

Technical Publication
CL-1108R0

Central Listings

HF Series Generators

REVISION HISTORY

REVISION	DATE	REASON FOR CHANGE
0	MAR 19, 2020	First Edition

This Document is the English original version, edited and supplied by the manufacturer.

The Revision state of this Document is indicated in the code number shown at the bottom of this page.

ADVISORY SYMBOLS

The following advisory symbols will be used throughout this manual. Their application and meaning are described below.



DANGERS ADVISE OF CONDITIONS OR SITUATIONS THAT IF NOT HEHEDED OR AVOIDED WILL CAUSE SERIOUS PERSONAL INJURY OR DEATH.



ADVISE OF CONDITIONS OR SITUATIONS THAT IF NOT HEHEDED OR AVOIDED COULD CAUSE SERIOUS PERSONAL INJURY, OR CATASTROPHIC DAMAGE OF EQUIPMENT OR DATA.



Advise of conditions or situations that if not heeded or avoided could cause personal injury or damage to equipment or data.

Note 

Alert readers to pertinent facts and conditions. Notes represent information that is important to know but which do not necessarily relate to possible injury or damage to equipment.

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SECTION 1 INTRODUCTION

This section is a compilation of the main components (Test Points, Connectors, LEDs, Switches and Fuses) of the electronic boards of the equipment.

Each drawing is accompanied by several tables including the most used components of the respective board. To find any component press “Ctrl + F”, enter the component reference (e.g. TP2) and press “Enter”.

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SECTION 2 GENERATOR BOARDS

The following list includes the boards which contain components that may require access during service procedures:

- IPM Driver board **A3063-XX** (page 5).
- Control board **A3640-XX** (page 7).
- Supply board **A3646-XX** (page 15).
- Hardware Bus - Ethernet CAN - SHFR Adaptation board **A9599-XX** (page 19).
- Booster Module **S0008007** (page 23).
- Dual Speed Starter **S0008009** (page 25).

Each board is represented by a layout followed by several tables with the most used Test Points, LEDs, Connectors, Pushbuttons, Switches and Jumpers.

Note 

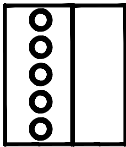
The Booster Module and the Hardware Bus - Ethernet CAN - SHFR Adaptation board may or may not be installed in the equipment, depending on the Generator configuration.

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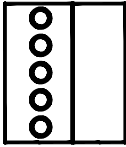
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P

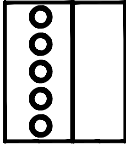


J1

N

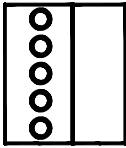


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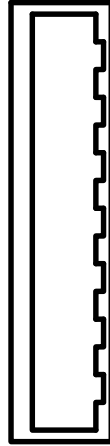


