Lab gruppen fp6400 service manual

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The signal is then passing the gain control on the front panel, going to amplifier U2 (IN2GTD). The gain in this amplifier can be reduced by opto resistor U5 to prevent clipping in the output amplifier. Limiter Q1, Q2 together with the phase linear lowpassfilter U3, U4 limits the slewrate of the signal going to the output amplifier A20TDL, preventing intermodulation in this amplifier if signals of too high frequencies are presented on the input terminal. The output amplifier A20TDL works as an ordinary power amplifier with the difference that the collector voltage to the output transistors is supplied from the switch mode amplifier A20TDH. The base voltage of the output transistors Q26-Q28, Q31-Q33 (A20TDL) is sensed by voltage divider R36-R38 and is then sent to the adjustable limiter U3, U4 on the IN2GTD-board, before it reaches the input of the switch mode amplifier (A20TDH) . Limit level is set by the MLS switches S1 and S2. This limiter is used to limit the maximum output voltage from the amplifier. These switches also change the sensitivity for the led bars on the front panel. The amplifier U1 (U2) on the A20TDH-board makes sure that the output signal on terminal CP4 (CP8) is a copy of the input signal on terminal CP12, by giving correct control voltage to pulse width modulator U3. U3 compares this voltage with an 614kHz triangular wave giving a pulse width modulated output signal from Q1 (Q7) which is filtered by L1, C1 (L4, C10). The gain from the base of the output transistors on the A20TDL-board to the output of the A20TDH-board is equal to one. VR1 (VR2) is used to add a DC-offset on the input of U1 (U2) giving +7,5V (CP4) -7,5V (CP8) relative output of the LF-amplifier (CP6A), which is the same as collector-emitter voltage for the output transistors Q26-Q28 and Q31-Q33. Repairing instructions REQUIRED MEASUREMENT EQUIPMENT: -Audio generator -Dummy load, 16 ohm -AC-voltmeter/THD-meter -2 digital voltmeters - Two channel oscilloscope for audio 1.Without changing any fuses check the power supply +155V, -155V, +16V, -16V and +45V. If these aren't OK go to the service manual for the power supply. (The +45V voltage is not regulated and can vary between 30 and 60V depending on the load of the power supply.) 2.If all fuses are OK, follow the signal from input to output, and repair in normal way. The best way is to place the amplifier on the front handles, loosen the rear panel, and mount it back on distances (delivered with this manual) to make it possible to measure. 3.If there is a fault in the power amplifier stage do as follows: 3:1 Turn VR1, VR2 (A20TDH) and VR3 (SP80FB) counter clockwise. 3:2 Short-circuit R38 on A20TDL-board. 3:3 Disconnect cables from CP23 and CP24 (A20TDL) (Q26-Q28 and Q31-Q33 collectors). 3:4 Replace broken fuses. (only for the channel you repair) 3:5 Connect DC-voltmeter (200V) to the positive (negative) rail voltage. 3:6 Connect another DC-voltmeter (20V) to the cable disconnected from CP23 (CP24). 