



SAW Components

SAW Rx 2in1 input duplex filter

GSM1800 / GSM1900

Series/type:	B9514
Ordering code:	B39202B9514P810
Date:	February 01, 2011
Version:	2.0



Data sheet



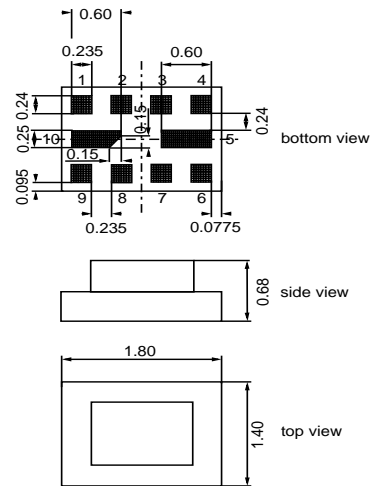
Application

- Low-loss 2in1 RF filter for mobile telephone GSM1900 and GSM1800 systems, receive path (Rx)
- Usable passband:
Filter 1 (GSM1800): 75 MHz
Filter 2 (GSM1900): 60 MHz
- Unbalanced to balanced operation for both filters
- Impedance transformation from 50 Ω to 150 Ω for both filters
- Low amplitude ripple
- Suitable for GPRS class 1 to 12



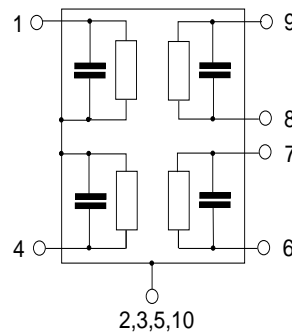
Features

- 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 [Diplex]
- 8,9 Output balanced [Filter 1]
- 6,7 Output balanced [Filter 2]
- 2,3,4,5,10 Case-ground





Data sheet



Characteristics of Filter 1 (GSM1800)

Temperature range for specification: $T = -30\text{ °C to }+85\text{ °C}$
 Terminating source impedance: $Z_S = 50\ \Omega \parallel 3.3\text{nH}$
 Terminating load impedance: $Z_L = 150\ \Omega \parallel 15\text{nH (balanced)}$

		min.	typ. @ 25 °C	max.	
Center frequency	f_c	—	1842.5	—	MHz
Maximum insertion attenuation 1805.0 ... 1880.0 MHz	α_{max}	—	2.1	2.8	dB
Amplitude ripple (p-p) 1805.0 ... 1880.0 MHz	$\Delta\alpha$	—	0.8	1.6	dB
Input VSWR 1805.0 ... 1880.0 MHz		—	1.5	2.2	
Output VSWR 1805.0 ... 1880.0 MHz		—	1.8	2.3	
CMRR ($ S_{21}-S_{31} / S_{21}+S_{31} $) 1805.0 ... 1880.0 MHz		20	23	—	dB
Attenuation	α				
10.0 ... 940.0 MHz		45	55	—	dB
940.0 ... 1705.0 MHz		20	38	—	dB
1705.0 ... 1785.0 MHz		12	17	—	dB
1920.0 ... 1980.0 MHz		17	25	—	dB
1980.0 ... 2030.0 MHz		25	30	—	dB
2030.0 ... 2700.0 MHz		28	34	—	dB
2700.0 ... 6000.0 MHz		30	43	—	dB



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SAW Rx 2in1 input duplex filter

