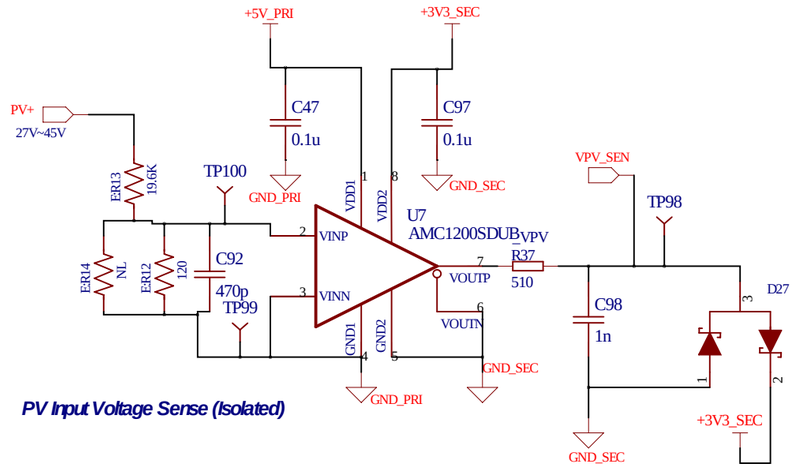
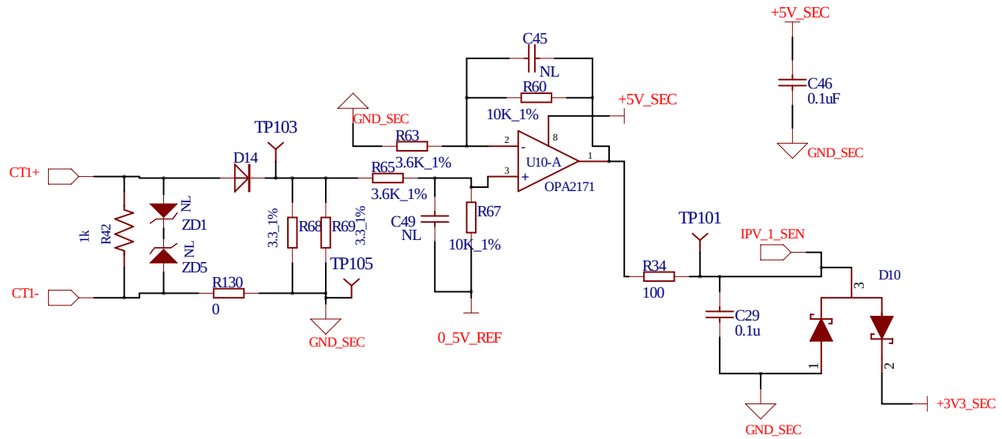


PV Input Voltage Sense (Isolated)

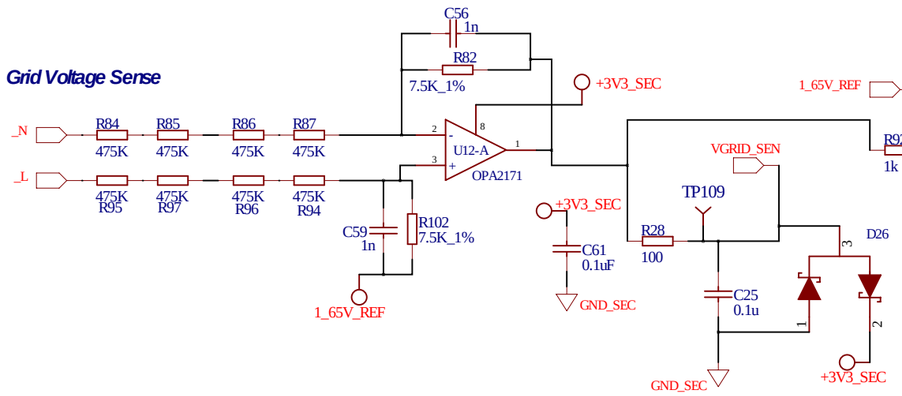


Primary MOSFET Current Sense

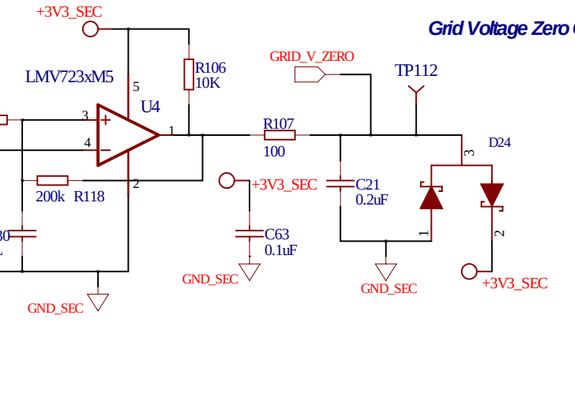
Ref Voltages: 2.5V, 1.65V, 0.8V and 0.5V

Title: Micro Solar Inverter		
Page Contents: Signal Conditioning 3 & Vref		
Size: B	Signal Conditioning & Vref	Revision: 3.0
Date: 04-04-12	Sheet 1 of 9	

