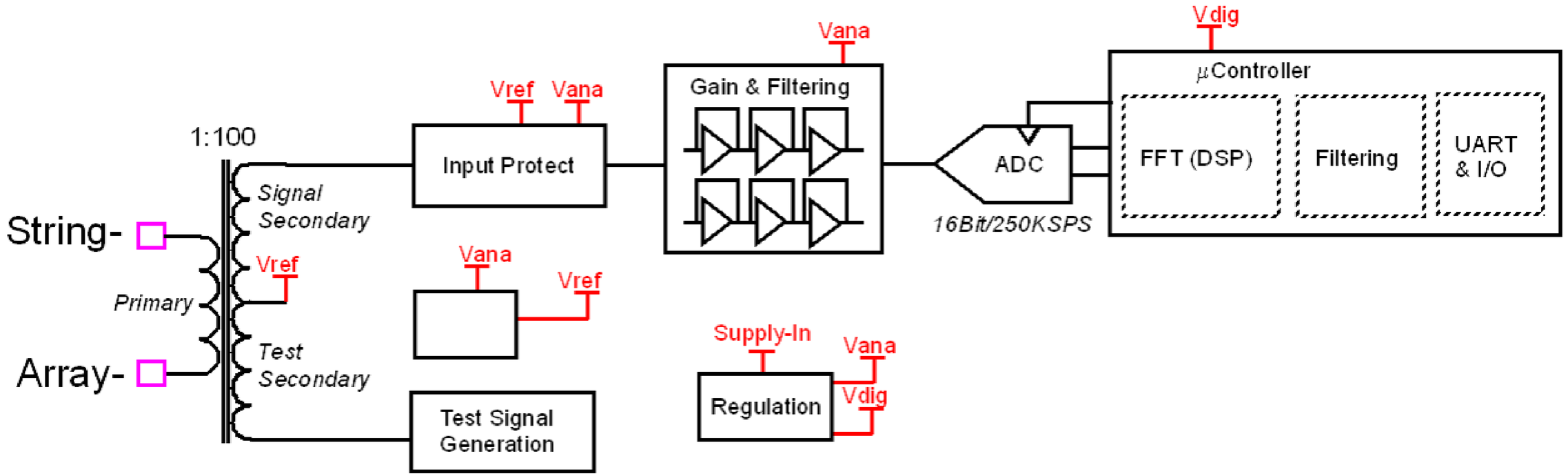
Revision History	
Revision	Notes



Designed for: National Semiconductor	Mod. Date: 6/20/2012	
Project: SM73201 - ARC EVAL		
Sheet Title: Arcturus Block Diagram Sheet		Sheet: 1 of 6
Size: B	Schematic: 870600728	Rev: 002
Assembly Variant: [No Variations]		
File: SM73201-ARC TQFP Block Diag.SchDoc		
Contact: http://www.national.com/support		