J2

N



J3



2.1 IPM DRIVER BOARD

**Table 2-1
A3063-XX TP List**

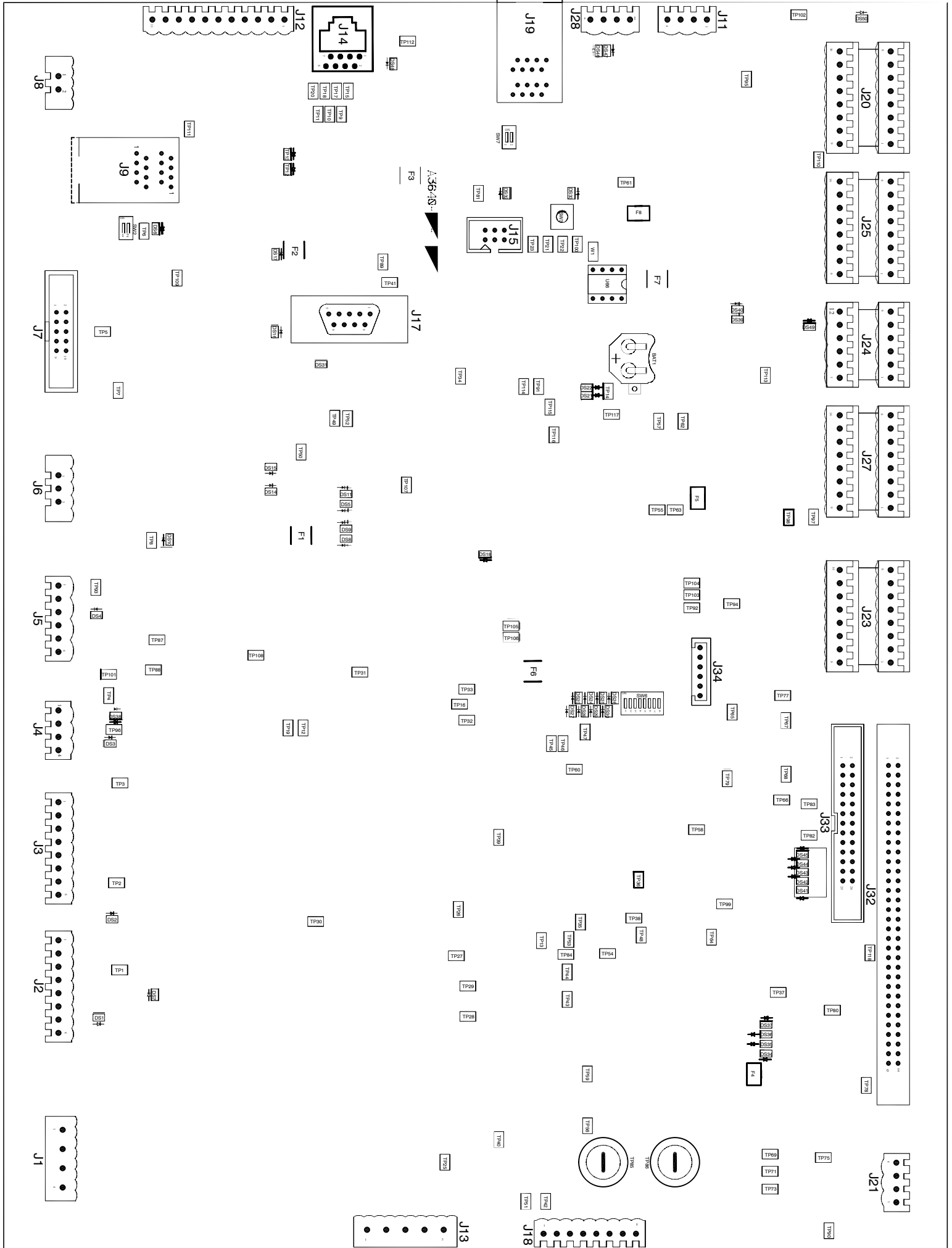
TEST POINTS	
TP	Measured signal
TP2	kV DR1
TP3	kV DR2
TP5	GND

**Table 2-2
A3063-XX LEDs List**

LEDs		
LED	Color	Measured signal
DS1	GREEN	+5V
DS2	GREEN	+24V

**Table 2-3
A3063-XX Connectors List**

CONNECTORS	
CONNECTOR	Description
J1	IPM1 CONNECTION
J2	IPM2 CONNECTION
J3	CONTROL BOARD



2.2 CONTROL BOARD

Note 

The following list includes the most used TP on the A3640-XX Control board. Some of the signals to be measured in the Control board are referenced to GND isolated from general ground, such as GND_P, GND_INT, GND_EXT and GND_SEC.

Table 2-4
A3640-XX TP List

TEST POINTS	
TP	Measured signal
TP1	-15V
TP2	+15V
TP3	+5V
TP4	GND
TP13	GND
TP14	GND
TP21	PREP
TP22	EXP
TP25	FIL CURR FG
TP26	FIL CURR FF
TP34	FLUORO SYNCHRONISM
TP35	SMALL FOCAL SPOT FILAMENT
TP36	LARGE FOCAL SPOT FILAMENT
TP37	kVp IMBALANCE
TP39	SMALL FOCAL SPOT FILAMENT INVERTER FREQUENCY
TP40	LARGE FOCAL SPOT FILAMENT INVERTER FREQUENCY
TP42	kV+
TP47	GND
TP48	Filtered mA
TP50	GND