Grid Voltage Sense

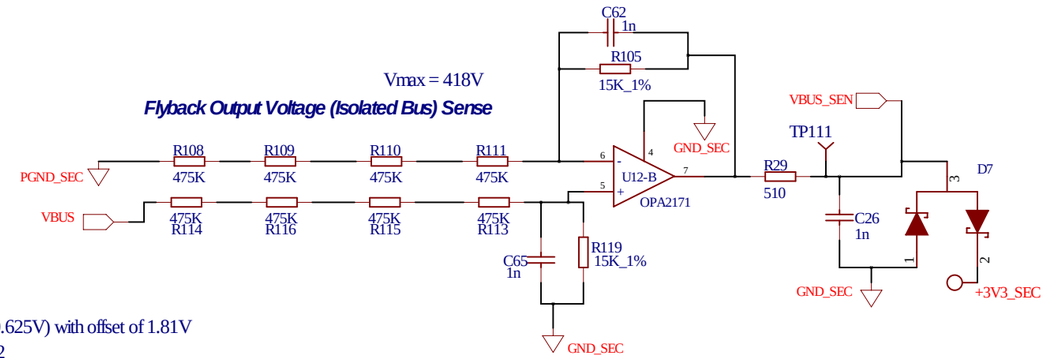


Grid Voltage Zero Cross Detect



Flyback Output Voltage (Isolated Bus) Sense

Vmax = 418V

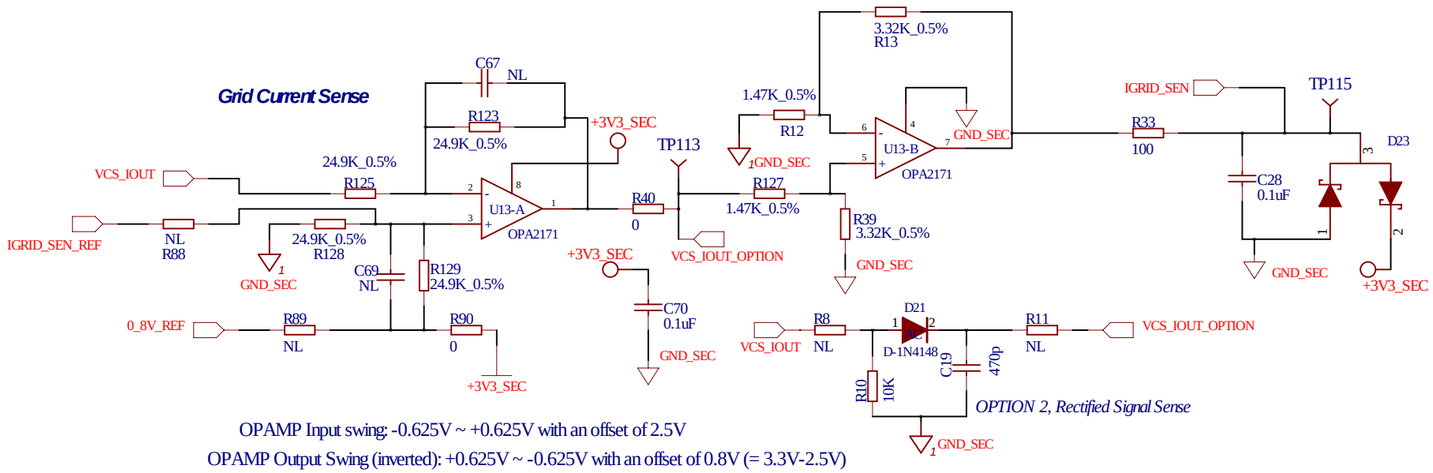


OPAMP Output Swing : G*(+0.625V ~ -0.625V) with offset of 1.81V

Gain G = R13/R12

Output Swing : +1.41V ~ -1.41V with offset of 1.81V

Grid Current Sense



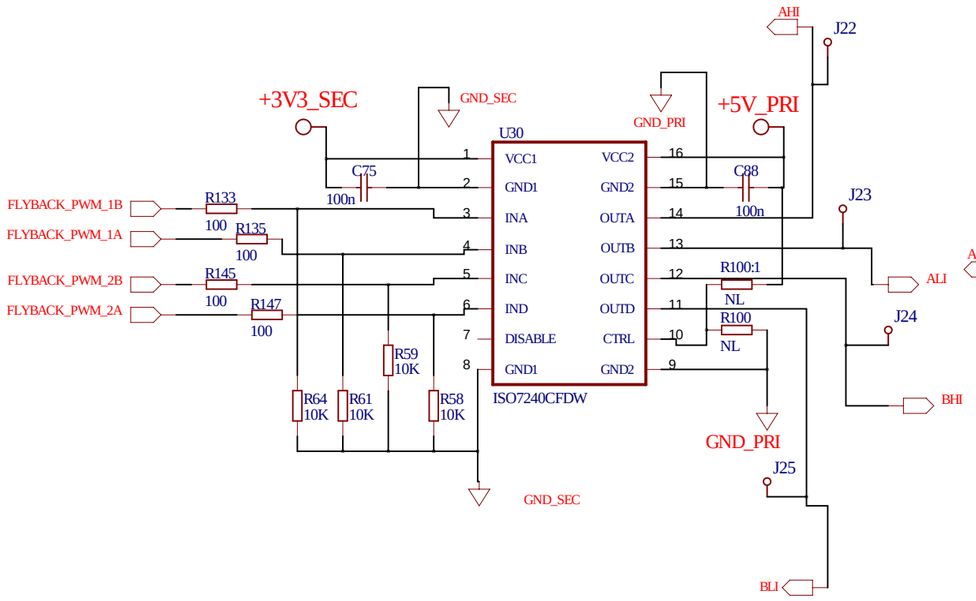
OPTION 2, Rectified Signal Sense

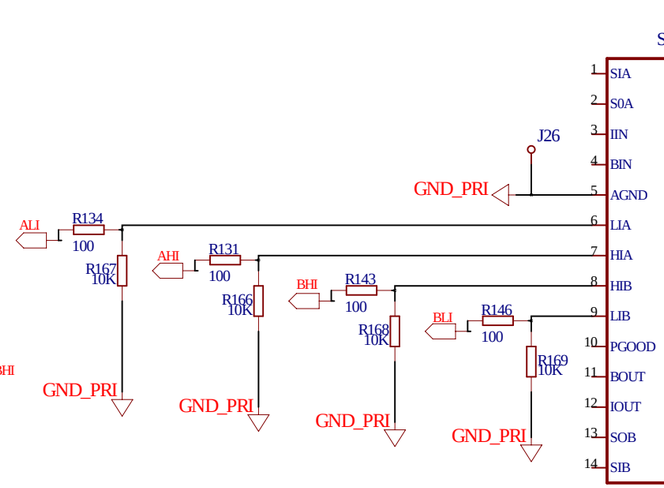
OPAMP Input swing: -0.625V ~ +0.625V with an offset of 2.5V

