DC3170A-A/DC3170A-B

4-Phase Step-Down Supply with Power System Management

General Description

Demonstration circuit DC3170A-A/-B features the LTC7883 and LTC7051 in a high current, high efficiency 4-phase step-down converter. The LTC7883 itself is a 4-channel, 4-phase, voltage mode step-down controller with a PSM interface. The LTC7051 is a SilentMOS™ smart power stage that integrates high speed drivers with low $R_{DS(ON)}$ MOSFETs. The DC3170A-A/-B comes in two different assembly types, which are specified below:

DC3170A-A:

V_{OA0} = 0.75V/50A

V_{OA1} = 0.9V/50A

V_{OB0} = 1.0V/50A

V_{OB1} = 1.2V/50A

DC3170A-B:

V_{OUT} = 1.0V/200A, 4-phase

The DC3170A-A/-B operates with a switching frequency of 500kHz over an input voltage range of 7V to 14V. Each LTC7051 is driven by a three-state PWM output of the LTC7883, while the LTC7051's current sense and temperature outputs are monitored by the LTC7883. The DC3170A-A/-B does not require external serial bus communications to run. It uses settings pre-programmed in the non-volatile memory of the LTC7883.

To fully explore the extensive power system management features of the LTC7883, download *LTpowerPlay*® onto the PC and use ADI's I²C/SMBus/PMBus dongle DC1613A to connect to the board. LTpowerPlay allows the user to reconfigure the LTC7883 while running, store the configuration in non-volatile memory, view telemetry of voltage, current, temperature, fault status, and more. For more details and instructions on LTpowerPlay, see the *LTpowerPlay Software GUI* section of this manual.

The LTC7883 and LTC7051 data sheets provide a complete description of the IC operation and application information and must be read in conjunction with this demo manual.

Design files for this circuit board are available at *www.analog.com*.

Performance Summary (T_A = 25°C) for the DC3170A-A

PARAMETER	CONDITIONS	VALUE
Minimum Input Voltage		7V
Maximum Input Voltage		14V
V_{OA0} Output Voltage Range		0.4V to 1.8V
V_{OA1} Output Voltage Range		0.4V to 1.8V
V_{OB0} Output Voltage Range		0.4V to 1.8V
V_{OB1} Output Voltage Range		0.4V to 1.8V
$I_{O(MAX)}$ for V_{OA0} – V_{0B1}		50A
Nominal F_{SWITCH}		500kHz
Typical Efficiency See *Figure 5* 250 LFM airflow	V_{OA0} = 0.75V, I_{OA0} = 50A, V_{IN} = 12V	86.8%
	V_{OA1} = 0.9V, I_{OA0} = 50A, V_{IN} = 12V	88.5%
	V_{OB0} = 1.0V, I_{OA0} = 50A, V_{IN} = 12V	89.2%
	V_{OB1} = 1.2V, I_{OA0} = 50A, V_{IN} = 12V	90.1%

Note: The upper end of the output voltage range is limited by the 2V voltage rating of the bulk output capacitors. The lower end is limited by the minimum on-time of the LTC7051, the input voltage, and the switching frequency.

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Performance Summary (T_A = 25°C) for the DC3170A-B

PARAMETER	CONDITION	VALUE
Minimum Input Voltage		7V
Maximum Input Voltage		14V
V_O Output Voltage Range	I_O = 0A to 200A, V_{IN} = 7V to 14V	0.4V to 1.8V
$I_{O(MAX)}$ for V_O	V_{IN} = 7V to 14V	200A
Nominal F_{SWITCH}		500kHz
Typical Efficiency See *Figure 6*	V_O = 1.0V, I_O = 200A, V_{IN} = 12V	89.7%

Note: The upper end of the output voltage range is limited by the 2V voltage rating of the bulk output capacitors. The lower end is limited by the minimum on-time of the LTC7051, the input voltage, and the switching frequency.

Quick Start Procedure

The evaluation setup for the DC3170A-A/-B is straight forward. While reading the instructions below, see either *Figure 1* or *Figure 2* for the DC3170A-A or DC3170A-B, respectively. Next, follow the procedure below:

1. With power off, connect the input supply, load, and meters as shown in the setup drawings. Preset the load to 0A and V_{IN} supply to be 0V.
2. Place the switches for RUNA0, RUNA1, RUNB0, and RUNB1 in the ON position.
3. Place the VCC RUN and VDRIVE RUN jumpers in the ON position.
4. Set the input voltage to 12V.
5. Check the output voltages. V_{OUT} for each rail should be within ±0.5% of its nominal value.
6. Apply the full load and recheck V_{OUT}.
7. Adjust the input voltage and load current to the desired levels within their limits and observe the regulation, output ripple, load step response, efficiency, and other parameters.

Notes:

- Do not hot plug V_{IN}. This could cause large transients on V_{IN}, which may damage the demo board.
- Make sure the electronic load is off before turning off the V_{IN} supply. Otherwise, the load may pull the output voltage below ground. This could damage the demo board.

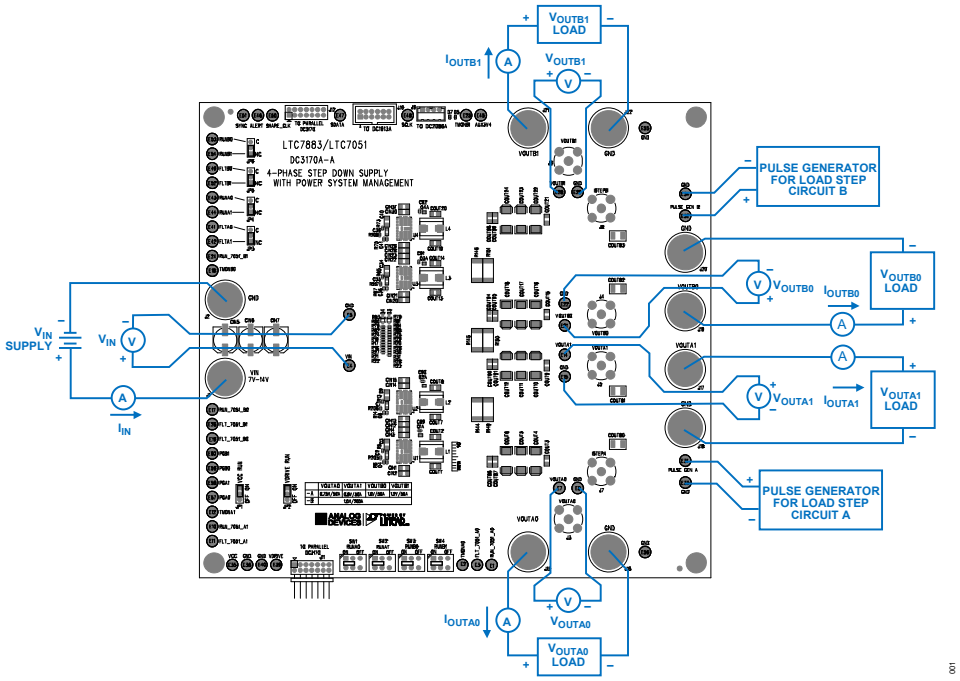


Figure 1. Proper Measurement Equipment Setup for the DC3170A-A

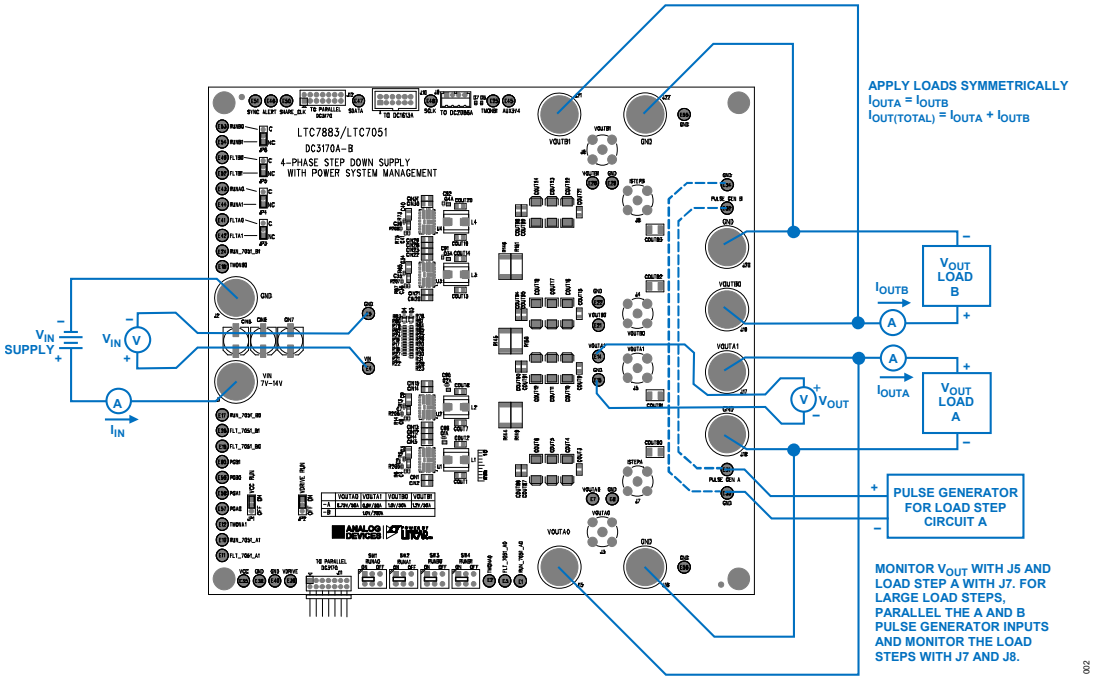


Figure 2. Proper Measurement Equipment Setup for the DC3170A-B

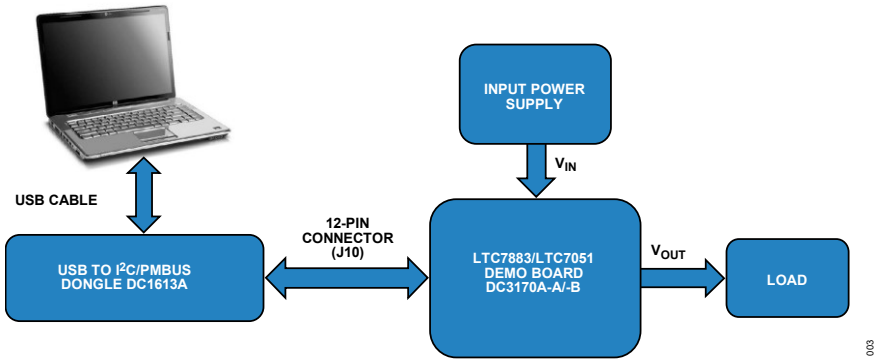


Figure 3. How to Interface the DC3170A-A/-B to a PC

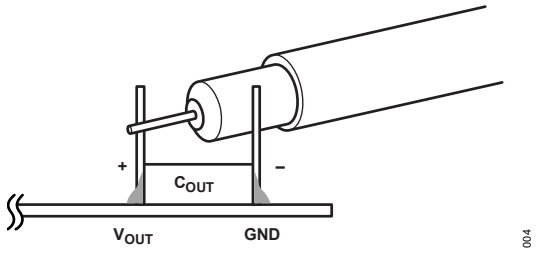


Figure 4. Proper Method of Measuring Output Voltage or Input Voltage Ripple

Measuring Efficiency

Instructions on how to take accurate efficiency measurements are provided below. While following these instructions, see either *Figure 1* (DC3170A-A) or *Figure 2* (DC3170A-B) and the schematic.

