DASH NO.	TYPE OR MODEL	NEXT ASSEMBLY
--	HET 2.0	100046950

REFERENCE INFORMATION

DUAL MOTOR DRIVER

TABLE OF CONTENTS

CONNECTOR KEYING TABLE

Jx	TYPE	FUNCTION	KEY
J1	HEADER 13x2 RIBBON	STAND CONTROLLER	8
J4	HEADER 10x2	GANTRY MOTOR	13
J5	HEADER 5x2 RIBBON	GANTRY MOTOR ENCODER	NA
J6	HEADER 4x2	LIFT HALL SENSOR	NA
J7	HEADER 2x1	COOLING FAN	NA
J8	DSUB 15-R	STAND CONTROL PANEL	2
J9	HEADER 10x2	DMD_24V, SPD DMD IF	18
J10	HEADER 13x2 RIBBON	STAND POWER DISTRIBUTION	11
J11	FTSH-105-01-L-D-K	FPGA JTAG	NA
J12	DSUB 26 HD RECEPTACLE	COUCH CONTROLLER	NA
J17	HEADER 4X3	GANTRY/LIFT 96V INPUT POWER	NA
J18	HEADER 4X1	EMOPS 24V	NA
J19	HEADER 5x2	TEST POINT HEADER	NA
J20	HEADER 5x2	TEST POINT HEADER	NA
J21	HEADER 10x2	TEST POINT / SWITCH HEADER	NA
J22	HEADER 4X1	GANTRY DRIVER OUTPUT	4
J23	HEADER 4X1	LIFT DRIVER OUTPUT	3

NOTES:

1. THIS IS A FLAT SCHEMATIC
2. INTERPRET COMPONENT REFERENCE DESIGNATORS PER AME Y14.44.
3. RESISTANCE VALUES ARE IN OHMS
   CAPACITANCE VALUES ARE IN MICROFARADS.
4. ALL RESISTORS ARE 1/8 W UNLESS OTHERWISE NOTED

THE ELECTRONIC SIGNATURE RECORD WILL BE APPENDED TO THE LAST PAGE OF THE SECURED DOCUMENT

DESCRIPTION OF CHANGE	UPDATE L29 AND L30 FROM 4330072071 TO SE41001170, PCB LAYOUT NOT UPDATED THIS TIME	PCB LAYOUT NOT UPDATED THIS TIME. RELEASE TO PRODUCTION	CHANGE U51 TO SE150079170 CHANGE U24 U25 U52 U53 TO SE600055170	CHANGE R411 TO 2.00K 3141324271	
ECO	1073438	200106022	200107719	1082021	
REV	E	F	G	H	

varian

TITLE:

PCB, DUAL MOTOR DRIVER

/

DRAWN:	SHEET			
M. ELPEL	1 OF 16	D	100046951	H
DATE: 10/25/2010				
ORCAD CAPTURE		SIZE	DWG NO	REV

15 GANT_HW_EN_MON
15 LIFT_ST_DISB_MON
15 LIFT_HW_EN_MON
15 GANT_ST_DISB_MON
15 DMD_PWR_OK
15 SPARE_MON
15 SPDIO_RST#

24V
C117 0.1 uF
U22 UDN2987LW-6-T
VS
IN1 IN2 IN3 IN4 IN5 IN6 IN7 IN8
OUT1 OUT2 OUT3 OUT4 OUT5 OUT6 OUT7 OUT8
OE/R FAULT GND
GND

GNT_HW_ENAB_MON_OUT
GNT_ST_DISB#_MON_OUT
LFT_HW_ENAB_MON_OUT
LFT_ST_DISB#_MON_OUT
DMDPWR_STS_OUT
SPAREMON_STS

R49 4.99K
R48 4.99K
R47 4.99K
R46 4.99K
R28 4.99K
R29 4.99K
R58 4.99K
R59 4.99K
R61 4.99K
GND

TP21 SPAREMON_STS
R314 10.0K
GND

3.3V
R60 10.0K
SPDIO_FLT# 15

MI1206K601R-00 L12
MI1206K601R-00 L13
MI1206K601R-00 L14
MI1206K601R-00 L15
MI1206K601R-00 L16

C122 1000 pF 250V
C121 1000 pF 250V
C120 1000 pF 250V
C119 1000 pF 250V
C118 1000 pF 250V
IOGND

DMD_24V
R808 15.0K
SPD2_24V_STATUS 15
R809 2.00K 1%
C676 0.01uF 250V
GND

J9
Vertical Ribbon Connector Connects to SPD2 J36

1 2 3 4 5 GND
6
7 GNT_HW_ENAB
8 GNT_HW_ENAB_OUTL
9 GNT_ST_DISB#
10 GNT_ST_DISB#_OUTL
11
12 DMD_DIG_GND
13 LFT_HW_ENAB
14 LFT_HW_ENAB_OUTL
15 LFT_ST_DISB#
16 LFT_ST_DISB#_OUTL
17
18 <KEY>
19 DMDPWR_STS
20
IOGND
N3428-6302RB

TP20

L11 MI1206K601R-00
C123 0.01uF 250V GND
IOGND

15 GANT_BRK_RLS1
R852 4.99K
GND

U134 BSP742T
24V
IN VBB VBB VBB VBB GND
OUT NC
C682 0.1 uF GND
GND

TP222

TP39
R52 10.0K
R315 1.78K
C167 1000 pF 250V
GND
R53 100K
IN24
U23A SN74LVC14A
3.3V
C20 0.1 uF GND
D40 GANT_HW_EN
R347 392 Ohm
GANT_HW_EN# 15

TP38
R50 10.0K
R316 1.78K
C169 1000 pF 250V
GND
R51 100K
IN23
U23B SN74LVC14A
GANT_ST_DISB 15
D41 R348 392 Ohm GANT_ST_DISB

TP40
R54 10.0K
R313 1.78K
C165 1000 pF 250V
GND
R55 100K
IN25
U23C SN74LVC14A
D49 R349 392 Ohm LIFT_HW_EN
LIFT_HW_EN# 15

TP41
R56 10.0K
R312 1.78K
C164 1000 pF 250V
GND
R57 100K
IN26
U23D SN74LVC14A
LIFT_ST_DISB 15
D39 R346 392 Ohm LIFT_ST_DISB