3:7 Turn VR3 (SP80FB) slowly clockwise, and watch the voltmeters. Rail voltage should increase rapidly, "collector voltage" should read 0. After turning VR3 maximum 30°, rail voltage should be 155V. = рЙкобЕЙ=j~ем~д=CmSQMM= m~ÖÉ=Q=EUF= = a)If the rail voltage is zero or very low, check Q1, D1A, D1B (Q7, D5A, D5B) (shorted) on the A20TDHboard. If Q1 (Q7) is broken, also replace R3 (R16) and D2 (D6). b)If the rail voltage is OK, turn VR1 (VR2) on the A20TDH-board slowly maximum clockwise. Voltage measured on the disconnected collector cable should stop at about 7,5V. c)If OK turn VR1 (VR2) (A20TDH) and TP3 (SP80FB) counter clockwise. 3:8 Repeat from 3:5 for the negative side. 3:9 Reconnect cable to CP23 (Q26-Q28 collector). 3:10 Connect dummy load 16 ohm to output, and connect an oscilloscope (10V/div) across the load. 3:11 Slowly turn VR3 (SP80FB) for 155V (-155V) rail voltage. 3:12 Slowly turn VR1 (VR2) (A20TDH) clockwise and look at the oscilloscope. There should be no DC on the oscilloscope. If there is DC (>1V) repair the positive (negative) output section on the A20TDL-board. 3:13 Turn back VR1 (VR2) (A20TDH) and VR3 (SP80FB), and disconnect the cable from CP23 (Q26-Q28 collector). 3:14 Reconnect cable to CP24 (Q31-Q33 collector) and repeat from 3:11 for the negative side. 3:15 Reconnect cables to CP23 and CP24. Turn VR3 for 155V rail voltage. Turn VR1 clockwise, no DC on the oscilloscope. Then slowly turn VR2 clockwise. There can be some oscillation with VR2 in middle position, but it will stop at further turning. 3:16 Connect 1kHz sine wave to the input of the amplifier. Adjust gain until there is signal on the output. It should be a 7V PK sine wave with no distortion. 3:17 Disconnect short circuit from R38, and the amplifier will work. = рЙкобЕЙ=j~ем~д=CmSQMM= m~ÖÉ=R=EUF= = рЙкобЕЙ=j~ем~д=CmSQMM= m~ÖÉ=S=EUF= = рЙкобЕЙ=j~ем~д=CmSQMM= m~ÖÉ=T=EUF= = `згйзеЙен=дблн= - Safety critical component. Should only be replaced with the specified type. Position Partnumber Description Comment FAN201 F80x25-24HS Fan 80x80x25mm 24VDC high speed FAN202 F80x25-24HS Fan 80x80x25mm 24VDC high speed K201 6K4FUI9330_LAB Trafo. 6,4KW flyback U93/76/30 I93/28/30 core LAB. Rev01 P1 NL4MP_NEU Connector speakon 4pole NEUTRIK NL4MP P2 CASOC5P270_LAB Cable assembly socket crimp terminal 5pole L270mm LAB. Rev01 P3 SOIDC3P1M_AMP Socket IDC terminal 3pole 1module AMP 640441-3 P101 NL4MP_NEU Connector speakon 4pole NEUTRIK NL4MP P102 CASOC5P270_LAB Cable assembly socket crimp terminal 5pole L270mm LAB. Rev01 P103 SOIDC3P1M_AMP Socket IDC terminal 3pole 1module AMP 640441-3 P201 Variant dependent, see separate list P201A Variant dependent, see separate list S201 Variant dependent, see separate list VR1 VR10KLIN31_TOK Potentiometer 10K LIN 31step TOKOS B103 TP96N08 Y4929 Rev1 VR101 VR10KLIN31_TOK Potentiometer 10K LIN 31step TOKOS B103 TP96N08 Y4929 Rev1 s~кб~ен=лйЙе6С6Е=ЕзгйзеЙенл= Position 230V 115V P201 MLEU3x1.52.5mBLK SJOOW-3xAWG12 P201A - MP5-15P15A125V S201 RK1-1-10A15x21 RK1-1-6A15x21 аЙлЕкбйнбзе=Сзк=о~кб~ен=3ЙйЙе3Йен=ЕзгйзеЙенл= Partnumber Description MLEU3x1.52.5mBLK