

MAX25221 Evaluation Kit/ MAX25221 Evaluation System

Evaluates: MAX25220, MAX25221

General Description

The MAX25221 evaluation kit (EV kit) is a fully assembled and tested surface-mount PCB used to evaluate MAX25221 automotive 4-Channel TFT-LCD Power Supply with VCOM Buffer and MAX25220 automotive 4-Channel TFT-LCD Power Supply without VCOM. Each output rail (AVDD, NAVDD, VGON, VGOFF and VCOM) can be independently adjusted via I²C. The EV kit demonstrates the device's features: adjustable output voltage, fault protection, VCOM temperature compensation, and non-volatile memory programming. The EV kit exposes an I²C interface which can operate in conjunction with the MINIQUSB+ adapter or a third party I²C master like a general-purpose microcontroller. The EV kit also includes Windows®-compatible software that provides a simple graphical user interface (GUI) for exercising the features of the IC. The EV system includes both the EV kit and the MINIQUSB+ adapter board.

Benefits and Features

- 2.65V to 5.5V Input Range
- Default Output Voltages
 - 6.8V Output at 200mA (Boost Converter)
 - -6.8V Output at -200mA (Inverting Regulator)
 - 12V Output at 15mA (Positive-Charge Pump Regulator)
 - -10V Output at 15mA (Negative-Charge Pump Regulator)
 - -2.49V Output at 100mA (VCOM Buffer)
- Selectable Switching Frequency (2.1MHz or 420kHz) with Spread-Spectrum Option. (The EV kit components will fit the 2.1MHz frequency. Using 420kHz will need hardware change.)
- Dedicated GUI
- Full Sequencing Flexibility
- Proven PCB Layout
- Fully Assembled and Tested

MAX25221 EV Kit Files

| FILE | DESCRIPTION |
|-------------------------|-----------------------|
| MAX25221GUISetupVxx.exe | Windows GUI Installer |

Windows is a registered trademark and service mark of Microsoft Corporation.

Quick Start

Required Equipment

- MAX25221 EV kit
- 2.65 to 5.5V, 3A power supply
- Voltmeter
- MINIQUSB+ interface board with USB cable
- User-supplied Windows-compatible PC with a spare USB port

Note: In the following sections, software-related items are identified by bolding. Text in **bold** refers to items directly from the EV kit software. Text in **bold and underlined** refers to items from the Windows operating system.

Procedure

The EV kit is fully assembled and tested. To verify board operation, follow the steps:

Stand Alone

- Verify that shunts are installed across pins 1-2 on jumpers J1–J4. Ensure that J5 has no jumper installed.
- Connect the positive terminal of the power supply to the TFT_POWER_IN pad and the negative terminal to the GND1 PCB pad.
- Set the power supply TFT_POWER_IN at 5V.
- Turn on the power supply.
- Verify that the green LED (DS1) is on.
- Verify that the boost converter (AVDD PCB pad) is 6.8V.
- Verify that the inverting converter (NAVDD PCB pad) is -6.8V.
- Verify that the positive-gate voltage regulator (VGON PCB pad) is +12V.
- Verify that the negative-gate voltage regulator (VGOFF PCB pad) is -10V.
- Verify that the VCOM buffer (VCOM PCB pad) regulator is -2.49V. (Only for MAX25221.)

Ordering Information appears at end of data sheet.

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I²C Mode

- Visit www.maximintegrated.com/evkitsoftware download the latest version of the EV kit software, MAX25221GUISetupVxx.exe.
- Install the EV kit software (GUI) on your PC by running the MAX25221GUISetupVxx.exe program.
- The EV kit software application will be installed together with the required MINIUSB+ drivers.
- Verify that shunts are installed across pins 1-2 on jumpers J1-J3, J5, J7, J9-J11, and J17.
- Verify that shunts are installed across pins 2-3 on jumper J12.
- Connect the MINIUSB+ interface board's P3 header to the J14 header on the EV kit.
- Connect the positive terminal of the power supply to the TFT_POWER_IN pad and the negative terminal to the GND1 PCB pad.
- Set the power supply VIN at 5V.
- Turn on the power supply.
- Verify that the green LED (DS1) is on.
- Launch the EV kit software application.
- From the EV kit software toolbar, select **Device** → **Scan for Address**. The GUI scans the I²C bus for available slave addresses on the bus and selects the first one (in this case, the MAX25221 I²C address with J5 settings: 52H). Press **OK** once the MAX25221/MAX25220 I²C address has been found. [Figure 1](#), is a screen capture of MAX25221 Evaluation Kit Software (GUI).
- Verify that the status bar in the bottom-right corner of the GUI displays **EV Kit: Connected**.
- In the **GENERAL SETTINGS** group box press **START button**.
- In the **INDICATORS SEQ_ON** and **FLT_PIN** status should be green.
- All channels are turned on outputting AVDD 6.8V, NAVDD -6.8V, VGON 12V, VGOFF -10V, VCOM -2.49V.
- For more details on how to use the GUI and all the features available, click on the GUI **Help** menu item.