U23E SN74LVC14A
U23F SN74LVC14A
D36 BAT54C
D117 BAT54C

SPD DMD INTERFACE

varian

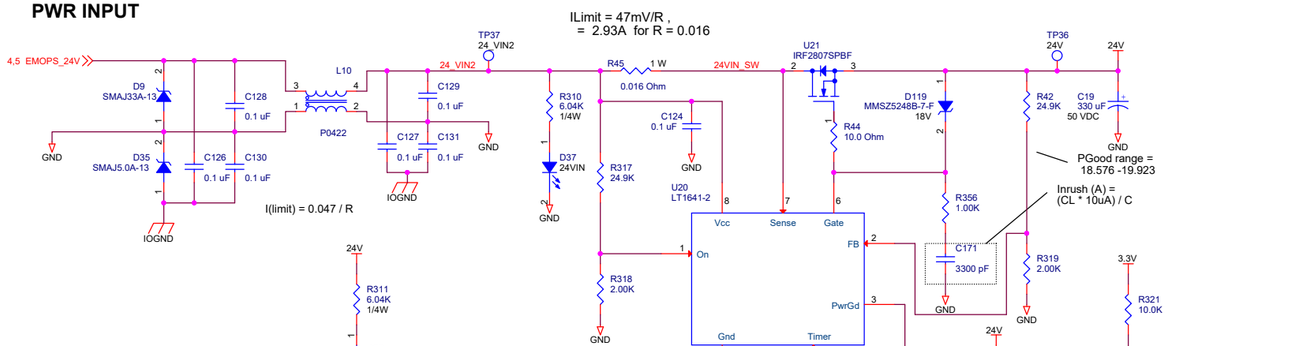
SCALE	NONE
SHEET	2 OF 16

DUAL MOTOR DRIVER

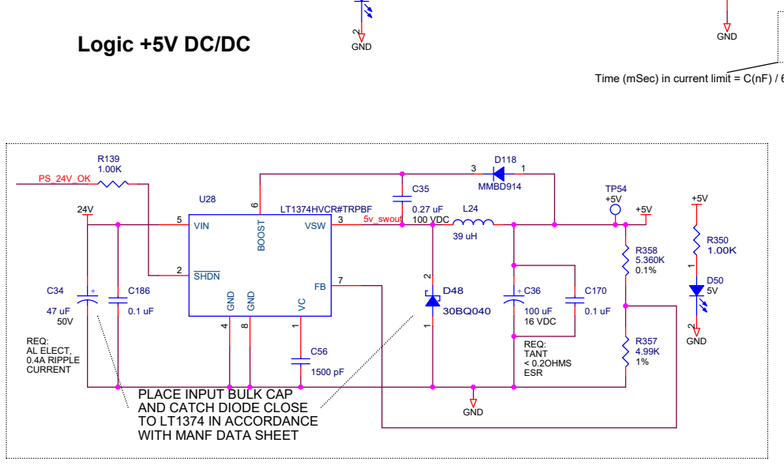
DWG NO	REV
100046951	H

CM# 00001082229 Released Ver: 10 Rev: H 14. July 2022

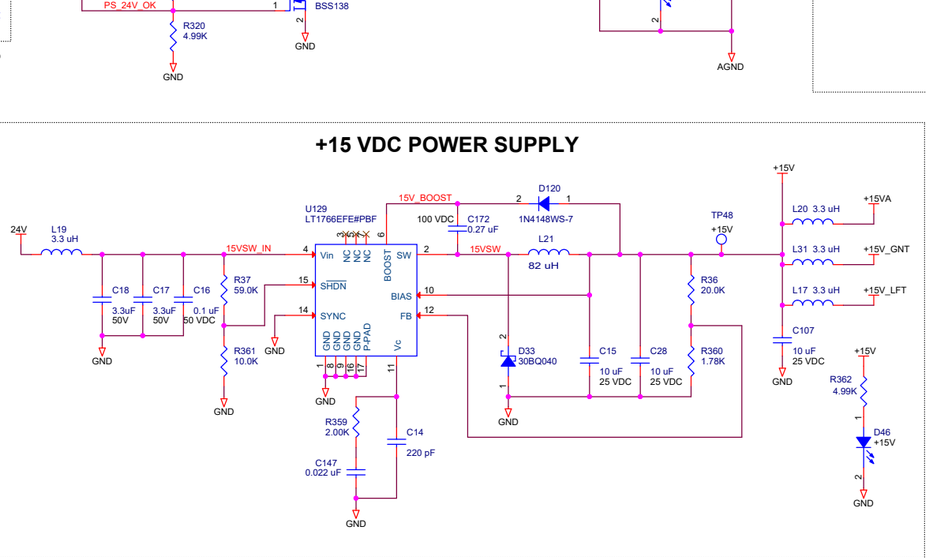
PWR INPUT



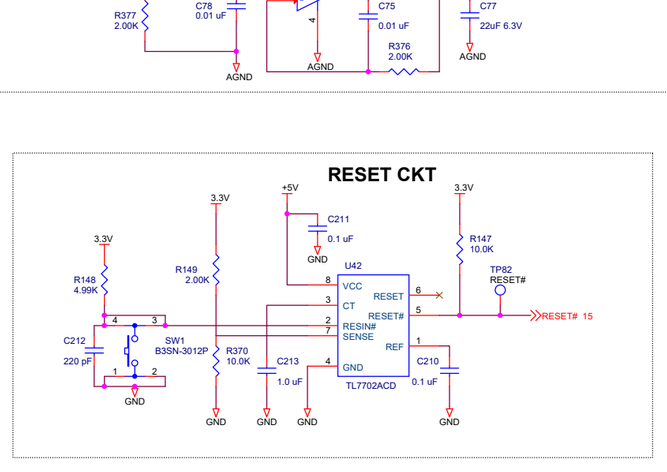
Logic +5V DC/DC



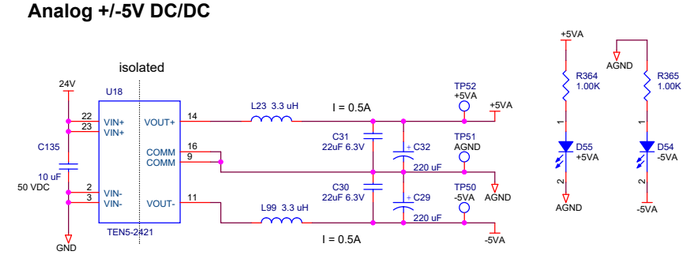
+15 VDC POWER SUPPLY



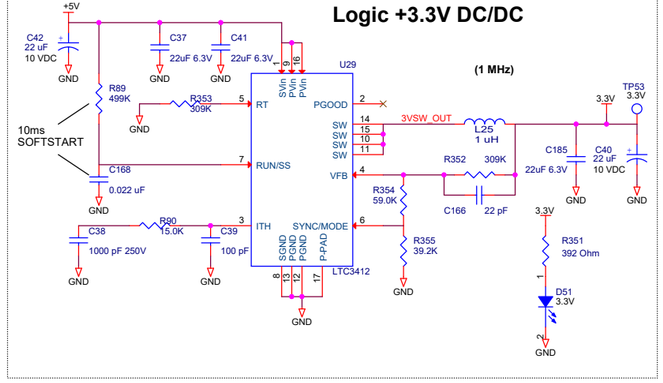
RESET CKT



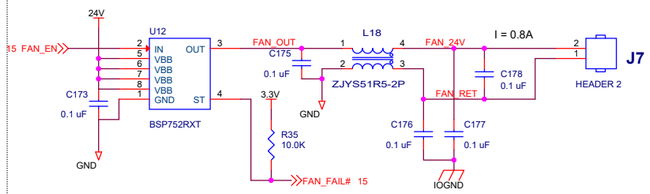
Analog +/-5V DC/DC



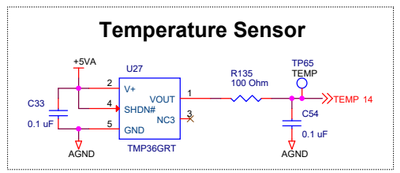
Logic +3.3V DC/DC



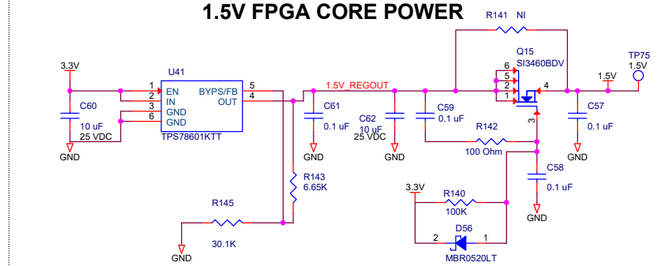
Cooling Fan Connector



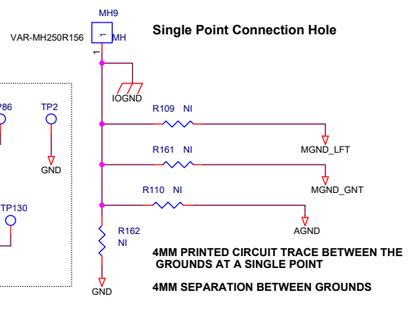
Temperature Sensor



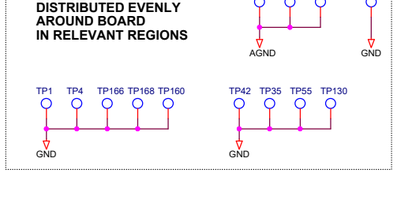
1.5V FPGA CORE POWER

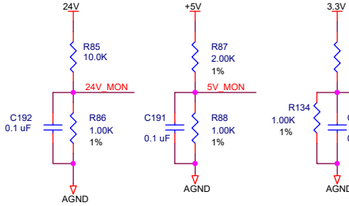


Single Point Connection Hole



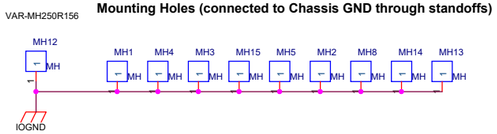
GND TEST POINTS DISTRIBUTED EVENLY AROUND BOARD IN RELEVANT REGIONS





24V_MON 14
5V_MON 14
3.3V_MON 14
1.5V_MON 14
5VA_NEG_MON 14
5VA_POS_MON 14
15V_MON 14

Mounting Holes (connected to Chassis GND through standoffs)



POWER - DIGITAL

varian	SCALE: NONE
	SHEET: 3 OF 16
DUAL MOTOR DRIVER	
DWG NO: 100046951	REV: H

CM# 0000108229 Rev: H Ver: 10 Released 14. July 2022

ILimit = 47mV/R ,
= 15.67A for R = 0.003

XQ21 7109DG
U68 IRF2807SPBF
TP132 P24V_GANT
EMOPS_24V
R252 1 W
0.003 Ohm
GANT24VIN_SENSE
P24V_GANT
C112 0.1 uF
GND
D115 MMSZ5248B-7-F 18V
R291 10.0 Ohm
R476 24.9K
PGood range = 18.576 -19.923
Inrush (A) = (CL * 10uA) / C
U86 LT1641-2
Vcc
Sense
Gate
FB
PwrGd
Gnd
Timer
On
15 GANT_24V_PWR_EN
R287 2.00K
R290 1.00K
C114 3300 pF
R288 2.00K
C113 0.68 uF
Time (mSec) in current limit = C(nF) / 62.
3.3V
24V
R475 20.0K
R292 10.0K
GANT_24V_GOOD# 15
Q25 BSS138
R289 4.99K

XQ22 7109DG
D74 MBRB20200CTT4G
GNT_VDRAIN_INT
R253 20.0K 1W
C104 220 uF 250V
C64 220 uF 250V
C84 220 uF 250V
C85 220 uF 250V
MGND_GNT

20A TRACES

R257 0.016 Ohm 1 W
R255 0.016 Ohm 1 W
R256 0.016 Ohm 1 W
GNT_VDRAIN
L28 HZ0805E601R
L50 HZ0805E601R
KELVIN CONNECTED
GNT_96V_ISNS
ROUTE AS PAIR

-5VA
+15VA
C27 0.1 uF
C26 0.1 uF
AGND
LT1990CS8#PBF
U30
KELVIN CONNECTED
R116 NI
Vout = I x 0.00533 x 10
(Full scale 20A = 1.066V)
TP93 GNT_MOT CURR_MON
GNT_MOT_CURR_MON 14
R853 0.0

+5VA
C222 0.1 uF
U37 OPA340
R242 499K
3.3V
R408 4.99K
TP129 GNT_OVER CURR
15 GANT_OVER_CURR
R239 1.00K
C308 100 pF
U65 LMV331
C102 100 pF
TP126 GANT_CURRLIM_DAC
14 GANT_CURRLIM_DAC
Limit = 25A = 1.315V
R235 1.00K
C100 0.1 uF
C307 0.1 uF

U33
V+
VSENSE
BIAS
COM
NC4
NC7
IOUT
ALPHA
AD8212YRMZ
R163 200K 1/4W
Q14 FMMT596TA
R380 1.00K
R381 10.0K
C226 100 pF
Vout = I x 53.33mV/A
Vsns 0 -> 0.053V
Vout 0.0 TO 2.13V
(Full scale 40A = 2.13V)

TP115 96V_GNT
96V_GNT
XQ12 7109DG
D57 MBRB20200CTT4G
MGND_GNT
XQ16 7109DG
U52 IXTA26P20P
R207 15.0K
D66 BZX84C18-7-F
R208 10.0 Ohm
96v_gant_nety
R251 100 K 1/4W
SPLIT
15 GANT_96V_PWR_EN
Q24 ZVNL120GTA
R286 4.99K
GND
GANT96V_SW
R209 15.0K
D67 BZX84C18-7-F
R211 10.0 Ohm
96v_gant_netx
R210 100 K 1/4W
15 GANT_96V_BYPASS
Q26 ZVNL120GTA
R293 4.99K
RT2
MS22 10008
GANT96V_SOFT
XQ17 7109DG
U53 IXTA26P20P

GNT_VDRAIN_INT
96V_GNT
GANT96V_SW
GANT96V_SOFT
EMOPS_24V
R173 10.0K
EMOPS_24V_MON
C283 0.1 uF
R179 1.00K 1%
P24V_GANT
R169 10.0K
P24V_GANT_MON
C279 0.1 uF
R175 1.00K 1%
R157 100 K 1/4W
R170 24.9K
GNT_VDRAIN_INT_MON
C280 0.01uF 250V
R176 2.00K 1%
R150 100 K 1/4W
R168 24.9K
96V_GNT_MON
C278 0.01uF 250V
R174 2.00K 1%
R151 100 K 1/4W
R171 24.9K
GANT96V_SW_MON
C648 0.01uF 250V
R177 2.00K 1%
R156 100 K 1/4W
R172 24.9K
GANT96V_SOFT_MON
C282 0.01uF 250V
R178 2.00K 1%
AGND

