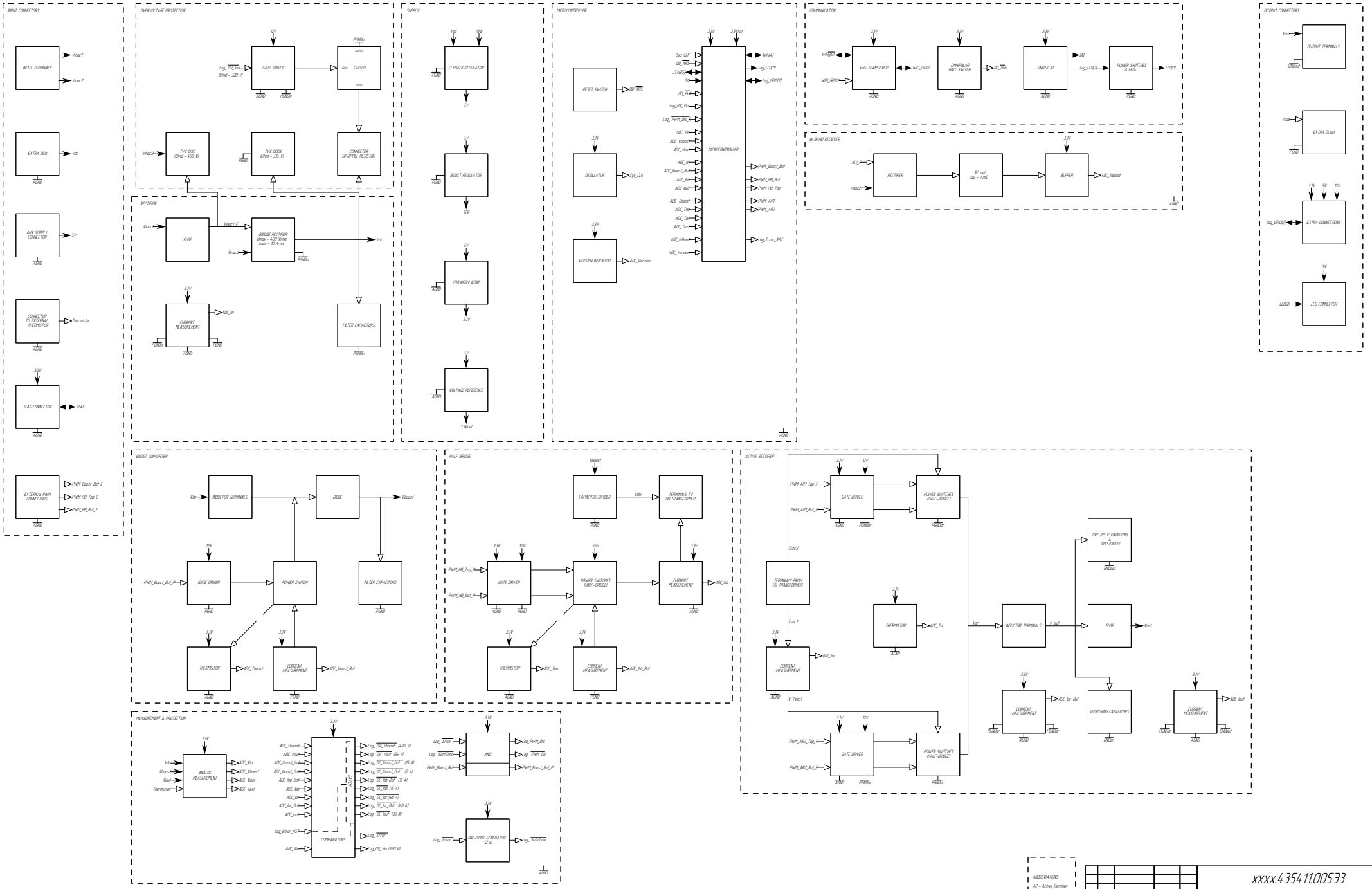
FUNCTION CIRCUIT



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Изм.	Лист	№ докум.	Подпись	Дата	
Разраб.	Семенковой				П-ВХОД-6
Пров.	Гладковой				Схема электрическая принципиальная
Т.контр.					
Н.контр.	Гладковой				
Утв.	Рабинович				

Лит.	Масса	Масштаб
Лист 1	Листов 10	

ООО "Эвентауль"

Копировал

Формат А1

Инв.№ подл. | Подп. и дата | Взам.инв.№ | Инв.№ дубл. | Подп. и дата

CONNECTORS

INPUT CONNECTORS

AC INPUT

XT10

Цепь	Конт.
Vrsac1	1

7796
Vrsac1

XT2

Цепь	Конт.
Vrsac2	1

7796
Vrsac2

EXTRA DCin

XT15

Цепь	Конт.
Vdc	1

Vdc
7796
+Vdc

XT14

Цепь	Конт.
PGNDin	1

7796
PGNDin
PGNDin

XS1

Цепь	Конт.
5Vusb	1
	2
	3
	4
AGND	5
AGND	S

5Vusb
AGND
USB3076-30-A
USB Supply only!

XP1

Цепь	Конт.
Thermistor+	1
Thermistor-	2

B2B-PH-K-S(LF)(SN)
Thermistor

XP4

Цепь	Конт.
JTAG_TMS	1
JTAG_TRST	2
JTAG_TDI	3
AGND	4
3.3Vjtag	5
	6
JTAG_TDO	7
AGND	8
JTAG_TCK	9
AGND	10
JTAG_TCK	11
AGND	12
JTAG_EMU0	13
JTAG_EMU1	14

