LTC4110

DESCRIPTION

Demonstration circuit DC1259A is a single-battery battery-backup controller featuring the LTC4110. The LTC4110 controller provides all the features and functions to offer a complete standalone battery-backup system. The LTC4110 is scalable with other LTC4110s to allow a larger battery array for increased capacity and/or redundancy.

A SMBus interface is offered to allow host communications in control and status and/or support Smart Batteries. However, no host is required to use the LTC4110. An on-board LTC1694 SMBus accelerator is used to provide 3.3V pull-up power and fast rise times of the bus for maximum speed and reliability.

From the factory, the DC1259A is configured for a 12.6V Li-ion Smart Battery in charge and discharge. The battery is connected to the BAT terminal. However, the Demoboard can be easily configured for a Standard Battery as well. Set JP1 to INT to allow batteries without a thermistor pin to be charged.

Note: If you use a standard battery, it is strongly recommended you have the final production version of the battery provide an extra pin to support the NTC/thermistor pin. This will allow the LTC4110 to:

- 1) Detect the physical presence of the battery and optionally report it to a host.
- 2) Start a complete charge cycle from the beginning including safe recovery of an over-discharged battery.
- 3) Allow the battery terminals to be 0V when no battery is present.

All the pin does inside the battery is connect a 300 ohm resistor (Li-ion) or a 10K NTC to Battery (B-) per the Smart Battery Standards. For more information, contact the factory.

Smart Batteries offer an integrated, high-accuracy gas gauge report allowing the host system to know exactly the state of charge of the battery at all times. Smart Batteries are the battery packs found on all mainstream notebooks made today. If you wish to try an industry

standard Smart Battery that plugs-and-plays with the Demoboard, we recommend you contact Inspired Energy: http://www.inspired-energy.com/

If the battery you're using is not 12.6V Li-ion, the Demoboard provides jumper options to support other chemistries and cell stack voltages. Consult the Schematic and Datasheet for more information.

Power input is connected to the DCIN terminal. The recommended input power is $12V_{\pm}$ 5% at 1.4A minimum up to 7A maximum as required to power the load. To successfully perform a calibration test, a 1.7A load on the VSYS or DCOUT terminals must be connected and turned on.

The battery backed load is to be connected to the DCOUT terminal. The VSYS terminal is optional and intended for loads that are NOT battery backed up. Why a VSYS connection? R1 exist as part of the Calibration protection system that looks for insufficient load current to support calibration safely. See datasheet for more information.

The Calibration feature of the LTC4110 allows one to test load the battery without generating any heat. The Flyback converter is used in reverse as a current source dumping current back into the DCIN supply. The DCIN supply simply sees a reduction in load current.

The 3 GPIO pins are initially defined to be STATUS pins on power up. JP4 can be used to change them to be Hi-Z state on power up until programmed by the host.

The optional DC1223A-B SMBUS to USB port adapter along with the associated "QuickEval" software is used to automatically download IDs over the internet to program the LTC4110. The software will allow one to control, monitor and data-log the system and battery status for demonstration purposes only. You DO NOT need this software to run the DC1259A. Contact your LT representative for ordering a DC1223A-B.

Design files for this circuit board are available. Call the LTC factory.



QUICK START GUIDE FOR DEMONSTRATION CIRCUIT DC1259A BATTERY BACKUP MANAGER BOARD

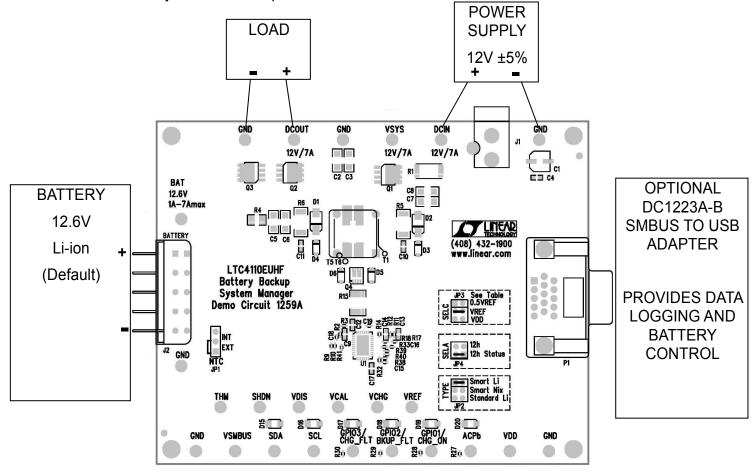
Table 1.Performance Summary

Parameter	Conditions/Notes	Value
DCIN Input Voltage Range	19V Abs Max.	12V± 5%
DCIN Trip voltage (Falling)		10.2V± 2.5%
DCIN Trip voltage (Rising)		11.2V± 2.5%
DCIN Hysteresis (Rising)	Set by R73. C29 used as a low pass filter for noise rejection.	+1V
DCIN minimum Current for Chg Only		1.4A
DCIN Minimum Current	Current needed for charge and calibration test.	3.1 A
Maximum Load Current	VSYS + DCOUT	7A
Minimum Load Current for Calibration	VSYS + DCOUT Load current > 0.65A (DCIN min) + 1A Cal Current.	1.7A
Battery Chemistry Select/Type	Preset for Smart Li-ion per JP2	Smart Li-ion
Battery Charge Voltage	Preset for 3 cells per JP3: Vchg = GND	12.6V±0.5%
Battery Charge Current	Full-scale Current as set by Ichg and R4	1A± 3.3%
Battery Discharge Cutoff Voltage	Set by Vdis pin. 2.9V/Cell.	8.7V± 2%
Calibration Discharge Cutoff Voltage	Set by Vcal pin. 2.9V/Cell.	8.7V± 2%
Calibration Discharge Current	Full-Scale Current as set by Ical and R4	1A ± 3.3%
Calibration DCIN Min load current Shdn	Cal Fault Min DCIN Current Shutdown. (Detected by R1)	0.5A ± 30%
Calibration DCIN OVP Shutdown Rising	Cal Fault OVP Shutdown voltage. (Detected by DCDIV)	13.2V
SMBus Address	Smart Battery Default. Adjustable.	12h
Power Up GPIO Mode	Preset per JP4	Status
SMBus voltage (internal)	Removing R62 allows external power of VSMBUS terminal.	3.3V
ACPb Delay on power up.	Delay in ACPb being asserted after DCDIV detection. Set by C18.	21ms
Max Bulk Charge Time allowed.	Set by Vref load current and C17. See datasheet.	6.7Hours
NTC/Battery Detection	Set per JP1 to detect the presence of a Smart Battery when plugged in.	EXT



