

LTM4622A

Ultrathin Dual 2A Step-Down μ Module Regulator

DESCRIPTION

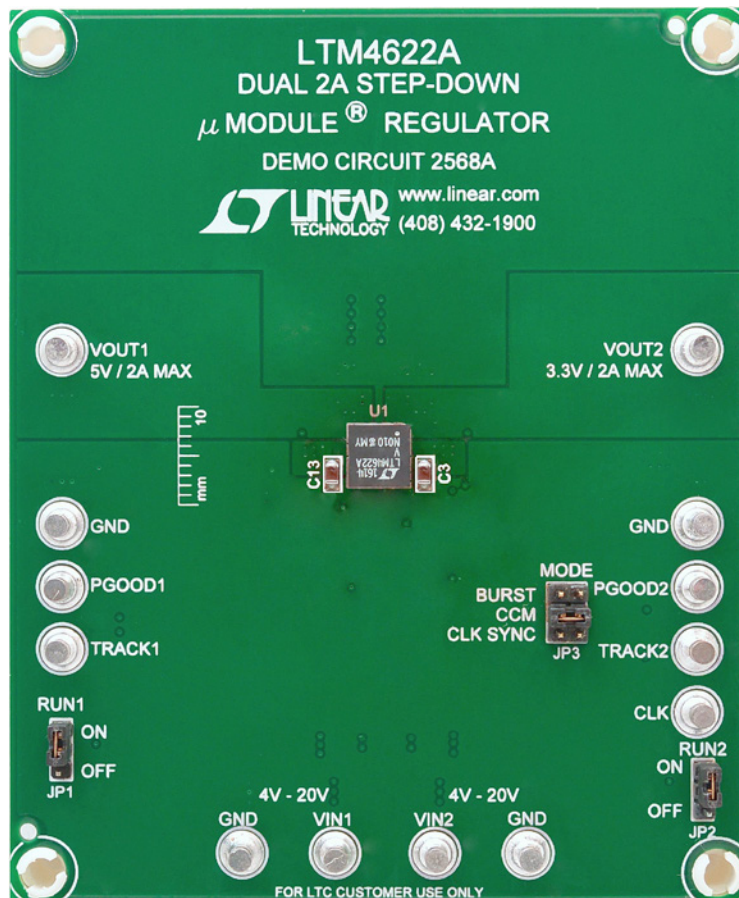
Demonstration circuit 2568A features the [LTM[®]4622A](#) μ Module[®] regulator, a tiny low profile high performance high efficiency dual step-down regulator. The LTM4622A has an operating input voltage range of 3.6V to 20V and is able to provide an output current of up to 2A for each channel. Each output's voltage is programmable from 1.5V to 12V. The LTM4622A is a complete DC/DC point of load regulator in a low profile thermally enhanced 6.25mm \times 6.25mm \times 1.82mm LGA package requiring only a few input and output capacitors. Output voltage tracking is available

through the TRACK/SS pin for supply rail sequencing. External clock synchronization is available through the MODE pin. For high efficiency at low load currents, the MODE pin jumper (JP3) selects the Burst Mode[®] option for operation in less noise sensitive applications. The LTM4622A data sheet must be read in conjunction with this demo manual for working on or modifying demo circuit 2568A.

Design files for this circuit board are available at <http://www.linear.com/demo/DC2568A>

LT, LT, LTC, LTM, Linear Technology, the Linear logo, μ Module and Burst Mode are registered trademarks of Linear Technology Corporation. All other trademarks are the property of their respective owners.

BOARD PHOTO



PERFORMANCE SUMMARY

PARAMETER	CONDITIONS/NOTES	VALUE
Input Voltage Range		4V – 20V
Output Voltage V_{OUT1} , V_{OUT2}	Programmable with FB Pin Resistors	$5V_{DC}$, $3.3V_{DC}$
Maximum Continuous Output Current Each Phase	Derating is Necessary for Certain Operating Conditions, See Data Sheet for Details	2ADC
Default Operating Frequency		1MHz
Efficiency	$V_{IN} = 12V$, $V_{OUT1} = 5V$, $I_{OUT} = 2A$, $f_{SW} = 1MHz$	91.6% (See Figure 2)
	$V_{IN} = 12V$, $V_{OUT2} = 3.3V$, $I_{OUT} = 2A$, $f_{SW} = 1MHz$	88.5% (See Figure 2)

QUICK START PROCEDURE

Demonstration circuit 2568A is an easy way to evaluate the performance of the LTM4622A. Please refer to Figure 1 for test setup connections and follow the procedure below.