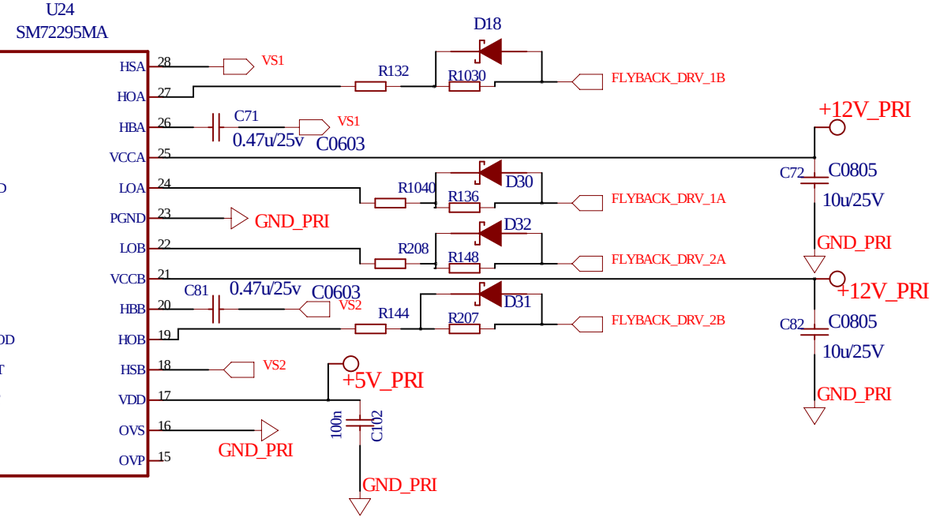
OPAMP Output Swing (inverted): +0.625V ~ -0.625V with an offset of 0.8V (= 3.3V-2.5V)

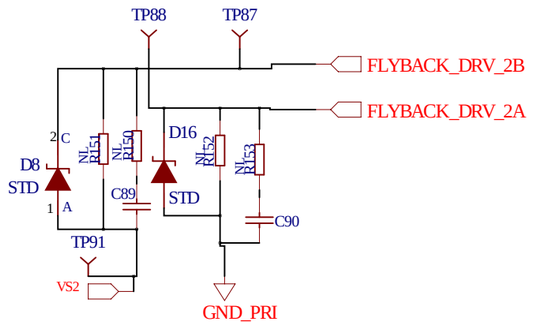
Title: MIcro Solar Inverter		
Page Contents: Signal Conditioning 2		
Size: B	Signal Conditioning	Revision: 3.0
Date: 04-04-12	Sheet 2 of 9	