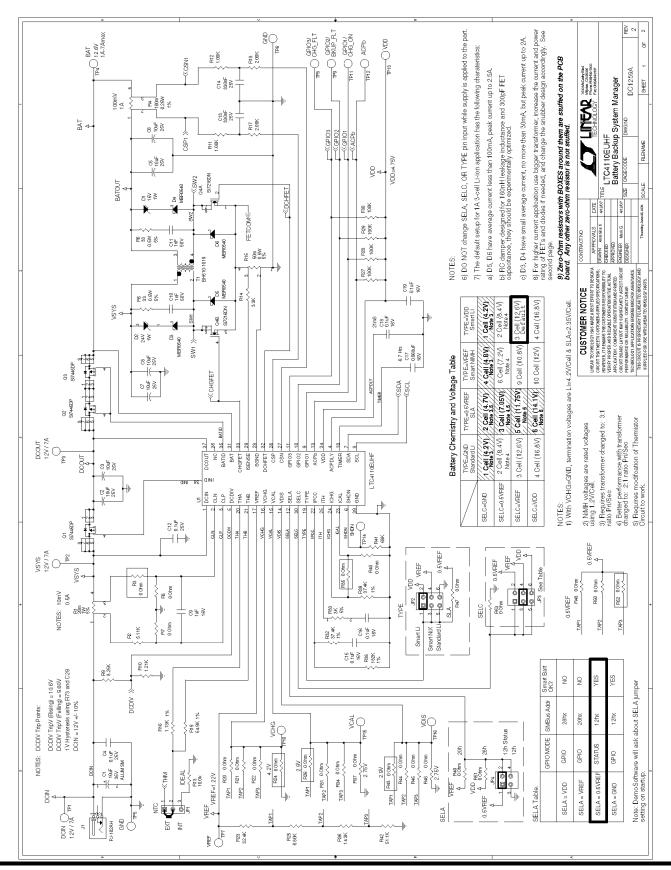
QUICK START PROCEDURE

- Connect a properly rated power source to DCIN terminals J1 or terminals labeled DCIN and GND.
- 2. Optionally connect a load to DCOUT and GND terminals.
- 3. Configure the jumpers for your specific battery.
- 4. Plug in the battery. Industry standard 5 Pin AMP Smart Battery connector is provided as
- well as generic soldering Test Points for hardwire connections.
- 5. Turn on the input power supply.
- 6. Optionally use the provided DC1223A-B demonstration software to control and configure the DC1259A.

