



SAW Components

SAW Duplexer

Cellular / WCDMA Band V

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

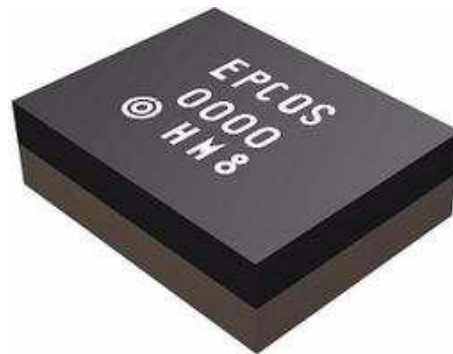
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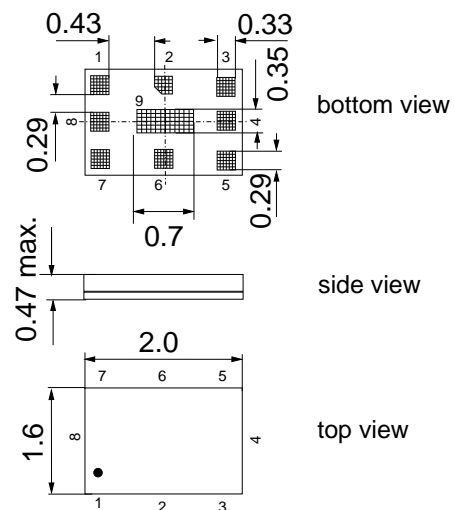
Preliminary Data

Application

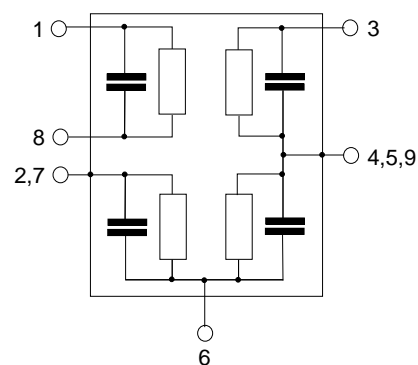
- Multimode SAW duplexer for mobile telephone Cellular/WCDMA Band V, Band VI (830-840 MHz) and Band IXX (830-845 MHz) systems
- Low insertion attenuation
- Low amplitude ripple
- High Tx band isolation
- Single ended to balanced transformation in Antenna - Rx path
- Impedance transformation 50Ω to 100Ω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



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

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B8568
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836.50 / 881.50 MHz
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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.	
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	α _{WCDMA} ¹⁾		1.2	2.1 ²⁾	dB
Amplitude ripple	Δα				
824.0 ... 849.0 MHz			0.6	1.6	dB
@f _{Carrier} 826.4 ... 846.6 MHz	α _{WCDMA} ¹⁾		0.4	1.3 ²⁾	dB
Error Vector Magnitude	EVM ³⁾				
@f _{Carrier} 826.4 ... 846.6 MHz			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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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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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}				
869.0 ... 894.0 MHz			2.2	2.7	dB
@f _{Carrier} 871.4 ... 891.6 MHz	α _{WCDMA} ¹⁾		1.9	2.5 ²⁾	dB
Amplitude ripple (p-p)	Δα				
869.0 ... 894.0 MHz			0.8	1.2	dB
@f _{Carrier} 871.4 ... 891.6 MHz	α _{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

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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.

