



## **SAW Components**

### **SAW Duplexer**

LTE Band 20

<b>Series/type:</b>	<b>B8091</b>
<b>Ordering code:</b>	<b>B39851B8091P810</b>
<b>Date:</b>	<b>March 01, 2013</b>
<b>Version:</b>	<b>2.2</b>

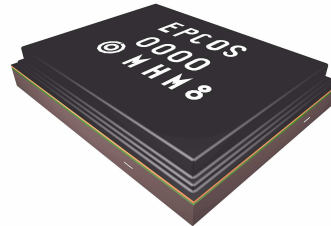


Datasheet



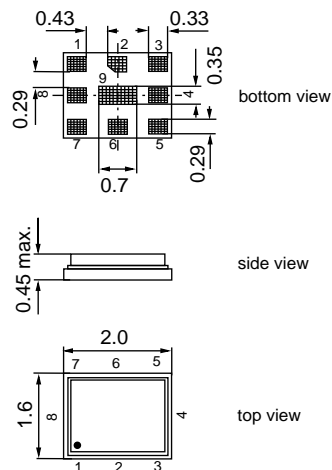
Application

- Low-loss SAW duplexer for LTE Band 20 systems
- Very high isolation
- Usable passband 30 MHz
- Single-ended to balanced transformation in Antenna-Rx path
- Impedance transformation 50 Ω to 100 Ω in Antenna-Rx path
- Very small size and low height



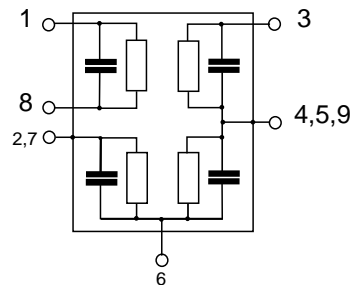
Features

- Package size 2.0 \* 1.6 \* 0.45 mm<sup>3</sup>
- Cu-Frame Technology
- RoHS compatible
- 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, 9 To be grounded





**SAW Components**

**B8091**

**SAW Duplexer**

**847.0 / 806.0 MHz**

**Datasheet**



**Characteristics**

Temperature range for specification: T = -15 °C to +85 °C  
 TX terminating impedance: Z<sub>Tx</sub> = 50 Ω  
 ANT terminating impedance: Z<sub>Ant</sub> = 50 Ω || 9.1 nH  
 RX terminating impedance: Z<sub>Rx</sub> = 100 Ω (balanced) || 56 nH

Characteristics Tx-Antenna				min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>c</sub>				847.0		MHz
<b>Maximum insertion attenuation</b>	α						
832.0 ... 862.0	MHz			-	2.2	3.0	dB
832.0 ... 862.0	MHz			-	2.2	2.7 <sup>1)</sup>	dB
<b>Amplitude ripple (p-p)</b>	Δα						
832.0 ... 862.0	MHz			-	1.2	2.0	dB
<b>Input VSWR (Tx port)</b>							
832.0 ... 862.0	MHz			-	1.8	2.1	
<b>Output VSWR (Ant Port)</b>							
832.0 ... 862.0	MHz			-	1.7	2.1	
<b>Linearity<sup>2)</sup></b>							
<b>Blocker -15dBm at Ant-port</b>							
	IMD2 (f <sub>Tx</sub> -f <sub>Rx</sub> )			-105 <sup>3)</sup>	-113	-	
	IMD2 (f <sub>Tx</sub> +f <sub>Rx</sub> )			-100 <sup>3)</sup>	-112	-	
	IMD3 (2f <sub>Tx</sub> -f <sub>Rx</sub> )			-95 <sup>3)</sup>	-108	-	
	IMD3 (2f <sub>Tx</sub> +f <sub>Rx</sub> )			-100 <sup>3)</sup>	-113	-	
<b>Absolute attenuation</b>	α						
10.0 ... 771.0	MHz			30	38	-	dB
771.0 ... 791.0	MHz			35	42	-	dB
791.0 ... 821.0	MHz			44	49	-	dB
873.0 ... 903.0	MHz			13	35	-	dB
925.0 ... 960.0	MHz			30	40	-	dB
1565.0 ... 1606.0	MHz			40	45	-	dB
1664.0 ... 2170.0	MHz			40	47	-	dB
2400.0 ... 2620.0	MHz			35	38	-	dB
2620.0 ... 2690.0	MHz			30	47	-	dB
3328.0 ... 3448.0	MHz			20	43	-	dB
4000.0 ... 6000.0	MHz			18	24	-	dB

