ROHDE&SCHWARZ

SERVICE DOCUMENTS

FRN-Synthesis

819.3860.02

Contents

5 Service Manual "FRN Synthesis"

5.1 Function Description

(See circuit diagram 819.3860 S)

The FRN synthesis subassembly contains an oscillator generating frequencies from 48 to 58 MHz to produce the fine resolution in the frequency synthesis circuit of the SMGU/SMHU following mixing-down with 40 MHz in a fractional-N PLL. The output frequency of the subassembly (3 to 3.625 MHz) is obtained after dividing by 16 to improve the spectral purity.

5.1.1 VCO 48 to 58 MHz with Down-mixing and 16:1 Divider

The VCO in a Clapp circuit with the FET V310 as the active element oscillates over the range 48 to 58 MHz. Its negative input resistance cancels the resistance in the oscillator circuit which is tuned using the diodes V58-71. The frequency range is adjusted using C70, 71. The output of the buffer stage with V90 contains a diagnostics detector which monitors the output level of the VCO. The signal is amplified to TTL levels by V120 following a further buffer stage (V100) and divided down in the following divider by a factor of 16 to the output frequency of the subassembly of 3 to 3.625 MHz. The output level is monitored by a diagnostics detector. The output signal of the buffer stage is amplified to 17 dBm by V111 and mixed down in U140 with 40 MHz to an IF of 8 to 18 MHz. The signal is amplified to TTL levels by V150, 155 following lowpass filtering. The signal is then applied to the divider of the fractional-N PLL.

5.1.2 40-MHz Amplifier and M Divider

The 40-MHz input signal at X72 with a level of 5 dBm is amplified in an buffer stage by V355 and monitored by a diagnostics detector. Following an amplifier with a common-gate FET circuit (V372), the signal is applied to a diode limiter in which variations in the input level and the amplifier stages are eliminated. The signal is available as an RF signal at mixer U140 following lowpass filtering. The 40-MHz signal is amplified to TTL levels by V380 via a second stage in the gate circuit (V360). After being fed to D387 a 8:1 fixed divider the signal is passed to the programmable M divider with a division factor that can be varied between 25 and 54. The output signal of 94 to 200 kHz following D390, 395 is the reference frequency for the fractional-N PLL. V112 and D380 ensure that a new M factor is loaded synchronously when the frequency is changed.

5.1.3 Fractional-N PLL

Operating Principle

Changing the division factor from N to N + 1 in a fractional-N divider now and again causes the VCO frequency to be a fractional multiple of the reference frequency, i.e. FVCO = N,F x fREF. This procedure results in a PLL with a high frequency resolution.

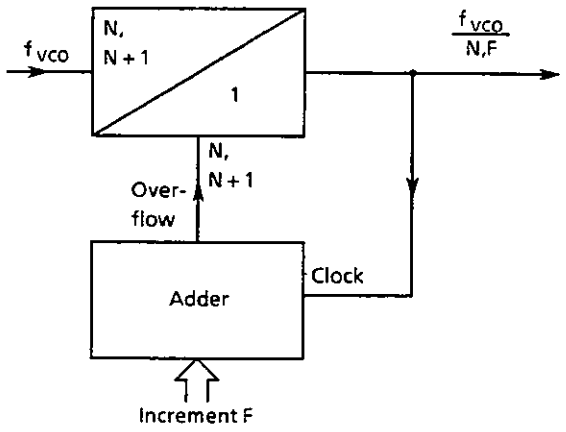


Fig. 5-1 Block diagram of N.F divider

An increment F is added on each output pulse from the divider. The division factor is switched to N + 1 for one reference frequency period if the adder overflows.

Example:

$$F = 0{,}1 \rightarrow \overline{N} = \frac{(9 \times N) + (N+1)}{10} = N{,}1 = N{,}F$$

This switch-over of the division factor produces a phase discontinuity which leads via the PLL to spurious modulation of the oscillator. Spurious signal can be reduced by 60 to 80dB by a compensation circuit.

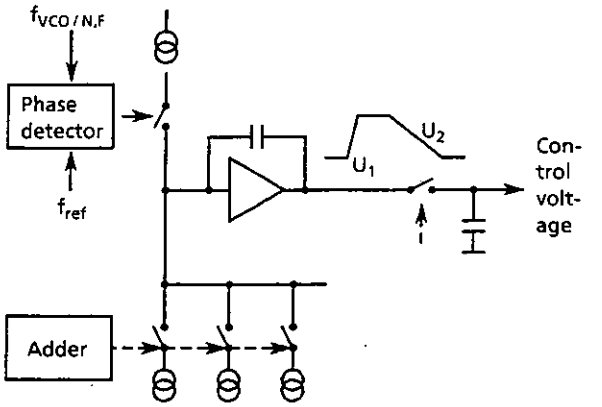


Fig. 5-2 Block diagram of N,F PLL

With its output signal, the phase detector switches a current source which charges the integration capacitor from V1 to V2. This voltage is sampled by the sample-and-hold circuit. The compensation current sources then discharge the integrator to V1. The on period of these current sources is controlled by the respective value in the adder, a current source being assigned to each digit. A bias current source also ensures that the phase shift in the PLL is constant.

Circuit description

The gate array D165 contains an interface for data transmission, the N.F divider with 8-digit adder and the control circuit for the compensation circuit sources of the first four digits after the decimal point.

D160 generates the clock for various parts of the circuit, the level is monitored by a diagnostics detector. The control signal for the sample-and-hold circuit is generated in D175. D180, 185, 186 synchronize the compensation and divider output pulses with the input clock. Crosstalk between the output signals of the gate array is thus reduced.

The output frequency of the N.F divider is compared with the reference frequency from the M divider in the phase detector comprising a J-K flipflop D220 and D221.

The current sources which determine the accuracy of the compensation consist of transistor current sources in a common array V235 followed by FET cascode stages. Diode selectors controlled by HCMOS levels are used to switch the currents for the phase detector, bias and compensation. The most important resistors for determining the current are fitted in an array (R235) in order to achieve as high a temperature stability as possible.

A sample-and-hold circuit controlled by the level converter V323 samples the output voltage of integrator N300 at the reference frequency. The control gain is switched over by D40 depending on the division factor. A preset voltage generated by the transistor current source V12 is added in N2 to the PI controller output voltage.

The output stages V20, 21 and V22, 23 are used to quick charge and discharge capacitors C15, 24 of the lag filter when the frequency is changed. The lag filter is also bypassed by the FET switch N20. The time constant of the PI controller is switched over by V303. The FET switch control triggered by the subassembly strobe is generated by the monostable D10 with the level converter V13. This ensures that the subassembly frequency settles rapidly.

The output voltages of the PI controller and the IF diagnostics detector are monitored by the alarm detector N410. Error message 42 is output if voltages are not within the limits.

5.2 Tests and Adjustments

5.2.1 Testing and Adjusting the 48 to 58-MHz Oscillator

The bottom screen cover should be screwed on when adjusting the VCO. Connect spectrum analyzer to jumper X1 using the adapter cable, connect power supply unit (0 to +20 V) to jumper X2, 1-3. Preliminary adjustment of VCO to following frequency range using C70, 71:

2.5 V --> f = 48 ±0.2 MHz
17.5 V --> f = 58 ±0.2 MHz.

Vary the tuning voltage from 1 to 19 V, the VCO should oscillate over the complete frequency range without drop-outs, spurious sidebands or marked increases in noise.

* Level at X1: -14 to -11 dBm
* Diagnostics voltage (SF 120): +0.4 to +0.7 V

5.2.2 Testing the Buffer Amplifier and 16:1 Divider

Connect spectrum analyzer to X3 using adapter cable, the power supply unit remains connected to X2.

* Level at X3: -6 to -4 dBm.

Connect oscilloscope to X4 using 10:1 probe. HCMOS levels must be reached in the tuning range of the VCO (1 to 19 V).

Connect spectrum analyzer to X71, set jumper X4 to 1-2.

* Measure level at X71: 3.000 to 3.625 MHz, +3 to +7dm
* Diagnostics voltage (SF 121): +0.2 to +0.5 V.

5.2.3 Checking the 40-MHz Signal

Connect signal generator set to 40 MHz, +5 dBm to X72.

* Diagnostics voltage (SF 122): +0.8 to +1.2 V.

Measure signal at X5 using adapter cable, vary the input power at X72 from +2 to +8 dBm.

* Level at X5: -17.5 to -14.5 dBm.

Measure the signal at P25 using an oscilloscope and 10:1 probe. HCMOS levels must be reached at an input power of +2 to +8 dBm. The signal generator set to 40 MHz, +5 dBm remains connected to X72.

5.2.4 Testing the M Divider

Connect frequency counter to P26 with 10:1 probe. Increment the M factor from 25 to 53, the output frequency at P26 is 5 MHz/M.

Setting on SMGU/SMHU: fRF = 1002.5 MHz (M = 25) to fRF = 2125.3 MHz (M = 53) step size ΔfRF = 40.1 MHz, this corresponds to an increase in the M factor of 1.

5.2.5 Checking the IF signal 8 to 18 MHz

Connect power supply unit (0 to +20 V) to jumper X2, 1-3. Measure the signal at P6 using an oscilloscope and 10:1 probe. Vary the tuning voltage from 1 to 19 V, HCMOS levels must be achieved over the complete tuning range.

* Diagnostics voltage (SF 123): +1.1 to +2.7 V.

5.2.6 Commissioning the PLL

5.2.6.1 Checking the Preset Voltage

Insert jumper X6 at 2-3. Measure the present voltage of the VCO at the following frequency settings using the diagnostics voltmeter (SF 118).

