SAW Components

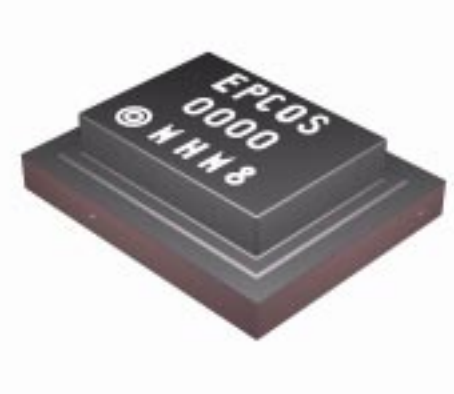
SAW Duplexer

LTE Band 13

Series/type:	**B7928**
Ordering code:	**B39781B7928P810**
Date:	December 28, 2011
Version:	2.0

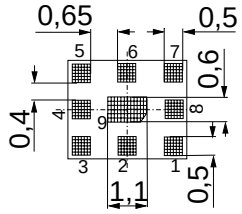
Application

- Low-loss SAW duplexer for mobile telephone W-CDMA Band 13 system
- Low insertion attenuation
- Low amplitude ripple
- Single ended to balanced transformation in Antenna - Rx path
- Impedance transformation 50Ω to 100Ω in Antenna - Rx path

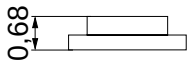


Features

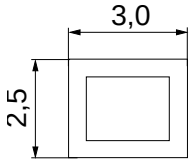
- Package size 3.0 x 2.5 x 0.68 mm³
- RoHS compatible
- Approx. weight 0.020 g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)



bottom view



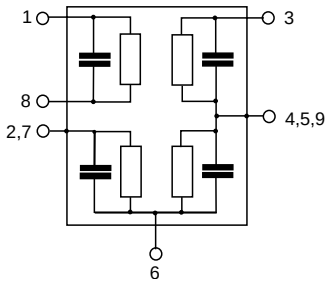
side view



top view

Pin configuration

■	3	Tx Input
■	1, 8	Rx Output (balanced)
■	6	Antenna
■	2, 4, 5, 7, 9	To be grounded



Data sheet SMD

Characteristics

Temperature range for specification: T = –30 ˚C to +85 ˚C
Antenna terminating impedance: Z_{Ant} = 50 Ω || 15nH (ideal)
Rx terminating impedance: Z_{Rx} = 100 Ω (balanced)
Tx terminating impedance: Z_{Tx} = 50 Ω

Characteristics Tx-Antenna				min.	typ. @ 25 ˚C	max.	
Center frequency		f_c		—	782.0	—	MHz
Maximum insertion attenuation		α					
777.0 ... 787.0	MHz			—	1.5	2.3	dB
Amplitude ripple (p-p)		Δα					
777.0 ... 787.0	MHz			—	0.5	1.3	dB
TX port VSWR							
777.0 ... 787.0	MHz			—	1.4	2.0	
Antenna port VSWR							
777.0 ... 787.0	MHz			—	1.6	2.0	
Attenuation		α					
10.0 ... 716.0	MHz			30	40	—	dB
716.0 ... 728.0	MHz			40	45	—	dB
728.0 ... 746.0	MHz			30	48	—	dB
746.0 ... 756.0	MHz			45	56	—	dB
758.0 ... 766.0	MHz			30	34	—	dB
766.0 ... 768.0	MHz			23	29	—	dB
768.0 ... 769.0	MHz			12	28	—	dB
769.0 ... 770.0	MHz			6	31	—	dB
770.0 ... 771.0	MHz			3	20	—	dB
771.0 ... 772.0	MHz			2.5	9	—	dB
800.0 ... 808.0	MHz			15	34	—	dB
808.0 ... 869.0	MHz			30	39	—	dB
869.0 ... 894.0	MHz			30	43	—	dB
1554.0 ... 1565.0	MHz			30	52	—	dB
1565.0 ... 1607.0	MHz			45	53	—	dB
1805.0 ... 2170.0	MHz			30	53	—	dB
2331.0 ... 2361.0	MHz			30	48	—	dB
2400.0 ... 2484.0	MHz			35	47	—	dB
3108.0 ... 3148.0	MHz			25	28	—	dB