1) in (+25,+55 °C) temperature range  
 2) Power level +21.5 dBm at Tx port  
 3) Guaranteed by design (no 100% testing in production)



<b>SAW Components</b>	<b>B8091</b>
<b>SAW Duplexer</b>	<b>847.0 / 806.0 MHz</b>

Datasheet



**Characteristics**

Temperature range for specification:  $T = -15\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$   
 TX terminating impedance:  $Z_{Tx} = 50\ \Omega$   
 ANT terminating impedance:  $Z_{Ant} = 50\ \Omega \parallel 9.1\ \text{nH}$   
 RX terminating impedance:  $Z_{Rx} = 100\ \Omega$  (balanced)  $\parallel 56\ \text{nH}$

Characteristics Antenna-Rx	min.	typ. @ 25 °C	max.	
<b>Center frequency</b> $f_c$		806.0		MHz
<b>Maximum insertion attenuation</b> $\alpha$				
791.0 ... 821.0 MHz	-	2.6	3.5	dB
791.0 ... 821.0 MHz	-	2.6	3.0 <sup>1)</sup>	dB
<b>Amplitude ripple (p-p)</b> $\Delta\alpha$				
791.0 ... 821.0 MHz	-	1.5	2.4	dB
<b>Input VSWR (Ant port)</b>				
791.0 ... 821.0 MHz	-	1.7	2.0	
<b>Output VSWR (Rx Port)</b>				
791.0 ... 821.0 MHz	-	2.1	2.5	
<b>Common mode rejection ratio</b>				
791.0 ... 821.0 MHz	25	29	-	dB
<b>Absolute attenuation</b> $\alpha$				
10.0 ... 760.0 MHz	45	53	-	dB
760.0 ... 782.0 MHz	23	50	-	dB
832.0 ... 833.5 MHz	30	55	-	dB
833.5 ... 862.0 MHz	50	56	-	dB
873.0 ... 903.0 MHz	40	55	-	dB
1623.0 ... 1683.0 MHz	40	65	-	dB
2400.0 ... 2545.0 MHz	40	58	-	dB
2545.0 ... 4000.0 MHz	35	50	-	dB
4000.0 ... 6000.0 MHz	30	36	-	dB
<b>Absolute mean attenuation</b> $\alpha_{\text{mean}}$				
782.0 ... 790.0 MHz	4	10	-	dB
782.0 ... 790.0 MHz	7 <sup>2)</sup>	10	-	dB

<sup>1)</sup> In (+25,+55 °C) temperature range  
<sup>2)</sup> At +25 °C



<b>SAW Components</b>	<b>B8091</b>
<b>SAW Duplexer</b>	<b>847.0 / 806.0 MHz</b>

Datasheet



**Characteristics**

Temperature range for specification: T = -15 °C to +85 °C  
 TX terminating impedance: Z<sub>Tx</sub> = 50 Ω  
 ANT terminating impedance: Z<sub>Ant</sub> = 50 Ω || 9.1 nH  
 RX terminating impedance: Z<sub>Rx</sub> = 100 Ω (balanced) || 56 nH

