



## SAW Components

### SAW Rx 2in1 filter

Cellular + PCS / WCDMA band V + WCDMA band II

<b>Series/type:</b>	<b>B9318</b>
<b>Ordering code:</b>	<b>B39202B9318G110</b>
<b>Date:</b>	<b>March 08, 2007</b>
<b>Version:</b>	<b>2.0</b>

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Data sheet



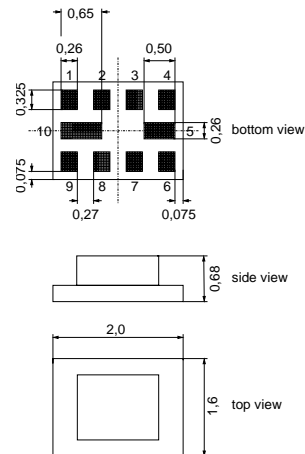
**Application**

- Low-loss RF filter for mobile telephone CDMA systems, receive path (Rx) of Cellular and PCS
- Also applicable for mobile phone WCDMA systems, receive path of Band V and BAND II
- Bandwidth
  - Filter 1 (Cellular): 25 MHz
  - Filter 2 (PCS): 60 MHz
- Impedance transformation from:
  - Filter 1 (Cellular): 50 Ω to 100 Ω
  - Filter 2 (PCS): 50 Ω to 100 Ω
- Unbalanced to balanced operation



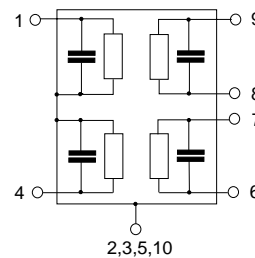
**Features**

- Package size 2.0 x 1.6 x 0.68 mm<sup>3</sup>
- Package code QCS10H
- RoHS compatible
- Approximate weight 0.008 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



**Pin configuration**

- 1 Input [ Filter 1: Cellular ]
- 4 Input [ Filter 2: PCS ]
- 6,7 Output balanced [ Filter 2: PCS ]
- 8,9 Output balanced [ Filter 1: Cellular ]
- 2,3,5,10 Case ground





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**Characteristics filter 1 (Cellular)**

Temperature range for specification:  $T = -30\text{ °C to }+85\text{ °C}$   
 Terminating source impedance:  $Z_S = 50\ \Omega$  (unbalanced)  
 Terminating load impedance:  $Z_L = 100\ \Omega$  (balanced)

		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	$f_C$	—	881.5	—	MHz
<b>Maximum insertion attenuation</b>	$\alpha_{max}$				
869.0 ... 894.0 MHz		—	1.7	2.4 <sup>1)</sup>	dB
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$				
869.0 ... 894.0 MHz		—	0.5	1.2	dB
<b>Amplit. ripple over any 5MHz channel</b>	$\Delta\alpha$				
869.0 ... 894.0 MHz		—	0.4	0.7	dB
<b>Group delay over any 5MHz channel</b>					
869.0 ... 894.0 MHz		—	15	40	ns
<b>Input VSWR</b>					
869.0 ... 894.0 MHz		—	1.6	2.0	
<b>Output VSWR</b>					
869.0 ... 894.0 MHz		—	1.7	2.0	
<b>Output amplitude balance (<math> S_{31}/S_{21} </math>)</b>					
869.0 ... 894.0 MHz			-0.1/0.7	-1.0/1.0	dB
<b>Output phase balance (<math>\phi(S_{31}) - \phi(S_{21}) + 180^\circ</math>)</b>					
869.0 ... 894.0 MHz			-3/2	-5/+5	°
<b>Attenuation</b>	$\alpha$				
0.0 ... 820.0 MHz		47	55	—	dB
820.0 ... 835.0 MHz		45	48	—	dB
835.0 ... 849.0 MHz		47	52	—	dB
914.0 ... 950.0 MHz		24	30	—	dB
950.0 ... 2000.0 MHz		45	52	—	dB
2000.0 ... 3000.0 MHz		40	47	—	dB
3000.0 ... 6000.0 MHz		40	45	—	dB