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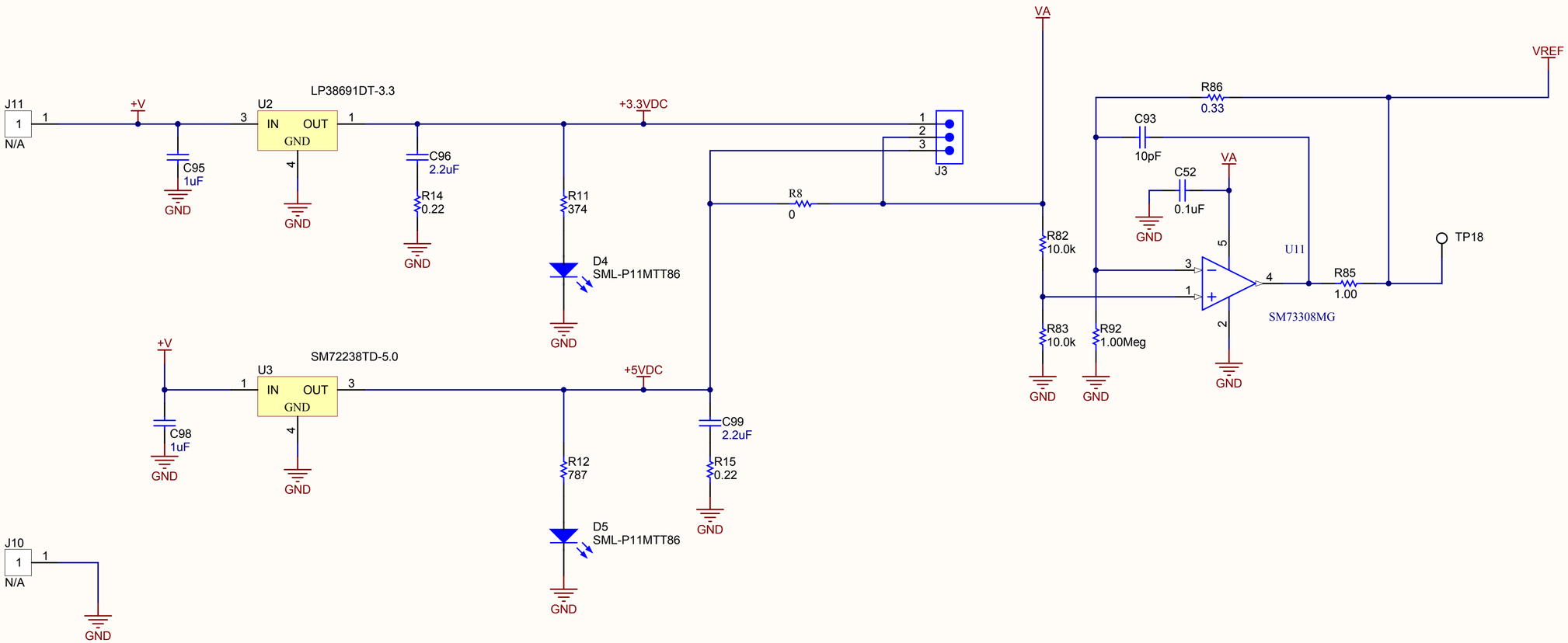

Designed for: National Semiconductor	Mod. Date: 6/18/2012	
Project: SM73201 - ARC EVAL		
Sheet Title: Arcturus Power Management		Sheet: 2 of 6
Size: B	Schematic: 870600728	Rev: 002
Assembly Variant: [No Variations]		
File: SM73201-ARC TQFP Power Mgmt.SchDoc		
Contact: http://www.national.com/support		