Characteristics

Temperature range for specification: T = –30 ˚C to +85 ˚C
Antenna terminating impedance: Z_{Ant} = 50 Ω || 15nH (ideal)
Rx terminating impedance: Z_{Rx} = 100 Ω (balanced)
Tx terminating impedance: Z_{Tx} = 50 Ω

Characteristics Antenna-Rx		min.	typ. @ 25 ˚C	max.	
Center frequency	f_c	—	751.0	—	MHz
Maximum insertion attenuation	α				
746.0 ... 756.0 MHz		—	2.0	2.5	dB
Amplitude ripple (p-p)	α				
746.0 ... 756.0 MHz		—	1.0	1.3	dB
Antenna port VSWR					
746.0 ... 756.0 MHz		—	1.8	2.2	
Rx port VSWR					
746.0 ... 756.0 MHz		—	1.8	2.2	
CMRR ($\lvert S_{32}-S_{42}\rvert/\lvert S_{32}+S_{42}\rvert$)					
746.0 ... 756.0 MHz		22	25	—	dB
Attenuation	α				
10.0 ... 650.0 MHz		50	69	—	dB
650.0 ... 730.0 MHz		35	39	—	dB
730.0 ... 736.0 MHz		26	35	—	dB
769.0 ... 775.0 MHz		15	30	—	dB
777.0 ... 787.0 MHz		50	56	—	dB
793.0 ... 805.0 MHz		45	56	—	dB
805.0 ... 2000.0 MHz		45	54	—	dB
2000.0 ... 3500.0 MHz		40	50	—	dB
3500.0 ... 6000.0 MHz		23	35	—	dB

Characteristics

Temperature range for specification: T = –30 ˚C to +85 ˚C
Antenna terminating impedance: Z_{Ant} = 50 Ω || 15nH (ideal)
Rx terminating impedance: Z_{Rx} = 100 Ω (balanced)
Tx terminating impedance: Z_{Tx} = 50 Ω

Characteristics Tx-Rx					min.	typ. @ 25 ˚C	max.	
Differential mode isolation				α				
746.5	...	749.0	MHz		50	59	—	dB
749.0	...	755.5	MHz		53	61	—	dB
777.0	...	781.0	MHz		54	60	—	dB
781.0	...	787.0	MHz		55	59	—	dB
1552.0	...	1574.0	MHz		30	67	—	dB
2328.0	...	2361.0	MHz		30	62	—	dB
3104.0	...	3148.0	MHz		30	57	—	dB
Common mode isolation				α				
777.0	...	781.0	MHz		54	61	—	dB
781.0	...	787.0	MHz		57	62	—	dB

Characteristics

Temperature range for specification: T = –30 ˚C to +85 ˚C
Antenna terminating impedance: Z_{Ant} = 50 Ω
Rx terminating impedance: Z_{Rx} = 100 Ω (balanced)
Tx terminating impedance: Z_{Tx} = 50 Ω

Intermodulation Characteristics SV-LTE coexistance CDMA Cell - LTE Band 13[1)]	**min.**	**typ. @ 25 ˚C**	**max.**	
Case 1 - IM3 in CDMA Cell Rx band[2)] f_{TX13} = 779.0 ... 787.0 MHz P_{TX13}[3)] = 19.5 dBm f_{jam} = 824.0 ... 832.0 MHz P_{jam} = 14 dBm f_{RX5} = 869.0 ... 877.0 MHz				
P_{RX5}	—	-113	—	dBm
Case 2 - IM3 in B13 Rx band[2)] f_{TX13} = 786.0 ... 787.0 MHz P_{TX13}[3)] = 19.5 dBm f_{jam} = 824.0 ... 825.0 MHz P_{jam} = 14 dBm f_{RX13} = 747.0 ... 750.0 MHz				
P_{RX13}	—	-102	—	dBm