Preliminary Data

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

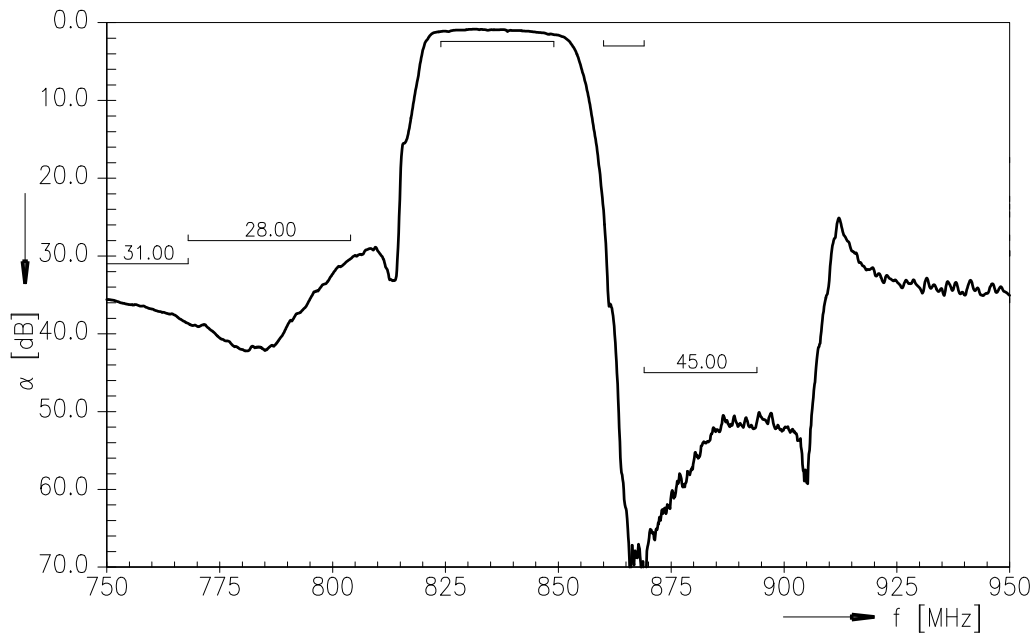
Attenuation of WCDMA signal ("Powertransferfunction", α_{WCDMA}) is determined by

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

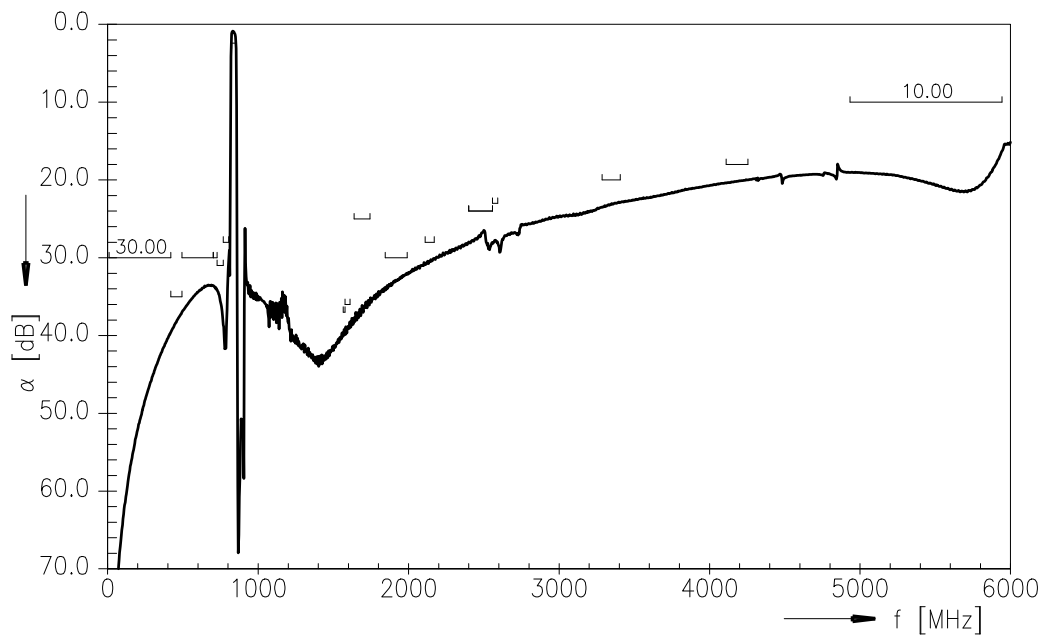
f_{Carrier} according to 3GPP TS 25.101 (e.g. for WCDMA Band 5-Passband, f_{Carrier} ranges from 826.4 MHz (lowest Tx channel) to 846.6 MHz (highest Tx channel)). $H_{RRC}(f)$ is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following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