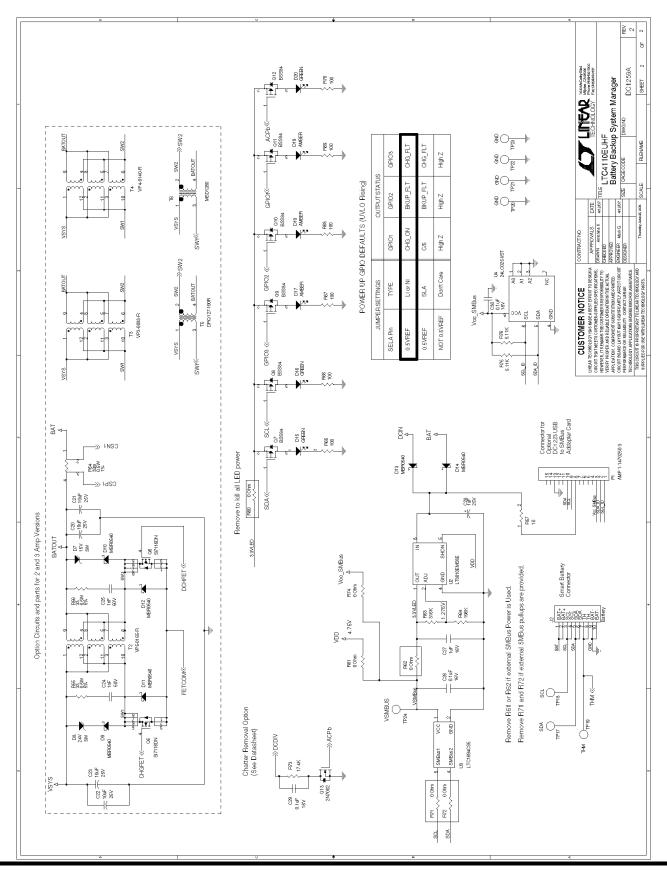




QUICK START GUIDE FOR DEMONSTRATION CIRCUIT DC1259A BATTERY BACKUP MANAGER BOARD









DC1259A Rev 2 8/1/2008

Parts List

orporation	
O	
Technology	10FUHF
near	17.7

Item	ΟţΩ	Otv Reference	Part Description	Manufacturer / Part #
REQUIRED CIRCU	RED C			
		C2,C3,C5-C8	CAP.,SM, X5R,10uF, 25V, 10%,1206	Murata, GRM31CR6C106KA88L
				AVX, 06033C104KAT2A
			CAP., X7R, 1uF,10%, 16V, 0603	Murata, GRM188R71C105KA12D
			CAP., X7R, 1nF, 10%,50V, 0603	AVX, 06035C102KAT2A
	2	C13,C14	CAP., X5R, 0.33uF, 10%, 25V, 0603	Taiyo Yuden, TMK107BJ334KA-T
		C15,C16,C18,C19	CAP., X5R, 0.1uF,10%,16V, 0402	AVX, 0402YD104KAT2A
	7	C17	CAP., X7R, 68nF, 10%,16V, 0603	AVX, 0603YC683KAT2A
	٦	C29	CAP., X7R, 0.1uF,10%,10V, 0402	MURATA, GRM155R61A104KA01
	-	D1	DIODE, zener, 15V, SMA	Diodes Inc., SMAZ15-13-F
	-	D2	DIODE, zener, 24V, SMA	Diodes Inc., SMAZ24-13-F
	4	D3-6	DIODE, schottky, MBR05401G, SOD123	ON Semi., MBR0540T1G
	3	Q1,Q2,Q3	Mosfet, P-Chan, SI7445DP, PPAK_SO-8	Vishay, SI7445DP-T1-E3
	-	Q4	Mosfet, N-Chan, Si7216DN, PPAK-1212-DUAL	Vishay, SI7216DN-T1-E3
	_	Q13	Transistor, N-Chan, 2N7002, SOT-23	Fairchild, Semi., 2N7002
	-	Т1	Trans, L10-1019	BH Electronics, L10-1019
	_	<u>U1</u>	I.C., LTC4110EUHF, QFN38	Linear Tech.,LTC4110EUHF
	1	R1	Res.,sense, 20m, 5%, 2512_KELVIN	Panasonic, ERJ-M1WSJ20MU
	1	R2	Res.,chip, 5.11K, 1%, 1/10W, 0402	VISHAY, CRCW04025K11FKED
		R4	Res, sense 100m, 1%, 0.25W1206_KELVIN	Panasonnic, ERJ-8RSFR10V
	2	R5,R6	Res., chip, 33, 0.5W, 5%, 2010	Panasonic, ERJ-12ZYJ330U
	-	R9	Res.,chip, 8.87K, 1%, 1/16W, 0402	VISHAY, CRCW04028K87FKED
	_	R10	Res.,chip, 1.21K, 1%, 1/16W, 0402	VISHAY, CRCW04021K21FKED
	2	R11,R12	Res.,chip, 1.00K, 1%, 1/16W, 0402	VISHAY, CRCW04021K00FKED
	٦	R14	Res., chip, 3.32K,1%, 1/16W, 0402	VISHAY, CRCW04023K32FKED
	١	R15	Res., sense,50m, 1%, 0.5W, 1812_KELVIN	Panasonic, ERJ-L12KF50MU
	1	R16	Res., chip, 1.13K, 1%, 1/16W, 0402	VISHAY, CRCW04021K13FKED
	2	R18,R17	Res., chip, 2.00K, 1%, 1/16W, 0402	VISHAY, CRCW04022K00FKED
	7	R19	Res., chip, 54.9K, 1%, 1/16W, 0402	VISHAY, CRCW040254K9FKED
	٦	R23	Res., chip, 32.4K, 1%, 1/16W, 0402	
	١	R25	Res., chip, 6.80K, 1%, 1/16W, 0402	VISHAY, CRCW04026K80FKED
		R27,R28,R29,R30	Res., chip, 100K, 1%, 1/16W, 0402	VISHAY, CRCW0402100KFKED
	2	R32,R39	Res., chip, 37.4K, 1%, 1/16W, 0402	VISHAY, CRCW040237K4FKED
	١	R33	Res., chip, 3K, 1%, 0402	VISHAY, CRCW04023K00FKED
	١	R36	Res., chip, 14.3K, 1%, 1/16W, 0402	VISHAY, CRCW040214K3FKED
	_	R38	Res., chip, 182K, 1%, 1/16W, 0402	VISHAY, CRCW0402182KFKED
	1	R41	Res., chip, 68K, 1%, 0402	
	٦	R42	Res., chip, 51.1K, 1%, 1/16W, 0402	VISHAY, CRCW040251K1FKED
	1	R73	Res., chip, 19.6K, 1%, 0402	VISHAY, CRCW040219K6FKED