Mains lead EU Plug type CEE7/VII 3x1.5mm2 2.5m Black MP5-15P15A125V Mains plug type 5-15P 15A 125V RK1-1-10A15x21 Switch Rocker Single Pole Double Trough on - on 10A 15x21mm RK1-1-6A15x21 Switch Rocker Single Pole Double Trough on - on 6A 15x21mm SJOOW-3xAWG12 Cable SJOOW 3xAWG12 UL style 817 = рЙкобЕЙ=j~ем~д=CmSQMM= m~ЦЙ=U=EUF= = pé~êÉé~êí=ãáêí=Ñçê=ÑmSQMM= Completed modules Partnumber Description A20TDH-32-2 Amplifier high frequency 2kW class TD, variant 32-2 A20TDL-32-2 Amplifier low frequency 2kW class TD, variant 32-2 IN2GTD-2x32-2 2 channel input amplifier and gainswitch class TD, variant 2x32-2 LD92-2x32-2 Led display 9 x led 2 channel, variant 2x32-2 SP80CB-2x32-2 Switch mode powersupply 8kW capacitor bank, variant 2x32-2 SP80FA-2x32-2 Switch mode powersupply 8kW flyback board A, variant 2x32-2, 230V SP80FA-2x32-2U Switch mode powersupply 8kW flyback board A, variant 2x32-2U, 115V SP80FB-2x32-2 Switch mode powersupply 8kW flyback board B, variant 2x32-2, 230V SP80FB-2x32-2U Switch mode powersupply 8kW flyback board B, variant 2x32-2U, 115V PIND-2x32-2 Led display power indication 2 x led, 230V PIND-2x32-2U Led display power indication 2 x led, 115V Mecanical parts - Safety critical component. Should only be replaced with the specified type. Partnumber Description TCA20TDA-PBLK Top / bottom cover FP-FP6400 Front panel SPLA20TDA-A Side panel left SPRA20TDA-A Side panel right RP-FP6400 Rear panel 230V RP-FP6400U Rear panel 115V HDL2HEM5_MEN Handle DCSL1-PBLK Dustfilter clip left DCSR1-PBLK Dustfilter clip right DF139x62x5-20 Dustfilter left DF115x62x5-20 Dustfilter right KNBD18.5_TAI Gain potentiometer knob Screws Partnumber Description MRX3x10SV Machine screw, pan head, phillips, M3x10, black MFX3x12SV Machine screw, countersunk head, phillips, M3x12, black MFX3x20SV Machine screw, countersunk head, phillips, M3x20, black RTS-HST2.9x9.5SV Self tapping screw, pan head, torx, 2.9x9.5mm, black MC6S4x10FBB-SV Hexagon socket screw, cap head, M4x10 with spring washer, black LAB_T3x8-SV Top / bottom cover screw, torx, M3x8, black = рЙкобЕЙ=j~ем~д=^OMqae= m~ÖÉ=N=ETF= = A20TDH Schematics for A20TDH..... 2 Board placement for A20TDH..... 3 Component list for A20TDH-32-2 - rev 02..... 4 = рЙкобЕЙ=j~ем~д=^OMqae= m~ÖÉ=O=ETF= = рЙкобЕЙ=j~ем~д=^OMqae= m~ÖÉ=P=ETF= = рЙкобЕЙ=j~ем~д=^OMqae= m~ÖÉ=Q=ETF= = `згйзеЙен=дблн=Сзк=^OMqaeJPOJO=J=кЙо=MO= - Safety critical component. Should only be replaced with the specified type. Position Partnumber Description Comment Side C1 330n250VMMK15 Capacitor polyester 330n 250V MMK 15mm Top C2 330n250VMMK15 Capacitor polyester 330n 250V MMK 15mm Top C3 330n250VMMK15 Capacitor polyester 330n 250V MMK 15mm Top C4 3u3160VMKP27.5 Capacitor polypropylene 3u3 160V MKP 27.5mm May have different Top value C5 1u50VMMK5 Capacitor polyester 1u 50V MMK 5mm Top C6 4n7200VX7R5%5 Capacitor ceramic 4n7 200V X7R 5% 5mm Top C7 470u10V10x18A Capacitor electrolytic 470u 10V 10x18mm axial Top C8 100n63VMMK5 Capacitor polyester 100n 63V MMK 5mm Top C9 10u50V Capacitor electrolytic 10u 50V 5mm Top C10 330n250VMMK15 Capacitor