

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1098

10/12/14-BIT 125 MSPS ADC

LTC2281, LTC2283, LTC2285

DESCRIPTION

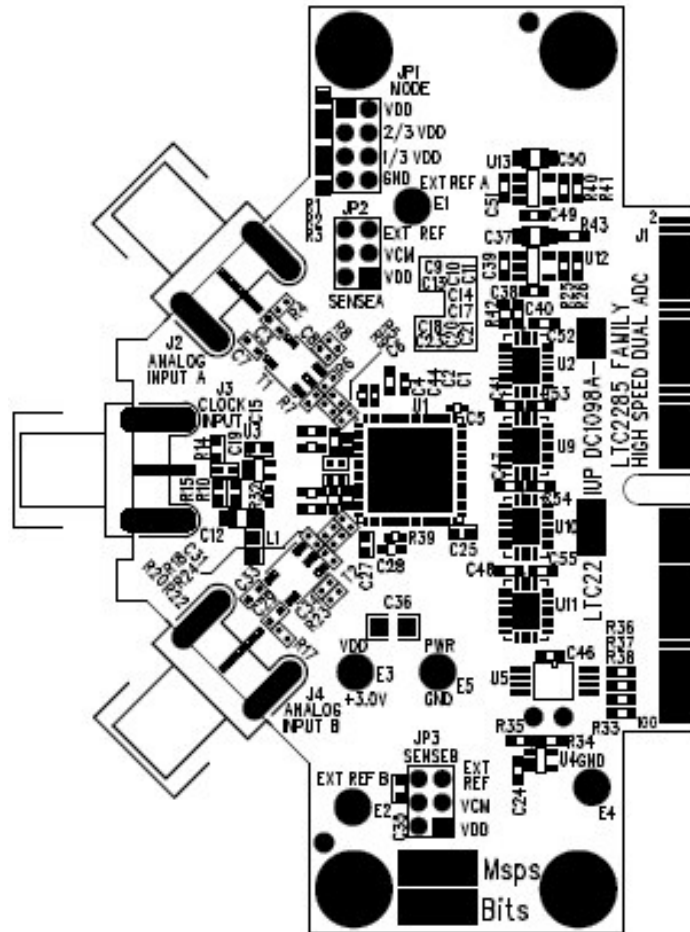
Demonstration circuit 1098 supports a family of 10/12/14-BIT 125 MSPS ADCs. Each assembly features one member of this family of high speed, high dynamic range ADCs.

The versions of 1098 demo board are listed in Table 1. Depending on the required resolution, sample rate and input frequency, the DC1098 is supplied with the appropriate A/D and with an optimized in-

put circuit. The circuitry on the analog inputs is optimized for analog input frequencies below 70 MHz or from 70 MHz to 140MHz. For higher input frequencies, contact the factory for support.

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

LTC is a trademark of Linear Technology Corporation



QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 1098

10/12/14-BIT 125 MSPS ADC

Table 1. DC1098A Variants

DC1098 VARIANTS	ADC PART NUMBER	RESOLUTION*	MAXIMUM SAMPLE RATE	INPUT FREQUENCY
1098A-A	LTC2281	10-Bit	125 MSPS	1MHz - 70MHz
1098A-B	LTC2283	12-Bit	125 MSPS	1MHz - 70MHz
1098A-C	LTC2295	14-Bit	125 MSPS	1MHz - 70MHz
1098A-D	LTC2291	10-Bit	125 MSPS	70MHz - 140MHz
1098A-E	LTC2293	12-bit	125 MSPS	70MHz - 140MHz
1098A-F	LTC2295	14-Bit	125 MSPS	70MHz - 140MHz

Table 2. Performance Summary (T_A = 25°C)