1842.5 / 1960.0 MHz

Data sheet



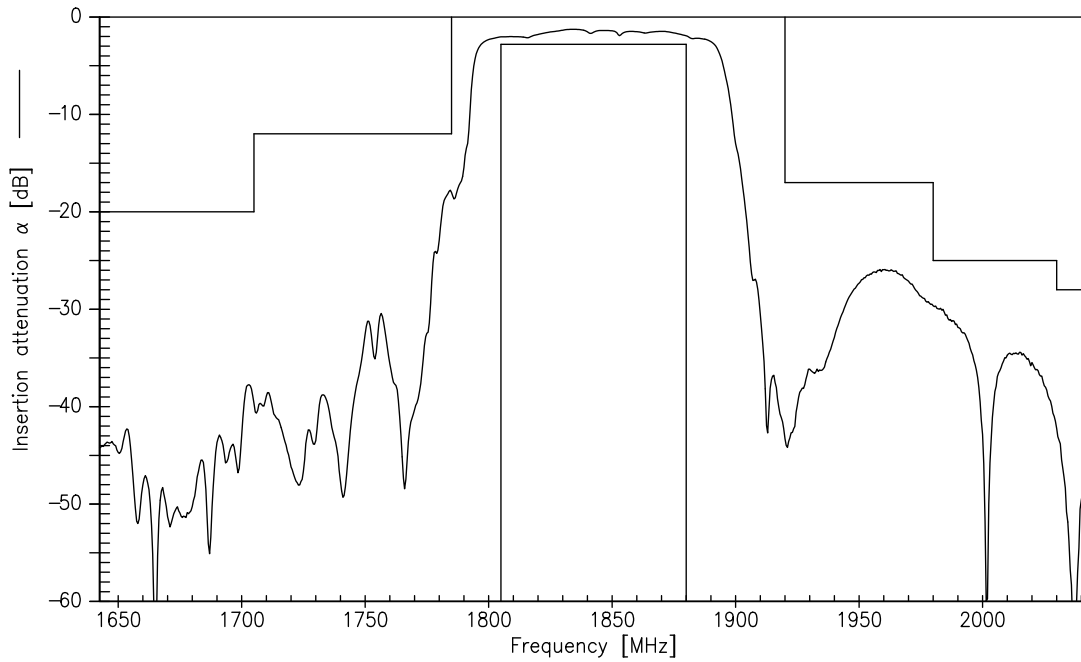
Maximum ratings of Filter 1

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				

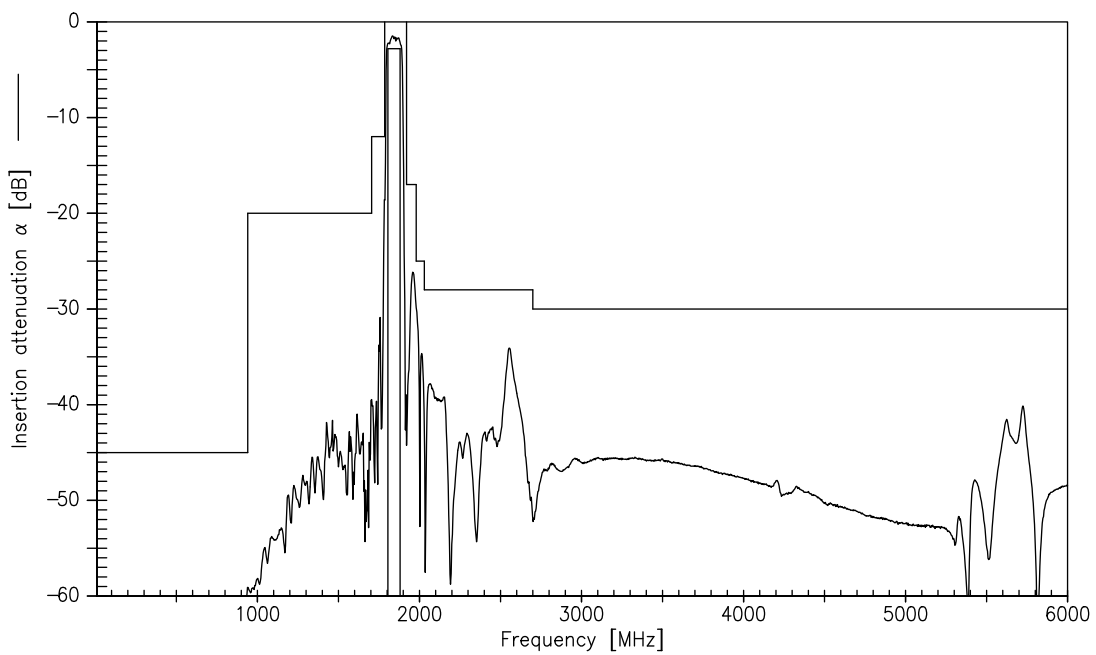
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



