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## DG1208, DG1209 Evaluation Kits

Evaluates: DG1208, DG1209

### General Description

The DG1208/DG1209 evaluation kits (EV kits) provide a proven design to evaluate the DG1208/DG1209, low-leakage and low-charge-injection multiplexer devices. The DG1208EVKIT# and DG1209EVKIT# are fully assembled and tested, and come populated with the DG1208EUE+ and DG1209EUE+ multiplexers, respectively. The DG1208 is a single 8-to-1 multiplexing device; the DG1209 is a dual 4-to-1 device. Both multiplexer devices are available in 4mm x 4mm 16-lead TQFN or 16-lead TSSOP packages.

### Features

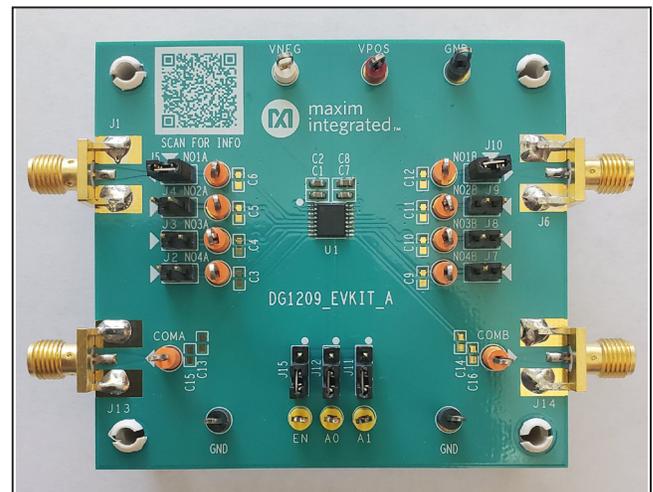
- SMA Connectors for Analog Inputs and Outputs
- Jumpers at Enable and Address Selection Inputs for Easy Configuration
- Test Points for All Digital and Analog Signals
- Fully Assembled and Tested
- Proven PCB Layout

*[Ordering Information](#) appears at end of data sheet.*

### DG1208 Evaluation Kit Board Photo



### DG1209 Evaluation Kit Board Photo



## DG1208EVKIT# Quick Start

### Recommended Equipment

- DG1208EVKIT#
- ±20V, 100mA tri-output DC power supply
- Digital multimeter

### Procedure

The DG1208EVKIT# is fully assembled and tested. Follow the steps below to verify board operation:

- 1) Connect the tri-output power supply to the DG1208EVKIT#:
  - Set the positive voltage supply to +15V and connect to the VPOS test point.
  - Set the negative voltage supply to -15V and connect to the VNEG test point.
  - Connect the return of the power supply to GND test point.
- 2) Verify that all jumpers are in their default positions as shown in [Table 1](#).
- 3) Turn on the power supply. Ensure that both positive and negative supplies have less than 1mA (max).
- 4) Move the shunt at J15 to position 1–2 to enable the device. Verify the voltage at the EN test point is 15V.
- 5) Measure the on-resistance of channel 1 between COM and NO1 at 100Ω (typ).
- 6) Move the shunt at J14 from position 2–3 to position 1–2. Verify the voltage at the A0 test point is 15V.
- 7) Measure the on-resistance of channel 2 between COM and NO2 at 100Ω (typ).
- 8) Repeat steps 6 and 7 to test all 8 channels. Verify the on-resistance of each channel is 100Ω (typ). Use the relations in [Table 2](#) to set the jumpers at A2–A0 selection inputs.