<sup>1)</sup> pcb loss of 0.1dB extracted



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**Maximum ratings**

Operable temperature range	T	-30/+85	°C	
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	machine model, 10 pulses
Input power at				
WCDMA band V	P <sub>IN</sub>	10	dBm	continuous wave @ +55°C ambient
Tx band				

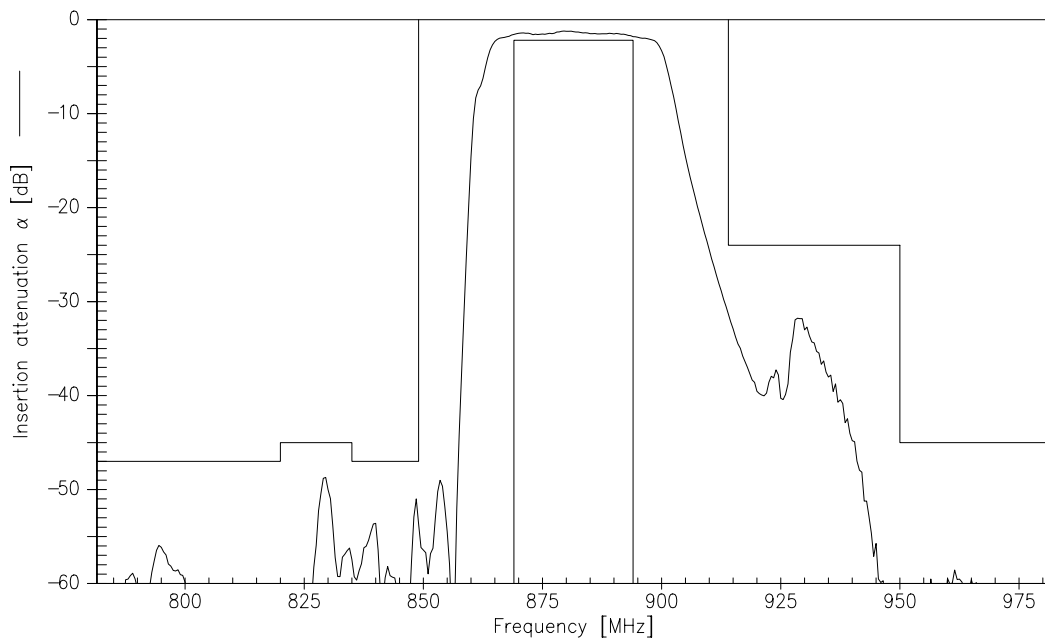
<sup>1)</sup> acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.



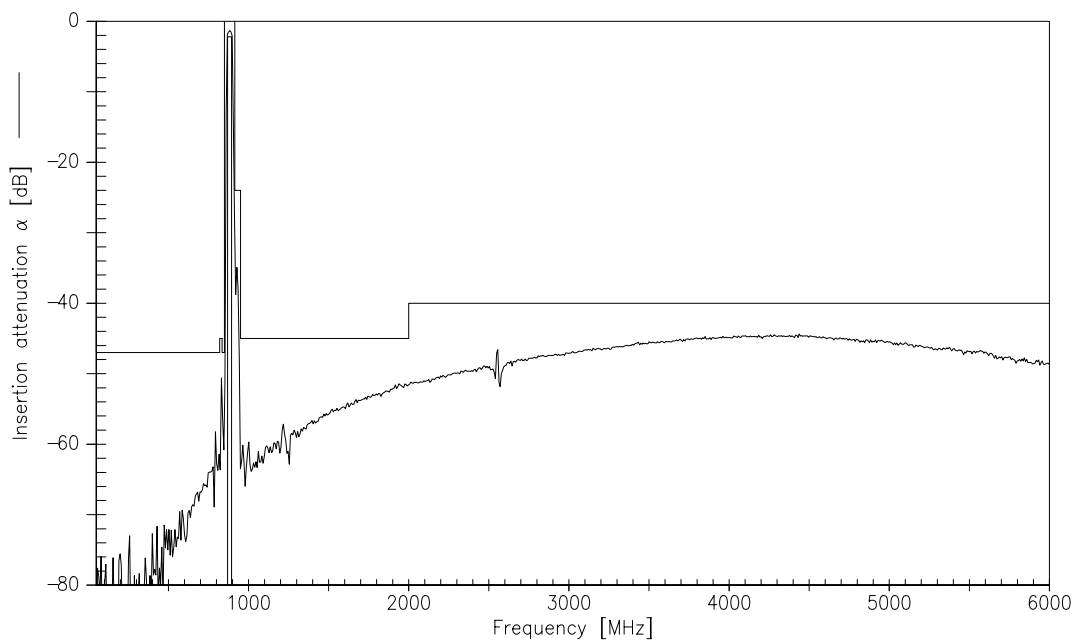
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Transfer function filter 1 (Cellular)