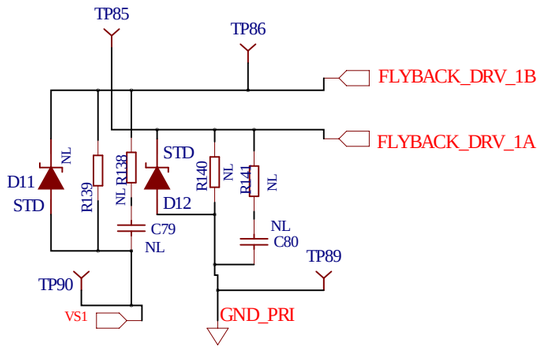
A



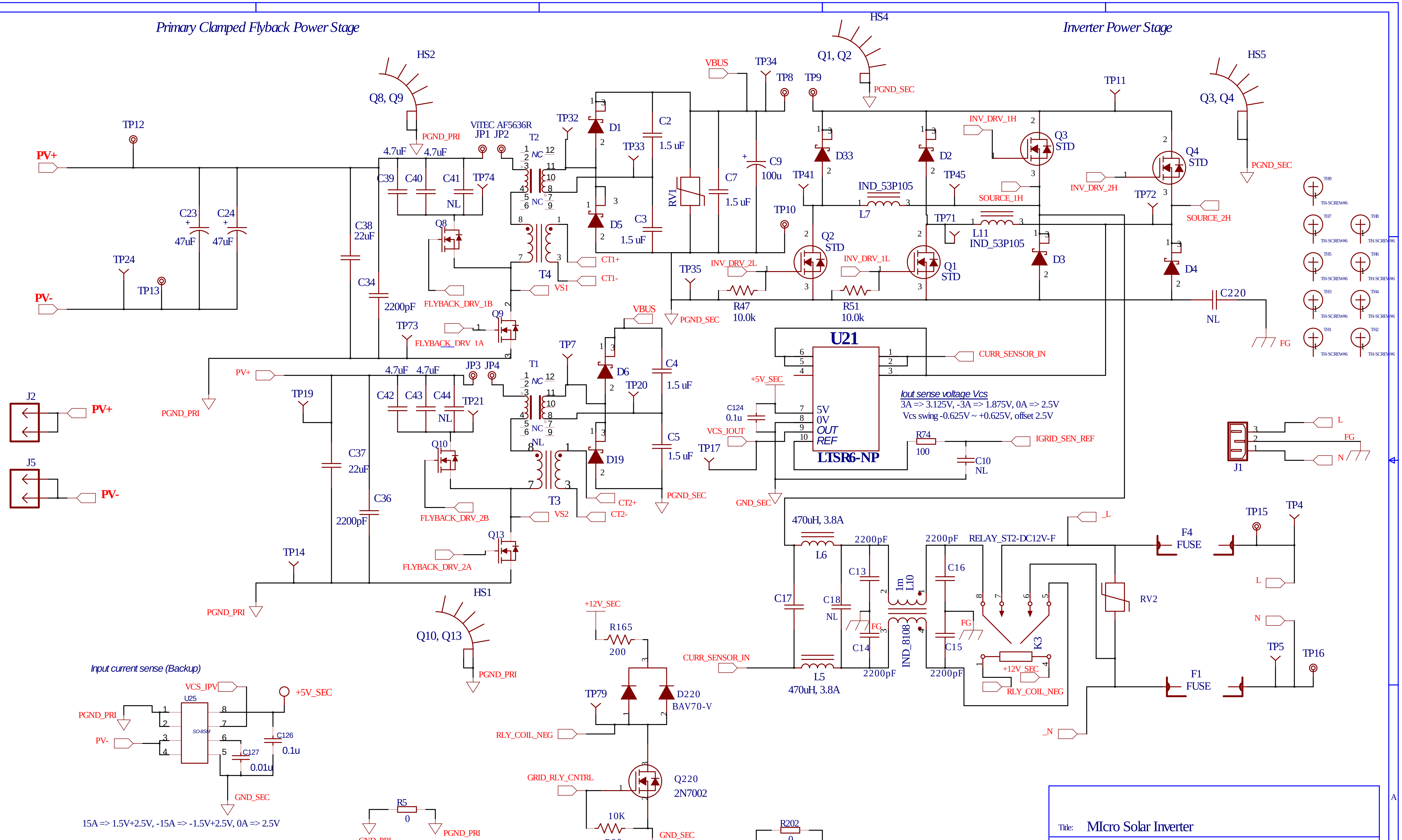








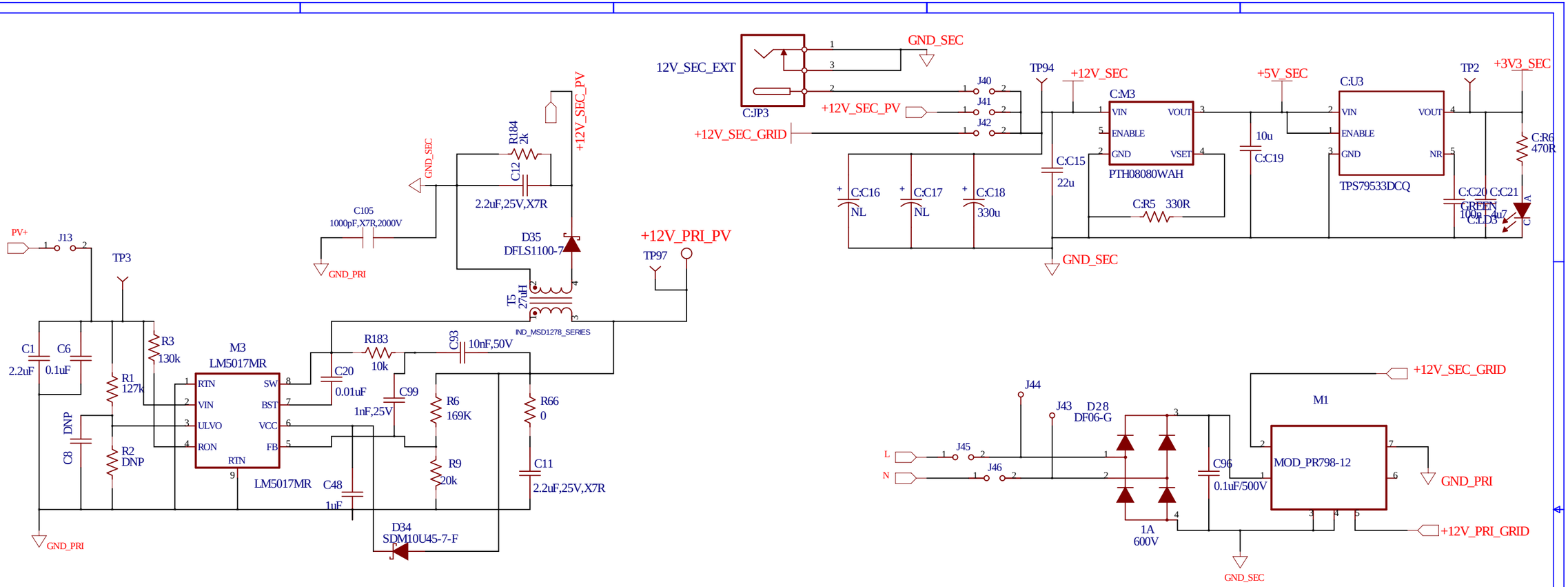
Title: MIcro Solar Inverter		A
Page Contents: Flyback Stage Gate Drive		
Size: B	Flyback Gate Drive	Revision: 3.0
Date: 04-04-12	Sheet 3 of 9	

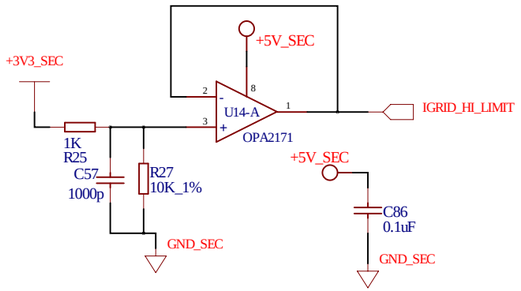

Primary Clamped Flyback Power Stage
Inverter Power Stage
HS2
Q8, Q9
PGND_PRI
ViTEC AF5636R
JP1 JP2
T2
TP12
PV+
PV-
C23 47uF
C24 47uF
TP24
TP13
C38 22uF
C34 2200pF
C39 C40 C41 NL
4.7uF 4.7uF
TP74
Q8
T4
VS1
CT1+
CT1-
FLYBACK_DRV_1B
Q9
FLYBACK_DRV_1A
TP73
TP32
D1
D5
C2 1.5 uF
C3 1.5 uF
TP33
RV1
C7 1.5 uF
C9 100u
VBUS
TP34
TP8
TP9
HS4
Q1, Q2
PGND_SEC
TP41
TP10
D33
D2
IND_53P105
L7
TP45
TP71
L11 IND_53P105
Q2 STD
Q1 STD
INV_DRV_2L
INV_DRV_1L
R47 10.0k
R51 10.0k
TP35
INV_DRV_1H
Q3 STD
SOURCE_1H
D3
HS5
Q3, Q4
TP11
INV_DRV_2H
Q4 STD
TP72
SOURCE_2H
D4
C220 NL
FG
J2 PV+
J5 PV-
PV+
PGND_PRI
TP19
C42 C43 C44 NL
4.7uF 4.7uF
JP3 JP4
T1
TP21
Q10
C37 22uF
C36 2200pF
T3
VS2
CT2+
CT2-
FLYBACK_DRV_2B
Q13
FLYBACK_DRV_2A
TP14
HS1
Q10, Q13
TP7
D6
TP20
C4 1.5 uF
C5 1.5 uF
D19
TP17
VBUS
U21
LTSR6-NP
5V 0V OUT REF
+5V_SEC
C124 0.1u
VCS_IOUT
GND_SEC
CURR_SENSOR_IN
Iout sense voltage Vcs
3A => 3.125V, -3A => 1.875V, 0A => 2.5V
Vcs swing -0.625V ~ +0.625V, offset 2.5V
R74 100
IGRID_SEN_REF
C10 NL
J1
L
FG
N
470uH, 3.8A
L6
2200pF
C13
C18 NL
C17
C14
L10 1m
IND_8108
L5
470uH, 3.8A
2200pF
C16
C15
RELAY_ST2-DC12V-F
K3
+12V_SEC
RLY_COIL_NEG
RV2
_L
F4 FUSE
F1 FUSE
TP15
TP4
TP5
TP16
_N
+12V_SEC
R165 200
D220 BAV70-V
TP79
Q220 2N7002
GRID_RLY_CNTRL
10K R99
R202 0
GND_SEC
PGND_SEC
R5 0
GND_PRI
PGND_PRI
Input current sense (Backup)
VCS_IPV
+5V_SEC
U25
C126 0.1u
C127 0.01u
15A => 1.5V+2.5V, -15A => -1.5V+2.5V, 0A => 2.5V

