SAW Components

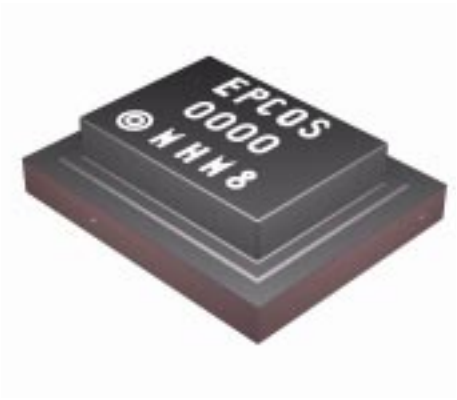
SAW Duplexer

LTE Band 13

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

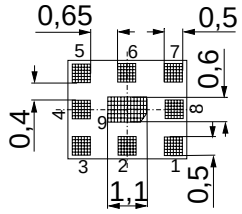
Application

- 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

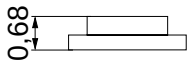


Features

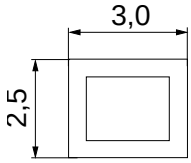
- Package size 3.0 x 2.5 x 0.68 mm³
- RoHS compatible
- Approx. weight 0.020 g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)



bottom view



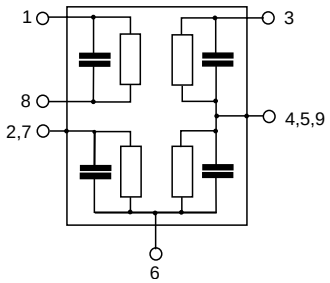
side view



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

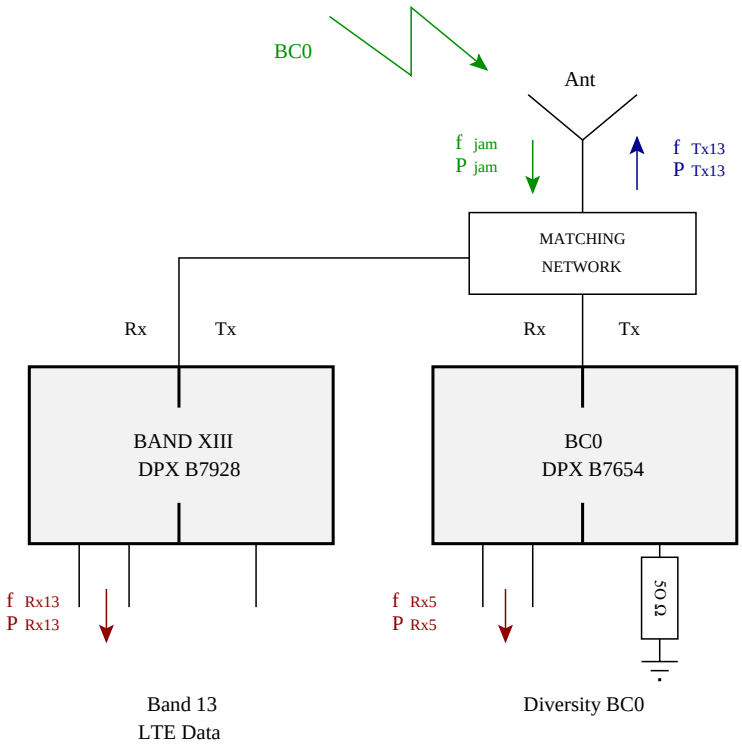
1) In combination with TDK-EPC BC0 duplexer B7654
2) See picture 1 on page 7.
3) Power level at Ant of picture 1 on page 7.