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Serial Interface

+5VDC
L101
BLM18PG331SN1D
C10
0.1uF
GND
L100
BLM18PG331SN1D
R16
10.0k
U1
DIAG_TX
R_DIAG_RX
R41
10.0k
DIAG_RX
C62
0.1uF
C58
0.1uF
MCLR
TIN1
TIN2
T1OUT
T2OUT
R1OUT
R2OUT
R1IN
R2IN
R10
10.0k
C1+
C1-
C2+
C2-
V+
V-
VS
GND
LMS202ECMX
J14
C61
0.1uF
C60
0.1uF
C59
0.1uF
CSTCR6M00G53-R0
Y1
R90
2.21k
R91
1.00Meg
+3.3VDC
R13
10.0k
C9
2.2uF
+3.3VDC
C56
0.1uF
J4
TSW-102-07-L-S
MR_L
U13
VCC
RESET
MR
GND
SM72240MF-3.08
U8
Place Cap next to pins 28 & 29 of U8
Place Cap next to pins 57 & 58 of U8
+3.3VDC
C4
1uF
C5
1uF
C43
0.1uF
C1
0.1uF
C2
1.5µF
C6
0.1uF
Place Cap next to pins 58 & 59 of U8
VDD
C45
1.5µF
C3
1.5µF
C7
0.1uF
C8
0.1uF
Place Cap next to pins 5 & 6 of U8
Place Cap next to pins 42 & 43 of U8
+3.3VDC
R9
20.0k
J6
TSW-102-07-L-S
+3.3VDC
L2
BLM18PG331SN1D
VDDA
C100
2.2µF
C47
0.1uF
Place Cap next to pins 16 & 17 of U8
TMS320F28033PAGT
XRS
VDDIO
VDDIO
VSS
VSS
VDD
VDD
VDD
VSS
VSS
GPIO32/SDAA/EPWMSSYNCI/ADCSOCAO
GPIO33/SCLA/EPWMSYNCO/ADCSOCBO
GPIO32/EQEP1I/LINRXA
ADCINA0/Vrefhi
VREGENZ
ADCINB0
GPIO24/ECAP1
GPIO34/COMP2OUT/COMP3OUT
VDDA
VSSA
GPIO0/EPWM1A
GPIO1/EPWM1B/COMP1OUT
GPIO2/EPWM2A
GPIO3/EPWM2B/SPISOMIA/COMP2OUT
GPIO4/EPWM3A
GPIO5/EPWM3B/SPISIMOA/ECAP1
GPIO10/EPWM6A/ADCSOCBO
GPIO8/EPWM5A/ADCSOCAO
GPIO9/EPWM5B/LINTXA/HRCAP1
X1
X2
GPIO30/CANRXA
GPIO31/CANTXA
GPIO29/SCITXDA/SCLA/TZ3
ADCINB4/COMP2B/AIO12
ADCINB7
ADCINB3
ADCINB2/COMP1B/AIO10
GPIO28/SCIRXDA/SDAA/TZ2
GPIO6/EPWM4A/EPWMSYNCI/EPWMSYNCO
GPIO18/SPICLKA/LINTXA/XCLKOUT
GPIO16/SPISIMOA/TZ2
GPIO19/XCLKIN/SPISTEA/LINRXA/ECAP1
GPIO17/SPISOMIA/TZ3
ADCINA2/COMP1A/AIO2
ADCINA7
GPIO11/EPWM6B/LINRXA/HRCAP2
GPIO22/EQEP1S/LINTXA
GPIO21/EQEP1B/COMP2OUT
GPIO20/EQEP1A/COMP1OUT
GPIO7/EPWM4B/SCIRXDA
GPIO12/TZ1/SCITXDA
ADCINA6/COMP3A/AIO6
ADCINA4/COMP2A/AIO4
ADCINA1
ADCINB6/COMP3B/AIO14
ADCINB1
ADCINA3
TEST2
TRST
GPIO36/TMS
GPIO35/TDI
GPIO37/TDO
GPIO38/TCK/XCLKIN
LED_1
LED_2
LED_3
TP1
+3.3VDC
R79
10.0k
NOISE_EN
ADC_CLK
ADC_CS
R_ADC_DATA
AUX3
AUX2
AUX1
ADC
+V
J8
644884-6
+3.3VDC +3.3VDC
R1
10.0k
R2
10.0k
R3
10.0k
Programming Header
J5
R4
2.21k
+3.3VDC
R88
374
D1
SML-P11MTT86
LED_1
R89
374
D2
SML-P11YTT86
LED_2
R98
374
D3
SML-P11UTT86
LED_3

Designed for: National Semiconductor	Mod. Date: 6/18/2012	
Project: SM73201 - ARC EVAL		
Sheet Title: Arcturus DSP		Sheet: 3 of 6
Size: B	Schematic: 870600728	Rev: 002
Assembly Variant: [No Variations]		
File: SM73201-ARC TQFP MCU.SchDoc		
Contact: http://www.national.com/support		