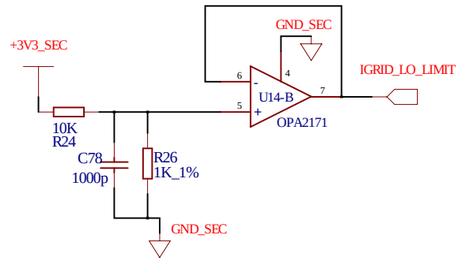
Title: MIcro Solar Inverter

Page Contents: Flyback & Inverter Power Stage

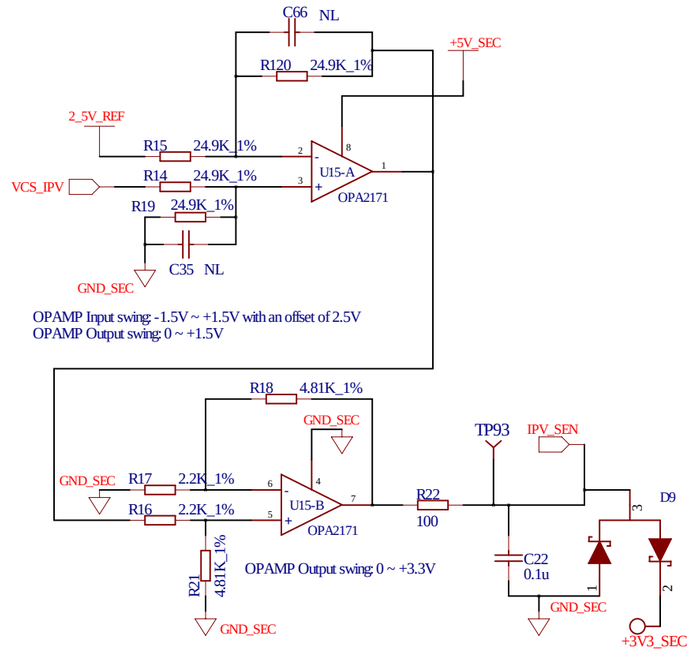
Size: B	Power Stage	Revision: 3.0
Date: 04-04-12		Sheet 4 of 9

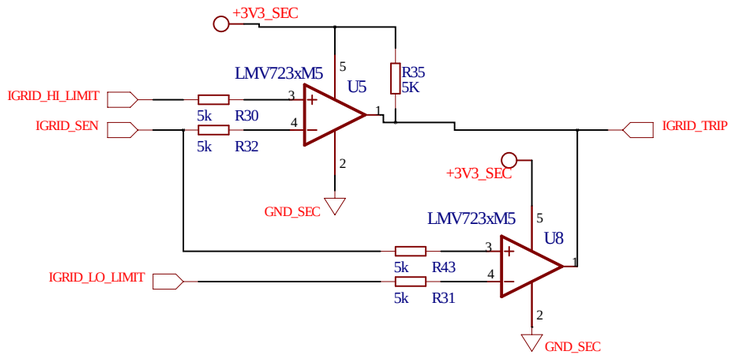

PV+
J13
TP3
C1
2.2uF
C6
0.1uF
R3
130k
R1
127k
DNP
C8
R2
DNP
M3
LM5017MR
RTN
VIN
ULVO
RON
SW
BST
VCC
FB
RTN
LM5017MR
R183
10k
C20
0.01uF
C99
1nF,25V
C93
10nF,50V
R6
169K
R9
20k
C48
1uF
R66
0
C11
2.2uF,25V,X7R
D34
SDM10U45-7-F
GND_PRI
C105
1000pF,X7R,2000V
GND_PRI
GND_SEC
R184
2k
C12
2.2uF,25V,X7R
+12V_SEC_PV
D35
DFLS1100-7
T5
27uH
IND_MSD1278_SERIES
+12V_PRI_PV
TP97
12V_SEC_EXT
C:JP3
GND_SEC
J40
J41
J42
+12V_SEC_PV
+12V_SEC_GRID
TP94
+12V_SEC
C:M3
VIN
VOUT
ENABLE
GND
VSET
PTH08080WAH
C:C15
22u
C:C16
NL
C:C17
NL
C:C18
330u
C:R5 330R
+5V_SEC
10u
C:C19
C:U3
VIN
VOUT
ENABLE
GND
NR
TPS79533DCQ
TP2
+3V3_SEC
C:R6
470R
C:C20
100u
C:C21
4u7
C:LD3
GREEN
J44
J43
D28
DF06-G
J45
J46
L
N
+12V_SEC_GRID
M1
MOD_PR798-12
C96
0.1uF/500V
GND_PRI
+12V_PRI_GRID
1A
600V
GND_SEC
GND_PRI
C:JP2
J15
J38
J39
+12V_PRI_EXT
+12V_PRI_PV
+12V_PRI_GRID
+12V_PRI
C:M2
VIN
VOUT
ENABLE
GND
VSET
PTH08080WAH
C:C8
22u
C:C9
NL
C:C10
NL
C:C11
330u
C:R3 330R
+5V_PRI
10u
C:C12
Not used at this time
C:U2
NL
VIN
VOUT
ENABLE
GND
NR
TPS79533DCQ
TP6
+3V3_PRI
C:R4
470R
C:C13
100u
C:C14
4u7
GREEN
C:LD2
GND_PRI
Title: Micro Solar Inverter
Page Contents: Bias Supply
Size: B
Bias Supply
Revision: 3.0
Date: 04-04-12
Sheet 5 of 9

