

RF360 Europe GmbH

A Qualcomm – TDK Joint Venture

SAW Components

SAW filter 2in1 filter

GSM Dualband EU

Series/type:	B9521
Ordering code:	B39182B9521P810
Date:	January 05, 2012
Version:	2.0

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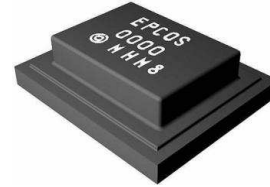
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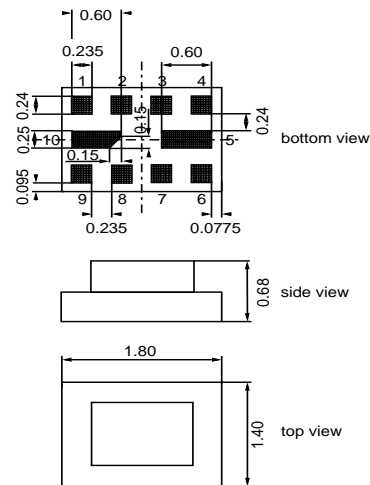
Data Sheet

Application

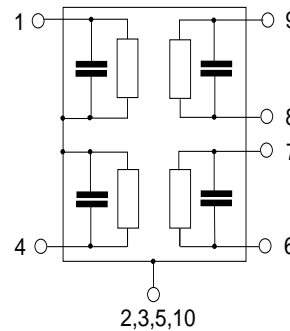
- Low-loss 2in1 RF filter for mobile telephone GSM 900 and GSM 1800 systems, receive path (Rx)
- Usable passband:
 Filter 1 (GSM 900) : 35 MHz
 Filter 2 (GSM1800) : 75 MHz
- Unbalanced to unbalanced operation for both filters
- Very low insertion attenuation
- Low amplitude ripple
- Suitable for GPRS class 1 to 12


Features

- Package size 1.8 x 1.4 x 0.68 mm³
- RoHS compatible
- Approx. weight 0.006g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- **Moisture Sensitive Level 3**


Pin configuration

- 1 Input [Filter 1]
- 4 Input [Filter 2]
- 6 Output [Filter 2]
- 9 Output [Filter 1]
- 7,8 To be ground
- 2,3,5,10 Case-ground



Data Sheet

Characteristics of Filter 1 (GSM 900)

Temperature range for specification: $T = -20$ to $+85$ °C
 Terminating source impedance: $Z_S = 50 \Omega$
 Terminating load impedance: $Z_L = 50 \Omega$

				min.	typ. @ 25 °C	max.	
Center frequency	f_C			—	942.5	—	MHz
Maximum insertion attenuation	α_{max}			—	1.6	3.0	
		925.0 ... 960.0	MHz				dB
Amplitude ripple (p-p)	$\Delta\alpha$			—	0.8	2.0	
		925.0 ... 960.0	MHz				dB
Input VSWR				—	1.7	2.2	
		925.0 ... 960.0	MHz				
Output VSWR				—	1.7	2.2	
		925.0 ... 960.0	MHz				
Attenuation	α						
		10.0 ... 480.0	MHz	45	49	—	dB
		480.0 ... 850.0	MHz	40	44	—	dB
		850.0 ... 905.0	MHz	29	33	—	dB
		905.0 ... 914.0	MHz	15	24	—	dB
		980.0 ... 1850.0	MHz	28	33	—	dB
		1850.0 ... 1920.0	MHz	40	45	—	dB
		1920.0 ... 3700.0	MHz	32	36	—	dB
		3700.0 ... 6000.0	MHz	28	31	—	dB