AGND
AGND
AGND
AGND
20021121-00014T4LF
JTAG
Mates with 20021021-00014C1LF

EXTERNAL PWM

XP6

Цепь	Конт.
	1
AGND	2
PWM_Boost_Bot_E	3

AGND
B2B-XH-A(LF)(SN)
Ext. PWMboost

XP8

Цепь	Конт.
PWM_HB_Top_E	1
AGND	2
PWM_HB_Bot_E	3

AGND
B2B-XH-A(LF)(SN)
Ext. PWMhb

OUTPUT CONNECTORS

OUTPUT TERMINALS

XT8

Конт.	Цепь
1	Vout

7800
Vout

XT4

Конт.	Цепь
1	GNDout

7800
GNDout

RIPPLE RESISTOR

Vdc

XT3

Конт.	Цепь
1	Vdc

7796
Ripple+

XT1

Конт.	Цепь
1	Ripple-

7796
Ripple-

XP2

Конт.	Цепь
1	LED_Red-
2	5V
3	LED_Green-

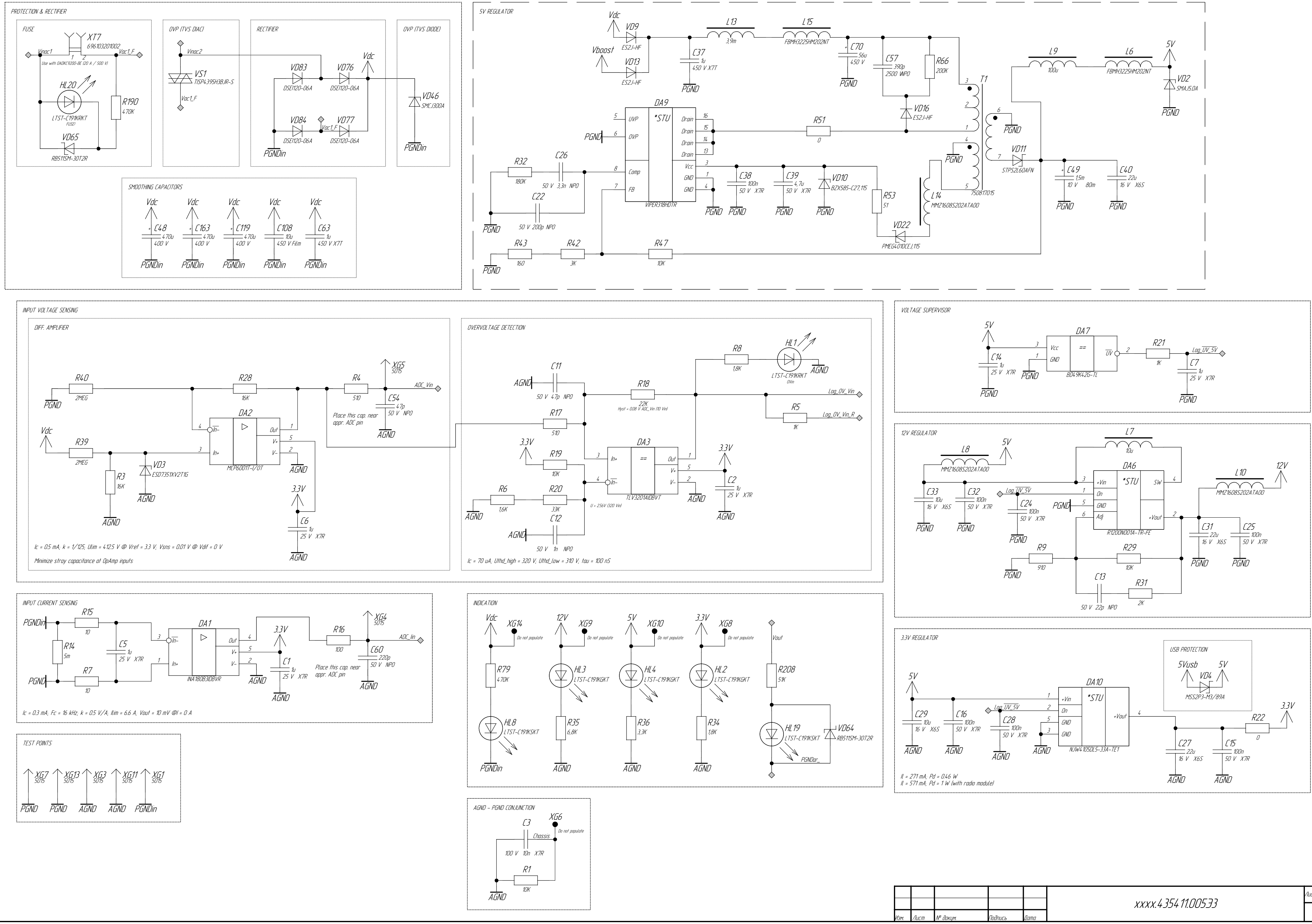
5V
B2B-XH-A(LF)(SN)
LED

XP3

Конт.	Цепь
1	GPIO4
2	GPIO5
3	
4	
5	AGND
6	5Vext
7	AGND
8	10Vext
9	AGND
10	3.3Vext

AGND
AGND
AGND
B10B-XH-A(LF)(SN)
Extra Connections

SUPPLY



Изм.	Лист	№ докум.	Подпись	Дата	xxxx.4354.11.00533	Лист 3

Копировал

Формат A2

Перв. примен.

Справ. №

Подп. и дата

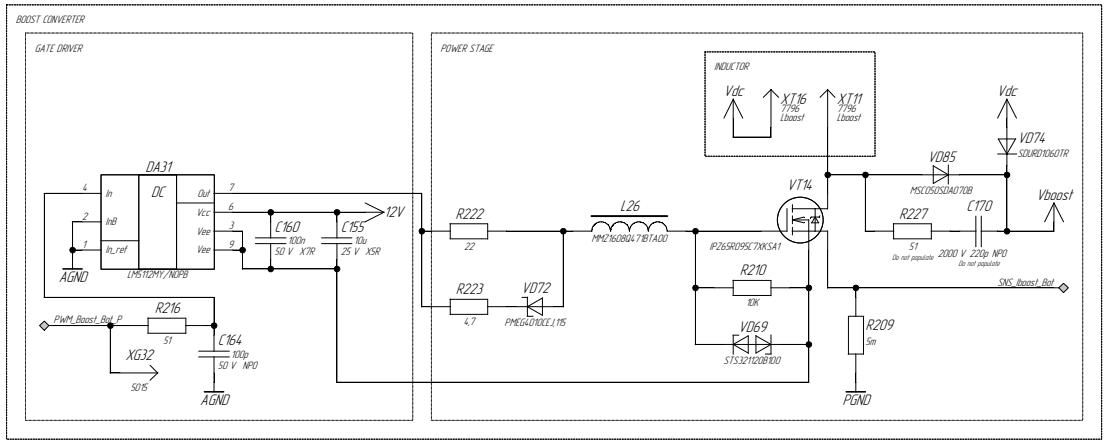
Инв. № дубл.

