LINEAR TECHNOLOGY

LTM2882
Dual Isolated RS232 µModule Transceiver with Integrated DC/DC Converter

DESCRIPTION

Demonstration circuit DC1554A is a dual isolated RS232 µModule® transceiver with integrated power featuring the LTM®2882. The demo circuit provides 2-channel, 2500V$_{RMS}$, galvanically isolated RS232 transceiver interface. All components are integrated into the µModule transceiver. The demo circuit operates from external supplies on V$_{CC}$ and V$_L$. The part generates the output voltage V$_{CC2}$ and communicates all necessary signaling across the isolation barrier using LTC's Isolation µModule Technology.

Design files for this circuit board are available at http://www.linear.com/demo.

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Table 1. Performance Summary (T$_A$ = 25°C)

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V$_{CC}$	Input Supply Range	LTM2882-5	4.5	5	5.5	V
		LTM2882-3	3.0	3	3.6	V
V$_L$	Logic Signal Supply Range		1.62		5.5	V
V$_{CC2}$	Output Voltage	LTM2882-5 I$_{LOAD}$ = 150mA	4.8	5	5.2	V
		LTM2882-3 I$_{LOAD}$ = 100mA	4.8	5	5.2	V
f$_{MAX}$	Maximum Data Rate	R$_L$ = 3k, C$_L$ = 2.5nF	100			kbps
		R$_L$ = 3k, C$_L$ = 1nF	250			kbps
		R$_L$ = 3k, C$_L$ = 250pF	1000			kbps
V$_{IORM}$	Maximum Working Insulation Voltage	GND to GND2	560			Vpk
	Common Mode Transient Immunity			30		kV/µs

OPERATING PRINCIPLES

The LTM2882 contains an isolated DC/DC converter delivering power to V$_{CC2}$ at 5V from the input supply V$_{CC}$. Isolation is maintained by the separation of GND and GND2 where significant operating voltages and transients can exist without affecting the operation of the LTM2882. The logic side ON pin enables or shuts down the LTM2882. RS232 signaling is controlled by the logic inputs T1IN, T2IN, and DE. Connection to the transceiver pins, R1IN – T1OUT or R2IN – T2OUT, permits RS232 communication on the isolated side of the demo circuit. The circuit features two channels, supporting multiple RS232 channels or the addition of flow control on a single RS232 interface. Jumpers and inclusion of a standard RS232 configured DB9 connector allow the RS232 Transceiver interface to be looped back for easy performance verification using a PC. Additional logic signaling from the logic side to the isolated side is available with the DIN to DOUT pins. This channel may be used to control the state of the driver outputs from the logic side, T1OUT and T2OUT, by connecting DOUT to DE.

Data is transmitted out the driver pins T1OUT and T2OUT from the inputs T1IN and T2IN with the input DE set high. Data is received through the receiver pins R1IN and R2IN to the outputs R1OUT and R2OUT, receivers are always active.

QUICK START PROCEDURE

Demonstration circuit DC1554 is easy to set up and evaluate the performance of the LTM2882. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below.

Note: Use a short ground lead on the oscilloscope probe when measuring input or output voltage ripple and high speed signals.

Note: Jumpers JP4, JP5, JP8, JP9 and JP10 may be installed in three possible positions depending upon the desired operating state. Positions may be vertical or horizontal. Please pay careful attention to the demo circuit labeling and reference the attached schematic for proper configuration.

1. Place jumpers in the following positions.

    JP1   ON (default)

    JP2 V_{CC} (note: logic signals referenced to V_{CC})

    JP3   ON (default)

    JP4   LOOP (center horizontal position)

    JP5   LOOP (center horizontal position)

    JP6   LOW (default)

    JP7   ON (default)

    JP8   ON (default)

    JP9   Remove

    JP10   Remove

2. With power off, connect the input power supply to V_{CC} and GND.

3. Turn on the power at the input.

    Note: Make sure the input voltage does not exceed 6V.

4. Check for the proper output voltages. V_{CC2} = 5V, LED D1 is ON and LED D2 is ON.

5. Once the proper output voltages are established, connect a standard 9-pin RS232 cable between J1 on the demo board and a computer.

6. Launch any program with the ability to send, receive, and monitor RS232 characters or data, including the ability to control the communication handshaking. Realterm is a free, powerful, terminal program which can easily be used for the above purposes. Signals may be verified with the use of an oscilloscope connected to any of the appropriate signal turrets on the demo card.

