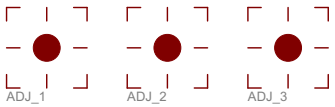
CCM Buck LED Driver
LED Driver Board

CCM Buck LED Driver with XMC1402

[1] Contents
[2] 4-Channel CCM Buck Converter, XMC1402, DMX512, DALI
[3] 5V Power Supply, Connectors

Fiducials



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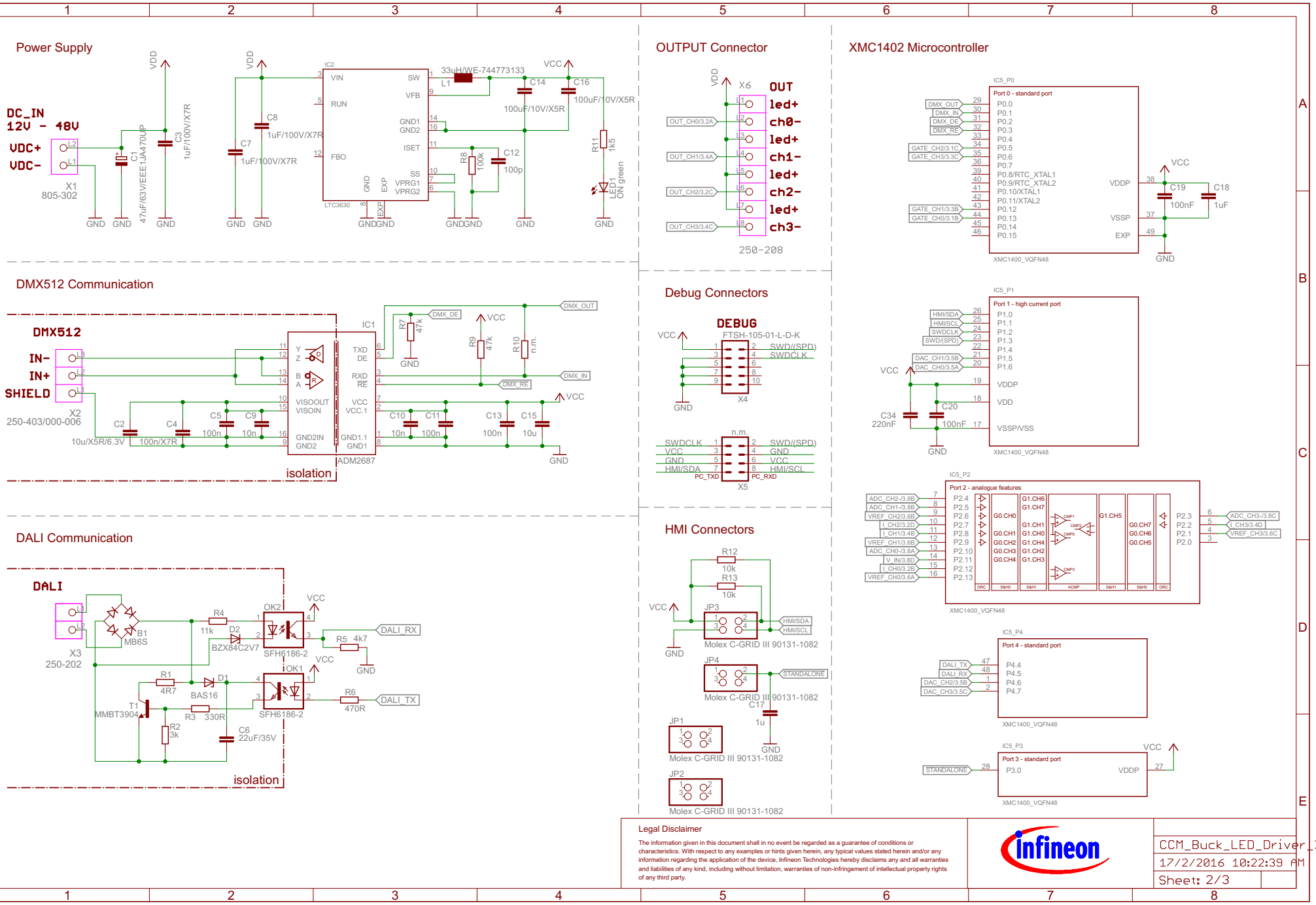
Power Supply
DC_IN
12V - 48V
VDC+
VDC-
X1
805-302
VDD
GND
C1
47uF/63V/EEEFJA470UP
C3
1uF/100V/X7R
C7
1uF/100V/X7R
C8
1uF/100V/X7R
IC2
LTC3630
VIN
SW
VFB
RUN
GND1
GND2
ISET
FBO
SS
VPRG1
VPRG2
EXP
L1
33uH/WE-744773133
C14
100uF/10V/X5R
C16
100uF/10V/X5R
R8
100k
C12
100p
R11
1k5
LED1
ON green
VCC
OUTPUT Connector
X6
OUT
led+
ch0-
led+
ch1-
led+
ch2-
led+
ch3-
OUT_CH0/3.2A
OUT_CH1/3.4A
OUT_CH2/3.2C
OUT_CH3/3.4C
250-208
XMC1402 Microcontroller
IC5_P0
Port 0 - standard port
P0.0
P0.1
P0.2
P0.3
P0.4
P0.5
P0.6
P0.7
P0.8/RTC_XTAL1
P0.9/RTC_XTAL2
P0.10/XTAL1
P0.11/XTAL2
P0.12
P0.13
P0.14
P0.15
DMX_OUT
DMX_IN
DMX_DE
DMX_RE
GATE_CH2/3.1C
GATE_CH3/3.3C
GATE_CH1/3.3B
GATE_CH0/3.1B