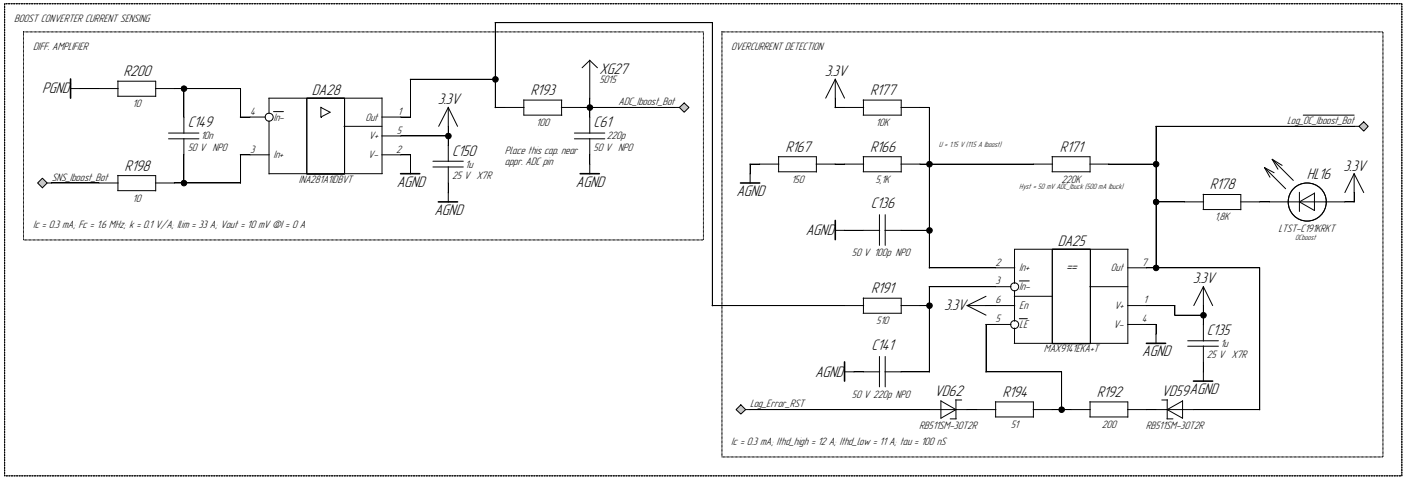
Взам. инв. №

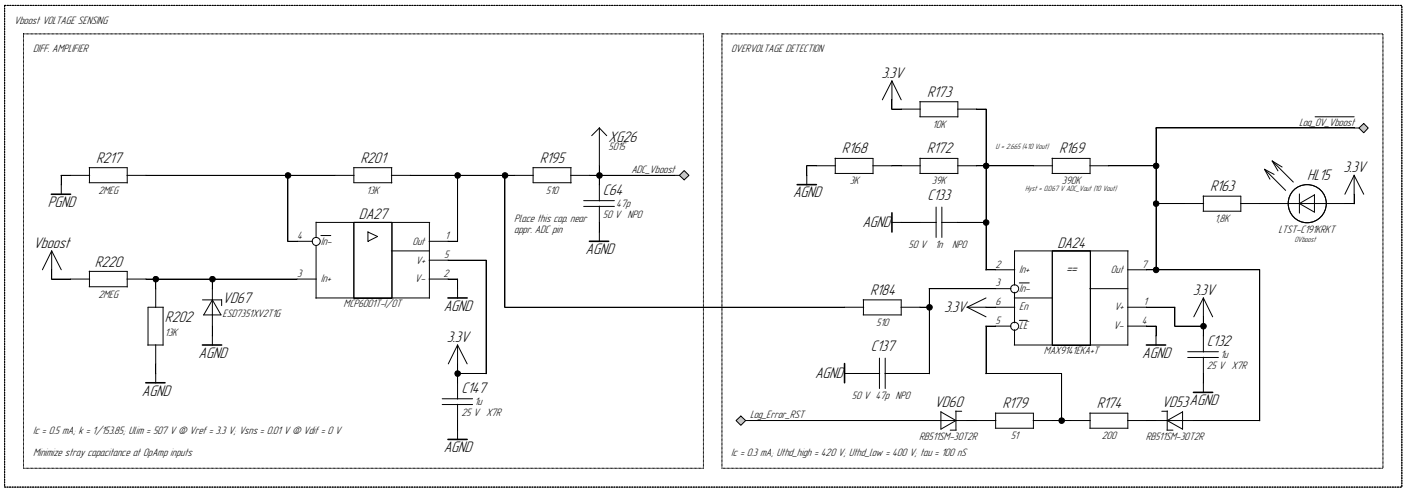
Подп. и дата

Инв. № подл.

BOOST CONVERTER







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HALF-BRIDGE

GATE DRIVER

VT8 NX7002BKWX (do not populate)
VT7 NX7002BKWX (do not populate)
Set these transistors when using gate driver without cross-conductive protection
3.3V
12V
L24 MMZ1608S202ATA00
R211 4.7
VD70 ES2J-HF
C153 1u 25 V X7R
C156 1u 25 V X7R
C161 1u 25 V X7R
C168 100n 50 V X7R
C169 1u 25 V X7R
C167 100n 50 V X7R
C166 10u 25 V X5R
DA30 DEV
VCCI, VCCI, GND, INB, INA, DIS, DT
OUTB, VDDB, VSSB, OUTA, VDDA, VSSA
ULC2122201B1
PWM_HB_Top, PWM_HB_Bot, Log_PWM_Dis
R215 51, R214 51, R213 51
C159 220p 50 V NPO
C158 100p 50 V NPO
C152 100p 50 V NPO
XG30, XG29, XG25 5015
R212 5.6K
C157 10n 50 V NPO
DT = 56 nS
L25 MMZ1608B617CTAH0
AGND, PGND

POWER SWITCHES

Vboost
VT16, VT15 TPS0H05DWS
R221 22, R224 22
R228 10K, R226 10K
VD73, VD71 STS32112DBR100
V_HB
R225 5m
DC LINK SNUBBER
C171 10n 2000 W7R
C173 10n 2000 W7R
R229 10, R230 10
SWITCHING NODE SNUBBER
C172 100p 1000 WN90
R231 10

CAPACITOR DIVIDER

C142 10u 450 V Film
C90 1.2m 250 V
C43 1.2m 250 V
R154 27K
C143 10u 450 V Film
C91 1.2m 250 V
C44 1.2m 250 V
R85 27K
Vdiv

TERMINALS TO TRANSFORMER

XT5 Vdiv 7796 Tauf prim.
XT13 Vhb 7796 Tauf prim.