$f_{SMGU/SMHU}$ / MHz	Diagnostics voltage (SF 118) / V
1020,478000	12,8 ±0,7
1019,648000	6,4 ±0,35
1019,228000	3,2 ±0,2
1019,434000	4,8 ±0,3
1019,336000	4 ±0,25
1019,277000	3,6 ±0,25
1019,252000	3,4 ±0,25
1019,238000	3,3 ±0,25

5.2.6.2 PLL Function Test

Insert jumpers X6 and X2 at 1-2. Measure signal at P19 using oscilloscope and 10:1 probe.

Setting on SMGU/SMHU:

- ▸ RF 1019.53125 MHz
- * Signal at P19: see Fig. 5-3
- * Diagnostics voltage (SF 118): + 5 to + 6 V.

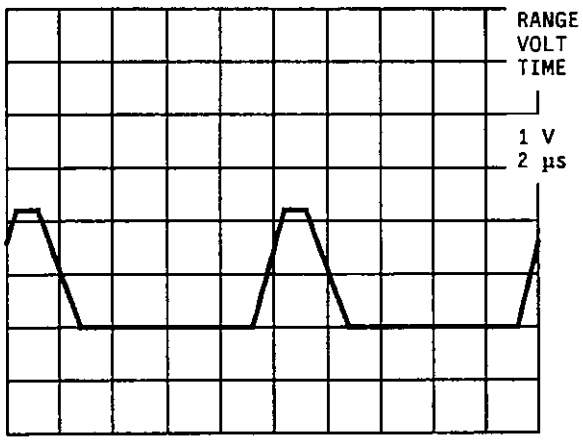


Fig. 5-3 Voltage at P19

5.2.6.3 Checking the Settling Time

Connect storage oscilloscope to P20 using probe (external triggering at P30,5).

Setting on SMGU/SMHU:

RF sweep, f_{START} = 1019.140625,

f_{STOP} = 1021.093750, fSTEP = 1.953125 MHz.

Figs. 5-4 and 5-5 show the typical settling behaviour of the PI controller voltage at P20.

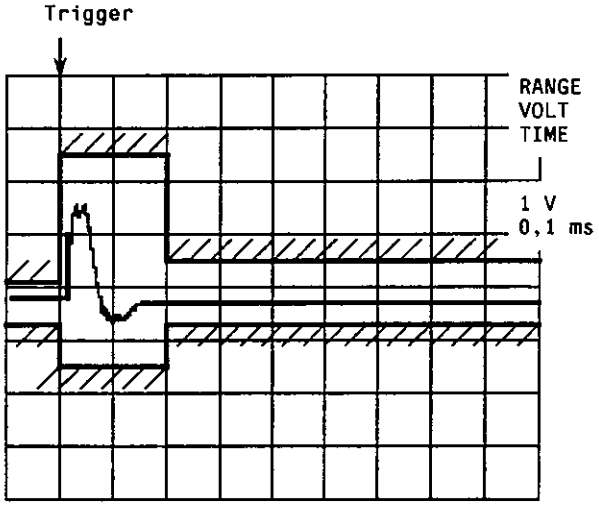


Fig. 5-4 PI controller voltage at P20, $f_{SMGU/SMHU}$: f_{START} → f_{STOP}

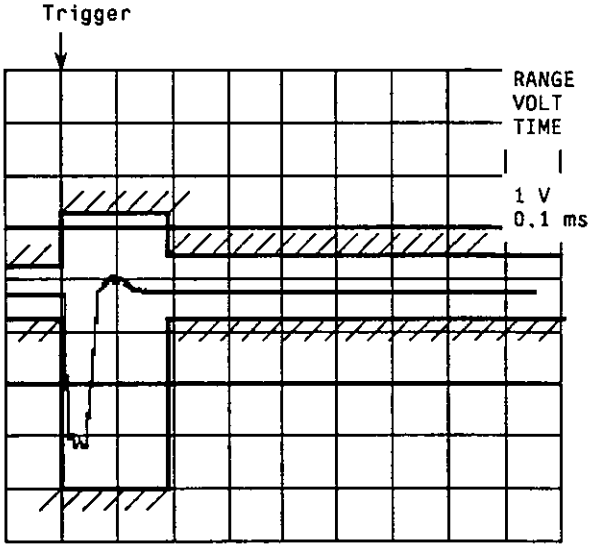


Fig. 5-5 PI controller voltage at P20, $f_{SMGU/SMHU}$: f_{STOP} → f_{START}

5.2.6.4 Checking Oscillator Linearity

The top and bottom screening covers must be screwed on. Adjust the output voltage of the PI controller on the diagnostics voltmeter (SF 117) to ≤|0.3 V| alternately at $f_{SMGU/SMHU}$ = 2038.281 and $f_{SMGU/SMHU}$ = 2042.187 using C70, 71.

The magnitude of the diagnostics voltage must be ≤2 V at the following settings.

$f_{SMGU/SMHU}$ / MHz	|Diagnostics voltage (SF 117)| / V
2038,672000	≤2
2039,062000	≤2
2039,453000	≤2
2039,844000	≤2
2040,234000	≤2
2040,625000	≤2
2041,015	≤2
2041,406000	≤2
2041,796000	≤2

5.2.6.5 Setting and Checking Compensation

Insert jumper X4 at 2-3. Connect spectrum analyzer to X71 and cable W72 to X72 again. The top and bottom screen covers must remain screwed on for this adjustment, the spectrum analyzer and the SMGU/SMHU must be synchronized at the same reference frequency.

Setting on SMGU/SMHU: f_{RF} = 2038.281641 MHz, SF 25 (control bandwidth of FRN loop too wide).

Setting on spectrum analyzer:
CF = 52 MHz, REF level = 5 dBm, RES BW = 30 Hz, video BW = 1 Hz, sweep time = 20 s, span = 0 Hz.

Adjust the level of the spurious signals to a minimum (≤-83 dBc) using R261.

Setting on SMGU/SMHU: f_{RF} = 2038.281289 MHz.

Setting on spectrum analyzer:
CF = 52.0011 MHz, otherwise as above.
Adjust the level of the spurious signals to a minimum (≤-83 dBc) using R263.

Check the spurious signals at nx1 kHz (n = 1 to 5) from the carrier with the following frequency settings on the SMGU/SMHU (≤-78 dBc).

Spectrum analyzer setting:
CF = 52 MHz, REF level = 5 dBm, span = 10 kHz, RES BW = 30 Hz.

SMGU/SMHU settings: SF 25

$f_{SMGU/SMHU}$ / MHz
2038.281641
2038.281289
2038.281254
2038.281250

Spectrum analyzer settings:
CF = 57 MHz, otherwise as above.

SMGU/SMHU settings:
SF 49, $f_{SMGU/SMHU}$ = 2041.797266 MHz.

Then remove top cover and insert jumper X4 at 1-2. Switch the control bandwidth of the FRN loop to narrow using SF 26.

5.2.7 Checking the Alarm

SMGU/SMHU setting: f_{RF} = 1000 MHz.

Disconnect the 40-MHz signal at X72, the display "Err 42" must light up. Connect the cable to X72 again. Connect a power supply unit (0 to ±20 V) to X6, 2-3.

The display "Err 42" must light up at <-8.8 V and >+8.8 V and must disappear again at >-8.2 V and <+8.2 V. Disconnect the power supply unit and connect the jumper X6 at 1-2 again, screw the top screen cover on again.

5.3 Troubleshooting

Faults in the FRN synthesis can be recognized at the RF output of the SMGU/SMHU by means of a small frequency error ($\Delta f < 1.95$ MHz at f_{RF} = 1 GHz) and a poor spectrum close to the carrier. The PLL function is monitored by an alarm detector for the PI controller voltage and a detector for the input clock of the FRN divider. No synchronization errors occur in the following PLLs (summing loops 1 and 2) if there is a PLL fault because of the low frequency variation of the output signal (3.000 to 3.625 MHz). If "Err 42" (FRN synthesis) and "Err 46" (summing loops) occur nevertheless, either the 48 to 58 MHz oscillator, a series-connected buffer stage for the FRN synthesis or the 40-MHz signal for the fixed frequencies has failed.

5.3.1 Failure of the PLL (Err 42)

- Use the diagnostics function to check which voltage is out of tolerance:
  SF 117, PI controller: -8 to +8 V,
  SF 123, IF level: +1.1 to +2.7 V.

- If only the PI controller voltage is out of tolerance and if the output frequency at X71 displayed by SF 78 is correct, check the preset voltage and the adjustment of the oscillator using C70, 71 according to Section 5.2.6.1.

- If the PI controller voltage is out of tolerance and if the output frequency of the subassembly is incorrect, check the following parts of the circuit:

  1. The M divider with test points P25 (5 MHz) and P26 (5 MHz/M); the M factor is displayed using SF 83.

  2. The fractional-N divider with P8 (f_{IF} = 8 to 18 MHz, $f_{IF} = 16 \times f_{FRN} - 40$MHz) P9 ($f_{IF}$/N.F, N.F = 40 to 194, N.F = M/5 MHz ($f_{FRN} \times 16 - 40$ MHz), P11 (f_{IF}/N.F).
     The output frequency f_{FRN} is displayed using SF 78, the M factor using SF 83.

  3. The operating points of the compensation current sources, the voltage stabilization, the integrator with test point P19, the sample-and-hold stage with P20, P21 and the function of the preset voltage according to Section 5.2.6.2.