1. With power off, place the jumpers in the following positions for a typical application for $5V_{OUT}$ and $3.3V_{OUT}$ rails.

JP1	JP2	JP3
RUN1	RUN2	MODE
ON	ON	CCM

2. Before powering up the input supply and loads, preset the input voltage supply to be between 4V to 20V. Preset the load current for each output rail to 0A.
3. With power off, connect the loads, input voltage supply and meters as shown in Figure 1.
4. Turn on the input power supply. The output voltage meters for each output rail should display the programmed output voltage $\pm 2\%$.
5. Once the proper output voltages are established, adjust the load current on each rail within the 0A to 2A range and observe each output rail's load regulation, efficiency, and other parameters.
6. To observe increased light load efficiency, place the MODE pin jumper (JP3) in the BURST position.

NOTES:

1. V_{IN1} , V_{IN2} are tied together by default (via R30 jumper). Because $INTV_{CC}$ is generated from V_{IN1} , for applications where V_{IN1} and V_{IN2} use separate supplies (R30 unstuffed) V_{IN1} must be at least 3.6V in order to enable V_{OUT2} .
2. Demonstration circuit 2568A is designed to exhibit the wide output voltage range of the LTM4622A. In order to keep inductor current ripple within reasonable limits, it is recommended to increase programmed switching frequency for higher output voltages. The programmed switching frequency for data provided in this manual is consistent with switching frequency recommendations corresponding to the programmed output voltage. Please refer to the LTM4622A data sheet for more details regarding recommended switching frequency for your particular application.