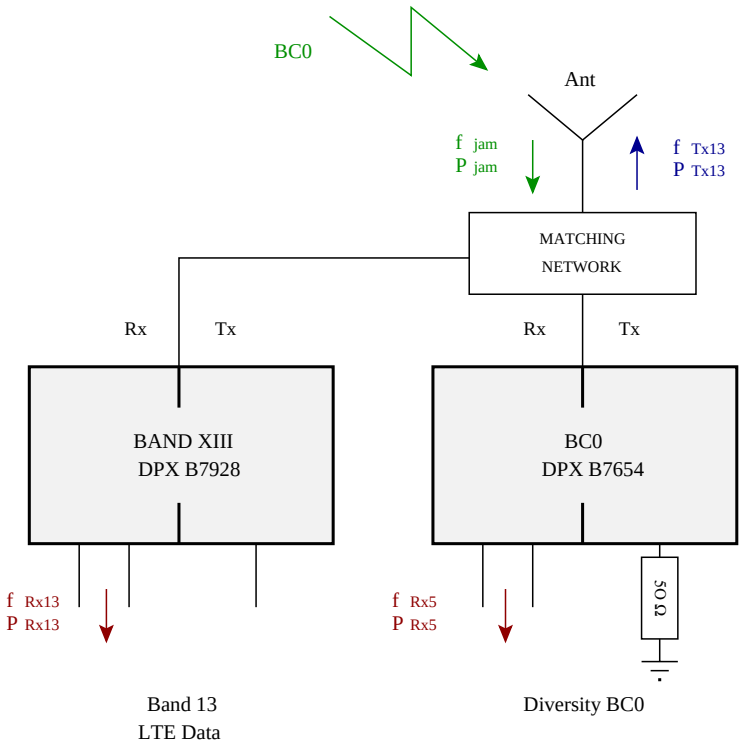
1) In combination with TDK-EPC BC0 duplexer B7654
2) See picture 1 on page 7.
3) Power level at Ant of picture 1 on page 7.

Maximum ratings

Temperature range for specification[1)]	T	–30/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	100[2)]	V	machine model, 1 pulse
Input power at	P_{IN}			source and load impedance 50 Ω
777.0 ... 787.0 MHz		28	dBm	} continuous wave
elsewhere		10	dBm	*T* = 55˚C, 5000 h

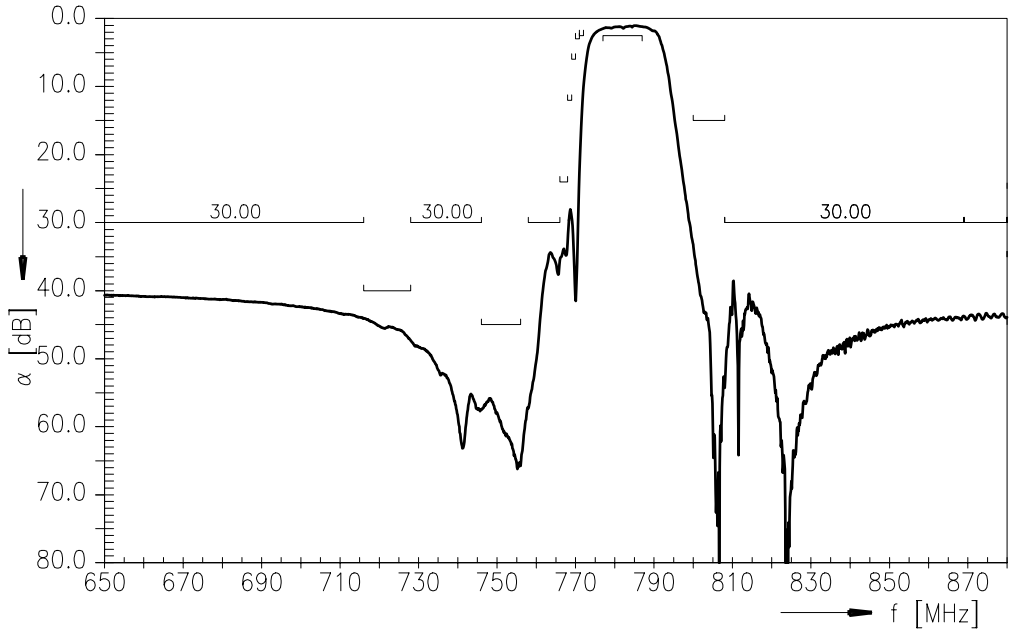
1) Defines the temperature range for specification values.

2) acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.

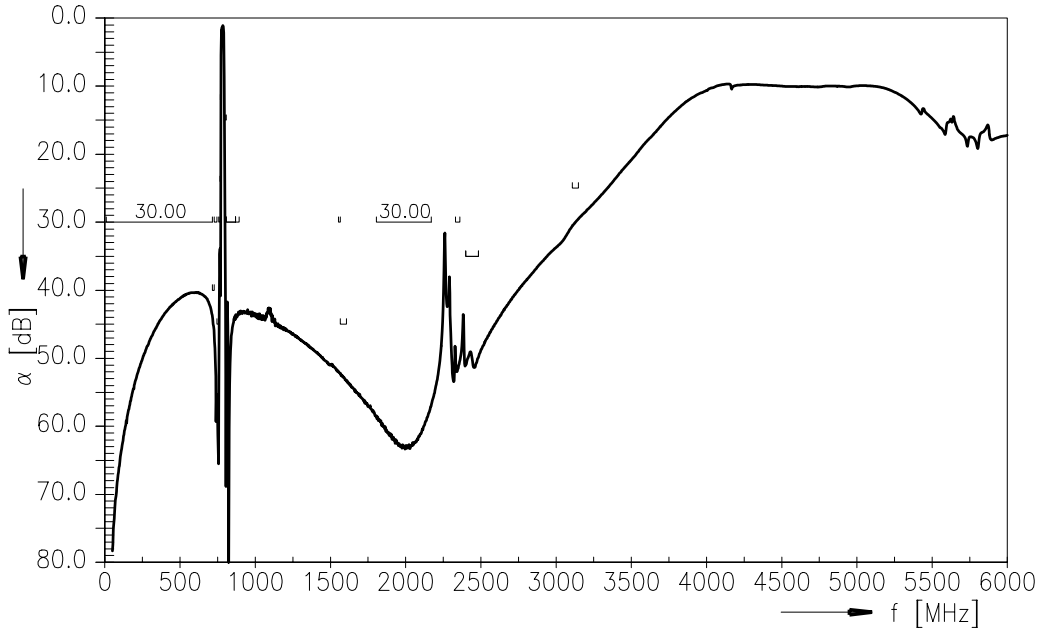


Picture 1: Signal definition for SV-LTE coexistence intermodulation specification using TDK-EPC LTE Band 13 duplexer B7928 in combination with BC0 duplexer B7654.