- If the IF level is out of tolerance and there is an error message (the PI controller voltage may still be within tolerance), use the diagnostics function to check the oscillator level (SF 120) and the 40-MHz signal (SF 122). If these are still correct, check the 40-MHz buffer stage with V372, the oscillator buffer stage with V111, the mixer N140 and the IF amplifier with V150, V155.
  It should be noted that no further settings (N, F and M dividers, preset voltage) can be carried out apart from the diagnostics function if there is no IF signal from the subassembly.

5.3.2 Occurrence of Spuriae near the Carrier

If spuriae with an amplitude of -70 to -15 dBc occur ≤2 kHz from the carrier, and if their frequency and amplitude change by a large amount when the output frequency of the SMGU/SMHU is slightly adjusted (f = 10 to 100 Hz), check the adjustment according to Section 5.2.6.5. If this cannot be carried out, check the control signals for the compensation current sources at test points P12 (bias) and P13 to P16 (1st to 4th digits after the point), the voltage stabilization, the operating points of the current sources, the integrator and the sample-and-hold stage.

5.3.3 Signals at Test Points and DC Operating Points

Oscillator 48 to 58 MHz
V75 source: +0.5 to +2.5 V
V90 collector: +5 to +6 V
X1: 48 to 58 MHz, -14 to -11 dBm into 50 Ω

Buffer stages
V100 source: +0.7 to +2 V
V111 emitter: +4 to +4.5 V
X3: 48 to 58 MHz, -6 to 4 dBm into 50 Ω

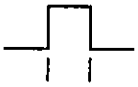
16:1 Divider
V125 emitter: +4.8 to +5.2 V
P4: 48 to 58 MHz, HCMOS levels
P5: 3.000 to 3.625 MHz, HCMOS levels

IF amplifier 8 to 18 MHz
V150, 155 collector: + 1 to + 3 V DC
P6: 8 to 18 MHz, HCMOS levels

40-MHz isolating amplifier
V355 collector: + 5.5 to + 6.5 V
V360, 372 source: + 0.7 to + 2 V
X5: 40 MHz, -17.5 to -14.5 dBm into 50 Ω

M divider
V405 emitter: + 4.7 to + 5.1 V
P25: 40 MHz, HCMOS levels
P26: 5 MHz/M, HCMOS levels

Fractional divider with synchronization
P7, P8: 8 to 18 MHz, HCMOS levels, duty factor ≈ 50 %
P9: narrow pulse, 94 to 200 kHz, HCMOS levels

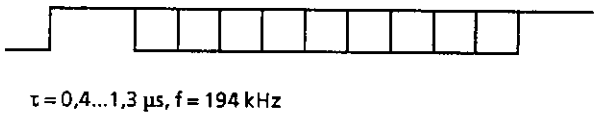


P10: as P9

P11: narrow pulse, 90 to 194 kHz, HCMOS levels

P12: pulse, HCMOS levels

P13: pulse train, HCMOS levels,
$f_{SMGU/SMHU}$ = 1040 MHz



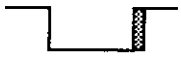
P14: pulse train as with P13
$f_{SMGU/SMHU}$ = 1040 MHz

P14: pulse train as with P13
$f_{SMGU/SMHU}$ = 1040 MHz

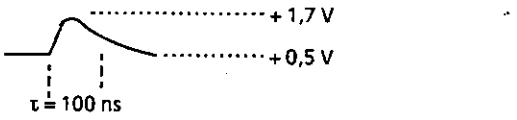
P14: pulse train as with P13
$f_{SMGU/SMHU}$ = 1040.000001 MHz

Phase detector

P17: pulse, HCMOS levels
$f_{SMGU/SMHU}$ = 1040 MHz



P18: narrow pulse, $f_{SMGU/SMHU}$ = 1040 MHz



Compensation current sources

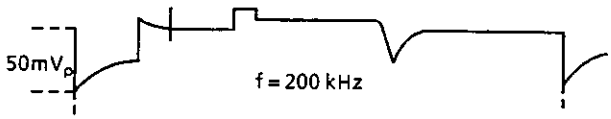
V230 emitter: -14 V
V275 emitter: + 14 V
V235.2: + 6.75 V to + 7.25 V
V236, 240, 245, 250 source: -7 to -10 V

Voltage stabilization

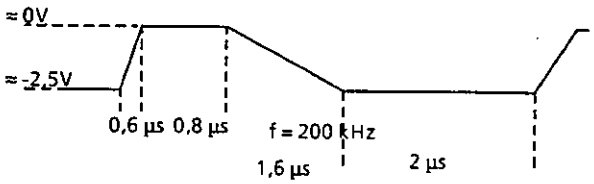
V332 emitter: + 4.7 to + 4.95 V
V331 emitter: + 2.3 to + 2.5 V

Integrator

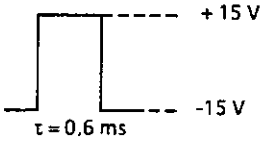
N300.2: = 2,4 V DC



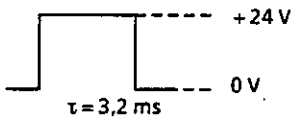
P19: $f_{SMGU/SMHU}$ = 1040 MHz



Sample-and-hold stage
P21: f = 94 to 200 kHz



Loop filter with gain correction and preset voltage
P20: -8 to +8 V DC, typ. -2 to +2 V DC with adjusted VCO
V26 emitter: -14 V
V12 emitter: -6.7 to -7.7 V
N20.3: pulse



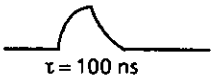
SMGU/SMHU setting:
RF sweep, sweep time = 10 ms

P22: +2.5 to +17.5 V DC

Diagnostics multiplexer and latch

SMGU/SMHU setting:
RF sweep, sweep time = 10 ms

P30: very narrow pulse, HCMOS levels, period 10 ms, pulse width 100 ns



P31: as with P30

5.4 Interfaces

Signal		D	T	Range of values	Connection Point	Remarks
Name	Description					
+24 V	Power supply +24 V	I	P	23,4 ... 24,5 V 10 ... 30 mA	X7A24	Power supply
+15 V	Power supply +15 V	I	P	14,8 ... 15,3 V 240 ... 300 mA	X7A26	Power supply
+5 V	Power supply +5 V	I	P	4,9 ... 5,1 V 100 ... 150 mA	X7A28	Power supply
−15 V	Power supply −15 V	I	P	-15,2 ... -14,2 V 40 ... 70 mA	X7A30	Power supply
GND	Ground	R	P	HC-MOS	X7A10 X7A12 X7A14 X7A16 X7A23 X7A25 X7A27 X7A29 X7A31	
BA0	Subassembly address	I	D	HC-MOS	X7A21	Subassembly addressing
BA1	Subassembly address	I	D	HC-MOS	X7A20	Subassembly addressing
BA2	Subassembly address	I	D	HC-MOS	X7A19	Subassembly addressing
G1	Strobe 1	I	D	HC-MOS	X7A22	Subassembly addressing
TF.CLK	CLOCK	I	D	HC-MOS	X7A11	Data transmission
TR.DAT	Data	I	D	HC-MOS	X7A13	Data transmission
TST	Diagnostics	O	A	-5 ... +5 V	X7A17	Selftest
Ala	Alarm	O	L	Open collector	X7A18	Selftest
FRNREF	Reference	I	A	40 MHz 3 ...7 dBm	X72	RF interface 50 Ω
FRN	FRN output	O	A	3,000 ... 3,625 MHz 3 ... 7 dBm	X71	RF interface 50 Ω

Direction
- I ..... Input
- O .... Output
- R .... Reference
- M .... Measurement

Type
- A Analog
- H Digital High
- L Digital Low
- P Power

5.5 Positions of Plug-in Jumpers

X2 at 2-3
X4 at 1-2
X6 at 1-2

5.6 Required Measuring Equipment

Spectrum analyzer (... 200 MHz)
(e.g. FSA)

RF generator, high spectral purity, 40 MHz
(e.g. SMG)

Oscilloscope >100 MHz
(e.g. BOL)

Digital storage oscilloscope
(e.g. BOS)

RF adapter cable

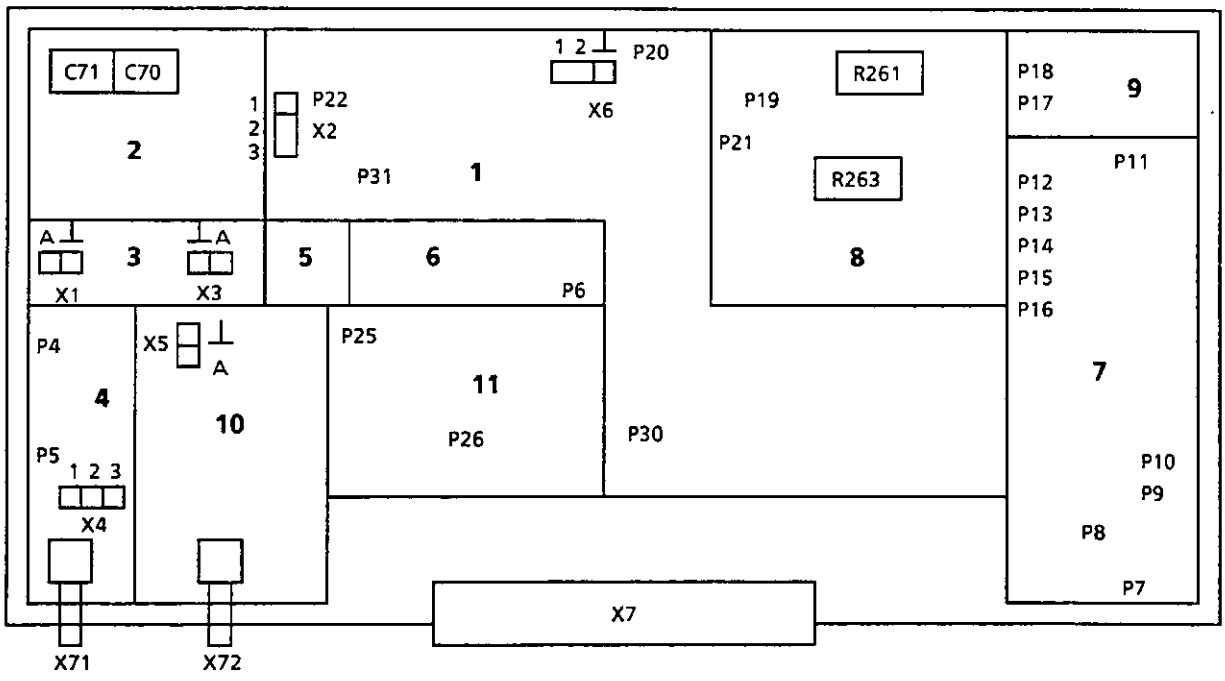
Test adapter

Frequency counter

Voltmeter
(e.g. URE)