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

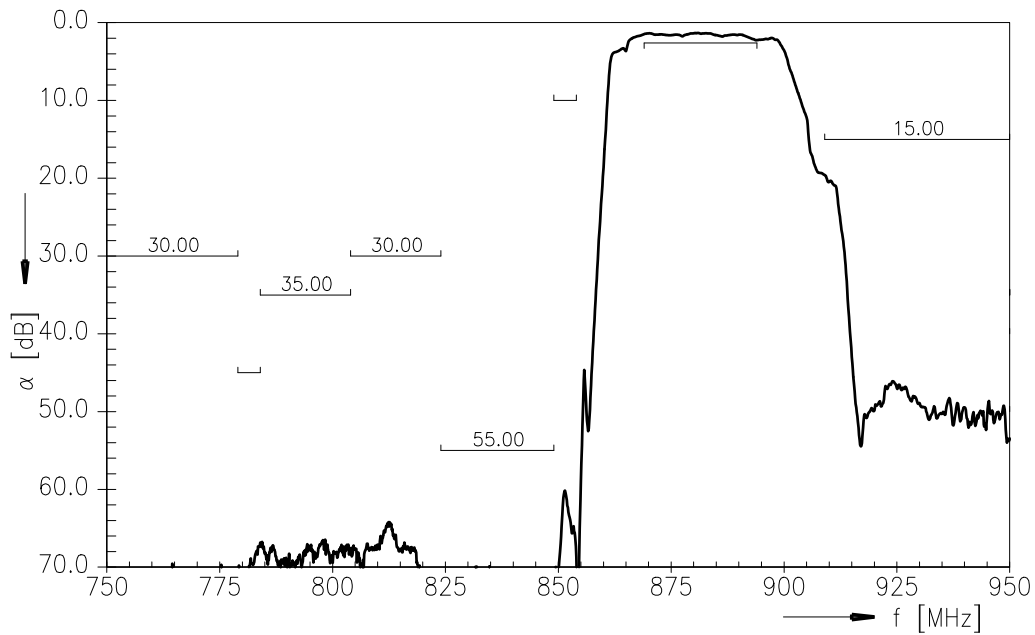
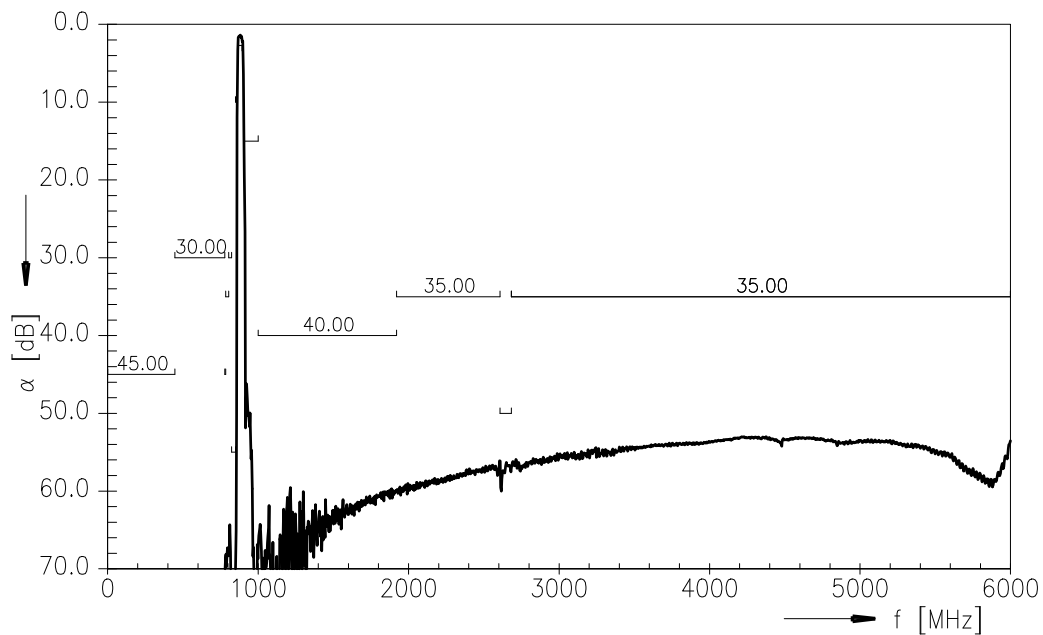
Frequency Response TX-ANT (Passband)



Frequency Response TX-ANT (Wideband)



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

Frequency Response RX-ANT (Passband)

Frequency Response RX-ANT (Wideband)