PARAMETER	CONDITION	VALUE
Supply Voltage	Depending on sampling rate and the A/D converter provided, this supply must provide up to 200mA.	Optimized for 3.0V [2.7V ↔ 3.6V min/max]
Analog Input Range	Depending on Sense Pin Voltage	1V _{pp} to 2V _{pp}
Logic Input Voltages	Minimum Logic High	2.4V
	Maximum Logic Low	0.8V
Logic Output Voltage (74VCX245 output buffer, V _{cc} = 2.5V)	Minimum Logic High @ -1.6mA	2.3V (33Ω Series terminations)
	Maximum Logic Low @ 1.6mA	0.7V (33Ω Series terminations)
Sampling Frequency (Convert Clock Frequency)	See Table 1	
Convert Clock Level	50 Ω Source Impedance, AC coupled or ground referenced (Convert Clock input is capacitor coupled on board and terminated with 50Ω.)	2V _{p-p} ↔ 2.5V _{p-p} Sine Wave or Square wave (See Note 1)
Resolution	See Table 1	
Input Frequency Range	See Table 1	
SFDR	See Applicable Data Sheet	
SNR	See Applicable Data Sheet	

Note 1: For sample rates below 20MSPS a square wave must be used to achieve full performance.

QUICK START PROCEDURE

Demonstration circuit 1098 is easy to set up to evaluate the performance of most members of the LTC2285 family of Dual A/D converters – LTC2281, LTC2283, and LTC2285. Refer to the latest DC1098 schematic for new variants.

SETUP

If a DC890 FastDAACS Data Acquisition and Collection System was supplied with the DC1098 demonstration circuit, follow the DC890 Quick Start Guide

Refer to Figure 1 for proper measurement equipment setup and follow the procedure below.

to install the required software and for connecting the DC890 to the DC1098 and to a PC running Windows98, 2000 or XP.