HALF-BRIDGE TEMPERATURE SENSOR

BUFFER
3.3V
R175 1K
RK3 B57871S0103F001 (Mount with height = 7 mm)
XG25 5015
ADC_Thb
C72 1u 25 V X7R
Place this cap. near appr. ADC pin
R100/R25 = 0.068;
R50 = 3603 -> U = 2.58 V
R55 = 2986 -> U = 2.47 V
R60 = 2488 -> U = 2.35 V
R65 = 2083 -> U = 2.23 V
R70 = 1752 -> U = 2.10 V
R75 = 1481 -> U = 1.97 V
R80 = 1258 -> U = 1.84 V
R85 = 1072 -> U = 1.71 V

HALF-BRIDGE LOW SIDE CURRENT SENSING

DIFF. AMPLIFIER

PGND
R219 10, R218 10
C165 10n 50 V NPO
DA29 INA281A1IDBVT
3.3V
C162 1u 25 V X7R
XG31 5015
ADC_Ihb_Bot
Ic = 0.3 mA, Fc = 1.6 MHz, k = 0.1 V/A, Ilim = 3.3 A, Vout = 10 mV @Il = 0 A

OVERCURRENT DETECTION

3.3V
R186 10K
Log_OC_Ihb_Bot
R180 150, R185 5.1K
U = 1.15 V (1.15 A biased)
R181 220K
Hyst = 50 mV ADC_Buck (500 mA Buck)
R165 1.8K
HL17 LTST-C191KRKT (clear)
C138 50 V 100p NPO
DA23 MAX9141EKA+T
R187 510
C139 50 V 220p NPO
C134 1u 25 V X7R
Log_Error_RST
VD057 RB515SM-30T2R
R176 51
R170 200
VD055 RB515SM-30T2R
Ic = 0.3 mA, Ilthd_high = 12 A, Ilthd_low = 11 A, tau = 100 nS

HALF-BRIDGE CURRENT SENSING

CURRENT SENSOR

V_HB
DA32 ACS723KLATR-20AB-T
Isns, Vhb, Vout, Fault, Vcc, GND, VOC
R206 51, R207 51
VD066, VD068 ESD7351XV2T1G
XG28 5015
ADC_Ihb
C73 220p 50 V NPO
Place this cap. near appr. ADC pin
R203 1K, R204 110
R205 1K
VOC = Ifault / 30.3 = 330 mV
L23 MMZ1608S202ATA00
C154 100n 50 V X7R
C151 1u 25 V X7R
VD063 ESD7351XV2T1G
Ic = 35 mA, Fc = 1 MHz, k = 0.066 V/A, Ilim = ±20 A, Vout = 1.65 V @Il = 0 A, Ifault = 10 A

OVERCURRENT DETECTION

3.3V
R196 1K
Log_OC_Ihb
R199 10K
U = 3 V
R182 220K
R188 1.8K
HL18 LTST-C191KRKT (clear)
C144 50 V 100p NPO
DA26 MAX9141EKA+T
R197 510
C145 50 V 220p NPO
C140 1u 25 V X7R
Log_Error_RST
VD61 RB515SM-30T2R
R189 51
R183 200
VD56 RB515SM-30T2R
Ic = 0.3 mA