**Table 1. DG1208 EV Kit Shunt Positions**

JUMPER	SHUNT POSITION	DESCRIPTION
<b>NO_CHANNELS</b>		
J10	Open	Disconnect NO1 to SMA connector J6.
	1–2*	Connect NO1 to SMA connector J6.
J9	Open*	Disconnect NO2 to SMA connector J6.
	1–2	Connect NO2 to SMA connector J6.
J8	Open*	Disconnect NO3 to SMA connector J6.
	1–2	Connect NO3 to SMA connector J6.
J7	Open*	Disconnect NO4 to SMA connector J6.
	1–2	Connect NO4 to SMA connector J6.
J5	Open*	Disconnect NO5 to SMA connector J1.
	1–2	Connect NO5 to SMA connector J1.
J4	Open*	Disconnect NO6 to SMA connector J1.
	1–2	Connect NO6 to SMA connector J1.
J3	Open*	Disconnect NO7 to SMA connector J1.
	1–2	Connect NO7 to SMA connector J1.
J2	Open*	Disconnect NO8 to SMA connector J1.
	1–2	Connect NO8 to SMA connector J1.
<b>CONTORL INPUTS</b>		
J11	1–2	Connect the selection input A2 to high.
	2–3*	Connect the selection input A2 to low.
J12	1–2	Connect the selection input A1 to high.
	2–3*	Connect the selection input A1 to low.
J14	1–2	Connect the selection input A0 to high.
	2–3*	Connect the selection input A0 to low.
J15	1–2	Enable the device.
	2–3*	Disable the device; all channels are switched off.

\*Default position.

**Table 2. DG1208 EV Kit Control Logic**

A2	A1	A0	EN	CH. SWITCH ON
X	X	X	0	All Channel Switched Off
0	0	0	1	NO1
0	0	1	1	NO2
0	1	0	1	NO3
0	1	1	1	NO4
1	0	0	1	NO5
1	0	1	1	NO6
1	1	0	1	NO7
1	1	1	1	NO8

Example to measure channel 5:

- Set the shunt at J11 at position 1–2 (A2 = 1).
- Set the shunt at J12 at position 2–3 (A1 = 1).
- Set the shunt at J14 at position 2–3 (A0 = 1).
- Measure the on-resistance of channel 5 between the NO5 and COM test points.

### DG1209EVKIT# Quick Start

#### Recommended Equipment

- DG1209EVKIT#
- ±20V, 100mA tri-output DC power supply
- Digital multimeter

#### Procedure

The DG1209EVKIT# is fully assembled and tested. Follow the steps below to verify board operation:

- 1) Connect the tri-output power supply to the DG1209EVKIT#:
  - Set the positive voltage supply to +15V and connect to the VPOS test point.

- Set the negative voltage supply to -15V and connect to the VNEG test point.
  - Connect the return of the power supply to GND test point.
- 2) Verify that all jumpers are in their default positions as shown in [Table 3](#).
  - 3) Turn on the power supply. Ensure that both positive and negative supplies have less than 1mA (max).
  - 4) Move the shunt at J15 to position 1–2 to enable the device. Verify the voltage at the EN test point is 15V.
  - 5) Measure the on-resistance of channel 1A between COMA and NO1A at 100Ω (typ).
  - 6) Move the shunt at J12 from position 2–3 to position 1–2. Verify the voltage at A0 test point is 15V.
  - 7) Measure the on-resistance of channel 2A between COMA and NO2A at 100Ω (typ).
  - 8) Repeat steps 6 and 7 to test all 8 channels. Verify the on-resistance of each channel is 100Ω (typ). Use the relations in [Table 4](#) to set the jumpers at the A1 and A0 selection inputs.

**Table 3. DG1209 EV Kit Shunt Positions**

JUMPER	SHUNT POSITION	DESCRIPTION
<b>NO_CHANNELS</b>		
J5	Open	Disconnect NO1A to SMA connector J1.
	1-2*	Connect NO1A to SMA connector J1.
J4	Open*	Disconnect NO2A to SMA connector J1.
	1-2	Connect NO2A to SMA connector J1.
J3	Open*	Disconnect NO3A to SMA connector J1.
	1-2	Connect NO3A to SMA connector J1.
J2	Open*	Disconnect NO4A to SMA connector J1.
	1-2	Connect NO4A to SMA connector J1.
J10	Open	Disconnect NO1B to SMA connector J6.
	1-2*	Connect NO1B to SMA connector J6.
J9	Open*	Disconnect NO2B to SMA connector J6.
	1-2	Connect NO2B to SMA connector J6.
J8	Open*	Disconnect NO3B to SMA connector J6.
	1-2	Connect NO3B to SMA connector J6.
J7	Open*	Disconnect NO4B to SMA connector J6.
	1-2	Connect NO4B to SMA connector J6.
<b>CONTORL INPUTS</b>		
J11	1-2	Connect the selection input A1 to high.
	2-3*	Connect the selection input A1 to low.
J12	1-2	Connect the selection input A0 to high.
	2-3*	Connect the selection input A0 to low.
J15	1-2	Enable the device.
	2-3*	Disable the device; all channels are switched off.