1. Disable the V_{CC} and VDRIVE bias supplies on the board by placing the VCC RUN and VDRIVE RUN jumpers in the OFF position.
2. Disconnect the V_{CC} and VDRIVE supplies from the rest of the circuit by removing the 0Ω jumpers at R139 and R143.
3. Tie the V_{CC} and VDRIVE turrets together and connect to an external 5V bias supply. Include the power provided by the external 5V bias in the efficiency measurements.
4. For the DC3710A-A, disable the unused rails by placing their RUN switches in the OFF position.
5. Monitor V_{OUT} and V_{IN} at the local ceramic C_{OUT} and C_{IN} capacitors. These are shown in the table below:

ASSEMBLY TYPE	RAIL	LOCAL C_{OUT}	LOCAL C_{IN}
-A	V_{OUTA0}	COUT1	CIN2
	V_{OUTA1}	COUT7	CIN12
	V_{OUTB0}	COUT14	CIN23
	V_{OUTB1}	COUT20	CIN31
-B	V_{OUT}	COUT7	CIN12

Note: For the DC3170A-B, make sure the loads are applied and connected symmetrically. For instance, if two loads are used, connect one to V_{OUTA1} and the other to V_{OUTB}. Keep the two loads equal.

Air Flow Requirements and Overtemperature Protection

At room temperature, the DC3170A-A/-B can operate with full load on all outputs with an airflow of 250 LFM or more. The thermal image at full load of the DC3170A-B is shown in *Figure 7*. The LTC7883 monitors the temperature of each LTC7051 using the LTC7051's TDIO pin. The LTC7883's non-volatile memory is configured for the overtemperature fault thresholds and response detailed below:

- Warning threshold = 90°C
- Shutdown threshold = 110°C
- Continuous restart attempts
- Direct V_{BE} sensing

Output Voltage and Input Voltage Ripple Measurements

To measure the output voltage ripple, connect the oscilloscope to the respective BNC connector using a coaxial cable. The $V_{OUT\ BNC}$ connectors are labeled as V_{OUTA0}, V_{OUTA1}, V_{OUTB0}, and V_{OUTB1} on the DC3170A-A and V_{OUTA1} on the DC3170A-B. These BNC connectors monitor the voltage across the 100µF X5R 0805 ceramic capacitor closest to the V_{OUT} terminals. These capacitors are COUT3, COUT9, COUT15, and COUT21, respectively.

Notes:

- Use 50Ω coupling on the oscilloscope. This will prevent unwanted measurement noise.
- If V_{OUT} at other locations or V_{IN} needs to be measured, then connect short, stiff leads to the (+) and (-) terminals of the output or input capacitor. The probe's ground ring needs to contact the (-) lead, and the probe tip needs to contact the (+) lead. See *Figure 4*.

Dynamic Load Circuits

The DC3170A provides two simple dynamic load circuits labeled A and B. The circuits consist of the PSMN1R5-30BLE MOSFET (RDS_{ON} = 2.1mΩ max at V_{GS} = 10V, T_J = 100°C) and a 1mΩ sense resistor to monitor the load step current. When on, the MOSFET will be operating in its linear region, and its drain current will be set by an external pulse generator tied to its gate. Depending on the jumper settings, dynamic load circuit A is connected to either V_{OUTA0} or V_{OUTA1}, while dynamic load step circuit B is connected to either V_{OUTB0} or V_{OUTB1}. To apply a load step to an output, follow the steps below.

1. See the setup diagrams shown in *Figure 1* (DC3170A-A) or *Figure 2* (DC3170A-B) and the schematic.
2. For the DC3170A-A, make sure the output under test is properly connected.
    a. Connect V_{OUTA0} or V_{OUTA1} to dynamic load circuit A with either R114 or R122, respectively. Do not stuff both at the same time; otherwise, the two outputs will be shorted.
    b. Connect V_{OUTB0} or V_{OUTB1} to dynamic load circuit B with either R116 or R125, respectively. Do not stuff both at the same time; otherwise, the two outputs will be shorted.
3. For the DC3170A-B, no jumpers need to be installed or moved. Dynamic load circuit A is connected to V_{OUTA1}, and dynamic load circuit B is connected to V_{OUTB0} with R122 and R116, respectively. The V_{OUTA0}, V_{OUTA1}, V_{OUTB0}, and V_{OUTB1} planes are tied together with 0mΩ 2512 copper jumpers.
4. Connect the pulse generator from either PULSE GEN A to GND or PULSE GEN B to GND, depending on which V_{OUT} for the DC3170A-A or which portion of V_{OUT} of the DC3170A-B needs to be monitored.
5. Preset the amplitude of the pulse generator to 0.0V and the duty cycle to 2% or less with a pulse frequency of 10Hz or faster.
6. Depending on which output is being tested, connect an oscilloscope to the BNC connectors labelled I_{STEPA} or I_{STEPB} with a coaxial cable. Use 50Ω coupling at the oscilloscope to prevent unwanted measurement noise.
7. Monitor V_{OUT} at the respective $V_{OUT\ BNC}$ connector.
8. Turn on the converter. Slowly increase the output of the pulse generator until the load step pulse has reached the desired height. The current sense gain is 1mV/Amp.
9. Monitor V_{OUT}, I_{STEP} and other parameters.

Note: If the load step current starts to run away during operation, either reduce the output of the pulse generator or reduce the duty cycle.

Paralleling Outputs

The DC3170A provides optional jumpers to connect the phases together. These jumpers can be found on sheets 3 and 4 of the schematic. On the DC3170A-B, all four phases are connected with these jumpers to provide a 4-phase output, with phase A1 being the leader. 2+1+1, 2+2, and 3+1 configurations are also possible with these jumpers. Refer to the data sheet for details on how to parallel phases.

Interfacing the DC3170A-A/-B to other PSM demo boards

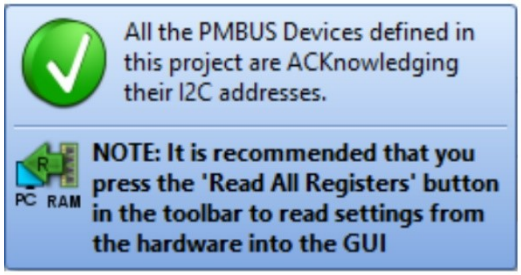
The DC3170A can be connected to other DC3170A demo boards or other PSM demo boards using the connectors at J11 and J12. These connectors are on opposite sides of the PCB. This allows the same PC to monitor and control multiple demo boards.

LTpowerPlay Software GUI

LTpowerPlay is a powerful Windows®-based development environment that supports ADI's power system management ICs. The software supports a variety of different tasks. LTpowerPlay can be used to evaluate ADI's power management ICs and demo boards. It can also be used in offline mode (with no hardware present) in order to build a multi-chip configuration file that can be saved and reloaded at a later time. LTpowerPlay provides unprecedented diagnostic and debug features. It becomes a valuable diagnostic tool during board bring-up to program or tweak the power management scheme in a system. LTpowerPlay utilizes the DC1613A USB-to-SMBus controller to communicate with one of many potential targets, including the DC3170A-A/-B or a customer board. The software also provides an automatic update feature to keep the software current with the latest set of device drivers and documentation. The LTpowerPlay Quick Start Procedure is below.

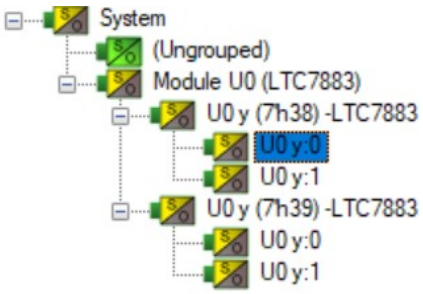
LTpowerPlay Quick Start Procedure

1. Download and install *LTpowerPlay*.
2. Connect the DC3170A-A/-B as shown in *Figure 3*.
3. Launch the LTpowerPlay GUI. The GUI should automatically identify the DC3170A-A/-B. A blue message box will appear briefly in the lower left corner.

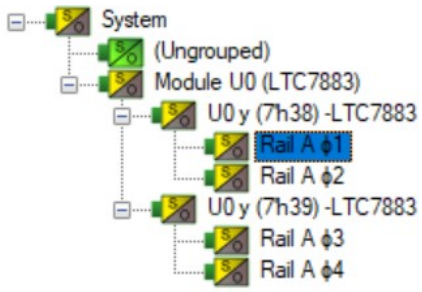


4. A system tree appears on the left-hand side of the screen. The system trees for the DC3170A-A and DC3170A-B are shown below:

   DC3170A-A:

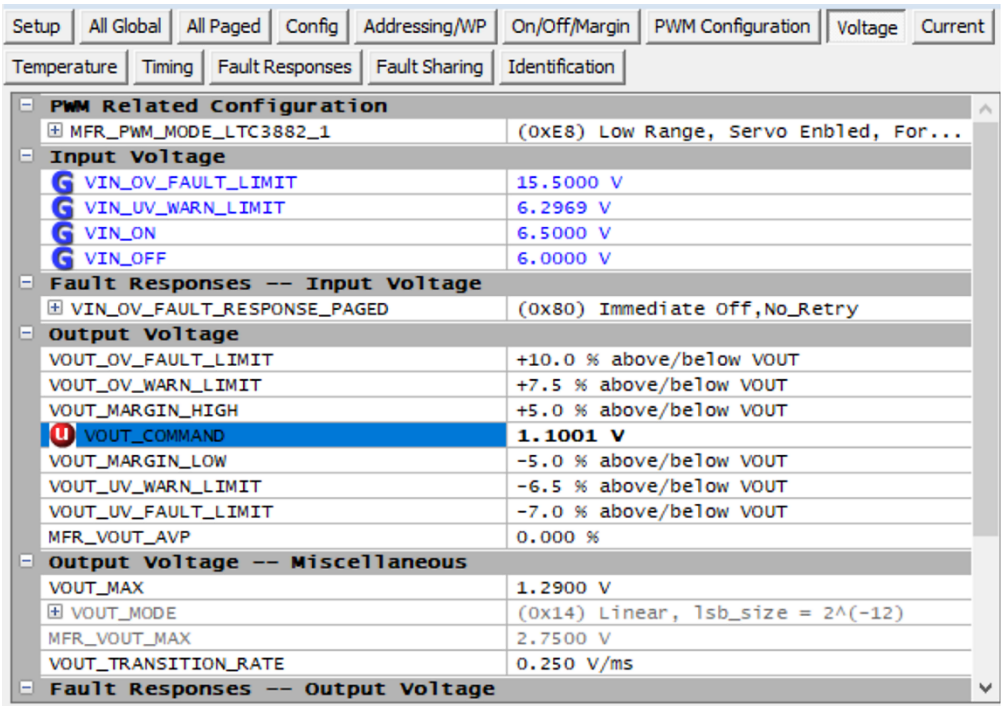


DC3170A-B:



5. In the toolbar, click the **R** (RAM to PC) icon to allow the GUI to read the RAM of the LTC7883.

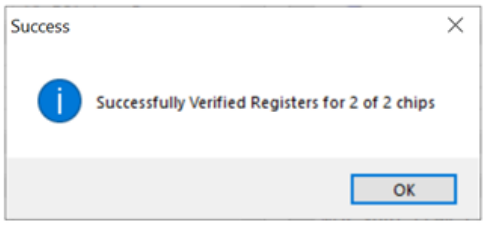
6. To change the output voltage of a rail on the DC3170A-A, select the phase from the system tree. Then, enter the new value in the **VOUT_COMMAND** box under the **Voltage** tab, as shown below:



The output voltage of VOB1 is being reduced from 1.200V to 1.1001V. If **VOUT_COMMAND** is increased, VOUT_MAX may also need to be increased to ensure it has sufficient margin.

7. Click the **W** (PC to RAM) icon to write the new values to the RAM of the LTC7883.

8. If the write is successful, the output voltage will change to 1.1001V, and the following message will appear.



9. To change the output voltage or other parameters of the DC3170A-B, update the value of one phase in the GUI. The other phases will automatically be updated. Then click the **W**, as mentioned above.

10. To save the changes to NVM, click the **RAM to NVM** button.

11. Save the demo board configuration to a (*.proj) file. Click the **Save** icon and save the file with a new name.

Notes on addresses

- The 7h38 and 7h39 are the addresses of the two units inside the LTC7883. Phases 1 and 2, also known as phases A0 and A1, are at address 7h38. Phases 3 and 4, also known as phases B0 and B1, are at address 7h39.
- For the DC3170A-A, the MFR_RAIL_ADDRESS is set to the default value of 0x80. This allows LTpowerPlay to treat each phase as an independent rail.
- For the DC3170A-B, the MFR_RAIL_ADDRESS of each phase is set to 0x1D. Setting the rail address to a value other than 0x80, 0x5A or 0x5B allows LTpowerPlay to treat each phase as though it belongs to the same rail. Once one phase is changed, the same change will be made in all phases. In addition, LTpowerPlay will sum the currents of each phase to provide the total output current.

Typical Performance Characteristics

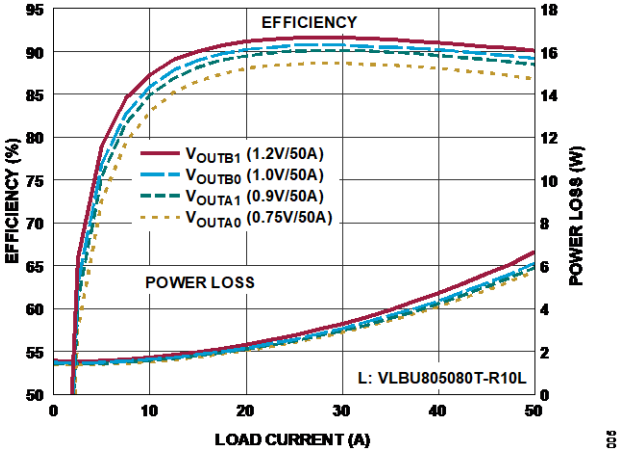


Figure 5. Efficiency of the DC3170A-A

Conditions:

- RUN pins of the rails not under test were pulled low.
- External 5V bias was applied to the LTC7883 and LTC7051. DRVCC and VDRIVE supplies were disabled and disconnected from the circuit. Power from the external 5V bias is included in the efficiency measurements.

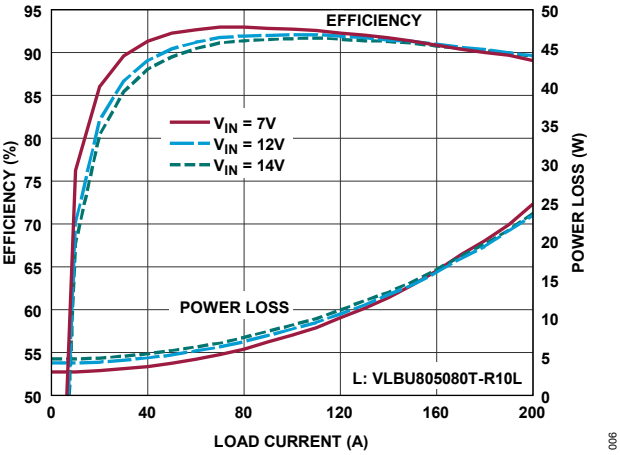


Figure 6. Efficiency of the DC3170A-B

Conditions:

- 250 LFM airflow
- External 5V bias was applied to the LTC7883 and LTC7051. DRVCC and VDRIVE supplies were disabled and disconnected from the circuit. Power from the external 5V bias is included in the efficiency measurements.

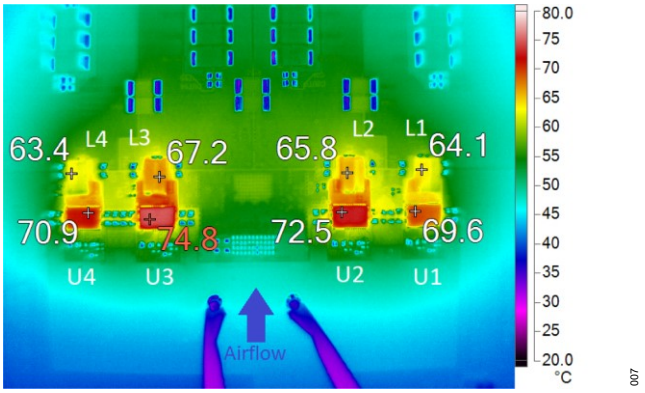


Figure 7. Thermal Image of the DC3170A-B with Full Load (200A)

Hot spot is the LTC7051 at U3 (phase B0).

Conditions:

- V_{IN} = 12V
- Airflow = 250 LFM
- Ambient temperature = 23°C

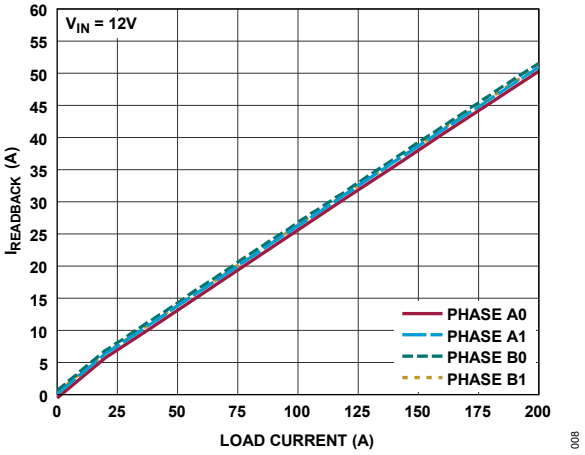


Figure 8. Current Sharing Accuracy of the DC3170A-B

Conditions:

- R_{ISNS} = 49.9Ω
- IOUT_CAL_GAIN = 0.499mΩ
- MFR_IOUT_CAL_GAIN_TC = 0ppm/°C

Table 1. LTC7051 Readback Temperature vs. Measured Temperature of the DC3170A-B

1.0V/200A/12V_{IN}/250 LFM			
LTC7051 LOC.	READBACK TEMP (°C)	MEASURED TEMP (°C)	DIFFERENCE (°C)
A0	71.4	69.6	1.8
A1	74.4	72.5	1.9
B0	74.3	74.8	-0.5
B1	71.0	70.9	0.1

RUN PINS LOW, 5V BIAS APPLIED			
LTC7051 LOC.	READBACK TEMP (°C)	MEASURED TEMP (°C)	DIFFERENCE (°C)
A0	27.6	27.2	0.4
A1	28.0	27.4	0.6
B0	26.9	27.6	-0.7
B1	26.7	26.7	0.0

Conditions:

- LTC7883 TSNS pins are tied to the TDIO pins of the LTC7051
- MFR_TEMP_1_GAIN = 1.9856
- MFR_TEMP_1_OFFSET = -0.6113
- Bit 5 of MFR_PWM_MODE_LTC3882-1 = 1 for direct V_{BE} measurements
- Ambient temperature = 23°C

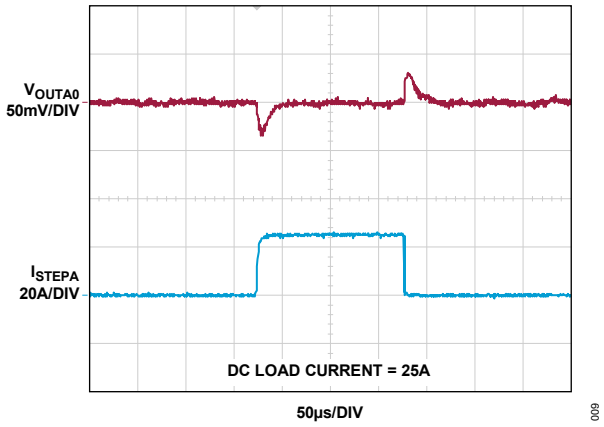


Figure 9. 25A to 50A to 25A Load Step Response of V_{OUTA0} (0.75V/50A) of the DC3170A-A

Conditions:

- V_{IN} = 12V, F_{SW} = 500kHz, L = 100nH
- $C_{OUT(BULK)}$ = 4x 560µF/3mΩ
- $C_{OUT(CER)}$ = 7x 100µF/X5R/0805

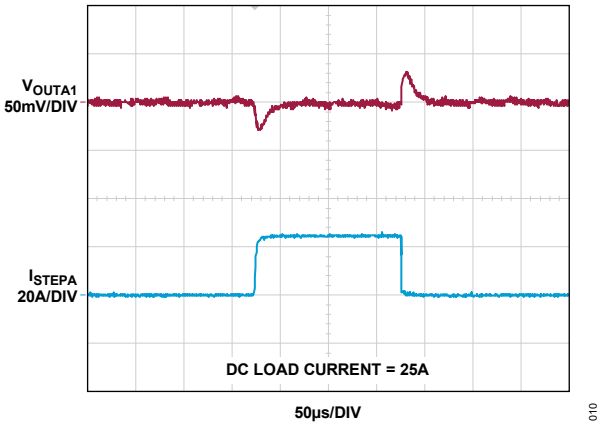


Figure 10. 25A to 50A to 25A Load Step Response of V_{OUTA1} (0.9V/50A) of the DC3170A-A