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Копировал

Формат А2

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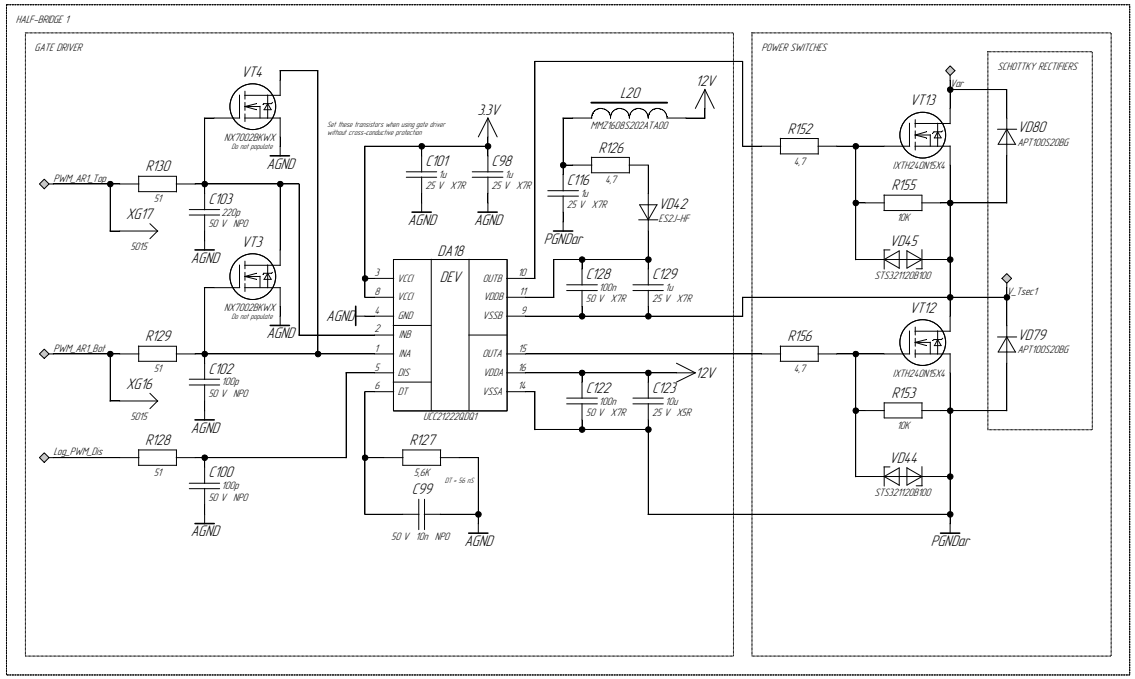
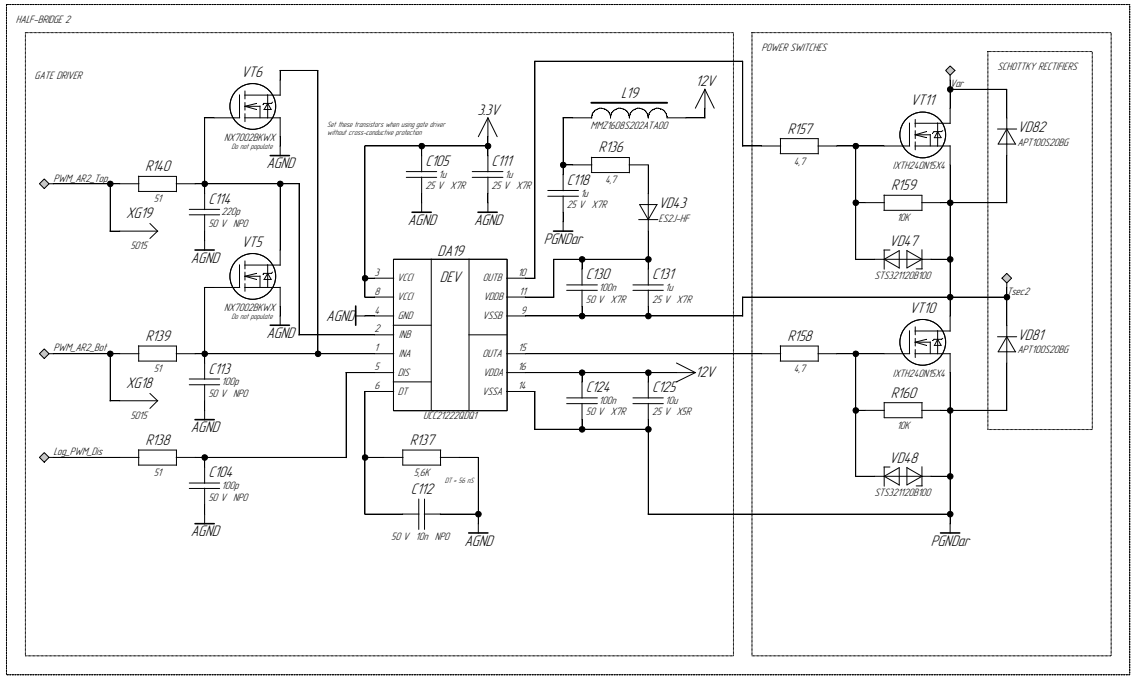
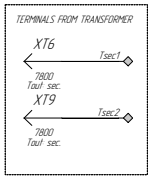
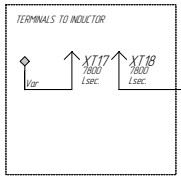
Справ. №
Инв. № подл.
Подп. и дата
Взам. инв. №
Инв. № дубл.
Подп. и дата

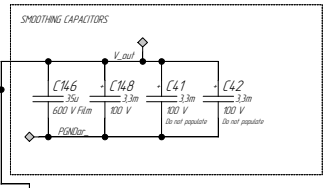
ACTIVE RECTIFIER: POWER STAGE 1

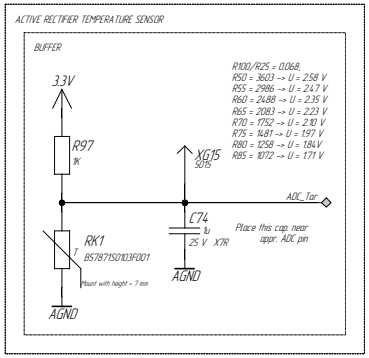


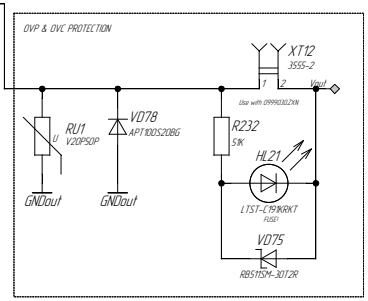












					xxxx.4354 11.00533	Лист 6
Изм.	Лист	№ докум.	Подпись	Дата		

Копировал

Формат А2

Перв. примен.

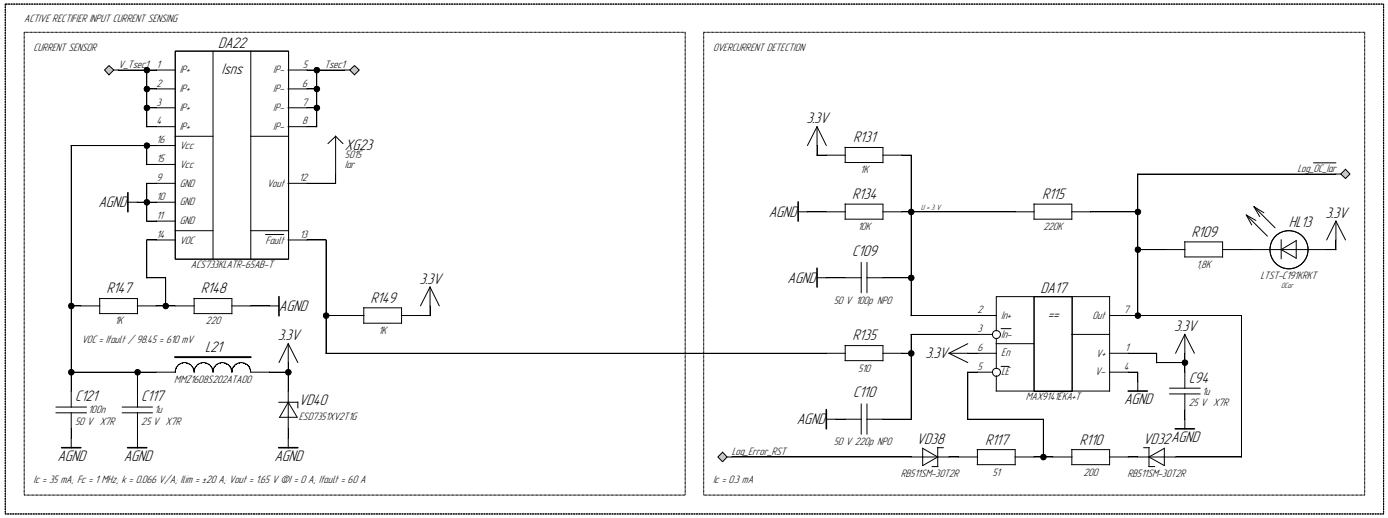
Справ. №

Инв. № дубл.