Transfer function filter 1 (Cellular) - wideband



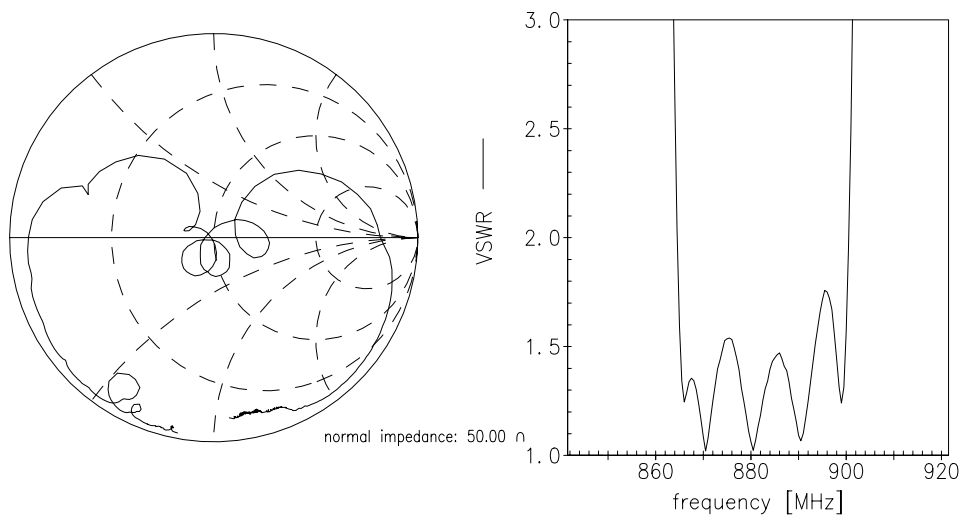


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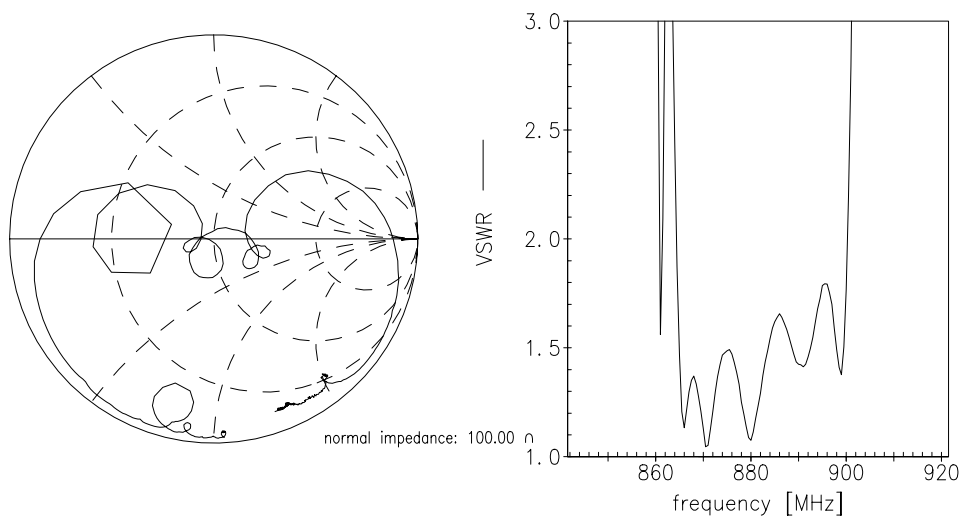