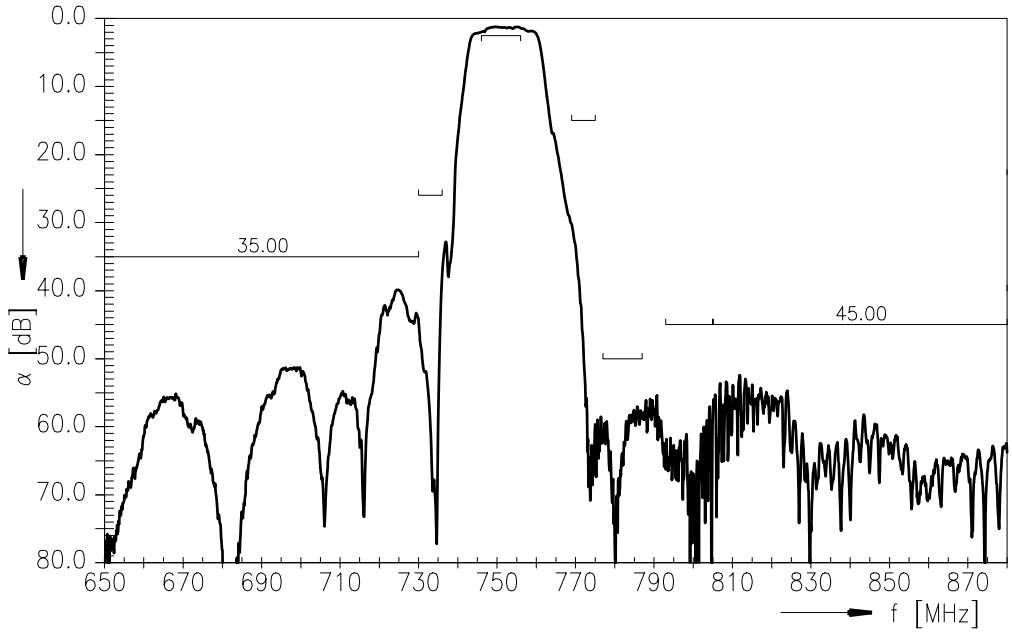
Frequency response Tx-Antenna



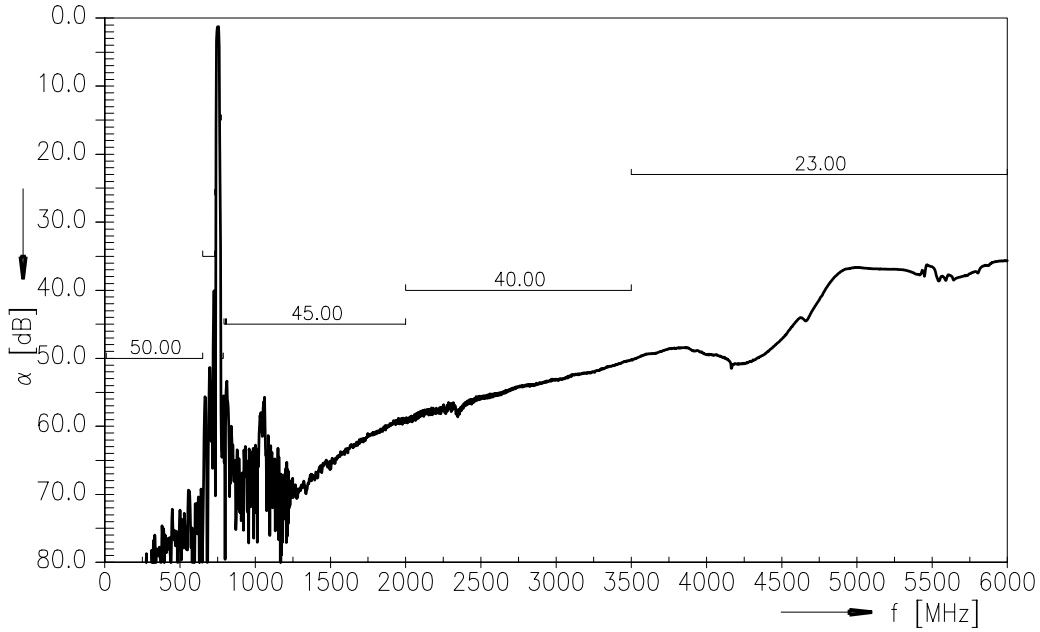
Frequency response Tx-Antenna (wideband)