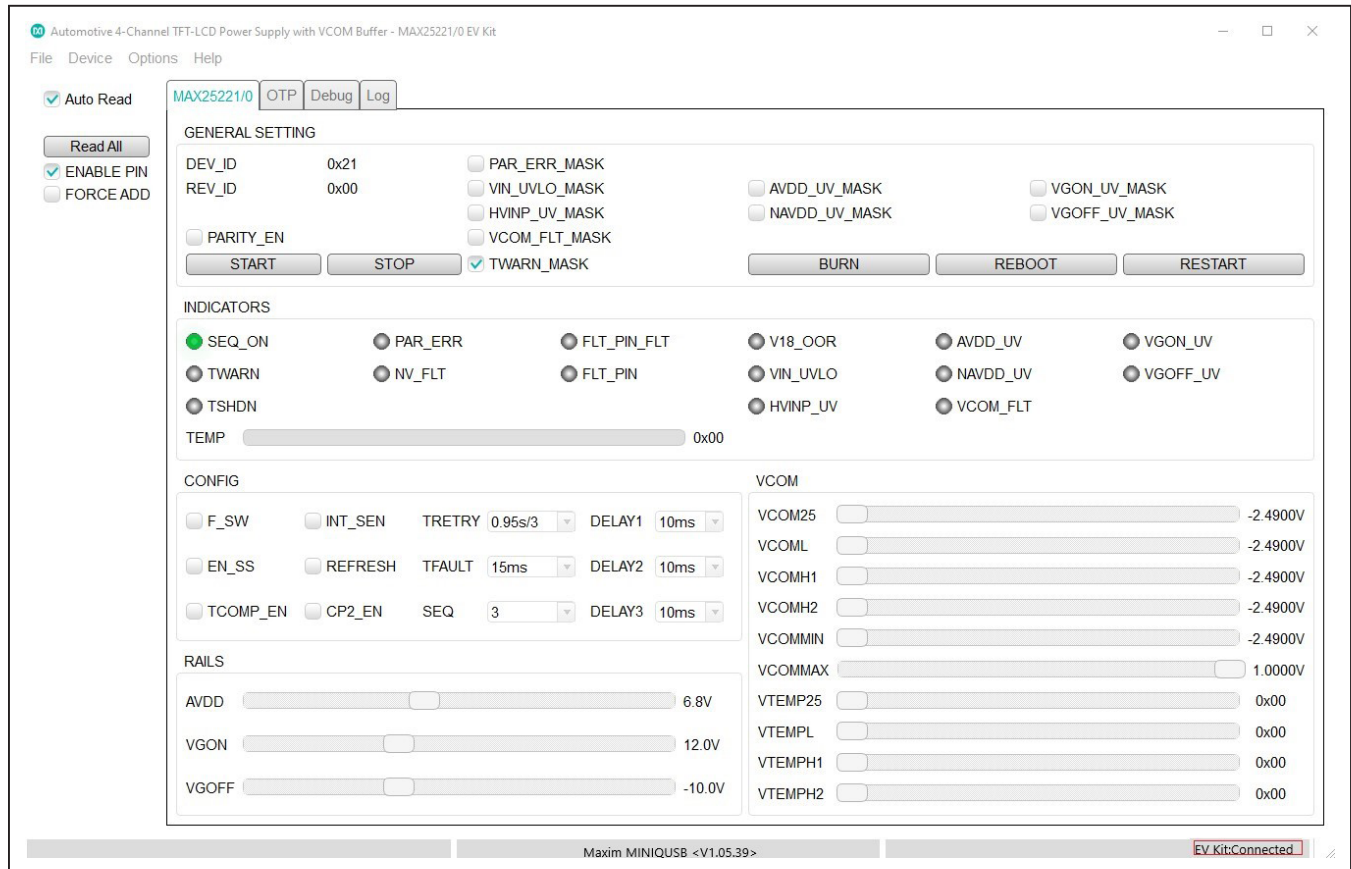


Figure 1. MAX25221 Evaluation Kit Software (GUI)

Detailed Description of Hardware

Jumper Setting

In the following tables, several jumper settings illustrate features of the MAX25221 EV kit.

Power LED Enable (J1)

A green LED (DS1) is used to indicate that the EV kit is powered on.

The LED can be disconnected from the power supply, allowing precise current-consumption evaluation (see [Table 1](#)).

Fault LED Enable (J2)

A red LED (DS2) is used to indicate a fault condition. The LED can be disconnected from the power supply, allowing precise current-consumption evaluation (see [Table 2](#)).

SCL Pull Up (J3)

See [Table 3](#) for jumper functions SCL Pull Up (J3).

Table 1. Jumper Functions (J1)

| SHUNT POSITION | DS1 POWER LED |
|----------------|---------------|
| 1-2* | Connected |
| Open | Disconnected |

*Default position.

Table 2. Jumper Functions (J2)

| SHUNT POSITION | DS2 FAULT LED |
|----------------|---------------|
| 1-2* | Connected |
| Open | Disconnected |

*Default position.

Table 3. Jumper Functions SCL Pull Up (J3)

| SHUNT POSITION | SCL VOLTAGE PULL UP |
|----------------|--|
| 1-2 | On-board 1.5k Ω Pull up to DVDD |
| Open | External Pull up |

*Default position.

Enable (J4)

The MAX25221/MAX25220 IC can be disabled acting on the EN pin, reducing the current consumption to its minimum value. Furthermore, an external digital signal can be used to enable/disable the IC (see [Table 4](#) and [Table 6](#)).

ADD_SEL I²C Slave Address—Mode (J5)

The IC's 7-bit I²C slave address can be selected between two options through the J5 jumper setting (see [Table 5](#)). Additionally, the stand-alone mode can be selected with this jumper.

External ADD control (J6)

For future improvement.

Default condition Open.

External Enable (J7)

The MAX25221/MAX25220 IC can be enabled or disabled acting GUI command **ENABLE_P** or external digital command (see [Table 6](#)).

Table 4. Jumper Functions Enable (J4)

| SHUNT POSITION | MAX25221/MAX25220 |
|----------------|---|
| 1-2* | Enable |
| Open** | External control from EN loop on board edge |
| 2-3 | Disable |

*Default position.

** J7 must be open.

Table 5. Jumper Functions (J5)

| SHUNT POSITION | MODE 7-BIT I ² C SLAVE ADDRESS |
|----------------|---|
| 1-2* | I ² C Mode: 0x52 |
| 2-3 | I ² C Mode: 0x42 |
| Open | Stand Alone |

*Default position.

Table 6. Jumper Functions (J7)

| SHUNT POSITION | MAX25221/MAX25220 |
|----------------|---|
| 1-2* | Enabled from GUI Control [ENABLE_PIN] |
| Open | Externally controlled through digital signal (EN at board edge) |

*Default position.

NVM Programming (J8, J13)

The EV kit is equipped with a low voltage boost regulator able to provide the VPROG voltage (8.5V) needed for NVM programmability. The VPROG is controlled by the GUI and enabled only during burning procedure. In order to use this feature, J13 jumper must be installed and J8 can be used to select the boost circuitry input voltage (see [Table 7](#) and [Table 8](#)).

FLT (J9)

Allows the Fault signal FLTB to be sent to GUI or an external device (see [Table 9](#)).

SCL (J10)

The SCL can be connected to MINIQUSB+ or external device (see [Table 10](#)).

Table 7. Jumper Functions (J8)

| SHUNT POSITION | VPROG BOOST INPUT VOLTAGE |
|----------------|---------------------------|
| 1-2 | MINIQUSB+ 3.3V |
| 2-3* | VIN |

*Default position.

Table 8. Jumper Functions (J13)

| SHUNT POSITION | VPROG BOOST OUTPUT VOLATGE |
|----------------|----------------------------|
| 1-2* | +8.5V power VPROG pin |
| Open | |

*Default position.

Table 9. Jumper Functions (J9)

| SHUNT POSITION | FLT SIGNAL |
|----------------|-------------------------------------|
| 1-2* | MINIQUSB+ 3.3V |
| Open | External Signal (FLT at board edge) |

*Default position.

Table 10. Jumper Functions (J10)

| SHUNT POSITION | SCL SIGNAL |
|----------------|-----------------|
| 1-2* | MINIQUSB+ 3.3V |
| Open | External Signal |

*Default position.

SDA (J11)

The SDA could be connected to GUI or external device (see [Table 11](#)).

Digital Domain Voltage (J12)

The EV kit exposes open-drain digital signals (FLT, SDA, and SCL) that are pulled up to what is referred as the “digital domain voltage.”

Digital domain voltage can be selected between the EV kit input voltage (VIN) and the fixed 3.3V provided by the MINIQUSB+. Alternatively, you can force an external voltage as digital reference (see [Table 12](#)).

SDA Pull Up (J17)

See [Table 13](#) for jumper functions SDA Pull Up (J17).

Table 11. Jumper Functions (J11)

| SHUNT POSITION | SDA SIGNAL |
|----------------|-----------------|
| 1-2* | MINIQUSB+ 3.3V |
| Open | External Signal |

*Default position.