polyester 330n 250V MMK 15mm Top C11 330n250VMMK15 Capacitor polyester 330n 250V MMK 15mm Top C12 330n250VMMK15 Capacitor polyester 330n 250V MMK 15mm Top C13 3u3160VMKP27.5 Capacitor polypropylene 3u3 160V MKP 27.5mm May have different Top value C14 1u50VMMK5 Capacitor polyester 1u 50V MMK 5mm Top C15 4n7200VX7R5%5 Capacitor ceramic 4n7 200V X7R 5% 5mm Top C16 470u10V10x18A Capacitor electrolytic 470u 10V 10x18mm axial Top C17 100n63VMMK5 Capacitor polyester 100n 63V MMK 5mm Top C18 10u50V Capacitor electrolytic 10u 50V 5mm Top C19 100n63VMMK5 Capacitor polyester 100n 63V MMK 5mm Top C20 10u50V Capacitor electrolytic 10u 50V 5mm Top C21 100n63VMMK5 Capacitor polyester 100n 63V MMK 5mm Top C22 10u50V Capacitor electrolytic 10u 50V 5mm Top C23 2n2250VMMK5 Capacitor polyester 2n2 250V MMK 5mm Top C24 100p200VNP05%5 Capacitor ceramic 100p 200V NP0 5% 5mm Top C25 39p200VNP05%5 Capacitor ceramic 39p 200V NP0 5% 5mm Top C26 270p100VNP05%5 Capacitor ceramic 270p 100V NP0 5% 5mm Top C27 2n2250VMMK5 Capacitor polyester 2n2 250V MMK 5mm Top C28 100p200VNP05%5 Capacitor ceramic 100p 200V NP0 5% 5mm Top C29 39p200VNP05%5 Capacitor ceramic 39p 200V NP0 5% 5mm Top C30 270p100VNP05%5 Capacitor ceramic 270p 100V NP0 5% 5mm Top C31 68p200VNP05%5 Capacitor ceramic 68p 200V NP0 5% 5mm Top C32 1n200VNP05%5 Capacitor ceramic 1n 200V NP0 5% 5mm Top C33 100n63VMMK5 Capacitor polyester 100n 63V MMK 5mm Top C34 100n63VMMK5 Capacitor polyester 100n 63V MMK 5mm Top C35 100n63VMMK5 Capacitor polyester 100n 63V MMK 5mm Top C36 100n63VMMK5 Capacitor polyester 100n 63V MMK 5mm Top C37 10u50V Capacitor electrolytic 10u 50V 5mm Top C38 1n200VNP05%5 Capacitor ceramic 1n 200V NP0 5% 5mm Top C39 220p200VNP05%5 Capacitor ceramic 220p 200V NP0 5% 5mm Top C40 - Not used Top C40A 2u2100VMMK15 Capacitor polyester 2u2 100V MMK 15mm Top C41 1n200VNP05%5 Capacitor ceramic 1n 200V NP0 5% 5mm Top C42 100n50VY5W5%5 Capacitor ceramic 100n 50V Y5W 5% 5mm Bot. C43 - Not used Top C44 1n5200V_MUR Feed trough capacitor 1n5 200V Murata Bot. TF418454E152P C45 1n5200V_MUR Feed trough capacitor 1n5 200V Murata Bot. TF418454E152P = = рЙкобЕЙ=j~ем~д=^OMqae= m~ÖÉ=R=ETF= Position Partnumber Description Comment Side C46 1n5200V_MUR Feed trough capacitor 1n5 200V Murata Bot. TF418454E152P C47 1n5200V_MUR Feed trough capacitor 1n5 200V Murata Bot. TF418454E152P C48 1n5200V_MUR Feed trough capacitor 1n5 200V Murata Bot. TF418454E152P C49 220p200VNP05%5 Capacitor ceramic 220p 200V NP0 5% 5mm Top C50 220p200VNP05%5 Capacitor ceramic 220p 200V NP0 5% 5mm Top C51 1n200VNP05%5 Capacitor ceramic 1n 200V NP0 5% 5mm Top C52 1n200VNP05%5 Capacitor ceramic 1n 200V NP0 5% 5mm Top C53 470p200VNP05%5 Capacitor ceramic 470p 200V NP0 5% 5mm Top C54 470p200VNP05%5 Capacitor ceramic 470p 200V NP0 5% 5mm Top C55 - Not used Top C56 - Not used Top D1 - Not used Bot. D1A BYW81PI200LY Diode power BYW81PI200 lying Bot. D1B BYW81PI200LY Diode power BYW81PI200 lying Bot. D2 BZW06P15B Diode transient voltage suppression BZW06P15B Top D3 5V6.4W2% Diode zener 5V6 .4W 2% Top D4 BYW100-200 Diode power switch BYW100-200 Top