**Table 2-4 (cont.)
A3640-XX TP List**

TP	Measured signal
TP51	kV-
TP54	Filtered kVp
TP56	mA+
TP57	kV DEMAND
TP59	mA-
TP60	kV INVERTER FREQUENCY
TP61	GND
TP64	GND
TP66	RAMP
TP67	UP PT
TP68	DWN PT
TP69	SCAN
TP77	ABC IN
TP81	GND
TP85	mAs
TP86	
TP92	ALOE/XOn
TP93	IGBT FAULT

Note 

Beside the most used test points, J12 connector on the A3640-XX Control board can also be useful for certain signals measurement: kVp, mA, Small and Large Focus Filaments, +24V, ±15V, +5V, Aloe and IGBT fault (refer to the Schematics document).

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Table 2-5
A3640-XX LEDs List

LEDs		
LED	Color	Measured signal
DS1	GREEN	-15V
DS2	GREEN	+15V
DS3	GREEN	+5V
DS4	GREEN	+24V DELAYED
DS5	YELLOW	/LINE CONT
DS6	GREEN	+5V SEC1
DS7	GREEN	SUPPLY FIL
DS8	YELLOW	/BUCKY DR2
DS9	YELLOW	/BUCKY DR1
DS10	GREEN	+5V SEC
DS11	YELLOW	/CHRG DR
DS12	YELLOW	RXCAN0
DS13	YELLOW	TXCAN0
DS14	YELLOW	TXCAN1
DS15	YELLOW	RXCAN1
DS16	RED	/ROT FAULT
DS17	YELLOW	/RST
DS18	YELLOW	/C FLUORO ORDER +
DS21	YELLOW	μ PROCESSOR
DS22	RED	ALARM
DS23	YELLOW	/ERROR LED1
DS24	YELLOW	/ERROR LED3
DS25	YELLOW	/ERROR LED5
DS26	YELLOW	/ERROR LED7
DS27	RED	/ERROR LED0
DS28	YELLOW	/ERROR LED2
DS29	YELLOW	/ERROR LED4
DS30	YELLOW	/ERROR LED6

**Table 2-5 (cont.)
A3640-XX LEDs List**

LED	Color	Measured signal
DS31	YELLOW	BACKUP TIMER STATUS
DS32	YELLOW	TXCAN2
DS33	YELLOW	RXCAN2
DS34	YELLOW	/PREP
DS35	YELLOW	/EXP
DS36	YELLOW	/ALOE
DS37	YELLOW	/READY
DS38	GREEN	+24V UNR
DS39	YELLOW	RS232 RXD
DS40	YELLOW	RS232 TXD
DS41	YELLOW	START DR1
DS42	YELLOW	START DR2
DS43	YELLOW	FLD3 CAM1
DS44	YELLOW	FLD2 CAM1
DS45	YELLOW	FLD1 CAM1
DS46	YELLOW	RXD0
DS47	YELLOW	TXD0
DS49	GREEN	+5V ISO2
DS50	GREEN	+15V PERM ISO

**Table 2-6
A3640-XX Connectors List**

CONNECTORS	
CONNECTOR	Description
J1	FILAMENT SUPPLY IN
J2	SUPPLY
J3	POWER IN
J4	CONTACTOR
J5	IPM DRIVER

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**Table 2-6 (cont.)
A3640-XX Connectors List**

CONNECTOR	Description
J6	CHARGE/DISCHARGE
J7	DUAL SPEED STARTER
J8	BUZZER
J9	CAN
J11	SPARE IN
J12	SUPERVISION
J13	FIL POWER
J14	HSW
J15	BDM
J17	LICENSE
J18	HV TRF
J19	CAN
J20	GP INP0
J21	ANALOG
J23A	BATTERY MONITOR
J23B	FLUORO/DSI
J24A	OUT1
J24B	OUT2
J25A	CONSOLA
J25B	RS422/485
J27	INTERLOCKS
J28	DOSE
J30	SCOPE PROBE
J32	INTERFACE BOARD
J33	GENERATOR J5 CONNECTOR
J34	AMP

