# MAX1624 Evaluation Kit

Evaluates: MAX1624

## General Description

The MAX1624 evaluation kit (EV kit) provides a digitally programmable output voltage between 1.1V and 3.5V from a 5V input supply. It delivers up to 11.5A output current with greater than 90% efficiency. The MAX1624 EV kit features 1% output accuracy. The MAX1624 features a resistor-programmable switching frequency from 100kHz to 1MHz, as well as current-mode operation for superior load- and line-transient response. This EV kit is a fully assembled and tested circuit board. For a low-cost version of this kit that includes the Intel $V_{RM}$ connector and aluminum-electrolytic filter capacitors, order the MAX1624VRMEVKIT.

## Ordering Information

| PART | TEMP. RANGE | BOARD TYPE |
|---|---|---|
| MAX1624EVKIT | 0°C to +70°C | Surface Mount |
| MAX1624VRMEVKIT | 0°C to +70°C | Through Hole |

## Features

- **4.5V to 5.5V Input Voltage Range**
- **1.1V to 3.5V Output Voltage**
- **11.5A Output Current**
- **Efficiency = 90%, $V_{IN}$ = 5V, $V_{OUT}$ = 2.5V @ $I_{OUT}$ = 10A**
- **Selectable 0.5%, 1%, 2% AC Load Regulation**
- **Power-OK Output**
- **Glitch-Catcher™ Provides Excellent Load-Transient Response**
- **500kHz Switching Frequency**
- **24-Pin SSOP Package**
- **Low-Profile Components**

## Component List

| DESIGNATION | QTY | DESCRIPTION |
|---|---|---|
| C1, C2, C3 | 3 | 100µF, 10V electrolytic capacitors<br>Sanyo 10SL100M |
| C4 | 0 | Open |
| C5, C6, C7 | 3 | 220µF, 4V electrolytic capacitors<br>Sanyo 4SP220M |
| C8, C9, C10 | 3 | 0.1µF ceramic capacitors |
| C11, C12 | 2 | 4.7µF, 16V tantalum capacitors<br>Sprague 595D475X0016A2T |
| C13 | 1 | 2.2µF ceramic capacitor<br>United Chemicon/Marcon<br>THCR30E1E225Z |
| C14, C15 | 2 | 4700pF ceramic capacitors |
| C16 | 1 | 1µF ceramic capacitor |
| C17 | 1 | 22µF ceramic capacitor<br>TDK C5650Y5U1E226M |
| CC1 | 1 | 1000pF ceramic capacitor |
| CC2 | | 0.056µF ceramic capacitor |
| D1 | 1 | Schottky diode<br>Central Semiconductor CMPSH-3 |
| L1 | 1 | 0.5µH power inductor<br>Coiltronics UP4-R47 or<br>Coilcraft DO5022P-501HC |
| N1, N2 | 2 | N-channel MOSFETs ($D^2PAK$)<br>International Rectifier IRL3103S |

| DESIGNATION | QTY | DESCRIPTION |
|---|---|---|
| U2 | 1 | N- and P-channel MOSFET (SO-8)<br>International Rectifier IRF7107 |
| R1, R2 | 2 | 0.012Ω, 1%, 1W resistors<br>Dale WSL-2512-R012-F or<br>IRC LR2512-01-R012-F |
| R3 | 1 | 0.5Ω, 5%, 1/2W resistor<br>Dale WSL-2010-R5-J or<br>IRC LR2010-01-R5-J |
| R4 | 1 | 100Ω, 5% resistor |
| R5 | 1 | 40.2kΩ, 1% resistor |
| R6–R11 | 6 | 100kΩ, 5% resistors |
| R12, R13 | 2 | 39Ω, 5% resistors |
| R14, R15 | 0 | Open |
| R16 | 1 | 1kΩ, 5% resistor |
| U1 | 1 | MAX1624EAG |
| JU1 | 1 | 4-pin header |
| JU2 | 1 | 2-pin header |
| None | 1 | Shunt |
| SW1 | 1 | Dip-10 dip switch |
| None | 1 | MAX1624 PC board |
| None | 1 | MAX1624 data sheet |

