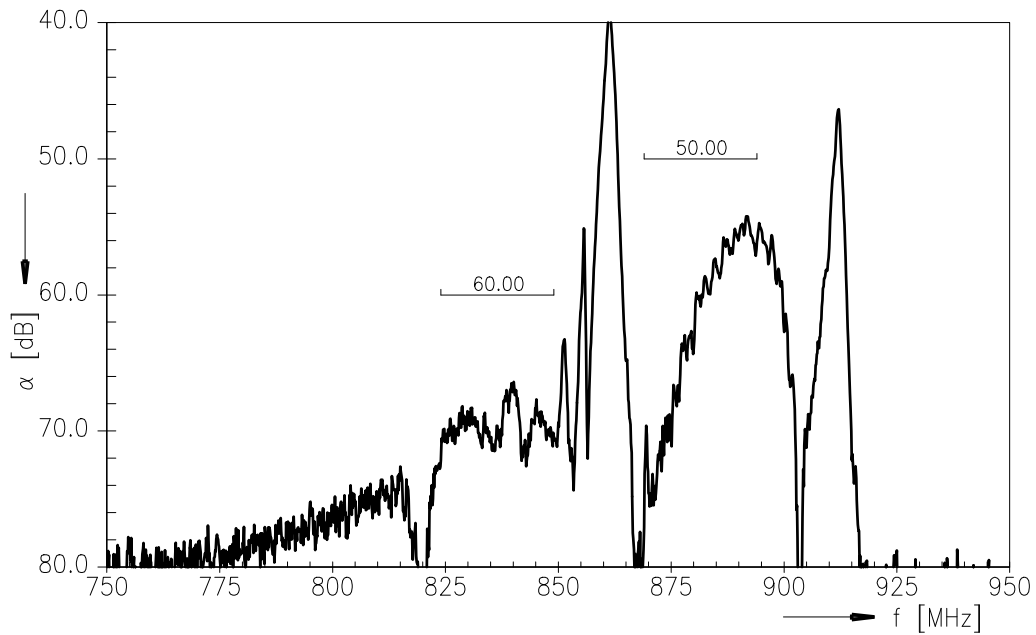
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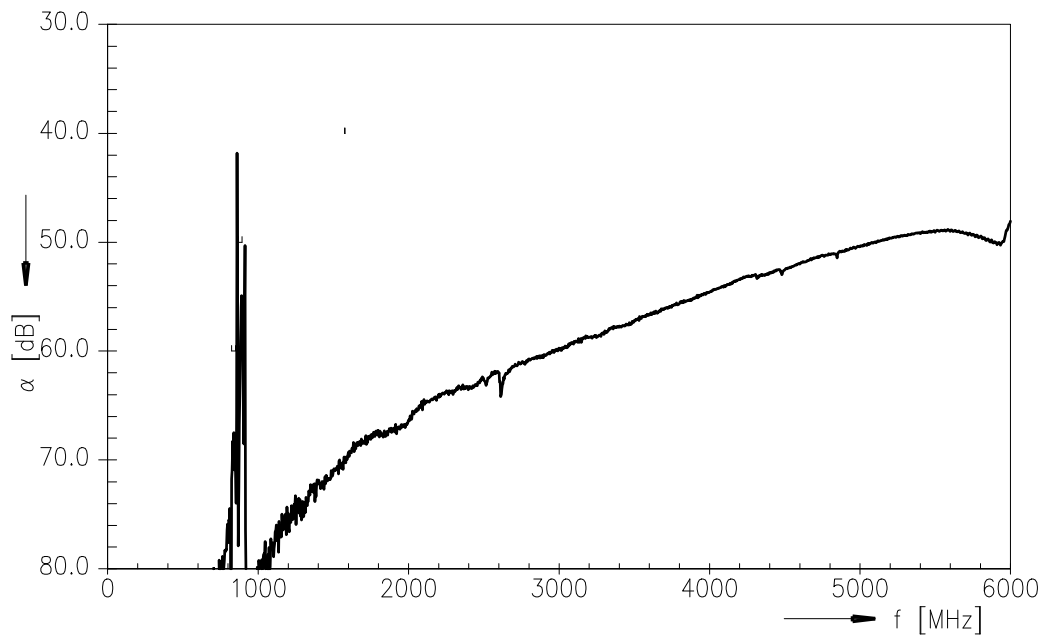
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Frequency Response TX-RX (Passband Differential Mode Isolation)



Frequency Response TX-RX (Wideband Differential Mode Isolation)