\*Default position.

**Table 4. DG1209 EV Kit Control Logic**

A1	A0	EN	CH. SWITCH ON
X	X	0	All Channel Switched Off
0	0	1	NO1A, NO1B
0	1	1	NO2A, NO2B
1	0	1	NO3A, NO3B
1	1	1	NO4A, NO4B

Example – to measure the channel 3B:

- Set the shunt at J11 at position 1-2 (A1 = 1).
- Set the shunt at J12 at position 2-3 (A0 = 1).
- Measure the on-resistance of channel 3B between NO3B and COMB test points.

### Detailed Description

The DG1208 and DG1209 continue the Maxim’s family of low-leakage and low-charge-injection multiplexers. The DG1208/DG1209 EV kits have multiple SMA connectors, test points, and jumpers for inputs and outputs, allowing easy configuration and evaluation.

The DG1208/DG1209 EV kits can be powered from either a bipolar supply or a single supply with nominal voltage up to 20V. Digital Inputs A<sub>-</sub> and EN can be configured high or low using on-board jumpers, or directly from the test points. Each analog input and output can be accessed from the SMA connector, as well as the test point associated with them.

### Configure the DG1208/DG1209 EV Kits

On the DG1208/DG1209 EV kits, every analog and digital channel has their own test points. The output channels have dedicated SMA connectors; each four input channels share an SMA connector. See [Table 1](#) and [Table 3](#) for the shunt positions to connect SMA to correct analog channels.

Use the relations in [Table 5](#) and [Table 6](#) to find the test point functions when evaluating the DG1208 or DG1209.

### Control Logic

The DG1208 EV kit uses three selection inputs A2, A1 and A0, and an enable input EN to determine the switching logic. The DG1209 EV kit uses two selection inputs A1 and A0, and an enable input EN. See [Table 2](#) and [Table 4](#) for detailed control logic.

**Table 5. DG1208 EV Kit Test Points**

TEST POINTS	DESCRIPTION
COM	COM output channel
GND	Ground reference
VPOS	Positive power supply
VNEG	Negative power supply
A2, A1, A0	Address selection inputs
EN	Enable input
NO8–NO1	NO_ input channels
J1, J6	SMA connectors for NO_ inputs
J13	SMA connector for COM output

**Table 6. DG1209 EV Kit Test Points**

TEST POINTS	DESCRIPTION
COMA, COMB	COMA, COMB output channel
GND	Ground reference
VPOS	Positive power supply
VNEG	Negative power supply
A1, A0	Address selection inputs
EN	Enable input
NO4A–NO1A NO4B–NO1B	NO_ input channels
J1, J6	SMA connectors for NO_ inputs
J13, J14	SMA connectors for COMA, COMB outputs

### Ordering Information

PART	TYPE
DG1208EVKIT#	EV Kit
DG1209EVKIT#	EV Kit

#Denotes RoHS compliance.

