



SAW Components

SAW Rx 2in1 filter

GSM 1900 / GSM 850

Series/type:	B9506
Ordering code:	B39202B9506L310
Date:	October 31, 2008
Version:	2.0

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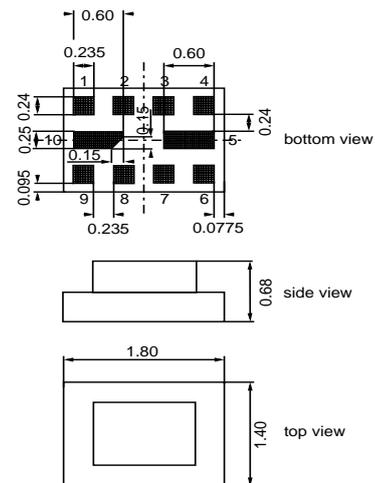
Data sheet

Application

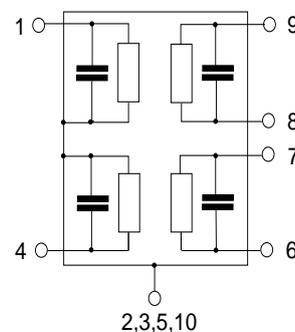
- Low-loss 2in1 RF filter for mobile telephone GSM 1900 and GSM 850 systems, receive path (Rx)
- Usable passband:
 - Filter 1 (GSM 1900): 60 MHz
 - Filter 2 (GSM 850): 25 MHz
- Unbalanced to balanced operation for both filters
- Impedance transformation from 50 Ω to 150 Ω for both filters
- Low amplitude ripple
- Suitable for GPRS class 1 to 12


Features

- Package size 1.8 x 1.4 x 0.68 mm³
- Package code QCS10U
- RoHS compatible
- Approx. weight 0.006g
- Package for Surface Mount Technology (SMT)
- Ni, gold-plated terminals
- Electrostatic Sensitive Device (ESD)


Pin configuration

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



Data sheet

Characteristics of Filter 1 (GSM1900)

Temperature range for specification:	T	=	-20 °C to +75 °C
Terminating source impedance:	Z_S	=	50 Ω
Terminating load impedance:	Z_L	=	150 Ω 13 nH (balanced)

		min.	typ. @ 25 °C	max.	
Center frequency	f_C	—	1960.0	—	MHz
Maximum insertion attenuation	α_{max}	—	1.3	2.3 ¹⁾	dB
1930.0 ... 1990.0 MHz					
Amplitude ripple (p-p)	$\Delta\alpha$	—	0.4	1.4 ²⁾	dB
1930.0 ... 1990.0 MHz					
Input VSWR		—	1.7	2.1	
1930.0 ... 1990.0 MHz					
Output VSWR		—	1.7	2.1	
1930.0 ... 1990.0 MHz					
Output amplitude balance (S_{31}/S_{21})		-1.3	-0.8/0.2	1.3	dB
1930.0 ... 1990.0 MHz					
Output phase balance ($\phi(S_{31})-\phi(S_{21})+180^\circ$)		-10	-7/+5	10	°
1930.0 ... 1990.0 MHz					
Attenuation	α				
10.0 ... 1510.0 MHz		40	44	—	dB
1510.0 ... 1830.0 MHz		30	34	—	dB
1830.0 ... 1890.0 MHz		20	25	—	dB
1890.0 ... 1910.0 MHz		12	16	—	dB
2010.0 ... 2070.0 MHz		12	17	—	dB
2070.0 ... 2400.0 MHz		19	23	—	dB
2400.0 ... 2500.0 MHz		35	40	—	dB
2500.0 ... 3860.0 MHz		28	33	—	dB
3860.0 ... 3980.0 MHz		36	43	—	dB
3980.0 ... 5790.0 MHz		30	39	—	dB
5790.0 ... 6000.0 MHz		32	40	—	dB