Table 2-7
A3640-XX Pushbuttons List

PUSHBUTTON SWITCHES	
SWITCH	Function
SW3	RESET

Table 2-8
A3640-XX Switches List

SWITCHES		
SWITCH		Function
SW2		NOT USED
SW6	1	NOT USED
	2	DISABLES HARDWARE ERRORS
	3	DEMO MODE (NO X-RAY)
	4	DISABLES THE FILAMENTS
	5	DISABLES DOSEMETER
	6	NOT USED
	7	NOT USED
	8	INITIALIZES THE EEPROM
SW7		NOT USED

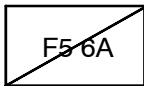
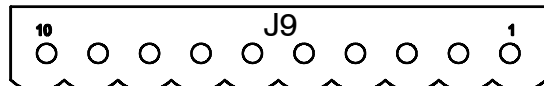
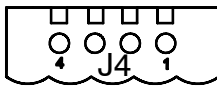
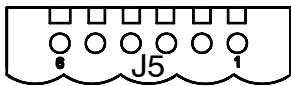
Table 2-9
A3640-XX Jumpers List

JUMPERS	
JUMPER	Function
W1	SOFTWARE UPDATE

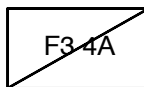
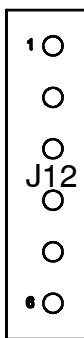
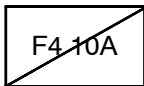
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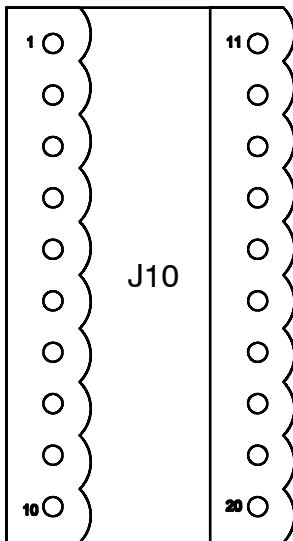
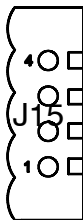
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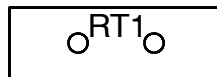
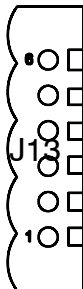
DS6



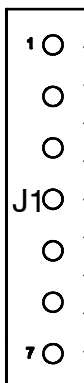
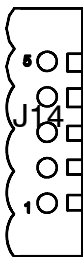
P1
DS1



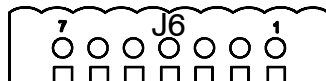
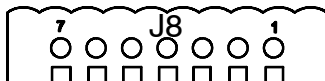
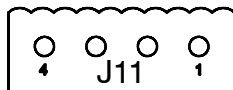
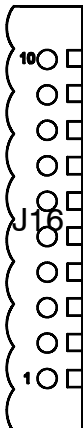
TP5
TP2
TP3



DS7
P



DS2
DS3
DS4
DS5
DS6
P1
P3
P4
P7
P6



2.3 SUPPLY BOARD

Table 2-10
A3646-XX TP List

TEST POINTS	
TP	Measured signal
TP1	+24V
TP2	+24V VPERM
TP3	+24V DELAY
TP4	+5V
TP5	+5V DELAY
TP6	+15V
TP7	-15V
TP8	GND
TP11	GND

Table 2-11
A3646-XX LEDs List

LEDs		
LED	Color	Measured signal
DS1	GREEN	+24V PERM UNR
DS2	GREEN	+24V UNR
DS3	GREEN	+5V
DS4	GREEN	+15V
DS5	GREEN	-15V
DS6	GREEN	LOCK
DS7	GREEN	+5V DELAY
DS8	GREEN	+24V DELAY

