Universal Switching Corporation

Specification Sheet G2S02-001

Solid-State Differential Analog Switching Array
DC-100kHz, sizes from 16x16 to 64x64
Series G2S02

CE

September 2006

General

The Series G2S02 is part of the G2 family of high performance modules. It is a solid-state differential analog switching array for routing and distributing audio and instrumentation signals in a full fanout (broadcast) mode.

Specifically designed for rugged high performance audio or instrumentation switching, the I/O ports are differential. Inputs are terminated with 50K ohms between the input pairs (not to ground). Outputs have a 100 ohm output impedance (dual 50 ohm). Other input and output impedances can be specified as well. See page 2. Standard high density connectors (DC-37) provide I/O connectivity to the array with 16 channels per connector.

The module may be configured for a minimum of 16 inputs and 16 outputs, and up to a maximum of 64 inputs and 64 outputs. All arrays are "fixed" size and may not be expanded in the field without additional external equipment. This provides the most cost effective packaging solution.

The switching array is non-blocking with full fanout allowing the user to connect any input to one, many, or up to all outputs at any given time (broadcast). No input loading or impedance mis-matches are presented to the user due to the architecture of the switching array.

For control and DC power, the module must be installed into any G2 type mainframe controller. The mainframe must have the -200 or -D200 power supply configuration.

Applications

- Data acquisition systems
- Airborne surveillance systems
- Flight simulators or situation rooms
- Routing and distribution of audio signals
- Training, conference or security centers
- Time-Code distribution

Features

- Solid-state switching elements
- Wide DC-100kHz bandpass (3dB at 500kHz)
- Non-blocking with full fanout (broadcast)
- True differential I/O circuitry
- Hot-swap module technology

Model G2S02-6432-20
Differential 32x32

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Configurations

Switching array size is specified by the middle four digits. The first two digits of these four specifies the total number of I/O pairs (in+out), while the second two specifies the number of differential output signals. In the models with 5 middle digits, the first three indicate the number of total I/O ports.

NOTE: Other impedance combinations from the standard 50K ohm in, 100 ohm out (suffix -20) are available. The input impedance can be 100, 300 or 600 ohms, while the output can be 100, 300 or 600.

Input Impedance Options:

-21x = 100 ohm input
-23x = 300 ohm input
-26x = 600 ohm input
-25x = 50K ohm input

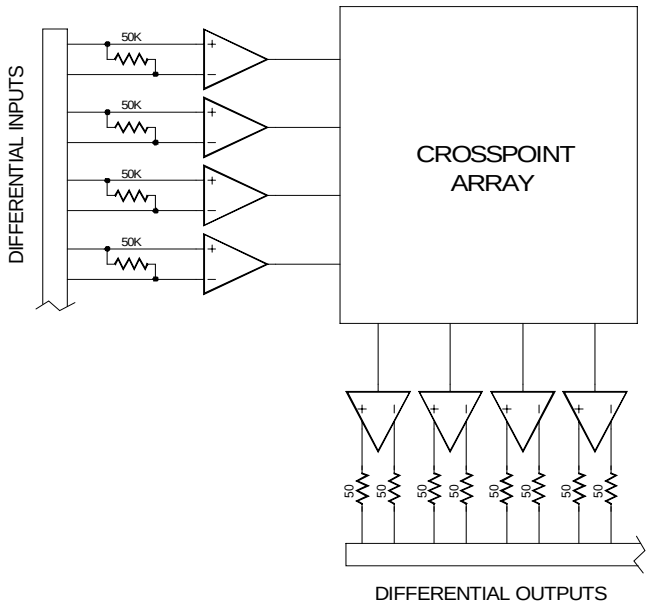
Output Impedance Options:

-2x1 = 100 ohm output
-2x3 = 300 ohm output
-2x6 = 600 ohm output

Model	Array Size	Slot Height
G2S02-3216-20	16 in x 16 out	1 slot
G2S02-4832-20	16 in x 32 out	1 slot
G2S02-6448-20	16 in x 48 out	2 slots
G2S02-8064-20	16 in x 64 out	2 slots
G2S02-4816-20	32 in x 16 out	1 slot
G2S02-6432-20	32 in x 32 out	1 slot
G2S02-8048-20	32 in x 48 out	2 slots
G2S02-9664-20	32 in x 64 out	2 slots
G2S02-6416-20	48 in x 16 out	2 slots
G2S02-8032-20	48 in x 32 out	2 slots
G2S02-9648-20	48 in x 48 out	2 slots
G2S02-11264-20	48 in x 64 out	2 slots
G2S02-7216-20	64 in x 16 out	2 slots
G2S02-9632-20	64 in x 32 out	2 slots
G2S02-11248-20	64 in x 48 out	2 slots
G2S02-12864-20	64 in x 64 out	2 slots