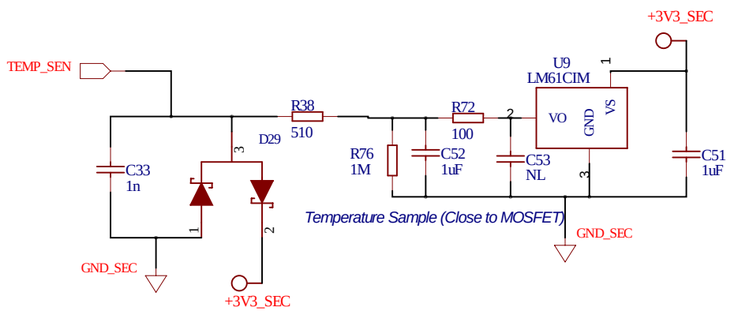




PV Current Sample

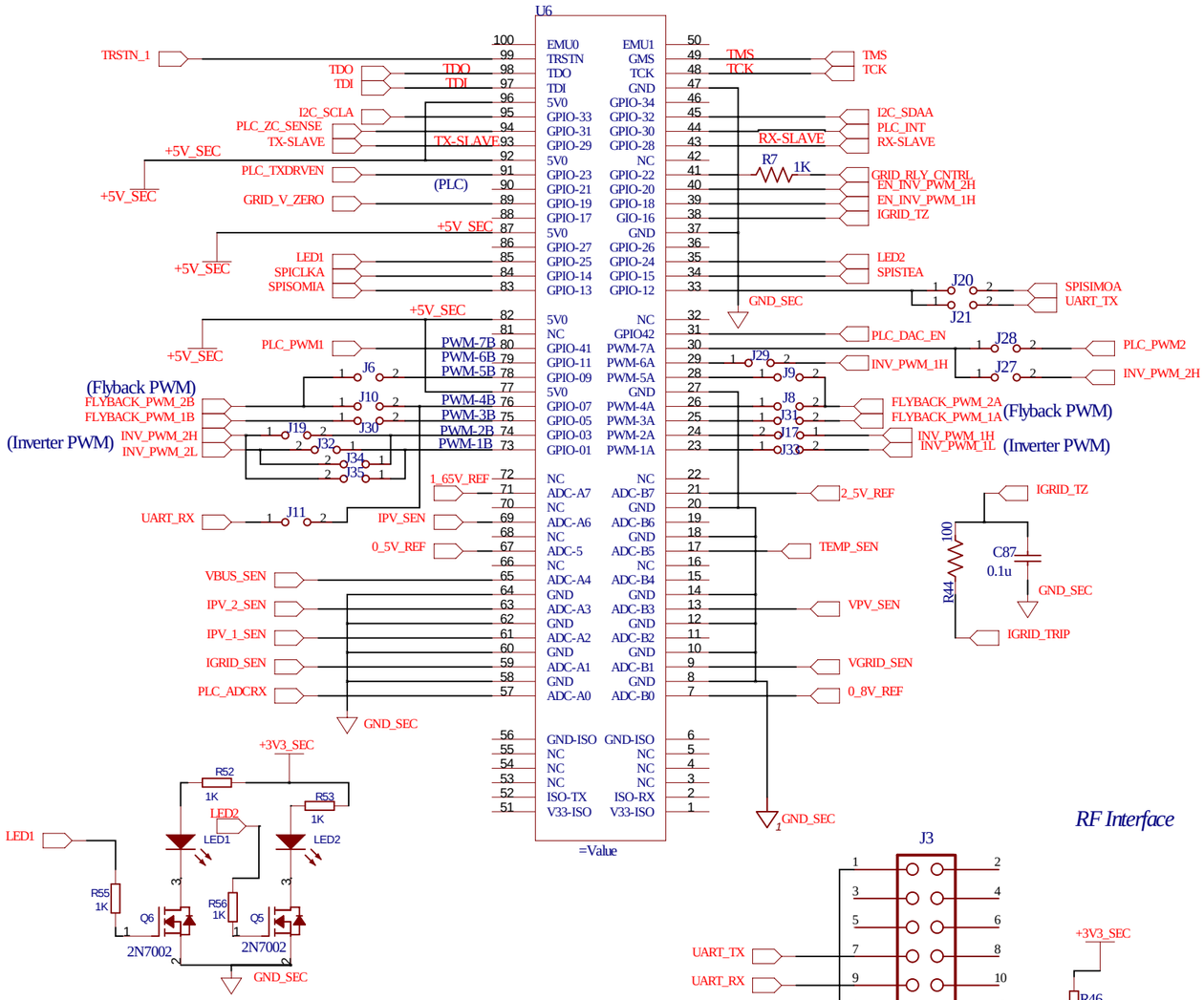




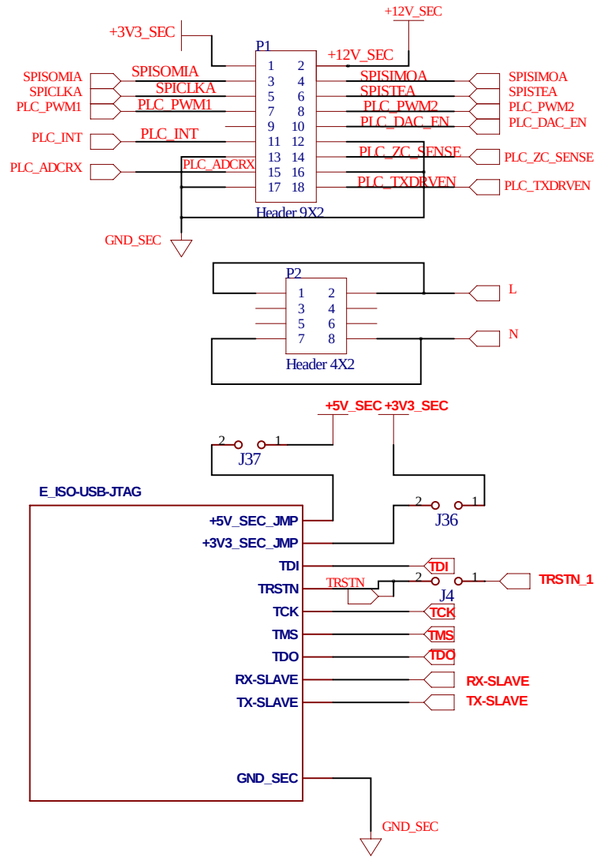


Title: Micro Solar Inverter		
Page Contents: Signal Conditioning 1		
Size: B	Signal Conditioning	Revision: 2.0
Date: 04-04-12	Sheet 6 of 9	