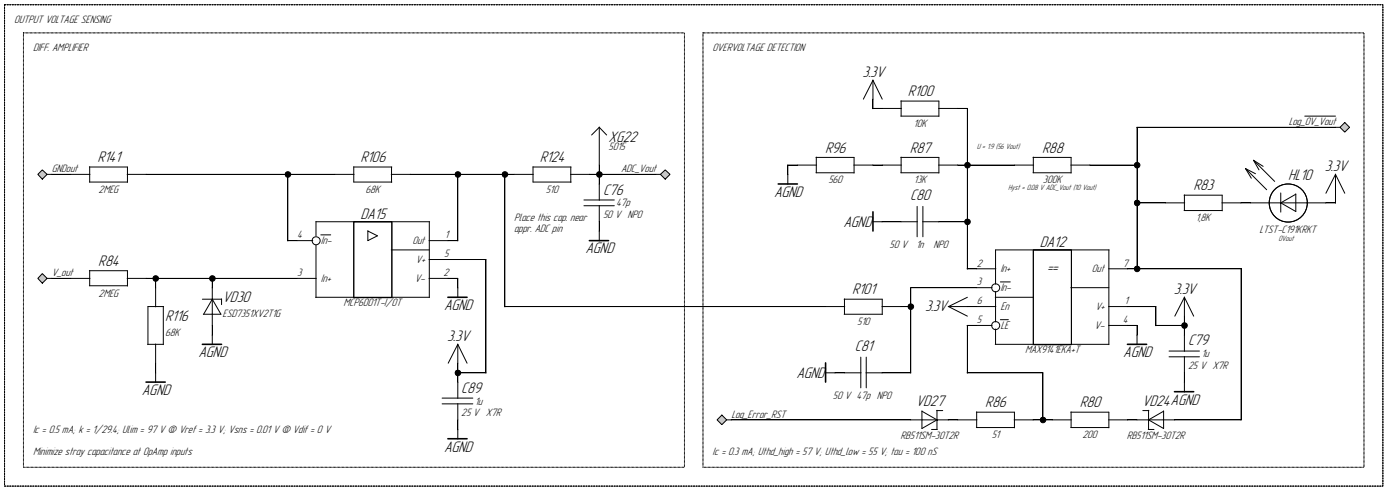
Взам. инв. №

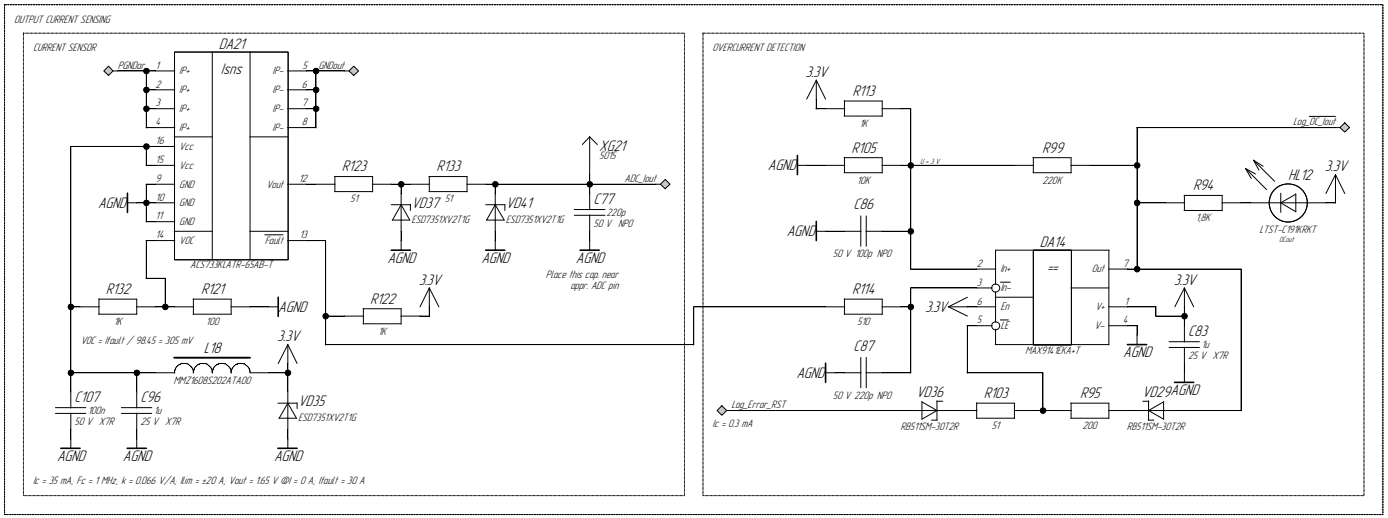
Подп. и дата

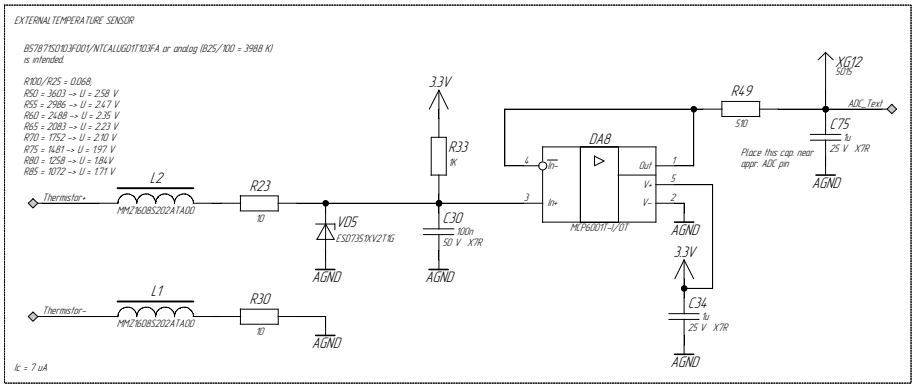
Инв. № подл.