Table 12. Jumper Functions (J12)

| SHUNT POSITION | DIGITAL DOMAIN |
|----------------|---------------------------------------|
| 1-2 | MINIQUSB+ 3.3V |
| 2-3* | VIN |
| Open | Externally provided (DVDD test point) |

*Default position.

Table 13. Jumper Functions SDA Pull Up (J17)

| SHUNT POSITION | SDA VOLTAGE PULL UP |
|----------------|--------------------------------|
| 1-2* | On-board 1.5kΩ Pull up to DVDD |
| open | External Pull up |

*Default position.

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VCOM only for MAX25221

The VCOM output voltage is programmed using I²C to a value between -2.49V and +1V with output peak currents between +/-120 mA.

The VCOM output could operate in two different ways.

VCOM without temperature compensation (see [Table 14](#)).

VCOM with temperature compensation.

The VCOM output voltage can be compensated for temperature changes using an external or internal temperature sensors, see [Table 15](#), [Table 16](#), and [Table 17](#).

For details of how to use the VCOM temperature compensation function, refer to the sections VCOM Temperature Compensation and VCOM Temperature Compensation Example in the MAX25220/MAX25221 Datasheet.

Table 14. VCOM without Temperature Compensation Registers

| REGISTER | DESCRIPTION | |
|----------|---|----------------------------------|
| TCOMP_EN | TCOMP_EN" bit in the DELAYVCOM_LS Register [0X08 Bit 1] | [0] disables this functionality. |
| VCOM25 | Sets the VCOM value between the range define from the registers VCOMMIN and VCOMMAX | |
| VCOMMIN | Define Minimum value of VCOM | |
| VCOMMAX | Define Maximum value of VCOM | |

*Default position.

Table 15. VCOM Temperature Compensation Setting Registers

| REGISTER | DESCRIPTION | |
|----------|--|---|
| TCOMP_EN | TCOMP_EN" bit in the DELAYVCOM_LSB Register [0X08 Bit 1] | [1] Enable [0] Disable |
| INT_SEN | int_sensor bit in the CONFIG register [0X07 Bit 7] select the sensor | [0] Internal Sensor [1]* External T Sensor |

*Default position.

Ordering Information

| PART | TYPE |
|----------------|-----------|
| MAX25221EVKIT# | EV Kit |
| MAX25221EVSYS# | EV System |

#Denotes RoHS compliant.

VPROG

The EV kit includes a Boost converter in order to supply 8.5V 25mA for programming. To perform non-volatile programming this voltage should be connected to the VPROG pin.

Verify the Jumpers status See [Table 7](#) and [Table 8](#).

Using the GUI send a BURN command, the VPROG_EN connected to SHDN pin enable the Boost converter for a time of 20ms.

All values in registers 0x07 to 0x15 will be stored in non-volatile memory.

Table 16. VTEMP Registers

| REGISTER | DESCRIPTION |
|----------|---|
| VTEMPL | Voltage at TEMP* pin corresponding to low-temperature breakpoint in VCOM compensation curve. |
| VTEMP25 | Voltage at TEMP* pin at 25°C |
| VTEMP_H1 | Voltage at TEMP pin corresponding to first high-temperature breakpoint in VCOM compensation curve. |
| VTEMP_H2 | Voltage at TEMP pin corresponding to second high-temperature breakpoint in VCOM compensation curve. |

Table 17. VCOM Registers

| REGISTER | DESCRIPTION |
|----------|--|
| VCOM_L | Delta VCOM at the temperature corresponding to VTEMP_L. This value sets the difference between the VCOM value at 25°C and that at VTEMP_L. |
| VCOM25 | Set the VCOM value at 25°C |
| VCOM_H1 | Delta VCOM at VTEMP_H1. This value sets the difference between the VCOM value at 25°C and that at VTEMP_H1. |
| VCOM_H2 | Delta VCOM at VTEMP_H2. This value sets the difference between the VCOM value at VTEMP_H1 and that at VTEMP_H2. |

MAX25221 Frequency Switch (FSW) 2.1MHz EV Kit Bill of Materials

The table below refers only to MAX25221 FSW 2.1MHz. For MAX25221 FSW 420kHz and MAX25220 see the dedicated tables to follow.