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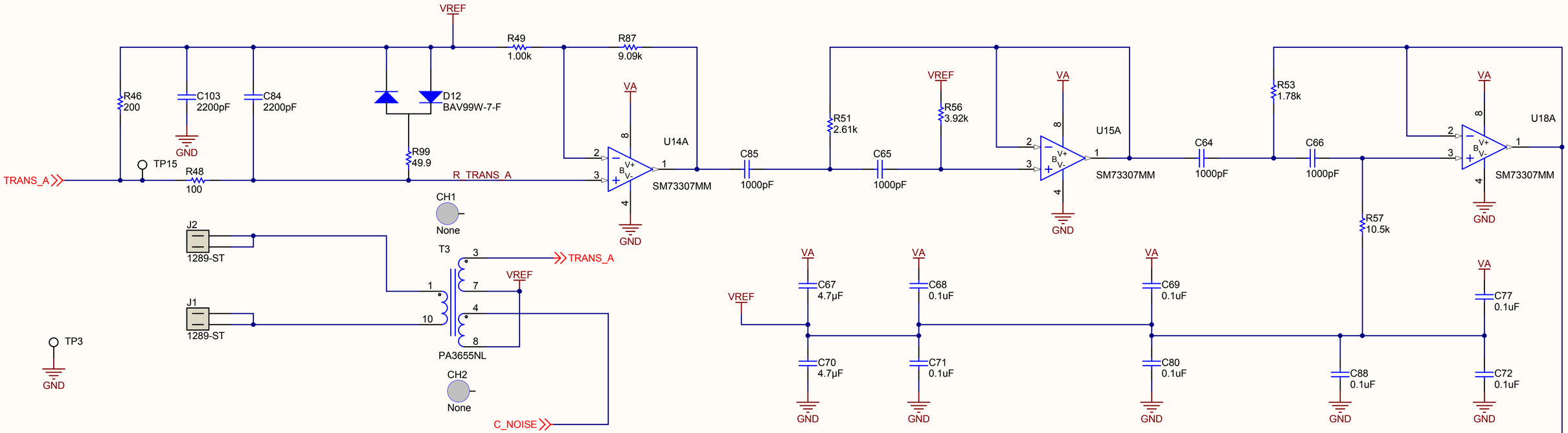
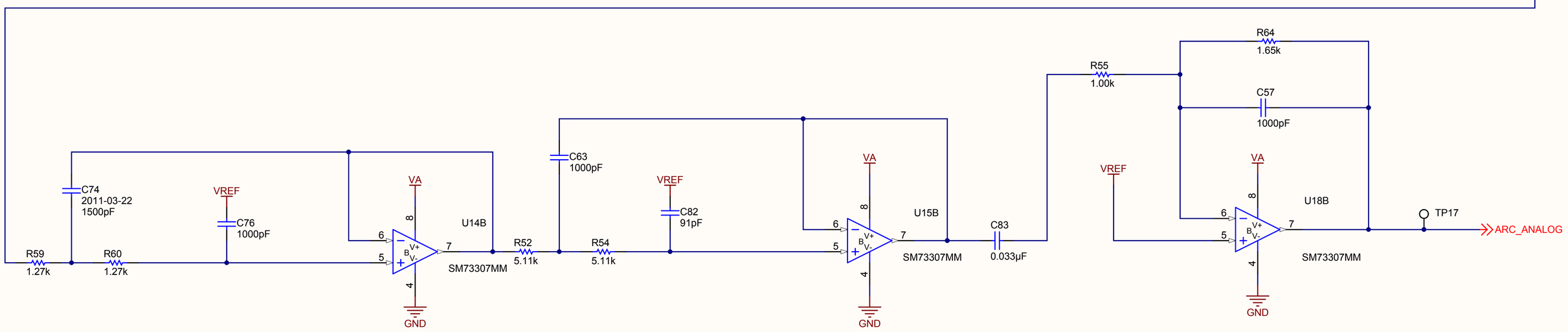


TP2

GND

CH1 and CH2 are slots to increase the creepage distance between the primary and secondary transformer pins that may be needed for safety certification (the creepage requirement is voltage dependent)

12.5mm creepage on reference board design



Designed for: National Semiconductor	Mod. Date: 6/18/2012	
Project: SM73201 - ARC_EVAL		
Sheet Title: Arc Detect Analog Front End		Sheet: 4 of 6
Size: B	Schematic: 870600728	Rev: 002
Assembly Variant: [No Variations]		
File: SM73201-ARC TQFP Detect AFE.SchDoc		
Contact: http://www.national.com/support		