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

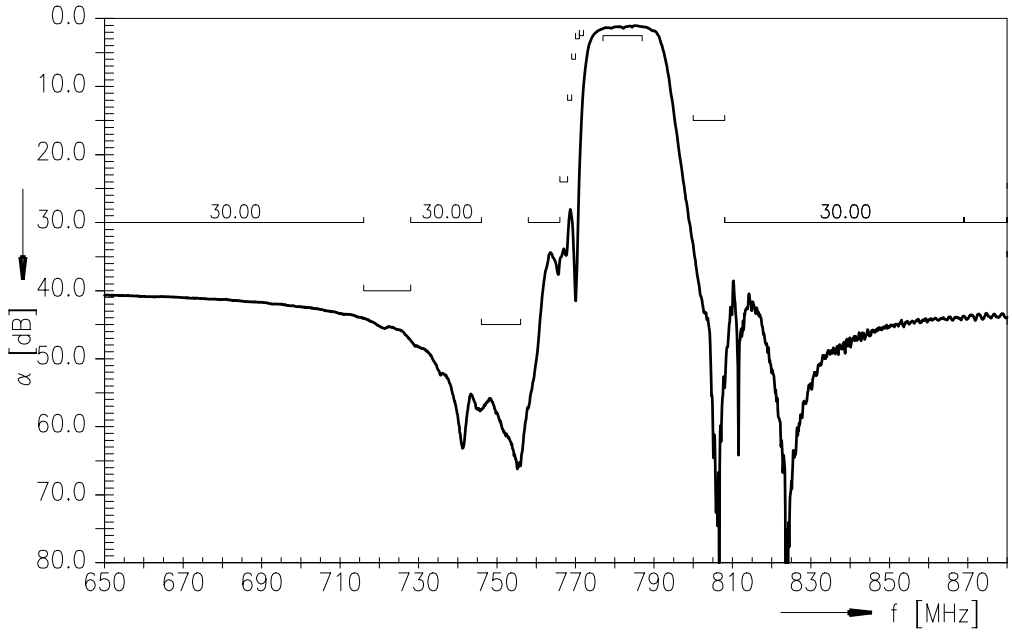
1) Defines the temperature range for specification values.

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

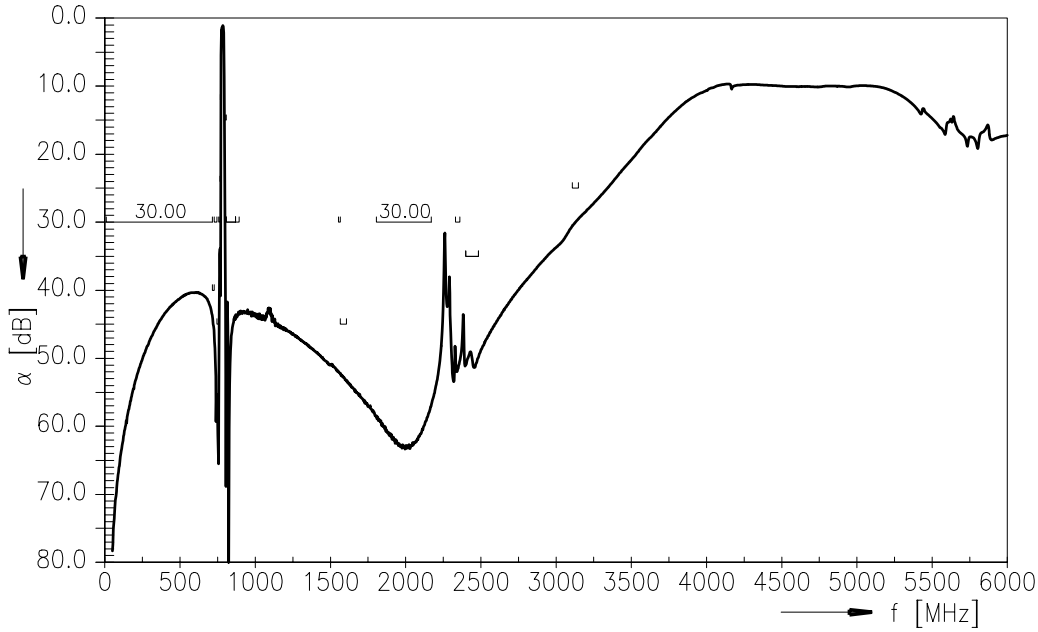


Picture 1: Signal definition for SV-LTE coexistence intermodulation specification using TDK-EPC LTE Band 13 duplexer B7928 in combination with BC0 duplexer B7654.