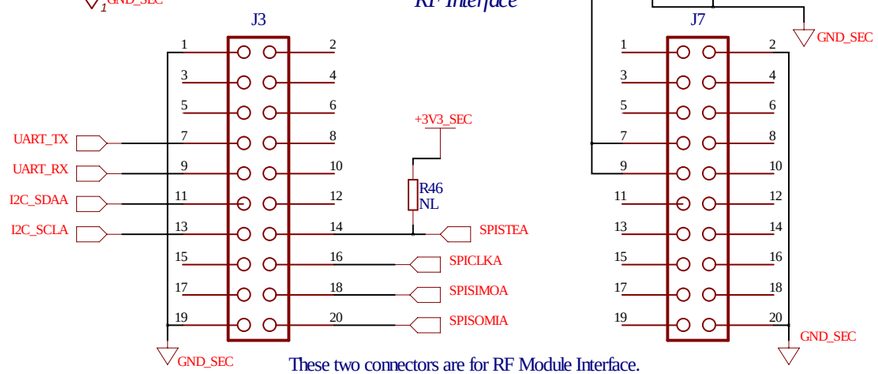
Piccolo Interface



PLC Interface



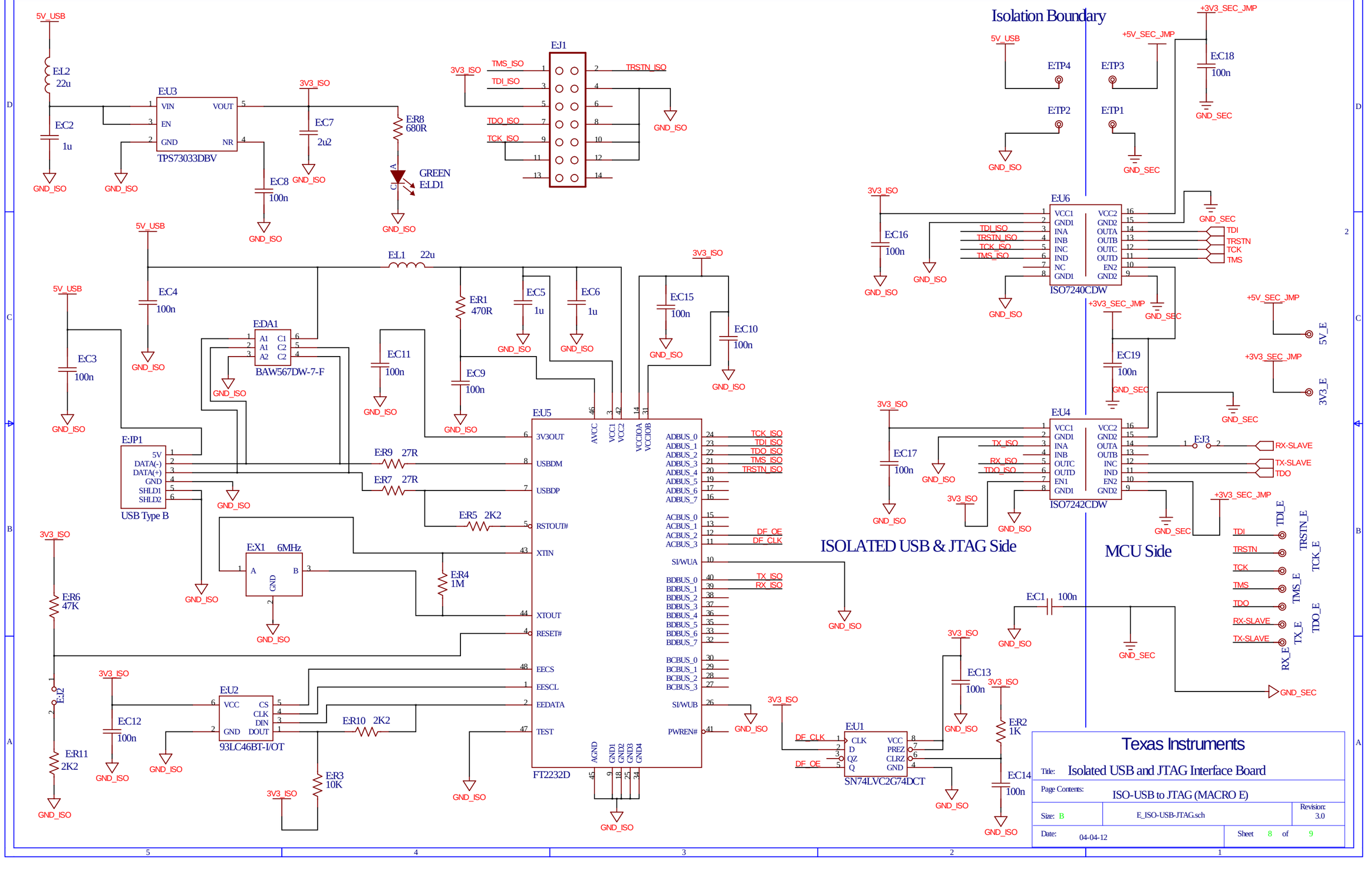
RF Interface

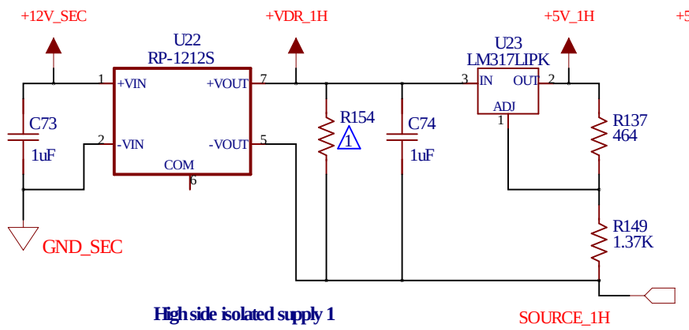


These two connectors are for RF Module Interface.
Dimensions must meet spec for interface module CC2530-EVM-UG