DC1259A Rev 2 8/1/2008

Parts List

tion	
y Corpora	
echnolog	OEUHF
Linear 1	LTC4110

	1 <u>C</u>	C1 CAPALI	CAP., ALUM, 10uF, 35V, 20%, AECAP-C35V	SANYO., 35CE10AX
C27 CAP., X7R, 1uF,10%, 16V, 0603 C24,C25 CAP., X7R, 1nF, 10%, 50V, 0603 C26,C30 CAP., X7R, 1nF, 10%, 50V, 0603 C26,C30 CAP, X5R, 01L, 10%, 10%, 1206 C20 CAP., X5R, 10LF, 10%, 25V, size A C20 CAP., SM, X5R, 10LF, 25V, 10%, 1206 DF DIODE, zener, 15V, SMA DB DIODE, zener, 15V, SMA DB DIODE, schottky, MBR05401G, SCD123 D13-D12 DIODE, schottky, MBR05401G, SCD123 D13-D14 DIODE, schottky, MBR05401G, SCD123 D17-D18,D19 LED,GREEN, LN1351C,4V,15mA D17-D18,D19 LED,AMBER, LN1361C, 4V,15mA JF JPA JPA DIOOP, Single row header, 3X2 JPA JPA JPA Shunt, 0.079 JT Right-Angle Header, Keyless, 787441-1 P1 ToO79, dual row header, 3X2 JPA Shunt, 0.079 JT Right-Angle Header, Evless, 787441-1 P1 Trans, stor, 116DN, PPAK-1212-8 QC,QS Trans, VP4-0140-R TT Trans, VP4-0140-R	_	Q4	CAP., X7R, 0.1uF,10%,25V, 0603	AVX, 06033C104KAT2A
C24,C25 CAP., XTR, 1nF, 10%,50V, 0603 C26,C30 CAP., TANT,1LF, 10%, 15V, 10402 C28 CAP., TANT,1LF, 10%, 12V, size A C20-C23 CAP.SR, 10.1uF, 10%, 25V, 10%, 1206 D7 DIODE, senetr, 15V, 8MA D9-D12 DIODE, senetr, 15V, 8MA D15-D14 DIODE, schottky, MBR05401G, SCD123 D15-D16, D20 LED, GREEN, LM1351C,4V, 15mA D17-D18, D19 LED, GREEN, LM1351C,4V, 15mA D17-D18, D19 LED, GREEN, LM1351C,4V, 15mA JP1 LD0 JP2, JP3 0.079, dual row header, 3X2 JP4 Shuth, 200 dual row header, 3X2 JP7-DX4 Shuth, 20C POWER JACK, T/H, PJ-102AH D7 Mostler, N-Chan, BSS84, SOT-23 D7 Tans, VP3-0165-R D7 Trans, VP3-03083-R T6 Trans, VP3-0383-R T7 Trans, VP3-0383-R T6 Trans, VP3-0383-R T7 Trans, VP3-0383-R T6 Trans, VP3-0383-R T7 Trans, VP3-0383-R T7 Trans, VP3-0383-R T6	_	C27	CAP., X7R, 1uF,10%, 16V, 0603	Murata, GRM188R71C105KA12D
C26,C30 CAP., X5R, 0.1uF,10%, 16V, 0402 C28 CAP., TANT,1uF, 10%, 25V, size A C20-C23 CAP., SM, X5R, 10uF, 25V, 10%, 1206 DD7 DIODE, 2ener, 24V, 5MA DB-D12 DIODE, schottky, MBR05401G, SOD123 D13-D14 DIODE, schottky, MBR05401G, SOD123 D15-D14 DIODE, schottky, MBR05401G, SOD123 D17-D14 DIODE, Schottky, MBR05401G, SOD123 D17-D14, D20 LED, GREEN, LN1451C, 4V, 15mA D17-D18, D19 LED, GREEN, LN1451C, 4V, 15mA D17-D18, D19 LED, GREEN, LN1451C, 4V, 15mA JP4 D10DE, schottky, MBR05401G, SOD123 JP4 D10DE, Schottky, MBR05401G, SOD123 JP4 D10DE, Schottky, MBR05401G, SOD123 JP4 Shuth, D10B D079, dual row header, 3VI JP4 Shuth, D10B D079, dual row header, 3VI JP4 Right-Angle Header, Keyless, 78741-1 TAR D1 D10B D079, dual row header, 3VI TAR D2 D17 D18 TAR TAR D2 D18 TAR TAR TAR TAR	0	C24,C25	CAP., X7R, 1nF, 10%,50V, 0603	AVX, 06035C102KAT2A
C28 CAP., TANT, Juf, 10%, 25V, size A C20-C23 CAP, SM, X5R, 10uF, 25V, 10%, 1206 D7 DIODE, zener, 15V, SMA D8 DIODE, zener, 15V, SMA D9-D12 DIODE, zener, 15V, SMA D13-D14 DIODE, schottiv, MBR05401G, SCD123 D15,D16,D20 LED, GREEN, LN1351C, 4V, 15mA D17,D18,D19 LED, GALD, GALD	2	C26, C30	CAP., X5R, 0.1uF,10%,16V, 0402	AVX, 0402YD104KAT2A
C20-C23 CAP, SM, X5R, 10uF, 25V, 10%, 1206 D7 DIODE, zener, 15V, SMA D8 DIODE, zener, 15V, SMA D9-D12 DIODE, zener, 15V, SMA D9-D12 DIODE, zener, 15V, SMA D13-D14 DIODE, schottiky, MBR05401G, SOD123 D15,D16,D20 LED,GREEN, LN1351C,4V,15mA D17,D18,D19 LED,GREEN, LN1351C,4V,15mA JP1 LED,GREEN, LN1351C,4V,15mA JP2,JP3 LED,AMBER, LN1451C,4V,15mA JP3 LED,AMBER, LN1451C,4V,15mA JP4 LED,GREEN, LN1351C,4V,15mA JP7 JP1 JP7 LED,AMBER, LN1451C,4V,15mA JP7 JPA JP7 JPA JP7 GOT9, dual row header, 3x2 JP7 Shurt, 0.079 JT Shurt, DOT9 JP7 Right-Angle Header, Keyless, 78741-1 ACONN, DC POWER, JACK, TH, PJ-102AH JP MStott-Angle Header, Keyless, 78741-1 TT Trans, VP3-0150-N TT Trans, VP3-0150-N TT Trans, VP3-0150-N TT	1		CAP., TANT,1uF, 10%, 25V, size A	AVX, TAJA105K025R
D7 DIODE, zener, 15V, SMA D8 DIODE, zener, 24V, SMA D8-D12 DIODE, schottky, MBR05401G, SOD123 D13-D14 DIODE, schottky, MBR05401G, SOD123 D13-D14 DIODE, schottky, MBR05401G, SOD123 D15-D16-D20 LED, AMBER, LN1451C, 4V, 15mA D17, D18, D19 LED, AMBER, LN1451C, 4V, 15mA JP1 0.079, single row header, 3X2 JP2, JP3 0.079, dual row header, 3X2 JP4 0.079, dual row header, 3X2 JP A Shunt, 0.079 JP A Trans, start, NP4-0140-R Tenes, DRG127-100-R Trans, VP5-0188E, MS8E U3 Tr	0	C20-C	CAP.,SM, X5R,10uF, 25V, 10%,1206	Murata, GRM31CR6C106KA88L