QUICK START PROCEDURE

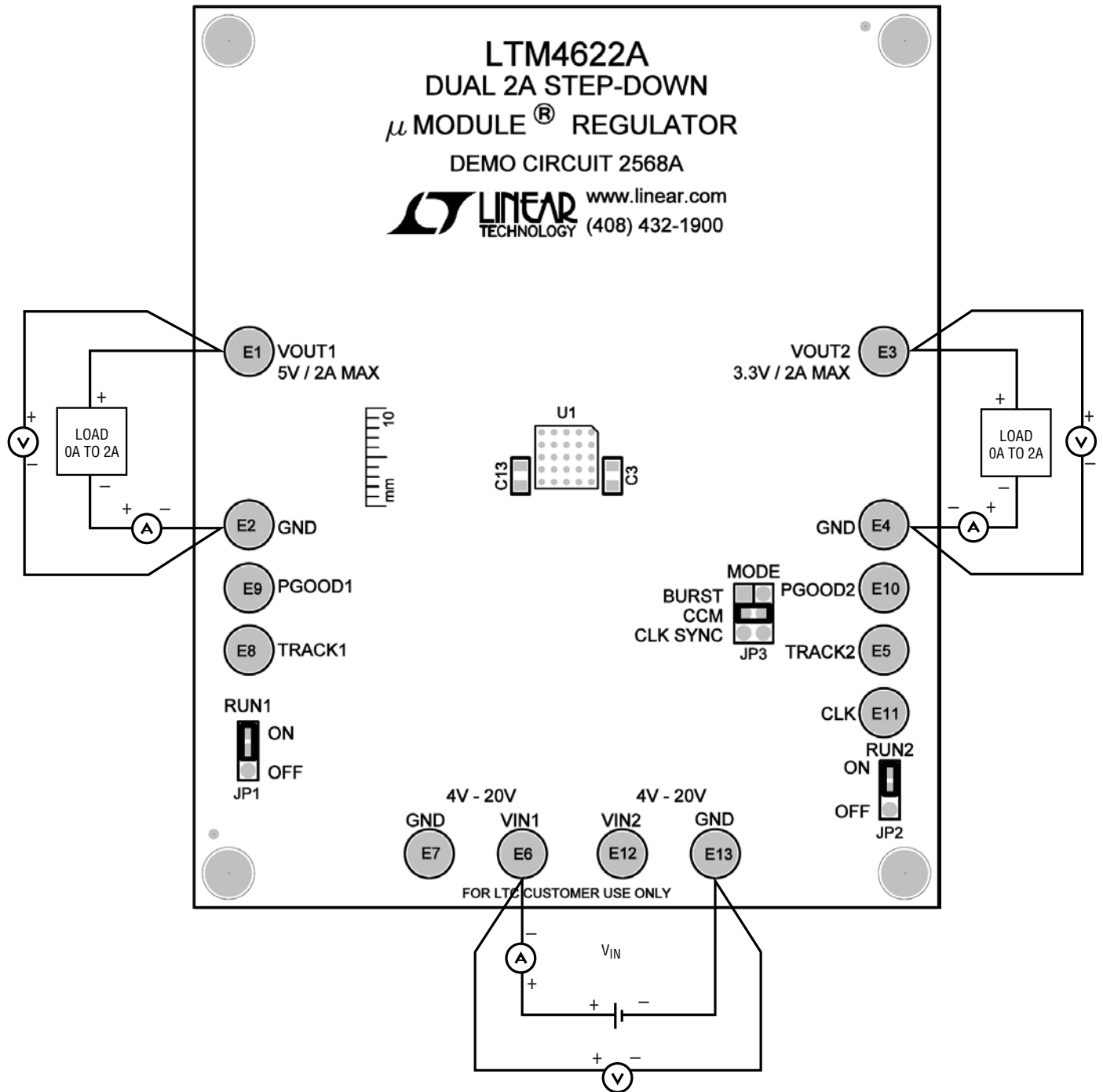


Figure 1. DC2568A Test Setup

QUICK START PROCEDURE

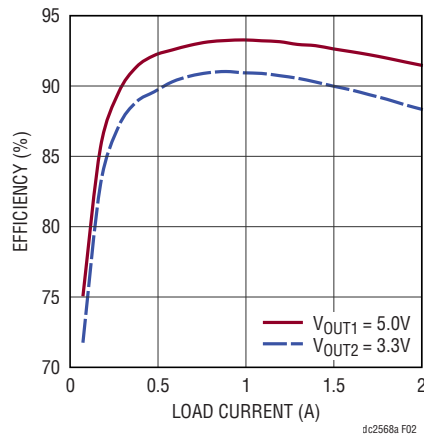
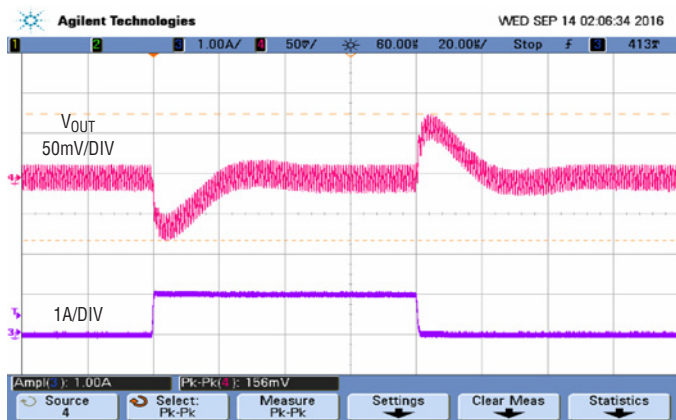
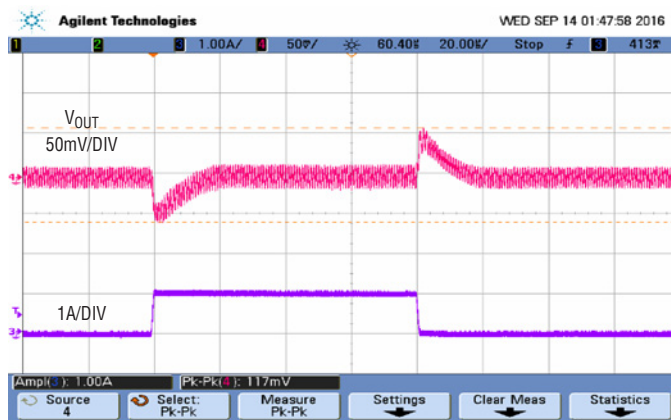