EMOPS_24V_MON 14
P24V_GANT_MON 14
GNT_VDRAIN_INT_MON 14
96V_GNT_MON 14
GANT96V_SW_MON 14
GANT96V_SOFT_MON 14

J18
EMOPS_24V 3,5
GND
350989-4

+96V PROTECTION SHUNT FOR GANTRY

tau = RC = (880uF x 1880 ohms) = 1.65 Sec

GNT_VDRAIN
R155 NI 1W
R154 NI 1W
R153 NI 1W
R152 NI 1W
D58 MURS120T3
J24
1-770166-0
GNT_96VSHUNT-
+15V_GNT
R295 10.0K
3.3V
R294 10.0K
Q16 IRFS4115
Q27 BSS138
15 GANT_MOT_SHUNT_EN#
MGND_GNT

J17
96V_LFT 5
96V_GNT
12S
350991-4
MGND_GNT
MGND_LFT

+15V POWER FOR GANTRY

TP134 +15V_GNT
C106 10 uF 25 VDC
R474 4.99K
D79 SMBJ17A
D78 +15V_GNT
MGND_GNT

96V_GNT
96V_LFT
EMOPS_24V
D65 96V_GNT
D42 96V_LFT
D1 EMOPS_24V
R621 20.0K 1W
R62 20.0K 1W
R345 6.65K 1/8W
MGND_GNT
MGND_LFT
GND

TP131 MGND_GNT
TP83 MGND_GNT
TP167 MGND_GNT
TP133 MGND_GNT

GANTRY 96V INTERFACE

varian

SCALE	NONE
SHEET	4 OF 16

DUAL MOTOR DRIVER

DWG NO	REV
100046951	H

CM# 0000108229
Released
Rev: H
Ver: 10
14. July 2022

ILimit = 47mV/R ,
= 15.67A for R = 0.003

XQ1 7109DG
U2 IRF2807SPBF
3,4 EMOPS_24V
R7 1 W 0.003 Ohm
LIFT24VIN_SENSE
C3 0.1 uF
D2 MMSZ5248B-7-F 18V
R3 10.0 Ohm
TP22 P24V_LIFT
P24V_LIFT
R308 24.9K
PGood range = 18.576 -19.923
Inrush (A) = (CL * 10uA) / C
U1 LT1641-2
Vcc
Sense
Gate
FB
PwrGd
Gnd
Timer
On
15 LIFT_24V_PWR_EN
R8 2.00K
R4 1.00K
C1 3300 pF
R6 2.00K
3.3V
R2 10.0K
24V
R309 20.0K
LIFT_24V_GOOD# 15
Q2 BSS138
R5 4.99K
C2 0.68 uF
Time (mSec) in current limit = C(nF) / 62.
GND

XQ2 7109DG
D10 MBRB20200CTT4G
R12 20.0K 1W
C6 220 uF 250V
C43 220 uF 250V
C7 220 uF 250V
C21 220 uF 250V
LFT_VDRAIN_INT
MGND_LFT

20A TRACES

-5VA
+15VA
C174 0.1 uF
C209 0.1 uF
U88 LT1990CS8#PBF
KELVIN CONNECTED
R13 0.016 Ohm 1 W
R31 0.016 Ohm 1 W
R32 0.016 Ohm 1 W
LFT_VDRAIN
L27 HZ0805E601R
L26 HZ0805E601R
KELVIN CONNECTED
ROUTE AS PAIR
LFT_96V_ISNS+

Vout = I x 0.00533 x 10
(Full scale 20A = 1.066V)
R382
NI
TP61 LFT_MOT CURR_MON
14 LFT_MOT_CURR_MON
R854 0.0
+5VA
C223 0.1 uF
U36 OPA340
R238 1.00K
R241 499K
3.3V
R410 4.99K
TP128 LFT_OVER CURR
LIFT_OVER_CURR 15
U63 LMV331
C313 100 pF
C99 100 pF
R234 1.00K
C96 0.1 uF
C311 0.1 uF
TP124 LFT_OVER_CURR_LIM
14 LIFT_CURRLIM_DAC
Limit = 25A = 1.315V

TP44 96V_LFT
96V_LFT
4 96V_LFT
XQ8 7109DG
D52 MBRB20200CTT4G
MGND_LFT
U24 IXTA26P20P
XQ3 7109DG
LIFT96V_SW
R63 15.0K
D43 BZX84C18-7-F
96v_lft_netx
R694 10.0 Ohm
R65 100 K 1/4W
SPLIT
RT1 MS22 10008
LIFT96V_SOFT
XQ4 7109DG
U25 IXTA26P20P
R66 15.0K
D44 BZX84C18-7-F
R68 10.0 Ohm
R67 100 K 1/4W
Q1 ZVNL120GTA
15 LIFT_96V_PWR_EN
R1 4.99K
Q3 ZVNL120GTA
15 LIFT_96V_BYPASS
R9 4.99K
GND

U32
V+
VSENSE
BIAS
COM
NC4
NC7
IOUT
ALPHA
AD8212YRMZ
R115 200K 1/4W
Q13 FMMT596TA
R378 1.00K
R379 10.0K
C225 100 pF
AGND
MGND_LFT

Vout = I x 53.33mV/A
Vsns 0 -> 0.0533V
Vout 0.0 TO 2.13V
(Full scale 40A = 2.13V)

CURRENT LIMIT DAC

P24V_LIFT
R74 10.0K
P24V_LIFT_MON
C203 0.1 uF
R75 1.00K 1%
LFT_VDRAIN_INT
R98 100 K 1/4W
R83 24.9K 1/8 W
LFT_VDRAIN_INT_MON
C195 0.01uF 250V
R84 2.00K 1%
96V_LFT
R91 100 K 1/4W
R76 24.9K 1/8 W
96V_LFT_MON
C202 0.01uF 250V
R77 2.00K 1%
LIFT96V_SW
R92 100 K 1/4W
R78 24.9K 1/8 W
LIFT96V_SW_MON
C199 0.01uF 250V
R79 2.00K 1%
LIFT96V_SOFT
R97 100 K 1/4W
R81 24.9K 1/8 W
LIFT96V_SOFT_MON
R602 2.00K 1%
C196 0.01uF 250V
AGND

P24V_LIFT_MON 14
LFT_VDRAIN_INT_MON 14
96V_LFT_MON 14
LIFT96V_SW_MON 14
LIFT96V_SOFT_MON 14

+96V PROTECTION SHUNT

LFT_VDRAIN
tau = RC = (880uF x 1880 ohms) = 1.65 Sec
R96 NI 1W
R95 NI 1W
R94 NI 1W
R93 NI 1W
J25
1-770166-0
D53 MURS120T3
LFT_96VSHUNT-
+15V_LFT
R11 10.0K
3.3V
R10 10.0K
Q9 IRFS4115
Q4 BSS138
15 LIFT_MOT_SHUNT_EN#
MGND_LFT
GND

+15V POWER FOR LIFT

TP23 +15V_LFT
+15V_LFT
R344 4.99K
C9 10 uF 25 VDC
D15 SMBJ17A
D14 +15V_LFT
MGND_LFT
TP43 MGND_LFT
TP56 MGND_LFT
TP24 MGND_LFT
TP3 MGND_LFT

LIFT 96V INTERFACE

varian

SCALE	NONE
SHEET	5 OF 16

DUAL MOTOR DRIVER

DWG NO	REV
100046951	H

CM# 0000010822229
Released
Rev: H
14. July 2022

FROM/TO
STAND POWER DIST

J10

N3429-6302RB

LIFT BRAKE DRIVER

LAT-LNG BRAKE DRIVER

SPD_EMOPS_INTERFACE

varian	SCALE NONE
	SHEET 6 OF 16
DUAL MOTOR DRIVER	
DWG NO 100046951	REV H

CM# 0000108229
Released
Rev: H
Ver: 10
14. July 2022

ANALOG INTERFACE

+5VA
C316
0.1 uF
AGND
AGND
C315
0.1 uF
-5VA

TP123
GANTRY_DAC_VMON
R233
100 Ohm
14 GANT_DAC
GANTRY_DAC_VMON
+5VA
U60
OPA743NA
-5VA
R232
22.1 Ohm
TP122
GANTRY_IMON+
L30
DLW44SN851SK2L
C373
22 pF
C374
22 pF
AGND
IOGND
GANT_CURR_FB_A
GANT_CURR_FB_B

OPAMP OUT (0..+4.98V)
0V = -20A
2.5V = 0.0A
5.0V = +20A

IMON FEEDBACK DAC
0 --> 5.0V

24V
15 EM_24V_EN
U133
BSP742T
IN
OUT
VBB
GND
NC
C681
0.1 uF
R818
10.0K
EM_GANT_24V
R851
6.04K
1/4W
D220
EM_GANT_24V

J1
N3429-6302RB
TP176
TP175
TP164
TP163
TP162
TP161
GMTN_ENABLE
<KEY>
GND
E2
GANTRY_GPI4
GANTRY_GPI1
CCW_LIMIT_24V
GANTRY_GPI2
CW_LIMIT_24V
E1
GANTRY_GPI3

FROM/TO
STAND CONT

DIGITAL OUTPUTS

24V
U84
UDN2987LW-6-T
VS
IN1
IN2
IN3
IN4
IN5
IN6
IN7
IN8
OUT1
OUT2
OUT3
OUT4
OUT5
OUT6
OUT7
OUT8
OE/R
FAULT
GND
C372
0.1 uF
15 GANT_SER_CLK
15 GANT_SER_SYNC
15 GANT_SER_DATA0
15 GANT_SER_DATA1
15 GANT_SERIO_RST#
R427
2.00K
R425
2.00K
3.3V
R426
10.0K
GANTRY_GPI1_Y
GANTRY_GPI2_Y
GANTRY_GPI3_Y
GANTRY_GPI4_Y
GANT_SERIO_FLT# 15
MI1206K601R-00 L49
MI1206K601R-00 L48
MI1206K601R-00 L47
MI1206K601R-00 L46
C368
C369
C370
C371
1000 pF 250V
IOGND

3.3V
C330
0.1 uF
TP155
R303
10.0K
R462
1.78K
C367
1000 pF 250V
R281
100K
IN60
U85A
SN74LVC14A
D107
GMTN_ENABLE
R422
392 Ohm
GANT_MTN_EN# 15