Transfer function Filter 1 (GSM1800)



Transfer function Filter 1 (GSM1800) - Wideband



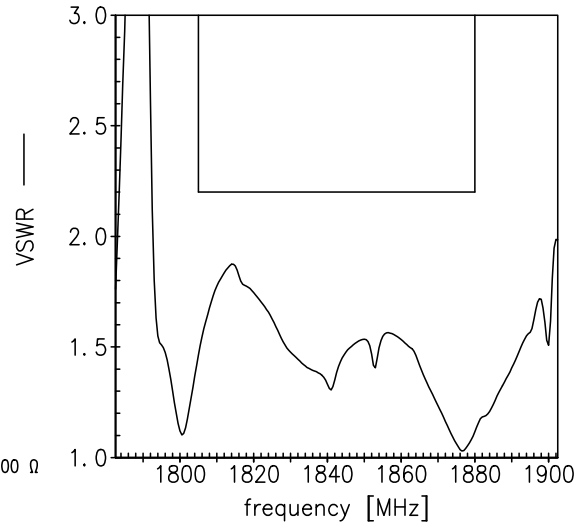
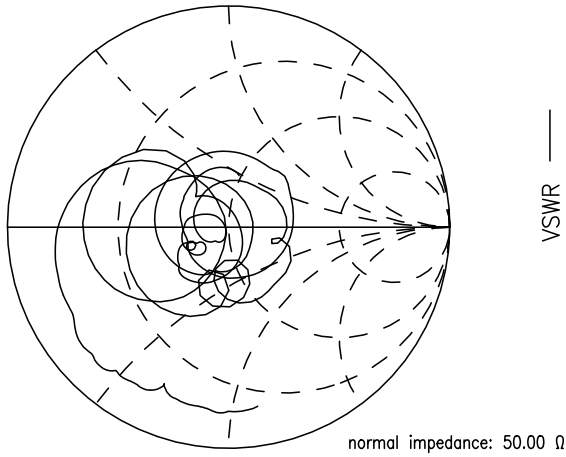


Data sheet

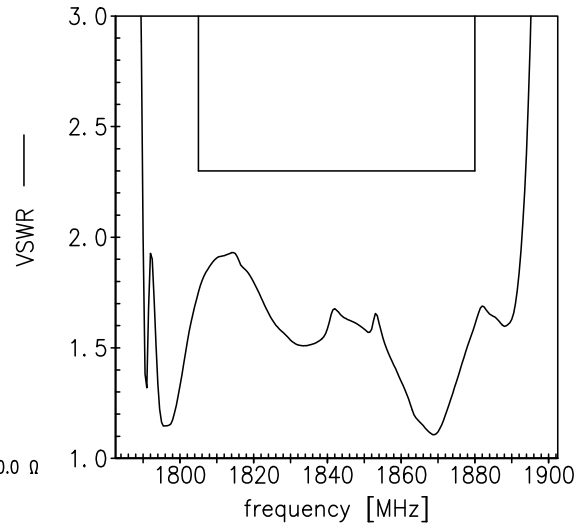
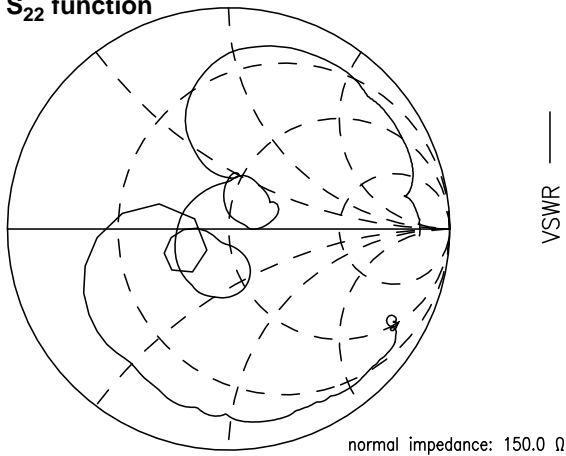