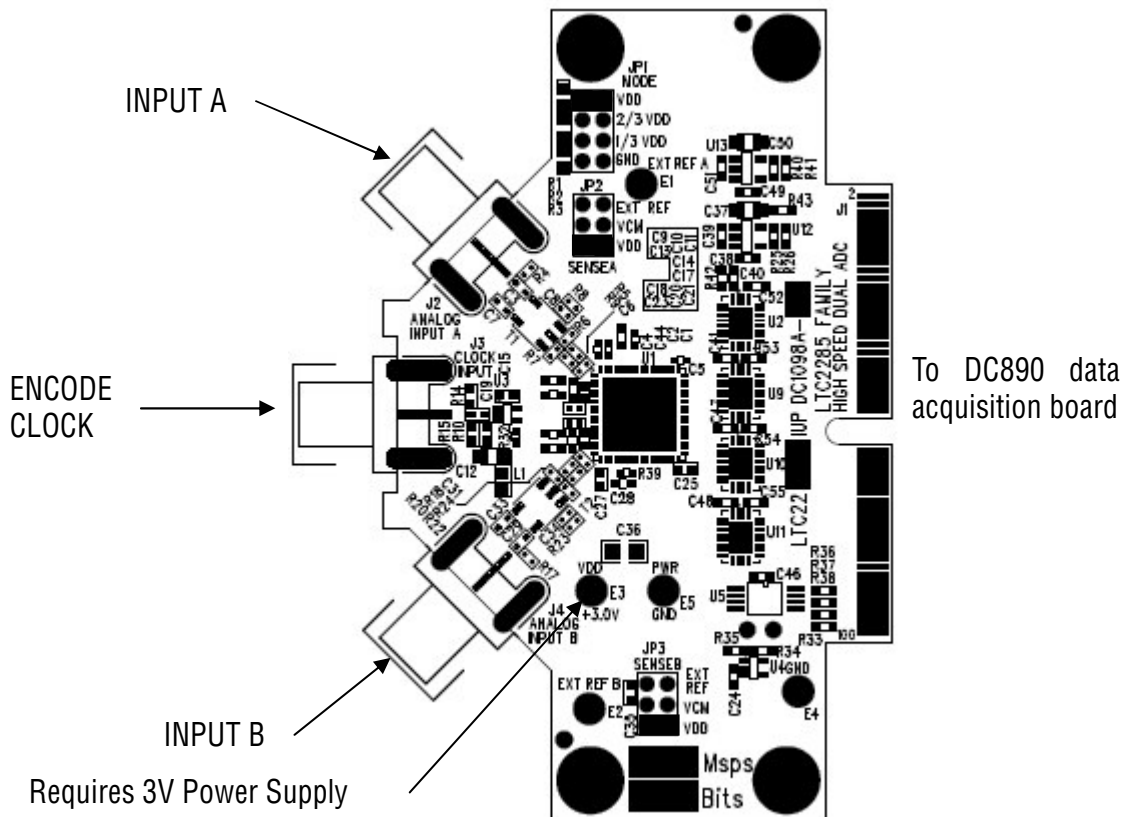


Figure 1. DC1098 Setup

DC1098 DEMONSTRATION CIRCUIT BOARD JUMPERS

The DC1098 demonstration circuit board should have the following jumper settings as default: (as per figure 1)

JP1: Mode: Vdd. 2s complement, Clock duty stabilizer off (see data sheet for function of Mode pin.)

JP2: Sense A: Vdd, (2V P-P input range)

JP3: Sense B: Vdd, (2V P-P input range)

APPLYING POWER AND SIGNALS TO THE DC1098 DEMONSTRATION CIRCUIT BOARD:

If a DC890 is used to acquire data from the DC1098, the DC890 should be powered up FIRST, before applying +3V across the pins marked "+3.0V" and "PWR GND" on the DC1098. However, the output buffers on DC1098 will not be enabled until power is applied to DC890. The DC1098 demonstration circuit requires up to 200 mA depending on the sampling rate and the A/D converter supplied.

ENCODE CLOCK

NOTE: This is not a logic compatible input. It is terminated with 50 Ohms.

Apply an encode clock to the SMA connector on the DC1098 demonstration circuit board marked "J3 CLOCK INPUT". This input is connected to ground through a 50Ω resistor, and followed by a blocking capacitor. For the best noise performance, the CLOCK INPUT must be driven with a very low jitter source. When using a sinusoidal generator, the amplitude should be as large as possible, up to 3V_{P-P} or 13 dBm. Using band pass filters on the clock and the analog input will improve the noise performance by reducing the wideband noise power of the signals. Data sheet FFT plots are taken with 10 pole LC filters made by TTE (Los Angeles, CA) to suppress signal generator harmonics, non-harmonically related spurs and broad band noise. Low phase noise Agilent 8644B generators are used with TTE band pass filters for both the Clock input and the Analog input.

A square wave encode clock is recommended for sample rates lower than 20MSPS. This is because the lower slew rate of a sinusoidal encode clock translates to increased clock jitter and hence lower SNR.

The Encode Clock can be driven with a 2.5V CMOS Logic Level square wave if R14 is replaced with an acceptable load for the drive capability of the logic. Note that logic devices are generally not able to drive cable. A barrel is recommended for logic drive. If a cable is used, the cable carrying the clock signal must be terminated to maintain the signal integrity of the Encode Clock Source and the signal source must be able to drive the 0 to 2.5V square wave signal into 50Ω load.

ANALOG INPUT NETWORK

Apply the analog input signals of interest to the SMA connectors on the DC1098 demonstration circuit board marked "ANALOG INPUT (A and B)". These inputs are capacitively coupled to ETC1-1-13 Balun transformers on high input frequency versions, or directly coupled through ETC1-1T Flux coupled transformers on low input frequency versions.

For optimal distortion and noise performance the RC network on the analog inputs are optimized for different analog input frequencies on the different versions of the DC1098. Refer to table 1. For input frequencies below about 70MHz, the circuit in Fig. 2 is recommended. For input frequencies above 70MHz and below 170MHz, the circuit in Fig. 3 is recommended.