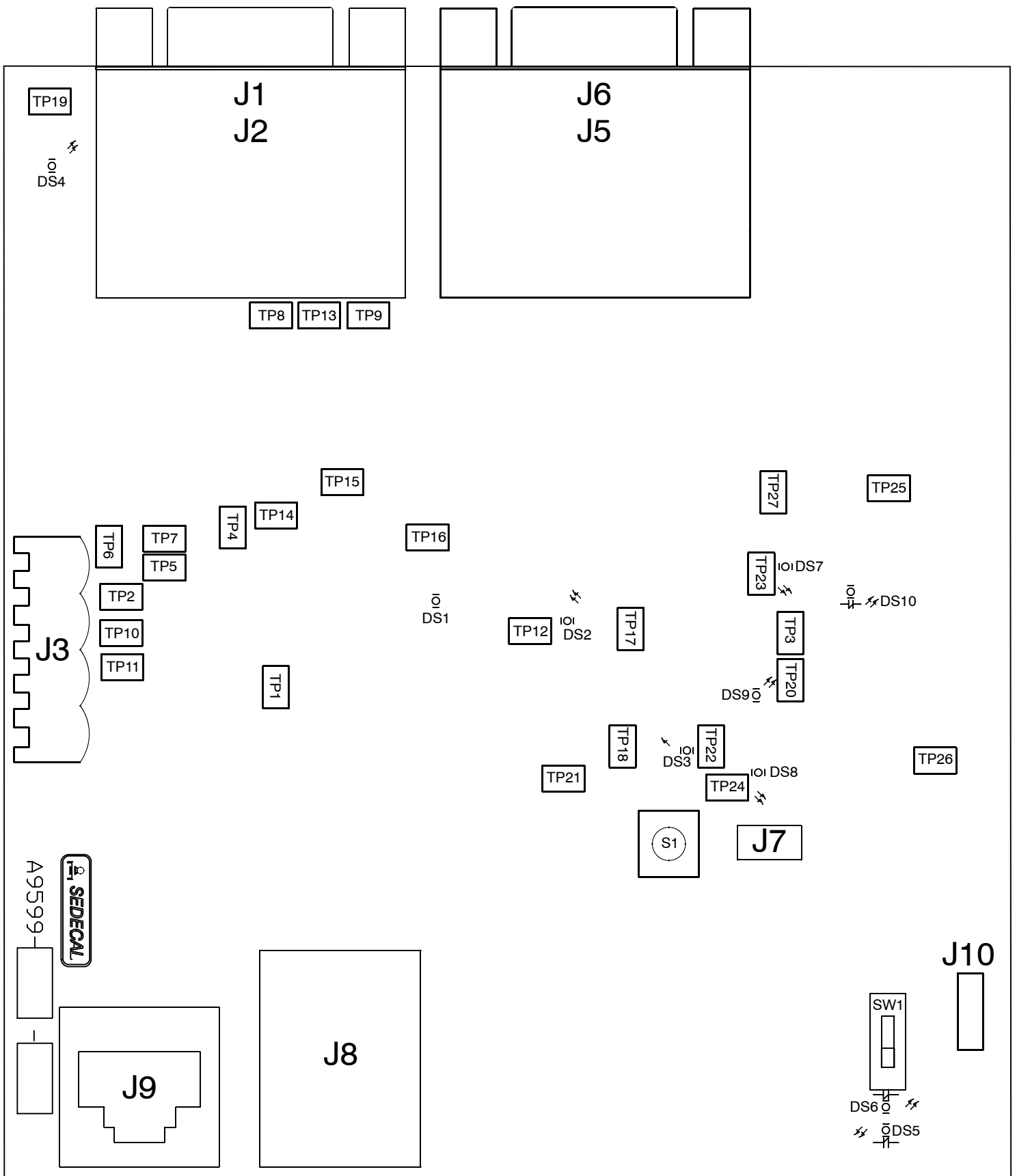
Table 2-12
A3646-XX Connectors List

CONNECTORS	
CONNECTOR	Description
J1	120/230 AC IN
J2	24 AC
J3	COLLIMATOR & LOCKS POWER IN
J4	LOCKS OUT
J5	COLLIMATOR
J6	PCB CONTROL SUPPLY
J7	ON/OFF
J8	CONTROL PCB
J9	ROOM LIGHT & DETECTORS CONTROL
J10	PS INTERFACE
J11	FILAMENT SUPPLY OUT
J12	RELAY K1
J13	RELAY K1
J14	DC POWER IN
J15	POWER DELAY
J16	GENERAL PURPOSE POWER

Table 2-13
A3646-XX Fuses List

FUSES	
FUSE	Description
F1	1.5A, 250V, SB
F2	3A, 250V, SB
F3	4A, 250V, SB
F4	10A, 250V, SB
F5	6.25A, 250V, SB