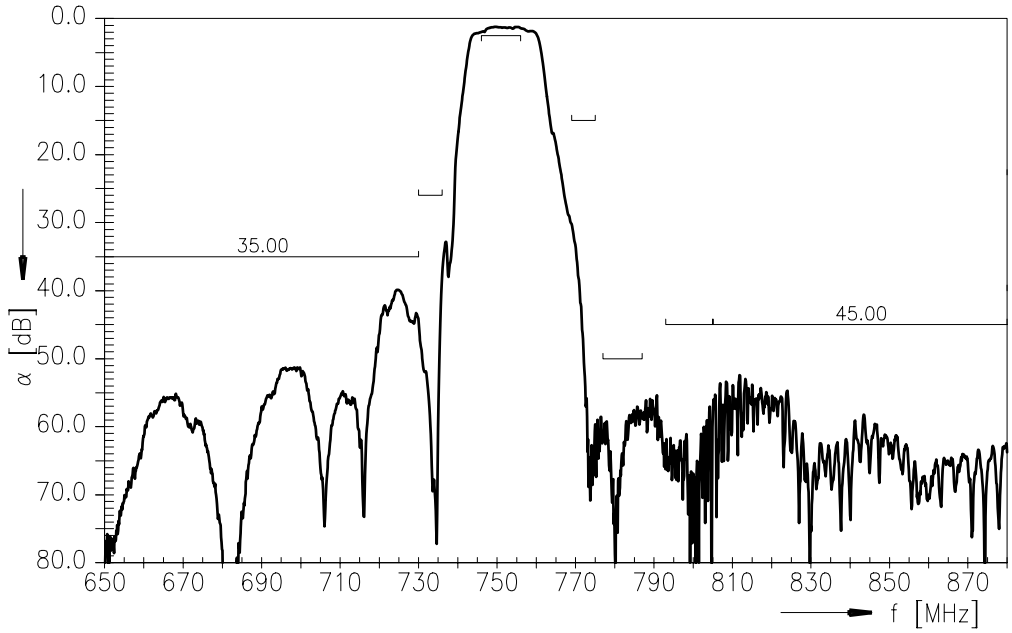
Frequency response Tx-Antenna



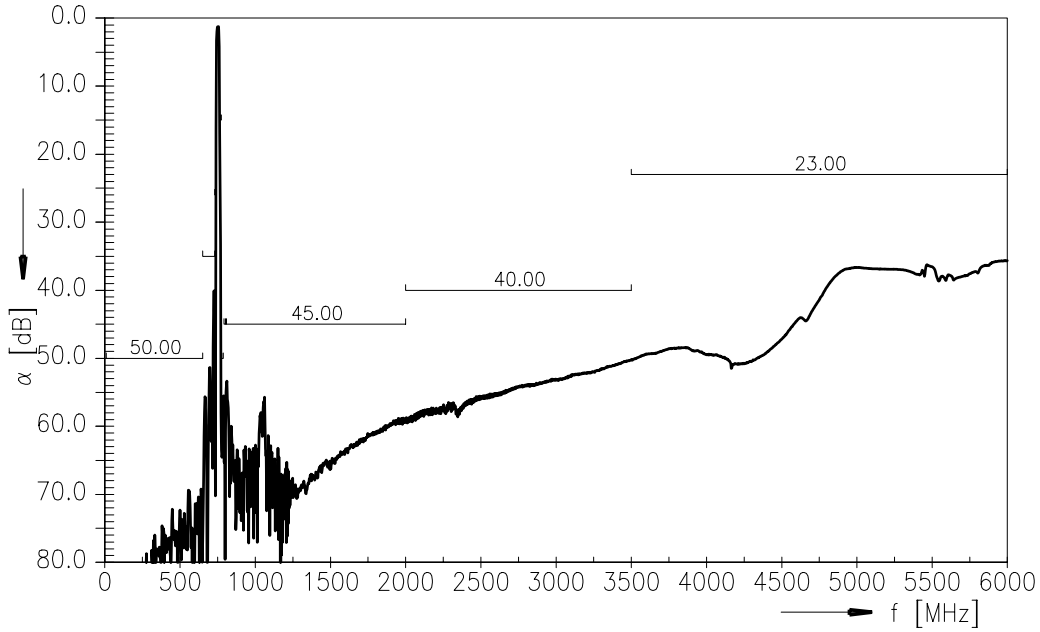
Frequency response Tx-Antenna (wideband)