For input frequencies between 250MHz and 500MHz, the circuit in Fig. 4 is recommended. For input frequencies greater than 250MHz contact the factory for support.

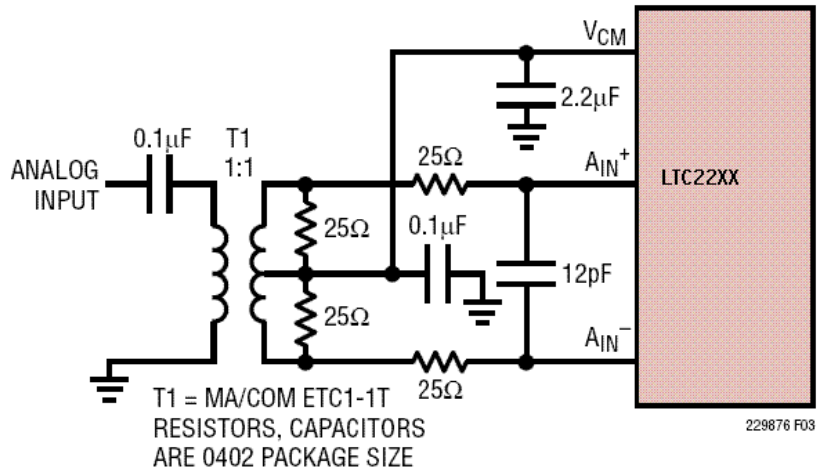


Figure 2. Analog Front End Circuit For $1\text{MHz} < A_{IN} < 70\text{MHz}$ (1 of 2)

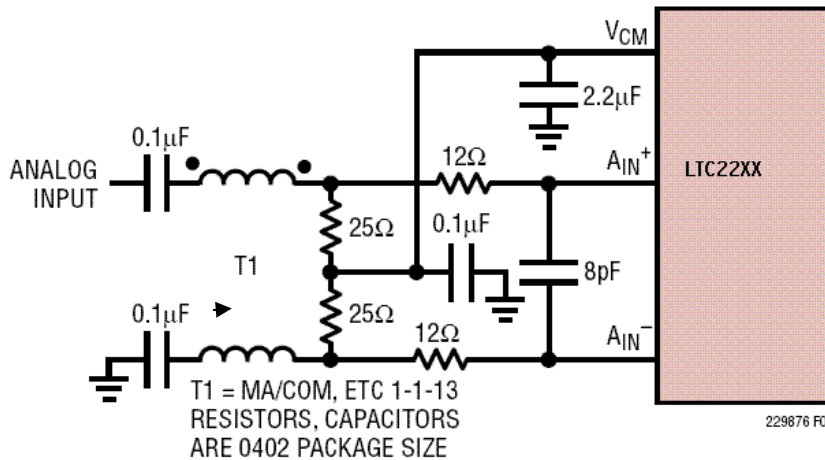


Figure 3. Analog Front End Circuit For $70\text{MHz} < A_{IN} < 170\text{MHz}$ (1 of 2)