Conditions:

- V_{IN} = 12V, F_{SW} = 500kHz, L = 100nH
- $C_{OUT(BULK)}$ = 4x 560µF/3mΩ
- $C_{OUT(CER)}$ = 7x 100µF/X5R/0805

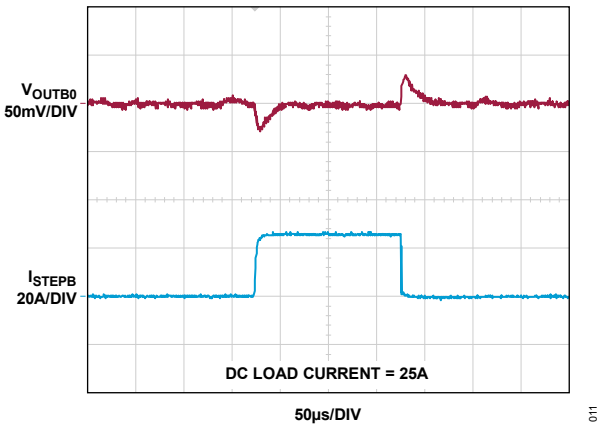


Figure 11. 25A to 50A to 25A Load Step Response of V_{OUTB0} (1.0V/50A) of the DC3170A-A

Conditions:

- V_{IN} = 12V, F_{SW} = 500kHz, L = 100nH
- $C_{OUT(BULK)}$ = 4x 560µF/3mΩ
- $C_{OUT(CER)}$ = 7x 100µF/X5R/0805

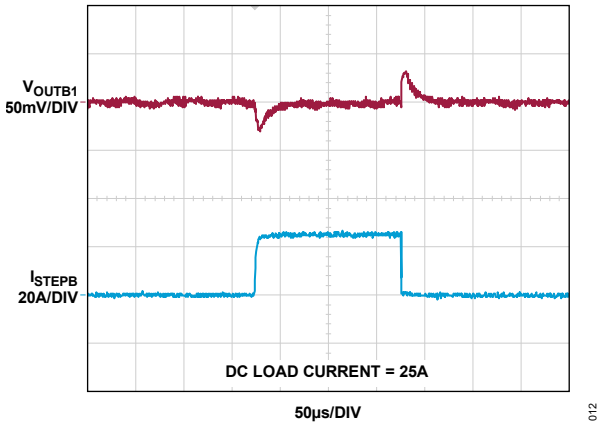


Figure 12. 25A to 50A to 25A Load Step Response of V_{OUTB1} (1.2V/50A) of the DC3170A-A

Conditions:

- V_{IN} = 12V, F_{SW} = 500kHz, L = 100nH
- $C_{OUT(BULK)}$ = 4x 560µF/3mΩ
- $C_{OUT(CER)}$ = 7x 100µF/X5R/0805

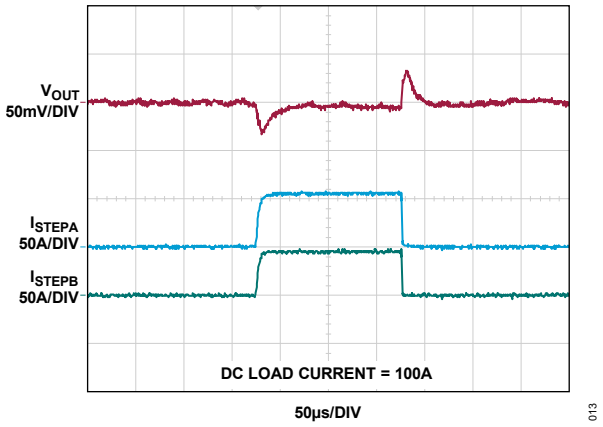


Figure 13. 100A to 200A to 100A Load Step Response of the DC3170A-B (V_{OUT} = 1.0V/200A)

Conditions:

- V_{IN} = 12V, F_{SW} = 500kHz, L = 100nH
- $C_{OUT(BULK)}$ = 14x 560µF/3mΩ
- $C_{OUT(CER)}$ = 22x 100µF/X5R/0805

Bill of Materials

REQUIRED CIRCUIT COMPONENTS FOR THE -A ASSEMBLY					
ITEM	QTY	REF DES	PART DESCRIPTION	MANUFACTURER	PART NUMBER
1	4	C11, C12, C43, C44	CAP., 330pF, C0G, 50V, 5%,0402	MURATA YAGEO	GRM1555C1H331JA01D CC0402JRNPO9BN331
2	4	C13, C16, C45, C48	CAP., 680pF, C0G, 50V, 5%, 0402	AVX MURATA MURATA	04025A681JAT2A GRM1555C1H681JA01D GRM1555C1H681JA01J
3	4	C14, C15, C46, C47	CAP., 10pF, C0G, 50V, 5%, 0402, AEC-Q200	MURATA	GCM1555C1H100JA16D
4	4	C19, C20, C51, C52	CAP., 4700pF, X7R, 50V, 10%, 0402	AVX MURATA	04025C472KAT2A GRM155R71H472KA01D
5	8	C2, C7, C26, C28, C33, C39, C58, C60	CAP., 1µF, X5R, 50V, 10%, 0603	AVX MURATA TAIYO YUDEN TDK	06035D105KAT2A GRM188R61H105KAALD UMK107BJ105KA-T C1608X5R1H105K080AB
6	3	C23, C31, C57	CAP., 0.1µF, X7R, 25V, 10%, 0402	AVX TAIYO YUDEN	04023C104KAT2A TMK105B7104KV-FR
7	2	C27, C59	CAP., 2.2µF, X5R, 16V, 10%, 0603	AVX MURATA TDK	0603YD225KAT2A GRM188R61C225KE15D C1608X5R1C225K080AB
8	4	C4, C8, C36, C41	CAP., 47pF, C0G/NP0, 50V, 5%, 0402	KEMET MURATA MURATA TDK VISHAY KEMET	C0402C470J5GAC7867 GRM1555C1H470JA01D GRM1555C1H470JZ01D C1005C0G1H470J050BA VJ0402A470JXAAC C0402C470J5GACTU
9	36	CIN1, CIN2, CIN3, CIN4, CIN8, CIN9, CIN10, CIN11, CIN12, CIN13, CIN14, CIN15, CIN16, CIN17, CIN18, CIN19, CIN20, CIN21, CIN22, CIN23, CIN24, CIN25, CIN26, CIN27, CIN28, CIN29, CIN30, CIN31, CIN32, CIN33, CIN34, CIN35, C3, C9, C34, C40	CAP., 10µF, X5R, 25V, 10%, 0805	AVX SAMSUNG MURATA	08053D106KAT2A CL21A106KAFN3NE GRM21BR61E106KA73L
10	16	CIN38, CIN39, CIN40, CIN41, CIN42, CIN43, CIN44, CIN45, CIN46, CIN47, CIN48, CIN49, CIN50, CIN51, CIN52, CIN53	CAP., 1µF, X7R, 16V, 10%, 0603, AEC-Q200	MURATA TDK	GCM188R71C105KA64D CGA3E1X7R1C105K080AC
11	3	CIN5, CIN6, CIN7	CAP., 270µF, ALUM POLY, OS-CON, 16V, 20%, RADIAL, SMD, 8x11.9mm, E12, SVPC Series	PANASONIC	16SVPC270M
12	28	COUT1, COUT2, COUT3, COUT7, COUT8, COUT9, COUT13, COUT14, COUT15, COUT19, COUT20, COUT21, COUT84, COUT85, COUT86, COUT87, COUT88, COUT89,	CAP., 100µF, X5R, 6.3V, 20%, 0805	MURATA MURATA	GRM21BR60J107ME15K GRM21BR60J107ME15L

		COUT90, COUT91, COUT92, COUT93, COUT94, COUT95, COUT96, COUT97, COUT98, COUT99			
13	16	COUT4, COUT5, COUT6, COUT10, COUT11, COUT12, COUT16, COUT17, COUT18, COUT22, COUT23, COUT24, COUT34, COUT55, COUT77, COUT79	CAP., 560µF, ALUM POLY, SP cap, 2V, 20%, 7343, SMD	PANASONIC	EEFGX0D561R
14	4	L1, L2, L3, L4	IND., 0.10µH, PWR, FERRITE, 15%, 65A, 0.2mΩ, 8x5mm, VLBU	TDK	VLBU805080T-R10L
15	1	R18	RES., 1kΩ, 1%, 1/16W, 0402, AEC-Q200	VISHAY NIC	CRCW04021K00FKED NRC04F1001TRF
16	25	R2, R3, R10, R11, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R63, R64, R71, R72, R78, R79, R80, R81, R82, R83	RES.,10kΩ, 5%, 1/16W, 0402	SAMSUNGYAGEO	RC1005J103CSRC0402JR-0710KL
17	2	R35, R89	RES.,24.9kΩ, 1%, 1/10W, 0402, AEC-Q200	PANASONIC	ERJ2RKF2492X
18	1	R36	RES.,20kΩ, 1%, 1/10W, 0402, AEC-Q200	KOA SPEER PANASONIC	RK73H1ETTP2002F ERJ2RKF2002X
19	2	R41, R93	RES.,4.32kΩ, 1%, 1/16W, 0402, AEC-Q200	VISHAY	CRCW04024K32FKED
20	1	R42	RES.,11kΩ, 0.1%, 1/16W, 0402, METAL FILM, AEC-Q200	PANASONIC	ERA2AEB113X
21	4	R44, R45, R98, R99	RES., 4.02kΩ, 1%, 1/16W, 0402	YAGEO	RC0402FR-074K02L
22	4	R46, R47, R100, R101	RES.,54.9kΩ, 1%, 1/16W,0402, AEC-Q200	KOA SPEER VISHAY STACKPOLE ELECTRONICS, INC.	RK73H1ETTP5492F CRCW040254K9FKED RMCF0402FT54K9
23	8	R5, R13, R57, R61, R65, R73, R110, R113	RES.,1Ω, 5%, 1/16W, 0402	YAGEO	RC0402JR-071RL
24	4	R50, R51, R104, R105	RES., 49.9Ω, 1%, 1/8W, 0402, PULSE PROOF	VISHAY	CRCW040249R9FKEDHP
25	2	R56, R214	RES., 332Ω, 1%, 1/10W, 0603, AEC-Q200	PANASONIC Vishay	ERJ3EKF3320V CRCW0603332RFKEA
26	1	R58	RES., 52.3Ω,1%,1/10W, 0603, AEC-Q200	PANASONIC STACKPOLE ELECTRONICS, INC. VISHAY	ERJ3EKF52R3V RMCF0603FT52R3 CRCW060352R3FKEA
27	18	R6, R14, R30, R31, R52, R53, R59, R67, R75, R84, R85, R106, R107, R111, R197, R198, R199, R200	RES.,0Ω, 1/16W, 0402, AEC-Q200	NIC VISHAY	NRC04ZOTRF CRCW04020000Z0ED