Controller
(e.g. PUC)

Layout diagram



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Schaltteillisten
Stromläufe
Bestückungspläne
Part lists
Circuit diagrams
Components plans
Listes des pièces détachées
Schémas de Circuit
Plans des composants

(R 29500 Bl 2)
095.1000 Bl. 2

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C1	CK 1,5NF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7600.00	WESTERMANN	FKP2	
C2	CK 68NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2923.00	ROEDERSTEI	MKT 1826-368-06-4	
C3	CC 4,7NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8450.00	PHILIPS_CO	2238 581 16623	
C4	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C5	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C6	CC 2,2PF+-0,25 50VNP01206 CERAMIC CHIP CAPACITOR	CC 0007.8171.00	MURATA	GRM42-6C0G 2R2 C50PT	
C10	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C11	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C12	CC 220PF+-1%50V NP0 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C13	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C15	CK 33NF+-1% 63V 10QARD. CAPACITOR	CK 0294.6351.00	SIEMENS	B33531-A5333-F	
C19	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C22	CK 47NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2917.00	ERO	MKR 1826-347-06-4	
C23	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C24	CK 1UF+-5%250V RM22,5 CAPCITOR	0711.6747.00	SIEMENS	B32650-L3105-J	
C26	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C30	CC 22PF+-1%50V NP0 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6C0G 220F 50PT	
C35	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C36	CC 22PF+-1%50V NP0 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6C0G 220F 50PT	
C37	CC 1PF+-0,25 50V NP0 1206 CERAMIC CHIP CAPACITOR	CC 0099.8667.00	PHILIPS_CO	2238 863 15108	
C38	CC 470PF+-1%50V NP0 1206 CERAMIC CHIP CAPACITOR	CC 0099.8515.00	PHILIPS_CO	2238 863 18471	
C50	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C70	CT 13PF TAUCHTR.RD7X12 AIR-TYPE TRIMMER	CT 0092.4266.00	TEKELEC	AT 5401 1-14PF 250V-	
C71	CT 13PF TAUCHTR.RD7X12 AIR-TYPE TRIMMER	CT 0092.4266.00	TEKELEC	AT 5401 1-14PF 250V-	
C72	CG 33 PF+-1PF 250V TK+100 MICA CAPACITOR	CG 0006.9274.00	TAB	L1M	
C74	CC 22PF 2% N470/IA 3 ROHR CERAMIC CAPACITOR	0022.3019.00	DRALORIC	RDLL 3X10	
C75	CC 68PF+- 5%100V NP0 VIEL CERAMIC CAPACITOR	CC 0060.0759.00	AVX	MR051 A680JAA	
C76	CC 56PF+- 5%100V NP0 VIEL CERAMIC CAPACITOR	CC 0060.0742.00	AVX	MR051A560JAA	
C77	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C78	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C80	CC 330PF+- 5%100V NP0 VIE CERAMIC CAPACITOR	CC 0060.0836.00	AVX	MR05 1 A 331 JA...	
C81	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C83	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C87	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C90	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C91	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C92	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C93	CC 330PF+-1%50V NP0 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C95	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C96	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6C0G 101F 50PT	
C100	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C101	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C102	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C103	CC 22PF+-2%6X9P100 CAPACITOR	CC 0087.6335.00	PHILIPS_CO	2222 678	
C104	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6C0G 101F 50PT	
C110	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6C0G 101F 50PT	
C112	CC 18PF+-2%3X4N750 CAPACITOR	CC 0087.6812.00	PHILIPS_CO	2222 678 58 189	
C113	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C114	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	PHILIPS_CO	2222 581 16618	
C120	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C126	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C127	CE 220UF+-20%16V RM5 ELECTROLYTIC CAPACITOR	0008.7562.00	FROLYT	EKS00CC322D	
C128	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C130	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C134	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C135	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C136	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6C0G 101F 50PT	
C137	CC 680PF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8421.00	MURATA	GRM42-6 X7R681K50PT	
C138	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C140	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6C0G 101F 50PT	
C142	CC 220PF+-2%6X7N750 CAPACITOR	CC 0087.6941.00	PHILIPS_CO	2222 678 58221	
C143	CC 33PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8780.00	MURATA	GRM42-6C0G 330F 50PT	
C145	CC 270PF+-2%6X9N750 CAPACITOR	CC 0087.6958.00	PHILIPS_CO	2222 631 58271	
C146	CC 47PF+-1%50V C0G 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6C0G 470F 50PT	
C147	CC 270PF+-2%6X9N750 CAPACITOR	CC 0087.6958.00	PHILIPS_CO	2222 631 58271	
C148	CC 15PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8750.00	MURATA	GRM42-6C0G 150F 50PT	
C149	CC 120PF+-2%6X9NP0 CAPACITOR	CC 0087.6558.00	PHILIPS_CO	2222 678 10121	
C150	CC 56PF+-2%5X6NP0 CAPACITOR	CC 0087.6512.00	PHILIPS_CO	2222 678	
C152	CC 56PF+-2%5X6NP0 CAPACITOR	CC 0087.6512.00	PHILIPS_CO	2222 678	
C155	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C156	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C157	CC 22PF+-1%50V NP0 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6C0G 220F 50PT	
C158	CC 22PF+-1%50V NP0 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6C0G 220F 50PT	
C159	CC 22PF+-1%50V NP0 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6C0G 220F 50PT	
C160	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C161	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C162	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6C0G 101F 50PT	
C163	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C165	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C166	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C167	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C168	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C169	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C170	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C171	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C175	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C182	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C185	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C186	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C188	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C189	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C190 ..195	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C200	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C201	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C202	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C203	CC 390PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8880.00	PHILIPS_CO	2238 863 18391	
C212	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	MURATA	GRM42-6COG 100 C50PT	
C215	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C223	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C224	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C225	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C228	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C230	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C235	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C240	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C245	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C250	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C251	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C265	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C276	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C280	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C281	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C290	CK 68NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2923.00	ROEDERSTEI	MKT 1826-368-06-4	
C292	CK 470PF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7575.00	ROEDERSTEI	KP1830-147 01 1 3 W	
C293	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C301	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C305	CC 2,2PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8171.00	MURATA	GRM42-6COG 2R2 C50PT	

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C320	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C321	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C322	CC 3,3PF+-0,25PF3X4NP0 CAPACITOR	CC 0087.6364.00	PHILIPS_CO	2222 678	
C323	CC 47PF+-2%3X4N750 CAPACITOR	CC 0087.6864.00	PHILIPS_CO	2222 678 58479	
C326	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C327	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C330	CE 220UF+-20%16V RM5 ELECTROLYTIC CAPACITOR	0008.7562.00	FROLYT	EKS00CC322D	
C331	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C332	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C333	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C334	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C350	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C351	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C360	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C362	CC 27PF+-2%3X4N750 CAPACITOR	CC 0087.6835.00	VALVO	2222 678 58279	
C365	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C366	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C367	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C369	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C370	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C371	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6C0G 101F 50PT	
C372	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C373	CC 18PF+-2%3X4N750 CAPACITOR	CC 0087.6812.00	PHILIPS_CO	2222 678 58 189	
C374	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C375	CC 82PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8821.00	MURATA	GRM42-6C0G 820F 50PT	
C376	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6C0G 121F 50PT	
C377	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6C0G 101F 50PT	
C378	CC 6,8PF+-0,25 50VNP01206 CERAMIC CHIP CAPACITOR	CC 0007.8236.00	MURATA	GRM42-6C0G 6R8 C50PT	
C379	CC 15PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8750.00	MURATA	GRM42-6C0G 150F 50PT	
C380	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C381	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C385	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C387	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C388	CC 47PF+-1%50V C0G 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6C0G 470F 50PT	
C389	CC 47PF+-1%50V C0G 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6C0G 470F 50PT	
C390	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C391	CC 47PF+-1%50V C0G 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6C0G 470F 50PT	
C392	CC 47PF+-1%50V C0G 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6C0G 470F 50PT	
C393	CC 47PF+-1%50V C0G 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6C0G 470F 50PT	