TP156
R304
10.0K
R461
1.78K
C366
1000 pF 250V
R282
100K
IN61
U85B
D108
GANT_CTRL_SPARE
R423
392 Ohm
GANT_CTRL_SPARE 15

TP157
R305
10.0K
R460
1.78K
C365
1000 pF 250V
R283
100K
IN62
U85C
D109
GANT_CCW_LIMIT
R424
392 Ohm
GANT_CCW_LIMIT# 15

TP158
R306
10.0K
R459
1.78K
C364
1000 pF 250V
R284
100K
IN64
U85D
D114
GANT_CW_LIMIT
R421
392 Ohm
GANT_CW_LIMIT# 15

TP159
R307
10.0K
R458
1.78K
C363
1000 pF 250V
R285
100K
IN65
U85E
D113
GANT_SER_PAGE_SEL
R420
392 Ohm
GANT_SER_PAGE_SEL 15

D110
BAT54C
D111
BAT54C
D112
BAT54C
U85F
SN74LVC14A

1:4 CONFIG

GANT_CURR_CMD_A
GANT_CURR_CMD_B
R226
4.99K
1%
R225
4.99K
1%
GANT_CURR_CMD_A_IN
GANT_CURR_CMD_B_IN
R414
3.32K
C93
1000 pF 250V
C321
22 pF
C324
22 pF
R415
NI
U57
AD620BR
+5VA
-5VA
C322
0.1 uF
C323
0.1 uF
TP87
GANTRY_VIN
R181
100 Ohm
C274
0.1 uF
GANTRY_CURR_CMD 14

Input Diff. Range: +/-10V
Scaling: 4A/1V

+/-2.5V
4A/0.25V

STAND CONTROLLER INTERFACE

varian	SCALE	NONE
	SHEET	7 OF 16
DUAL MOTOR DRIVER		
DWG NO 100046951		REV H

CM# 0000010822229
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15 GANT_BRK_RLS
R440 4.99K
24V
U81
IN
OUT
VBB
VBB
VBB
VBB
GND
NC
BSP742T
TP148
STS8 D101
C344 0.1 uF
GND
332 Ohm R438
GANTRY BRAKE DRIVER

15 GANT_HALL_PWR_EN
+5V
C354 0.1 uF
U77
GND
IN1
IN2
EN
OUT3
OUT2
OUT1
OC
TPS2021D
3.3V
R448 10.0K
GANT_HALL_PWR_OK 15
+5VF2
C352 0.1 uF
C111 22uF 6.3V
TP141 +5VF2
C353 0.01uF 250V
L32 ZJYS51R5-2P
HALL_GANTRY_+5V
HALL_GANTRY_GND
C380 0.01uF 250V
C381 0.01uF 250V
IOGND

Gantry Brake Drive

Route together
R227 0.0
R229 0.0
GANT_BRK_ISEN+
GANT_BRK_ISEN-
GANT_BRK_ISEN_IN+
GANT_BRK_ISEN_IN-
0.5W R272 0.47 Ohm
0.5W R271 0.47 Ohm
C320 100 pF
+5VA
C319 0.1 uF
AGND
INA193AIDBVTG4 U58
R228 100 Ohm
R413 2.00K
C94 100 pF
GANTRY_BRK_IMON TP119
GANTRY_BRK_IMON 14
R236 39.2K
R237 499K
3.3V
U61
VCC
IN+
IN-
GND
LMV331
R240 4.99K
GANT_BRK_OVCURR 15
R411 2.00K
R412 4.99K
C97 0.1 uF
C314 0.1 uF
GND

Brake Current Monitor
Gain = 20
Vout = I * 20 * *0.235

Brake Overcurrent Limit = 0.500A

TP149 GBRAKE
D102 MURS120T3
L36 ZJYS51R5-2P
choke 2A limt
R441 10.0 Ohm
R439 10.0 Ohm
C345 1000 pF 250V
C343 1000 pF 250V
IOGND
GANTRY_BRAKE+
GANTRY_BRAKE-

FROM/TO GANTRY MOTOR
J4
S5V_1
ENCODER_DA2
ENCODER_DA1
HALL_GANTRY_+5V
HALL_GANTRY_A
HALL_GANTRY_C
15 GANT_BEMF_DECODE
S5VRET_1
ENCODER_DB2
ENCODER_DB1
HALL_GANTRY_GND
HALL_GANTRY_B
GANT_POLE_DECODE 15
5-794630-0
IOGND

FROM/TO STAND CONTROLLER
Route together as pairs.
120 ohm Diff. line impedance
J5
S5V_1
S5VRET_1
ENCODER_DA1
ENCODER_DB1
ENCODER_DA2
ENCODER_DB2
N3793-6302RB
C382 1000 pF 250V
C383 0.01uF 250V
R464 100K
IOGND

HALL_GANTRY_A
HALL_GANTRY_B
HALL_GANTRY_C
HZ0805E601R L33
HZ0805E601R L34
HZ0805E601R L35
TP143
TP144
TP146
+5VF2
R446 10.0K
R648 10.0K
R443 10.0K
C379 1000 pF 250V
C378 1000 pF 250V
C377 1000 pF 250V
R268 20.0K
R269 20.0K
R270 20.0K
IN80
IN81
IN82
C351 1000 pF 250V
C349 1000 pF 250V
C347 1000 pF 250V
U78
U79
U80
SN74LVC1G14
TP142 HALL2_SNS1#
TP145 HALL2_SNS2#
TP147 HALL2_SNS3#
R447 392 Ohm
R444 392 Ohm
R442 392 Ohm
D96
D98
D100
GANT_HALL1
GANT_HALL2
GANT_HALL3
GANT_HALL_SNS1# 15
GANT_HALL_SNS2# 15
GANT_HALL_SNS3# 15
C350 0.1 uF
C348 0.1 uF
C346 0.1 uF

D97 BAT54C
D99 BAT54C
IN80
IN81
IN82
+5V

GANTRY BRAKE & MOTOR HALL SENSOR IF

varian

SCALE	NONE
SHEET	8 OF 16

DUAL MOTOR DRIVER
/

DWG NO	REV
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15 GANT_PWM0
15 GANT_PWM1
15 GANT_PWM2
15 GANT_PWM3
15 GANT_PWM4
15 GANT_PWM5

TP140 GANTRY_PWM0
TP185 GANTRY_PWM1
TP138 GANTRY_PWM2
TP136 GANTRY_PWM3
TP135 GANTRY_PWM4
TP137 GANTRY_PWM5

RN4 10.0K
RN3 10.0K

U75 IRS2110STRPBF
U72 IRS2110STRPBF
U69 IRS2110STRPBF
VDD HIN LIN SD VSS COM VB HO VS VCC LO

+15V_GNT
3.3V
GND
MGND_GNT

C355 0.1 uF
C358 0.1 uF
C361 0.1 uF
C356 0.1 uF
C359 0.1 uF
C362 0.1 uF

D88 MURS120T3
D80 MURS120T3
D75 MURS120T3
D89 MURS120T3
D81 MURS120T3
D76 MURS120T3

R263 4.70 Ohm
R258 4.70 Ohm
R254 4.70 Ohm

GANTRY_MOTOR_VB1
GANTRY_MOTOR_VB2
GANTRY_MOTOR_VB3

D90 SMBJ17A
D82 SMBJ17A
D77 SMBJ17A

C109 0.33 uF
C108 0.33 uF
C105 0.33 uF

GANTRY_MOTOR_GHA
GANTRY_MOTOR_GLA
GANTRY_MOTOR_GHB
GANTRY_MOTOR_GLB
GANTRY_MOTOR_GHC
GANTRY_MOTOR_GLC

R160 6.20 Ohm
R217 6.20 Ohm
R159 6.20 Ohm
R214 6.20 Ohm
R158 6.20 Ohm
R212 6.20 Ohm

Q19 IRFS4115
Q22 IRFS4115
Q18 IRFS4115
Q21 IRFS4115
Q17 IRFS4115
Q20 IRFS4115

XQ15 7109DG
XQ20 7109DG
XQ14 7109DG
XQ19 7109DG
XQ13 7109DG
XQ34 7109DG

C67 0.01uF 250V 250V
C66 0.01uF 250V 250V
C65 0.01uF 250V 250V

GANTRY_MOTOR_A
GANTRY_MOTOR_B
GANTRY_MOTOR_C

R219 10.0K
R216 10.0K
R213 10.0K

C88 1000 pF 250V 250V
C87 1000 pF 250V 250V
C86 1000 pF 250V 250V

R218 0.010 1 W
R215 0.010 1 W

TP116 GANTRY_MOTOR_C

R796 0.010 1 W
R797 0.010 1 W

-5VA +15VA AGND

C91 0.1 uF
C90 0.1 uF
C284 0.1 uF
C329 0.1 uF

Vout = I x 0.01 x 10
(Full scale 20A = 2.0V)

U55 LT1990CS8#PBF
U89 LT1990CS8#PBF

Kelvin Connection

Gantry_sense_A
Gantry_sense_B

GANTRY_MOTOR_SNB
GANTRY_MOTOR_SNA

R165 49.9 Ohm
R164 49.9 Ohm
R166 49.9 Ohm
R167 49.9 Ohm

D123 BAV99
D124 BAV99

ROUTE AS PAIR

+5VA
C271 0.1 uF
C272 0.1 uF

U45 AD623
U44 AD623

R404 49.9K
R403 49.9K
R183 49.9K
R182 49.9K

C276 1000 pF 250V
C68 1000 pF 250V

GANTRY_CURA_IN_P
GANTRY_CURA_IN_N
GANTRY_CURB_IN_P
GANTRY_CURB_IN_N

R185 15.0K
R184 15.0K

C228 10 pF
C273 10 pF
C69 10 pF
C70 10 pF

VREF_BEMF_GNT

R188 100 Ohm
R187 100 Ohm

TP100
TP99

GANTRY_MOT_CURA 14
GANTRY_MOT_CURB 14

C268 1000 pF 250V
C221 1000 pF 250V

Rg 15k
CUR Gain = 76.6mV/A

R222 NI
R419 NI

C224 0.1 uF
C227 0.1 uF

U43 ADG1212YRUZ

15 GANT_CURR_SAMP

GANTRY_MOTOR_CURA_P
GANTRY_MOTOR_CURA_N
GANTRY_MOTOR_CURB_P
GANTRY_MOTOR_CURB_N

ROUTE AS PAIRS

C230 0.1 uF
C277 0.1 uF

OFFSET SELECT

VREF_BEMF_GNT R189 NI R399 0.0 AGND
VREF1.25V 3,12

TO GANTRY MOTOR

TP118 GANTRY_MOTOR_A
TP117 GANTRY_MOTOR_B
GANTRY_MOTOR_A1
GANTRY_MOTOR_B1
GANTRY_MOTOR_C

J22 4S HEADER 4 350584-1
IOGND

D68 GANT_MTR_ENAB
R449 392 Ohm
R450 4.99K

U54 SN74LVC1G00DBVR
15 GANT_MOT_DRV_EN
12,15,16 WDOK
C89 0.1 uF

U70 TMP36GRT
C608 0.1 uF
R120 100 Ohm
TP60 GANTRY_DRVR_TEMP
GANTRY_DRVR_TEMP 14
C53 0.1 uF

Place near J22.
TP84 MGND_GNT

GANTRY MOTOR INTERFACE

varian

SCALE	NONE
SHEET	9 OF 16
DWG NO	100046951
REV	H

DUAL MOTOR DRIVER

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Released
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ANALOG INTERFACE