Maximum ratings

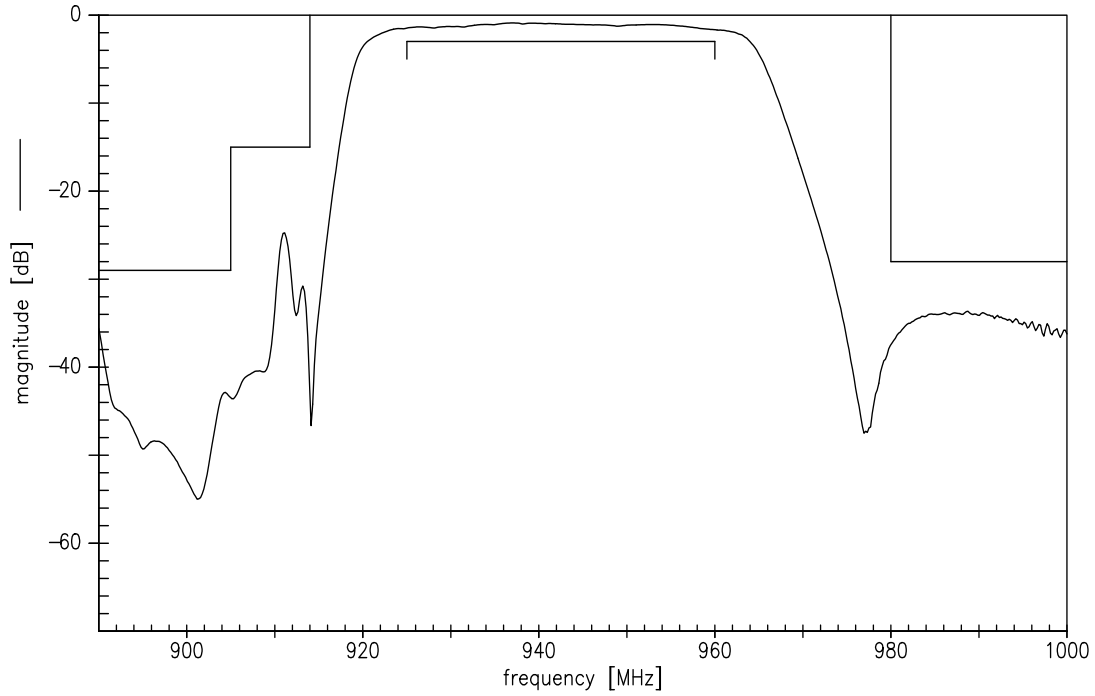
Operable temperature range	T	-40/+85	°C	
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	0	V	
ESD voltage	V _{ESD}	100 ¹⁾	V	machine model, 1 pulse
Input power at				
GSM 850, GSM 900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
GSM 1800, GSM 1900	PIN	15	dBm	
Tx bands				