DB DIODE, schottky, MBR05401G, SOD123 D9-D12 DIODE, schottky, MBR05401G, SOD123 D13-D14 DIODE, Schottky, MBR05401G, SOD123 D15-D16,D20 LED, GREEN, LN1351C,4V,15mA D17,D18,D19 LED, AMBER, LN1451C, 4V,15mA JP1, D13 0.079, single row header, 3PIN JP2,JP3 0.079, dual row header, 3A2 JP4,JP3 0.079, dual row header, 2A2 JP7,JP4 Shunt, 0.079 JP Shunt, 0.079 JP Right-Angle Header, Revies, 787441-1 JP Right-Angle Header, Revies, 787441-1 JP Right-Angle Header, Revies, 787441-1 JP Rosef, A. Chan, SI7116DN, PPAK-1212-8 JP Trans, VP5-0155-R TA Trans, VP5-0165-R Tans, VP5-0165-R Trans, VP5-0165-R TE Trans, AP3-0140-R TE Trans, AP3-0140-R TE Trans, AP3-0160-RSBE, MSSE U3 I.C., LTC1694	0		DIODE, zener, 15V, SMA	Diodes Inc., SMAZ15-13-F
D9-D12 DIODE, schottky, MBR05401G, SOD123 D13-D14 DIODE, schottky, MBR05401G, SOD123 D13-D14 DIODE, Schottky, MBR05401G, SOD123 D17,D18,D19 LED, GREEN, LN1351C,4V,15mA JD17,D18,D19 LED, AMBER, LN1451C,4V,15mA JD17,D18,D19 LED, AMBER, LN1451C,4V,15mA JD2,JP3 0.079, dual row header, 3x2 JPA Shunt, 0.079 JT Shunt, 0.079 JT Shunt, 0.079 JT Right-Angle Header, Keyless, 787441-1 PT Right-Angle Header, Keyless, 787441-1 DC CONN., DC POWER JACK, TH, PJ-102AH JZ Right-Angle Header, Keyless, 787441-1 PT Mosfet, N. Chan, SI7146DN, PPAK-1212-8 DC DCNN., DC POWER JACK, TH, PJ-102AH TA Trans, VP3-015-R TA Trans, VP3-015-R TA Trans, VP4-0140-R TF Trans, VP4-0140-R TG Trans, VP4-0140-R TG LC., LT3010EMS8E, MS8E U3 LC., LT3010EMS8E, MS8E RA4R50 RA4R50 RA24R5	0		DIODE, zener, 24V, SMA	Diodes Inc., SMAZ24-13-F
D13-D14 DIODE, schottky, MBR05401G, SOD123 D15,D16,D20 LED,GREEN, LN1351C,4V,15mA D17,D18,D19 LED,AMBER, LN1451C,4V,15mA JP1 0.079, single row header, 3RIN JP2,JP3 0.079, dual row header, 2x2 JPX1-JPX4 0.079, dual row header, 2x2 JPX1-JPX4 0.079, dual row header, 2x2 JPX1-JPX4 Shurt, 0.079 JT Right-Angle Header, Keyless, 787441-1 D1 Right-Angle Header, Keyless, 787441-1 D2 D7 JT Right-Angle Header, Keyless, 787441-1 D4 Mosfet, N-Chan, SI7116DN, PPAK-1212-8 D7 Trans, VP3-0155-R T7 Trans, VP4-0140-R T6 Trans, VP4-0140-R T6 Trans, VP4-0140-R T6 Trans, VP4-0140-R T6 Trans, MSD1260-183ML U3 LC., LTC1694Cs5#TRPBF, TSOT23-5 U4 LC., LTC1694Cs5#TRPBF, TSOT23-6 R7,R8,R40 DO NOT INSTALL 0402 R44-R50 R8-chip, 10.0k, 1%, 116W, 0603 R24-R26,R43-R52 Res, chip, 10.0hm, 0603	0	П	DIODE, schottky, MBR05401G, SOD123	ON Semi., MBR0540T1G
D15,D16,D20 LED,GREEN, LN1451C,4V,15mA D17,D18,D19 LED,AMBER, LN1451C,4V,15mA JP1 0.079, single row header, 3R2 JP2,JP3 0.079, dual row header, 3X2 JP4 0.079, dual row header, 2X2 JPX1-JPX4 Shunt, 0.079 JPX1-JPX4 Shunt, 0.079 JPX1-JPX4 Shunt, 0.079 JZ Mosfet, N-Chan, SI7116DN, PPAK-1212-8 TZ Transistor, P-Chan, BSS84, SOT-23 TZ Transistor, P-Chan, BSS84, SOT-23 TS Trans, VP3-0083-R TS Trans, DRQ127-100-R TS Trans, DRQ127-100-R LC LTC1694CS5#TRPBF, TSOT23-5 U4 I.C., LTG10EMS8E, MS8E U3 I.C., LTG10EMS8E, MS8E RR3,R35 Res.,chip, 0 Ohm, 0402 RR4,R50 Res.,chip, 0 Ohm, 0603 R24,R26,R43,R52 Res.,chip, 0 Ohm, 0603 R60	2	D13-D	DIODE, schottky, MBR05401G, SOD123	ON Semi., MBR0540T1G
D17,D18,D19 LED, AMBER, LN1451C, 4V,15mA JP1 0.079, single row header, 3PIN JP2,JP3 0.079, dual row header, 3x2 JP4 0.079, dual row header, 2x2 JP4 0.079, dual row header, 2x2 JP4 0.079, dual row header, 2x2 JP4 Shunt, 0.079 JJ Shunt, 0.079 JP Mosfet, N-Chan, SI7146DN, PPAK-1212-8 QG,QS QCONN, DC POWER, SS84, SOT-23 T2 Trans, VP3-015-R T6 Trans, VP4-0140-R T6 Trans, VP4-0140-R T6 Trans, VP4-0140-R T6 Trans, NSB2-0156-R U2 I.C., LT3010EMS8E, MS8E U3 I.C., LT3010EMS8E, MS8E R3,R35 Res,chip, 0 Ohm, 0402 R4,R8B	3	D15,D16,D20	LED,GREEN, LN1351C,4V,15mA	Panasonic, LN1351CTR
JP1 0.079, single row header, 3N2 JP2, JP3 0.079, dual row header, 3X2 JP4 0.079, dual row header, 2X2 JPA1 0.079, dual row header, 2X2 JPA1 - JPX4 Shurt, 0.079 J1 Right-Angle Header, Keyless, 787441-1 J2 Right-Angle Header, Keyless, 787441-1 DA, QS, QS, Q10, Q11, Q12 Transistor, P-Chan, SI7416DN, PPAK-1212-8 QC, QS Mosfet, N-Chan, SIAS84, SOT-23 T2 Transistor, P-Chan, SSS44, SOT-23 T3 Trans, VP5-0155-R T5 Trans, VP5-0145-R T6 Trans, VP4-0140-R T6 Trans, VP4-0140-R T6 Trans, DRQ127-100-R T6 Trans, DRQ127-100-R U2 I.C., LT3010EMS8E, MS8E U3 I.C., LT694CS5#TRPBF, TSOT-3-6 R3,R35 Res, chip, 0 Ohm, 0402 R7,R8,R40 DO NOT INSTALL 0402 R44,R50 RA4,R50 R24,R26,R43,R37 DO NOT INSTALL 0603 R64,R51,R71,R72, Res, chip, 0 Ohm, 0603	3		LED, AMBER, LN1451C, 4V,15mA	Panasonic, LN1451CTR
JP2, JP3 0.079, dual row header, 3x2 JP4 0.079, dual row header, 2x2 JP4 0.079, dual row header, 2x2 JT Shunt, 0.079 J1 CONN, DC POWER JACK, T/H, PJ-102AH J2 Right-Angle Header, Keyless, 787441-1 P1 Right-Angle Header, Keyless, 787441-1 D7 Mosfet, N-Chan, SI7116DN, PPAK-1212-8 Q7,Q8,Q9,Q10,Q11,Q12 Transistor, P-Chan, BSS84, SOT-23 T5 Trans, VP3-0083-R T5 Trans, VP4-0140-R T6 Trans, WSD1260-183ML U2 I.C., LT3010EMSB, MSB U3 I.C., LT3010EMSB, MSB U3 I.C., LT609ECS5#TRPBF, TSOT23-5 U4 I.C., 24LC025-I/ST, TSSOP-8 R7,R8,R40 DO NOT INSTALL 0402 R44,R50 Res.,chip, 10 Ohm, 0402 R44,R50 Res.,chip, 0 Ohm, 0603 R24,R26,R43,R52 DO NOT INSTALL 0603 R60,R62,R71,R72, Res.,chip, 0 Ohm, 0603	_	JP1	0.079, single row header, 3PIN	SAMTEC, TMM103-02-L-S