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C394	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C395	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C396	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C397	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C402	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C405	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C407	CE 220UF+-20%16V RM5 ELECTROLYTIC CAPACITOR	0008.7562.00	FROLYT	EKS00CC322D	
C420	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C421	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C422	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C425	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C426	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C430	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C431	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C435	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C436	CE 2,2UF+-20%40V SAL ELECTR.CAPACITOR	CE 0007.3911.00	VALVO	2222 128 37228	
D10	BL MM74HC4538N 2XMULTIVIB DUAL MULTIVIBRATOR	0099.9740.00	PHILIPS_SE	(PC)74HC4538(N)	
D40	BL MM74HC4051N 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0099.9670.00	PHILIPS	(PC)74HC4051N(P)	
D126	BL 74AC161SC 4B.BIN CNT 4BIT SYNC.PRES.BIN COUNT.	BL 0820.3519.00	NSC	74AC161(SC)	
D160	BL PC74HC00T 4X2IN.NAND QUAD 2INPUT NAND GATE	BL 0007.3463.00	PHILIPS_SE	(PC)74HC00D(T)	
D165	BG L5A0429 FRACDIV ASIC GATE-ARRAY	0820.3290.00	LSI_LOGIC	L5A0429	
D175	BL 74AC161SC 4B.BIN CNT 4BIT SYNC.PRES.BIN COUNT.	BL 0820.3519.00	NSC	74AC161(SC)	
D180	BL PC74HCT00T 4X2IN.NAND NAND GATE	BL 0007.6156.00	PHILIPS_SE	(PC)74HCT00D(T)	
D185	BL PC74HCT175T 4XD-FF RES QUAD D-TYPE FLIPFLOP	BL 0007.6462.00	PHILIPS	(PC)74HCT175(T)	
D186	BL PC74HCT175T 4XD-FF RES QUAD D-TYPE FLIPFLOP	BL 0007.6462.00	PHILIPS	(PC)74HCT175(T)	
D200	BL PC74HC238P 3TO8 L.DEC DECODER/DEMULTIPLEXER	0620.0847.00	PHILIPS	(PC)74HC238N(P)	
D201	BL MM74HC4538N 2XMULTIVIB DUAL MULTIVIBRATOR	0099.9740.00	PHILIPS_SE	(PC)74HC4538(N)	
D205	BL MM74HC11N 3X3IN.ANDG TRIPLE 3-INPUT AND GATE	0099.9486.00	PHILIPS_SE	(PC)74HC11N(P)	
D210	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D211	BL MM74HC4051N 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0099.9670.00	PHILIPS	(PC)74HC4051N(P)	
D215	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D216	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D220	BL PC74HCT112T 2XJK-FF CL DUAL JK-FF	BL 0007.6327.00	PHILIPS	(PC)74HCT112(T)	
D221	BL PC74HCT00T 4X2IN.NAND NAND GATE	BL 0007.6156.00	PHILIPS_SE	(PC)74HCT00D(T)	
D380	BL 74AC74SC 2XD-FLIPFL DUAL D-TYPE FLIPF	BL 0820.3602.00	NSC	74AC74(SC)	
D385	BL PC74HC00T 4X2IN.NAND QUAD 2INPUT NAND GATE	BL 0007.3463.00	PHILIPS_SE	(PC)74HC00D(T)	
D387	BL 74AC161SC 4B.BIN CNT 4BIT SYNC.PRES.BIN COUNT.	BL 0820.3519.00	NSC	74AC161(SC)	
D390	BL PC74HCT161T BIN.COUNT. BINARY COUNTER	BL 0007.6427.00	PHILIPS_SE	(PC)74HCT161(D/T)	

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
D395	BL PC74HCT161T BIN.COUNT. BINARY COUNTER	BL 0007.6427.00	PHILIPS_SE	(PC)74HCT161(D/T)	
L12	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L35	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L60	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L61	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L72	LD 287NH 8,5W CM18P FE-K COIL+CORE	0613.6289.00	TOKO	E521HN080023	
L75	LD 4,70UH10%1,200HM0,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L80	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L90	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L101	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L102	LD 0,39UH10%0,300HM0,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L111	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L113	LD 0,39UH10%0,300HM0,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L142	LD 0,39UH10%0,300HM0,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L143	LD 0,56UH10%0,500HM0,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L146	LD 0,56UH10%0,500HM0,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L148	LD 0,56UH10%0,500HM0,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L155	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L175	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L280	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L326	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L333	LD 1,20UH10%0,180HM0,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L362	LD 0,47UH10%0,350HM0,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L365	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L372	LD 0,82UH10%0,850HM0,420A CHOKE	LD 0067.2857.00	DALE	IM2	
L375	LD 0,27UH10%0,160HM0,975A CHOKE	LD 0067.2792.00	DALE	IM2	
L376	LD 0,27UH10%0,160HM0,975A CHOKE	LD 0067.2792.00	DALE	IM2	
L377	LD 0,22UH10%0,140HM1,045A CHOKE	LD 0067.2786.00	DALE	IM2	
L405	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L420	LD 1,20UH10%0,180HM0,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L422	LD 1,20UH10%0,180HM0,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L425	LD 1,20UH10%0,180HM0,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L426	LD 1,20UH10%0,180HM0,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L430	LD 2,20UH10%0,400HM0,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L431	LD 2,20UH10%0,400HM0,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L435	LD 2,20UH10%0,400HM0,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L436	LD 2,20UH10%0,400HM0,415A CHOKE	LD 0067.2905.00	DALE	IM2	
N1	BO LF156J FET OPAMP OPERATIONAL AMPLIFIER	BO 0645.7251.00	ANALOG_DEV	PM156Z	

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
N2	BO AD744AQ FET OPAMP OPERATIONAL AMPLIFIER	0820.3590.00	ANALOG_DEV	AD744AQ	
N20	BS SD5000N 4X ANALOGSCH BJ SD5000N 4XANALOGSWITCH	BJ 0342.2340.00	TEMIC	SD5000ON(I)	
N300	BO SE5534AFE LN OPAMP OPERATIONAL AMPLIFIER	BO 0301.3335.00	SIGNETICS	SE5534AFE	
N330	BO NE5532AFE 2XLN OPAMP OPERATIONAL AMPLIFIER	BO 0356.0450.00	SIGNETICS	NE5532AFE	
N410	BO LM339N 4X COMPAR COMPARATOR	BO 0342.2062.00	NSC	LM339N	
P4 ..22	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
P25	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
P26	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
P30	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
P31	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
R1	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2	
R2	RL 0,60W 392 OHM+-1%TK50 RESISTOR	RL 0082.2183.00	RESISTA	MK2	
R3	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R6	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R7	RL 0,60W 210 KOHM+-1%TK50 RESISTOR	RL 0083.2258.00	RESISTA	MK2	
R8	RL 0,60W 107 KOHM+-1%TK50 RESISTOR	RL 0083.2035.00	RESISTA	MK2	
R9	RL 0,60W 53,6KOHM+-1%TK50 RESISTOR	RL 0082.2590.00	RESISTA	MK2	
R10	RG 221 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6004.00	ROEDERSTEI	D25	
R11	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R12	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R13	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R14	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R15	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R16	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R17	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R18	RL 0,35W27,4KOHM+-0,1%T25 RESISTOR	RL 0084.3906.00	DRALORIC	SMA0207	
R19	RL 0,35W13,7KOHM+-0,1%T25 RESISTOR	RL 0084.3329.00	DRALORIC	SMA0207	
R20	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R21	RL 0,35W6,81KOHM+-0,1%T25 RESISTOR	RL 0084.2745.00	DRALORIC	SMA0207	
R22	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R23	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R24	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R25	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R26	RL 0,60W 825 OHM+-1%TK50 RESISTOR	RL 0082.2502.00	RESISTA	MK2	
R27	RL 0,60W 392 KOHM+-1%TK50 RESISTOR	RL 0083.2512.00	RESISTA	MK2	
R28	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R29	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R30	RL 0,60W 182 KOHM+-1%TK50 RESISTOR	RL 0083.2193.00	RESISTA	MK2	