D5 - Not used Bot. D5A BYW81PI200LY Diode power BYW81PI200 lying Bot. D5B BYW81PI200LY Diode power BYW81PI200 lying Bot. D6 BZW06P15B Diode transient voltage suppression BZW06P15B Top D7 5V6.4W2% Diode zener 5V6 .4W 2% Top D8 BYW100-200 Diode power switch BYW100-200 Top D9 12V.4W5% Diode zener 12V .4W 5% Top D10 12V.4W5% Diode zener 12V .4W 5% Top D11 12V.4W5% Diode zener 12V .4W 5% Top D12 12V.4W5% Diode zener 12V .4W 5% Top D13 18V1.3W5% Diode zener 18V 1.3W 5% Top D14 27V.4W5% Diode zener 27V .4W 5% Top K1 T5WFE20-10-6_LAB Transformer 5W flyback E20-10-6 LHM core Top LAB.GRUPPEN Rev 01 L1 13uHRM14_LAB Inductor 13uH RM14 LAB.GRUPPEN Rev 01 Top L2 u5HD1.18ST_LAB Inductor u5H Lab.gruppen Rev 01 Top L3 u5HD1.18ST_LAB Inductor u5H Lab.gruppen Rev 01 Top L4 13uHRM14_LAB Inductor 13uH RM14 LAB.GRUPPEN Rev 01 Top L5 u5HD1.18ST_LAB Inductor u5H Lab.gruppen Rev 01 Top L6 u5HD1.18ST_LAB Inductor u5H Lab.gruppen Rev 01 Top L7 47uHA6M Inductor 47uH axial 6 modules Top L8 47uHA6M Inductor 47uH axial 6 modules Top L9 47uHA6M Inductor 47uH axial 6 modules Top L10 47uHA6M Inductor 47uH axial 6 modules Top L11 u5HD1.18ST_LAB Inductor u5H Lab.gruppen Rev 01 Top P1 PH3P90L1M_AMP Pin header 3pole 90dg locking 1module AMP 640457-3 Top Q1 IXFN73N30 Transistor MOS power IXFN73N30 Bot. Q2 MTP2955 Transistor MOS power MTP2955 Top Q3 BUZ71 Transistor MOS power BUZ71 Top Q4 ZTX651STZ Transistor bipolar signal ZTX651STZ Top Q5 ZTX751STZ Transistor bipolar signal ZTX751STZ Top Q6 TIP120 Transistor bipolar power TIP120 Top Q7 IXFN73N30 Transistor MOS power IXFN73N30 Bot. Q8 MTP2955 Transistor MOS power MTP2955 Top Q9 BUZ71 Transistor MOS power BUZ71 Top Q10 ZTX651STZ Transistor bipolar signal ZTX651STZ Top = = рЙкобЕЙ=j~ем~д=^OMqae= m~ÖÉ=S=ETF= Position Partnumber Description Comment Side Q11 ZTX751STZ Transistor bipolar signal ZTX751STZ Top Q12 TIP120 Transistor bipolar power TIP120 Top Q13 IRF730 Transistor MOS power IRF730 Top Q14 BC557B Transistor bipolar signal BC557B Top R2 2R22W5%SO5 Resistor metal film 2R2 2W 5% 5mm stand off Top R3 4R7.25W5% Resistor Carbon Film 4R7.25W5% Top R4 1R1W5%SO5 Resistor metal film 1R 1W 5% 5mm stand off Top R5 680R.25W5% Resistor Carbon Film 680R.25W5% Top R6 47R.25W5% Resistor Carbon Film 47R.25W5% Top R7 2K2.7W1% Resistor Metal Film 2K2.7W1% Top R8 22K.25W5% Resistor Carbon Film 22K.25W5% Top R9 820R.25W5% Resistor Carbon Film 820R.25W5% Top R10 47R.25W5% Resistor Carbon Film 47R.25W5% Top R11 2K2.7W1% Resistor Metal Film 2K2.7W1% Top R12 4K7.7W1% Resistor Metal Film 4K7.7W1% Top R13 15R6W5%SO5 Resistor wirewound 15R 6W 5% 5mm stand off Top R15 2R22W5%SO5 Resistor metal film 2R2 2W 5% 5mm stand off Top R16 4R7.25W5% Resistor Carbon Film 4R7.25W5% Top R17 1R1W5%SO5 Resistor metal film 1R 1W 5% 5mm stand off Top R18 680R.25W5% Resistor Carbon Film 680R.25W5% Top R19 47R.25W5% Resistor Carbon Film 47R.25W5% Top R20 2K2.7W1% Resistor Metal Film 2K2.7W1% Top R21 22K.25W5% Resistor Carbon Film 22K.25W5% Top R22 820R.25W5% Resistor Carbon Film 820R.25W5% Top R23 47R.25W5% Resistor Carbon Film 47R.25W5% Top R24 1K8.7W1% Resistor