28	10	R7, R8, R15, R16, R68, R69, R76, R77, R195, R196	RES., 0Ω, 1/10W, 0603	BOURNS VISHAY YAGEO	CR0603-J/-000ELF CRCW06030000Z0EAC RC0603FR-070RL
29	1	R90	RES.,20kΩ, 1%, 1/16W, 0402, AEC-Q200	NIC VISHAY	NRC04F2002TRF CRCW040220K0FKED
30	1	R96	RES.,12.7kΩ, 1%, 1/16W, 0402	YAGEO	RC0402FR-0712K7L
31	4	U1, U2, U3, U4	IC, SilentMOS Smart Power Stage, LQFN-42	ANALOG DEVICES	LTC7051AV#PBF
32	1	U5	IC, STEP-DOWN DC/DC CONTROLLER, BGA-99	ANALOG DEVICES	LTC7883AY#PBF
LOAD STEP AND VOUT MONITOR CIRCUITS FOR THE -A ASSEMBLY					
ITEM	**QTY**	**REF DES**	**PART DESCRIPTION**	**MANUFACTURER**	**PART NUMBER**
1	2	Q5, Q6	XSTR., MOSFET, N-CH, 30V, 120A, D2PAK	NEXPERIA	PSMN1R5-30BLEJ
2	14	R115, R117, R118, R119, R120, R121, R123, R124, R129, R131, R132, R133, R136, R137	RES.,0Ω,1/10W,0603	BOURNS VISHAY YAGEO	CR0603-J/-000ELF CRCW06030000Z0EAC RC0603FR-070RL
3	2	R116, R122	RES.,0Ω,200A, 2512, COPPER, SENSE	VISHAY	WSL251200000ZEA9
4	2	R128, R130	RES.,10kΩ, 5%,1/16W,0402	SAMSUNG YAGEO	RC1005J103CS RC0402JR-0710KL
5	2	R134, R135	RES.,0.001Ω, 5%, 3W,2512, LONG-SIDE BOTTOM TERM., METAL, SENSE, AEC-Q200, HI TEMP	SUSUMU	KRL6432D-C-R001-J-T5
ADDITIONAL CIRCUIT COMPONENTS FOR THE -A ASSEMBLY					
ITEM	**QTY**	**REF DES**	**PART DESCRIPTION**	**MANUFACTURER**	**PART NUMBER**
1	0	C32, C64, C66, C68, C69, C71, C72	CAP., OPTION, 0603		
2	0	C5, C10, C17, C18, C21, C22, C24, C25, C29, C30, C37, C42, C49, C50, C53, C54, C55, C56, C61, C62, C89, C90, C91, C92	CAP., OPTION, 0402		
3	4	C85, C86, C87, C88	CAP., 0.01µF, X5R, 25V, 10%, 0603	AVX TDK	06033D103KAT2A C1608X7R1E103K080AA
4	0	COUT33, COUT35, COUT36, COUT37, COUT38, COUT39, COUT40, COUT41, COUT42, COUT53, COUT54, COUT56, COUT57, COUT58, COUT59, COUT60, COUT61, COUT62, COUT73, COUT75	CAP., OPTION, 7343		
5	0	COUT80, COUT81, COUT82, COUT83	CAP., OPTION, 1210		
6	0	D1, D2, D3, D4, D6, D8, D9, D10, D16, D17, D18, D19	DIODE, OPTION, SOD-323F		
7	4	D11, D12, D13, D14	DIODE, SCHOTTKY RECTIFIER, 45V, 30A, FlatPAK 5x6, AEC-Q101	VISHAY	V30K45HM3/H

8	0	Q1A, Q2A, Q3A, Q4A	XSTR., OPTION, PNP, SOT-23		
9	0	R114, R125, R144, R145, R146, R149, R150, R151	RES., OPTION, 2512		
10	0	R169, R170, R171, R172, R173, R176, R177, R178, R179, R180, R181, R182, R184, R185, R193, R194, R201, R202, R203, R204, R213, R215, R216	RES., OPTION, 0603		
11	0	R17, R48, R49, R54, R55, R60, R102, R103, R108, R109, R112, R147, R152, R154, R155, R156, R157, R158, R159, R160, R161, R162, R163, R164, R165, R166, R167, R168, R205, R206, R207, R208, R32, R37, R43, R38, R33, R39, R34, R40, R91, R94, R97, R86, R92, R87, R88, R95	RES., OPTION, 0402		
12	0	R188	RES., OPTION, 1206		
13	4	R189, R190, R191, R192	RES.,10Ω, 5%, 1/10W, 0603, AEC-Q200	PANASONIC VISHAY	ERJ3GEYJ100V CRCW060310R0JNEA
14	4	R209, R210, R211, R212	RES.,100Ω, 1%, 1/4W, 1206, AEC-Q200	NIC PANASONIC VISHAY	NRC12F1000TRF ERJ8ENF1000V CRCW1206100RFKEA
15	0	U8	IC, OPT,SOT-23	ANALOG DEVICES	ADR1581A

HARDWARE FOR THE -A ASSEMBLY

ITEM	QTY	REF DES	PART DESCRIPTION	MANUFACTURER	PART NUMBER
1	50	E1, E2, E3, E4, E5, E7, E8, E10, E11, E12, E14, E15, E17, E18, E19, E21, E22, E24, E25, E26, E28, E29, E31, E32, E33, E34, E35, E36, E39, E40, E41, E42, E43, E44, E45, E46, E47, E48, E49, E50, E51, E52, E53, E54, E55, E56, E57, E58, E59, E60	TEST POINT, TURRET, 0.094" MTG. HOLE, PCB 0.062" THK	MILL-MAX	2501-2-00-80-00-00-07-0
2	10	J1, J2, J15, J16, J17, J18, J19, J20, J21, J22	EVAL BOARD STUD HARDWARE SET, #10-32	ANALOG DEVICES	720-0010
3	1	J10	CONN., HDR, SHROUDED, MALE, 2x6, 2mm, VERT, ST, THT	AMPHENOL	98414-G06-12ULF
4	1	J11	CONN., HDR, MALE, 2x7, 2mm, R/A THT	MOLEX MOLEX	0877601416 87760-1416
5	1	J12	CONN., HDR, FEMALE, 2x7, 2mm, R/A THT	SULLINS CONNECTOR SOLUTIONS	NPPN072FJFN-RC
6	6	J3, J4, J5, J6, J7, J8	CONN., RF, BNC, RCPT, JACK, 5-PIN, ST, THT,50Ω	AMPHENOL RF	112404
7	1	J9	CONN., HDR, SHROUDED, MALE, 1x4, 2mm, VERT, ST, THT	HIROSE ELECTRIC	DF3A-4P-2DSA

8	6	JP1, JP2, JP3, JP4, JP5, JP6	CONN., HDR, MALE, 1x3, 2mm, VERT, ST, THT	SAMTEC	TMM-103-02-L-S
9	4	MP1, MP2, MP3, MP4	STANDOFF, NYLON, SNAP-ON, 0.50"	KEYSTONE	8833
10	4	SW1, SW2, SW3, SW4	SWITCH, SLIDE, DPDT, 0.3A, 6VDC, PTH	C&K	JS202011CQN
11	6	XJP1, XJP2, XJP3, XJP4, XJP5, XJP6	CONN., SHUNT, FEMALE, 2-POS, 2mm	SAMTEC	2SN-BK-G
REQUIRED CIRCUIT COMPONENTS FOR THE -B ASSEMBLY					
ITEM	**QTY**	**REF DES**	**PART DESCRIPTION**	**MANUFACTURER**	**PART NUMBER**
1	1	C12	CAP., 330pF, C0G, 50V, 5%, 0402	MURATA YAGEO	GRM1555C1H331JA01D CC0402JRNPO9BN331
2	1	C15	CAP., 10pF, C0G, 50V, 5%, 0402, AEC-Q200	MURATA	GCM1555C1H100JA16D
3	1	C16	CAP., 1000pF, C0G, 50V, 5%, 0402	MURATA TDK TDK	GRM1555C1H102JA01D C1005C0G1H102J C1005C0G1H102J050BA
4	4	C19,C20,C51,C52	CAP., 4700pF, X7R, 50V, 10%, 0402	AVX MURATA	04025C472KAT2A GRM155R71H472KA01D
5	8	C2,C7,C26,C28,C33,C39,C58,C60	CAP., 1µF, X5R, 50V, 10%, 0603	AVX MURATA TAIYO YUDEN TDK	06035D105KAT2A GRM188R61H105KAALD UMK107BJ105KA-T C1608X5R1H105K080AB
6	3	C23,C31,C57	CAP., 0.1µF, X7R, 25V, 10%, 0402	AVX TAIYO YUDEN	04023C104KAT2A TMK105B7104KV-FR
7	2	C27,C59	CAP., 2.2µF, X5R, 16V, 10%, 0603	AVX MURATA TDK	0603YD225KAT2A GRM188R61C225KE15D C1608X5R1C225K080AB
8	36	C3, C9, C34, C40, CIN1, CIN2, CIN3, CIN4, CIN8, CIN9, CIN10, CIN11, CIN12, CIN13, CIN14, CIN15, CIN16, CIN17, CIN18, CIN19, CIN20, CIN21, CIN22, CIN23, CIN24, CIN25, CIN26, CIN27, CIN28, CIN29, CIN30, CIN31, CIN32, CIN33, CIN34, CIN35	CAP., 10µF, X5R, 25V, 10%, 0805	AVX SAMSUNG MURATA	08053D106KAT2A CL21A106KAFN3NE GRM21BR61E106KA73L
9	5	C4, C8, C30, C36, C41	CAP., 47pF, C0G/NP0, 50V, 5%, 0402	KEMET MURATA MURATA TDK VISHAY KEMET	C0402C470J5GAC7867 GRM1555C1H470JA01D GRM1555C1H470JZ01D C1005C0G1H470J050BA VJ0402A470JXAAC C0402C470J5GACTU
10	16	CIN38, CIN39, CIN40, CIN41, CIN42, CIN43, CIN44, CIN45, CIN46, CIN47, CIN48, CIN49, CIN50, CIN51, CIN52, CIN53	CAP., 1µF, X7R, 16V, 10%, 0603, AEC-Q200	MURATA TDK	GCM188R71C105KA64D CGA3E1X7R1C105K080AC
11	3	CIN5, CIN6, CIN7	CAP., 270µF, ALUM POLY, OS-CON, 16V, 20%, RADIAL, SMD, 8x11.9mm, E12, SVPC Series	PANASONIC	16SVPC270M