Smith charts filter 1 (Cellular)

$S_{11}$  function



$S_{22}$  function





Data sheet



Characteristics filter 1(PCS)

Temperature range for specification: T = -30 °C to +85 °C  
 Terminating source impedance: Z<sub>S</sub> = 50 Ω (unbalanced)  
 Terminating load impedance: Z<sub>L</sub> = 100 Ω || 13 nH (balanced)

		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>C</sub>	—	1960.0	—	MHz
<b>Maximum insertion attenuation</b>	α <sub>max</sub>				
1930.6 ... 1989.4 MHz		—	1.8	2.6 <sup>1)</sup>	dB
<b>Amplitude ripple (p-p)</b>	Δα				
1930.6 ... 1989.4 MHz		—	0.8	1.6 <sup>2)</sup>	dB
<b>Amplit. ripple over any 5MHz channel</b>	Δα				
1930.6 ... 1989.4 MHz		—	0.4	0.9 <sup>3)</sup>	dB
<b>Group delay over any 5MHz channel</b>					
1930.6 ... 1989.4 MHz		—	23	30	ns
<b>Input VSWR</b>					
1930.6 ... 1989.4 MHz		—	1.5	2.1	
<b>Output VSWR</b>					
1930.6 ... 1989.4 MHz		—	1.5	2.1	
<b>Output amplitude balance ( S<sub>31</sub>/S<sub>21</sub> )</b>					
1930.6 ... 1989.4 MHz		-1.0	-0.5/0.3	1.0	dB
<b>Output phase balance (φ(S<sub>31</sub>) - φ(S<sub>21</sub>)+180°)</b>					
1930.6 ... 1989.4 MHz		-10	-4/4	10	°
<b>Attenuation</b>	α				
DC ... 1600.0 MHz		40	45	—	dB
1600.0 ... 1850.0 MHz		30	35	—	dB
1850.0 ... 1910.0 MHz		20	24	—	dB
2040.0 ... 2200.0 MHz		25	35	—	dB
2200.0 ... 2800.0 MHz		30	36	—	dB
2800.0 ... 3400.0 MHz		40	43	—	dB
3400.0 ... 6000.0 MHz		30	41	—	dB

1) Valid in temperature range -10 ... 80°C. Guaranteed for -30°C: 3.2 dB pcb loss of 0.2dB extracted.  
 2) Valid in temperature range -10 ... 80°C. Guaranteed for -30°C: 2.2 dB  
 3) Valid in temperature range -10 ... 80°C. Guaranteed for -30°C: 1.1 dB