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2.4 HARDWARE BUS - ETHERNET-CAN

Table 2-14
A9599-XX TP List

TEST POINTS	
TP	Measured signal
TP1	GND SHFR
TP2	H. B. GND
TP3	GND SHFR
TP4	FLUORO ORDER
TP5	PREP ORDER
TP6	POS OK
TP7	EXP ORDER
TP8	EXP RQST
TP9	EX ON
TP10	DYN MODE1
TP11	DYN MODE2
TP12	GND 15V ISO
TP13	H. B. GND
TP14	SYNC FLUORO
TP15	SYNC RAD
TP16	5V DELAY
TP17	24V DELAY
TP18	15V ISO
TP19	H. B. 24V
TP20	GND 15V ISO
TP21	CLOCK BUFFER
TP22	3.3V
TP23	24V DET ISO
TP24	5V DET ISO
TP25	GND DET ISO
TP26	GND DET ISO
TP27	12V DET ISO

Table 2-15
A9599-XX LEDs List

LEDs		
LED	Color	Measured signal
DS1	GREEN	5V DELAY
DS2	GREEN	24V DELAY
DS3	GREEN	15V ISO
DS4	GREEN	H. B. 24V
DS5	RED	μC LED ERROR
DS6	YELLOW	μC LED STAT
DS7	GREEN	24V DET ISO
DS8	GREEN	5V DET ISO
DS9	GREEN	3.3V
DS10	GREEN	12V DET ISO

Table 2-16
A9599-XX Connectors List

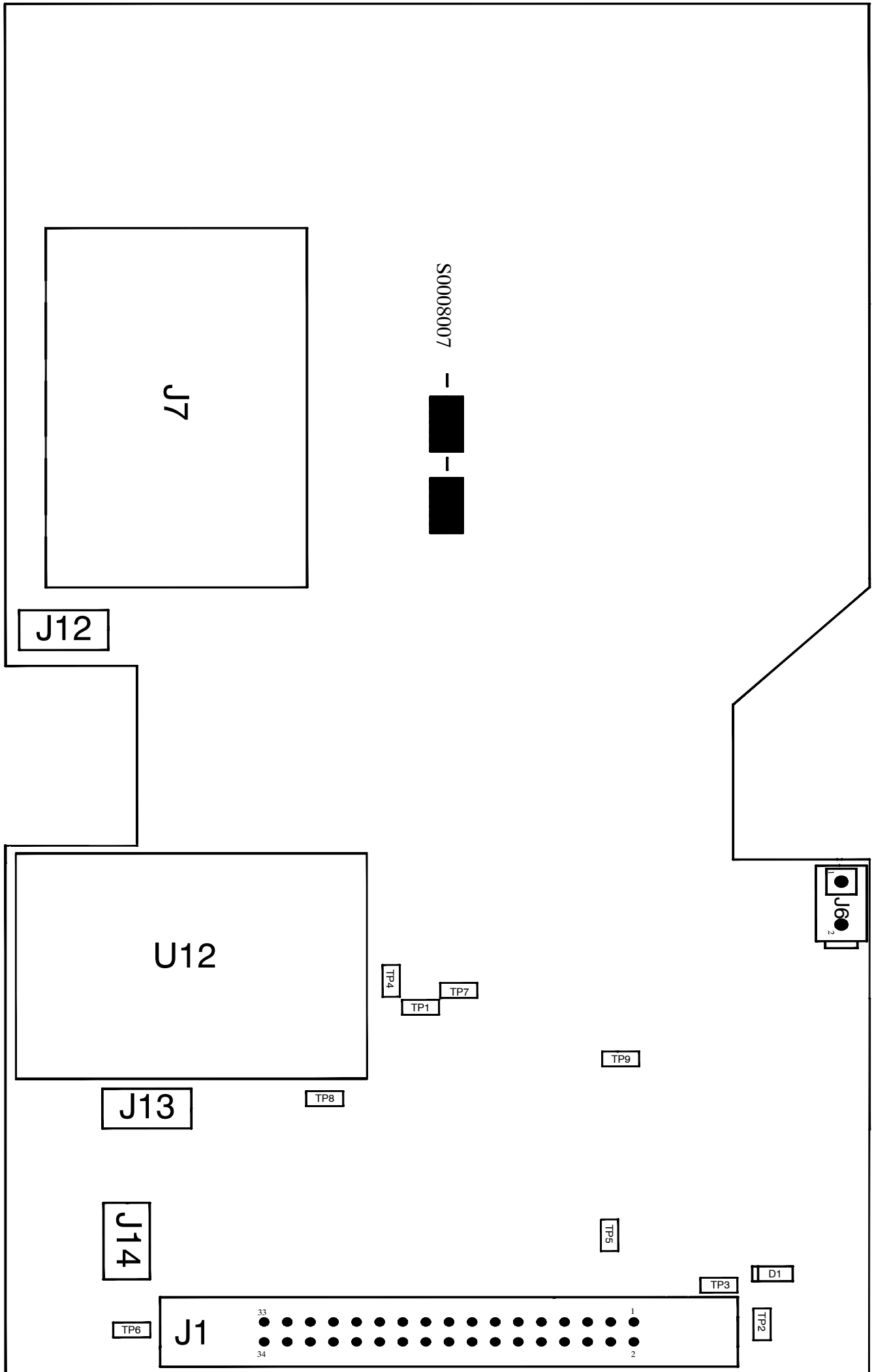
CONNECTORS	
CONNECTOR	Description
J1	HARDWARE BUS
J2	HARDWARE BUS
J3	PSU / CONTROL BOARD
J4 (on the rear of the board)	INTERFACE BOARD
J5	DR1
J6	DR2
J7	JTAG
J8	ETHERNET
J9	CONTROL BOARD
J10	RS232