1) 2.2 dB at 25 °C

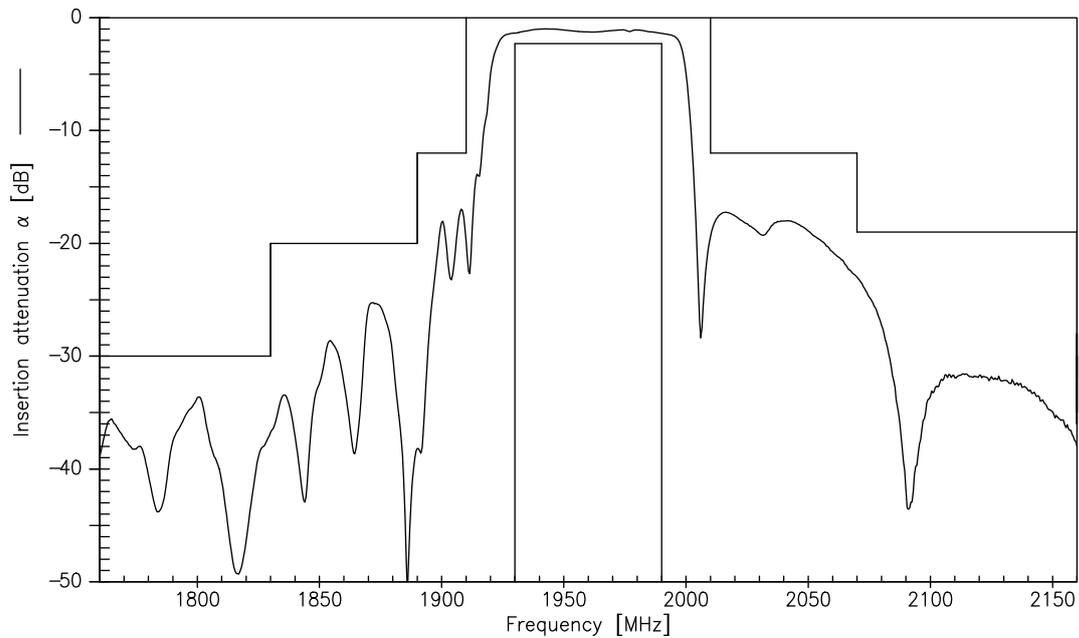
2) 1.3 dB at 25 °C

Maximum ratings of Filter 1

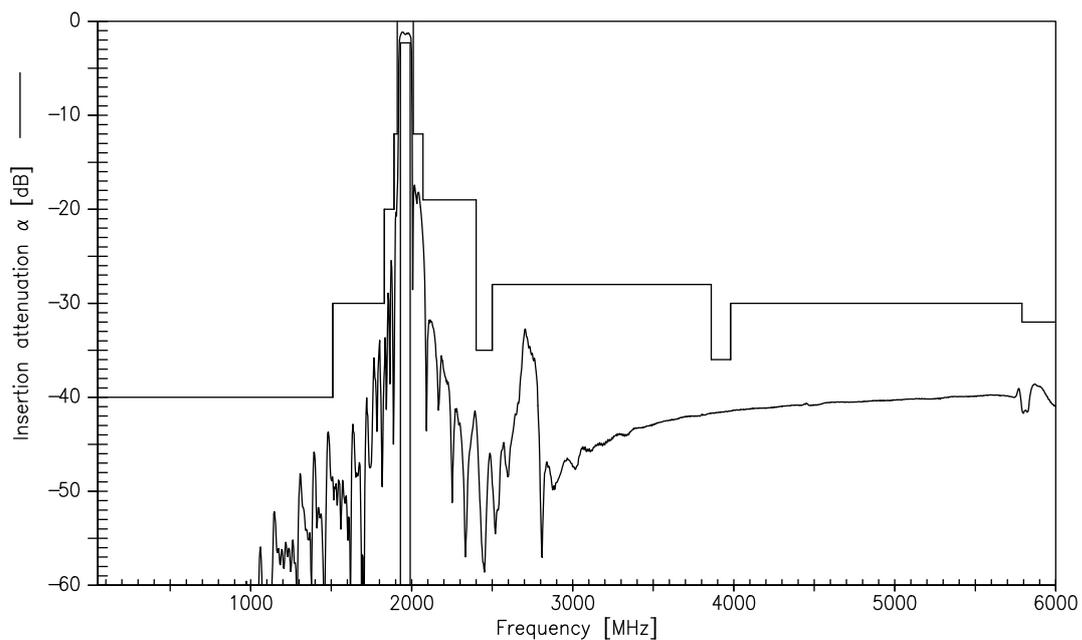
Operable temperature range	T	-40/+85	°C	
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5	V	
ESD voltage	V _{ESD}	50 ¹⁾	V	machine model, 1 pulse
Input Power at				
GSM 850, GSM 900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
GSM 1800, GSM 1900	P _{IN}	15	dBm	
Tx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