## Component Suppliers

| SUPPLIER* | PHONE | FAX |
|---|---|---|
| AVX | (803) 946-0690 | (803) 626-3123 |
| Central Semiconductor | (516) 435-1110 | (516) 435-1824 |
| Coilcraft | (708) 639-6400 | (708) 639-1469 |
| Dale-Vishay | (402) 564-3131 | (402) 563-6418 |
| International Rectifier | (310) 322-3331 | (310) 322-3332 |
| IRC | (512) 992-7900 | (512) 992-3377 |
| Motorola | (602) 303-5454 | (602) 994-6430 |
| Sanyo | (619) 661-6835 | (619) 661-1055 |
| Siliconix | (408) 988-8000 | (408) 970-3950 |
| Sprague | (603) 224-1961 | (603) 224-1430 |
| Sumida | (847) 956-0666 | (847) 956-0702 |

** Please indicate that you are using the MAX1624 when contacting these component suppliers.*

## Quick Start

The MAX1624 EV kit is fully assembled and tested. Follow these steps to verify board operation. **Do not turn on the power supply until all connections are completed.**

1) Connect a 5V supply voltage to the VIN pad. The ground connects to the GND pad.
2) Connect a voltmeter and load, if any, to the VOUT pad.
3) Turn on the power supply to the board. Verify that the output voltage is 0V.
4) Set switch SW1 per Table 1 to get the desired output voltage.

## Detailed Description

### Jumper Selection

The 3-pin header JU1 selects the loop gain. Table 2 lists the selectable jumper options. JU1 allows the user to trade off AC load regulation, transient response, and output filter capacitor size. Load regulation can be set to 0.5%, 1%, and 2%. The default value is 1%.

The 2-pin header JU2 selects the shutdown mode. Table 3 lists the selectable jumper options.

**Table 1. MAX1624 Output-Voltage Adjustment Settings (Abbreviated)**

| D4 | D3 | D2 | D1 | D0 | OUTPUT VOLTAGE (V) | COMPATIBILITY |
|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 3.5 | Intel-compatible codes |
| 1 | 0 | 0 | 0 | 1 | 3.4 | |
| 1 | – | – | – | – | Decreases in 100mV increments | |
| 1 | 1 | 1 | 1 | 0 | 2.1 | |
| 1 | 1 | 1 | 1 | 1 | No CPU (off) | |
| 0 | 0 | 0 | 0 | 0 | 1.9 | Non-Intel-compatible codes |
| 0 | 0 | 0 | 0 | 1 | 1.8 | |
| 0 | 0 | – | – | – | Decreases in 100mV increments | |
| 0 | 0 | 1 | 1 | 1 | 1.2 | |
| 0 | 1 | 0 | 0 | 0 | 1.1 | |
| 0 | 1 | – | – | – | 1.1 | |
| 0 | 1 | 1 | 1 | 0 | 1.1 | |
| 0 | 1 | 1 | 1 | 1 | No CPU (off) | |

**Table 2. Jumper JU1 Functions**

| SHUNT LOCATION | LG PIN | AC LOAD REGULATION (%) |
|---|---|---|
| 1 & 4 | Connected to GND | 0.5 |
| 1 & 3 | Connected to REF | 1 |
| 1 & 2 | Connected to $V_{CC}$ | 2 |

**Table 3. Jumper JU2 Functions**

| SHUNT LOCATION | REF PIN | MAX1624 OUTPUT |
|---|---|---|
| On | Connected to GND | Shutdown mode, $V_{OUT}$ = 0V |
| Off | Connected to REF | MAX1624 enabled |