| ITEM | REF_DES | DNI/DNP | QTY | MFG PART # | MANUFACTURER | VALUE | DESCRIPTION | COMMENTS |
|------|---|---------|-----|--|--|----------------------|--|--|
| 1 | ADD, DVDD, IREF+, IREF-, TEMP+, TEMP- | - | 6 | 5005 | KEystone | N/A | TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.35IN; BOARD HOLE=0.083IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; | |
| 2 | AVDD, EN, FLT, GND1-GND7, HVINP, NAVDD, SCL, SDA, TFT_POWER_IN, VCOM, VGOFF, VGON, VIN, VPROG | - | 20 | 9020 | BUSS | WEICO WIRE | MAXIMPAD | EVK KIT PARTS; MAXIM PAD; WIRE; NATURAL; SOLID; WEICO WIRE; SOFT DRAWN BUS TYPE-S; 20AWG |
| 3 | C1-C3, C7, C19, C37, C38, C40 | - | 8 | CL10B106MQ8NRN | SAMSUNG ELECTRONICS | 10UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 10UF; 6.3V; TOL=20%; MODEL=CL SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 4 | C4, C10, C11, C13, C21, C23, C39 | - | 7 | GRM188R71E105KA12; CGA3E1X7R1E105K; TMK107B7105KA; 0603C105KAT2A; GCM188R71E105KA64; C1608X7R1E105K080AE; CGA3E1X7R1E105K080AC | MURATA;TDK;TAIYO YUDEN; AVX;MURATA;TAIYO YUDEN;TDK | 1UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 25V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 5 | C5, C9, C12, C22, C31, C52 | - | 6 | CC0603KRX7R0BB104; GRM188R72A104KA35; HMK107B7104KA; 06031C104KAT2A; GRM188R72A104K | YAGEO;MURATA;TAIYO YUDEN; AVX;MURATA | 0.1UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 100V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 6 | C6, C8, C34, C36 | - | 4 | GRM188R72A223KAC4; C0603C223K1RAC; HMK107B7223KA; C1608X7R2A223K080AA | MURATA;KEMET;TAIYO YUDEN;TDK | 22000PF | CAPACITOR; SMT (0603); CERAMIC CHIP; 22000PF; 100V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 7 | C14, C24-C26 | - | 4 | C0603C104K8RAC | KEMET | 0.1UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 10V; TOL=10%; MODEL=C0603 SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 8 | C18 | - | 1 | C0603C103K5RAC; GRM188R71H103K; C0603X7R500-103KNE; C1608X7R1H103K080AE | KEMET;MURATA;VENKEL LTD.;TDK | 0.01UF | CAPACITOR; SMT; 0603; CERAMIC; 0.01uF; 50V; 10%; X7R; -55degC to + 125degC | |
| 9 | C27, C29 | - | 2 | C1210C106M3RAC; GRM32DR71E106M; C3225X7R1E106M250AC | KEMET;MURATA;TDK | 10UF | CAPACITOR; SMT (1210); CERAMIC CHIP; 10UF; 25V; TOL=20%; MODEL=; TG=-55 DEGC TO +125 DEGC; TC=X7R; | |
| 10 | C30 | - | 1 | GRM188R61H25K5E11 | MURATA | 2.2UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 2.2UF; 50V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R | |
| 11 | C33, C35 | - | 2 | UMK107BJ105KA; C1608X5R1H105K080AB; CL10A105KB8NNN; GRM188R61H105KAAL | TAIYO YUDEN;TDK;SAMSUNG; MURATA | 1UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 50V; TOL=10%; MODEL=_MK SERIES; TG=-55 DEGC TO +85 DEGC | |
| 12 | C47 | - | 1 | C0603C100K1GAC | KEMET | 10PF | CAPACITOR; SMT (0603); CERAMIC CHIP; 10PF; 100V; TOL=10%; MODEL=C0G; TG=-55 DEGC TO +125 DEGC; TC=+/- | |
| 13 | C50, C51 | - | 2 | GCM31CR71A226KE02 | MURATA | 22UF | CAP; SMT (1206); 22UF; 10%; 10V; X7R; CERAMIC CHIP | |
| 14 | D3 | - | 1 | NRVTS245ESFT1G | ON SEMICONDUCTOR | NRVTS245ESFT1G | DIODE; SCH; SMT (SOD-123FL); PIV=45V; IF=2.0A | |
| 15 | D4-D6 | - | 3 | BAT54S | FAIRCHILD SEMICONDUCTOR | BAT54S | DIODE; SCH; SCHOTTKY DIODE; SMT (SOT-23); PIV=30V; IF=0.2A | |
| 16 | D7 | - | 1 | CMDSH05-4 | CENTRAL SEMICONDUCTOR CORP | CMDSH05-4 | DIODE; SCH; SURFACE MOUNT LOW VF SILICON SCHOTTKY DIODE; SMT (SOD-323); PIV=40V; IF=0.5A | |
| 17 | DS1 | - | 1 | LTST-C170GKT | LITE-ON ELECTRONICS INC | LTST-C170GKT | DIODE; LED; STANDARD; GREEN; SMT (0805); PIV=2.1V; IF=0.01A | |
| 18 | DS2, DS3 | - | 2 | LTST-C170EKT | LITE-ON ELECTRONICS INC | LTST-C170EKT | DIODE; LED; STANDARD; RED; SMT (0805); PIV=2.0V; IF=0.02A | |
| 19 | J1-J3, J6, J7, J9-J11, J13, J17 | - | 10 | PBC02SAAN | SULLINS ELECTRONICS CORP. | PBC02SAAN | EVKIT PART-CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS; -65 DEGC TO +125 DEGC; | |
| 20 | J4, J5, J8, J12 | - | 4 | PEC03SAAN | SULLINS ELECTRONICS CORP. | PEC03SAAN | EVKIT PART-CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS; -65 DEGC TO +125 DEGC; | |
| 21 | J14 | - | 1 | 803-87-020-20-001101 | PRECI-DIP SA | 803-87-020-20-001101 | EVKIT PART-CONNECTOR; FEMALE; TH; DOUBLE ROW; 2.54MM; RIGHT ANGLE SOLDER TAIL; MATING PIN DIA 0.76MM; RIGHT ANGLE; 20PINS; | |
| 22 | J15 | - | 1 | 61301021121 | WURTH ELECTRONICS INC | 61301021121 | CONNECTOR; MALE; THROUGH HOLE; 2.54 DUAL PIN HEADER; STRAIGHT; 10PINS | |
| 23 | J16 | - | 1 | DF11-6DP-2DSA(24) | HIROSE ELECTRIC CO LTD | DF11-6DP-2DSA(24) | CONNECTOR; MALE; THROUGH HOLE; DF11 SERIES; DOUBLE-ROW CONNECTOR; STRAIGHT; 6PINS; | |
| 24 | L1 | - | 1 | ETQ-P3M1R0YFN | PANASONIC | 1UH | INDUCTOR; SMT; COMPOSITE; 1UH; 20%; 10.7A | |
| 25 | L2 | - | 1 | LQH32CN220K23 | MURATA | 22UH | INDUCTOR; 1210; 22UH; +/-10%; 0.25A; -40DEGC TO +85DEGC | |
| 26 | L3, L4 | - | 2 | 74437324022 | WURTH ELECTRONICS INC | 2.2UH | INDUCTOR; SMT; SHIELDED; 2.2UH; 20%; 3.25A | |
| 27 | MH1-MH4 | - | 4 | 91772A108; PHILLIPS-PAN-4-40X3/8IN; PMSSS4400038PH; 9901 | GENERIC PART | N/A | MACHINE SCREW; PHILLIPS; PAN; 4-40; 3/8IN; 18-8 STAINLESS STEEL; | |
| 28 | MH1-MH4 | - | 4 | MCH_SO_F_HEX_4-40X1/2 | GENERIC PART | N/A | STANDOFF; FEMALE-THREADED; HEX; 4-40; 1/2IN; ALUMINUM | |
| 29 | Q1 | - | 1 | BCP5516TA | DIODES INCORPORATED | BCP5516TA | TRAN; NPN MEDIUM POWER TRANSISTOR; NPN; SOT-223; PD-(2W); I-(1A); V-(60V) | |
| 30 | Q2 | - | 1 | IRLML6346 | INTERNATIONAL RECTIFIER | IRLML6346 | TRAN; HEXFET POWER MOSFET; NCH; SOT-23; PD-(1.3W); I-(0.00025A); V-(30V) | |

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MAX25221 Frequency Switch (FSW) 2.1Mhz EV Kit Bill of Materials (continued)

The table below refers only to MAX25221 FSW 2.1MHz. For MAX25221 FSW 420kHz and MAX25220 see the dedicated tables to follow.