12	22	COUT1, COUT2, COUT7, COUT8, COUT9, COUT13, COUT14, COUT15, COUT19, COUT20, COUT84, COUT85, COUT88, COUT89, COUT90, COUT91, COUT92, COUT93, COUT94, COUT95, COUT96, COUT97	CAP., 100µF, X5R, 6.3V, 20%, 0805	MURATA MURATA	GRM21BR60J107ME15K GRM21BR60J107ME15L
13	14	COUT10, COUT11, COUT12, COUT16, COUT17, COUT18, COUT40, COUT41, COUT42, COUT53, COUT54, COUT55, COUT75, COUT77	CAP., 560µF, ALUM POLY, SP-Cap, 2V, 20%, 7343, SMD	PANASONIC	EEFGX0D561R
14	4	L1, L2, L3, L4	IND., 0.10µH, PWR, FERRITE, 15%, 65A, 0.2mΩ, 8x5mm, VLBU	TDK	VLBU805080T-R10L
15	6	R144, R145, R146, R149, R150, R151	RES., 0Ω, 200A, 2512, COPPER, SENSE	VISHAY	WSL251200000ZEA9
16	10	R15, R16, R147, R157, R161, R177, R195, R196, R215, R216	RES., 0Ω, 1/10W, 0603	BOURNSVISHAYY AGEO	CR0603-J/-000ELFCRCW06030000Z0EA CRC0603FR-070RL
16	1	R18	RES.,1kΩ, 1%, 1/16W, 0402, AEC-Q200	VISHAY NIC	CRCW04021K00FKED NRC04F1001TRF
17	25	R2, R3, R10, R11, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R63, R64, R71, R72, R78, R79, R80, R81, R82, R83	RES.,10kΩ, 5%, 1/16W, 0402	SAMSUNG YAGEO	RC1005J103CS RC0402JR-0710KL
18	2	R35, R89	RES., 24.9kΩ, 1%, 1/10W, 0402, AEC-Q200	PANASONIC	ERJ2RKF2492X
18	1	R36	RES., 20kΩ, 1%, 1/10W, 0402, AEC-Q200	KOA SPEER PANASONIC	RK73H1ETTP2002F ERJ2RKF2002X
19	2	R41, R93	RES., 4.32kΩ, 1%, 1/16W, 0402, AEC-Q200	VISHAY	CRCW04024K32FKED
20	1	R42	RES., 11kΩ, 0.1%, 1/16W, 0402, METAL FILM, AEC-Q200	PANASONIC	ERA2AEB113X
21	1	R45	RES., 3.01kΩ, 1%, 1/10W, 0402, AEC-Q200	PANASONIC	ERJ2RKF3011X
22	1	R47	RES., 54.9kΩ, 1%, 1/16W, 0402, AEC-Q200	KOA SPEER VISHAY STACKPOLE ELECTRONICS, INC.	RK73H1ETTP5492F CRCW040254K9FKED RMCF0402FT54K9
18	8	R5, R13, R57, R61, R65, R73, R110, R113	RES., 1Ω, 5%, 1/16W, 0402	YAGEO	RC0402JR-071RL
19	4	R50, R51, R104, R105	RES., 49.9Ω, 1%, 1/8W, 0402, PULSE PROOF	VISHAY	CRCW040249R9FKEDHP
20	2	R56, R214	RES., 332Ω, 1%, 1/10W, 0603, AEC-Q200	PANASONIC Vishay	ERJ3EKF3320V CRCW0603332RFKEA

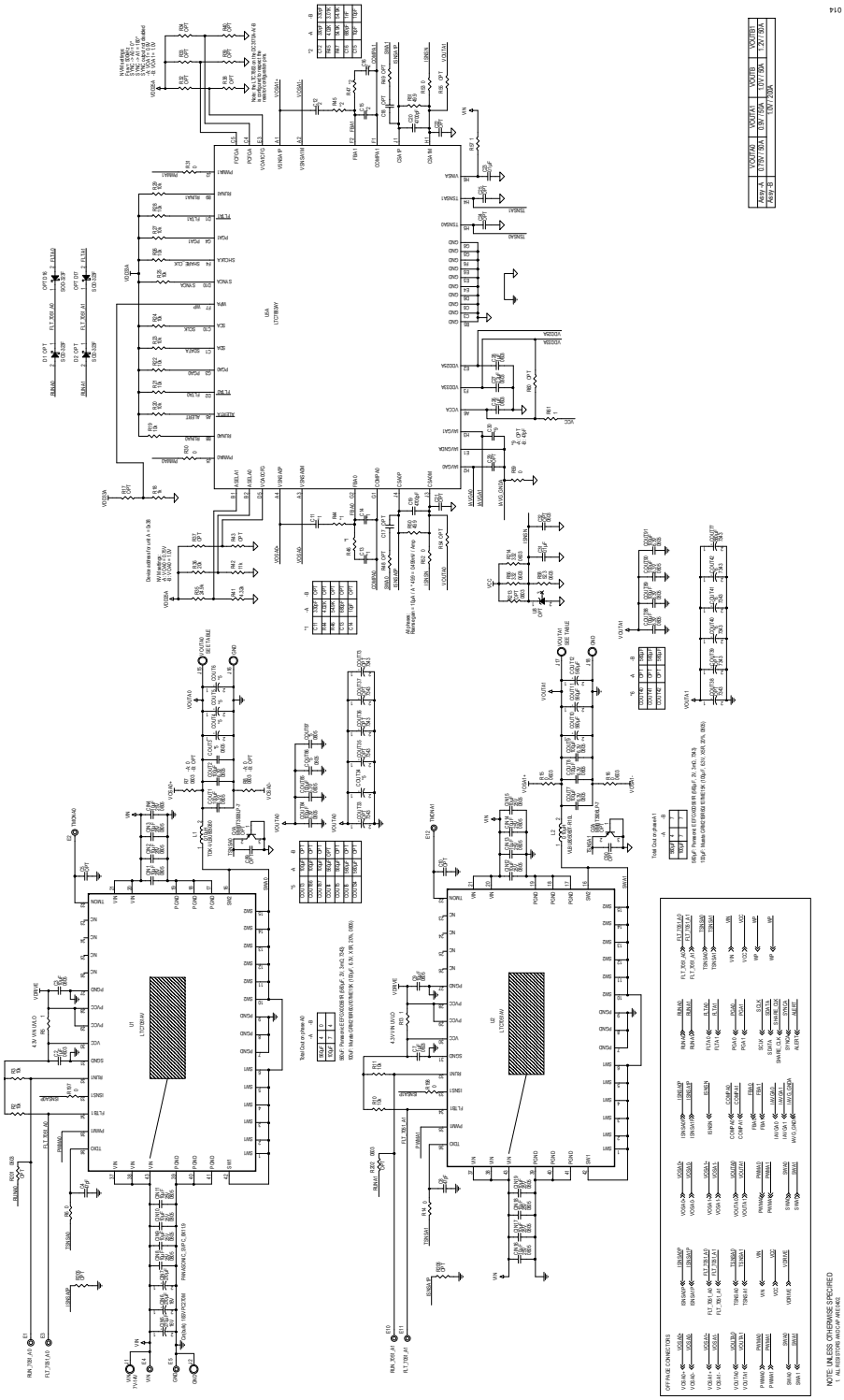
21	1	R58	RES., 52.3Ω, 1%, 1/10W, 0603, AEC-Q200	PANASONIC STACKPOLE ELECTRONICS, INC. VISHAY	ERJ3EKF52R3V RMCF0603FT52R3 CRCW060352R3FKEA
22	31	R6, R14, R30, R31, R52, R53, R59, R67, R75, R84, R85, R106, R107, R111, R154, R155, R156, R158, R159, R160, R162, R163, R164, R165, R166, R167, R168, R197, R198, R199, R200	RES., 0Ω, 1/16W, 0402, AEC-Q200	NIC VISHAY	NRC04ZOTRF CRCW04020000Z0ED
23	1	R90	RES., 20kΩ, 1%, 1/16W, 0402, AEC-Q200	NIC VISHAY	NRC04F2002TRF CRCW040220K0FKED
24	1	R96	RES., 12.7kΩ, 1%, 1/16W, 0402	YAGEO	RC0402FR-0712K7L
25	4	U1,U2,U3,U4	IC, SilentMOS Smart Power Stage, LQFN-42	ANALOG DEVICES	LTC7051AV#PBF
26	1	U5	IC, STEP-DOWN DC/DC CONTROLLER, BGA-99	ANALOG DEVICES	LTC7883AY#PBF
LOAD STEP AND VOUT MONITOR CIRCUITS FOR THE -B ASSEMBLY					
ITEM	**QTY**	**REF DES**	**PART DESCRIPTION**	**MANUFACTURER**	**PART NUMBER**
1	2	Q5, Q6	XSTR., MOSFET, N-CH, 30V, 120A, D2PAK	NEXPERIA	PSMN1R5-30BLEJ
2	2	R116, R122	RES., 0Ω, 200A, 2512, COPPER, SENSE	VISHAY	WSL251200000ZEA9
3	8	R120, R121, R124, R129, R132, R133, R136, R137	RES., 0Ω, 1/10W, 0603	BOURNS VISHAY YAGEO	CR0603-J/-000ELF CRCW06030000Z0EAC RC0603FR-070RL
4	2	R128, R130	RES., 10kΩ, 5%, 1/16W, 0402	SAMSUNG YAGEO	RC1005J103CS RC0402JR-0710KL
5	2	R134, R135	RES., 0.001Ω, 5%, 3W, 2512, LONG-SIDE BOTTOM TERM., METAL, SENSE, AEC-Q200, HI TEMP	SUSUMU	KRL6432D-C-R001-J-T5
ADDITIONAL CIRCUIT COMPONENTS FOR THE -B ASSEMBLY					
ITEM	**QTY**	**REF DES**	**PART DESCRIPTION**	**MANUFACTURER**	**PART NUMBER**
1	0	C32, C64, C66, C68, C69, C71, C72	CAP., OPTION, 0603		
2	0	C5, C10, C11, C13, C14, C17, C18, C21, C22, C24, C25, C29, C37, C42, C43, C44, C45, C46, C47, C48, C49, C50, C53, C54, C55, C56, C61, C62, C89, C90, C91, C92	CAP., OPTION, 0402		
3	4	C85, C86, C87, C88	CAP., 0.01µF, X5R, 25V, 10%, 0603	AVX TDK	06033D103KAT2A C1608X7R1E103K080AA
4	0	COUT3, COUT21, COUT86, COUT87, COUT98, COUT99	CAP., OPTION, 0805		
5	0	COUT4, COUT5, COUT6, COUT22, COUT23, COUT24, COUT33, COUT34, COUT35,	CAP., OPTION, 7343		