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

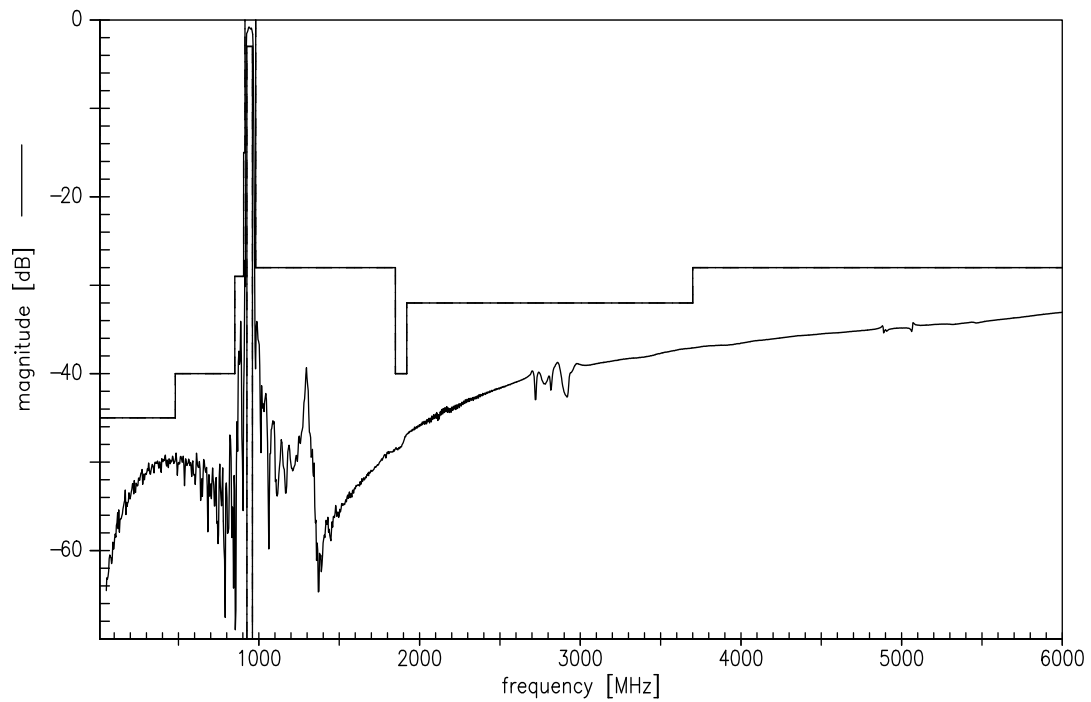
Data Sheet



Transfer function Filter 1 (GSM900)



Transfer function Filter 1 (GSM900) - Wideband

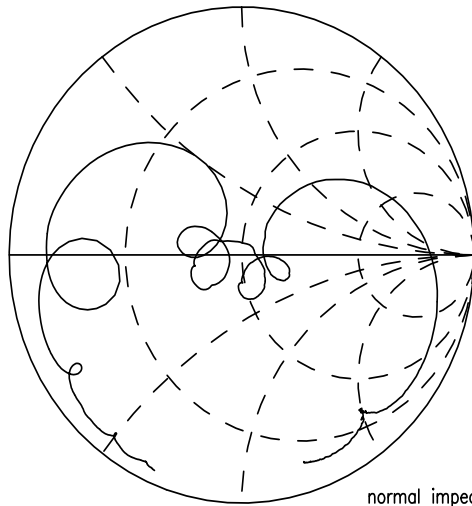


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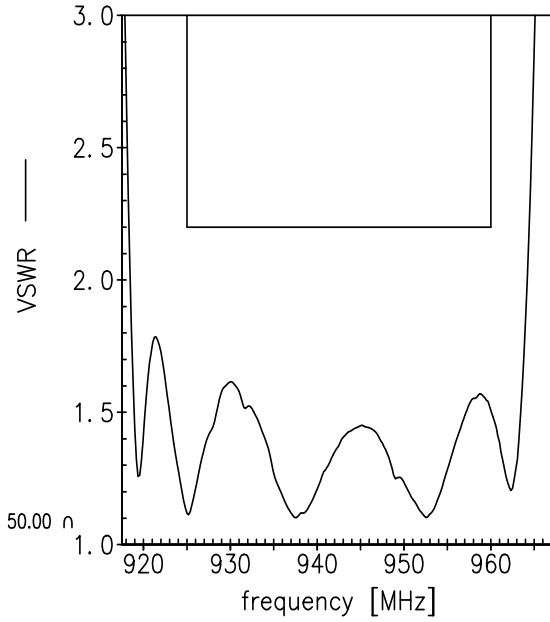