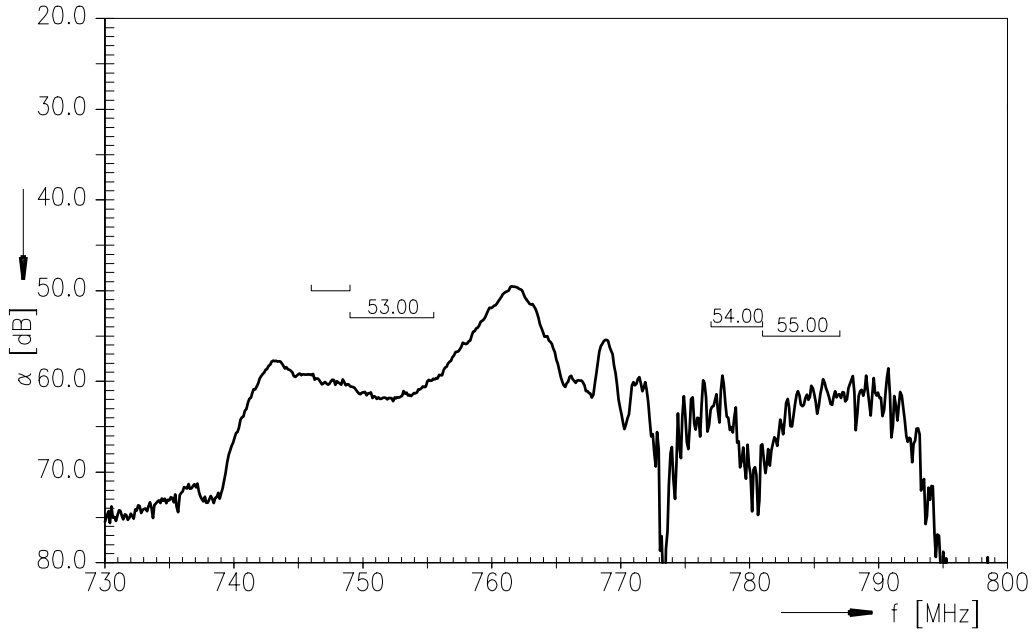
Frequency response Antenna-Rx



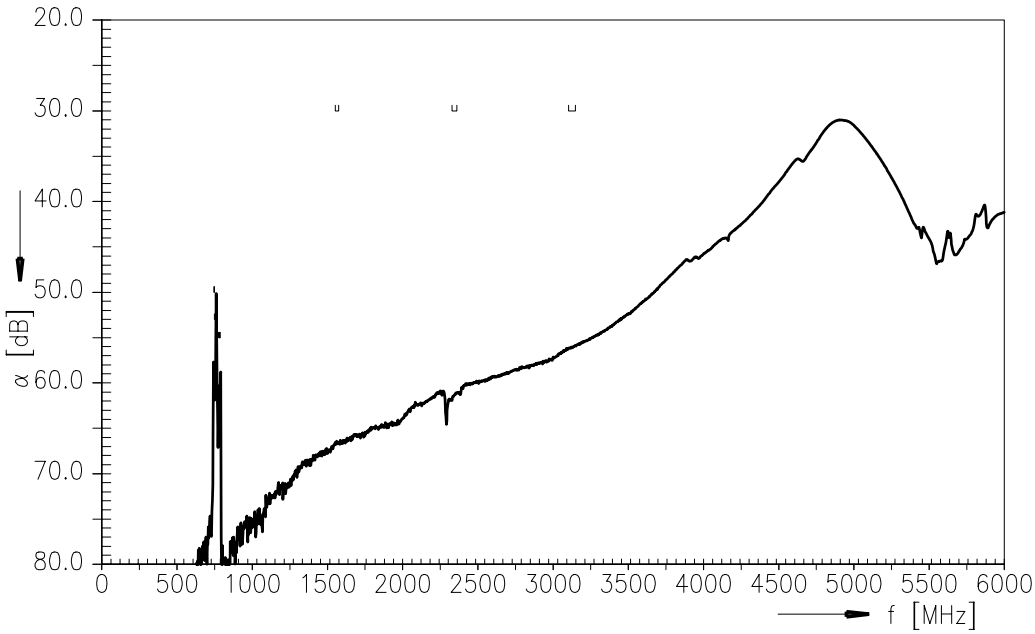
Frequency response Antenna-Rx (wideband)



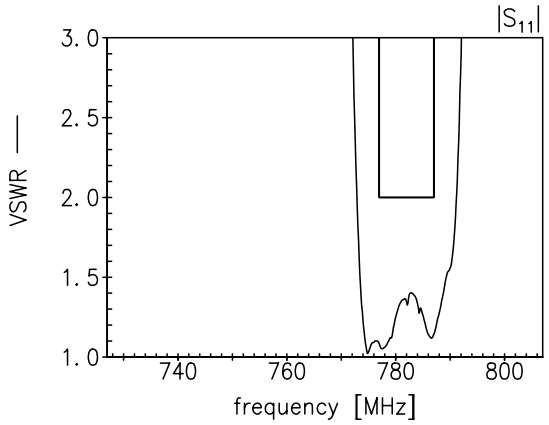
Frequency response Tx-Rx (Differential mode)