    Note: Jumpers JP9 and JP10 must be inserted in the center horizontal position to allow signal monitoring of the receiver input channels on the associated demo board turrets.
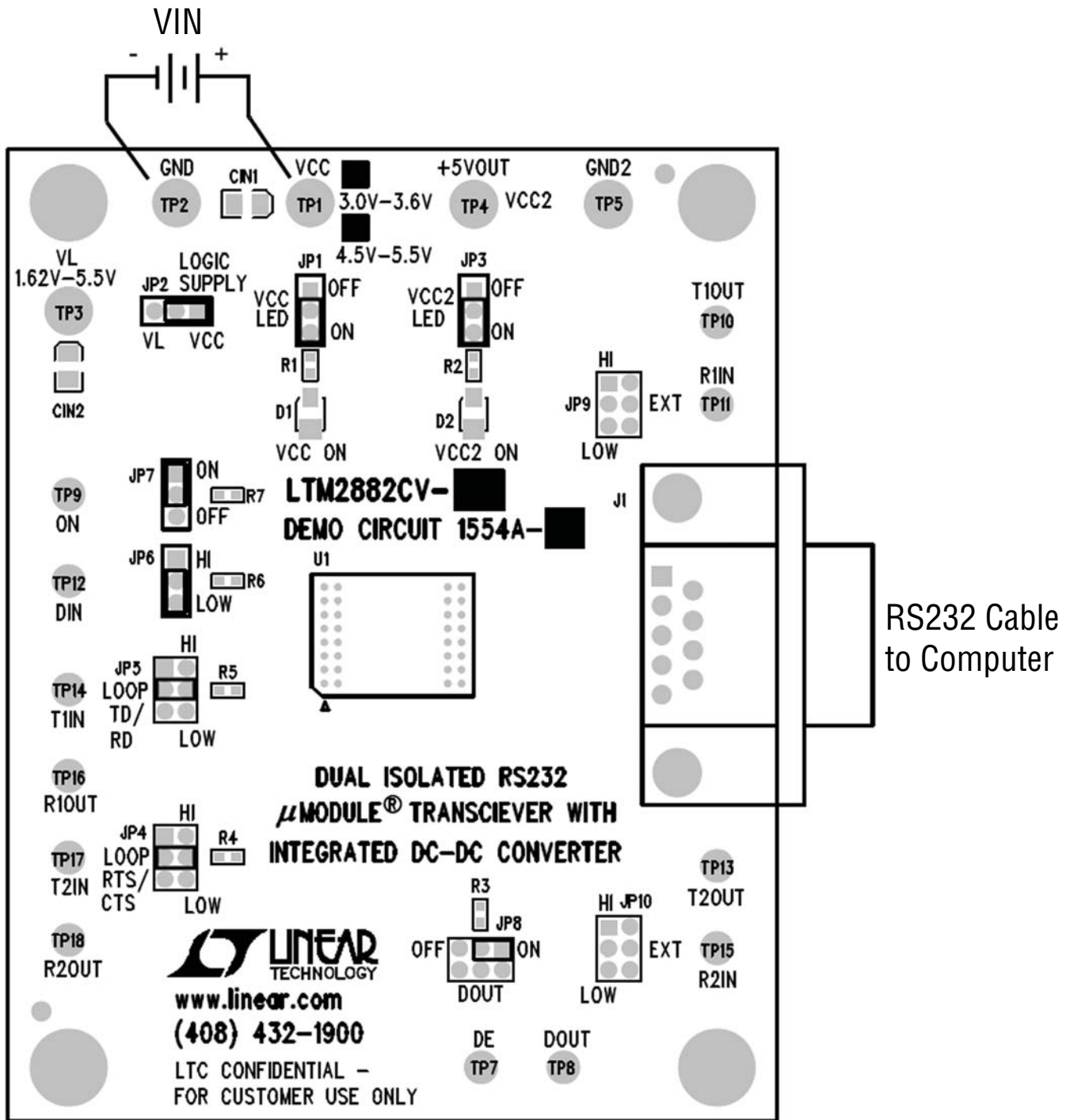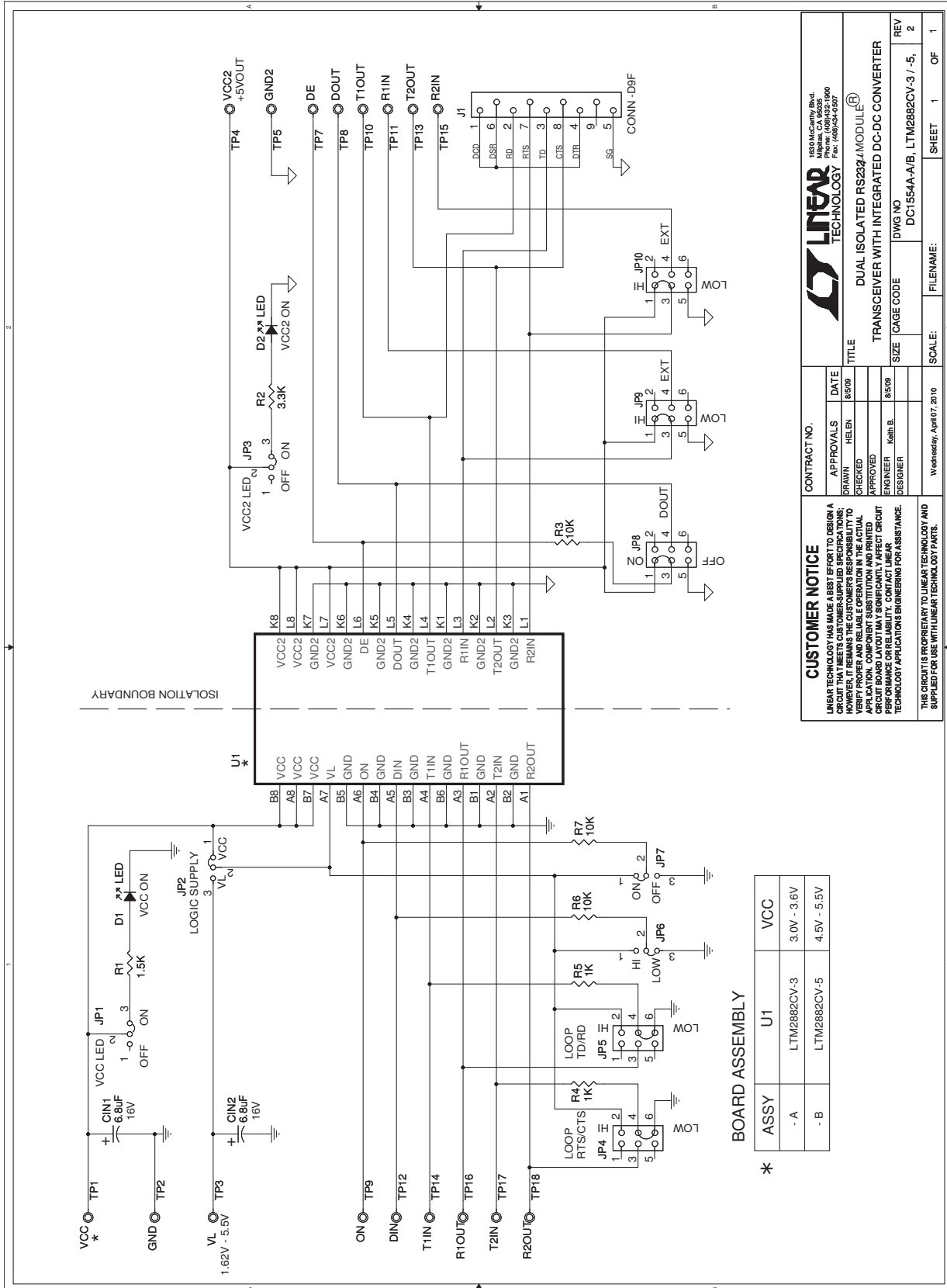
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QUICK START PROCEDURE