Smith charts of Filter 1

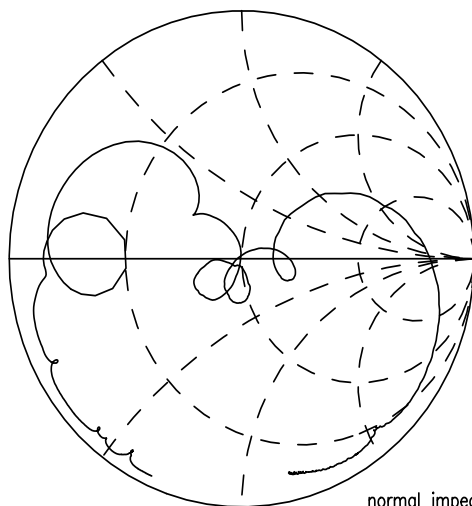
S₁₁ function



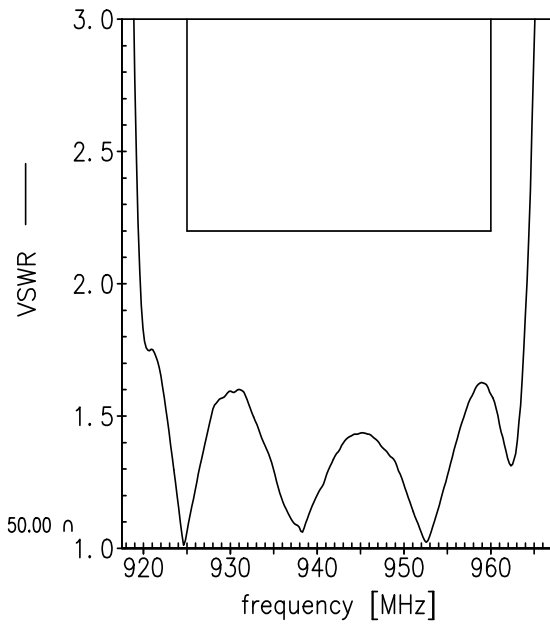
normal impedance: 50.00 Ω



S₂₂ function



normal impedance: 50.00 Ω



Data Sheet

Characteristics of Filter 2 (GSM 1800)

Temperature range for specification: $T = -20$ to $+85$ °C
 Terminating source impedance: $Z_S = 50 \Omega + 900\text{pH}$ (unbalanced)
 Terminating load impedance: $Z_L = 50 \Omega + 900\text{pH}$ (unbalanced)

		min.	typ. @ 25 °C	max.	
Center frequency	f_C	—	1842.5	—	MHz
Maximum insertion attenuation	α_{\max}	—	1.8	3.3	dB
1805.0 ... 1880.0 MHz					
Amplitude ripple (p-p)	$\Delta\alpha$	—	0.7	2.3	dB
1805.0 ... 1880.0 MHz					
Input VSWR		—	1.7	2.2	
1805.0 ... 1880.0 MHz					
Output VSWR		—	1.8	2.2	
1805.0 ... 1880.0 MHz					
Attenuation	α				
10.0 ... 940.0 MHz		40	43	—	dB
940.0 ... 1705.0 MHz		28	38	—	dB
1705.0 ... 1785.0 MHz		13	17	—	dB
1920.0 ... 1980.0 MHz		25	27	—	dB
1980.0 ... 2030.0 MHz		26	34	—	dB
2030.0 ... 2500.0 MHz		32	40	—	dB
2500.0 ... 2775.0 MHz		28	36	—	dB
2775.0 ... 5000.0 MHz		35	46	—	dB
5000.0 ... 6000.0 MHz		28	37	—	dB

Maximum ratings

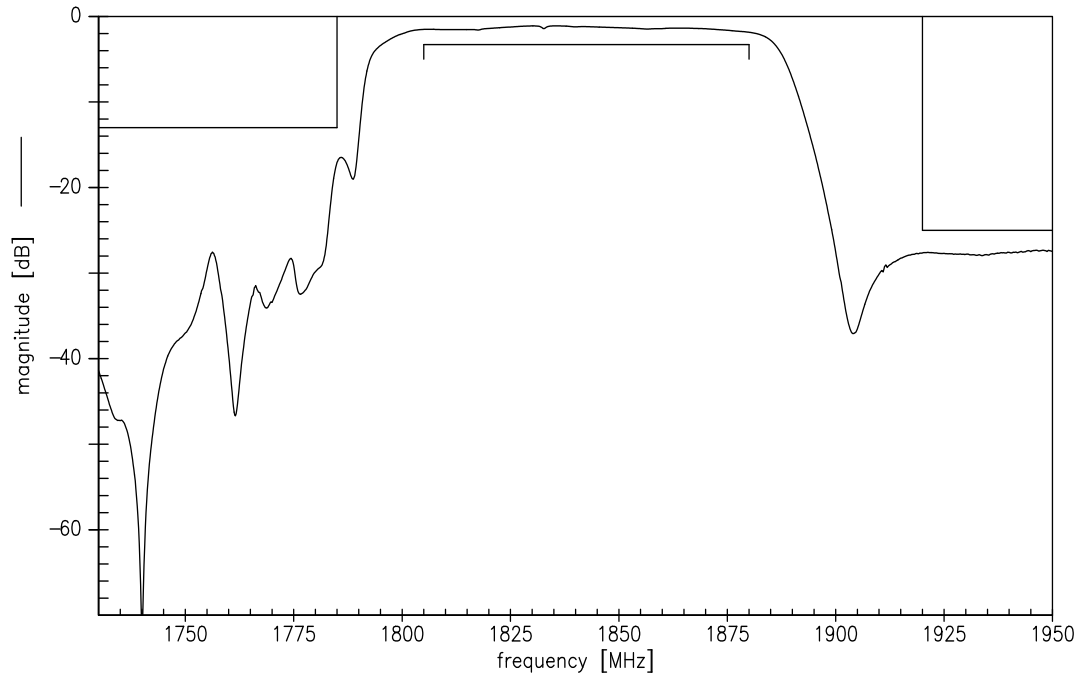
Operable temperature range	T	-40/+85	°C	
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5	V	
ESD voltage	V _{ESD}	50 ¹⁾	V	machine model, 1 pulse
Input power at				
GSM 850, GSM 900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
GSM 1800, GSM 1900	P _{IN}	15	dBm	
Tx bands				