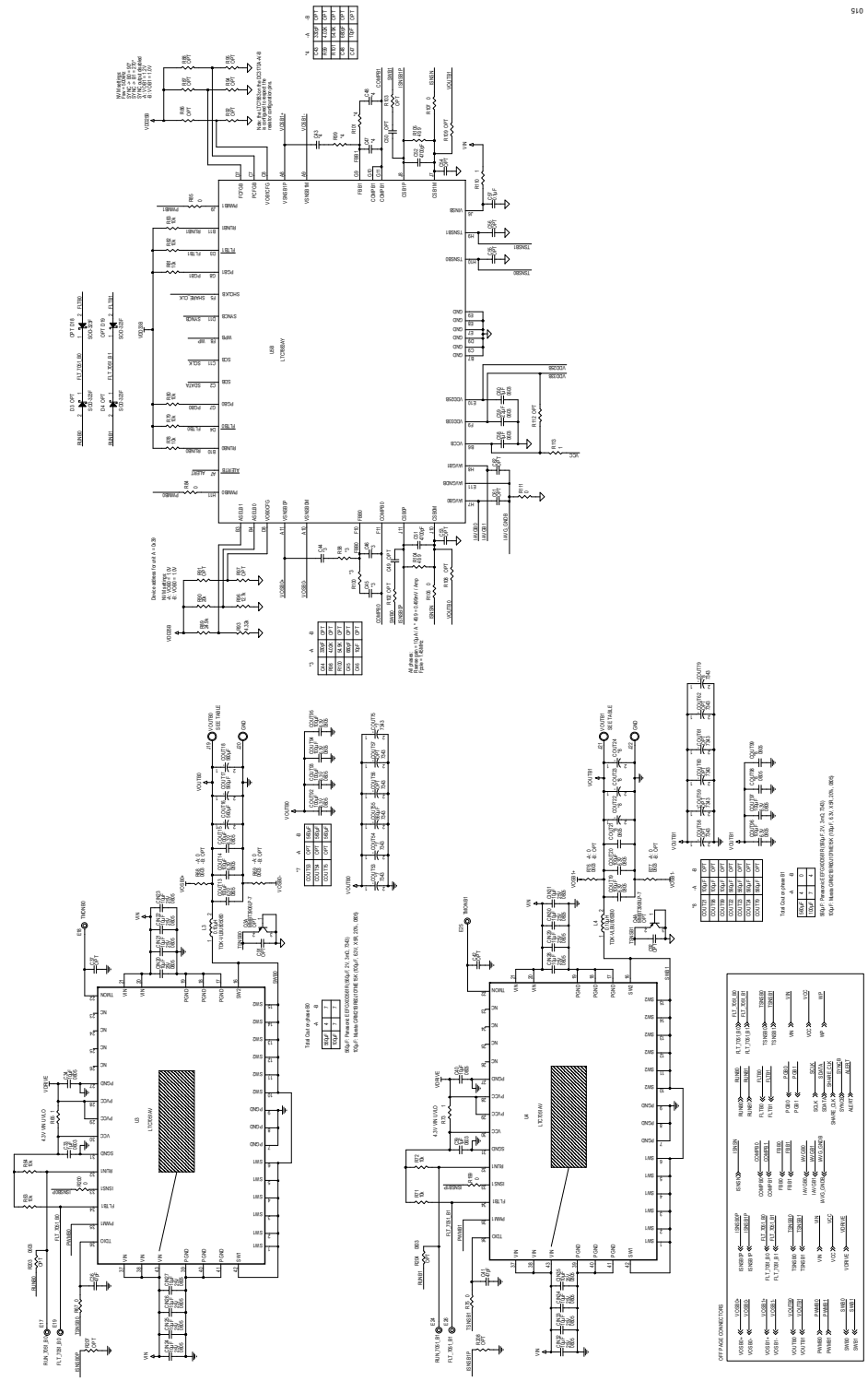
		COUT36, COUT37, COUT38, COUT39, COUT56, COUT57, COUT58, COUT59, COUT60, COUT61, COUT62, COUT73, COUT79			
6	0	COUT80, COUT81, COUT82, COUT83	CAP., OPTION, 1210		
7	0	D1, D2, D3, D4, D6, D8, D9, D10, D16, D17, D18, D19	DIODE, OPTION, SOD-323F		
8	4	D11, D12, D13, D14	DIODE, SCHOTTKY RECTIFIER, 45V, 30A, FlatPAK 5x6, AEC-Q101	VISHAY	V30K45HM3/H
9	0	Q1A, Q2A, Q3A, Q4A	XSTR., OPTION, PNP, SOT-23		
10	0	R114, R125	RES., OPTION, 2512		
11	0	R17, R44, R46, R48, R49, R54, R55, R60, R98, R99, R100, R101, R102, R103, R108, R109, R112, R147, R152, R157, R161, R205, R206, R207, R208	RES., OPTION, 0402		
12	0	R188	RES., OPTION, 1206		
13	4	R189, R190, R191, R192	RES.,10Ω, 5%, 1/10W, 0603, AEC-Q200	PANASONIC VISHAY	ERJ3GEYJ100V CRCW060310R0JNEA
14	4	R209, R210, R211, R212	RES.,100Ω, 1%, 1/4W, 1206, AEC-Q200	NIC PANASONIC VISHAY	NRC12F1000TRF ERJ8ENF1000V CRCW1206100RFKEA
17	0	R7,R8,R68,R69,R76,R77,R115,R117, R118,R119,R123,R131,R133,R169, R170,R171,R172,R173,R176,R178, R179,R180,R181,R182,R184,R185, R193,R194,R201,R202,R203,R204, R213	RES., OPTION, 0603		
18	0	U8	IC, VOLTAGE REF. ADJ. 1.25V, 10mA, SOT-23	ANALOG DEVICES	ADR1581A
HARDWARE FOR THE -B ASSEMBLY					
ITEM	**QTY**	**REF DES**	**PART DESCRIPTION**	**MANUFACTURER**	**PART NUMBER**
1	44	E1, E2, E3, E4, E5, E10, E11, E12, E14, E15, E17, E18, E19, E24, E25, E26, E31, E32, E33, E34, E35, E36, E39, E40, E41, E42, E43, E44, E45, E46, E47, E48, E49, E50, E51, E52, E53, E54, E55, E56, E57, E58, E59, E60	TEST POINT, TURRET, 0.094" MTG. HOLE, PCB 0.062" THK	MILL-MAX	2501-2-00-80-00-00-07-0
2	10	J1, J2, J15, J16, J17, J18, J19, J20, J21, J22	EVAL BOARD STUD HARDWARE SET, #10-32-INACTIVE PART	ANALOG DEVICES	720-0010

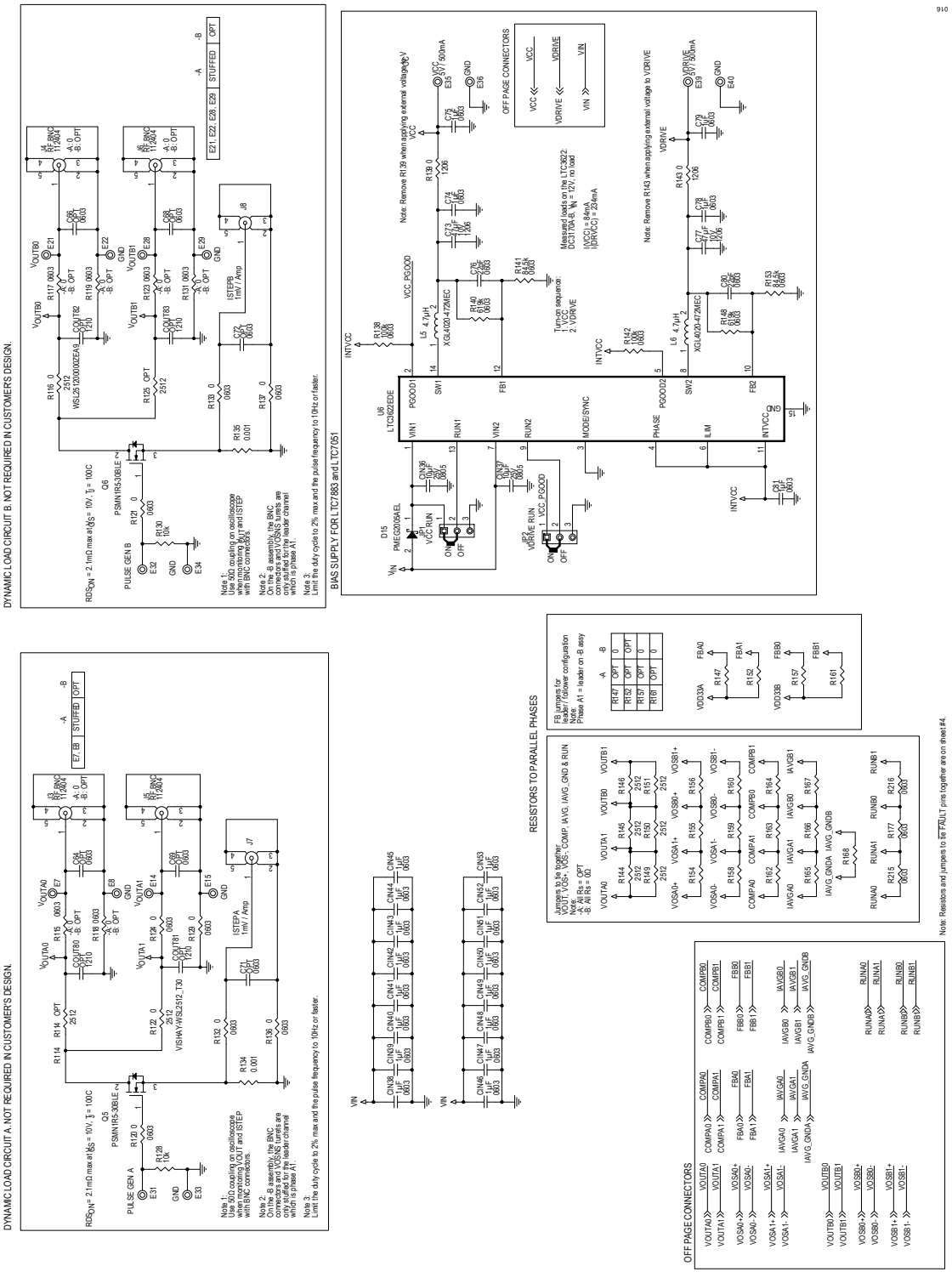
3	1	J10	CONN., HDR, SHROUDED, MALE, 2x6, 2mm, VERT, ST, THT	AMPHENOL	98414-G06-12ULF
4	1	J11	CONN., HDR, MALE, 2x7, 2mm, R/A THT	MOLEX MOLEX	0877601416 87760-1416
5	1	J12	CONN., HDR, FEMALE, 2x7, 2mm, R/A THT	SULLINS CONNECTOR SOLUTIONS	NPPN072FJFN-RC
6	3	J5, J7, J8	CONN., RF, BNC, RCPT, JACK, 5-PIN, ST, THT,50Ω	AMPHENOL RF	112404
7	1	J9	CONN., HDR, SHROUDED, MALE, 1x4, 2mm, VERT, ST, THT	HIROSE ELECTRIC	DF3A-4P-2DSA
8	6	JP1, JP2, JP3, JP4, JP5, JP6	CONN., HDR, MALE, 1x3, 2mm, VERT, ST, THT, NO SUBS. ALLOWED	SAMTEC	TMM-103-02-L-S
9	4	MP1, MP2, MP3, MP4	STANDOFF, NYLON, SNAP-ON, 0.50"	KEYSTONE	8833
10	4	SW1, SW2, SW3, SW4	SWITCH, SLIDE, DPDT, 0.3A, 6VDC, PTH	C&K	JS202011CQN
11	6	XJP1, XJP2, XJP3, XJP4, XJP5, XJP6	CONN., SHUNT, FEMALE, 2-POS, 2mm	SAMTEC	2SN-BK-G
PSM INTERFACE COMPONENTS FOR BOTH ASSEMBLIES					
ITEM	**QTY**	**REF DES**	**PART DESCRIPTION**	**MANUFACTURER**	**PART NUMBER**
1	2	C82, C83	CAP., 1µF, X5R, 50V, 10%, 0603	AVX MURATA TAIYO YUDEN TDK	06035D105KAT2A GRM188R61H105KAALD UMK107BJ105KA-T C1608X5R1H105K080AB
2	1	C84	CAP., 0.1µF, X7R, 50V, 5%, 0603	AVX	06035C104JAT2A
3	2	D5,D7	DIODE, SCHOTTKY, 20V, 0.5A, SOD-882, LEADLESS	NEXPERIA	PMEG2005AEL,315
4	2	Q9,Q11	XSTR., MOSFET, P-CH, 20V, 5.9A, SOT-23-3 (TO-236-3)	VISHAY	Si2365EDS-T1-GE3
5	1	R174	RES., 10KΩ, 1%, 1/10W, 0603, AEC-Q200	PANASONIC VISHAY VISHAY KOA SPEER	ERJ3EKF1002V CRCW060310K0FKEA CRCW060310K0FKEB RK73H1JTTD1002F
6	1	R175	RES., 15.8kΩ, 1%, 1/10W, 0603	NIC SAMSUNG YAGEO	NRC06F1582TRF RC1608F1582CS RC0603FR-0715K8L
7	1	R183	RES., 0Ω, 1/10W, 0603	BOURNS VISHAY YAGEO	CR0603-J/-000ELF CRCW06030000Z0EAC RC0603FR-070RL
8	2	R186,R187	RES., 4.99kΩ, 1%, 1/10W, 0603, AEC-Q200	PANASONIC VISHAY NIC	ERJ3EKF4991V CRCW06034K99FKEA NRC06F4991TRF
9	1	U7	IC, MEMORY, EEPROM, 2Kb (256x8), TSSOP-8,400kHz	Microchip MICROCHIP	24LC025-I/ST 24LC025T-I/ST
BIAS SUPPLY COMPONENTS FOR BOTH ASSEMBLIES					
ITEM	**QTY**	**REF DES**	**PART DESCRIPTION**	**MANUFACTURER**	**PART NUMBER**
1	2	C73, C77	CAP., 47µF, X5R, 10V, 20%, 1206	TAIYO YUDEN TDK	LMK316ABJ476ML-T C3216X5R1A476M160AB
2	5	C74, C78, C75, C79, C81	CAP., 1µF, X5R, 50V, 10%, 0603	AVX MURATA	06035D105KAT2A GRM188R61H105KAALD