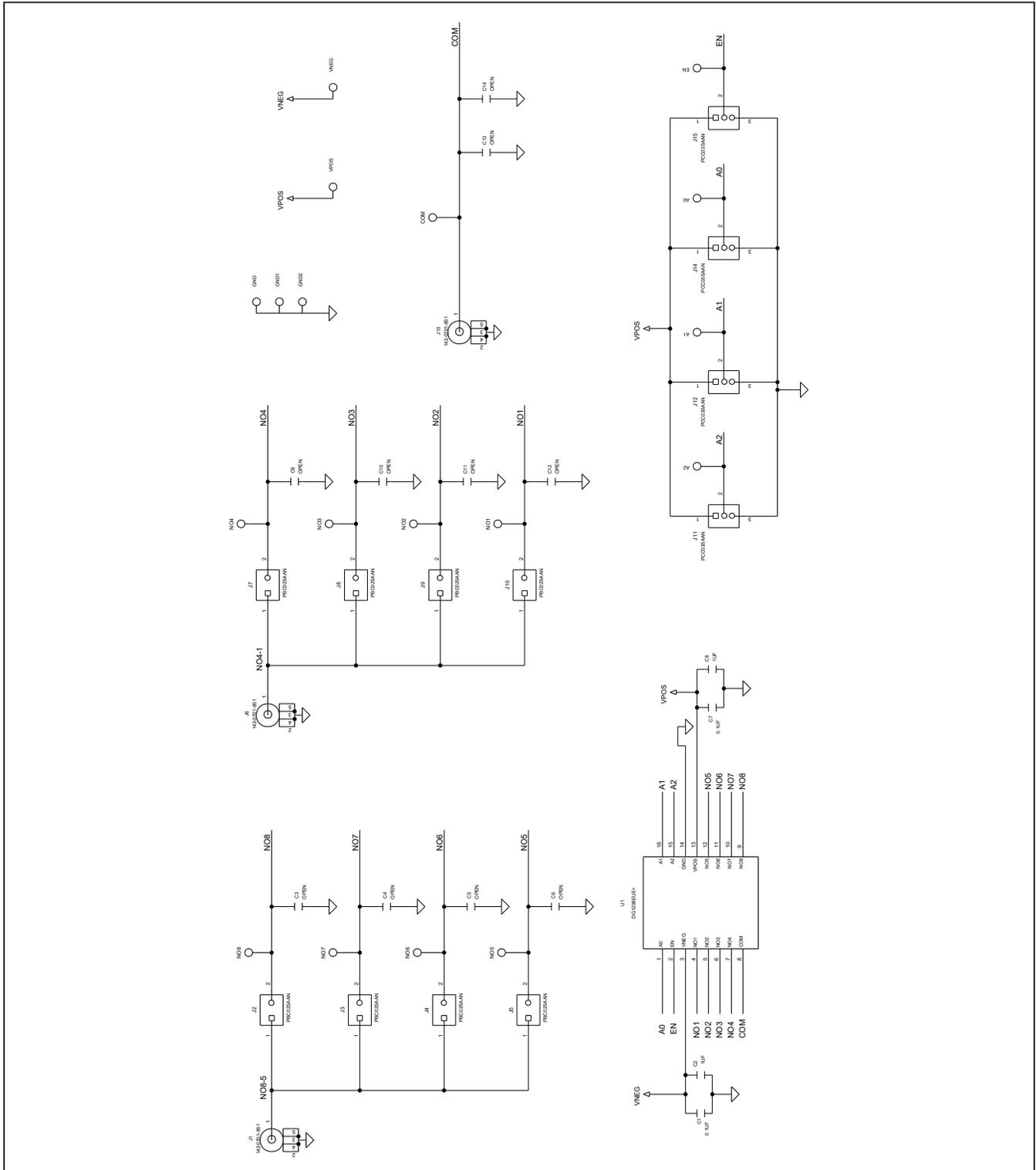
DG1208 EV Kit Bill of Materials

ITEM	REF_DES	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
1	A0-A2, EN	4	5009	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.35IN; BOARD HOLE=0.063IN; YELLOW; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
2	C1, C7	2	GCJ188R71H104KA12; GCM188R71H104K; CGA3E2X7R1H104K080AA; CGA3E2X7R1H104K080AD; CL10B104KB8WPN	MURATA;MURATA;TDK; TDK;SAMSUNG	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R; AUTO	
3	C2, C8	2	UMK107AB7105KA; CC0603KRX7R9BB105	TAIYO YUDEN;YAGEO	1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R	
4	COM, NO1-NO8	9	5013	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; ORANGE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
5	GND, GND1, GND2	3	5011	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
6	J1, J6, J13	3	142-0701-851	JOHNSON COMPONENTS	142-0701-851	CONNECTOR; END LAUNCH JACK RECEPTACLE; BOARDMOUNT; STRAIGHT THROUGH; 2PINS;	
7	J2-J5, J7-J10	8	PBC02SAAN	SULLINS ELECTRONICS CORP.	PBC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS	
8	J11, J12, J14, J15	4	PCC03SAAN	SULLINS	PCC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 3PINS; -65 DEGC TO +125 DEGC	
9	SPACER1-SPACER4	4	9032	KEYSTONE	9032	MACHINE FABRICATED; ROUND-THRU HOLE SPACER; NO THREAD; M3.5; 5/8IN; NYLON	
10	SU1-SU5	5	S1100-B;SX1100-B;STC02SYAN	KYCON;KYCON;SULLINS ELECTRONICS CORP.	SX1100-B	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.24IN; BLACK; INSULATION=PBT;PHOSPHOR BRONZE CONTACT=GOLD PLATED	
11	U1	1	DG1208EUE+	MAXIM	DG1208EUE+	EVKIT PART - IC; DG1208EUE+; LOW LEAKAGE; SINGLE 8-CHANNEL; ANALOG MULTIPLEXER; PACKAGE OUTLINE NUMBER: 21-0066; LAND PATTERN NUMBER: 90-0117; PACKAGE CODE: U16+1	
12	VNEG	1	5012	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; WHITE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
13	VPOS	1	5010	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; RED; PHOSPHOR BRONZE WIRE SIL;	
14	PCB	1	MAXDG1208	MAXIM	PCB	PCB:MAXDG1208	-
15	C3-C6, C9-C14	0	N/A	N/A	OPEN	PACKAGE OUTLINE 0603 NON-POLAR CAPACITOR	
TOTAL		48					