Smith charts Filter 1 (GSM1800)

S₁₁ function



S₂₂ function





SAW Components

B9514

SAW Rx 2in1 input duplex filter

1842.5 / 1960.0 MHz

Data sheet



Characteristics of Filter 2 (GSM1900)

Temperature range for specification: $T = -30\text{ °C to }+85\text{ °C}$
 Terminating source impedance: $Z_S = 50\ \Omega \parallel 3.3\text{nH}$
 Terminating load impedance: $Z_L = 150\ \Omega \parallel 18\text{nH (balanced)}$

		min.	typ. @ 25 °C	max.	
Center frequency	f_c	—	1960.0	—	MHz
Maximum insertion attenuation 1930.0 ... 1990.0 MHz	α_{\max}	—	2.1	3.0	dB
Amplitude ripple (p-p) 1930.0 ... 1990.0 MHz	$\Delta\alpha$	—	0.9	1.8	dB
Input VSWR 1930.0 ... 1990.0 MHz		—	1.5	2.1	
Output VSWR 1930.0 ... 1990.0 MHz		—	1.8	2.1	
CMRR ($ S_{21}-S_{31} / S_{21}+S_{31} $) 1930.0 ... 1990.0 MHz		22	28	—	dB
Attenuation	α				
10.0 ... 1510.0 MHz		40	46	—	dB
1510.0 ... 1830.0 MHz		30	34	—	dB
1830.0 ... 1850.0 MHz		23	32	—	dB
1850.0 ... 1890.0 MHz		18	30	—	dB
1890.0 ... 1910.0 MHz		9	14	—	dB
2010.0 ... 2070.0 MHz		4	16	—	dB
2070.0 ... 2400.0 MHz		21	36	—	dB
2400.0 ... 6000.0 MHz		30	38	—	dB



SAW Components	B9514
SAW Rx 2in1 input duplex filter	1842.5 / 1960.0 MHz
Data sheet	SMD