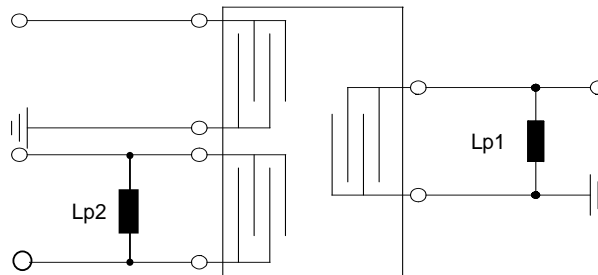
Characteristics Tx-Rx	min.	typ. @ 25 °C	max.	
<b>Differential mode isolation</b> α				
791.0 ... 820.5 MHz	48	51	-	dB
820.5 ... 821.0 MHz	43	60	-	dB
832.0 ... 834.0 MHz	36	54	-	dB
834.0 ... 862.0 MHz	54	57	-	dB
1574.0 ... 1577.0 MHz	40	70	-	dB
1664.0 ... 1724.0 MHz	20	68	-	dB
2496.0 ... 2586.0 MHz	20	65	-	dB
<b>Common mode isolation</b> α				
832.0 ... 862.0 MHz	60	66	-	dB

**Maximum Ratings**

Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	100 <sup>1)</sup>	V	MM Model
ESD voltage	V <sub>ESD</sub>	250 <sup>2)</sup>	V	HB Model
ESD voltage	V <sub>ESD</sub>	500 <sup>3)</sup>	V	CD Model
Input power at Tx Port				
832.0 ...862.0 MHz	P <sub>in</sub>	27.5	dBm	} LTE uplink 5MHz 55 °C, 50000h
elsewhere	P <sub>in</sub>	10	dBm	

- 1) Acc. to FESD22-A115B (MM - Machine Model), 10 negative & 10 positive pulses.
- 2) Acc. to JESD22-A114F (HBM - Human Body Level), 1 negative & 1 positive pulses.
- 3) Acc. to JESD22-C101C (CDM - Fiel Inducted Charged Device Model), 3 negative & 3 positive pulses.