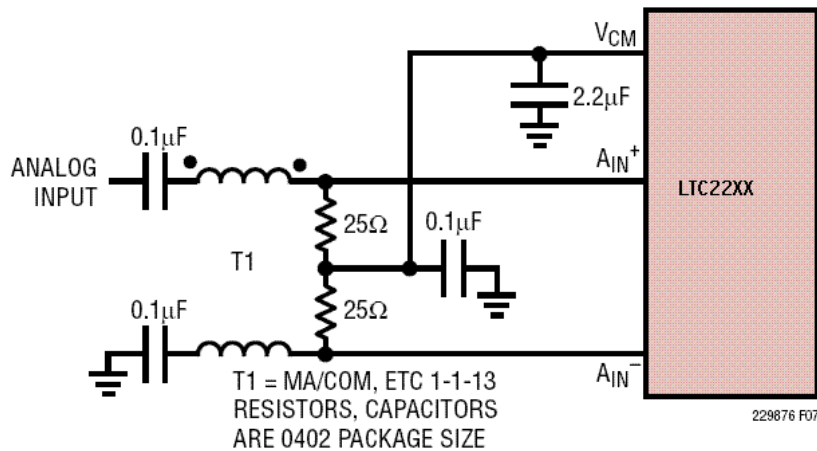


Figure 4. Analog Front End Circuit For $170\text{MHz} < A_{IN} < 300\text{MHz}$

Note that relative aperture measurements require removal of these networks, or the results will simply show the relative phase through the RC network. The measure of relative phase further requires a resistive power divider, and matched cables, or the results will be misleading. Any relative phase measurements should be confirmed by reversing the signals to confirm that the relative delay is not due to the external network.

DATA COLLECTION

The conversion clock output and the parallel data for both ADC channels are available on J1. This connector is designed to mate with a Samtec model MEC8-150-02-L-D-EM2 receptacle. It is recommended that this receptacle be used if something other than a DC890 board is used to collect data.

DC890 QuickEval-II Data Acquisition Board uses the *PScope System Software* provided or downloaded from the Linear Technology website at <http://www.linear.com/software/>. If a DC890 was provided, follow the Quick Start Guide and the instructions below.

To start the data collection software if "*PScope.exe*", is installed (by default) in `\Program Files\LTC\PScope\`, double click the PScope Icon or bring up the run window under the start menu and browse to the PScope directory and select PScope.

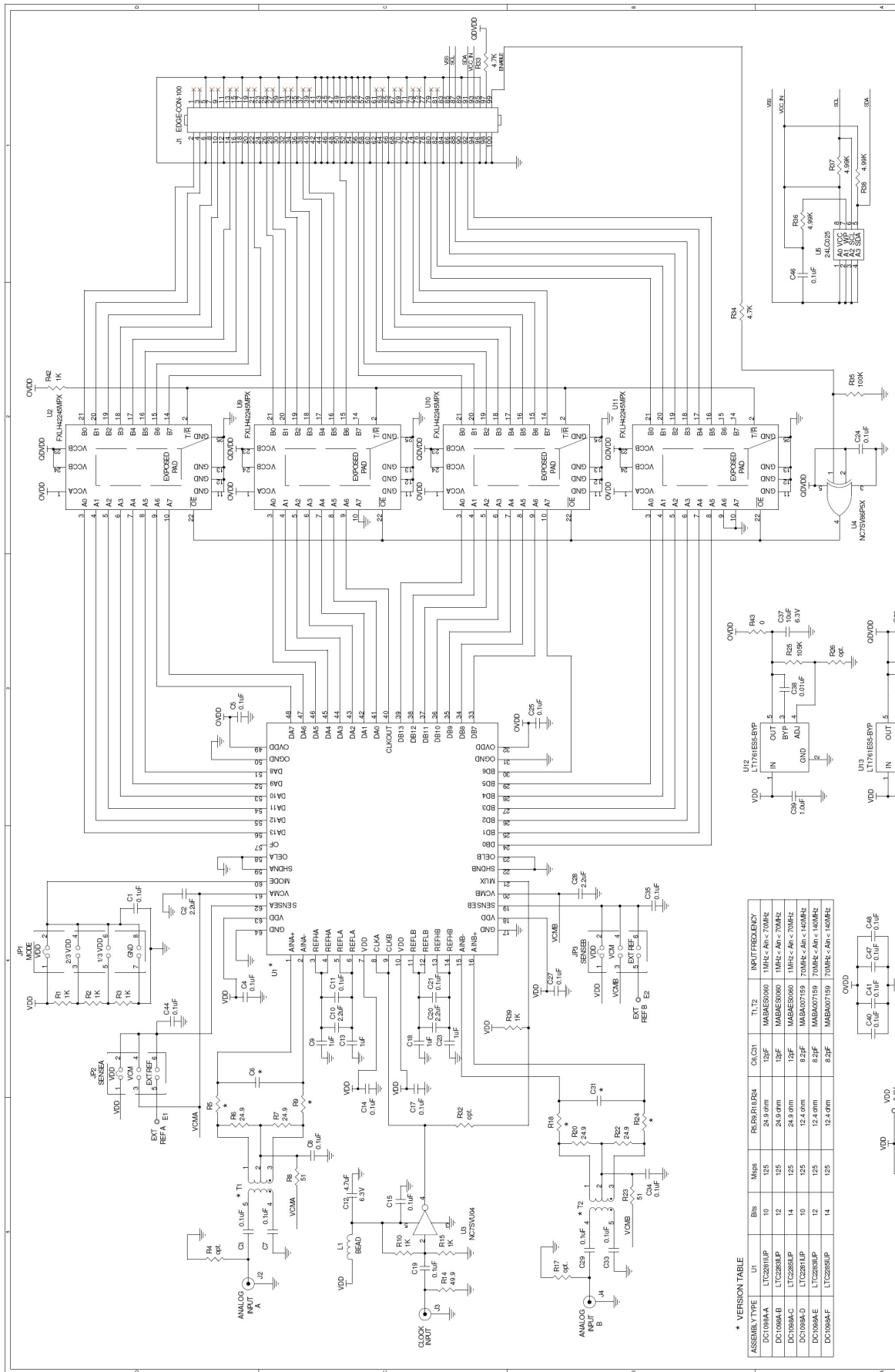
Configure PScope for the appropriate variant of the DC1098 demonstration circuit by selecting the cor-