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### Maximum ratings

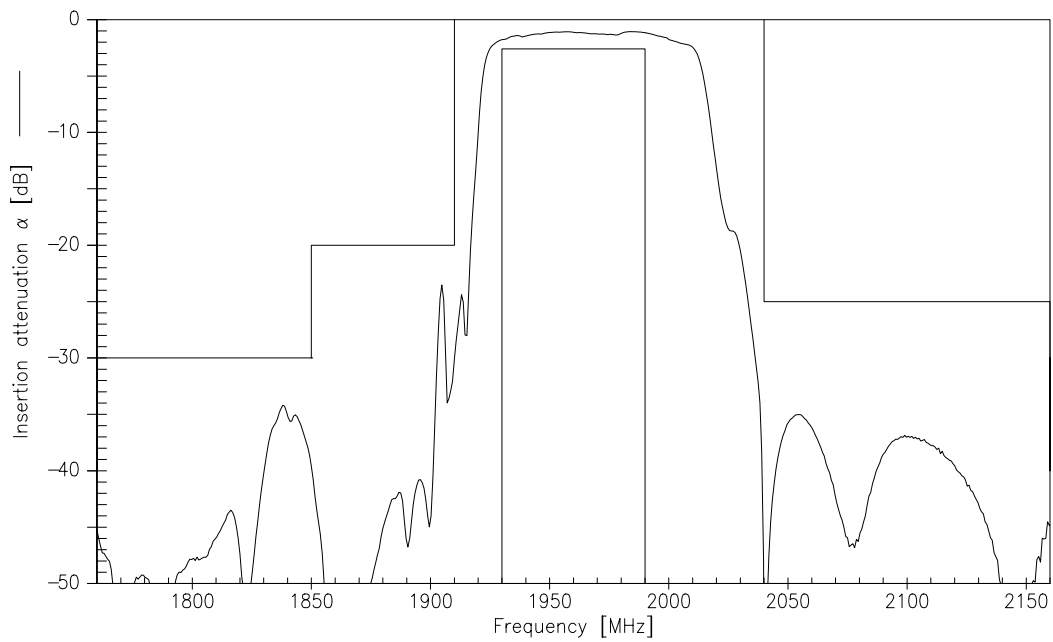
Operable temperature range	T	-30/+85	°C	
Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	V	machine model, 10 pulses
Input power at WCDMA band II	P <sub>IN</sub>	10	dBm	continuous wave @ +55°C ambient
Tx band				

<sup>1)</sup> acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.

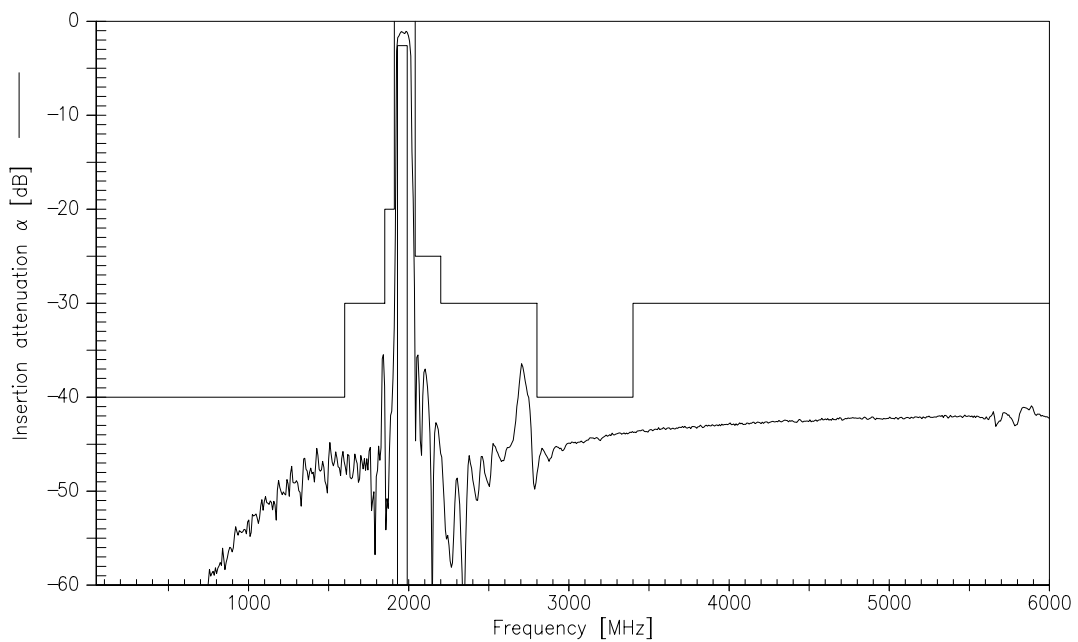




Transfer function filter 2 (PCS)