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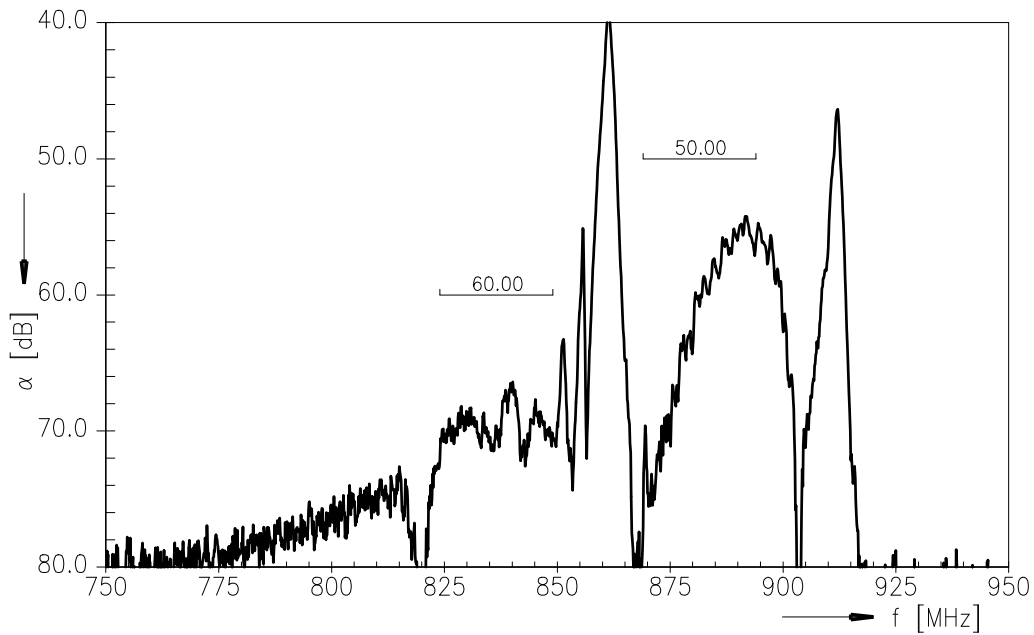
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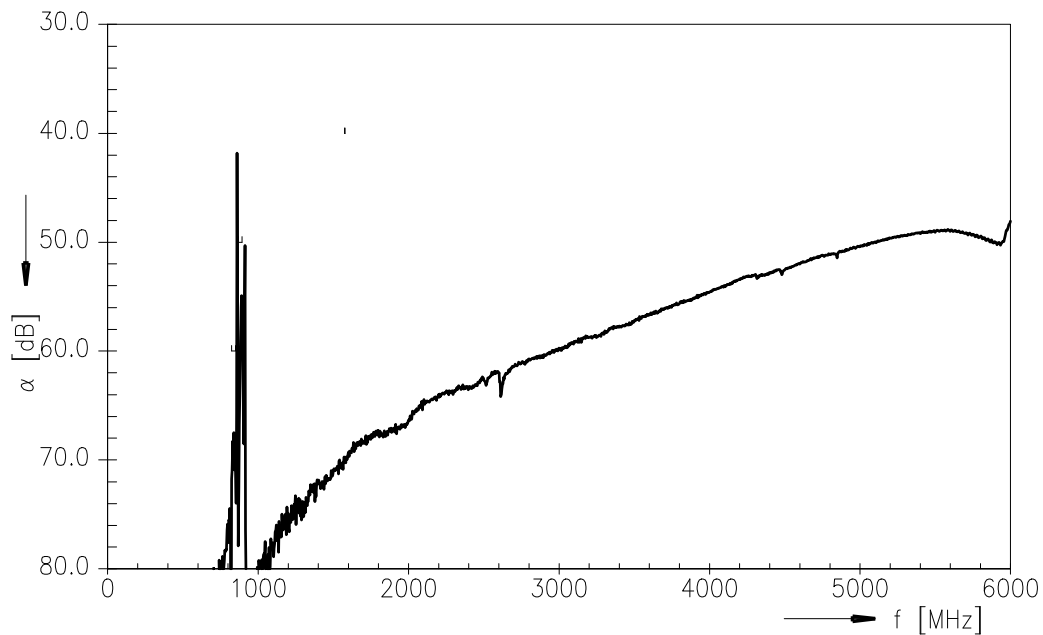
Preliminary Data

SMD

Frequency Response TX-RX (Passband Differential Mode Isolation)



Frequency Response TX-RX (Wideband Differential Mode Isolation)