DAC MONITOR

14 LIFT_DAC >> R231 100 Ohm → TP121 LIFT_DAC_VMON → LIFT_DAC_VMON → U59 OPA743NA (+5VA / -5VA, C318 0.1 uF AGND, C317 0.1 uF AGND) → R230 22.1 Ohm → TP120 LIFT_IMON+

OPAMP OUT (0..+4.98V)
0V = -20A
2.5V = 0.0A
5.0V = +20A

L29 DLW44SN851SK2L → AGND, C335 22 pF, C337 22 pF → IOGND

IMON FEEDBACK DAC
0--> 5.0V

FROM/TO CCHL

J12

	19	10	LIFT_GPO1
	20	1	LIFT_GPI1
		11	LIFT_GPO2
		2	LIFT_GPI2
		12	
LIFT_CURR_CMD_A	21	3	LIFT_GPI3
LIFT_CURR_CMD_B	22	13	
LIFT_CURR_FB_A	23	4	LIFT_GPI4
LIFT_CURR_FB_B	24	14	LIFT_LIMIT1
	25	5	
	26	15	LIFT_LIMIT2
		6	
		16	
		7	
		17	
		8	
		18	
		9	

CONN DSUB HD26-S

GND, GND, 28, 27, C376 1000 pF 250V, C375 0.01uF 250V, R463 100K, IOGND

DIGITAL OUTPUTS

24V, C526 0.1 uF, GND

U83 UDN2987LW-6-T (VS, FAULT, GND)

15 LIFT_SER_CLK	1 IN1	20 OUT1	LIFT_GPI1_Y
15 LIFT_SER_SYNC	2 IN2	19 OUT2	LIFT_GPI2_Y
15 LIFT_SER_DATA0	3 IN3	18 OUT3	LIFT_GPI3_Y
15 LIFT_SER_DATA1	4 IN4	17 OUT4	LIFT_GPI4_Y
	5 IN5	16 OUT5	
	6 IN6	15 OUT6	
	7 IN7	14 OUT7	
	8 IN8	13 OUT8	
15 LIFT_SERIO_RST#	10 OE/R	9 FAULT	LIFT_SERIO_FLT# 15

R430 2.00K → GND; R428 2.00K → GND; 3.3V, R624 10.0K

MI1206K601R-00 L40, L39, L38, L37

C331 1000 pF 250V, C332 1000 pF 250V, C333 1000 pF 250V, C334 1000 pF 250V → IOGND

U82 SN74LVC14A

3.3V, C339 0.1 uF, GND

U82A	IN90	R274 10.0K	TP150	R273 100K, R435 1.78K, C342 1000 pF 250V	LIFT_MTN_EN# 15
U82B	IN91	R276 10.0K	TP151	R275 100K, R434 1.78K, C341 1000 pF 250V	LIFT_SER_PAGE_SEL 15
U82C	IN92	R278 10.0K	TP152	R277 100K, R433 1.78K, C340 1000 pF 250V	LIFT_DOWN_LIMIT# 15
U82D	IN93	R280 10.0K	TP153	R279 100K, R432 1.78K, C338 1000 pF 250V	LIFT_UP_LIMIT# 15

D69 LIFT_MTN_EN, R416 392 Ohm, 3.3V

D70 LIFT_SER_PAGE_SEL, R436 392 Ohm, GND

D103 LIFT_DOWN_LIMIT, R437 392 Ohm, 3.3V

D106 LIFT_UP_LIMIT, R431 392 Ohm, 3.3V

D104 BAT54C: IN90, IN91, 3.3V

D105 BAT54C: IN92, IN93, 3.3V

1:4 CONFIG

Input Diff. Range: +/-10V
Scaling: 4A/1V

R224 4.99K 1% → LIFT_CURR_CMD_A_IN; R223 4.99K 1%

R417 3.32K, C92 1000 pF 250V, C325 22 pF, C328 22 pF, R418 NI

LIFT_CURR_CMD_B_IN → AGND

U56 AD620BR (+5VA, -5VA, C326 0.1 uF AGND, C327 0.1 uF AGND)

R180 100 Ohm → TP85 GANTRY_VIN → LIFT_CURR_CMD 14

C275 0.1 uF AGND

+/-2.5V
4A/0.25V

U82E / U82F SN74LVC14A

3.3V, GND

CCHL INTERFACE

varian

SCALE	NONE
SHEET	10 OF 16

DUAL MOTOR DRIVER
/

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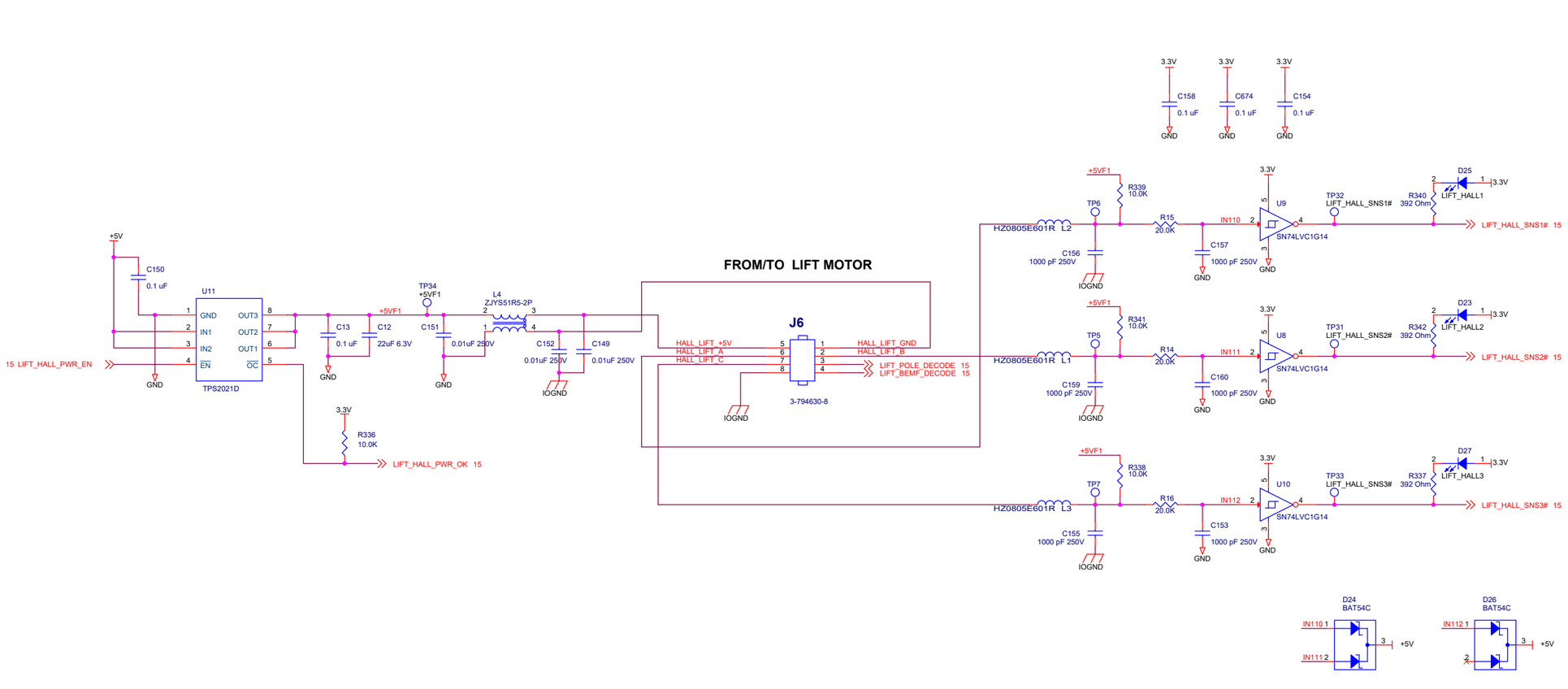

LIFT MOTOR HALL SENSOR IF

varian	SCALE NONE
	SHEET 11 OF 16
DUAL MOTOR DRIVER	
DWG NO 100046951	REV H

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15 LIFT_PWM0
15 LIFT_PWM1
15 LIFT_PWM2
15 LIFT_PWM3
15 LIFT_PWM4
15 LIFT_PWM5