**Matching network (element values depend on PCB layout)**

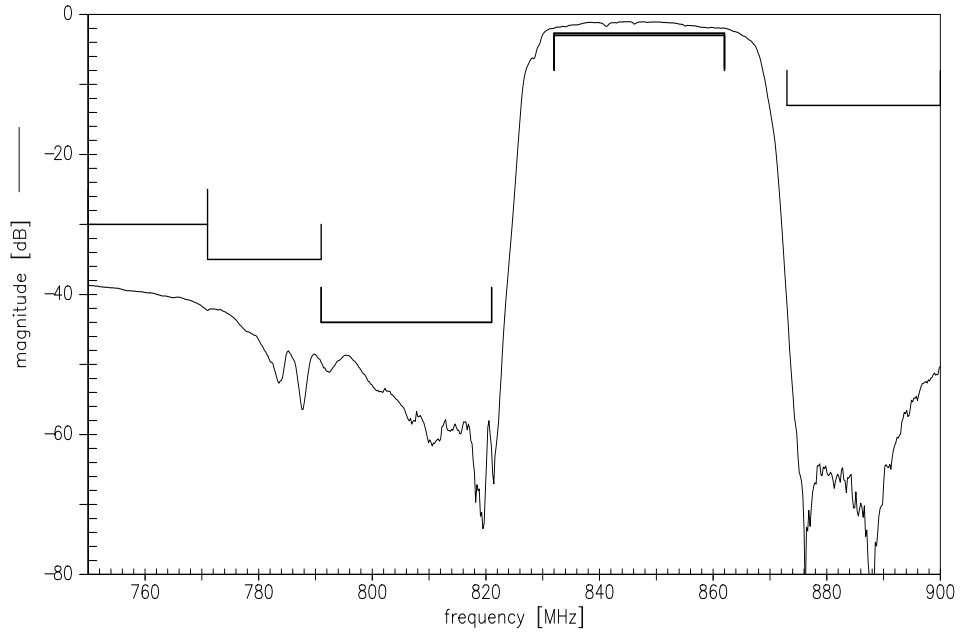


Lp1=9.1nH, Lp2 =56nH

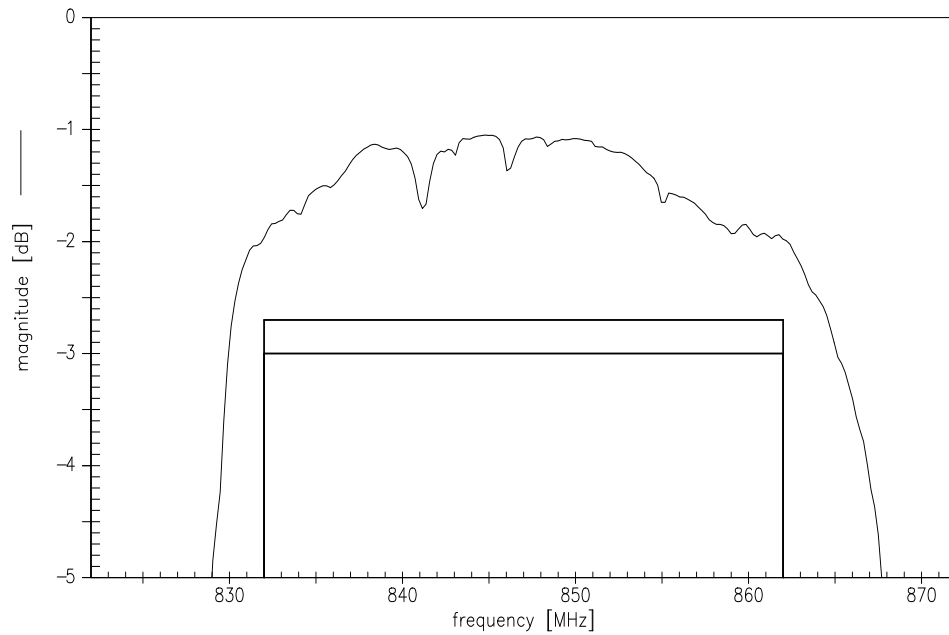
Please read *cautions and warnings and important notes* at the end of this document.