| ITEM | REF_DES | DNI/DNP | QTY | MFG PART # | MANUFACTURER | VALUE | DESCRIPTION | COMMENTS |
|-------|--------------------|---------|-----|---|--|----------------|---|----------|
| 31 | Q3 | - | 1 | BSS84 | FAIRCHILD SEMICONDUCTOR | BSS84 | ENHANCEMENT MODE FIELD EFFECT TRANSISTOR, P-CHANNEL, SOT-23, PD=0.38W, ID=-0.13A, VDSS=-50V, -55degC TO +150degC | |
| 32 | R1, R2, R26 | - | 3 | CR0603-FX-1001ELF | BOURNS | 1K | RESISTOR; 0603; 1K OHM; 1%; 100PPM; 0.10W; THICK FILM | |
| 33 | R3 | - | 1 | CRCW06033K40FK | VISHAY DALE | 3.4K | RESISTOR; 0603; 3.4K OHM; 1%; 100PPM; 0.10W; THICK FILM | |
| 34 | R4, R6 | - | 2 | CRCW06031K50FK | VISHAY DALE | 1.5K | RESISTOR; 0603; 1.5K; 1%; 100PPM; 0.10W; THICK FILM | |
| 35 | R5 | - | 1 | CHPHT0603K1002FGT | VISHAY SFERNICE | 10K | RESISTOR; 0603; 10K OHM; 1%; 100PPM; 0.0125W; THICK FILM | |
| 36 | R7 | - | 1 | CRCW0603330RFF | VISHAY DALE | 330 | RESISTOR; 0603; 330 OHM; 1%; 100PPM; 0.10W; THICK FILM | |
| 37 | R8, R14 | - | 2 | RC1608J000CS;CR0603-J/-000ELF;RC0603JR-070RL | SAMSUNG ELECTRONICS;BOURNS; YAGEO PH | 0 | RESISTOR; 0603; 0 OHM; 5%; JUMPER; 0.10W; THICK FILM | |
| 38 | R10 | - | 1 | ERJ-3GEYJ242 | PANASONIC | 2.4K | RESISTOR; 0603; 2.4K OHM; 5%; 200PPM; 0.10W; THICK FILM | |
| 39 | R12 | - | 1 | CRCW06031K00FK; ERJ-3EKF1001 | VISHAY DALE;PANASONIC | 1K | RESISTOR; 0603; 1K; 1%; 100PPM; 0.10W; THICK FILM | |
| 40 | R19 | - | 1 | ANY | ANY | 0 | RESISTOR; 0603; 0 OHM; 0%; JUMPER; 0.10W; THICK FILM; FORMFACTOR | |
| 41 | R21, R22 | - | 2 | CRCW0603100KFK; RC0603FR-07100KL; RC0603FR-13100KL; ERJ-3EKF1003; AC0603FR-07100KL | VISHAY DALE;YAGEO;YAGEO; PANASONIC | 100K | RESISTOR; 0603; 100K; 1%; 100PPM; 0.10W; THICK FILM | |
| 42 | R23 | - | 1 | CRCW0603510KFK | VISHAY DALE | 510K | RESISTOR; 0603; 510K; 1%; 100PPM; 0.10W; THICK FILM | |
| 43 | R24 | - | 1 | CRCW060386K6FK | VISHAY DALE | 86.6K | RESISTOR; 0603; 86.6K OHM; 1%; 100PPM; 0.10W; THICK FILM | |
| 44 | R25 | - | 1 | CRCW060310K0FK; ERJ-3EKF1002 | VISHAY DALE;PANASONIC | 10K | RESISTOR; 0603; 10K; 1%; 100PPM; 0.10W; THICK FILM | |
| 45 | RT1 | - | 1 | NCU18XH103F6S | MURATA | 10K | THERMISTOR; SMT (0603); 10K; TOL=+/-1% | |
| 46 | TP_GND1, TP_GND2 | - | 2 | 5006 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.35IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; | |
| 47 | U1 | - | 1 | MAX25221ATJ/V+ | MAXIM | MAX25221ATJ/V+ | EVKIT PART - IC; AUTOMOTIVE 4-CHANNEL TFT-LCD POWER SUPPLY WITH VCOM; PACKAGE OUTLINE DRAWING 21-0140; LAND PATTERN DRAWING: 90-0603; PACKAGE CODE: T3255-6C; TQFN32-EP | |
| 48 | U2 | - | 1 | MAX8571EUT+ | MAXIM | MAX8571EUT+ | IC; CONV; HIGH-EFFICIENCY LCD BOOST WITH TRUE SHUTDOWN; SOT23-6 | |
| 49 | PCB | - | 1 | MAX25221 | MAXIM | PCB | PCB:MAX25221 | - |
| 50 | C15, C16, C48, C49 | DNP | 0 | 0603YC101KAT2A | AVX | 100PF | CAPACITOR; SMT (0603); CERAMIC CHIP; 100PF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 51 | C17 | DNP | 0 | C0603C103K5RAC; GRM188R71H103K; C0603X7R500-103KNE; C1608X7R1H103K080AE | KEMET;MURATA;VENKEL LTD.;TDK | 0.01UF | CAPACITOR; SMT; 0603; CERAMIC; 0.01uF; 50V; 10%; X7R; -55degC to + 125degC | |
| 52 | C20, C41, C42 | DNP | 0 | GRM188R71E105KA12; CGA3E1X7R1E105K; TMK107B7105KA; 06033C105KAT2A; GCM188R71E105KA64; C1608X7R1E105K080AE; CGA3E1X7R1E105K080AC | MURATA;TDK;TAIYO YUDEN;AVX; MURATA;TAIYO YUDEN;TDK | 1UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 25V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 53 | C28 | DNP | 0 | GRM188R61H225KE11 | MURATA | 2.2UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 2.2UF; 50V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R | |
| 54 | C32 | DNP | 0 | CC0603KRX7R0BB104; GRM188R72A104KA35; HMK107B7104KA; 06031C104KAT2A; GRM188R72A104K | YAGEO;MURATA;TAIYO YUDEN; AVX;MURATA | 0.1UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 100V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 55 | C43-C46 | DNP | 0 | C1210C106M3RAC; GRM32DR71E106M; C3225X7R1E106M250AC | KEMET;MURATA;TDK | 10UF | CAPACITOR; SMT (1210); CERAMIC CHIP; 10UF; 25V; TOL=20%; MODEL=; TG=-55 DEGC TO +125 DEGC; TC=X7R; | |
| 56 | R9, R11, R18 | DNP | 0 | RC1608J000CS; CR0603-J/-000ELF; RC0603JR-070RL | SAMSUNG ELECTRONICS;BOURNS; YAGEO PH | 0 | RESISTOR; 0603; 0 OHM; 5%; JUMPER; 0.10W; THICK FILM | |
| 57 | R15, R16, R27, R28 | DNP | 0 | CRCW060310R0FK; MCR03E2PFX10R0; ERJ-3EKF10R0 | VISHAY DALE;ROHM | 10 | RESISTOR; 0603; 10 OHM; 1%; 100PPM; 0.10W; THICK FILM | |
| 58 | R17 | DNP | 0 | CHPHT0603K1002FGT | VISHAY SFERNICE | 10K | RESISTOR; 0603; 10K OHM; 1%; 100PPM; 0.0125W; THICK FILM | |
| 59 | R20 | DNP | 0 | N/A | N/A | 0 | RESISTOR; 0603; 0 OHM; 0%; JUMPER; 0.10W; THICK FILM; FORMFACTOR | |
| TOTAL | | | 128 | | | | | |

Note: DNI—DO NOT INSTALL (PACKOUT); DNP—DO NOT PROCURE.

MAX25221 Frequency Switch 420Khz EV Kit Bill of Materials

The table below refers only to MAX25221 FSW 420kHz.

| REF_DES | QTY | VALUE | DNI/DNP* | DESCRIPTION | MFG PART # | MFG |
|------------------|-----|----------|----------|--|---|--------------------------|
| C6, C8, C34, C36 | 4 | 100000PF | - | CAPACITOR; SMT (0603); CERAMIC CHIP; 100000PF; 100V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | GRM188R72A104KA35D | MURATA |
| C43-C44 | 2 | 10UF | DNP | CAPACITOR; SMT (1210); CERAMIC CHIP; 10UF; 25V; TOL=20%; MODEL=; TG=-55 DEGC TO +125 DEGC; TC=X7R; | C1210C106M3RAC; GRM32DR71E106M; C3225X7R1E106M250AC | KEMET |
| L3, L4 | 2 | 10UH | - | INDUCTOR; SMT; SHIELDED; 10UH; 20%; 3.25A | 74437346100 | WURTH ELECTRONICS INC |

Note: DNI—DO NOT INSTALL (PACKOUT); DNP—DO NOT PROCURE.