JP4 0.079, dual row header, 2x2 JPX1-JPX4 Shunt, 0.079 J1 CONN, DC POWER JACK, T/H, PJ-102AH J2 Right-Angle Header, Keyless, 787441-1 J2 Right-Angle Header, Keyless, 787441-1 D1 15 position, right angle t/h con, C6, C5 Mosfet, N-Chan, SI7146DN, PPAK-1212-8 C7, C8, C9, C10, C11, C12 Transistor, P-Chan, BSS84, SOT-23 T7 Trans, VP3-0155-R T5 Trans, VP4-0140-R T6 Trans, NPA1260-R U2 Trans, NPA1260-R U3 I.C., LT3010EMS8E, MS8E U3 I.C., LT3010EMS8E, MS8E U3 I.C., LTC1694CS5#TRPBF, TSOT23-5 U4 I.C., 24LC025-I/ST, TSSOP-8 R7, R8, R40 DO NOT INSTALL 0402 R44, R50 Res., chip, 0 Ohm, 0402 R44, R50 Res., chip, 10.0k, 1%, 116W, 10603 R20, R21, R22, R31, R34, R37 DO NOT INSTALL 0603 R60, R62, R71, R72, Res., chip, 0 Ohm, 0603	2	JP2,JP3	0.079, dual row header, 3x2	SAMTEC, TMM103-02-L-D
JPX1-JPX4 Shunt, 0.079 J1 CONN, DC POWER JACK, T/H, PJ-102AH J2 Right-Angle Header, Keyless, 787441-1 J2 Fight-Angle Header, Keyless, 787441-1 P1 15 position, right angle th con, QG,Q5 Mosfet, N-Chan, SI7116DN, PPAK-1212-8 Q7,Q8,Q9,Q10,Q11,Q12 Transistor, P-Chan, BSS84, SOT-23 T2 Trans, VP5-0155-R T3 Trans, VP3-0083-R T6 Trans, NP3-1040-R T6 Trans, NP4-0140-R U2 Trans, NPA1260-183ML U3 I.C., LT3010EMS8E, MS8E U3 I.C., LT3010EMS8E, MS8E U3 I.C., LT0040EMS8E, MS8E U3 I.C., LT006ACS#ITRPBF, TSOT-3-5 U4 I.C., 24LC025-I/ST, TSSOP-8 R7,R8,R40 DO NOT INSTALL 0402 R44,R50 Res., chip, 0 Ohm, 0402 R44,R50 Res., chip, 0 Ohm, 0403 R64,R50 Res., chip, 0 Ohm, 0603 R65,R51,R71,R72,R31,R34,R37 DO NOT INSTALL 0603 R66,R62,R71,R72,R31,R34,R37 Res., chip, 0 Ohm, 0603	_	JP4	0.079, dual row header, 2x2	SAMTEC, TMM102-02-L-D
J1 CONIN, DC POWER JACK, T/H, PJ-102AH J2 Right-Angle Header, Keyless, 787441-1 P1 15 position, right angle th con, Q6,Q5 Mosfet, N-Chan, SI7116DN, PPAK-1212-8 Q7,Q8,Q9,Q10,Q11,Q12 Transistor, P-Chan, BSS84, SOT-23 T2 Trans, VP5-0155-R T3 Trans, VP3-0083-R T6 Trans, NSD1260-183ML U2 Trans, MSD1260-183ML U3 I.C., LT3010EMS8E, MS8E U3 I.C., LT3010EMS8E, MS8E U3 I.C., LT3040EMS8E, MS8E U3 I.C., LT3010EMS8E, MS8E R7,R8,R40 DO NOT INSTALL 0402 R13 Res.,chip, 0 Ohm, 0402 R44.R50 DO NOT INSTALL 0603 R44.R50 Res.,chip, 0 Ohm, 0603 R60,R62,R71,R72, Res.,chip, 0 Ohm, 0603 R60,R62,R71,R72, Res.,chip, 0 Ohm, 0603	4	JPX1-JPX4	Shunt, 0.079	SAMTEC, 2SN-BK-G
J2 Right-Angle Header, Keyless, 787441-1 P1 15 position, right angle th con, Q6,Q5 Mosfet, N-Chan, SI7116DN, PPAK-1212-8 Q7,Q8,Q9,Q10,Q11,Q12 Transistor, P-Chan, BSS84, SOT-23 T2 Trans, VP5-0155-R T4 Trans, VP4-0140-R T5 Trans, VP4-0140-R T6 Trans, NPA1260-183ML U2 I.C., LT3010EMS8E, MS8E U3 I.C., LT3010EMS8E, MS8E U3 I.C., LTG94CS5#TRPBF, TSOT23-5 U4 I.C., 24LC025-I/ST, TSSOP-8 R7,R8,R40 DO NOT INSTALL 0402 R7,R8,R40 Res.,chip, 0 Ohm, 0402 R7,R8,R40 Res.,chip, 10.0k, 1%, 1/16W, 0603 R44-R50 Res., chip, 10.0k, 1%, 1/16W, 0603 R24,R26,R43,R52 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603	_	<u>L</u>	CONN, DC POWER JACK, T/H, PJ-102AH	CUI INC., CUI-PJ-102AH (PBF)
P1 15 position, right angle t/h con, Q6,Q5 Mosfet, N-Chan, SI7116DN, PPAK-1212-8 Q7,Q8,Q9,Q10,Q11,Q12 Transistor, P-Chan, BSS84, SOT-23 T2 Trans, VP5-0155-R T3 Trans, VP5-0155-R T4 Trans, VP4-0140-R T6 Trans, NPA1260-183ML U2 Trans, NPA1260-183ML U3 I.C., LT3010EMS8E, MS8E U3 I.C., LTG94CS5#TRPBF, TSOT23-5 U4 I.C., 24LC025-I/ST, TSSOP-8 R7,R8,R40 DO NOT INSTALL 0402 R7,R8,R40 DO NOT INSTALL 0603 R44-R50 Res.,chip, 10.0k, 1%, 1/16W, 0603 R24,R26,R43,R52 Res.,chip, 0 Ohm, 0603 R60,R62,R71,R72, Res.,chip, 0 Ohm, 0603	1	J2	Right-Angle Header, Keyless, 787441-1	TycoEllectronics. 5787441-1 (PBF)
Q6,Q5 Mosfet, N-Chan, SI7116DN, PPAK-1212-8 Q7,Q8,Q9,Q10,Q11,Q12 Transistor, P-Chan, BSS84, SOT-23 T2 Trans, VP5-0155-R T3 Trans, VP3-0083-R T4 Trans, VP4-0140-R T5 Trans, VP4-0140-R T6 Trans, NPA1260-183ML U2 I.C., LT3010EMS8E, MS8E U3 I.C., LT3040EMS8E, MS8E U4 I.C., LT694CS5#TRPBF, TSOT23-5 R7,R8,R40 I.C., 24LC025-I/ST, TSSOP-8 R7,R8,R40 DO NOT INSTALL 0402 R73 Res., chip, 0 Ohm, 0402 R73 Res., chip, 10.0k, 1%, 1/16W, 0603 R44-R50 Res., chip, 0 Ohm, 0603 R24,R26,R43,R52 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603	1	P1	15 position, right angle t/h con.,	TycoElectronics. 1-1734530-3