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

Transfer function Filter 1 (GSM1900)



Transfer function Filter 1 (GSM1900) - Wideband

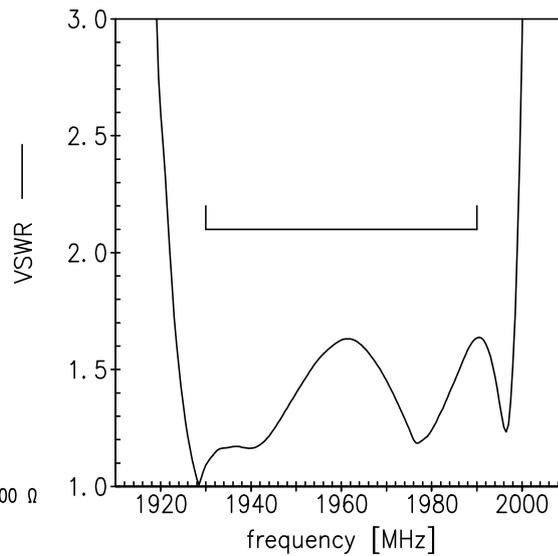
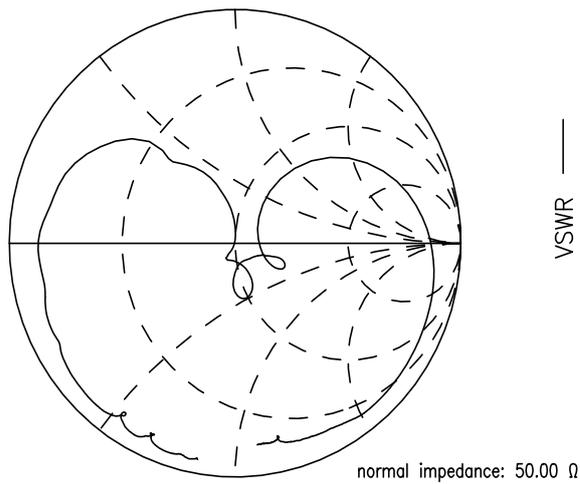


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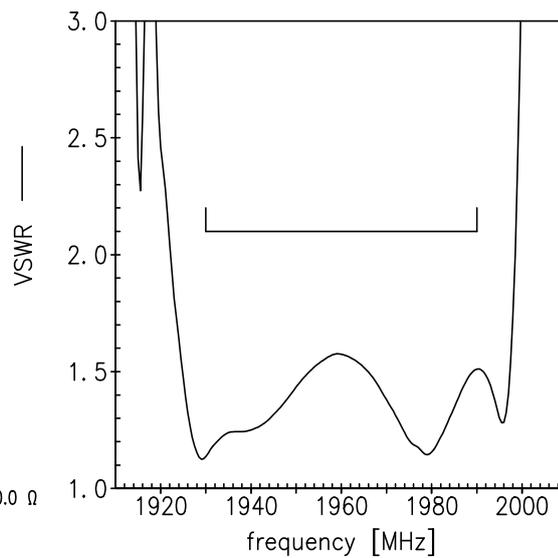
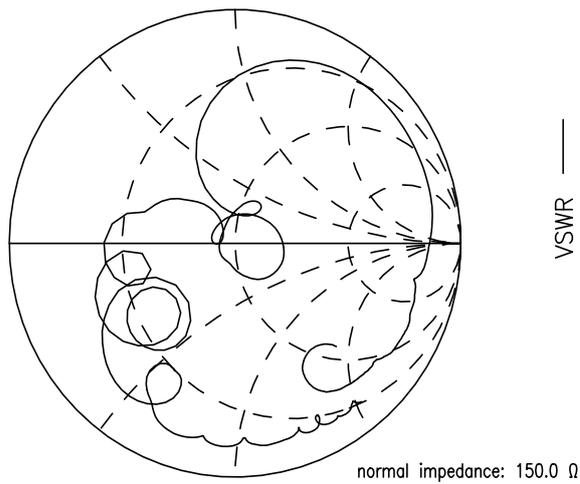