Figure 2. Measured Supply Efficiency at 12V_{IN}



V _{IN} (V)	V _{OUT} (V)	C _{OUT}
12	5	2 × 4.7μF + 1 × 47μF

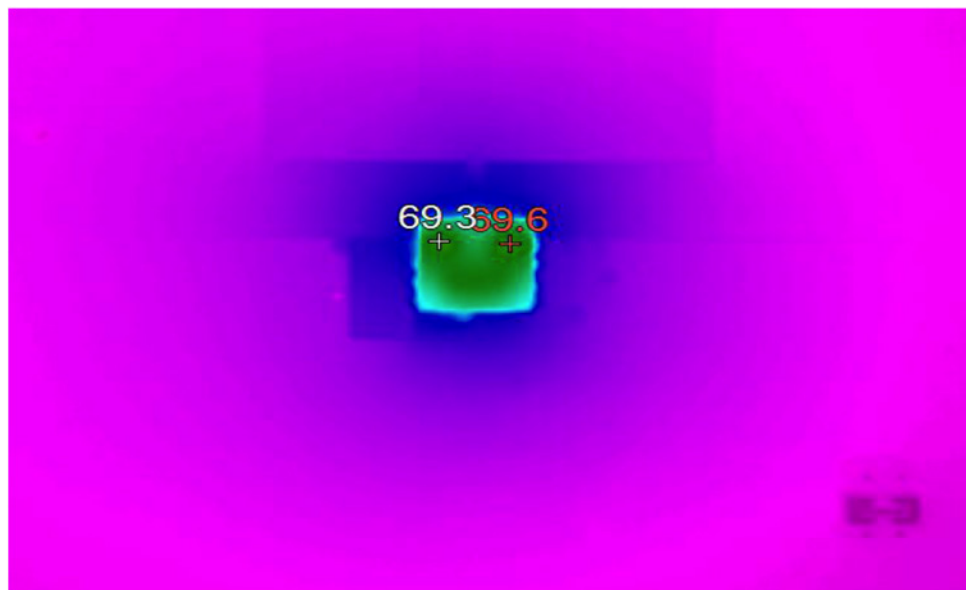
Figure 3. Measured Load Transient Response, (1A to 2A Load Step)



V _{IN} (V)	V _{OUT} (V)	C _{OUT}
12	3.3	2 × 4.7μF + 1 × 47μF

Figure 4. Measured Load Transient Response (1A to 2A Load Step)

QUICK START PROCEDURE



V _{IN} (V)	V _{OUT1} (V), I _{OUT1} (A)	V _{OUT2} (V), I _{OUT2} (A)	f _{sw} (MHz)	AMBIENT TEMPERATURE (°C)
12	5, 2	3.3, 2	1	26