Figure 1. Demo Board Setup

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
			REQUIRED CIRCUIT COMPONENTS	
1	2	CIN1, CIN2	CAP., TANT 6.8µF 16V 10% TAJA	AVX TAJA685K016R
2	2	D1, D2	LED, SMT, GREEN, 2.1V 15mA	PANASONIC LN1351C-(TR)
3	1	R1	RES., CHIP 1.5k 1/16W 5% 0603	VISHAY, CRCW06031K50JNEA
4	3	R3, R6, R7	RES., CHIP 10k 1/4W 5% 0603	VISHAY, CRCW060310K0JNEA
5	1	R2	RES., CHIP 3.3k 1/16W 5% 0603	VISHAY, CRCW06033K30JNEA
6	2	R4, R5	RES., CHIP 1k 1/4W 5% 0603	VISHAY, CRCW06031K00JNEA
			HARDWARE-FOR DEMO BOARD ONLY	
1	1	J1	CON, DSUB 9 PIN	SINGATRON DR-E9SB-NJ000-S0007
2	5	JP1-JP3, JP6,JP7	2mm SINGLE ROW HEADER, 3-PIN	SAMTEC, TMM-103-02-L-S
3	6	JP4, JP5, JP8-JP10	2mm DOUBLE ROW HEADER, 3×2 PIN	SAMTEC, TMM-103-02-L-D
4	10	JP1-JP10	SHUNT	SAMTEC, 2SN-BK-G
5	5	TP1-TP5	TEST POINT, TURRET, 0.095	MILL-MAX, 2501-2-00-80-00-00-07-0
6	12	TP7-TP18	TEST POINT, TURRET, 0.065	MILL-MAX, 2308-2-00-80-00-00-07-0
7	4	(Stand-Off)	STAND-OFF, NYLON 0.375" tall	KEYSTONE, 8832 (SNAP ON)

SCHEMATIC DIAGRAM

TITLE: DUAL ISOLATED RS232 TRANSCEIVER WITH INTEGRATED DC-DC CONVERTER

DWG NO: DC1554A-A/B, LTM2882CV-3 /-5,   REV 2

SHEET 1 OF 1

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This notice contains important safety information about temperatures and voltages. For further safety concerns, please contact a LTC application engineer.

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