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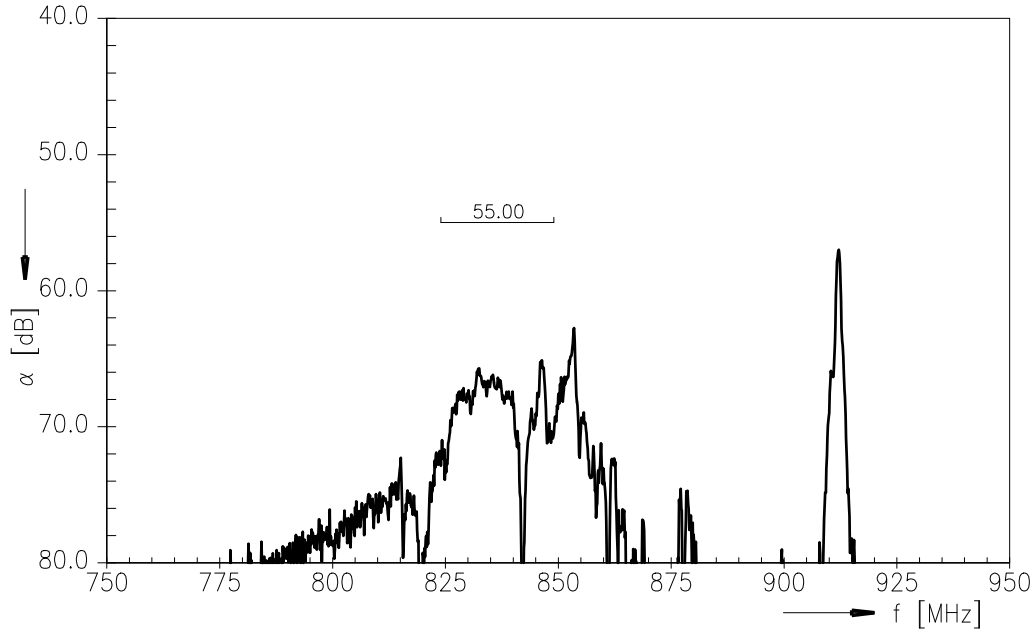
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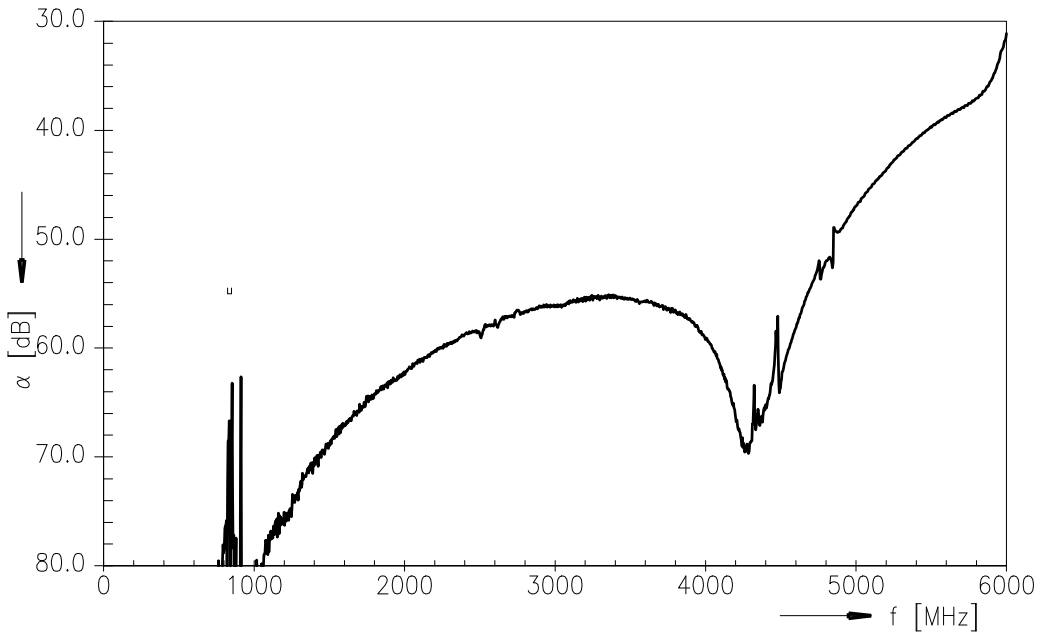
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Frequency Response TX-RX (Passband Common Mode Isolation)



Frequency Response TX-RX (Wideband Common Mode Isolation)