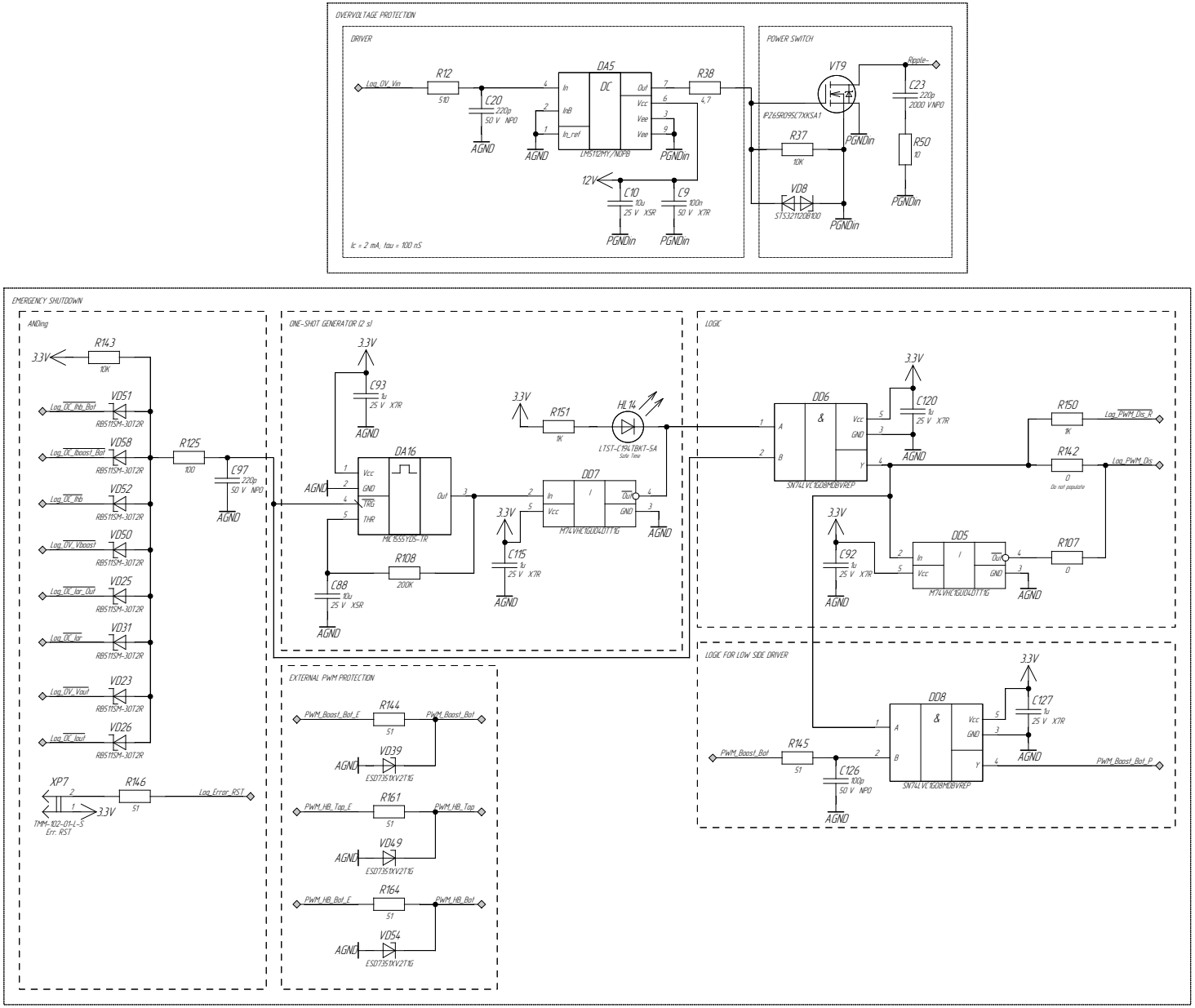

ACTIVE RECTIFIER INPUT CURRENT SENSING
CURRENT SENSOR
DA22
Isns
ACS733KLATR-65AB-T
V_Tsec1
Tsec1
XG23
Ior
AGND
Vcc
GND
VOC
Vout
Fault
R147
1K
R148
220
R149
1K
3.3V
VOC = Ifault / 98.45 = 610 mV
L21
MMZ1608S202ATA00
C121
100n
50 V X7R
C117
1u
25 V X7R
VD40
ESD7351X2T1G
Ic = 35 mA, Fc = 1 MHz, k = 0.066 V/A, Ilim = ±20 A, Vout = 1.65 V @I = 0 A, Ifault = 60 A
OVERCURRENT DETECTION
R131
1K
R134
10K
R115
220K
U = 3 V
Log_OC_Ior
R109
1.8K
HL13
LTST-C191KRKT
0Ior
C109
50 V 100p NP0
DA17
MAX9welEKA+T
R135
510
C110
50 V 220p NP0
C94
1u
25 V X7R
VD38
RB5115M-30T2R
R117
51
R110
200
VD32
Log_Error_RST
Ic = 0.3 mA
ACTIVE RECTIFIER OUTPUT CURRENT SENSING
CURRENT SENSOR
DA20
PGNDor
XG20
Ior_Out
R118
1K
R119
220
R120
1K
L17
C106
C95
VD33
OVERCURRENT DETECTION
R104
R111
R98
Log_OC_Ior_Out
R92
HL11
C84
DA13
R112
C85
C82
VD34
R102
R93
VD28