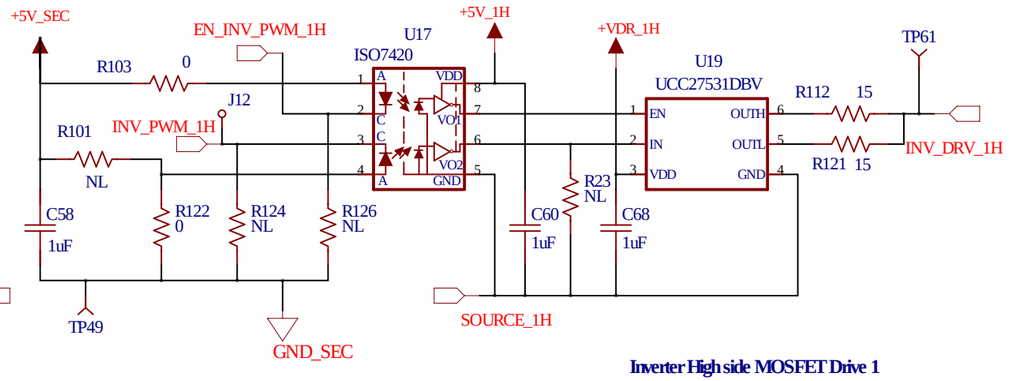
Title: Micro Solar Inverter		
Page Contents: Control Card, PLC & RF Interface		
Size: B	Control, PLC & RF	Revision: 3.0
Date: 04-04-12	Sheet 7 of 9	

A


Isolation Boundary
ISOLATED USB & JTAG Side
MCU Side
E:L2 22u
E:U3
TPS73033DBV
E:C2 1u
E:C7 2u2
E:C8 100n
E:R8 680R
E:LD1 GREEN
E:J1
E:L1 22u
E:C4 100n
E:C3 100n
E:DA1
BAW567DW-7-F
E:C11 100n
E:R1 470R
E:C5 1u
E:C6 1u
E:C9 100n
E:C15 100n
E:C10 100n
E:U5
FT2232D
E:JP1
USB Type B
E:R9 27R
E:R7 27R
E:R5 2K2
E:X1 6MHz
E:R4 1M
E:R6 47K
E:J2
E:R11 2K2
E:C12 100n
E:U2
93LC46BT-I/OT
E:R10 2K2
E:R3 10K
E:TP4
E:TP3
E:TP2
E:TP1
E:C18 100n
E:U6
ISO7240CDW
E:C16 100n
E:C19 100n
E:U4
ISO7242CDW
E:J3
E:C17 100n
E:C1 100n
E:C13 100n
E:R2 1K
E:C14 100n
E:U1
SN74LVC2G74DCT
5V_USB
3V3_ISO
GND_ISO
GND_SEC
+3V3_SEC_JMP
+5V_SEC_JMP
5V_E
3V3_E
TDI
TRSTN
TCK
TMS
TDO
RX-SLAVE
TX-SLAVE
TDI_E
TRSTN_E
TCK_E
TMS_E
TDO_E
TX_E
RX_E
TMS_ISO
TDI_ISO
TDO_ISO
TCK_ISO
TRSTN_ISO
DF_OE
DF_CLK
TX_ISO
RX_ISO
Texas Instruments
Title: Isolated USB and JTAG Interface Board
Page Contents: ISO-USB to JTAG (MACRO E)
Size: B
E_ISO-USB-JTAG.sch
Revision: 3.0
Date: 04-04-12
Sheet 8 of 9

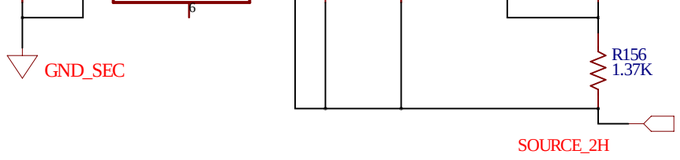


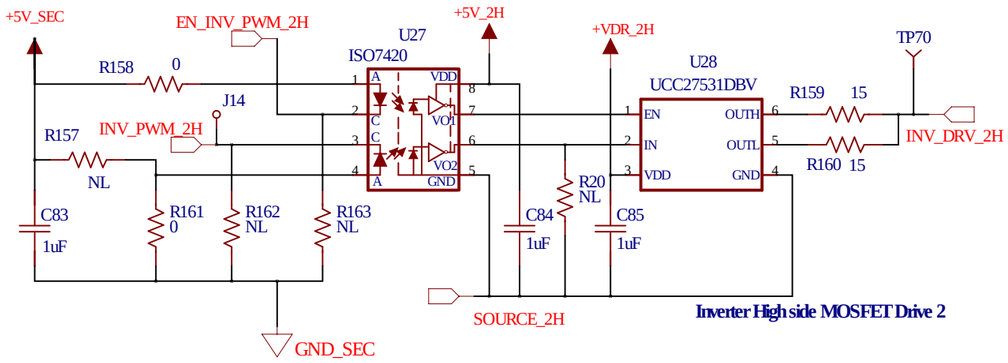
High side isolated supply 1



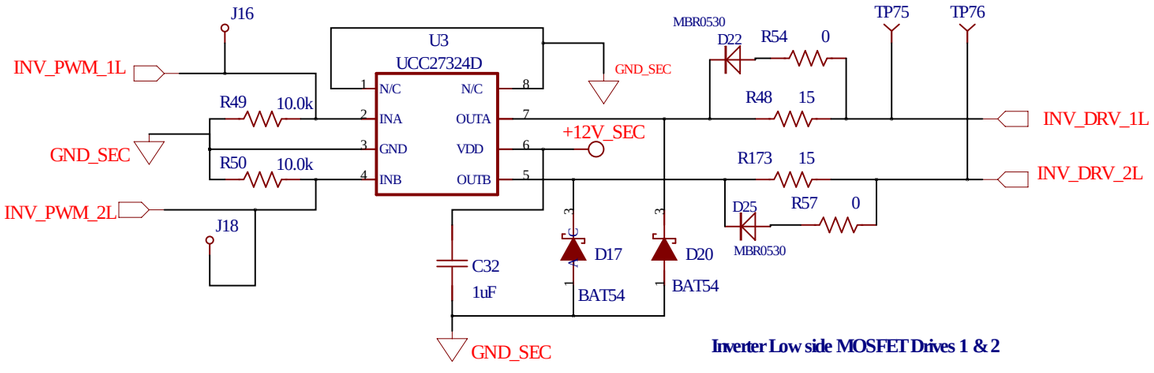
Inverter High side MOSFET Drive 1

High side isolated supply 2





Inverter High side MOSFET Drive 2



Inverter Low side MOSFET Drives 1 & 2

Title: Micro Solar Inverter		
Page Contents: Inverter Gate Drive		
Size: B	Inverter Gate Drive	Revision: 3.0
Date: 11-10-12	Sheet 9 of 9	

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