Table 2-17
A9599-XX Pushbuttons List

PUSHBUTTON SWITCHES	
SWITCH	Function
S1	μC RESET

Table 2-18
A9599-XX Switches List

SWITCHES	
SWITCH	Function
SW1	BOOTLOADER



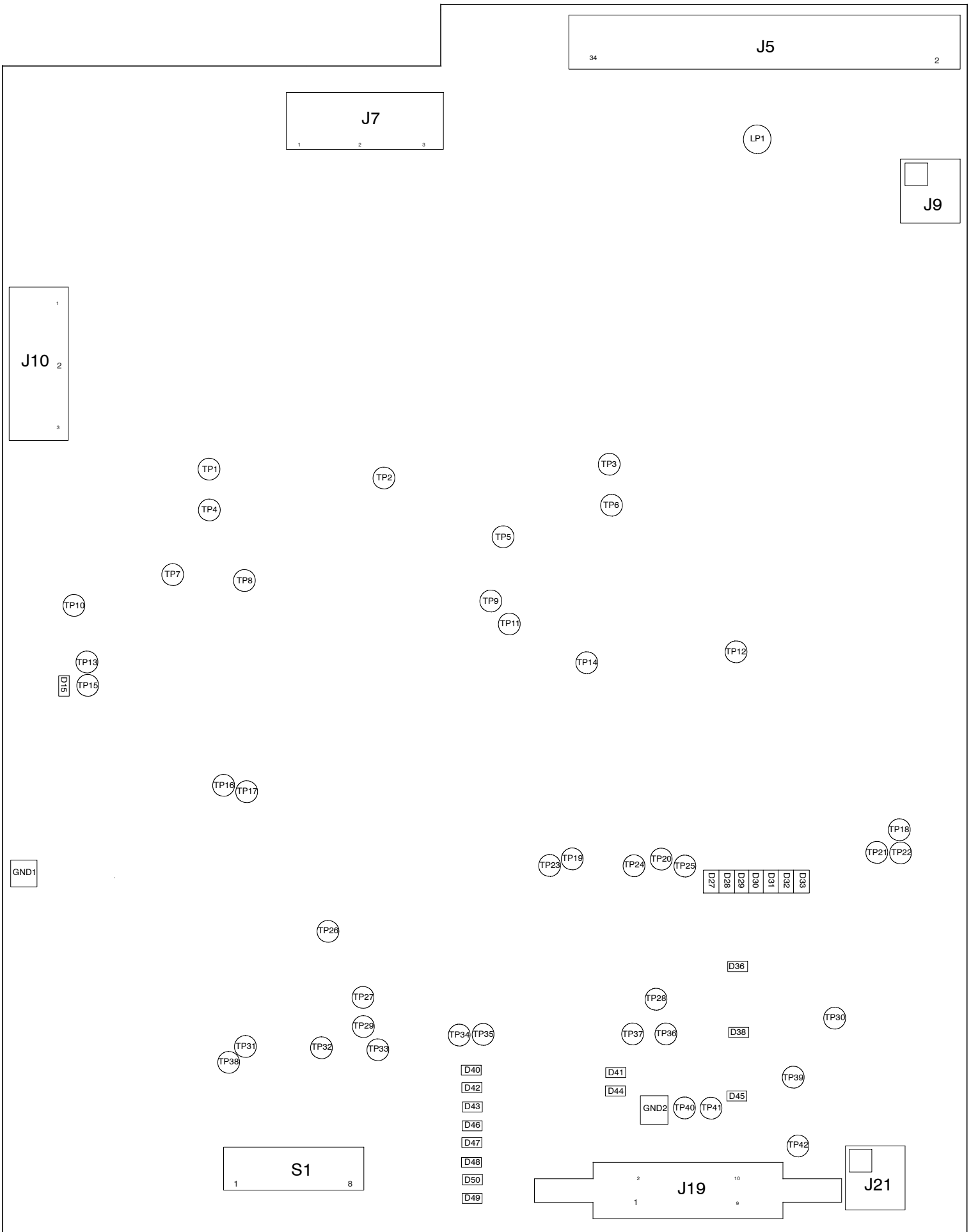
2.5 BOOSTER MODULE

Table 2-19
S0008007 TP List

TEST POINTS	
TP	Measured signal
TP6	+15V
TP7	+5V
TP8	-15V
TP9	+5V

Table 2-20
S0008007 Connectors List

CONNECTORS	
CONNECTOR	Description
J1	DUAL SPEED STARTER
J6	IGBT GATE
J7	DC BUS
J12	INDUCTANCE
J13	INDUCTANCE



2.6 DUAL SPEED STARTER

Table 2-21
S0008009 TP List

TEST POINTS	
TP	Measured signal
TP26	Vout
TP30	-15V
TP38	VAREF
TP39	+15V
TP41	+5V
TP42	+5V

Table 2-22
S0008009 LEDs List

LEDs		
LED	Color	Measured signal
D15	GREEN	-5V
D27	RED	/FLTINV
D28	RED	/FLTINV1
D29	RED	/FLTINV2
D30	RED	/FLTINV3
D31	RED	/FLTINV4
D32	RED	/FLTINV5
D33	RED	/FLTINV6
D36	GREEN	-15V
D38	GREEN	+15V
D40	RED	ERROR INDICATOR (<i>Refer to Section 4.1 of the Troubleshooting document</i>)
D41	YELLOW	RXD