P30 LIFT_PWM0
P29 LIFT_PWM1
P28 LIFT_PWM2
P26 LIFT_PWM3
P25 LIFT_PWM4
P27 LIFT_PWM5

RN2 10.0K
RN1 10.0K

+15V_LFT
LFT_VDRAIN
3.3V
GND
MGND_LFT

D19 MURS120T3
D16 MURS120T3
D11 MURS120T3
D20 MURS120T3
D17 MURS120T3
D12 MURS120T3

R34 4.70 Ohm
R33 4.70 Ohm
R30 4.70 Ohm

C179 0.1 uF
C181 0.1 uF
C183 0.1 uF
C182 0.1 uF
C180 0.1 uF
C184 0.1 uF

U6 U5 U3
VDD HIN LIN SD VSS
VB HO VS VCC LO COM
IRS2110STRPBF

LIFT_MOTOR_VB1
LIFT_MOTOR_VB2
LIFT_MOTOR_VB3

D21 SMBJ17A
D18 SMBJ17A
D13 SMBJ17A

C11 0.33 uF
C10 0.33 uF
C8 0.33 uF

C24 0.01uF 250V
C23 0.01uF 250V
C22 0.01uF 250V

XQ7 7109DG
XQ6 7109DG
XQ5 7109DG
XQ11 7109DG
XQ10 7109DG
XQ9 7109DG

Q8 IRFS4115
Q7 IRFS4115
Q6 IRFS4115
Q48 IRFS4115
Q11 IRFS4115
Q10 IRFS4115

R71 6.20 Ohm
R70 6.20 Ohm
R69 6.20 Ohm
R104 6.20 Ohm
R101 6.20 Ohm
R99 6.20 Ohm

LIFT_MOTOR_GHA
LIFT_MOTOR_GLA
LIFT_MOTOR_SNA
LIFT_MOTOR_GHB
LIFT_MOTOR_GLB
LIFT_MOTOR_SNB
LIFT_MOTOR_GHC
LIFT_MOTOR_GLC

LIFT_MOTOR_A
LIFT_MOTOR_B
LIFT_MOTOR_C

R106 10.0K
R103 10.0K
R100 10.0K
R105 0.010 1 W
R102 0.010 1 W
R108 0.010 1 W
R107 0.010 1 W

C46 1000 pF 250V
C45 1000 pF 250V
C44 1000 pF 250V

TP45 LIFT_MOTOR_C

-5VA +15VA AGND

C48 0.1 uF
C47 0.1 uF
C231 0.1 uF
C229 0.1 uF

Kelvin Connection

U26 LT1990CS8#PBF
U87 LT1990CS8#PBF

Vout = I x 0.01 x 10
(Full scale 20A = 2.0V)

Lift_sense_A
Lift_sense_B

OFFSET SELECT

VREF_BEMF_LFT
R124
VREF1.25V 3.9
NI
R366
0.0
AGND

LIFT_MOTOR_SNB
LIFT_MOTOR_SNA

R112 49.9 Ohm
R111 49.9 Ohm
R113 49.9 Ohm
R114 49.9 Ohm

D121 BAV99
D122 BAV99

ROUTE AS PAIR

U31
15 LIFT_CURR_SAMP
IN1 IN2 IN3 IN4
D1 D2 D3 D4
V+ V- NC GND
S1 S2 S3 S4
ADG1212YRUZ

LIFT_MOTOR_CURA_P
LIFT_MOTOR_CURA_N
LIFT_MOTOR_CURB_P
LIFT_MOTOR_CURB_N

ROUTE AS PAIRS

+5VA -5VA

C207 0.1 uF
C208 0.1 uF

C197 0.1 uF
C200 0.1 uF
C198 0.1 uF
C201 0.1 uF

U34 AD623
U35 AD623
V+ RG REF V-

R368 49.9K
R367 49.9K
R118 49.9K
R117 49.9K

C206 1000 pF 250V
C49 1000 pF 250V

C204 10 pF
C205 10 pF
C50 10 pF
C51 10 pF

R80 15.0K
R795 15.0K

R122 100 Ohm
R123 100 Ohm

R72 NI
R369 NI

TP62 LIFT_MOT_CURA 14
TP63 LIFT_MOT_CURB 14

C193 1000 pF 250V
C194 1000 pF 250V

Rg 15k
CUR Gain = 76.6mV/A

TP58 LIFT_MOTOR_A
TP57 LIFT_MOTOR_B

LIFT_MOTOR_A1
LIFT_MOTOR_B1
LIFT_MOTOR_C

TO LIFT MOTOR
J23
4S
HEADER 4
350988-4
IOGND

D22 LIFT_MTR_ENAB
R343 392 Ohm
R363 4.99K

15 LIFT_MOT_DRV_EN
9,15,16 WDOK

U7
VCC A B Y GND
SN74LVC1G00DBVR

C162 0.1 uF

U4
V+ SHDN# GND VOUT NC3
TMP36GRT

C163 0.1 uF
R119 100 Ohm
C52 0.1 uF
TP208 LIFT_DRVR_TEMP
LIFT_DRVR_TEMP 14

Place near J23.
TP46 MGND_LFT

LIFT MOTOR INTERFACE

varian

SCALE NONE
SHEET 12 OF 16

DUAL MOTOR DRIVER

DWG NO 100046951
REV H

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STAND MOUNTED CONTROL PANEL

15 PAN_24V_SW

24V

U90 BSP742T — R477 10.0K, C398 0.1 uF, GND

J8 STN CTRL PANEL — CONN DSUB 15-R

PAN_24V
PAN_CCH_GNT#
PAN_GND
PAN_24V_CCH
PAN_STN_LAT_LNG_FLOAT
PAN_STN_LFT_BRK_OVRD
PAN_LFT_BRK_OVRD_LED
PAN_STN_GNT_CW_LFT_UP
PAN_STN_GNT_CCW_LFT_DWN
PAN_STN_GNT_LFT_MOT_EN

HZ0805E601R L42
HZ0805E601R L45
MI1206K601R-00 L44
MI1206K601R-00 L43
HZ0805E601R L41

CCH_GNT# 6
6 24V_CCH

C385 1000 pF 250V
C387 1000 pF 250V
C389 1000 pF 250V
C386 1000 pF 250V
C396 1000 pF 250V

R296 100K
C115 0.01uF 250V
C116 1000 pF 250V
IOGND

LFT_BRK_OVRD_LED

24V POWER FOR LIFT BRAKE OVERRIDE LED

15 LIFT_BRK_OVRD_LED_CTRL

R472 4.99K

U71 BSP742T — C397 0.1 uF

R473 6.04K 1/4W

D116 LFT_BRK_OVRD

U74 BSP742T — C388 0.1 uF

C357 0.1 uF

U73A

TP173 — R301 10.0K — R467 1.78K — C391 1000 pF 250V — R264 100K — IN120 — SN74LVC14A — R454 392 Ohm — D94 SW_PWR_OK — STN_SW_PWR_OVL 15

U73B

TP172 — R302 10.0K — R466 1.78K — C390 1000 pF 250V — R265 100K — IN121 — SN74LVC14A — R453 392 Ohm — D93 STN_LAT_LNG_FLOAT — STN_LAT_LNG_FLOAT# 15

U73C

TP171 — R300 10.0K — R468 1.78K — C392 1000 pF 250V — R262 100K — IN122 — SN74LVC14A — R452 392 Ohm — D92 STN_LFT_BRK_OVRD — STN_LIFT_BRK_OVRD# 15

U73D

TP169 — R299 10.0K — R469 1.78K — C393 1000 pF 250V — R261 100K — IN123 — SN74LVC14A — R455 392 Ohm — D83 STN_GNT_CW_LFT_UP — STN_GANT_CW_LFT_UP# 15

U73E

TP169 — R297 10.0K — R471 1.78K — C395 1000 pF 250V — R259 100K — IN124 — SN74LVC14A — R456 392 Ohm — D84 STN_GNT_CCW_LFT_DWN — STN_GANT_CCW_LFT_DWN# 15

U73F

TP170 — R298 10.0K — R470 1.78K — C394 1000 pF 250V — R260 100K — IN125 — SN74LVC14A — R457 392 Ohm — D85 STN_GNT_LFT_MOT_EN — STN_GANT_LFT_MOT_EN# 15

U76

TP174 — R267 10.0K — R465 1.78K — C478 1000 pF 250V — R266 100K — IN126 — SN74LVC1G14 — R451 392 Ohm — D95 AXIS_SEL_LFT — AXIS_SEL_LFT# 15

C110 0.1 uF

D91 BAT54C — IN120, IN121 — 3.3V
D87 BAT54C — IN122, IN123 — 3.3V
D86 BAT54C — IN124, IN125 — 3.3V
D126 BAT54C — IN126 — 3.3V