Metal Film 1K8.7W1% Top R25 4K7.7W1% Resistor Metal Film 4K7.7W1% Top R26 15R6W5%SO5 Resistor wirewound 15R 6W 5% 5mm stand off Top R27 1K5.7W1% Resistor Metal Film 1K5.7W1% Top R28 1K8.7W1% Resistor Metal Film 1K8.7W1% Top R29 27K.7W1% Resistor Metal Film 27K.7W1% Top R30 2K2.7W1% Resistor Metal Film 2K2.7W1% Top R31 6K8.7W1% Resistor Metal Film 6K8.7W1% Top R32 4K7.7W1% Resistor Metal Film 4K7.7W1% Top R33 330R.25W5% Resistor Carbon Film 330R.25W5% Top R34 1K2.25W5% Resistor Carbon Film 1K2.25W5% Top R35 56K.7W1% Resistor Metal Film 56K.7W1% Top R36 1K5.7W1% Resistor Metal Film 1K5.7W1% Top R37 1K8.7W1% Resistor Metal Film 1K8.7W1% Top R38 2K2.7W1% Resistor Metal Film 2K2.7W1% Top R39 27K.7W1% Resistor Metal Film 27K.7W1% Top R40 6K8.7W1% Resistor Metal Film 6K8.7W1% Top R41 4K7.7W1% Resistor Metal Film 4K7.7W1% Top R42 330R.25W5% Resistor Carbon Film 330R.25W5% Top R43 1K2.25W5% Resistor Carbon Film 1K2.25W5% Top R44 56K.7W1% Resistor Metal Film 56K.7W1% Top R45 2K2.7W1% Resistor Metal Film 2K2.7W1% Top R46 2K2.7W1% Resistor Metal Film 2K2.7W1% Top R47 1K23W5%SO5 Resistor metal film 1K2 3W 5% 5mm stand off Top R48 12K.25W5% Resistor Carbon Film 12K.25W5% Top R49 47R.25W5% Resistor Carbon Film 47R.25W5% Top R50 27R.7W1%SO5 Resistor Metal Film 27R.7W1% 5mm stand off Top R51 1K.7W1% Resistor Metal Film 1K.7W1% Top R52 1K.7W1% Resistor Metal Film 1K.7W1% Top R53 2R2.25W5% Resistor Carbon Film 2R2.25W5% Top = = рЙкобЕЙ=j~ем~д=^OMqae= m~ÖÉ=T=ETF= Position Partnumber Description Comment Side R54 2R2.25W5% Resistor Carbon Film 2R2.25W5% Top R55 2K2.7W1% Resistor Metal Film 2K2.7W1% Top R56 2K2.7W1% Resistor Metal Film 2K2.7W1% Top R57 1R1W5%SO5 Resistor metal film 1R 1W 5% 5mm stand off Top R58 1R1W5%SO5 Resistor metal film 1R 1W 5% 5mm stand off Top R59 2K2.7W1% Resistor Metal Film 2K2.7W1% Top R60 2K2.7W1% Resistor Metal Film 2K2.7W1% Top R61 120K.7W1% Resistor Metal Film 120K.7W1% Top R62 2R22W5%2MST Resistor metal film 2R2 2W 5% 2modules standing Top R63 2R22W5%2MST Resistor metal film 2R2 2W 5% 2modules standing Top R64 2R22W5%2MST Resistor metal film 2R2 2W 5% 2modules standing Top R65 2R22W5%2MST Resistor metal film 2R2 2W 5% 2modules standing Top U1 LM318_NAT IC Operational amplifier LM318 National Top U2 LM318_NAT IC Operational amplifier LM318 National Top U3 LM319 IC comparator LM319 Top U4 HCPL2400 IC photocoupler HCPL2400 Top U5 LM393 IC comparator LM393 Top U6 HCPL2400 IC photocoupler HCPL2400 Top U7 LM393 IC comparator LM393 Top U8 UC3843 IC PWM UC3843 Top VR1 VR22KLY2X3M Trimpotentiometer 22K lying 2x3modules Top VR2 VR22KLY2X3M Trimpotentiometer 22K lying 2x3modules Top VR3 VR1KST2X1M Trimpotentiometer 1K standing 2x1modules Top VR4 VR10KST2X1M Trimpotentiometer 10K standing 2x1modules Top = рЙкобЕЙ=j~ем~д=^OMqai= m~ÖÉ=N=EUF= = A20TDL Schematics for A20TDL ..... 2 Board placement for A20TDL ..... 3 Component list for A20TDL - rev 02A..... 4 Variant specific components ..... 7 Description for variant dependent components..... 8 = рЙкобЕЙ=j~ем~д=^OMqai= m~ÖÉ=O=EUF=

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