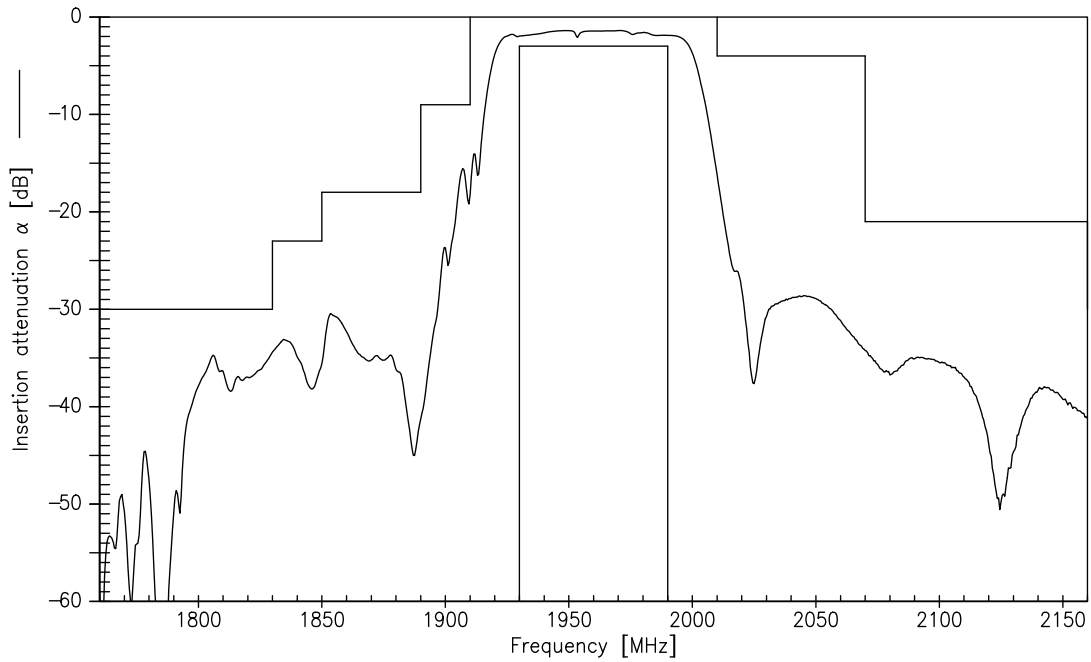
Maximum ratings of Filter 2

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				

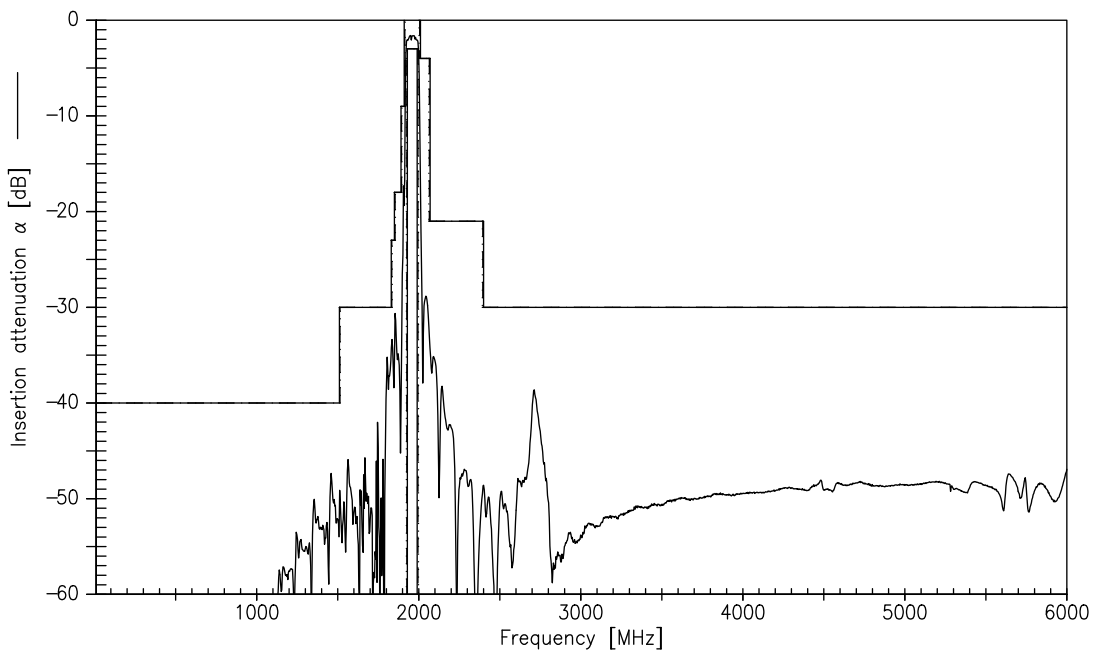
¹⁾ acc. to JESD22-A115A (machine model), 1 negative & 1 positive pulse.