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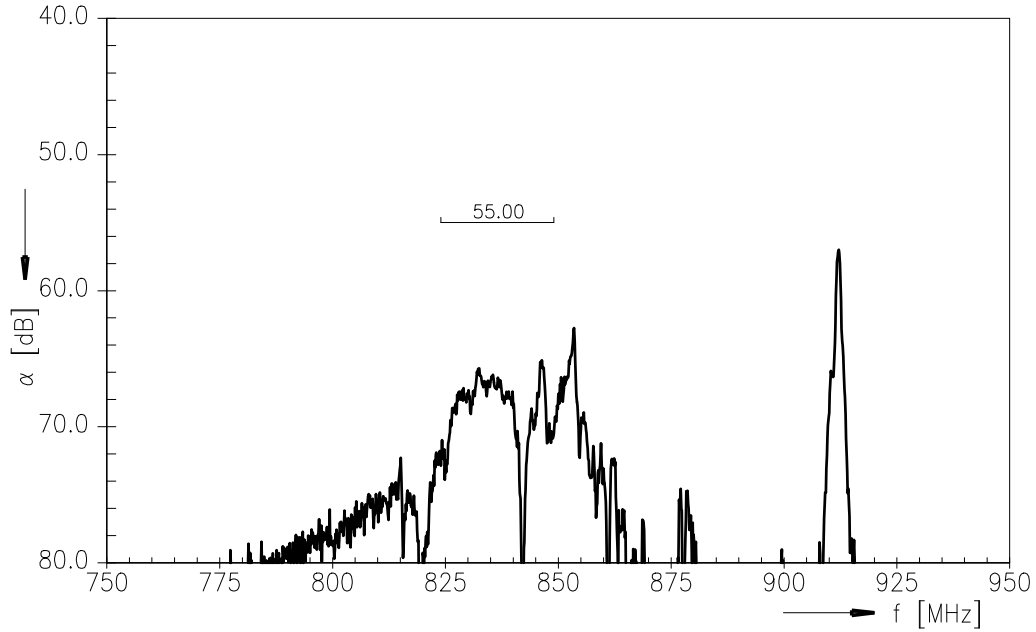
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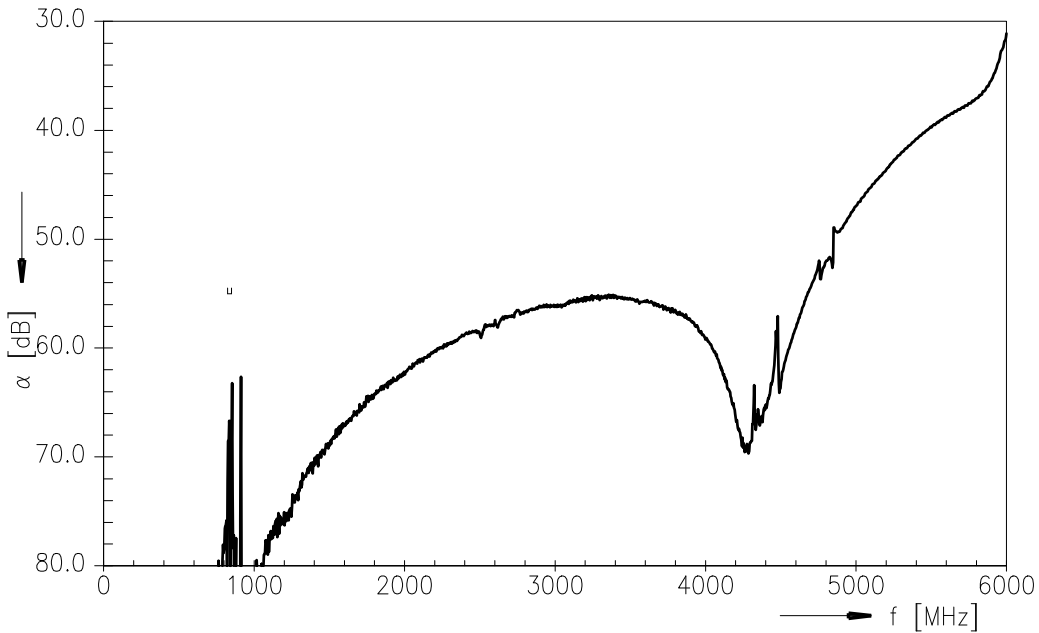
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Frequency Response TX-RX (Passband Common Mode Isolation)



Frequency Response TX-RX (Wideband Common Mode Isolation)