VDDP
VSSP
EXP
C19
100nF
C18
1uF
XMC1400_VQFN48
DMX512 Communication
DMX512
IN-
IN+
SHIELD
X2
250-403/000-006
IC1
ADM2687
TXD
DE
RXD
RE
VCC
VCC.1
VISOOUT
VISOIN
GND2IN
GND2
GND1.1
GND1
R7
47k
R9
47k
R10
n.m.
DMX_DE
DMX_OUT
DMX_IN
DMX_RE
C2
10u/X5R/6.3V
C4
100n/X7R
C5
100n
C9
10n
C10
10n
C11
100n
C13
100n
C15
10u
isolation
Debug Connectors
DEBUG
FTSH-105-01-L-D-K
SWD/(SPD)
SWDCLK
X4
n.m.
SWDCLK
VCC
GND
HMI/SDA
PC_TXD
PC_RXD
SWD/(SPD)
GND
VCC
HMI/SCL
X5
IC5_P1
Port 1 - high current port
P1.0
P1.1
P1.2
P1.3
P1.4
P1.5
P1.6
HMI/SDA
HMI/SCL
SWDCLK
SWD/(SPD)
DAC_CH1/3.5B
DAC_CH0/3.5A
VDDP
VDD
VSSP/VSS
C34
220nF
C20
100nF
XMC1400_VQFN48
DALI Communication
DALI
X3
250-202
B1
MB6S
R4
11k
D2
BZX84C2V7
OK2
SFH6186-2
R5 4k7
DALI_RX
R1
4R7
D1
BAS16
OK1
SFH6186-2
R6
470R
DALI_TX
T1
MMBT3904
R3 330R
R2
3k
C6
22uF/35V
isolation
HMI Connectors
R12
10k
R13
10k
JP3
Molex C-GRID III 90131-1082
HMI/SDA
HMI/SCL
JP4
STANDALONE
C17
1u
JP1
JP2
IC5_P2
Port 2 - analogue features
P2.4
P2.5
P2.6
P2.7
P2.8
P2.9