MAX25221 Evaluation Kit/
MAX25221 Evaluation System

Evaluates: MAX25220, MAX25221

MAX25220 EV Kit Bill of Materials

For the MAX25220 EV kit refer to the MAX25221 EV kit Bill of Materials and make the necessary changes from the table below.

| REF_DES | QTY | VALUE | DNI/DNP* | DESCRIPTION | MFG PART # | MFG |
|---------|-----|---------------|----------|--|---|---|
| C18 | 1 | 0.01UF | DNI | CAPACITOR; SMT; 0603; CERAMIC; 0.01uF; 50V; 10%; X7R; -55degC to + 125degC | C0603C103K5RAC. GRM188R71H103K. C0603X7R500-103KNE. C1608X7R1H103K080AE | KEMET. MURATA. VENKEL LTD. TDK |
| C21 | 1 | 1UF | DNI | CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 25V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | GRM188R71E105KA12. CGA3E1X7R1E105K. TMK107B7105KA. 06033C105KAT2A. GCM188R71E105KA64. C1608X7R1E105K080AE. CGA3E1X7R1E105K080AC | MURATA. TDK. TAIYO YUDEN. AVX. MURATA. TAIYO YUDEN. TDK |
| C52 | 1 | 0.1UF | DNI | CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 100V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | CC0603KRX7R0BB104 GRM188R72A104KA35. GCJ188R72A104KA01. HMK107B7104KA. 06031C104KAT2A | YAGEO MURATA. MURATA. TAIYO YUDEN. AVX |
| Q1 | 1 | BCP5516TA | DNI- | TRAN; NPN MEDIUM POWER TRANSISTOR; NPN; SOT-223; PD-(2W); I-(1A); V-(60V) | BCP5516TA | DIODES INCORPORATED |
| R7 | 1 | 330 | DNI | RESISTOR; 0603; 330 OHMS; 1%; 100PPM; 0.10W; THICK FILM | CRCW0603330RFB | VISHAY DALE |
| R8, R14 | 2 | 0 | DNI | RESISTOR; 0603; 0 OHM; 5%; JUMPER; 0.10W; THICK FILM | RC1608J000CS. CR0603-J/-000ELF. RC0603JR-070RL | SAMSUNG ELECTRONICS. BOURNS. YAGEO PH |
| R10 | 1 | 2.4K | DNI | RESISTOR; 0603; 2.4K OHM; 5%; 200PPM; 0.10W; THICK FILM | ERJ-3GEYJ242 | PANASONIC |
| R12 | 1 | 1K | DNI | RESISTOR; 0603; 1K; 1%; 100PPM; 0.10W; THICK FILM | CRCW06031K00FK. ERJ-3EKF1001 | VISHAY DALE. PANASONIC. |
| RT1 | 1 | 10K | DNI | THERMISTOR; SMT (0603); 10K; TOL=+/-1% | NCU18XH103F6S | MURATA. |
| U1 | 1 | MAX252210TJV+ | - | EVKIT PART - IC; AUTOMOTIVE 4-CHANNEL TFT-LCD POWER SUPPLY WITHVOUT COM; PACKAGE OUTLINE DRAWING: 21-0140; LAND PATTERN DRAWING: 90-0121; TQFN32-EP | MAX25220ATJV+ | MAXIM |

Note: DNI—DO NOT INSTALL (PACKOUT); DNP—DO NOT PROCURE.

MAX25221 EV Kit Schematic

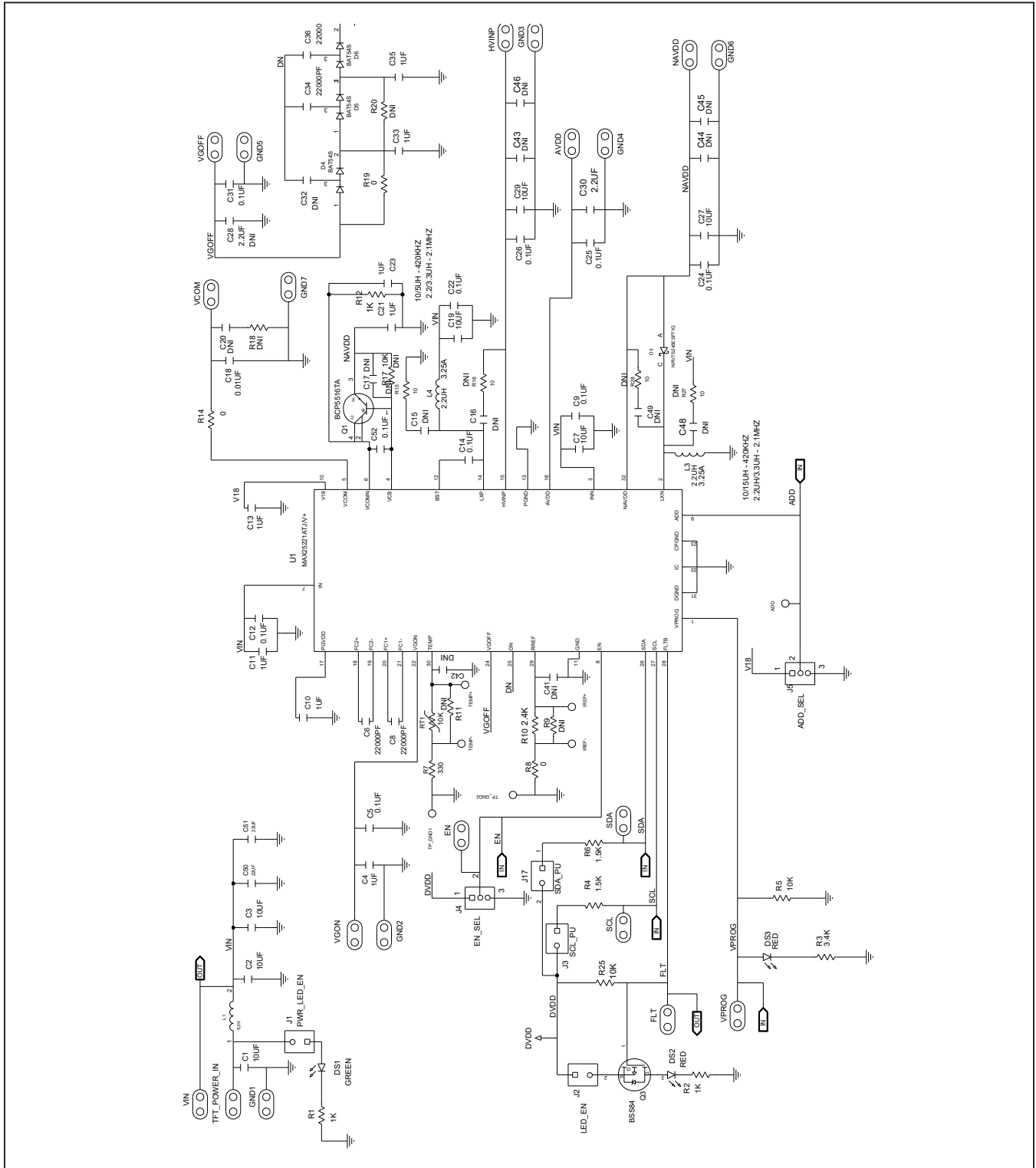


Figure 2. MAX25221 EV Kit Schematic 1-2

MAX25221 EV Kit Schematic (continued)