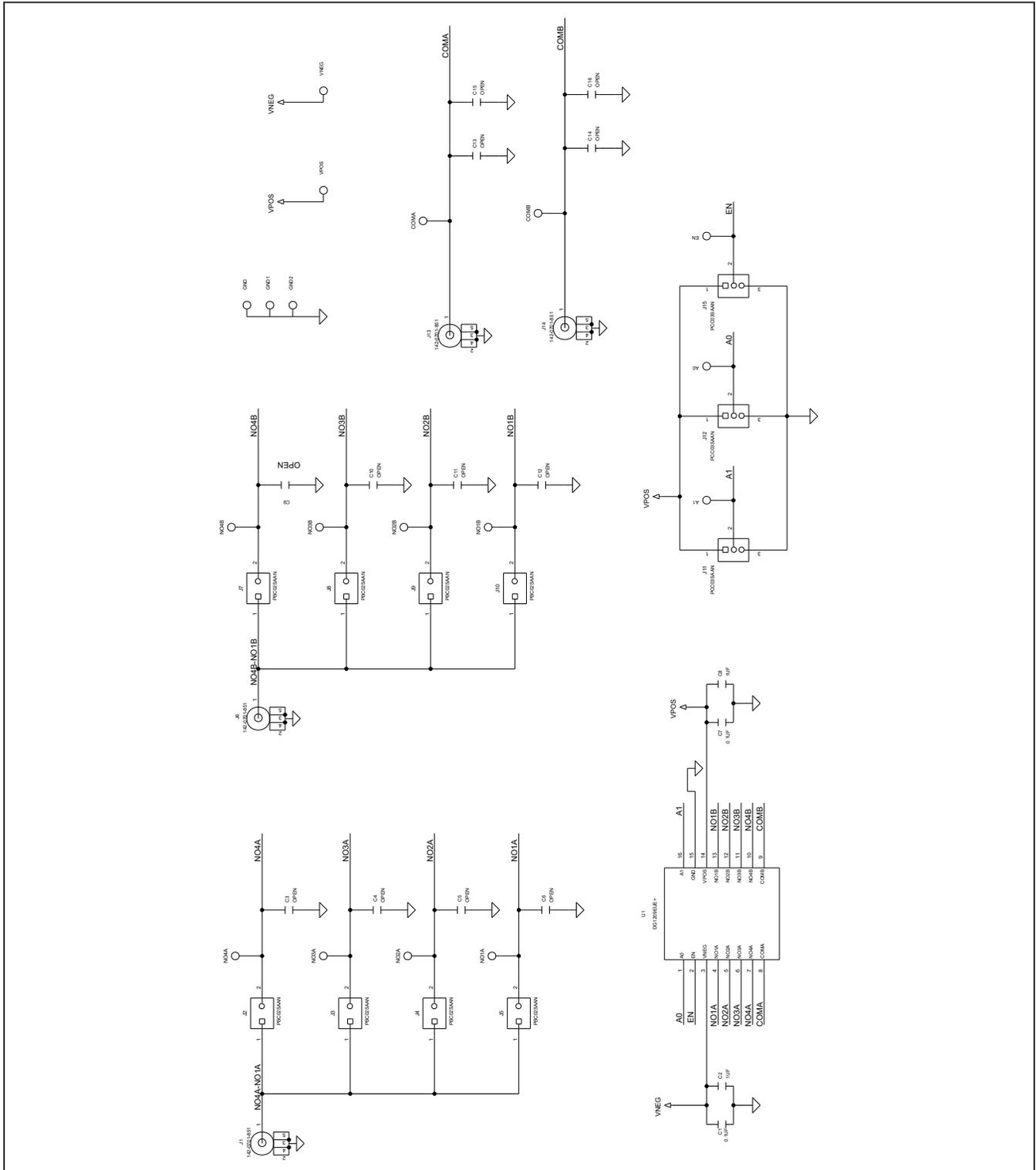
DG1209 EVKit Bill of Materials

ITEM	REF_DES	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
1	A0, A1, EN	3	5009	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.35IN; BOARD HOLE=0.063IN; YELLOW; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
2	C1, C7	2	GCM188R71H104KA12; GCM188R71H104K; CGA3E2X7R1H104K080AA; CGA3E2X7R1H104K080AD; CL10B104KB8WPN	MURATA;MURATA;TDK; TDK;SAMSUNG	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R; AUTO	
3	C2, C8	2	UMK107AB7105KA; CC0603KRX7R9BB105	TAIYO YUDEN;YAGEO	1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R	
4	COMA, COMB, NO1A-NO4A, NO1B-NO4B	10	5013	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; ORANGE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
5	GND, GND1, GND2	3	5011	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
6	J1, J6, J13, J14	4	142-0701-851	JOHNSON COMPONENTS	142-0701-851	CONNECTOR; END LAUNCH JACK RECEPTACLE; BOARDMOUNT; STRAIGHT THROUGH; 2PINS;	
7	J2-J5, J7-J10	8	PBC02SAAN	SULLINS ELECTRONICS CORP.	PBC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS	