SERVICE PENDANT

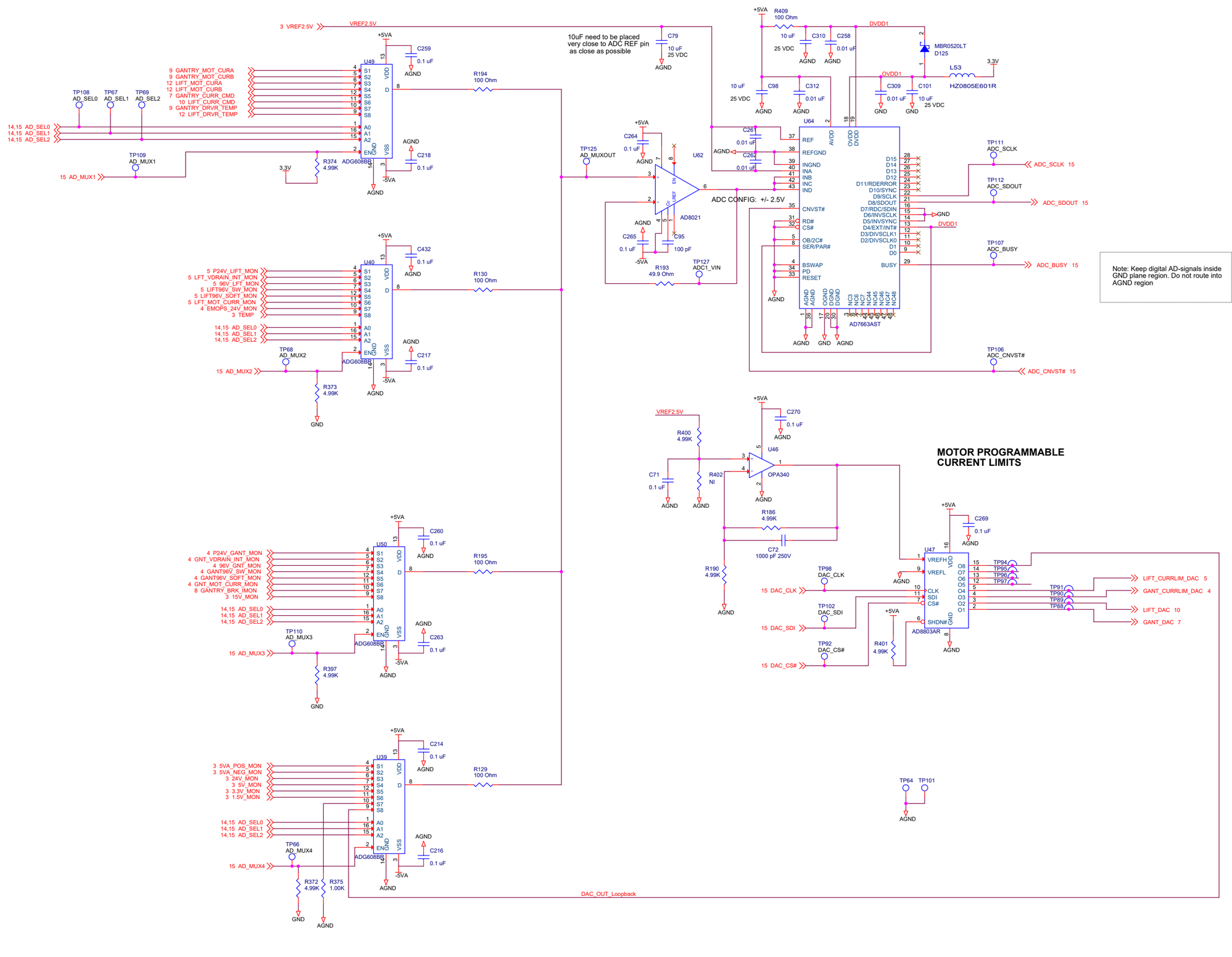
varian

SCALE	NONE
SHEET	13 OF 16

DUAL MOTOR DRIVER

DWG NO	REV
100046951	H

14. July 2022 Rev: H Ver: 10 Released CM# 0000108229


3 VREF2.5V
VREF2.5V
10uF need to be placed very close to ADC REF pin as close as possible
C79
10 uF
25 VDC
AGND
+5VA
C259
0.1 uF
U49
9 GANTRY_MOT_CURA
9 GANTRY_MOT_CURB
12 LIFT_MOT_CURA
12 LIFT_MOT_CURB
7 GANTRY_CURR_CMD
10 LIFT_CURR_CMD
9 GANTRY_DRVR_TEMP
12 LIFT_DRVR_TEMP
TP108 AD_SEL0
TP67 AD_SEL1
TP69 AD_SEL2
14,15 AD_SEL0
14,15 AD_SEL1
14,15 AD_SEL2
TP109 AD_MUX1
15 AD_MUX1
R374 4.99K
3.3V
ADG608BRU
R194 100 Ohm
C218
0.1 uF
-5VA
TP125 AD_MUXOUT
C264
0.1 uF
C265
0.1 uF
U62
AD8021
R193 49.9 Ohm
C95
100 pF
TP127 ADC1_VIN
ADC CONFIG: +/- 2.5V
R409 100 Ohm
C310
10 uF
25 VDC
C258
0.01 uF
DVDD1
MBR0520LT
D125
L53
HZ0805E601R
3.3V
C98
10 uF
25 VDC
C312
0.01 uF
OVDD1
C309
0.01 uF
C101
10 uF
25 VDC
GND
U64
C260
C262
C263
0.01 uF
REF
REFGND
INGND
INA
INB
INC
IND
CNVST#
RD#
CS#
OB/2C#
SER/PAR#
BSWAP
PD
RESET
AVDD
OVDD
OGND
DGND
NC
AD7663AST
D15
D14
D13
D12
D11/RDERROR
D10/SYNC
D9/SCLK
D8/SDOUT
D7/RDC/SDIN
D6/INVSCLK
D5/INVSYNC
D4/EXT/INT#
D3/DIVSCLK1
D2/DIVSCLK0
D1
D0
BUSY
TP111 ADC_SCLK
ADC_SCLK 15
TP112 ADC_SDOUT
ADC_SDOUT 15
TP107 ADC_BUSY
ADC_BUSY 15
TP106 ADC_CNVST#
ADC_CNVST# 15
Note: Keep digital AD-signals inside GND plane region. Do not route into AGND region
U40
5 P24V_LIFT_MON
5 LFT_VDRAIN_INT_MON
5 96V_LFT_MON
5 LIFT96V_SW_MON
5 LIFT96V_SOFT_MON
5 LFT_MOT_CURR_MON
4 EMOPS_24V_MON
3 TEMP
TP68 AD_MUX2
15 AD_MUX2
R373 4.99K
C432
0.1 uF
C217
0.1 uF
R130 100 Ohm
VREF2.5V
R400 4.99K
C71
0.1 uF
U46
OPA340
R402 NI
C270
0.1 uF
MOTOR PROGRAMMABLE CURRENT LIMITS
R186 4.99K
C72 1000 pF 250V
R190 4.99K
U47
AD8803AR
VREFH
VREFL
CLK
SDI
CS#
SHDN
TP98 DAC_CLK
15 DAC_CLK
TP102 DAC_SDI
15 DAC_SDI
TP92 DAC_CS#
15 DAC_CS#
R401 4.99K
C269
0.1 uF
TP94
TP95
TP96
TP97
TP91
TP90
TP89
TP88
LIFT_CURRLIM_DAC 5
GANT_CURRLIM_DAC 4
LIFT_DAC 10
GANT_DAC 7
U50
4 P24V_GANT_MON
4 GNT_VDRAIN_INT_MON
4 96V_GNT_MON
4 GANT96V_SW_MON
4 GANT96V_SOFT_MON
4 GNT_MOT_CURR_MON
8 GANTRY_BRK_IMON
3 15V_MON
TP110 AD_MUX3
15 AD_MUX3
R397 4.99K
C260
C263
0.1 uF
R195 100 Ohm
U39
3 5VA_POS_MON
3 5VA_NEG_MON
3 24V_MON
3 5V_MON
3 3.3V_MON
3 1.5V_MON
TP66 AD_MUX4
15 AD_MUX4
R372 4.99K
R375 1.00K
C214
C216
0.1 uF
R129 100 Ohm
TP64
TP101
DAC_OUT_Loopback
A/D CONVERTER
varian
SCALE NONE
SHEET 14 OF 16
DUAL MOTOR DRIVER
/
DWG NO 100046951
REV H
CM# 0000108229
Released
Rev: H
Ver: 10
14. July 2022

FPGA FUNCTIONAL INTERFACE

varian	SCALE: NONE
	SHEET: 15 OF 16
DUAL MOTOR DRIVER	
DWG NO: 100046951	REV: H

CM# 0000108229 Rev. H ver. 10 Released 14. July 2022

U66D — A3PE3000-FGG484

POWER IF: 3 RESET#, 16 CLK_100MHZ
FPGA POWER-JTAG: HDR1_TEST5, PCICLK2, PCIRST#, HDR1_TEST1–4
2 GANT_BRK_RLS1
6 EM_LIFT_UP#, 6 EM_LIFT_DWN#
9,12,16 WDOK
SPD_EMOPS_IF: 6 CCH_LIFT_MOT_EN#, 6 CCH_LIFT_DWN#, 6 CCH_LAT_LNG_FLOAT#, 6 EMO_GOOD#, 6 SITE_24V_PWR_OK#
A15 is reserved for HALL 1 rework
GANTRY_MOTOR_HALL_SENSOR_IF: 8 GANT_BRK_OVCURR, 8 GANT_HALL_SNS1#, 8 GANT_HALL_SNS2#, 8 GANT_HALL_SNS3#, 8 GANT_HALL_PWR_OK
SPD_DMD_IF: 2 SPDIO_FLT#, 2 GANT_HW_EN#, 2 GANT_ST_DISB, 2 LIFT_HW_EN#, 2 LIFT_ST_DISB
LIFT_MOTOR_HALL_SENSOR_IF: 11 LIFT_HALL_PWR_OK, 11 LIFT_HALL_SNS1#, 11 LIFT_HALL_SNS2#, 11 LIFT_HALL_SNS3#
ADC - DAC: 14 ADC_SDOUT, 14 ADC_BUSY
GANTRY 96V IF: 4 GANT_24V_GOOD#, 4 GANT_OVER_CURR
LIFT 96V IF: 5 LIFT_24V_GOOD#, 5 LIFT_OVER_CURR
POWER IF: 3 P24V_GOOD#, 3 FAN_FAIL#
SERVICE PENDANT: 13 STN_SW_PWR_OVL, 13 STN_LAT_LNG_FLOAT#, 13 STN_LIFT_BRK_OVRD#, 13 STN_GANT_CW_LFT_UP#, 13 STN_GANT_CCW_LFT_DWN#, 13 STN_GANT_LFT_MOT_EN#, 13 AXIS_SEL_LFT#
CCHL_IF: 10 LIFT_MTN_EN#, 10 LIFT_SER_PAGE_SEL, 10 LIFT_DOWN_LIMIT#, 10 LIFT_UP_LIMIT#, 10 LIFT_SERIO_FLT#
STAND CONTROLLER IF: 7 GANT_MTN_EN#, 7 GANT_CTRL_SPARE, 7 GANT_CCW_LIMIT#, 7 GANT_CW_LIMIT#, 7 GANT_SER_PAGE_SEL, 7 GANT_SERIO_FLT#

7 EM_24V_EN
2 SPD2_24V_STATUS
FPGA_WDI 16
FPGA_DONE 16

SPD_EMOPS_IF: EMOPS_STAT1 6, EMOPS_STAT2 6, LAT_LNG_BRK_RLS 6, LFT_BRK_RLS 6
GANTRY_MOTOR_HALL_SENSOR_IF: GANT_BRK_RLS 8, GANT_HALL_PWR_EN 8 (1.5V)
SPD_DMD_IF: GANT_HW_EN_MON 2, LIFT_ST_DISB_MON 2, LIFT_HW_EN_MON 2, GANT_ST_DISB_MON 2, DMD_PWR_OK 2, PAN_24V_SW 13, SPDIO_RST# 2
LIFT_MOTOR_HALL_SENSOR_IF: LIFT_HALL_PWR_EN 11
POWER IF: SPARE_MON 2, FAN_EN 3
SERVICE PENDANT: LIFT_BRK_OVRD_LED_CTRL 13
LIFT 96V IF: LIFT_96V_BYPASS 5, LIFT_24V_PWR_EN 5, LIFT_96V_PWR_EN 5, LIFT_MOT_SHUNT_EN# 5
LIFT_MOTOR_IF: LIFT_PWM0 12, LIFT_PWM1 12, LIFT_PWM2 12, LIFT_PWM3 12, LIFT_PWM4 12, LIFT_PWM5 12, LIFT_MOT_DRV_EN 12, LIFT_CURR_SAMP 12
CCHL_IF: LIFT_SER_CLK 10, LIFT_SER_SYNC 10, LIFT_SER_DATA0 10, LIFT_SER_DATA1 10, LIFT_SERIO_RST# 10
GANTRY 96V IF: GANT_96V_BYPASS 4, GANT_24V_PWR_EN 4, GANT_96V_PWR_EN 4, GANT_MOT_SHUNT_EN# 4
GANTRY_MOTOR_IF: GANT_PWM0 9, GANT_PWM1 9, GANT_PWM2 9, GANT_PWM3 9, GANT_PWM4 9, GANT_PWM5 9, GANT_MOT_DRV_EN 9, GANT_CURR_SAMP 9
STAND CONTROLLER IF: GANT_SER_CLK 7, GANT_SER_SYNC 7, GANT_SER_DATA0 7, GANT_SER_DATA1 7, GANT_SERIO_RST# 7
ADC - DAC: AD_MUX4 14, AD_MUX3 14, AD_MUX2 14, AD_MUX1 14, AD_SEL2 14, AD_SEL1 14, AD_SEL0 14, ADCNV# R394 33.2 Ohm ADC_CNVST# 14, ADCLK R395 33.2 Ohm ADC_SCLK 14, DACLK R396 33.2 Ohm DAC_CLK 14, DAC_SDI 14, DAC_CS# 14