If relative phase measurements produce results of greater than a fraction of a picosecond, please consult the factory for assistance.

Channel to Channel Crosstalk on this demo board is better than -110 dB for input frequencies below 140 MHz.

rect A/D Converter as installed on the DC1098. Under the "Configure" menu, go to "Device." Under the "Device" pull down menu, select device, LTC2280 through LTC2299. When evaluating 12-Bit parts, select the appropriate LTC22XX part in the Device List and PScope will automatically blank the last two LSBs when using a DC1098 supplied with a 14-Bit part.

If everything is hooked up properly, powered, and a suitable convert clock is present, clicking the "Collect" button should result in time and frequency plots displayed in the PScope window. The two channel mode in Pscope provides a page for each channel, and a page showing the frequency domain plots of both channels. An additional window called "X-channel" displays relative phase and amplitude of the two channels. This can be used to gauge cross-talk, or validate relative aperture delay. Additional information and help for *PScope* is available in the DC890 Quick Start Guide and in the online help available within the *PScope* program itself.



* VERSION TABLE

ASSEMBLY TYPE	U1	U2	U3	TI, T2	INRTR FREQ
DC1098AA	LTC2884P	10	125	24.9nm	MABES0000 1MHz < An < 70MHz
DC1098AB	LTC2884P	12	125	24.9nm	MABES0000 1MHz < An < 70MHz
DC1098AC	LTC2884P	10	125	24.9nm	MABES0000 1MHz < An < 70MHz
DC1098AD	LTC2884P	10	125	12.4nm	MABA007159 70MHz < An < 140MHz
DC1098AE	LTC2884P	12	125	12.4nm	MABA007159 70MHz < An < 140MHz
DC1098AF	LTC2884P	14	125	12.4nm	MABA007159 70MHz < An < 140MHz

CUSTOMER NOTICE
 LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN AND FABRICATE THIS PRODUCT TO MEET THE CUSTOMER'S REQUIREMENTS. HOWEVER, IT REMAINS THE CUSTOMER'S RESPONSIBILITY TO VERIFY PROPER AND RELIABLE OPERATION IN THE ACTUAL PERFORMANCE ENVIRONMENT. CUSTOMER'S PERFORMANCE AND AUTOMATICALLY AFFECTS CREDIT RISK. CUSTOMER'S PERFORMANCE AND AUTOMATICALLY AFFECTS CREDIT RISK. CUSTOMER'S PERFORMANCE AND AUTOMATICALLY AFFECTS CREDIT RISK.