Q7,Q8,Q9,Q10,Q11,Q12 Transistor, P-Chan, BSS84, SOT-23 T2 Trans, VP5-0155-R T3 Trans, VP3-0083-R T4 Trans, VP4-0140-R T5 Trans, VP4-0140-R T6 Trans, DRQ127-100-R T6 Trans, DRQ127-100-R U2 I.C., LT3010EMS8E, MS8E U3 I.C., LT3040CMS8E, MS8E U4 I.C., LTC1694CS5#TRPBF, TSOT23-5 R3,R35 Res.,chip, 0 Ohm, 0402 R7,R8,R40 DO NOT INSTALL 0402 R7,R8,R40 Res.,chip, 10.0k, 1%, 1/16W, 0603 R44-R50 RA4-R50 R24,R26,R43,R52 Res.,chip, 0 Ohm, 0603 R60,R62,R71,R72, Res.,chip, 0 Ohm, 0603	0		Mosfet, N-Chan, SI7116DN, PPAK-1212-8	Vishay, SI7116DN-T1-E3
T2 Trans, VP5-0155-R T3 Trans, VP3-0083-R T4 Trans, VP4-0140-R T5 Trans, VP4-0140-R T6 Trans, NPA1260-183ML U2 I.C., LT3010EMS8E, MS8E U3 I.C., LT71694CS5#TRPBF, TSOT23-5 U4 I.C., 24LC025-I/ST, TSSOP-8 R7,R8,R40 DO NOT INSTALL 0402 R73 Res., chip, 10.0k, 1%, 1/16W, 0603 R44-R50 RA4-R50 R24,R26,R43,R52 Res., chip, 0.0hm, 0603 R60,R62,R71,R72, Res., chip, 0.0hm, 0603	9	Q7,Q8,	Transistor, P-Chan, BSS84, SOT-23	Diodes Inc., BSS84-7-F
T3 Trans., VP3-0083-R T4 Trans., VP4-0140-R T5 Trans., VP4-0140-R T6 Trans., DRQ127-100-R L6 L73010EMS8E, MS8E U3 LC., LT3010EMS8E, MS8E U4 LC., LT3010EMS8E, MS8E R3,R35 Res., chip, 0 Ohm, 0402 R7,R8,R40 DO NOT INSTALL 0402 R73 Res., chip, 10.0k, 1%, 1/16W, 0603 R44R50 RA4-R50 R24,R26,R43,R52 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603	0			Cooper Bussmann, VP5-0155-R
T4 Trans., VP4-0140-R T5 Trans., DRQ127-100-R T6 Trans., MSD1260-183ML U2 I.C., LT3010EMS8E, MS8E U3 I.C., LT7694CS5#TRPBF, TSOT23-5 U4 I.C., 24LC025-I/ST, TSSOP-8 R7,R8,R40 Res.,chip, 0 Ohm, 0402 R73 R8,R40 R73 Res.,chip, 10.0k, 1%, 1/16W, 0603 R44-R50 DO NOT INSTALL 0603 R24,R26,R43,R52 Res.,chip, 0 Ohm, 0603 R60,R62,R71,R72, Res.,chip, 0 Ohm, 0603	0			Cooper Bussmann, VP5-0083-R
T5 Trans., DRQ127-100-R T6 Trans., MSD1260-183ML U2 I.C., LT3010EMS8E, MS8E U3 I.C., LTC1694CS5#TRPBF, TSOT23-5 U4 I.C., 24LC025-I/ST, TSSOP-8 R3,R35 Res., chip, 0 Ohm, 0402 R7,R8,R40 DO NOT INSTALL 0402 R13 Res., chip, 10.0k, 1%, 1/16W, 0603 R20,R21,R22,R31,R34,R37 DO NOT INSTALL 0603 R24,R50 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603	0	T4		Cooper Bussmann, VP4-0140-R
T6 Trans., MSD1260-183ML U2 I.C., LT3010EMS8E, MS8E U3 I.C., LTC1694CS5#TRPBF, TSOT23-5 U4 I.C., 24LC025-I/ST, TSSOP-8 R3,R35 Res., chip, 0 Ohm, 0402 R7,R8,R40 DO NOT INSTALL 0402 R13 Res., chip, 10.0k, 1%, 1/16W, 0603 R20,R21,R22,R31,R34,R37 DO NOT INSTALL 0603 R24,R50 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603	0	T5		Coiltronics, DRQ127-100-R
U2 I.C., LT3010EMS8E, MS8E U3 I.C., LTC1694CS5#TRPBF, TSOT23-5 U4 I.C., 24LC025-I/ST, TSSOP-8 R3,R35 Res., chip, 0 Ohm, 0402 R7,R8,R40 DO NOT INSTALL 0402 R13 Res., chip, 10.0k, 1%, 1/16W, 0603 R20,R21,R22,R31,R34,R37 DO NOT INSTALL 0603 R44-R50 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603	0	T6	Trans., MSD1260-183ML	CoilCraft, MSD1260-183ML
U3 I.C., LTC1694CS5#TRPBF, TSOT23-5 U4 I.C., 24LC025-I/ST, TSSOP-8 R3,R35 Res., chip, 0 Ohm, 0402 R7,R8,R40 DO NOT INSTALL 0402 R13 Res., chip, 10.0k, 1%, 1/16W, 0603 R20,R21,R22,R31,R34,R37 DO NOT INSTALL 0603 R44-R50 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603	1	U2		Linear Tech., LTC3010MS8E
U4 I.C., 24LC025-I/ST, TSSOP-8 R3,R35 Res.,chip, 0 Ohm, 0402 R7,R8,R40 DO NOT INSTALL 0402 R13 Res., chip, 10.0k, 1%, 1/16W, 0603 R20,R21,R22,R31,R34,R37 DO NOT INSTALL 0603 R44-R50 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603	1	lu3	LTC1694CS5#TRPBF, T	Linear Tech., LTC1694CS5#TRPBF
R3,R35 Res., chip, 0 Ohm, 0402 R7,R8,R40 DO NOT INSTALL 0402 R13 Res., chip, 10.0k, 1%, 1/16W, 0603 R20,R21,R22,R31,R34,R37 DO NOT INSTALL 0603 R44-R50 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603	\ -	U4		Microchip, 24LC025-I/ST
R3,R35 Res.,chip, 0 Ohm, 0402 R7,R8,R40 DO NOT INSTALL 0402 R13 Res., chip, 10.0k, 1%, 1/16W, 0603 R20,R21,R22,R31,R34,R37 DO NOT INSTALL 0603 R44-R50 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603				
R7,R8,R40 DO NOT INSTALL 0402 R13 Res., chip, 10.0k, 1%, 1/16W, 0603 R20,R21,R22,R31,R34,R37 DO NOT INSTALL 0603 R44-R50 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603	2			VISHAY, CRCW04020000Z0ED
R13 Res., chip, 10.0k, 1%, 1/16W, 0603 R20,R21,R22,R31,R34,R37 DO NOT INSTALL 0603 R44-R50 Res., chip, 0 Ohm, 0603 R60,R62,R71,R72, Res., chip, 0 Ohm, 0603	0	R7,R8,		
R20,R21,R22,R31,R34,R37 DO NOT INSTALL 0603 R44-R50 R24,R26,R43,R52 R60,R62,R71,R72, Res.,chip, 0 Ohm, 0603	_	R13		VISHAY, CRCW060310K0FKED
R44-R50 Res., chip, 0 Ohm, 0603 R60, R62, R71, R72, Res., chip, 0 Ohm, 0603	0	R20, R21, R22, R31, R34, R37		
R24,R26,R43,R52 Res.,chip, 0 Ohm, 0603 R60,R62,R71,R72,		R44-R50		
	8		Res., chip, 0 Ohm, 0603	VISHAY, CRCW06030000Z0EA
		R60, R62, R71, R72.		