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SAW Components

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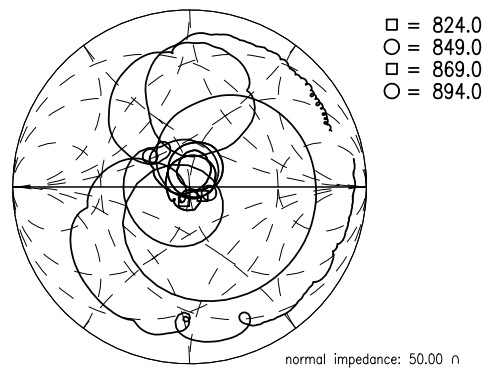
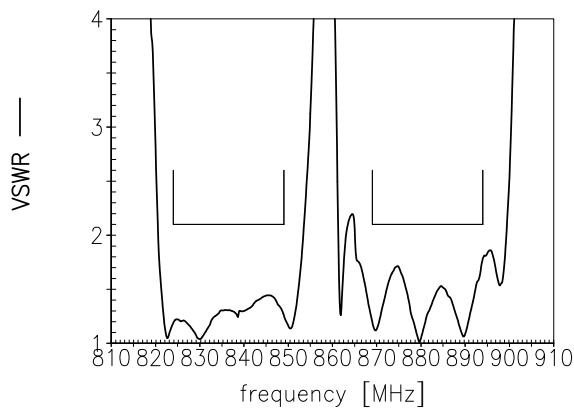
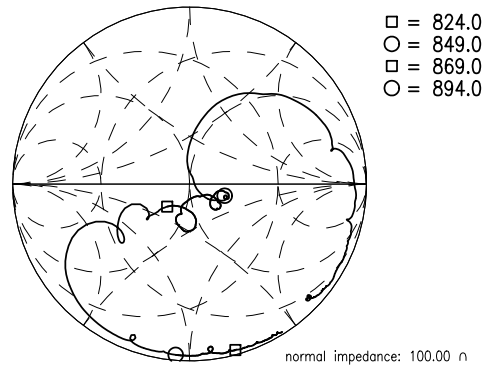
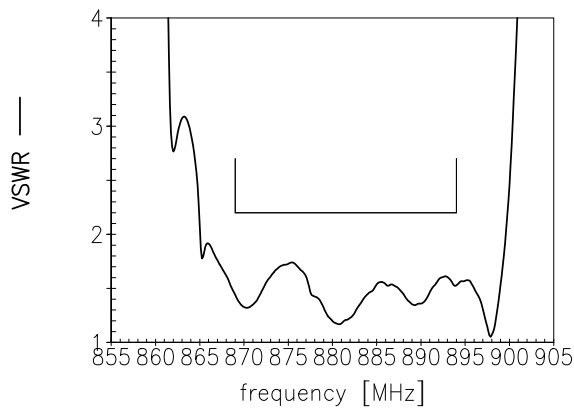
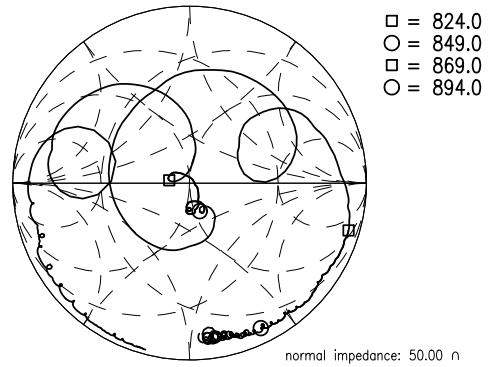
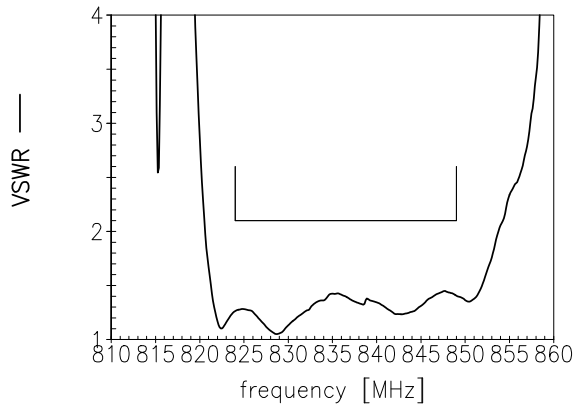
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Matching (TX, RX, ANT)



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References

Type	B8568
Ordering code	B39881B8568P810
Marking and package	C61157-A8-A38
Packaging	F61074-V8247-Z000
Date codes	L_1126
S-parameters	B8568_UN_NB.s4p, B8568_UN_WB.s4p; see file header for pin/port assignments;
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.
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 a large variety of matching coils.

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

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