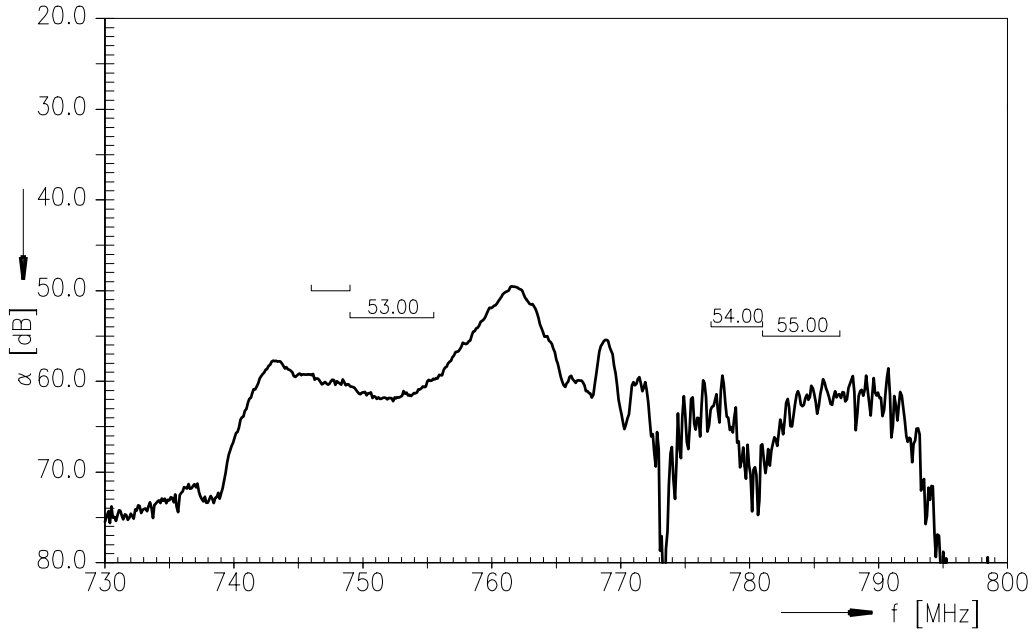
Frequency response Antenna-Rx



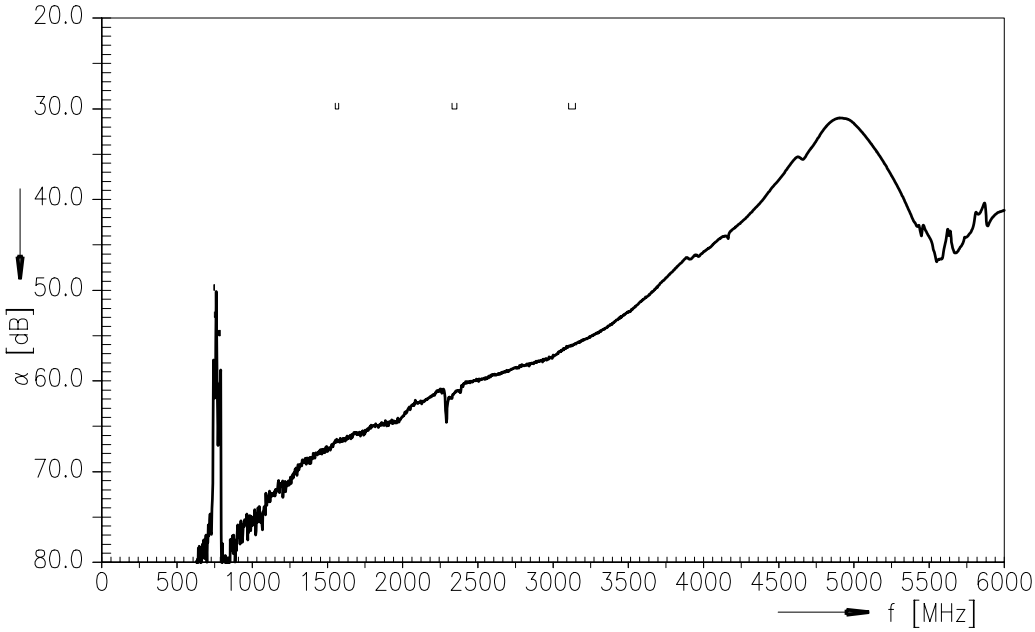
Frequency response Antenna-Rx (wideband)