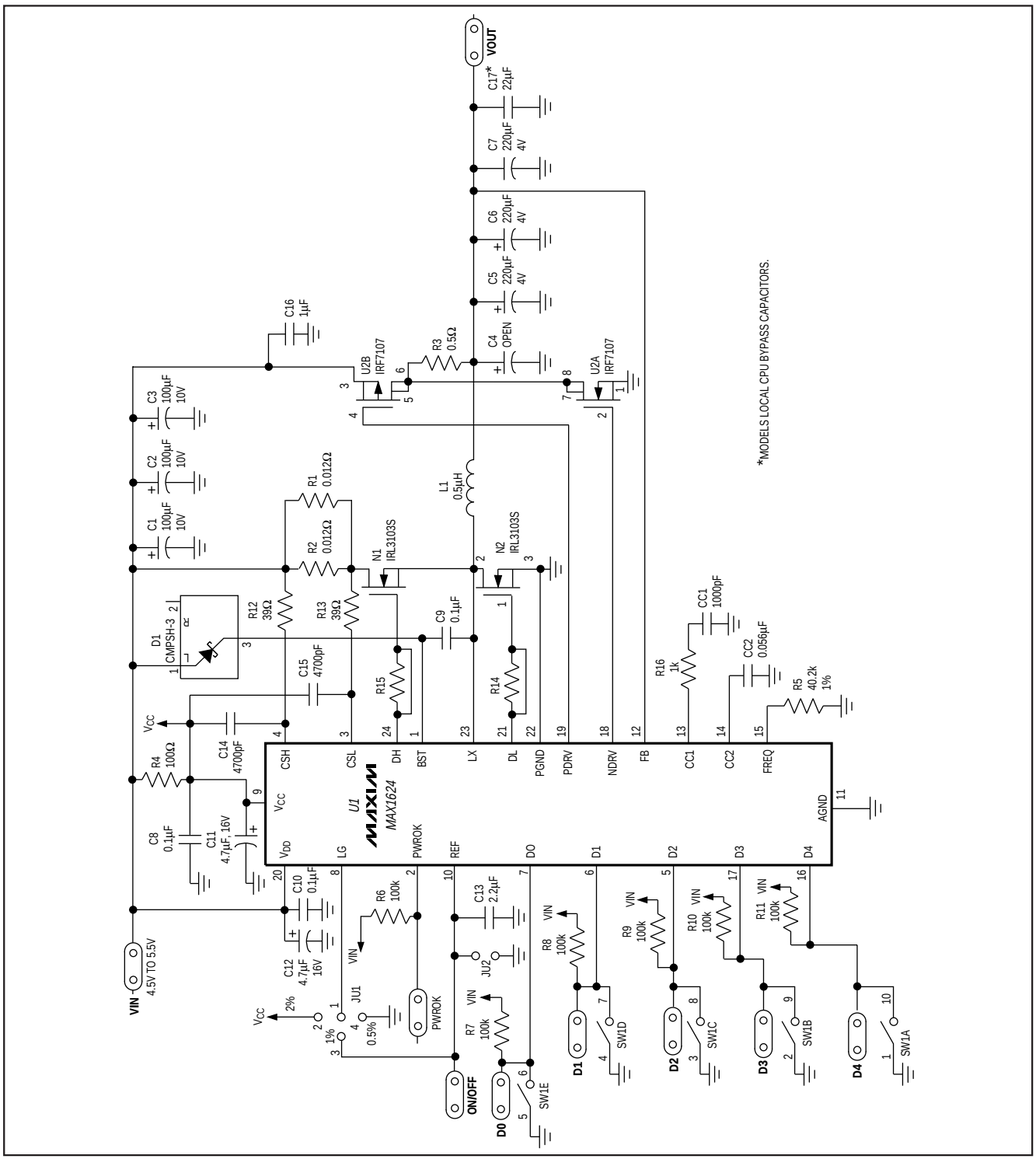


*Figure 1. MAX1624 EV Kit Schematic*

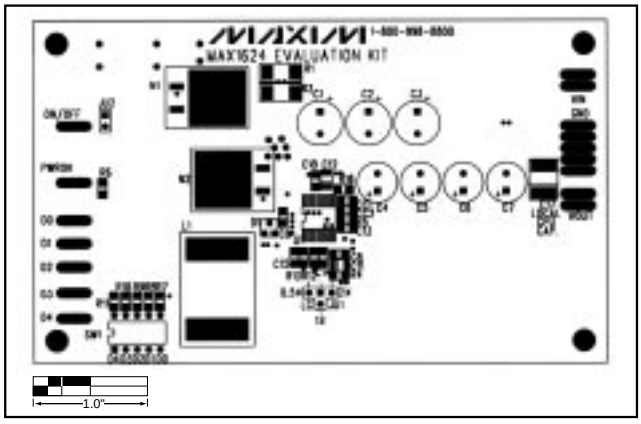


*Figure 2. MAX1624 EV Kit Component Placement Guide—Component Side*

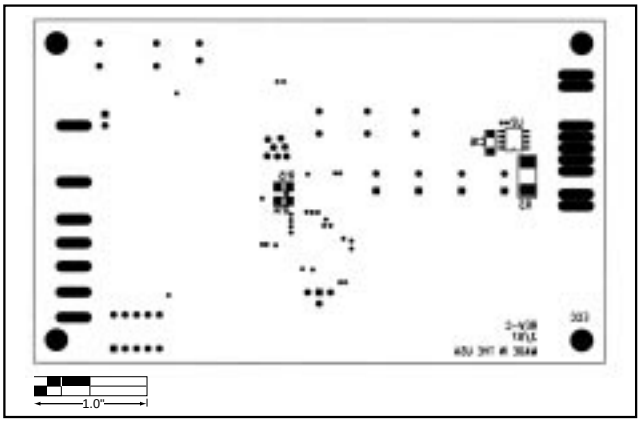


*Figure 3. MAX1624 EV Kit Component Placement Guide—Solder Side*

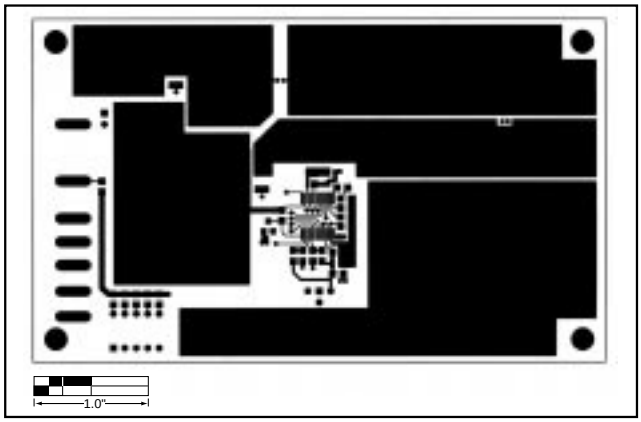