CONTRACT NO. _____ DATE _____
 APPROVALS _____
 DRAWN _____ DATE _____
 CHECKED _____
 DESIGNED _____
 ENGINEER _____
 MARK THOMAS, 424000

LINEAR TECHNOLOGY
 100 N. RIVER STREET
 WILMINGTON, MA 01890
 TEL: 508-652-0000
 FAX: 508-652-0001

DC1098A FAMILY
 HIGH SPEED DUAL ADC

REV A

U1, U2, U3: LTC2884P

U4: N77S08P8X

U5: LT1785S-BYP

U6: LT1785S-BYP

U7: LT1785S-BYP

U8: LT1785S-BYP

U9: LT1785S-BYP

U10: LT1785S-BYP

U11: LT1785S-BYP

U12: LT1785S-BYP

U13: LT1785S-BYP

U14: LT1785S-BYP

U15: LT1785S-BYP

U16: LT1785S-BYP

U17: LT1785S-BYP

U18: LT1785S-BYP

U19: LT1785S-BYP

U20: LT1785S-BYP

U21: LT1785S-BYP

U22: LT1785S-BYP

U23: LT1785S-BYP

U24: LT1785S-BYP

U25: LT1785S-BYP

U26: LT1785S-BYP

U27: LT1785S-BYP

U28: LT1785S-BYP

U29: LT1785S-BYP

U30: LT1785S-BYP

U31: LT1785S-BYP

U32: LT1785S-BYP

U33: LT1785S-BYP

U34: LT1785S-BYP

U35: LT1785S-BYP

U36: LT1785S-BYP

U37: LT1785S-BYP

U38: LT1785S-BYP

U39: LT1785S-BYP

U40: LT1785S-BYP

U41: LT1785S-BYP

U42: LT1785S-BYP

U43: LT1785S-BYP

U44: LT1785S-BYP

U45: LT1785S-BYP

U46: LT1785S-BYP

U47: LT1785S-BYP

U48: LT1785S-BYP

U49: LT1785S-BYP

U50: LT1785S-BYP

U51: LT1785S-BYP

U52: LT1785S-BYP

U53: LT1785S-BYP

U54: LT1785S-BYP

U55: LT1785S-BYP

U56: LT1785S-BYP

U57: LT1785S-BYP

U58: LT1785S-BYP

U59: LT1785S-BYP

U60: LT1785S-BYP

U61: LT1785S-BYP

U62: LT1785S-BYP

U63: LT1785S-BYP

U64: LT1785S-BYP

U65: LT1785S-BYP

U66: LT1785S-BYP

U67: LT1785S-BYP

U68: LT1785S-BYP

U69: LT1785S-BYP

U70: LT1785S-BYP

U71: LT1785S-BYP

U72: LT1785S-BYP

U73: LT1785S-BYP

U74: LT1785S-BYP

U75: LT1785S-BYP

U76: LT1785S-BYP

U77: LT1785S-BYP

U78: LT1785S-BYP

U79: LT1785S-BYP

U80: LT1785S-BYP

U81: LT1785S-BYP

U82: LT1785S-BYP

U83: LT1785S-BYP

U84: LT1785S-BYP

U85: LT1785S-BYP

U86: LT1785S-BYP

U87: LT1785S-BYP

U88: LT1785S-BYP

U89: LT1785S-BYP

U90: LT1785S-BYP

U91: LT1785S-BYP

U92: LT1785S-BYP

U93: LT1785S-BYP

U94: LT1785S-BYP

U95: LT1785S-BYP

U96: LT1785S-BYP

U97: LT1785S-BYP

U98: LT1785S-BYP

U99: LT1785S-BYP

U100: LT1785S-BYP

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А