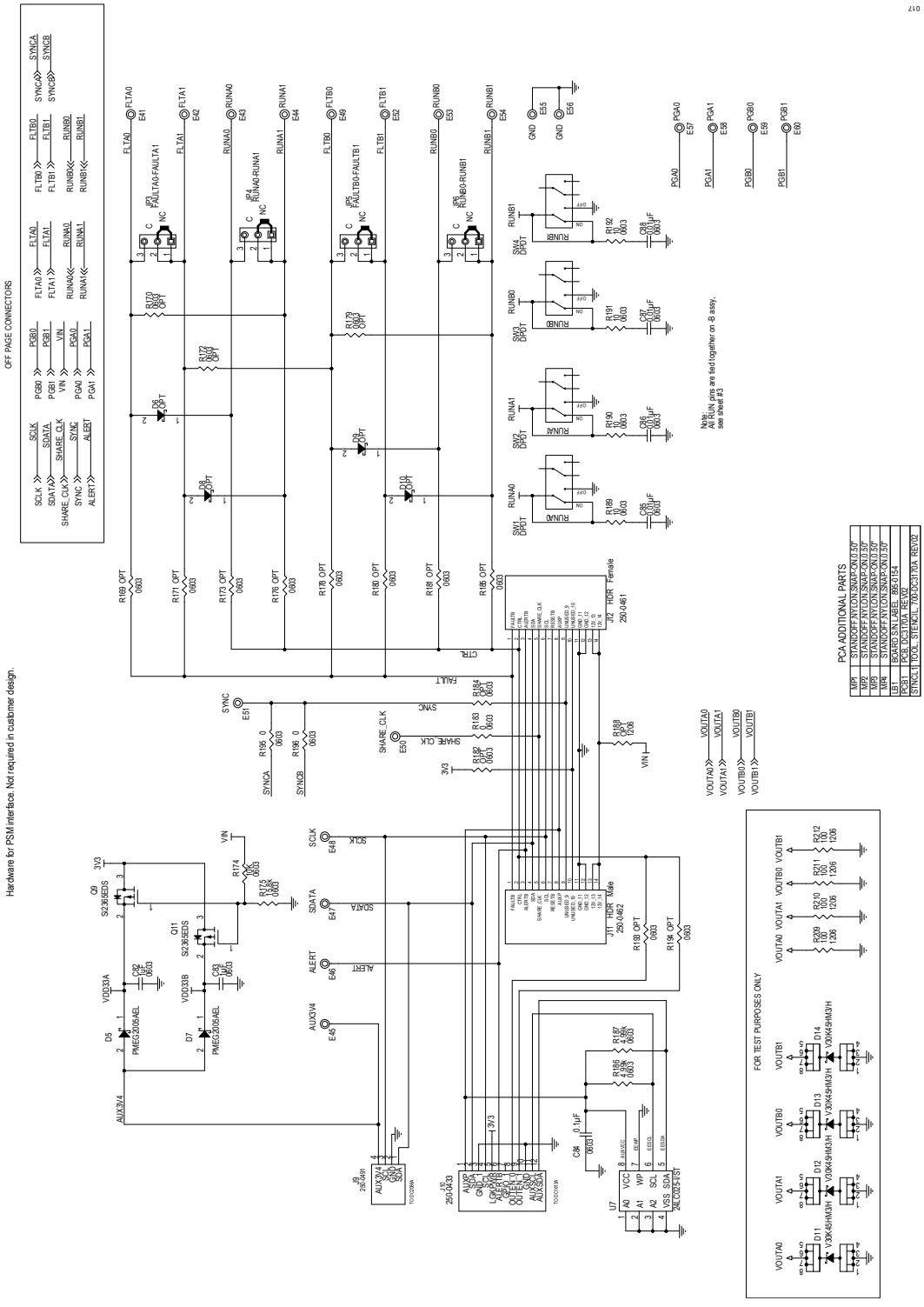
				TAIYO YUDEN TDK	UMK107BJ105KA-T C1608X5R1H105K080AB
3	2	C76, C80	CAP.,22pF,C0G,25V,10%,0603	AVX	06033A220KAT2A
4	2	CIN36, CIN37	CAP., 10µF, X5R, 25V, 10%, 0805	AVX SAMSUNG MURATA	08053D106KAT2A CL21A106KAFN3NE GRM21BR61E106KA73L
5	1	D15	DIODE, SCHOTTKY, 20V, 0.5A, SOD-882, LEADLESS	NEXPERIA	PMEG2005AEL,315
6	2	L5, L6	IND., 4.7µH, PWR, SHIELDED, 20%, 5.6A, 47.3mΩ, 4.3mmX4.3mm, AEC-Q200	COILCRAFT COILCRAFT	XGL4020-472MEC XGL4020-472MED
7	2	R138, R142	RES., 100kΩ, 1%, 1/10W, 0603, AEC-Q200	PANASONIC VISHAY	ERJ3EKF1003V CRCW0603100KFKEA
8	2	R139, R143	RES.,0Ω, 1/4W, 1206, AEC-Q200	VISHAY PANASONIC NIC	CRCW12060000Z0EA ERJ8GEY0R00V NRC12ZOTRF
9	2	R140, R148	RES., 619kΩ, 1%, 1/10W, 0603, AEC-Q200	NIC VISHAY	NRC06F6193TRF CRCW0603619KFKEA
10	2	R141, R153	RES., 84.5kΩ, 1%, 1/10W, 0603, AEC-Q200	NIC VISHAY	NRC06F8452TRF CRCW060384K5FKEA
11	1	U6	IC, DUAL 1A SYNCH. STEP-DOWN REG, DFN-14,ADJ	ANALOG DEVICES ANALOG DEVICES	LTC3622EDE#PBF LTC3622EDE#TRPBF

Schematics






DYNAMIC LOAD CIRCUIT B. NOT REQUIRED IN CUSTOMER'S DESIGN.
BIAS SUPPLY FOR LTC7883 and LTC7051
DYNAMIC LOAD CIRCUIT A. NOT REQUIRED IN CUSTOMER'S DESIGN.
RESISTORS TO PARALLEL PHASES
OFF PAGE CONNECTORS
Note: Resistors and jumpers to tie FAULT pins together are on sheet #4.


Hardware for PSM interface. Not required in customer design.
OFF PAGE CONNECTORS
Note:
All RUN pins are tied together on -B assy,
see sheet #3
FOR TEST PURPOSES ONLY
PCA ADDITIONAL PARTS
MP1 STANDOFF,NYLON,SNAP-ON,0.50"
MP2 STANDOFF,NYLON,SNAP-ON,0.50"
MP3 STANDOFF,NYLON,SNAP-ON,0.50"
MP4 STANDOFF,NYLON,SNAP-ON,0.50"
LBL1 BOARD S/N LABEL, 8854154
PCB1 PCB, DC3170A REV02
STNCL1 TOOL, STENCIL,7100DC3170A REV02