DC1259A Rev 2 8/1/2008

Parts List

ADDIT	TIONAL	ADDITIONAL DEMO BOARD CIRCUIT COMPONENTS	ONENTS	
	0	R54	Res., sense, 33m, 1%, 0.5W, 1206_KELVIN	Panasonnic, ERJ-8RQFR33V
	0	0 R55,R56	Res., chip, 33, 0.5W, 5%, 2010	Panasonic, ERJ-12ZYJ330U
	-	R57	Res., chip, 10, 1%, 0402	VISHAY, CRCW040210R0FKED
	-	R63	Res., chip, 316K, 1%, 0603	VISHAY, CRCW0603316KFKEA
	1	R64	Res., chip, 196K, 1%, 0603	VISHAY, CRCW0603196KFKEA
	9	6 R65,R66,R67,R68,R69,R70	Res., chip, 100, 1%, 0603	VISHAY, CRCW0603100RFKEA
	2	2 R75,R76	Res.,chip, 5.11K, 1%, 1/10W, 0402	VISHAY, CRCW04025K11FKED
HARD	WARE	HARDWARE FOR DEMO BOARD ONLY		
	24	24 TP1-TP24	Testpoint, turret, 0.063"	MILL MAX, 2308-2-00-80-00-00-07-0
	-	A MATCO AT A CODNIEDS	STANDOEF NVION 510"	KEVSTONE 8833 /SNIAD ONI)

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