P2.10
P2.11
P2.12
P2.13
P2.3
P2.2
P2.1
P2.0
ADC_CH2-/3.8B
ADC_CH1-/3.8B
VREF_CH2/3.6B
I_CH2/3.2D
I_CH1/3.4B
VREF_CH1/3.6B
ADC_CH0-/3.8A
V_IN/3.8D
I_CH0/3.2B
VREF_CH0/3.6A
ADC_CH3-/3.8C
I_CH3/3.4D
VREF_CH3/3.6C
G1.CH6
G1.CH7
G1.CH1
G1.CH0
G1.CH4
G1.CH2
G1.CH3
G0.CH0
G0.CH1
G0.CH2
G0.CH3
G0.CH4
G1.CH5
G0.CH7
G0.CH6
G0.CH5
CMP1
CMP2
CMP0
CMP3
ORC
S&H0
S&H1
ACMP
IC5_P4
Port 4 - standard port
P4.4
P4.5
P4.6
P4.7
DALI_TX
DALI_RX
DAC_CH2/3.5B
DAC_CH3/3.5C
IC5_P3
Port 3 - standard port
P3.0
VDDP
STANDALONE
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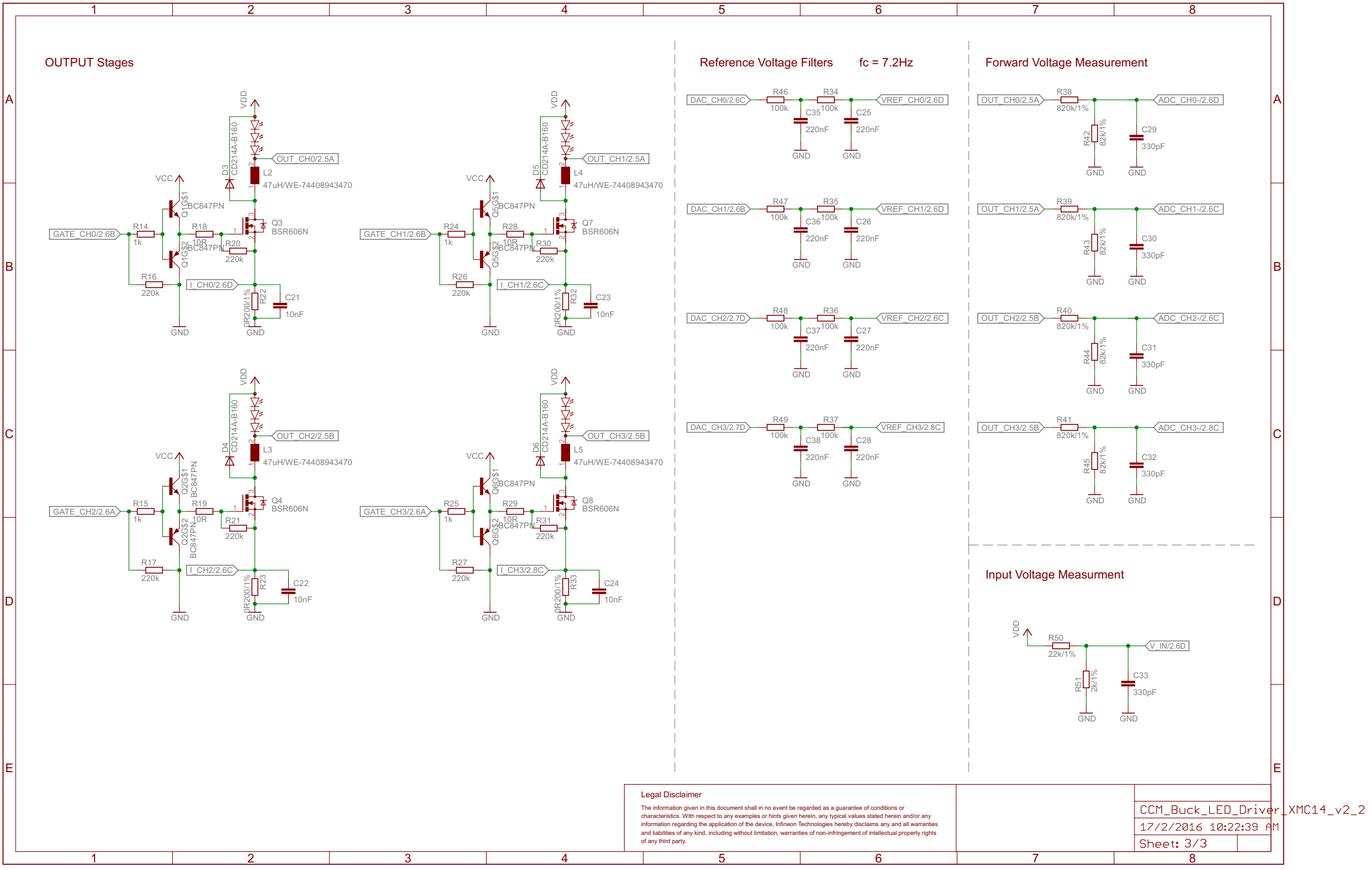
OUTPUT Stages
VDD
D3
CD214A-B160
OUT_CH0/2.5A
L2
47uH/WE-74408943470
VCC
Q1G$1
BC847PN
GATE_CH0/2.6B
R14
1k
R18
10R
Q3
BSR606N
Q1G$2
BC847PN
R20
220k
R16
220k
I_CH0/2.6D
R22
0R200/1%
C21
10nF
GND
D5
CD214A-B160
OUT_CH1/2.5A
L4
47uH/WE-74408943470
Q5G$1
BC847PN
GATE_CH1/2.6B
R24
1k
R28
10R
Q7
BSR606N
Q5G$2
BC847PN
R30
220k
R26
220k
I_CH1/2.6C
R32
0R200/1%
C23
10nF
D4
CD214A-B160
OUT_CH2/2.5B
L3