Frequency Response TX-ANT

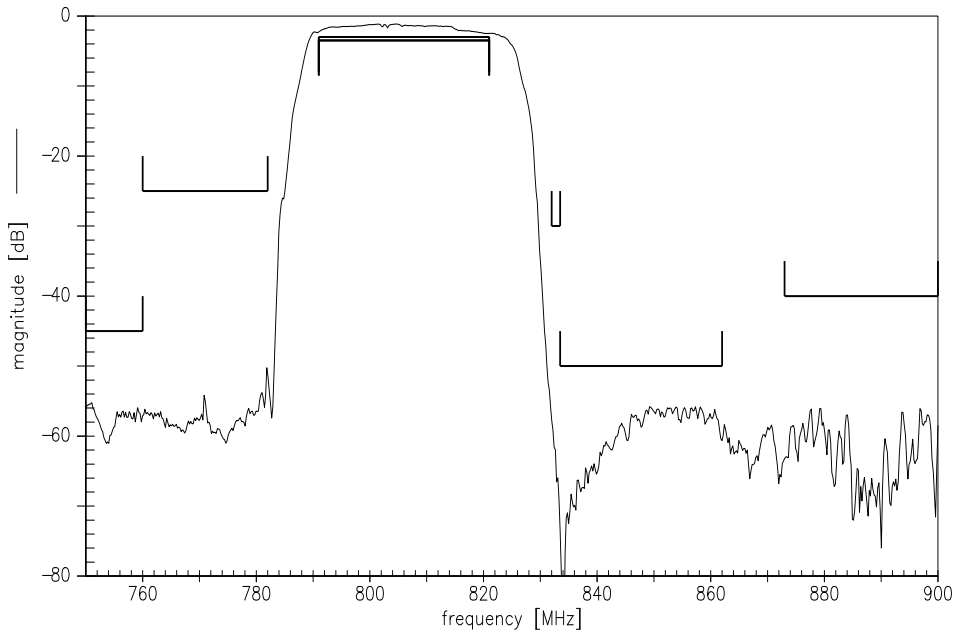


Frequency Response TX-ANT

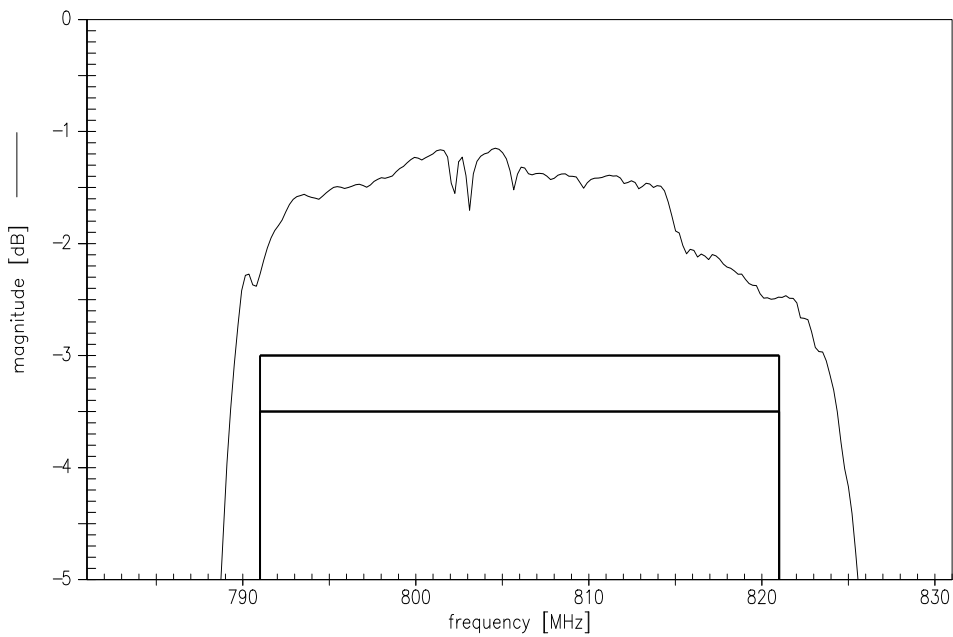




Frequency Response RX-ANT



Frequency Response RX-ANT





SAW Components

B8091

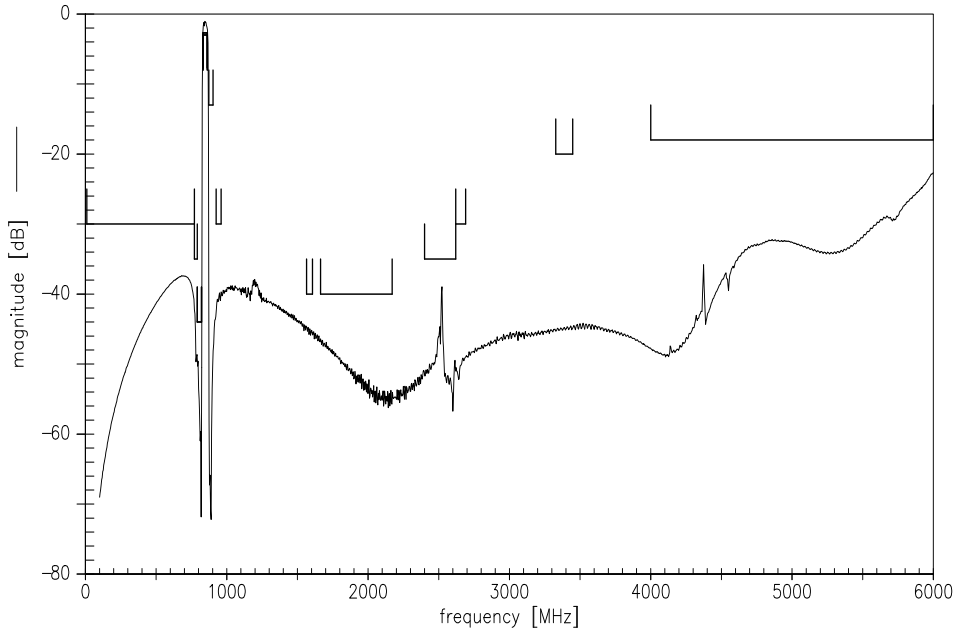
SAW Duplexer