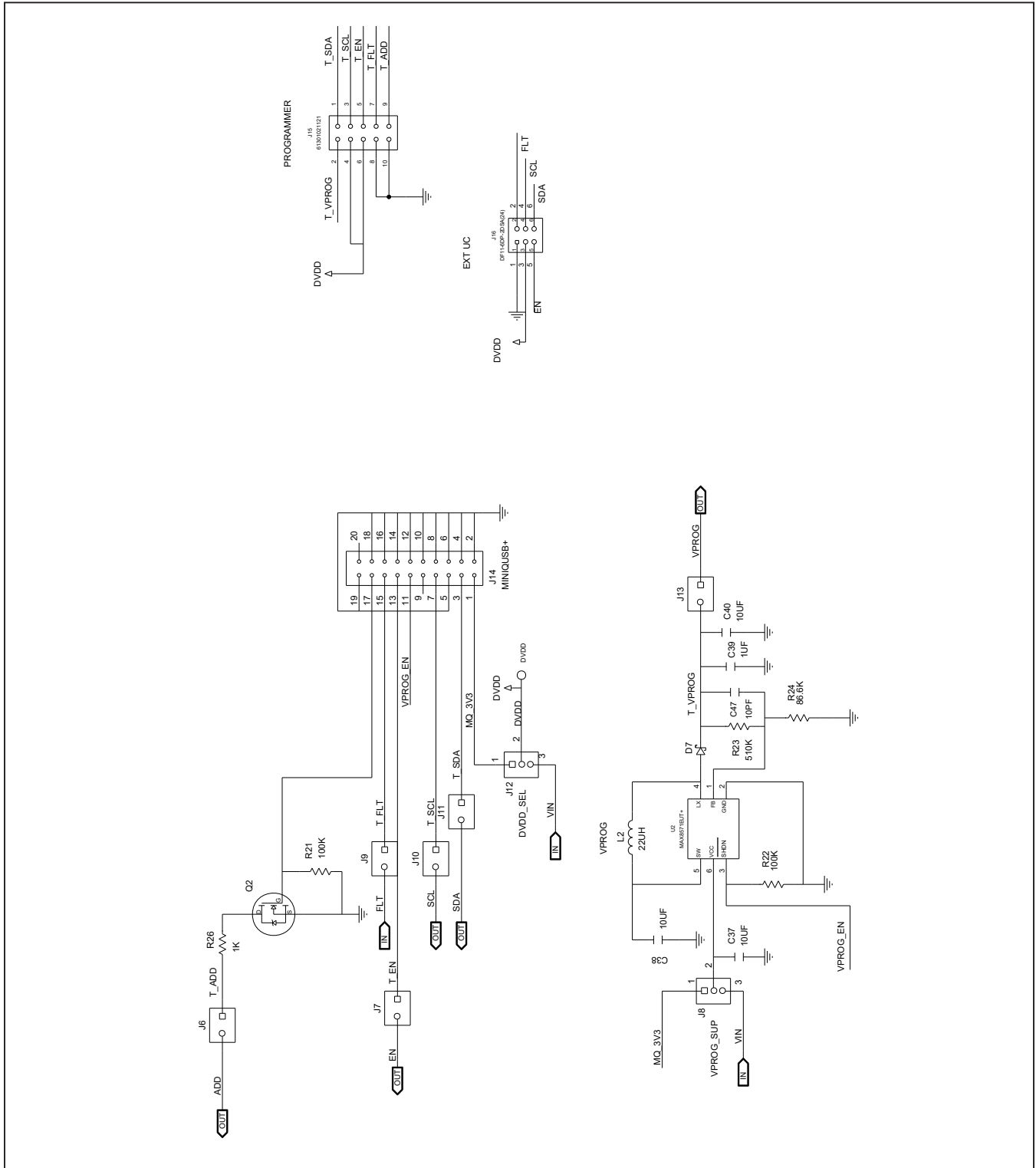
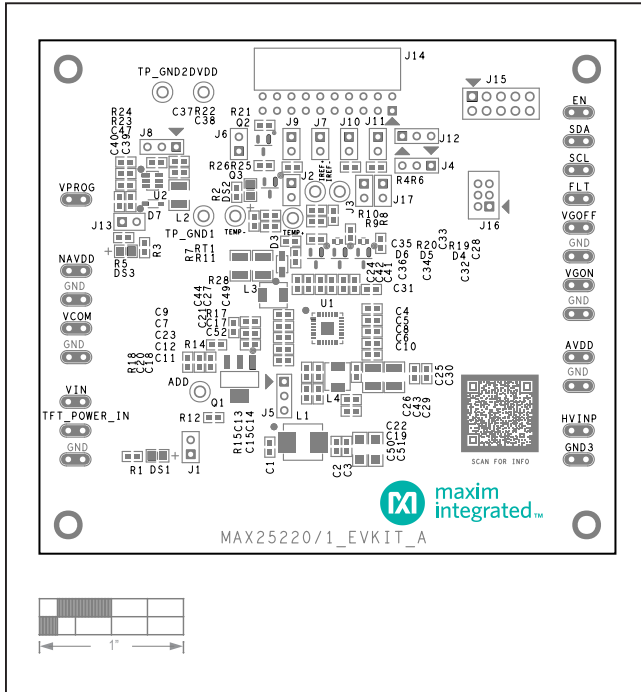


Figure 3. MAX25221 EV Kit Schematic 2-2

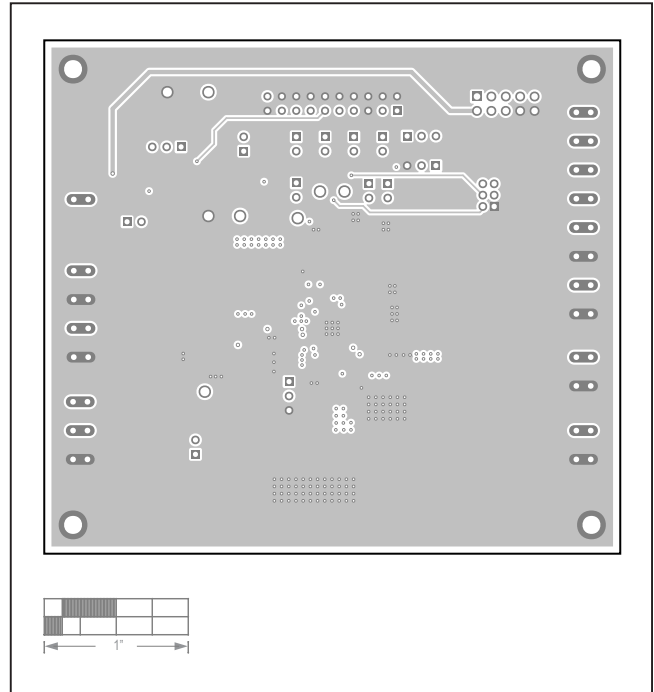
MAX25221 Evaluation Kit/
MAX25221 Evaluation System