Smith charts of Filter 1 (GSM1900)

S_{11} function



S_{22} function



Data sheet

Characteristics of Filter 2 (GSM850)

Temperature range for specification:	$T = -20\text{ °C to }+75\text{ °C}$
Terminating source impedance:	$Z_S = 50\ \Omega$
Terminating load impedance:	$Z_L = 150\ \Omega \parallel 82\text{ nH (balanced)}$

		min.	typ. @ 25 °C	max.	
Center frequency	f_c	—	881.5	—	MHz
Maximum insertion attenuation	α_{\max}	—	1.4	2.0 ¹⁾	dB
869.0 ... 894.0 MHz					
Amplitude ripple (p-p)	$\Delta\alpha$	—	0.5	1.2 ²⁾	dB
869.0 ... 894.0 MHz					
Input VSWR		—	1.6	2.0	
869.0 ... 894.0 MHz					
Output VSWR		—	1.6	2.0	
869.0 ... 894.0 MHz					
Output amplitude balance (S_{31}/S_{21})		-1.2	-1.0/+1.0	1.2	dB
869.0 ... 894.0 MHz					
Output phase balance ($\phi(S_{31})-\phi(S_{21})+180^\circ$)		-12	-7/+7	12	°
869.0 ... 894.0 MHz					
Attenuation	α				
10.0 ... 447.0 MHz		45	49	—	dB
447.0 ... 849.0 MHz		30	37	—	dB
914.0 ... 954.0 MHz		21	26	—	dB
954.0 ... 1738.0 MHz		28	36	—	dB
1738.0 ... 1788.0 MHz		40	56	—	dB
1788.0 ... 3476.0 MHz		35	43	—	dB
3476.0 ... 6000.0 MHz		26	30	—	dB

1) 1.7 dB at 25 °C

2) 0.9 dB at 25 °C

Maximum ratings of Filter 2

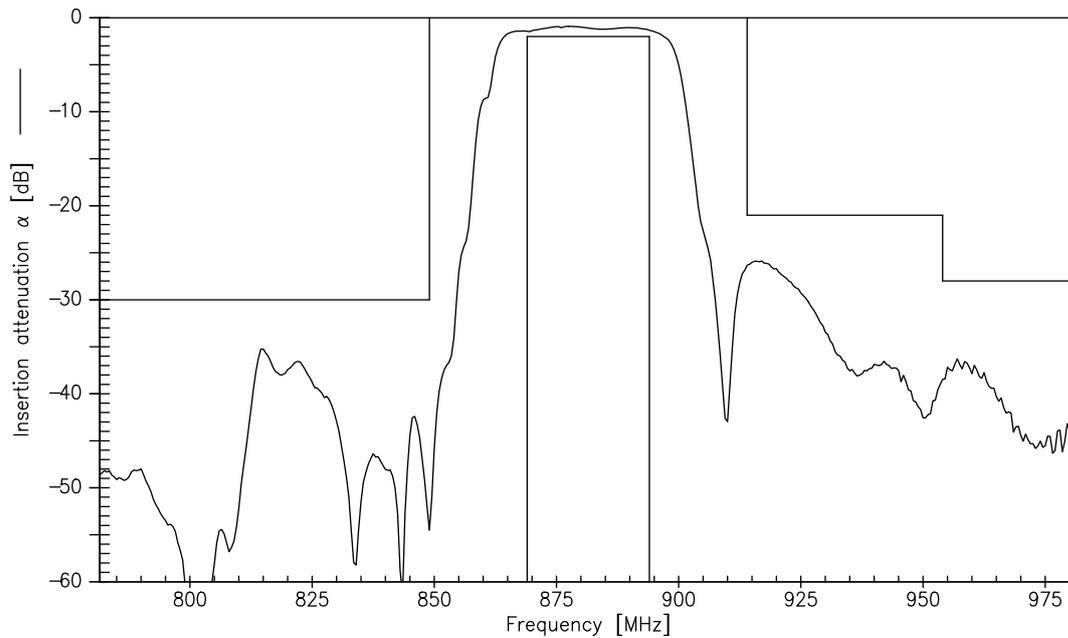
Operable temperature range	T	-40/+85	°C	
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5	V	
ESD voltage	V _{ESD}	100 ¹⁾	V	machine model, 1 pulse
Input Power at				
GSM 850, GSM 900	P _{IN}	15	dBm	effective power in the on-state, duty cycle 4:8
GSM 1800, GSM 1900	P _{IN}	15	dBm	
Tx bands				