847.0 / 806.0 MHz

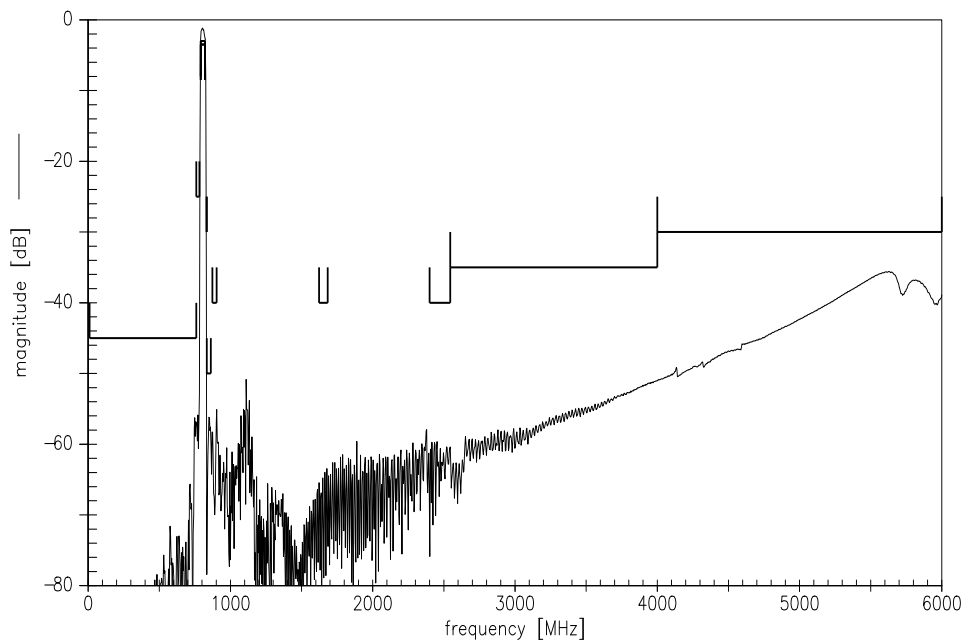
Datasheet



### Frequency Response ANT-TX



### Frequency Response ANT-RX

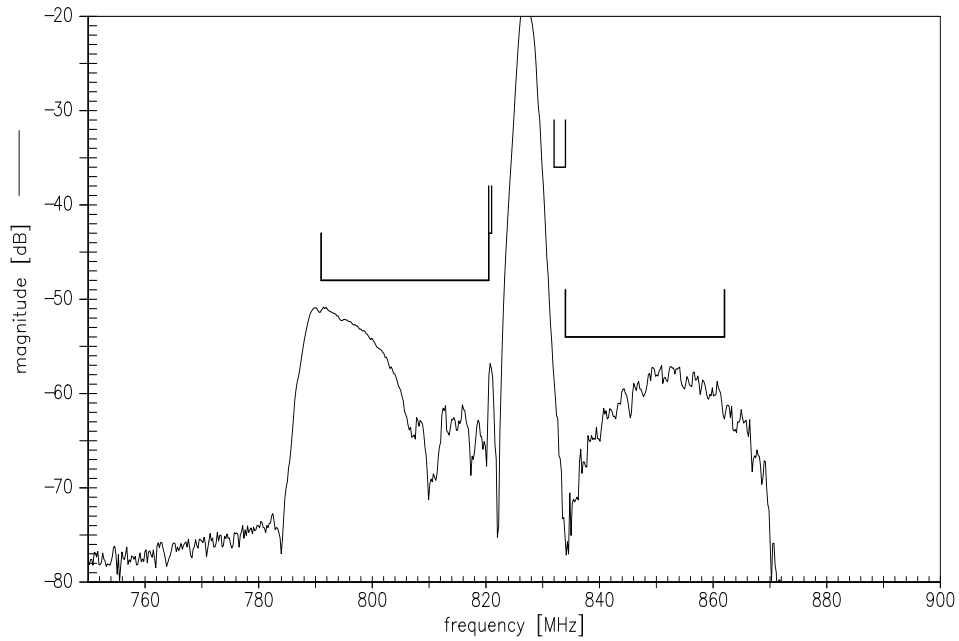


Please read *cautions and warnings* and *important notes* at the end of this document.