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R33	RL 0,35W3,40KOHM+-0,1%T25 RESISTOR	RL 0084.2168.00	DRALORIC	SMA0207	
R34	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R35	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R36	RL 0,35W6,98KOHM+-0,1%T25 RESISTOR	RL 0084.2768.00	DRALORIC	SMA0207	
R37	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R39	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R40	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R41	RG 1,3 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5708.00	ROEDERSTEI	D25	
R42	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R43	RG 2,43KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5750.00	ROEDERSTEI	D25	
R44	RG 3,57KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5795.00	ROEDERSTEI	D25	
R45	RG 5,62KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0735.00	ROEDERSTEI	D25	
R46	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R47	RG 27,4KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5895.00	ROEDERSTEI	D25	
R49	RL 0,60W 365 KOHM+-1%TK50 RESISTOR	RL 0083.2487.00	RESISTA	MK2	
R50	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R51	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R52	RL 0,60W 422 KOHM+-1%TK50 RESISTOR	RL 0083.2541.00	RESISTA	MK2	
R53	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R54	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R56	RG 15,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5843.00	ROEDERSTEI	D25	
R60	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R61	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R75	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R80	RL 0,60W 681 OHM+-1%TK50 RESISTOR	RL 0083.0490.00	RESISTA	MK2	
R81	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R84	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R85	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R86	RL 0,60W 5,62KOHM+-1%TK50 RESISTOR	RL 0082.2190.00	RESISTA	MK2	
R87	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R88	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R89	RL 0,60W 392 OHM+-1%TK50 RESISTOR	RL 0082.2183.00	RESISTA	MK2	
R90	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R95	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R100	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R101	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R104	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R110	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R111	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R112	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R113	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R114	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R115	RG 1,21KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9968.00	ROEDERSTEI	D25	
R116	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R117	RG 15,0 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5450.00	ROEDERSTEI	D25	
R120	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R121	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R122	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R123	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R124	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R126 ..128	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R129	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R135	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R136	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R137	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R140	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R141	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R142	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R143	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R144	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R145	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R146	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R150	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R151	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R152	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R153	RG 3,320HM+-1%TK100 1206 CHIP-RESISTOR	RG 0007.8388.00	PHILIPS	RC 02	
R155	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R156	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R159	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R160	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R161	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R162	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R163	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R164	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R165	RN 9X 1KOHM+-2%SIL10 H5 RESISTOR NETWORK	RN 0343.4323.00	BI_TECHNOL	L 10 1 S 102 M*	
R166	RN 9X 1KOHM+-2%SIL10 H5 RESISTOR NETWORK	RN 0343.4323.00	BI_TECHNOL	L 10 1 S 102 M*	
R167	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R168	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R169	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R173	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R175	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R176	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R177	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R180	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R182	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R185	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R186	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R187	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R188	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R190 ..195	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R200	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R201	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R202	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R205	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R206	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R207	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R208	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R210	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R211	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R212	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R213	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R214	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R215	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R216	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R217	RL 0,60W 5,62KOHM+-1%TK50 RESISTOR	RL 0082.2190.00	RESISTA	MK2	
R218	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R219	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R220	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R221	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R222	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R223	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R224	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	ROEDERSTEI	D25	
R225	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R228	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R229	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R230	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R231	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R235	RN 1X30K1/4X3K/1X2,74K/2X RESISTOR NETWORK	0801.4842.00	EBG	UPRN 11	
R236	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R237	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R240	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R241	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R245	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R246	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R250	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R251	RL 0,60W 75,0KOHM+-1%TK50 RESISTOR	RL 0083.1916.00	RESISTA	MK2	
R252	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R253	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R254	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R260	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R261	RS 0,75W10KOHM+-10%CERMET DEPOS.-CARBON POTENTIOMET	RS 0037.7396.00	BOURNS	3006 P-XXXXX	
R262	RL 0,60W 17,4KOHM+-1%TK50 RESISTOR	RL 0083.1468.00	RESISTA	MK2	
R263	RS 0,5W10KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0247.7903.00	SPECTROL	63 M ... TO 10	
R264	RL 0,60W 13,0KOHM+-1%TK50 RESISTOR	RL 0083.1368.00	RESISTA	MK2	
R265	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R267	RL 0,60W 301 KOHM+-1%TK50 RESISTOR	RL 0083.2406.00	RESISTA	MK2	
R268	RL 0,60W 301 OHM+-1%TK50 RESISTOR	RL 0083.0210.00	RESISTA	MK2	
R269	RL 0,60W 301 KOHM+-1%TK50 RESISTOR	RL 0083.2406.00	RESISTA	MK2	
R270	RL 0,60W 301 OHM+-1%TK50 RESISTOR	RL 0083.0210.00	RESISTA	MK2	
R275	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R276	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R280	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R281	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R282	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R290	RL 0,60W 7,50KOHM+-1%TK50 RESISTOR	RL 0083.1197.00	RESISTA	MK2	
R300	RG 1,21KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9968.00	ROEDERSTEI	D25	
R307	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R310	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R315 ..318	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R320	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R321	RL 0,60W 1,21KOHM+-1%TK50 RESISTOR	RL 0083.0655.00	RESISTA	MK2	
R322	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R323	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R324	RL 0,60W 2,61KOHM+-1%TK50 RESISTOR	RL 0083.0903.00	RESISTA	MK2	
R330	RL 0,60W 1,24KOHM+-1%TK50 RESISTOR	RL 0083.0661.00	RESISTA	MK2	
R331	RL 0,60W 1,24KOHM+-1%TK50 RESISTOR	RL 0083.0661.00	RESISTA	MK2	

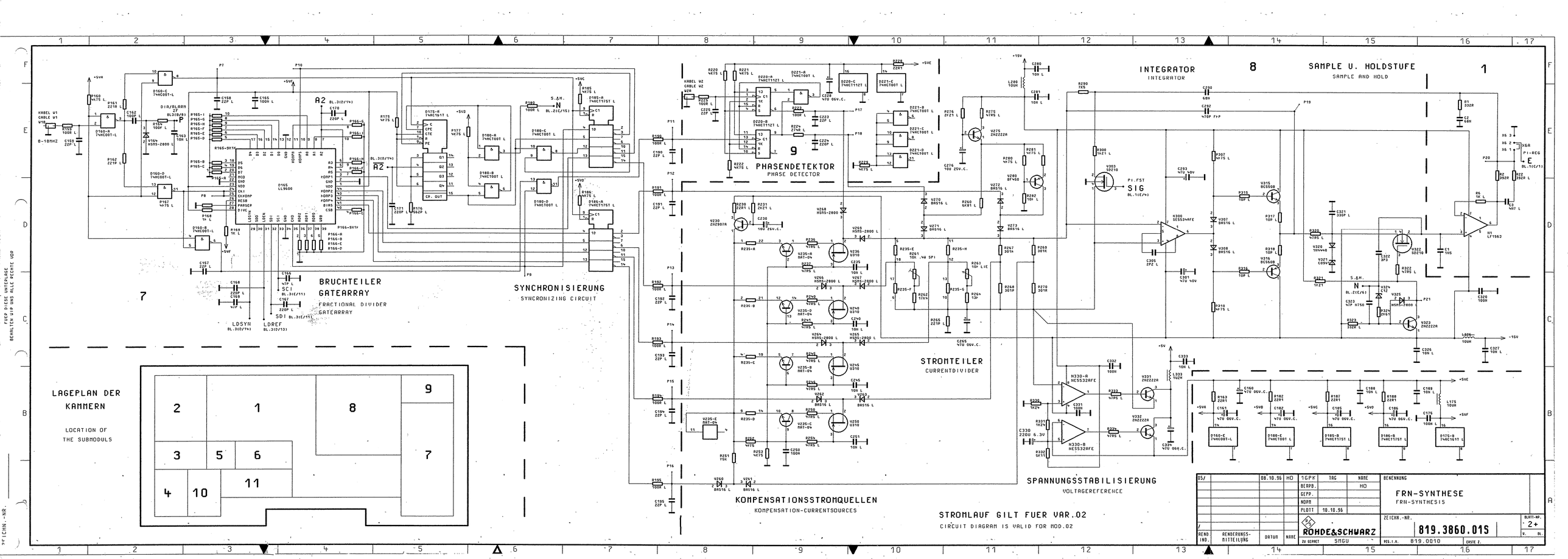
Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R332	RL 0,60W 5,11KOHM+-1%TK50 RESISTOR	RL 0082.2348.00	RESISTA	MK2	
R333	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R334	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R350	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R351	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R353	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R354	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R355	RL 0,60W 274 OHM+-1%TK50 RESISTOR	RL 0083.0178.00	RESISTA	MK2	
R360	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R361	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R362	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R363	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R364	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R370	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R371	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R372	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R373	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R375	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R376	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R380	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R381	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R386	RN 9X4,7KOHM+-2% SIL10 H5 NETWORK	RN 0327.0804.00	BI_TECHNOL	L 10 1 S 472 M*	
R387	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R388	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R399	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R405	RL 0,60W 121 OHM+-1%TK50 RESISTOR	RL 0082.9859.00	RESISTA	MK2	
R406	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R407	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R408	RG 9,09KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0787.00	ROEDERSTEI	D25	
R409	RL 0,60W 36,5KOHM+-1%TK50 RESISTOR	RL 0083.1716.00	RESISTA	MK2	
R410	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R411	RL 0,60W 10,5KOHM+-1%TK50 RESISTOR	RL 0083.1300.00	RESISTA	MK2	
R412	RL 0,60W 3,48KOHM+-1%TK50 RESISTOR	RL 0083.1016.00	RESISTA	MK2	
R413	RL 0,60W 174 KOHM+-1%TK50 RESISTOR	RL 0083.2170.00	RESISTA	MK2	
R414	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R415	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R416	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2	
R417	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R430	RL 0,60W4,75MOHM+-1%TK50 METALFILMRESISTOR	RL 0099.8250.00	RESISTA	MK2	