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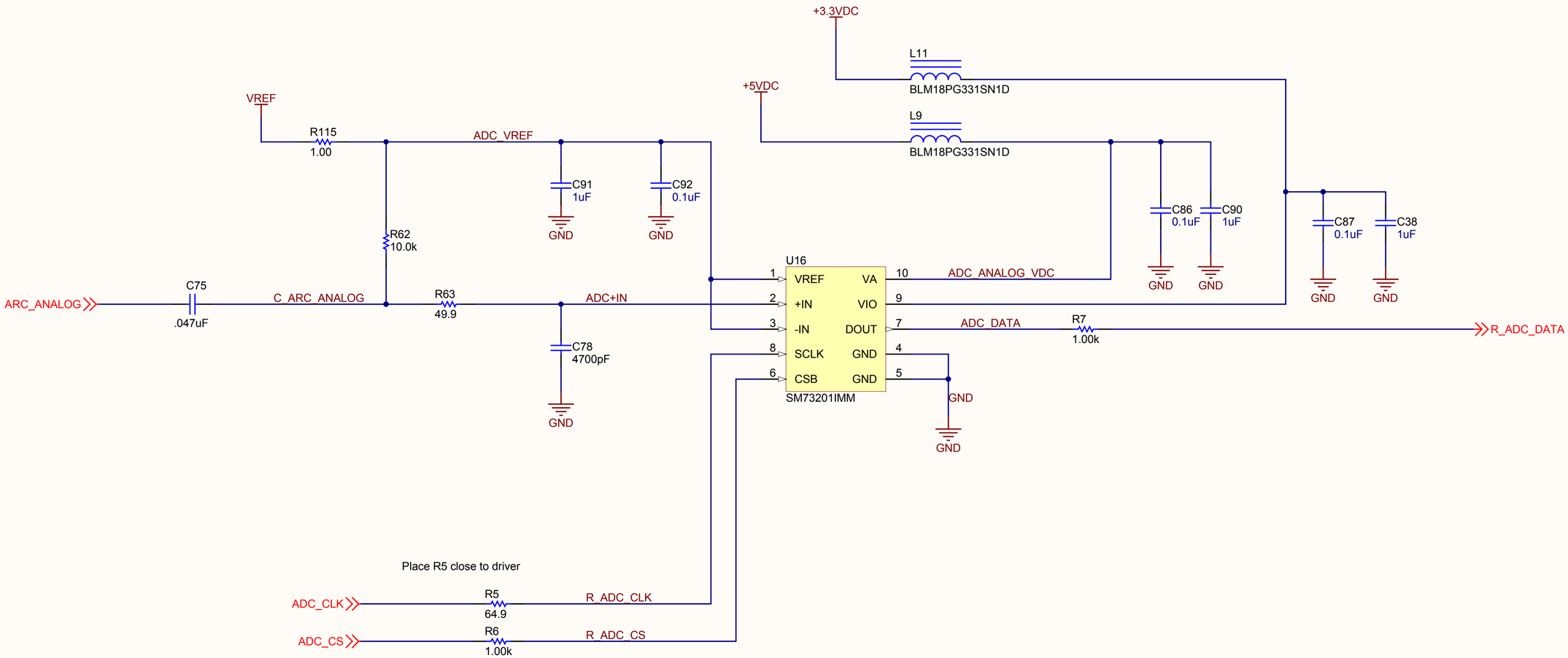

Designed for: National Semiconductor		Mod. Date: 6/18/2012
Project: SM73201 - ARC_EVAL		
Sheet Title: Arc Detect ADC		Sheet: 5 of 6
Size: B	Schematic: 870600728	Rev: 002
Assembly Variant: [No Variations]		
File: SM73201-ARC TQFP ARC Detect ADC.SchDoc		
Contact: http://www.national.com/support		

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PCB Part Number: 551600728-002 REV A

Board Mounting Hardware

H1 4N37PF@S

H2 4N37PF@S

H3 29311

H4 29311

FID1 FID2 FID3 FID4 FID5 FID6

T2

Board outline template

Designed for: National Semiconductor	Mod. Date: 4/26/2012	
Project: SM73201 - ARC EVAL		
Sheet Title: Arcturus Hardware		Sheet: 6 of 6
Size: B	Schematic: 870600728	Rev: 002
Assembly Variant: [No Variations]		
File: SM73201-ARC TQFP Hardware.SchDoc		
Contact: http://www.national.com/support		