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

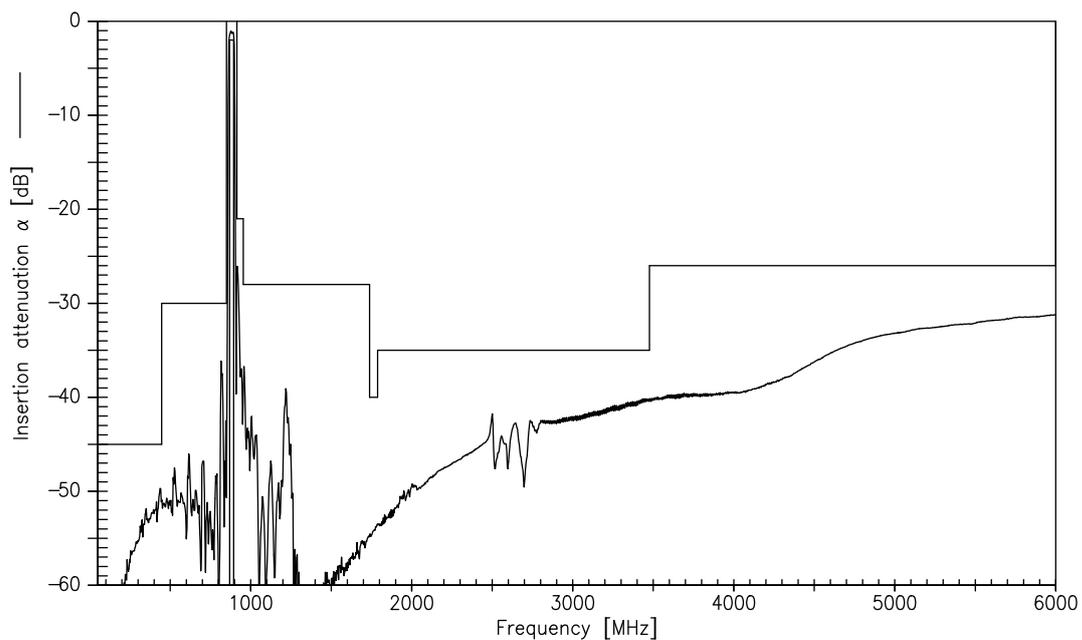
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Transfer function Filter 2 (GSM850)