Evaluates: MAX25220, MAX25221

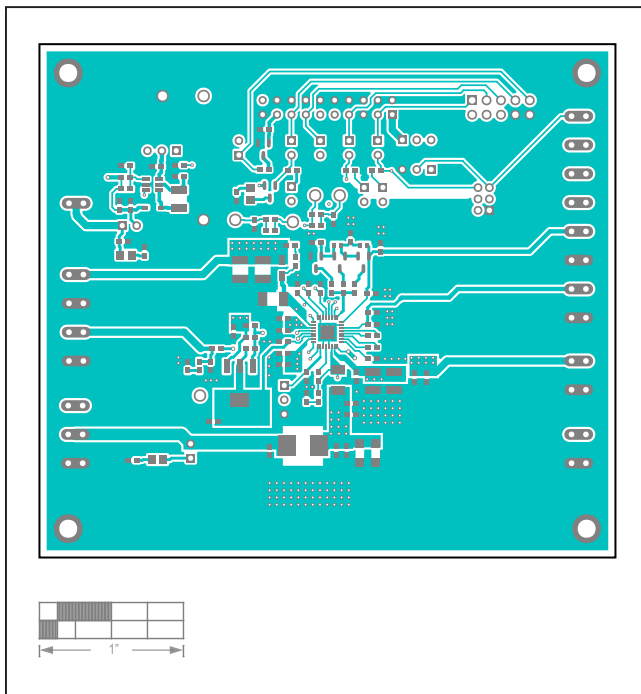
MAX25221 EV Kit PCB Layouts



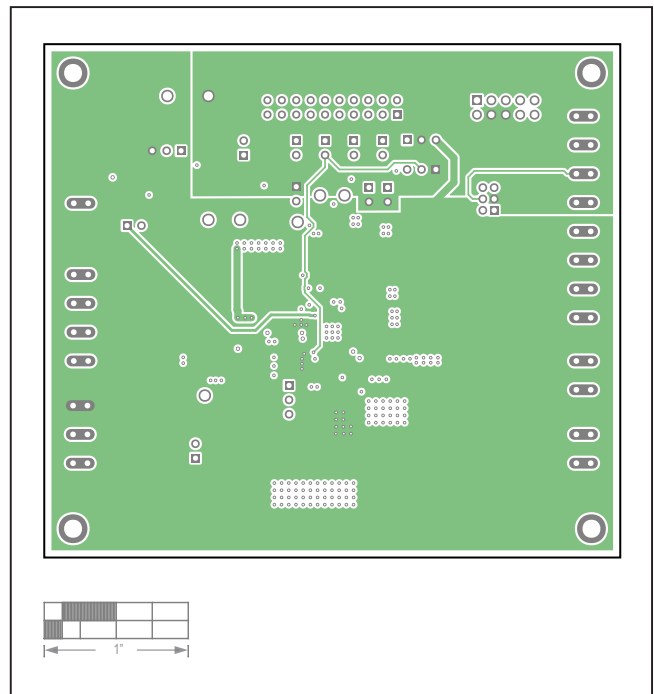
MAX25221 EV Kit Component Placement Guide—Top Silkscreen



MAX25221 EV Kit PCB Layout—Internal Layer2

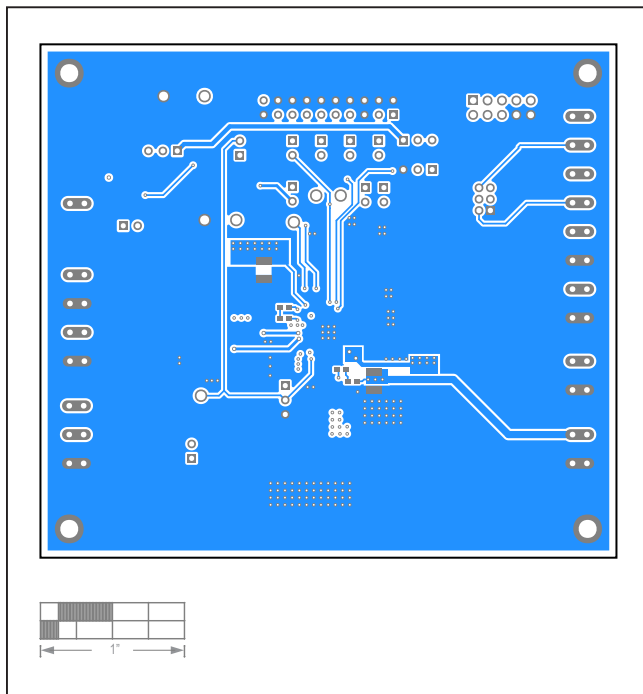


MAX25221 EV Kit PCB Layout—Top Layer+

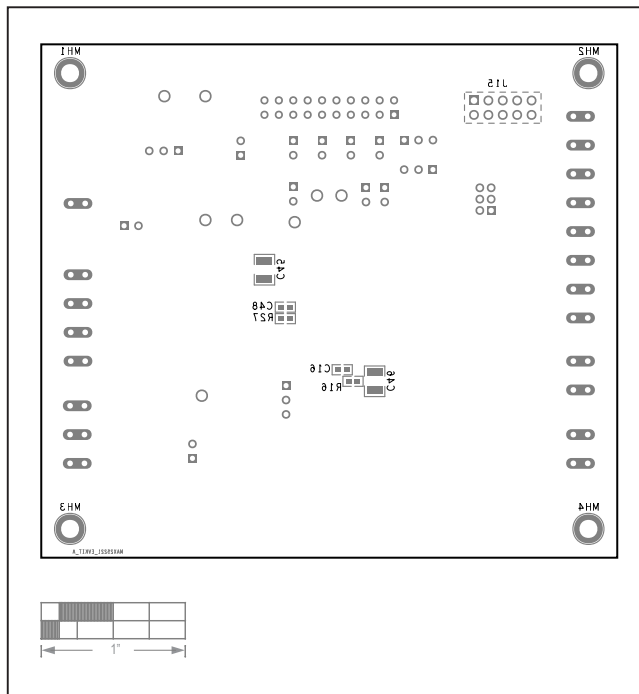


MAX25221 EV Kit PCB Layout—Internal Layer3

MAX25221 EV Kit PCB Layouts (continued)



MAX25221 EV Kit PCB Layout—Bottom Layer



MAX25221 EV Kit PCB Layout—Bottom Components

MAX25221 Evaluation Kit/
MAX25221 Evaluation System

Evaluates: MAX25220, MAX25221

Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|-----------------|---------------|-----------------|---------------|
| 0 | 6/20 | Initial release | — |

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