D59 DC OK R383 332 Ohm STS1
D60 TEMP OK R384 332 Ohm STS2
D61 GANT OVC R385 332 Ohm STS3
D62 LIFT OVC R386 332 Ohm STS4
D71 EMOPS R405 332 Ohm STS5
D63 I/O FLT R387 332 Ohm STS6
D72 WD OK R406 332 Ohm STS7
D64 FPGA DONE R388 332 Ohm STS8

J19 — 67997-110HLF — No Stuff — TP154 GND — No Stuff GND Post for J19
J20 — 67997-110HLF — No Stuff — TP165 GND — No Stuff GND Post for J20

ETX Connector X1 — J26 — FX8C-100S-SV5
C232 10 uF, C286 0.1 uF, C287 0.1 uF, C285 0.1 uF
R389 1.00K SPARE_PCI_2; R390 1.00K SPARE_PCI_3; R391 1.00K SPARE_PCI_0 PCICLK2; R392 1.00K SPARE_PCI_1
RX_CH0_DV, RX_CH0_ERR, RX_CH0_0, RX_CH0_1, RX_CH0_2, RX_CH0_3, TX_CH0_EN, TX_CH0_0, TX_CH0_1, TX_CH0_2, TX_CH0_3, RX_CH2_DV, RX_CH2_ERR, RX_CH2_0, RX_CH2_1, RX_CH2_2, RX_CH2_3, PCIRST#
TX_CH2_EN, TX_CH2_0, TX_CH2_1, TX_CH2_2, TX_CH2_3

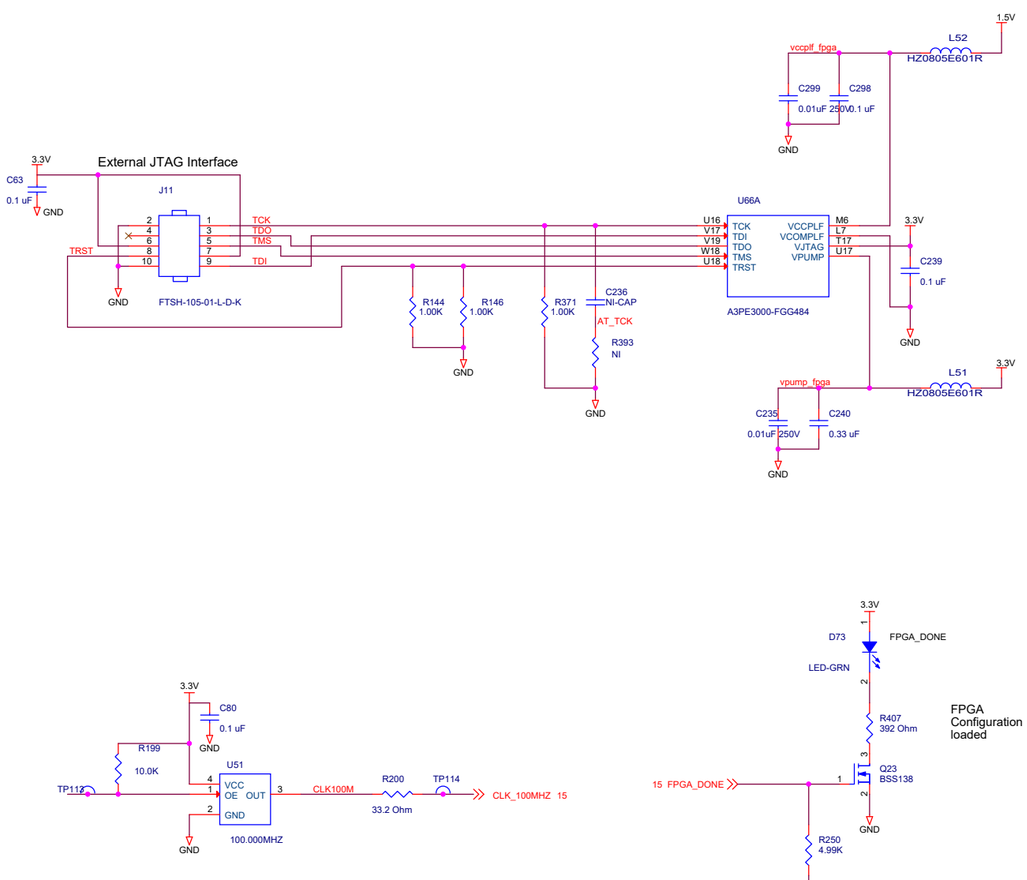
Compact Mezzanine Mounting Holes — MH6, MH11, MH10, MH7 — YSMTSO-30548-ET — IOGND

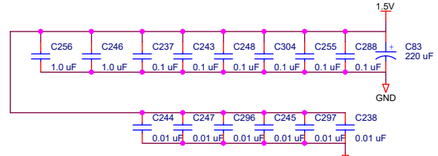
Serial EEPROM (Board Configuration Parameter)
C675 0.1 uF; R798 10.0K; R803 10.0K; R807 10.0K; U130 25LC640; R804 33.2 Ohm SCK
EEPROM_CS#, EEPROM_SDI, EEPROM_SCLK, EEPROM_SDO

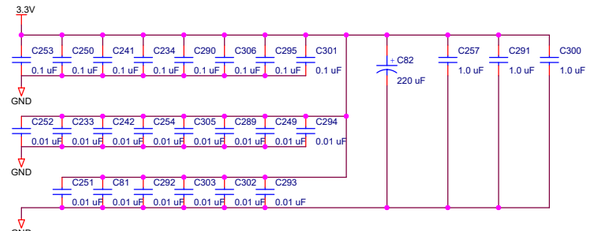
TP72 TP220, TP221, TP76 TP222, TP77 TP223, TP70 TP224, TP71 TP225

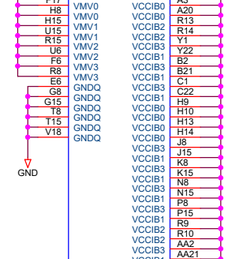
DMD Dash Number Configuration
R799 NI, R800 10.0K, R802 NI, R801 NI
R202 10.0K, R201 NI, R805 10.0K, R806 10.0K

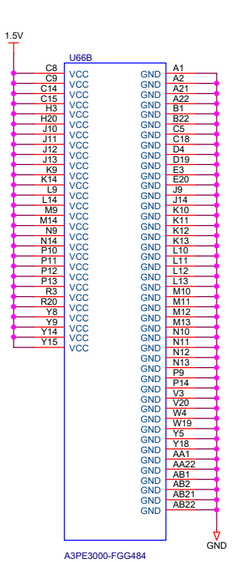
R205 3.32K, R204 20.0K, R203 10.0K
R196 3.32K, R197 20.0K, R198 10.0K
R243 3.32K, R244 20.0K, R245 10.0K
R246 3.32K, R247 20.0K, R248 10.0K

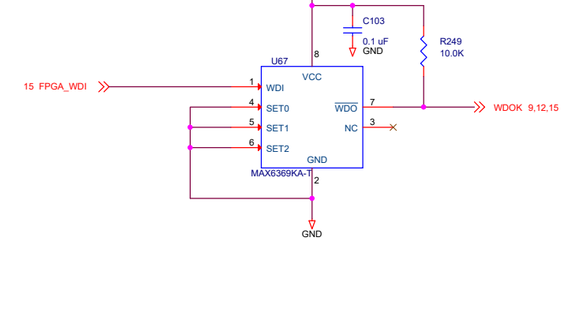


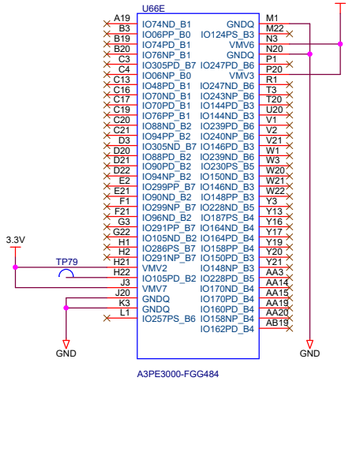












FPGA POWER-JTAG INTERFACE

varian	SCALE	NONE
	SHEET	16 OF 16
DUAL MOTOR DRIVER		
DWG NO 100046951		REV H

Signature File

varian
A Siemens Healthineers Company

Document: **100046951/SCH/000/10**
Description: **PCB, DUAL MOTOR DRIVER**

Change Master Number: **1082229**
ECN Number:
ECN Description:

Signature list

Date	Time	User	Status
01, July 2022	14:12:20	John Sullivan	Verification Rel
01, July 2022	01:41:15	Jotaro Aoi	Approved
30, June 2022	20:52:47	Edwin Von Borstel	In Eng Approval
30, June 2022	19:36:36	John Sullivan	In Checking
30, June 2022	19:32:05	John Sullivan	In Drafting
23, June 2022	14:58:05	John Sullivan	In Works

Signature File

varian
A Siemens Healthineers Company

Document: **100046951/SCH/000/10**
Description: **PCB, DUAL MOTOR DRIVER**

Change Master Number: **1082229**
ECN Number:
ECN Description:

Signature list

Date	Time	User	Status
14, July 2022	22:56:58	John Sullivan	Released
01, July 2022	14:12:20	John Sullivan	Verification Rel
01, July 2022	01:41:15	Jotaro Aoi	Approved
30, June 2022	20:52:47	Edwin Von Borstel	In Eng Approval
30, June 2022	19:36:36	John Sullivan	In Checking
30, June 2022	19:32:05	John Sullivan	In Drafting
23, June 2022	14:58:05	John Sullivan	In Works