47uH/WE-74408943470
Q2G$1
BC847PN
GATE_CH2/2.6A
R15
1k
R19
10R
Q4
BSR606N
Q2G$2
BC847PN
R21
220k
R17
220k
I_CH2/2.6C
R23
0R200/1%
C22
10nF
D6
CD214A-B160
OUT_CH3/2.5B
L5
47uH/WE-74408943470
Q6G$1
BC847PN
GATE_CH3/2.6A
R25
1k
R29
10R
Q8
BSR606N
Q6G$2
BC847PN
R31
220k
R27
220k
I_CH3/2.8C
R33
0R200/1%
C24
10nF
Reference Voltage Filters
fc = 7.2Hz
DAC_CH0/2.6C
R46
100k
R34
100k
VREF_CH0/2.6D
C35
220nF
C25
220nF
DAC_CH1/2.6B
R47
100k
R35
100k
VREF_CH1/2.6D
C36
220nF
C26
220nF
DAC_CH2/2.7D
R48
100k
R36
100k
VREF_CH2/2.6C
C37
220nF
C27
220nF
DAC_CH3/2.7D
R49
100k
R37
100k
VREF_CH3/2.8C
C38
220nF
C28
220nF
Forward Voltage Measurement
OUT_CH0/2.5A
R38
820k/1%
ADC_CH0-/2.6D
R42
82k/1%
C29
330pF
OUT_CH1/2.5A
R39
820k/1%
ADC_CH1-/2.6C
R43
82k/1%
C30
330pF
OUT_CH2/2.5B
R40
820k/1%
ADC_CH2-/2.6C
R44
82k/1%
C31
330pF
OUT_CH3/2.5B
R41
820k/1%
ADC_CH3-/2.8C
R45
82k/1%
C32
330pF
Input Voltage Measurment
VDD
R50
22k/1%
V_IN/2.6D
R51
2k/1%
C33
330pF
GND
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