8	J11, J12, J15	3	PCC03SAAN	SULLINS	PCC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 3PINS; -65 DEGC TO +125 DEGC	
9	SPACER1-SPACER4	4	9032	KEYSTONE	9032	MACHINE FABRICATED; ROUND-THRU HOLE SPACER; NO THREAD; M3.5; 5/8IN; NYLON	
10	SU1-SU5	5	S1100-B;SX1100-B;STC02SYAN	KYCON;KYCON;SULLINS ELECTRONICS CORP.	SX1100-B	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.24IN; BLACK; INSULATION=PBT;PHOSPHOR BRONZE CONTACT=GOLD PLATED	
11	U1	1	DG1209EUE+	MAXIM	DG1209EUE+	EVKIT PART - IC; DG1209EUE+; LOW LEAKAGE; DUAL 4-CHANNEL; ANALOG MULTIPLEXER; PACKAGE OUTLINE NUMBER: 21-0066; LAND PATTERN NUMBER: 90-0117; PACKAGE CODE: U16+1	
12	VNEG	1	5012	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; WHITE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
13	VPOS	1	5010	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; RED; PHOSPHOR BRONZE WIRE SIL;	
14	PCB	1	MAXDG1209	MAXIM	PCB	PCB:MAXDG1209	-
15	C3-C6, C9-C16	0	N/A	N/A	OPEN	PACKAGE OUTLINE 0603 NON-POLAR CAPACITOR	
TOTAL		48					