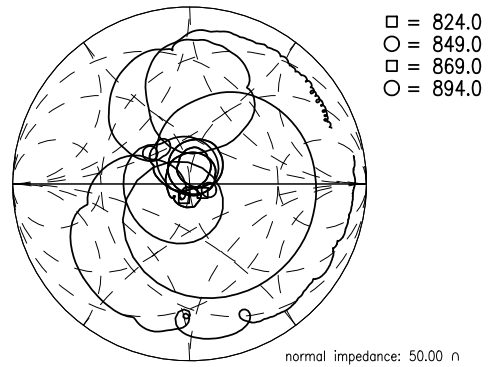
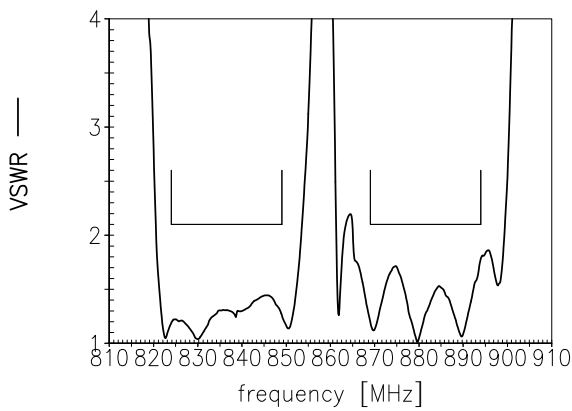
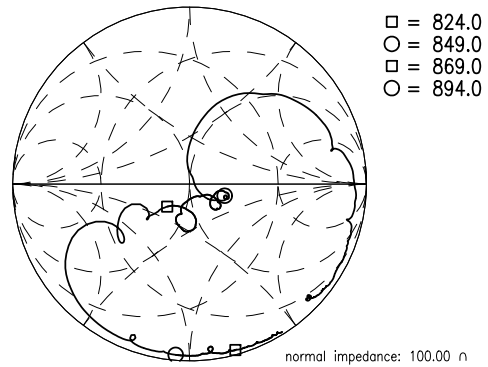
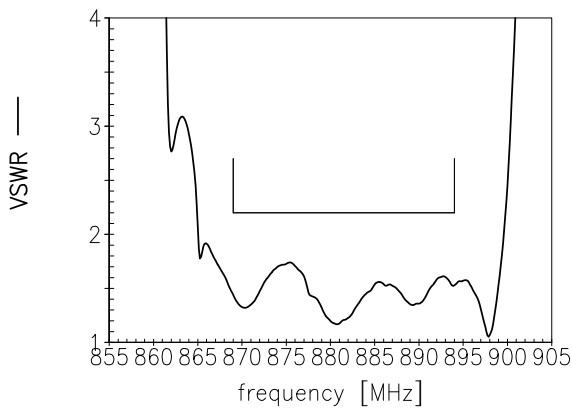
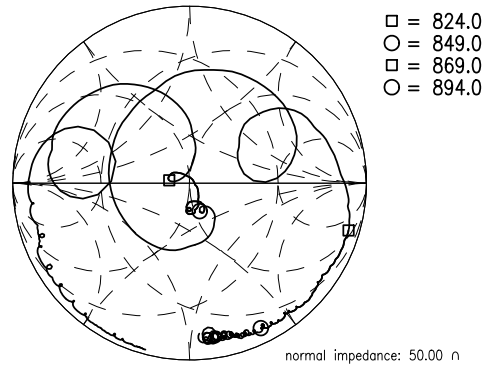
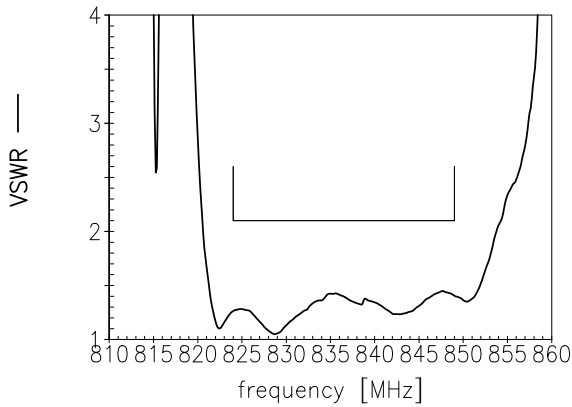


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Preliminary Data



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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