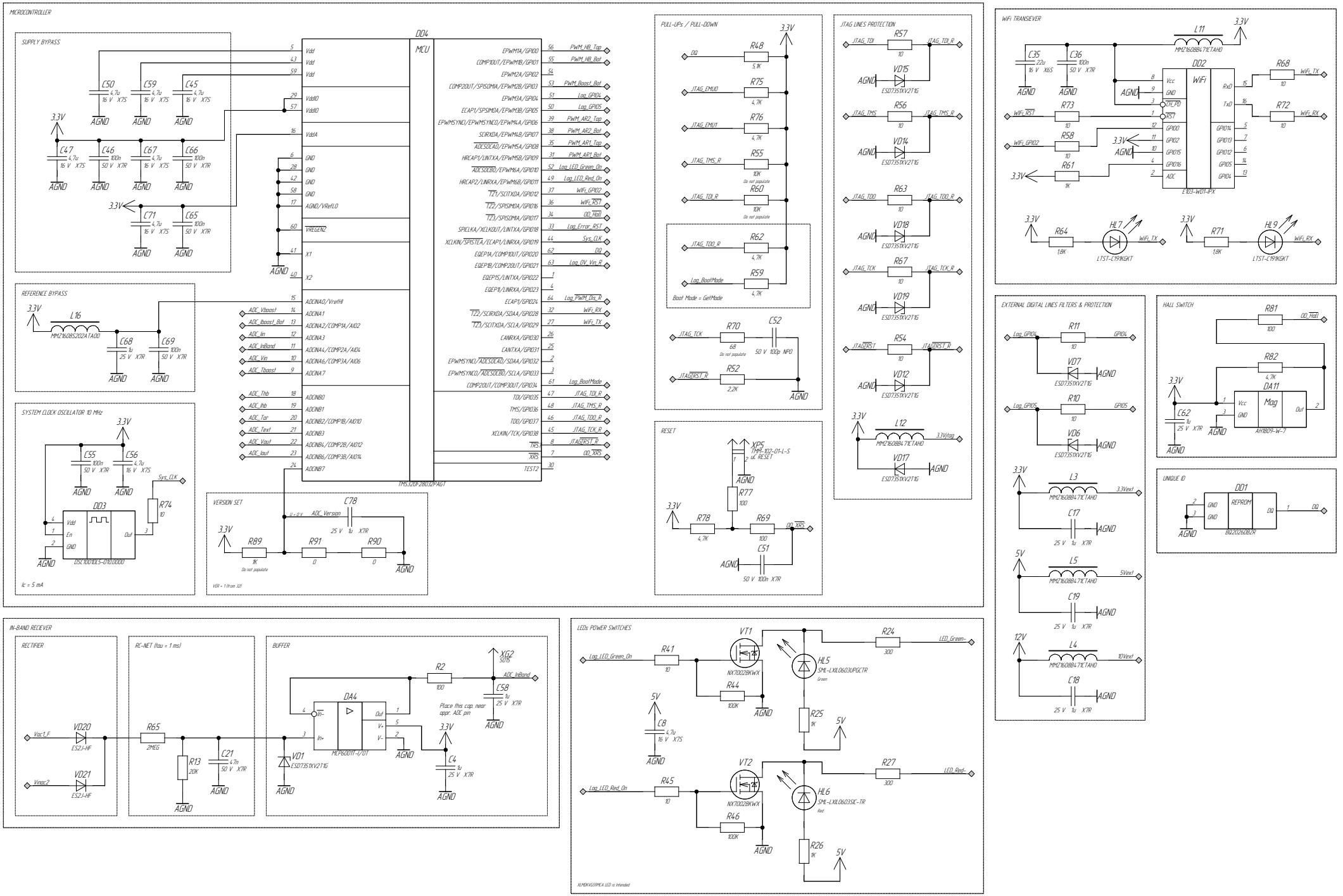
MEASUREMENTS








OVERVOLTAGE PROTECTION
DRIVER
Log_OV_Vin
R12
510
C20
220p
50 V NP0
AGND
DA5
DC
In
InB
In_ref
Out
Vcc
Vee
Vee
LMS1121MY/NOPB
R38
4.7
12V
C10
10u
25 V X5R
C9
100n
50 V X7R
PGNDin
Ic = 2 mA, tau = 100 nS
POWER SWITCH
VT9
IPZ65R095C7XKSA1
Ripple-
C23
220p
2000 V NP0
R37
10K
PGNDin
R50
10
VD8
STSS2LYU28B100
EMERGENCY SHUTDOWN
ANDing
R143
10K
3.3V
Log_OC_Inb_Bat
VD51
RB751S5M-30T2R
Log_OC_Boost_Bat
VD58
Log_OC_Inb
VD52
Log_OV_Vbus1
VD50
Log_OC_Isr_Out
VD25
Log_OC_Isr
VD31
Log_OV_Vout
VD23
Log_OC_Iout
VD26
R125
100
C97
220p
50 V NP0
XP7
TMM-102-01-L-S
Err. RST
R146
51
Log_Error_RST
ONE-SHOT GENERATOR (2 s)
C93
1u
25 V X7R
DA16
Vcc
GND
TRG
THR
Out
MC1555YDS-TR
R108
200K
C88
10u
25 V X5R
R151
1K
HL14
LTST-C194TBKT-5A
Solar Teal
DD7
In
Vcc
Out
GND
M74VHC1GU04DTT1G
C115
1u
25 V X7R
LOGIC
DD6
A
B
Y
SN74LVC1G08MEAVREP
C120
1u
25 V X7R
R150
1K
Log_PWM_Dis_R
R14.2
0
Do not populate
Log_PWM_Dis
DD5
M74VHC1GU04DTT1G
R107
0
C92
1u
25 V X7R
LOGIC FOR LOW SIDE DRIVER
DD8
SN74LVC1G08MEAVREP
C127
1u
25 V X7R
R145
51
C126
100p
50 V NP0
PWM_Boost_Bat
PWM_Boost_Bat_P
EXTERNAL PWM PROTECTION
PWM_Boost_Bat_E
R144
51
VD39
ESD7351XV2T1G
PWM_HB_Top_E
R161
VD49
PWM_HB_Bot_E
R164
VD54


MICROCONTROLLER
SUPPLY BYPASS
REFERENCE BYPASS
SYSTEM CLOCK OSCILLATOR 10 MHz
DD4
MCU
TMS320F28032PAGT
PULL-UPs / PULL-DOWN
JTAG LINES PROTECTION
RESET
VERSION SET
WiFi TRANSIEVER
EXTERNAL DIGITAL LINES FILTERS & PROTECTION
HALL SWITCH
UNIQUE ID
IN-BAND RECIEVER
RECTIFIER
RC-NET (tau = 1 ms)
BUFFER
LEDs POWER SWITCHES
Boot Mode = GetMode
XLMKVG39MCA LED is intended