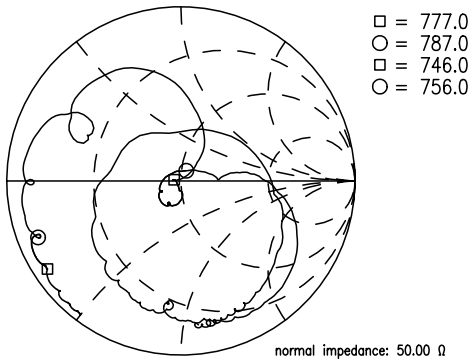


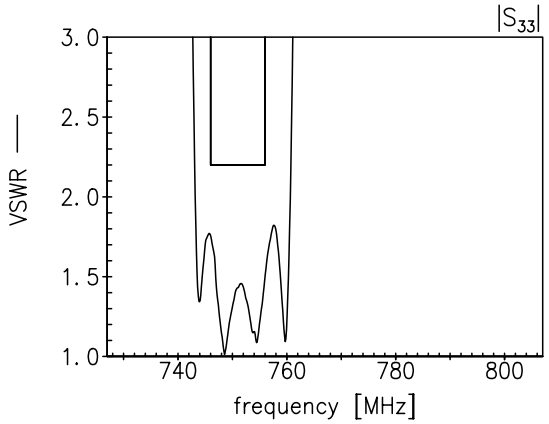
Frequency response Tx-Rx (Differential mode, wideband)

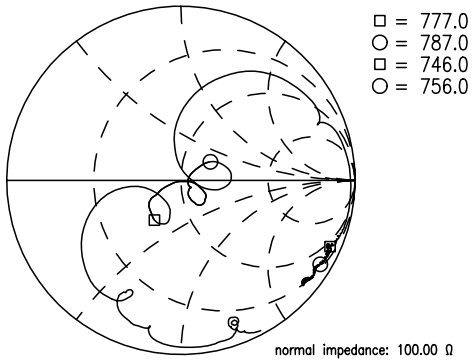


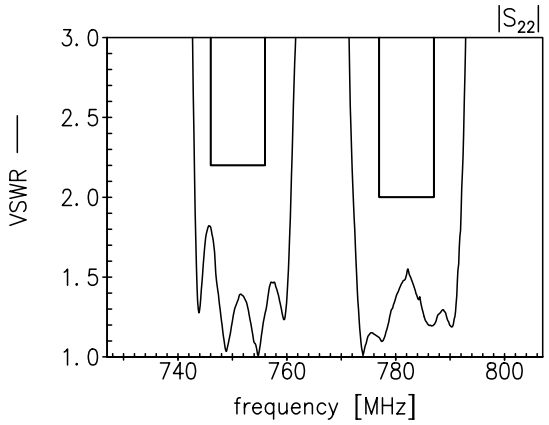
Return loss **S_{11} Tx-port** **S_{22} Antenna-port** **S_{33} Rx-port**

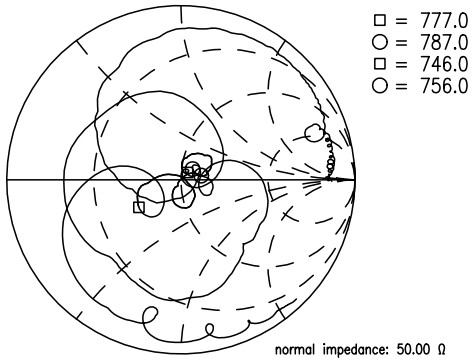












References

Type	B7928
Ordering code	B39781B7928P810
Marking and package	C61157-A3-A86
Packaging	F61074-V8156-Z000
Date codes	L_1126
S-parameters	B7928_NB.s4p; B7928_WB.s4p B7928_NB_UN.s4p; B7928_WB_UN.s4p
Soldering profile	S_6001
RoHS compatible	Defined as compatible with the following documents: "DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. 2005/618/EC from April 18th, 2005, amending Directive 2002/95/EC of the European Parliament and of the Council for the purposes of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment."
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 a large variety of matching coils.

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

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.

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, CSMP, CSSP, CTVS, DeltaCap, DigiSiMic, DSSP, 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.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

EPCOS:
B39781B7928P810