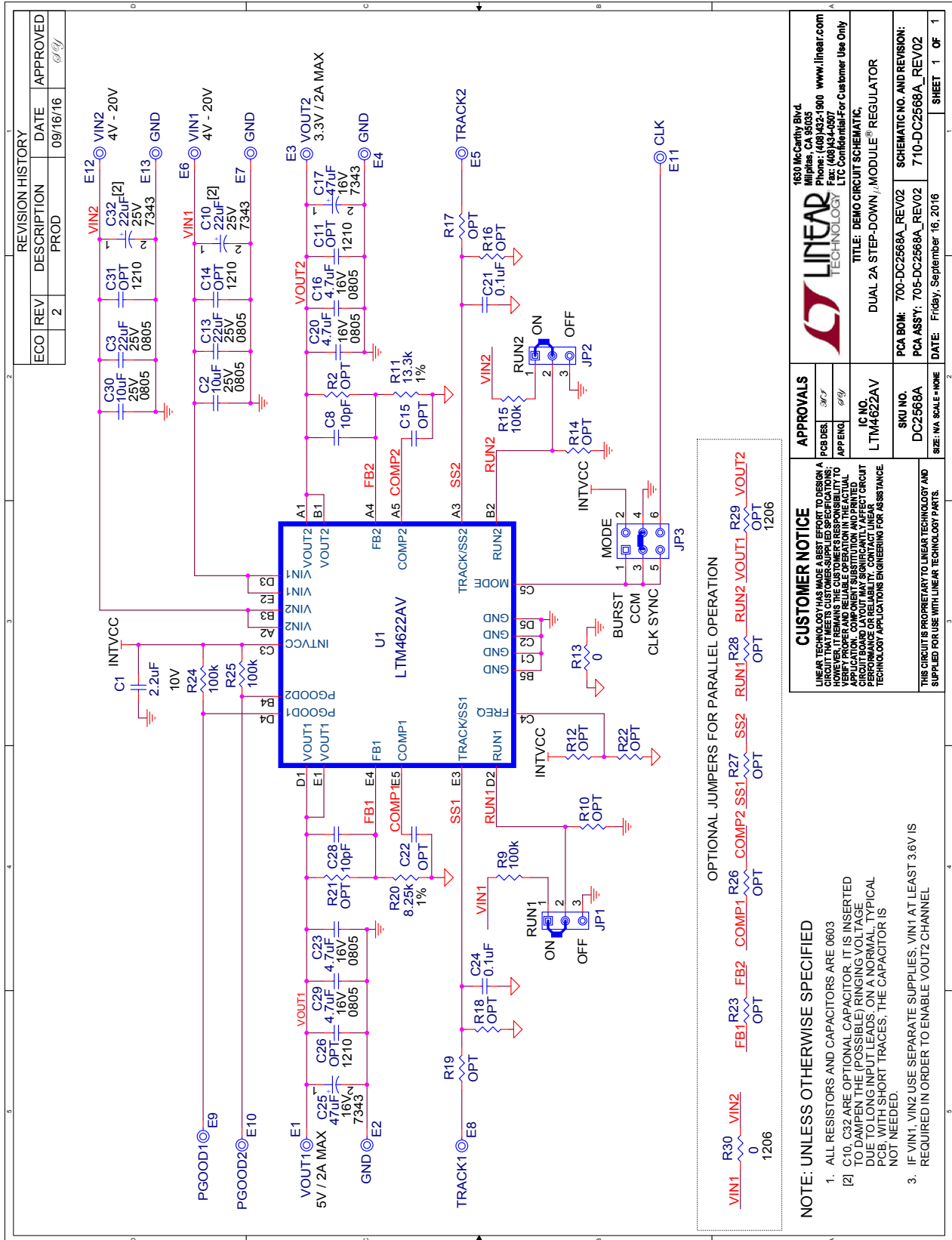
Figure 5. Thermal Capture at Full Load, Natural Convection

DEMO MANUAL DC2568A

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER	PART NUMBER
Required Circuit Components					
1	1	C1	CAP 0603 2.2 μ F 10% 10V X5R	MURATA	GRM188R61A225KE34D
2	2	C2, C30	CAP 0805 10 μ F 10% 25V X5R	MURATA	GRM21BR61E106KA73L
3	4	C16, C20, C23, C29	CAP 0805 4.7 μ F 10% 16V X5R	MURATA	GRM21BR61E106KA73L
4	2	C17, C25	CAP 7343 47 μ F 20% 16V POSCAP	PANASONIC	16TQC47MW
5	2	C21, C24	CAP 0603 0.1 μ F 10% 25V X5R	AVX	06033D104KAT2A
6	1	R11	RES 0603 13.3k 1% 0.1W	VISHAY	CRCW060313K3FKEA
7	1	R20	RES 0603 8.25k 1% 0.1W	VISHAY	CRCW06038K25FKEA
8	1	R30	RES 1206 0 Ω 0.5W	VISHAY	WSL120600000EA9
9	1	U1	IC, DUAL 2A STEP-DOWN μ Module REG., LGA	LINEAR TECHNOLOGY	LTM4622AV#PBF
Additional Demo Board Circuit Components					
1	2	C3, C13	CAP 0805 22 μ F 20% 25V X5R	MURATA	GRM21BR61E226ME-44L
2	2	C8, C28	CAP 0603 10pF 5% 25V X5R	AVX	06033A100JAT2A
3	2	C10, C32	CAP 7343 22 μ F 20% 25V TANT POLY	PANASONIC	25TQC22MV
4	0	C11, C14, C26, C31	CAP 1210 OPTION	OPTION	OPTION
5	0	C15, C22	CAP 0603 OPTION	OPTION	OPTION
6	0	R2, R10, R12, R14, R16-R19, R21-R23, R26-R28	RES 0603 OPTION	OPTION	OPTION
7	4	R9, R15, R24, R25	RES 0603 100k 5% 1/10W	VISHAY	CRCW0603100KJNEA
8	1	R13	RES 0603 0 Ω JUMPER	VISHAY	CRCW06030000Z0EA
9	0	R29	RES 1206 OPTION	OPTION	OPTION
Hardware					
1	13	E1-E13	TEST POINT, TURRET, 0.094", MTG. HOLE	MILL-MAX	2501-2-00-80-00-00-07-0
2	2	JP1, JP2	HEADER 3-PIN, 2mm	WURTH ELEKTRONIK	62000311121
3	1	JP3	HEADER 3-PIN, DBL ROW 2mm	WURTH ELEKTRONIK	62000621121
4	4	MP1-MP4	STANDOFF, NYLON, SNAP-ON, 0.250"	KEYSTONE	8831
5	3	XJP1-XJP3	CONN., SHUNT, FEMALE, 2-POS, 2mm	WURTH ELEKTRONIK	60800213421