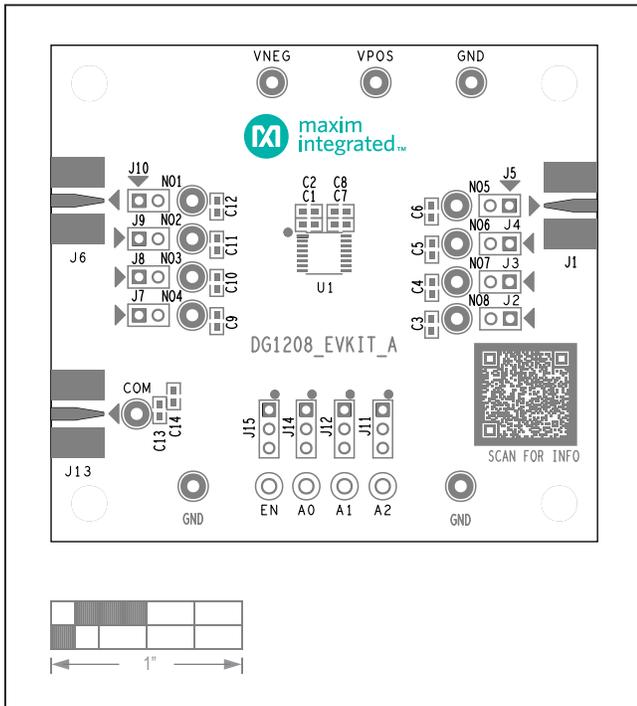
DG1208 EV Kit Schematic



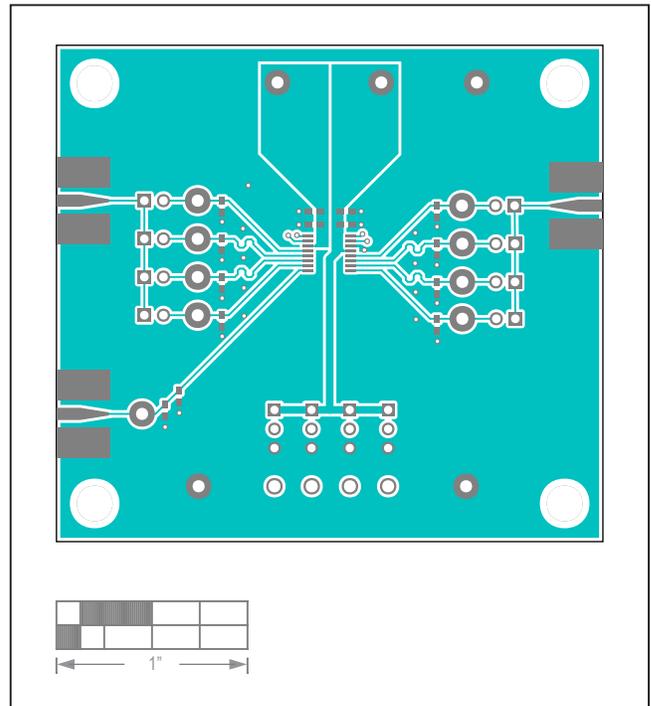
DG1209 EV Kit Schematic



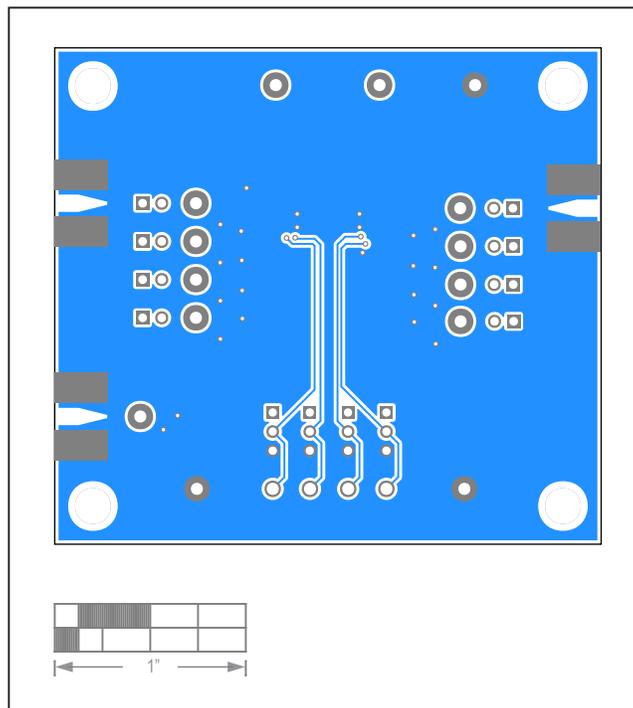
### DG1208 EV Kit PCB Layout



DG1208 EV Kit—Silkscreen Top

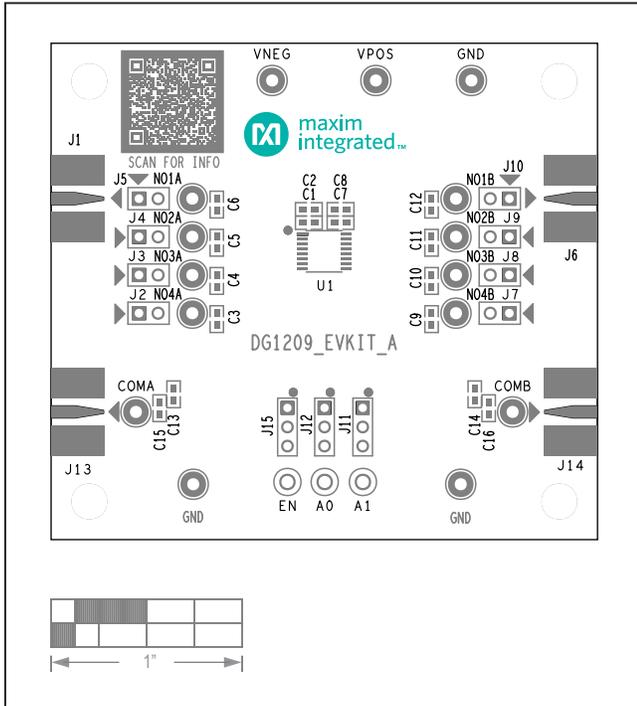


DG1208 EV Kit—Top Layer

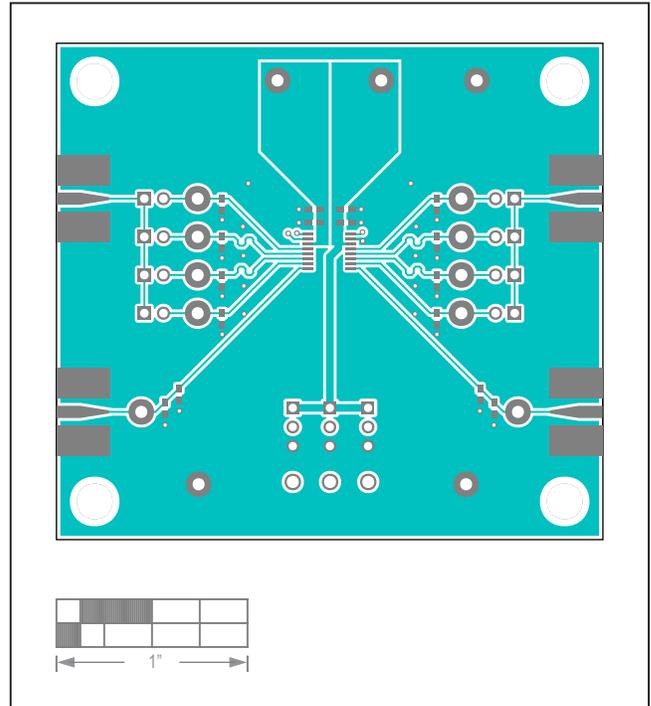


DG1208 EV Kit—Bottom Layer