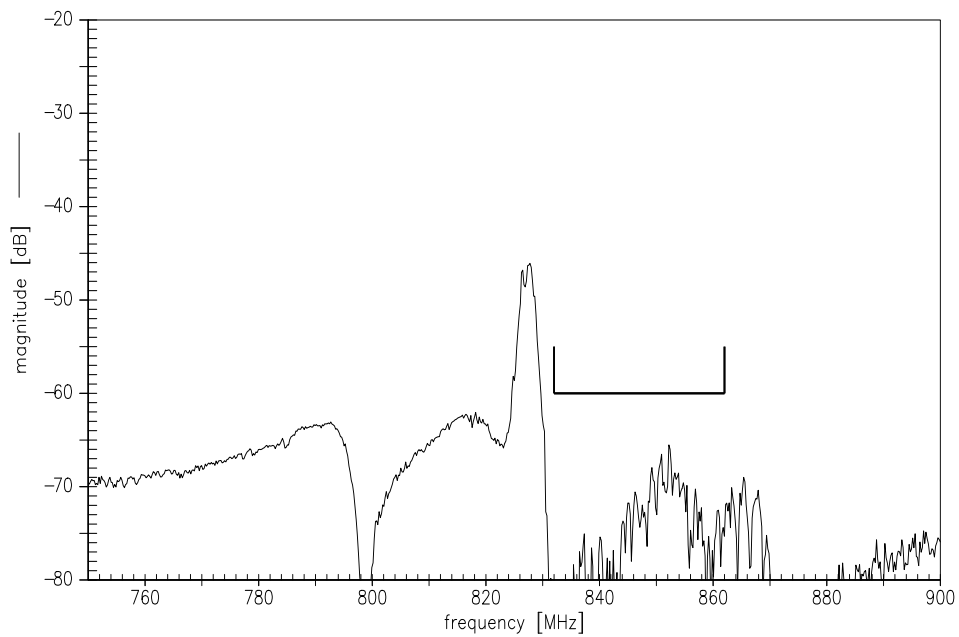




Frequency Response TX-RX (ISOLATION)

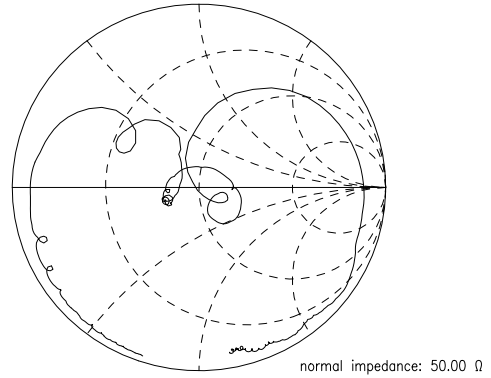
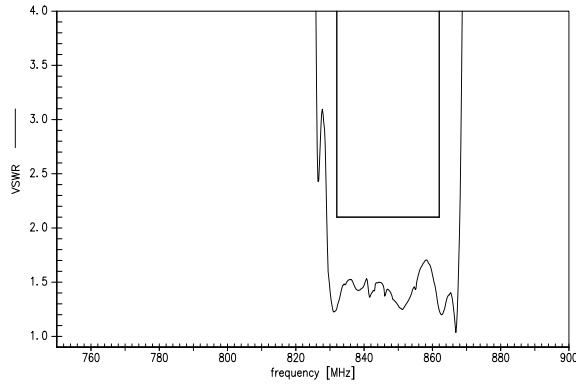