Transfer function Filter 2 (GSM850) - Wideband



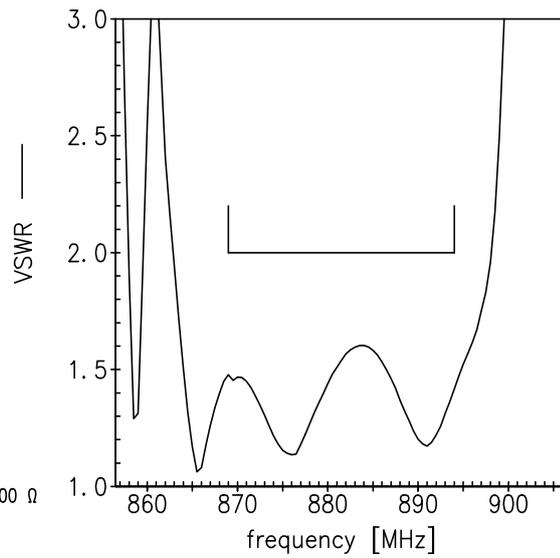
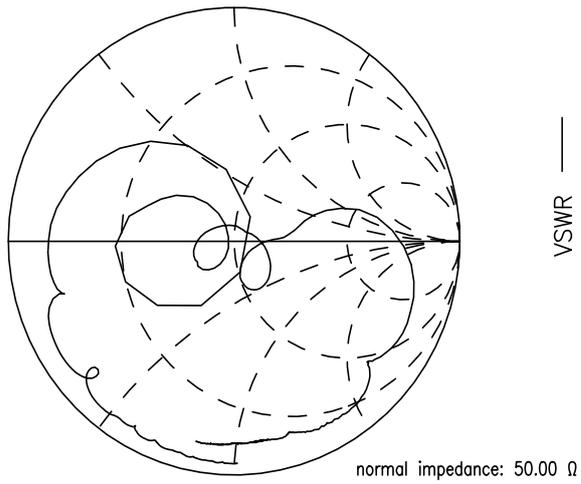
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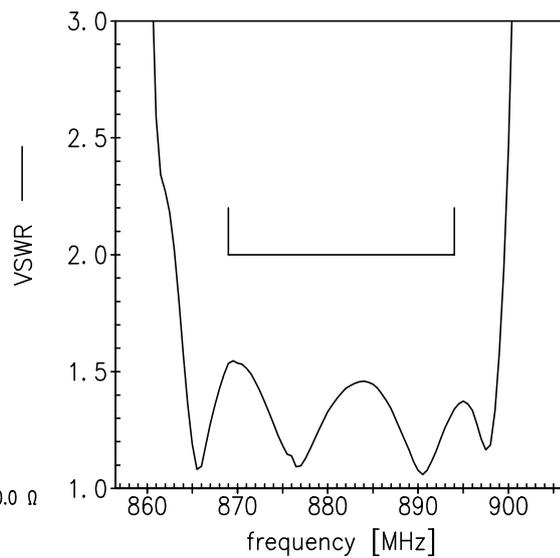
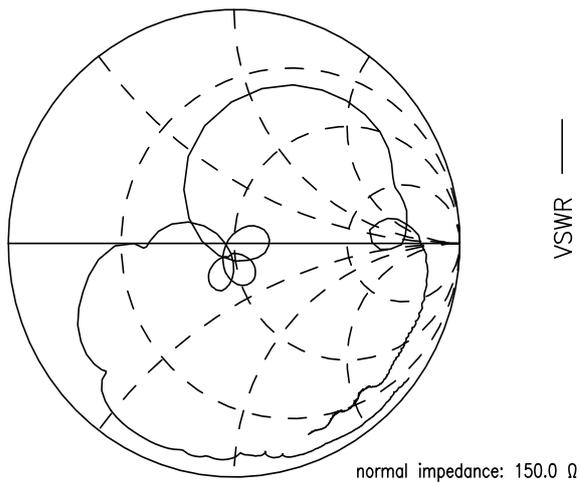


Smith charts of Filter 2 (GSM850)

S_{11} function



S_{22} function



SAW Components	B9506
SAW Rx 2in1 filter	1960.0 / 881.5 MHz

Data sheet



References

Type	B9506
Ordering code	B39202B9506L310
Marking and package	C61157-A7-A152
Packaging	F61074-V8226-Z000
Date codes	L_1126
S-parameters	B9506_LB_NB.s3p B9506_LB_WB.s3p B9506_UB_NB.s3p B9506_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."

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