D42	YELLOW	ERROR INDICATOR (<i>Refer to Section 4.1 of the Troubleshooting document</i>)

**Table 2-22 (cont.)
S0008009 LEDs List**

LED	Color	Measured signal
D43	YELLOW	ERROR INDICATOR (Refer to Section 4.1 of the Troubleshooting document)
D44	YELLOW	TXD
D45	GREEN	+5V
D46	YELLOW	ERROR INDICATOR (Refer to Section 4.1 of the Troubleshooting document)
D47	YELLOW	ERROR INDICATOR (Refer to Section 4.1 of the Troubleshooting document)
D48	YELLOW	ERROR INDICATOR (Refer to Section 4.1 of the Troubleshooting document)
D49	YELLOW	ERROR INDICATOR (Refer to Section 4.1 of the Troubleshooting document)
D50	YELLOW	ERROR INDICATOR (Refer to Section 4.1 of the Troubleshooting document)

**Table 2-23
S0008009 Connectors List**

CONNECTORS	
CONNECTOR	Description
J5	BOOSTER MODULE
J7	STATOR
J9	SUPPLY BOARD (N.U.)
J10	DC BUS
J19	CONTROL BOARD
J21	SUPPLY BOARD

**Table 2-24
S0008009 Switches List**

SWITCHES	
SWITCH	Function
S1	NOT USED

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