Frequency Response Common Mode Isolation

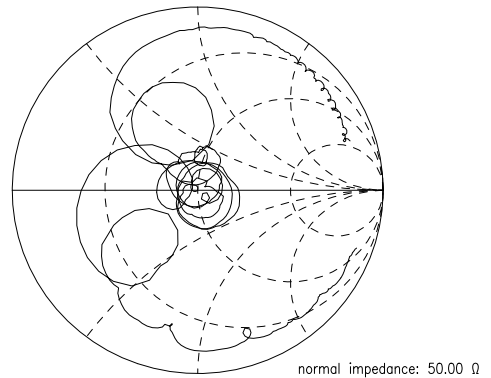
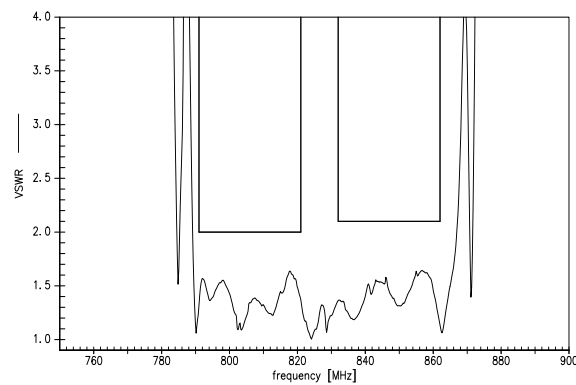




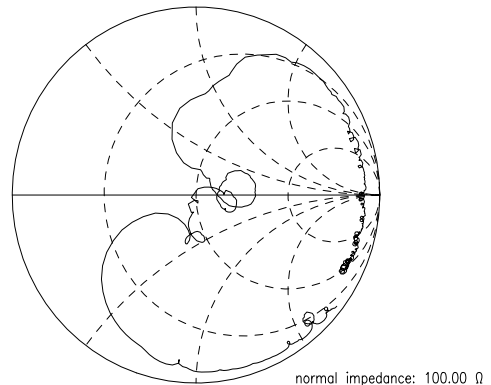
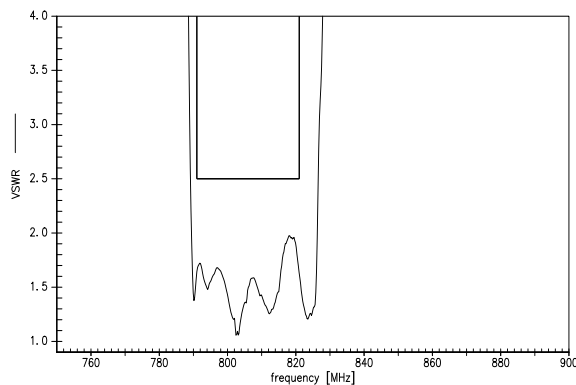
**S11 VSWR (TX)**



**S22 VSWR (ANT)**



**S33 VSWR (RX)**





<b>SAW Components</b>	<b>B8091</b>
<b>SAW Duplexer</b>	<b>847.0 / 806.0 MHz</b>

Datasheet



References

<b>Type</b>	B8091
<b>Ordering code</b>	B39851B8091P810
<b>Marking and package</b>	C61157-A8-A37
<b>Packaging</b>	F61074-V8247-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B8091_NB_UN.s4p, B8091_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.
<b>Moldability</b>	Before using in overmolding environment, please contact your EPCOS sales office.
<b>Matching coils</b>	See Inductor pdf-catalog <a href="http://www.tdk.co.jp/tefe02/coil.htm#aname1">http://www.tdk.co.jp/tefe02/coil.htm#aname1</a> and Data Library for circuit simulation <a href="http://www.tdk.co.jp/etvcl/index.htm">http://www.tdk.co.jp/etvcl/index.htm</a>

For further information please contact your local EPCOS sales office or visit our webpage at [www.epcos.com](http://www.epcos.com).

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

© EPCOS AG 2012. 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.

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



## 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](http://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](http://www.epcos.com/trademarks).