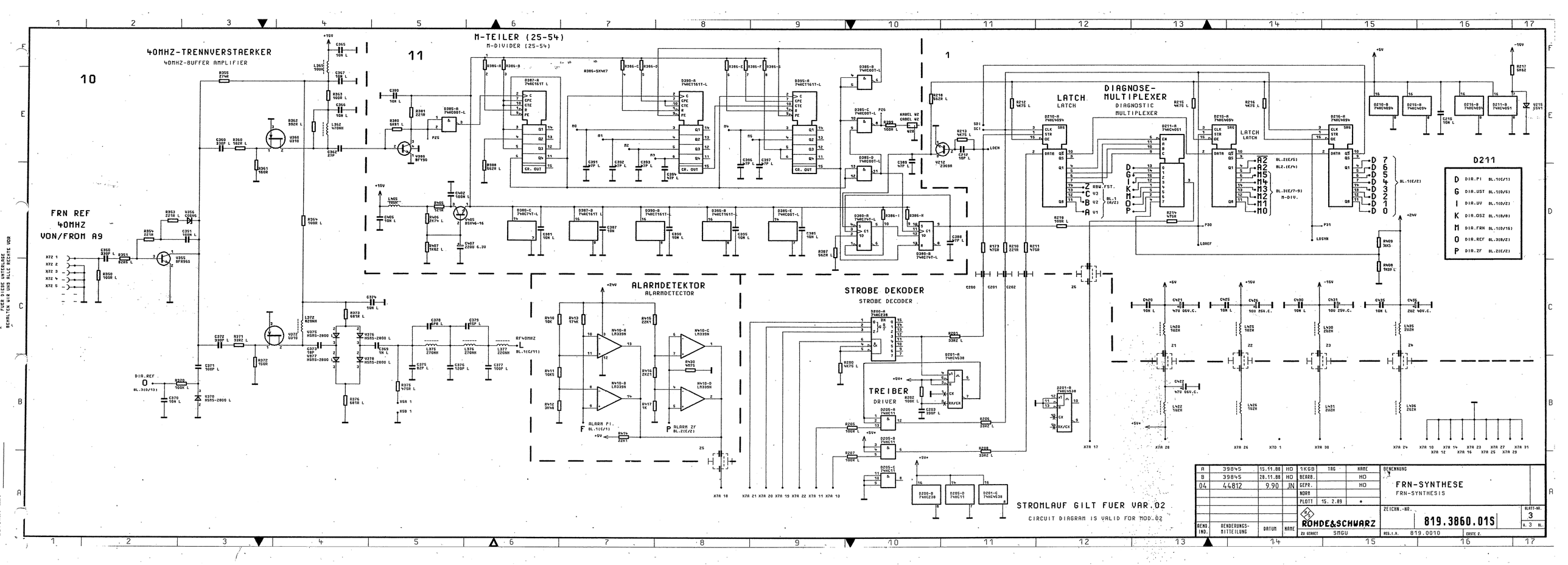
Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
U140	BM TAK1WH MIXER 750MHZ MIXER	0820.3483.00	MINI-CIRCU	TAK-1WH	
V10	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V12	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V13	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V14	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V20	AK BC337-40 N 45V 800MA TRANSISTOR	AK 0815.7684.00	PHILIPS	BC337-40 GEGURTET	
V21	AK BC327-40 P 45V 800MA TRANSISTOR	AK 0815.7678.00	PHILIPS_SE	BC327-40GEGURTET	
V22	AK BC327-40 P 45V 800MA TRANSISTOR	AK 0815.7678.00	PHILIPS_SE	BC327-40GEGURTET	
V23	AK BC337-40 N 45V 800MA TRANSISTOR	AK 0815.7684.00	PHILIPS	BC337-40 GEGURTET	
V24	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V25	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V26	AK 2N2907A P 60V 600MA TRANSISTOR	AK 0010.3583.00	VALVO	2N2907A	
V28 ..37	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V38 ..45	AE BZX55/B10 0,5W ZDI ZENER DIODE	AE 0289.4302.00	VALVO	BZX79B10	
V49	AE BZX55/B5V1 0,5W ZDI ZENER DIODE	AE 0262.5837.00	TELEFUNKEN	BZX55B5V1	
V50	AE BZX55/B5V1 0,5W ZDI ZENER DIODE	AE 0262.5837.00	TELEFUNKEN	BZX55B5V1	
V52	AE 1N827 6,2V REFDI REFERENCE DIODE	AE 0418.0029.00	COMPENSATE	1N827(A)	
V58 ..71	AE BB620 45/03PF CDI TUNING DIODE	0848.5251.00	SIEMENS	BB620	
V75	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V90	AK BFR91A N 12V 35MA TRANSISTOR	0644.0730.00	VALVO	BFR 91A	
V95	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V100	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V111	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V120	AK BFY90 N 15V 25MA TRANSISTOR	AK 0010.4550.00	VALVO	BFY90	
V125	AK BSX46-16 N 60V1000MA TRANSISTOR	AK 0010.6847.00	TEXAS	BSX46-16	
V135	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V150	AK BFY90 N 15V 25MA TRANSISTOR	AK 0010.4550.00	VALVO	BFY90	
V155	AK BFY90 N 15V 25MA TRANSISTOR	AK 0010.4550.00	VALVO	BFY90	
V164	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V212	AK 2N2369A N 15V 200MA TRANSISTOR	AK 0010.4680.00	VALVO	2N2369A ODER BSX20	
V215	AE BZX55/B5V1 0,5W ZDI ZENER DIODE	AE 0262.5837.00	TELEFUNKEN	BZX55B5V1	
V230	AK 2N2907A P 60V 600MA TRANSISTOR	AK 0010.3583.00	VALVO	2N2907A	
V235	AK MAT04FP 4XN TR.ARRAY TRANSISTOR ARRAY	0820.3577.00	PMI	MAT04FP	
V236	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V240	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V245	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V250	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V260 ..263	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V264 ..269	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V270 ..273	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V275	AK 2N2222A N 40V 800MA TRANSISTOR	AK 0010.5405.00	VALVO	2N2222A	
V280	AK BF450 P 40V 25MA TRANSISTOR	AK 0342.2240.00	SIEMENS	BF450	
V303	AM SD210DE N-E 30V MOSF MOS-FET	0844.7637.00	SILICONIX	SD210DE	
V307	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V308	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V315	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V316	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
V320	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V321	AE BZX79/B9V1 0,5W ZDI ZENER DIODE	AE 0491.7507.00	VALVO	BZX79B9V1	
V322	AM SD210DE N-E 30V MOSF MOS-FET	0844.7637.00	SILICONIX	SD210DE	
V323	AK 2N2222A N 40V 800MA TRANSISTOR	AK 0010.5405.00	VALVO	2N2222A	
V324	AE BZX55/B12 0,5W ZDI ZENER DIODE	AE 0218.8940.00	VALVO	BZX79B12	
V325	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V331	AK 2N2222A N 40V 800MA TRANSISTOR	AK 0010.5405.00	VALVO	2N2222A	
V332	AK 2N2222A N 40V 800MA TRANSISTOR	AK 0010.5405.00	VALVO	2N2222A	
V355	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V356	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V360	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V370	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V372	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V375 ..378	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V380	AK BFY90 N 15V 25MA TRANSISTOR	AK 0010.4550.00	VALVO	BFY90	
V405	AK BSX46-16 N 60V1000MA TRANSISTOR	AK 0010.6847.00	TEXAS	BSX46-16	
W1	DX KABEL W1 CABLE	0819.4496.00			0819.4473.00
W2	DX KABEL W2 CABLE	0819.4480.00			0819.4473.00
X2	FP STIFTLEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X4	FP STIFTLEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X6	FP STIFTLEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X7	FP STECKERLEISTE 32POL. MULTIPOINT CONNECTOR	FP 0514.4550.00	SIEMENS	V42254-B1200-B641	
X71	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X72	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X1A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X1B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X3A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X3B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X5A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	

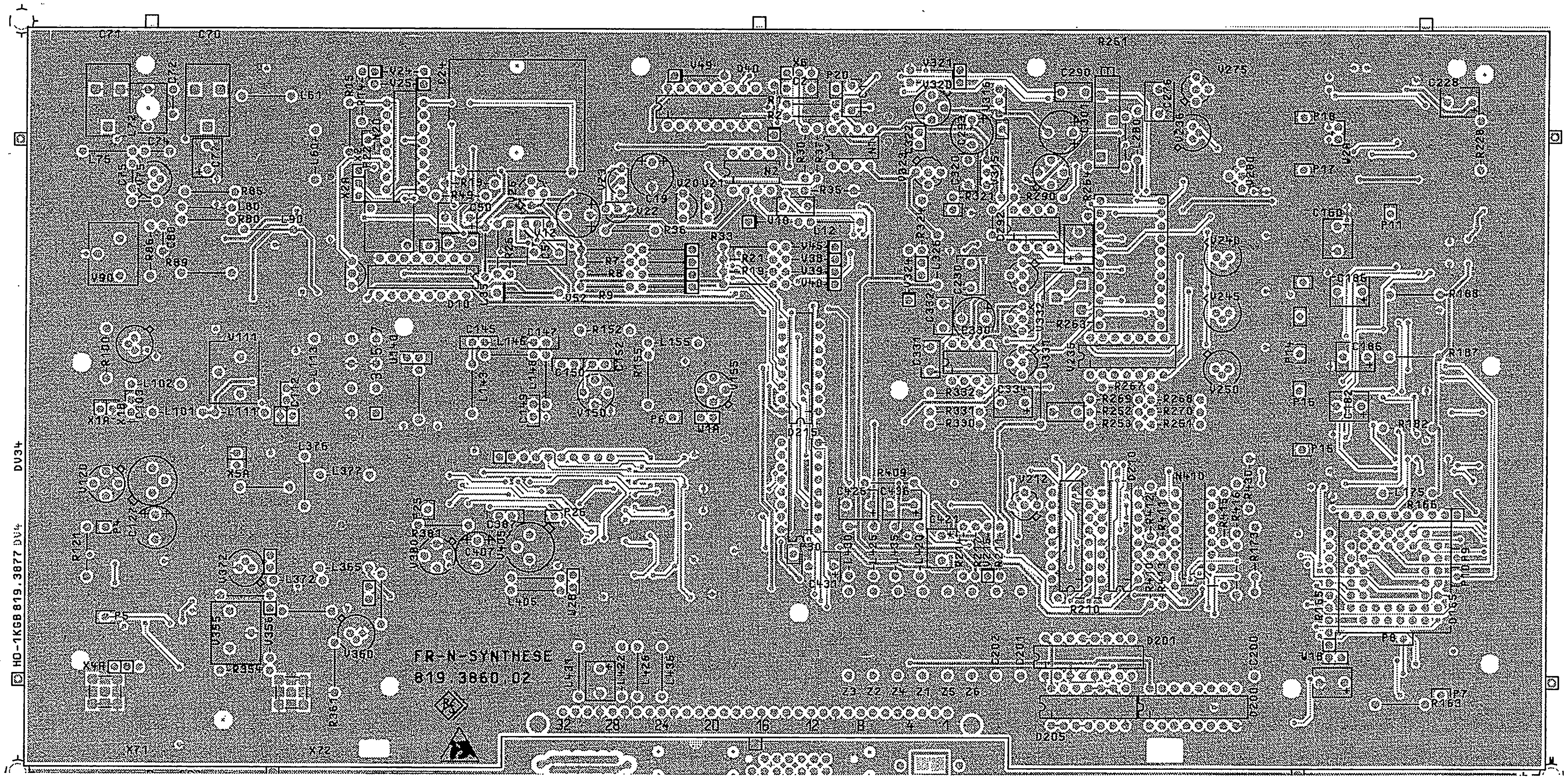
Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
X5B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
Z1 ..6	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	