Transfer function Filter 2 (GSM1900)



Transfer function Filter 2 (GSM1900) - Wideband

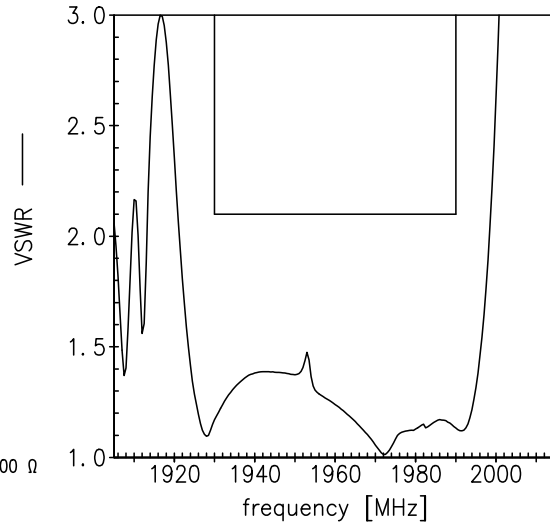
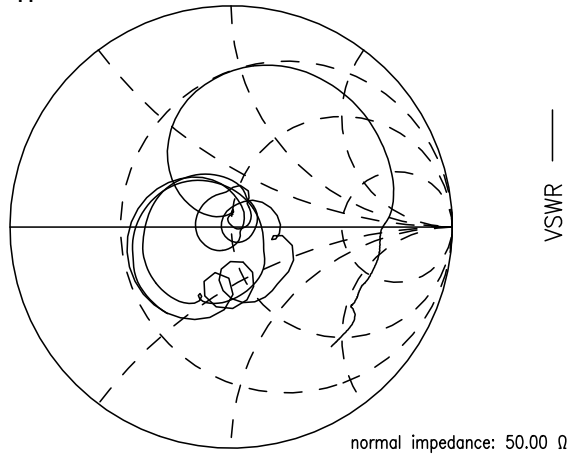


Data sheet

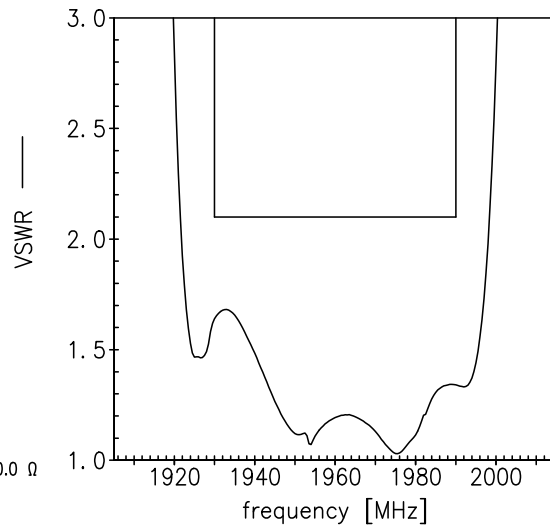
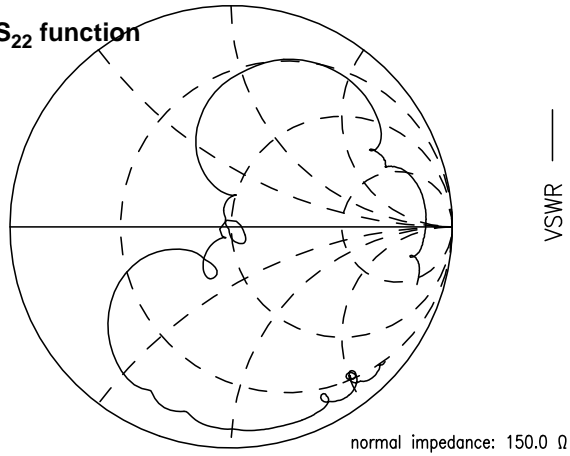
SMD

(GSM1900)

S₁₁ function



S₂₂ function



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**References**

Type	B9514
Ordering code	B39202B9514P810
Marking and package	C61157-A7-A152
Packaging	F61074-V8226-Z000
Date codes	L_1126
S-parameters	B9514_LB_NB.s3p, B9514_LB_WB.s3p B9514_UB_NB.s3p, B9514_UB_WB.s3p 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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Published by EPCOS AG
Surface Acoustic Wave Components Division
P.O. Box 80 17 09, 81617 Munich, GERMANY

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