*Figure 4. MAX1624 EV Kit PC Board Layout—Component Side*

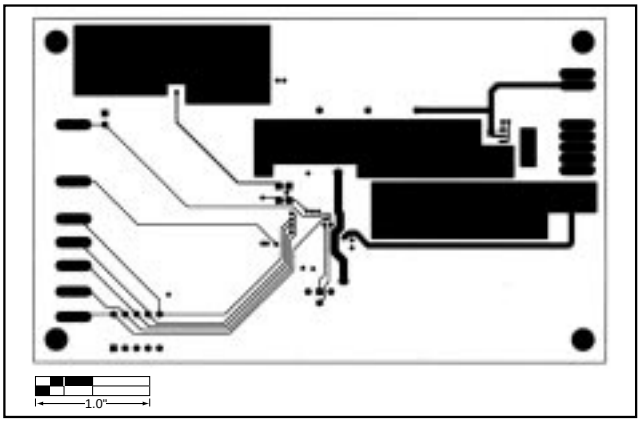


*Figure 5. MAX1624 EV Kit PC Board Layout—Solder Side*

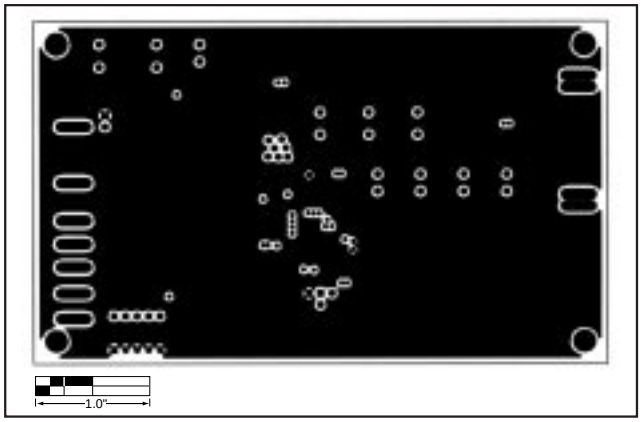


*Figure 6. MAX1624 EV Kit PC Board Layout—Internal GND Plane (layer 2)*

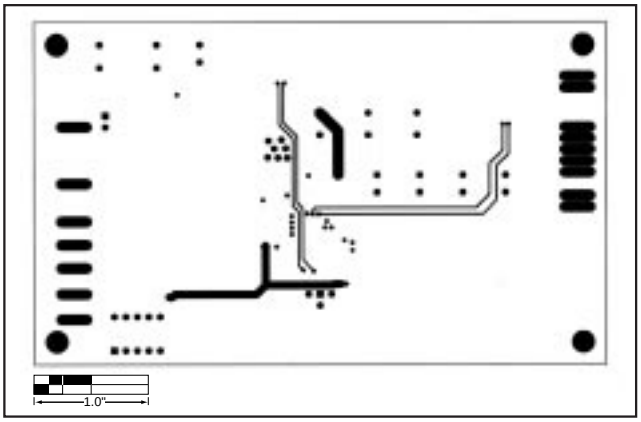


*Figure 7. MAX1624 EV Kit PC Board Layout—Internal Signal Plane (layer 3)*