VOREINSTELL-
SPANNUNGS D/A
PRETUNE-
VOLTAGE D/A
1
LOOPFILTER
LOOPFILTER
VERSTAERKUNGSKORREKTUR
LOOP GAIN SWITCH
2
OSZILLATOR 48-58MHZ
OSCILLATOR 48-58MHZ
3
TRENNSTUFE
BUFFER AMPLIFIER
4
TEILER %16
DIVIDER %16
FRN
3-3,625MHZ
ZU/TO A10
5
MISCHER
MIXER
6
TIEFPASS/ZF-VERSTAERKER 8-18MHZ
LOWPASS/IF-AMPLIFIER 8-18MHZ
STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02
ACHTUNG: EGB!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG.
ATTENTION: ESD!
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING.
FRN-SYNTHESE
FRN-SYNTHESIS
ROHDE&SCHWARZ
819.3860.01S
SMGU
819.0010
FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR


BRUCHTEILER
GATEARRAY
FRACTIONAL DIVIDER
GATEARRAY
SYNCHRONISIERUNG
SYNCHRONIZING CIRCUIT
PHASENDETEKTOR
PHASE DETECTOR
STROMTEILER
CURRENTDIVIDER
KOMPENSATIONSSTROMQUELLEN
KOMPENSATION-CURRENTSOURCES
SPANNUNGSSTABILISIERUNG
VOLTAGEREFERENCE
INTEGRATOR
INTEGRATOR
SAMPLE U. HOLDSTUFE
SAMPLE AND HOLD
LAGEPLAN DER KAMMERN
LOCATION OF THE SUBMODULS
STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02
FRN-SYNTHESE
FRN-SYNTHESIS
ROHDE&SCHWARZ
819.3860.01S
819.0010
SMGU
08.10.96
HO
FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR


40MHZ-TRENNVERSTAERKER
40MHZ-BUFFER AMPLIFIER
10
M-TEILER (25-54)
M-DIVIDER (25-54)
11
1
LATCH
LATCH
DIAGNOSE-
MULTIPLEXER
DIAGNOSTIC
MULTIPLEXER
LATCH
LATCH
FRN REF
40MHZ
VON/FROM A9
ALARMDETEKTOR
ALARMDETECTOR
STROBE DEKODER
STROBE DECODER
TREIBER
DRIVER
STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02
D211
D DIR.P1 BL.1(C/1)
G DIR.UST BL.1(D/5)
I DIR.UV BL.1(D/2)
K DIR.OSZ BL.1(B/8)
M DIR.FRN BL.1(D/16)
O DIR.REF BL.3(B/2)
P DIR.ZF BL.2(E/2)
FRN-SYNTHESE
FRN-SYNTHESIS
ROHDE&SCHWARZ
819.3860.01S
819.0010
BLATT-NR. 3
V. 3 BL.

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



VARIANTENERKLÄRUNG / VERSION
VAR 02 – GRUNDAUSFÜHRUNG / BASIC MODEL

ACHTUNG: EGB!
Elektrostatisch gefährdete Bauelemente erfordern eine besondere Handhabung.
ATTENTION ESD!
Electrostatic sensitive devices require a special handling.
(hierzu HVC 250)

Änd. Zust.	Änderungs-Mitteilung	Tag	Name
D	39845	02.89	HO

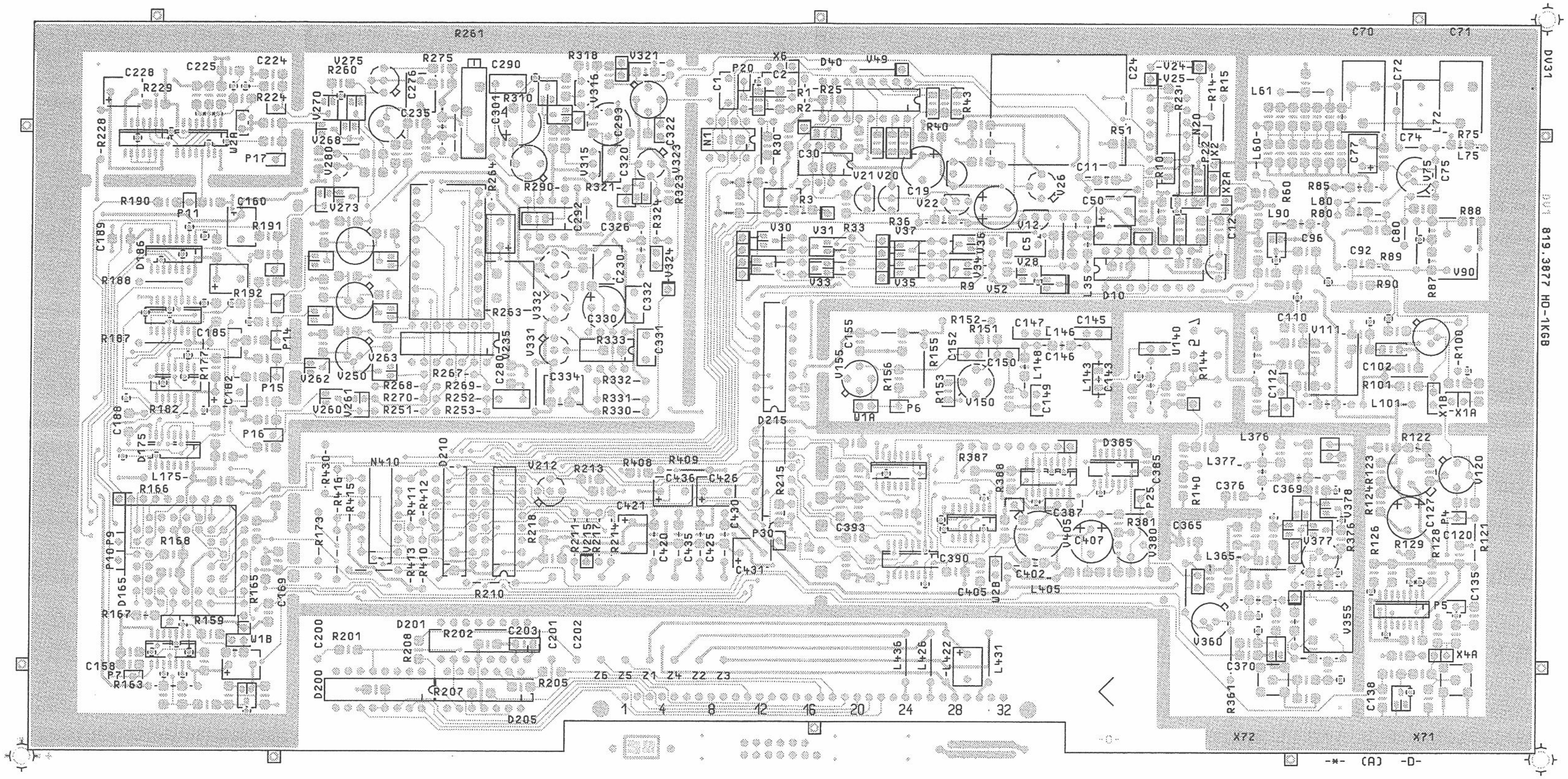
Maße ohne Toleranzangabe		
1KGB	Tag	Name
Bearb.	02.89	HO
Gepr.		
Norm		

ROHDE&SCHWARZ
zu Gerät: SMGU

Maßstab: 1 : 1
Halbzeug, Werkstoff
Benennung: FRN-SYNTHESE
Z
Zeichn.-Nr.: 819.3860.02
Blatt-Nr.: 2 v. Bl.
reg. i. V.: 819.0010 V
erste Z.

A
B
C
D
E
F

Ansicht und Leitungsführung Lötseite
View of tracks on solder side



Für diese Unterlage behalten wir uns alle Rechte vor.

(hierzu HVC 250)

ACHTUNG: EGB!
Elektrostatisch gefährdete Bauelemente erfordern eine besondere Handhabung.

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Electrostatic sensitive devices require a special handling.

VARIANTENERKLÄRUNG / VERSION
VAR 02 – GRUNDAUSFÜHRUNG / BASIC MODEL

Änd. Zust.	Änderungs-Mitteilung	Tag	Name		
D	39845	02.89	HO	Maße ohne Toleranzangabe	Maßstab 1 : 1
					Halbzeug, Werkstoff
				1KGB / Tag / Name	Benennung
				Bearb. 02.89 HO	FRN-SYNTHESE
				Gepr	Z
				Norm	
				ROHDE & SCHWARZ	Zeichn.-Nr. 819.3860.02 / Blatt-Nr. 3 / v. Bl.
				zu Gerät SMGU	reg. i. V. 819.0010 V / erste Z.