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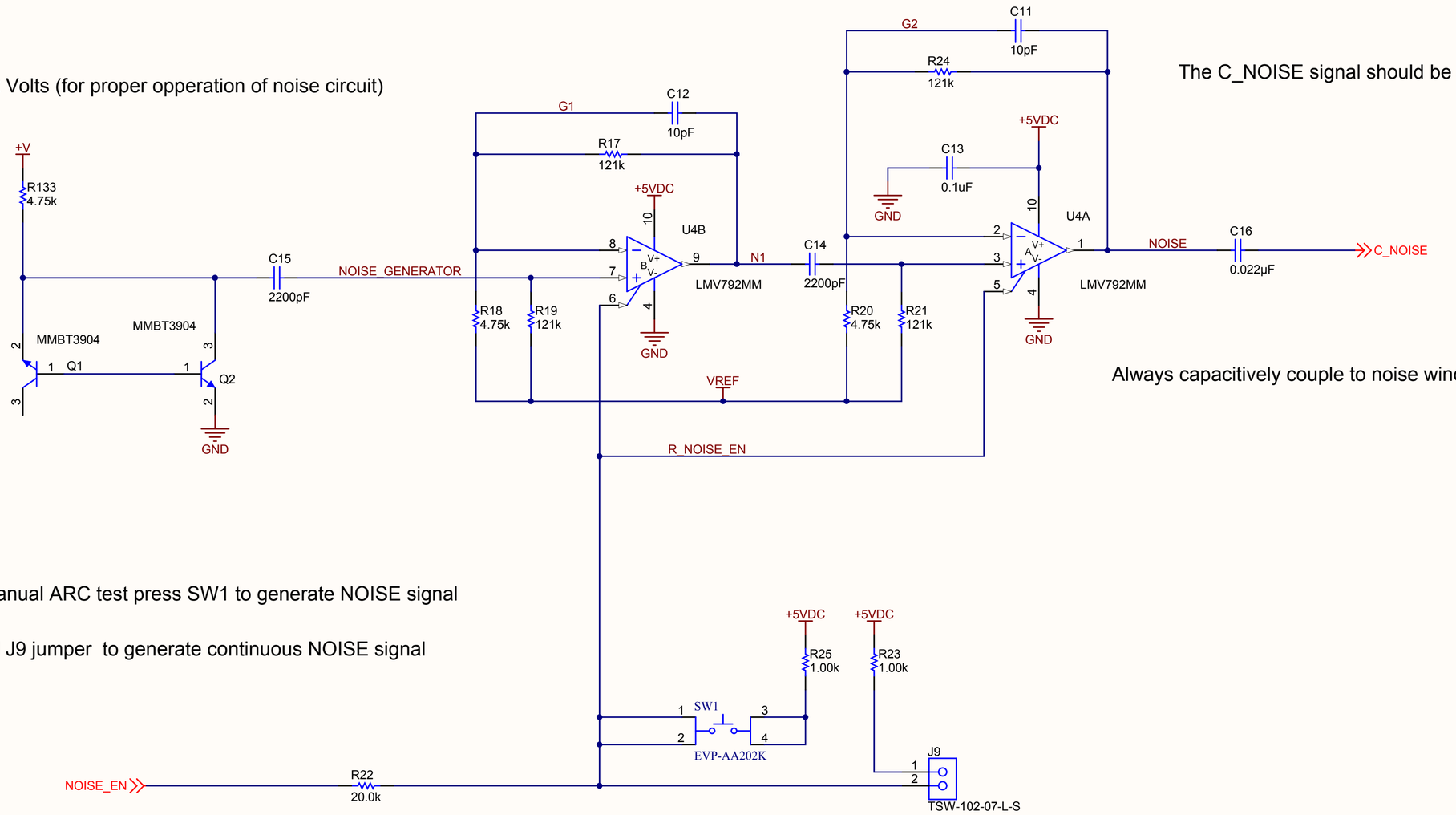
When using the PA3655NL transformer the NOISE signal should be at least 300 mV p-p for reliable opperation

+V should be between 8 and 12 Volts (for proper opperation of noise circuit)

The C_NOISE signal should be about 100 mV p-p



Always capacitively couple to noise winding on transformer

For CPU ARC test J9 must not be installed then drive NOISE_EN signal (GPIO6) high to generate NOISE signal

Designed for: National Semiconductor	Mod. Date: 6/18/2012	
Project: SM73201 - ARC_EVAL		
Sheet Title: Arc Detect Filter		Sheet: 7 of 7
Size: B	Schematic: 870600728	Rev: 002
Assembly Variant: [No Variations]		
File: SM73201 - ARC TQFP Test.SchDoc		
Contact: http://www.national.com/support		

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NOISE