SCHEMATIC DIAGRAM



APPROVALS		LINEAR TECHNOLOGY	1630 McCarthy Blvd. Milpitas, CA 95035 Phone: (408)452-1900 www.linear.com Fax: (408)452-1990 LTC.com/contact For Customer Use Only
PCB DES	APP ENG		
IC NO.	LTM4622AV	TITLE: DEMO CIRCUIT SCHEMATIC.	
SKU NO.	DC2568A	PCA BOM:	700-DC2568A_REV02
SIZE: N/A, SCALE: NONE		PCA ASSY:	705-DC2568A_REV02
		DATE:	Friday, September 16, 2016
		SHEET 1 OF 1	

CUSTOMER NOTICE

LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A CIRCUIT THAT MEETS CUSTOMER-SUPPLIED SPECIFICATIONS. HOWEVER, IT REMAINS THE CUSTOMER'S RESPONSIBILITY TO VERIFY PROPER AND RELIABLE OPERATION IN THE ACTUAL CIRCUIT BOARD LAYOUT. SIGNIFICANTLY AFFECT CIRCUIT PERFORMANCE OR RELIABILITY. CONTACT LINEAR TECHNOLOGY APPLICATIONS ENGINEERING FOR ASSISTANCE.

THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.



DEMO MANUAL DC2568A

DEMONSTRATION BOARD IMPORTANT NOTICE

Linear Technology Corporation (LTC) provides the enclosed product(s) under the following **AS IS** conditions:

This demonstration board (DEMO BOARD) kit being sold or provided by Linear Technology is intended for use for **ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY** and is not provided by LTC for commercial use. As such, the DEMO BOARD herein may not be complete in terms of required design-, marketing-, and/or manufacturing-related protective considerations, including but not limited to product safety measures typically found in finished commercial goods. As a prototype, this product does not fall within the scope of the European Union directive on electromagnetic compatibility and therefore may or may not meet the technical requirements of the directive, or other regulations.

If this evaluation kit does not meet the specifications recited in the DEMO BOARD manual the kit may be returned within 30 days from the date of delivery for a full refund. **THE FOREGOING WARRANTY IS THE EXCLUSIVE WARRANTY MADE BY THE SELLER TO BUYER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. EXCEPT TO THE EXTENT OF THIS INDEMNITY, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.**

The user assumes all responsibility and liability for proper and safe handling of the goods. Further, the user releases LTC from all claims arising from the handling or use of the goods. Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge. Also be aware that the products herein may not be regulatory compliant or agency certified (FCC, UL, CE, etc.).

No License is granted under any patent right or other intellectual property whatsoever. **LTC assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or any other intellectual property rights of any kind.**

LTC currently services a variety of customers for products around the world, and therefore this transaction **is not exclusive**.

Please read the DEMO BOARD manual prior to handling the product. Persons handling this product must have electronics training and observe good laboratory practice standards. **Common sense is encouraged.**

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

Mailing Address:

Linear Technology
1630 McCarthy Blvd.
Milpitas, CA 95035

Copyright © 2004, Linear Technology Corporation

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