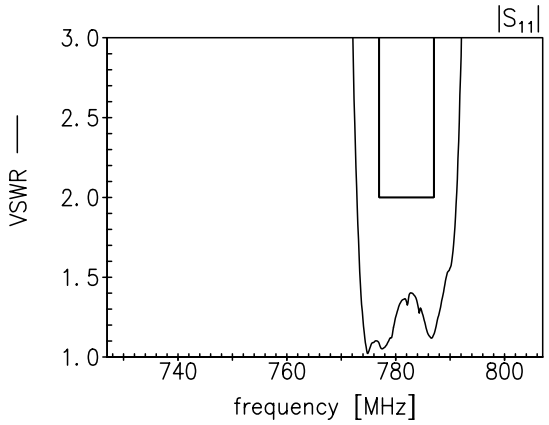
Frequency response Tx-Rx (Differential mode)

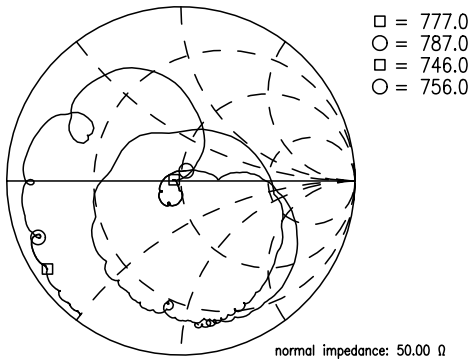


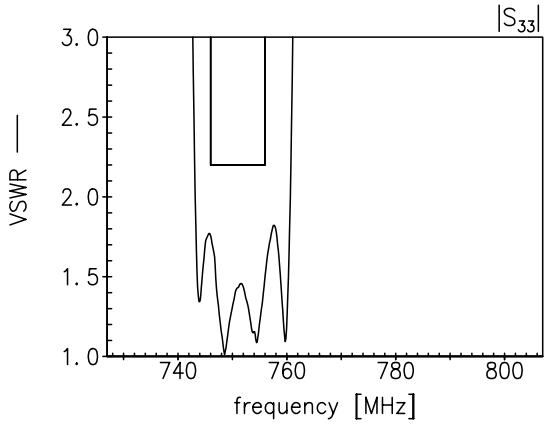
Frequency response Tx-Rx (Differential mode, wideband)

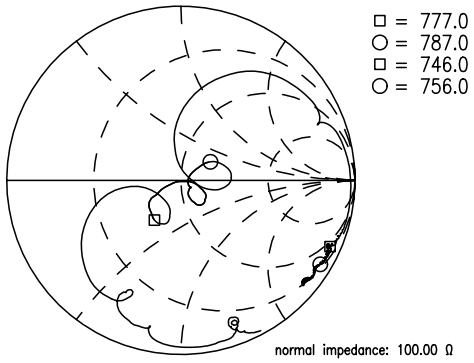


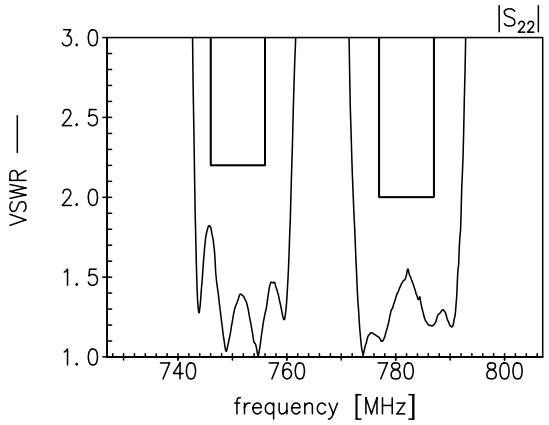
Return loss **S_{11} Tx-port** **S_{22} Antenna-port** **S_{33} Rx-port**

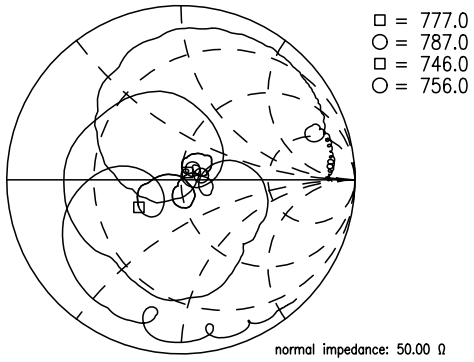












References

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.

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