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

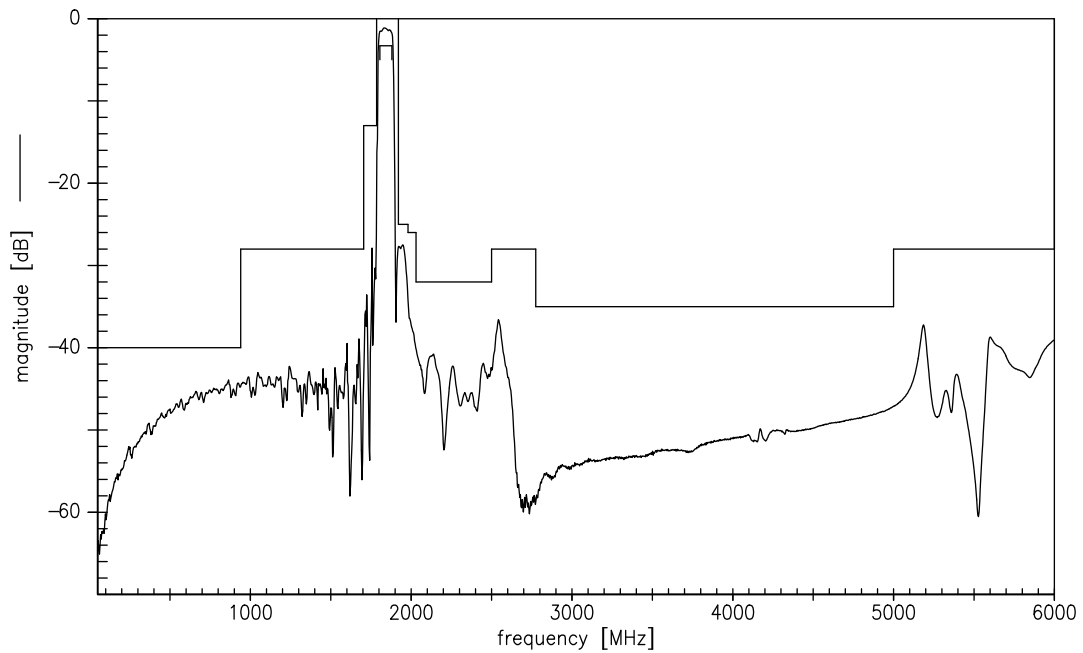
Data Sheet



Transfer function of Filter 2 (GSM1800)