Transfer function filter 2 (PCS) - wideband





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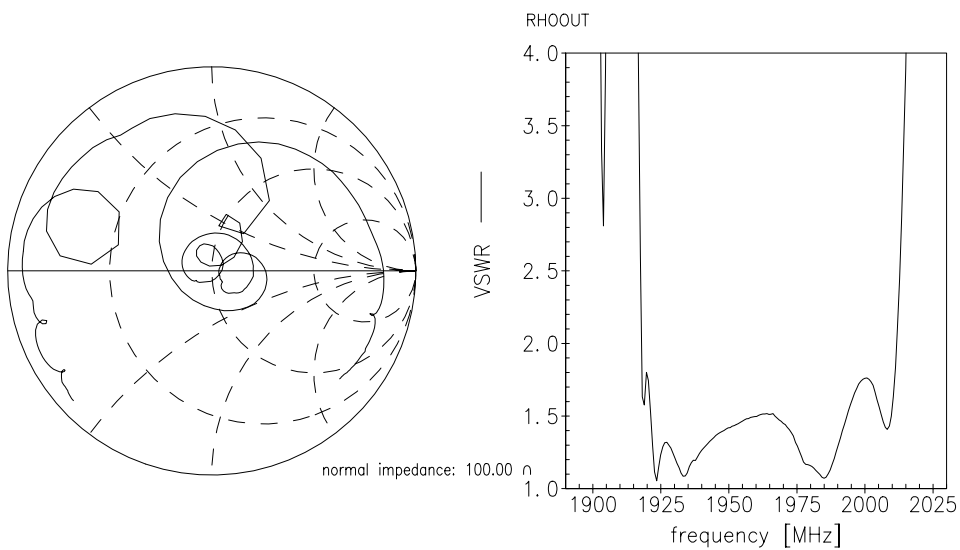
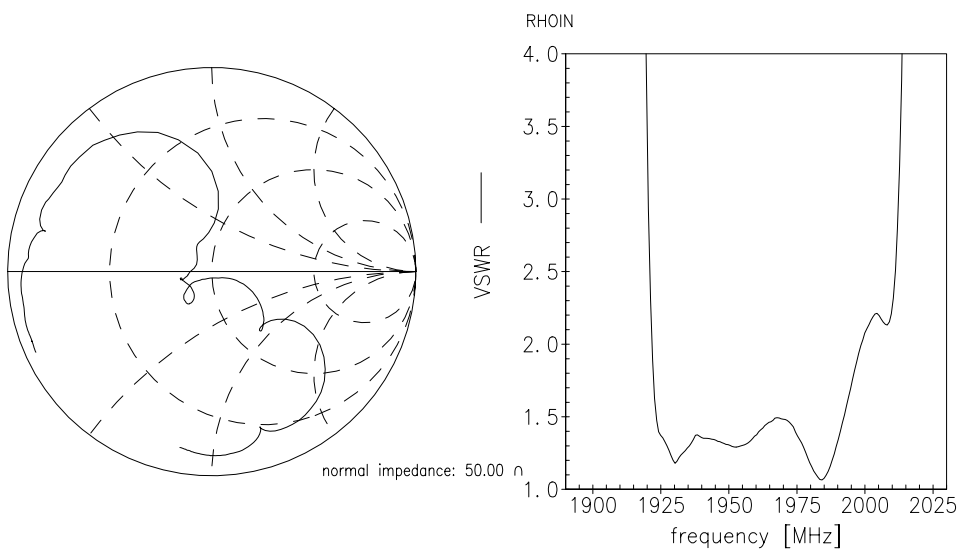
881.5 / 1960.0 MHz

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Smith charts filter 2 (PCS)

S<sub>11</sub> function





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### References

<b>Type</b>	B9318
<b>Ordering code</b>	B39202B9318G110
<b>Marking and package</b>	C61157-A7-A141
<b>Packaging</b>	F61074-V8152-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	Cellular: B9318_LB_NB.s3p, B9318_LB_WB.s3p PCS: B9318_UB_NB.s3p, B9318_UB_WB.s3p
<b>Soldering profile</b>	S_6001
<b>RoHS compatible</b>	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."

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