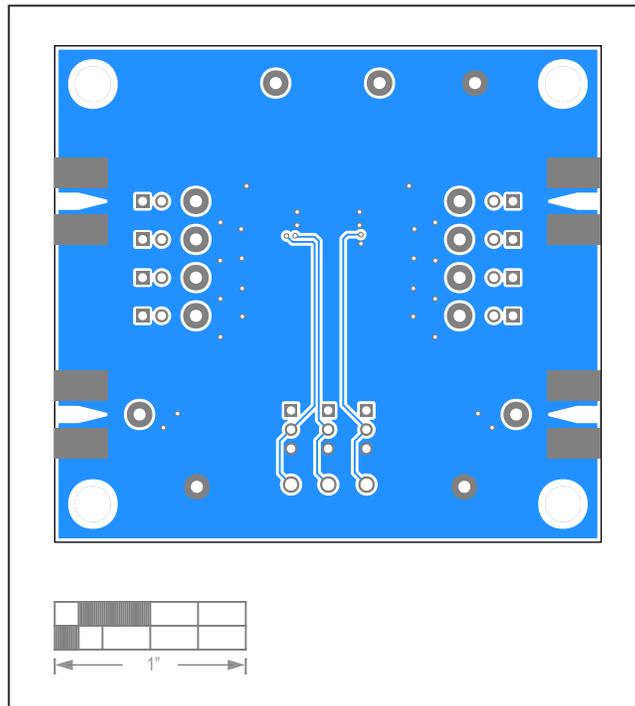
DG1209 EV Kit PCB Layout



DG1209 EV Kit—Silkscreen Top



DG1209 EV Kit—Top Layer



DG1209 EV Kit—Bottom Layer

**Revision History**

<b>REVISION NUMBER</b>	<b>REVISION DATE</b>	<b>DESCRIPTION</b>	<b>PAGES CHANGED</b>
0	11/20	Release for Market Intro	—

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