Transfer function of Filter 1 (GSM1800) - Wideband

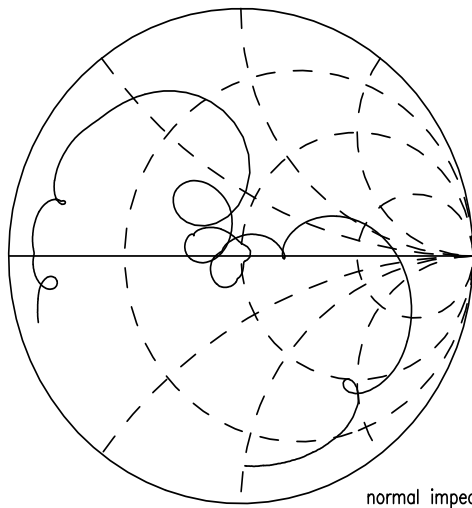


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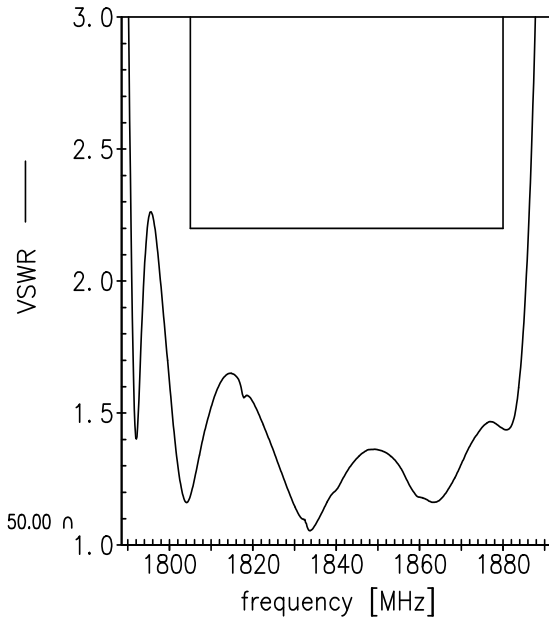


Smith charts of Filter 2

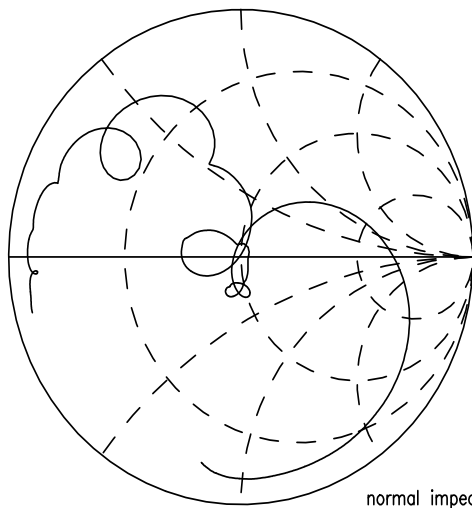
S₁₁ function



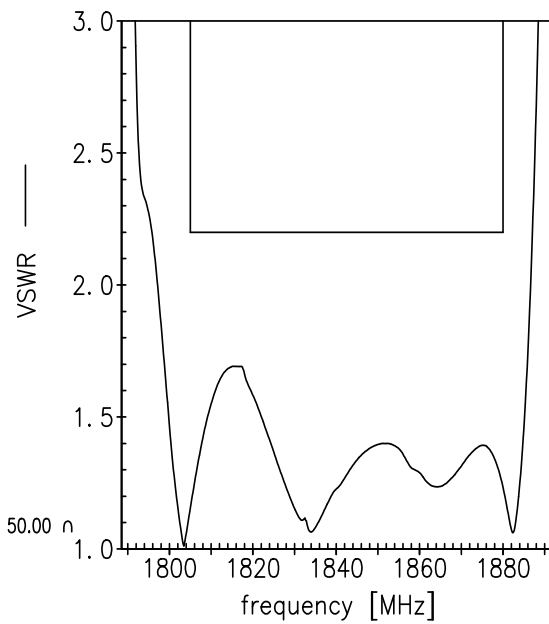
normal impedance: 50.00 Ω



S₂₂ function



normal impedance: 50.00 Ω



SAW Components	B9521
SAW filter 2in1 filter	942.5/1842.5 MHz

Data Sheet



References

Type	B9521
Ordering code	B39182B9521P810
Marking and package	C61157-A7-A152
Packaging	F61074-V8226-Z000
Date codes	L_1126
S-parameters	B9521_LB_NB.s2p;B9521_LB_WB.s2p B9521_UB_NB.s2p;B9521_UB_WB.s2p see file header for port/pin assignment table
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."
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

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