Simplified Example Schematic

The standard module contains differential input buffers with 50K ohm input terminations. Switching is accomplised in single-ended fashion then connected to precision output drivers. The drivers have standard 50 ohm series outputs as shown in the diagram below. Above are other input and output variations that can be specified with a three-digit model number suffix (-2xx). The standard suffix is -20 (same as -251).



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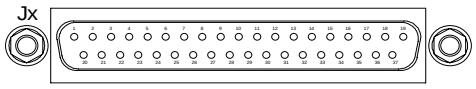
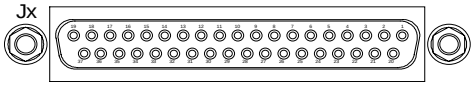
Single Slot Configurations

Below is the pin assignment for connectors J1 to J4 for the single slot versions. All connectors have the same layout. For versions that do not include a certain connector position, that connector is covered with a filler plate.



TYPICAL INPUT CONNECTOR
37 POSITION D-SUB MALE
(DC-37P)



TYPICAL OUTPUT CONNECTOR
37 POSITION D-SUB FEMALE
(DC-37S)

Connector J1: (Inputs 1-16)

Pin	Signal	Pin	Signal
1	Input 1 (+)	20	Input 1 (-)
2	Input 2 (+)	21	Input 2 (-)
3	Input 3 (+)	22	Input 3 (-)
4	Input 4 (+)	23	Input 4 (-)
5	Input 5 (+)	24	Input 5 (-)
6	Input 6 (+)	25	Input 6 (-)
7	**GND**	26	**GND**
8	Input 7 (+)	27	Input 7 (-)
9	Input 8 (+)	28	Input 8 (-)
10	Input 9 (+)	29	Input 9 (-)
11	Input 10 (+)	30	Input 10 (-)
12	Input 11 (+)	31	Input 11 (-)
13	Input 12 (+)	32	Input 12 (-)
14	**GND**	33	**GND**
15	Input 13 (+)	34	Input 13 (-)
16	Input 14 (+)	35	Input 14 (-)
17	Input 15 (+)	36	Input 15 (-)
18	Input 16 (+)	37	Input 16 (-)
19	**GND**		

Connector J3: (Outputs 1-16)

Pin	Signal	Pin	Signal
1	Output 1 (+)	20	Output 1 (-)
2	Output 2 (+)	21	Output 2 (-)
3	Output 3 (+)	22	Output 3 (-)
4	Output 4 (+)	23	Output 4 (-)
5	Output 5 (+)	24	Output 5 (-)
6	Output 6 (+)	25	Output 6 (-)
7	**GND**	26	**GND**
8	Output 7 (+)	27	Output 7 (-)
9	Output 8 (+)	28	Output 8 (-)
10	Output 9 (+)	29	Output 9 (-)
11	Output 10 (+)	30	Output 10 (-)
12	Output 11 (+)	31	Output 11 (-)
13	Output 12 (+)	32	Output 12 (-)
14	**GND**	33	**GND**
15	Output 13 (+)	34	Output 13 (-)
16	Output 14 (+)	35	Output 14 (-)
17	Output 15 (+)	36	Output 15 (-)
18	Output 16 (+)	37	Output 16 (-)
19	**GND**		

Connector J2: (Inputs 17-32)

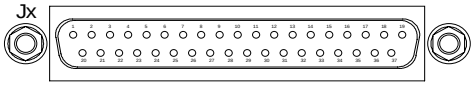
Pin	Signal	Pin	Signal
1	Input 17 (+)	20	Input 17 (-)
2	Input 18 (+)	21	Input 18 (-)
3	Input 19 (+)	22	Input 19 (-)
4	Input 20 (+)	23	Input 20 (-)
5	Input 21 (+)	24	Input 21 (-)
6	Input 22 (+)	25	Input 22 (-)
7	**GND**	26	**GND**
8	Input 23 (+)	27	Input 23 (-)
9	Input 24 (+)	28	Input 24 (-)
10	Input 25 (+)	29	Input 25 (-)
11	Input 26 (+)	30	Input 26 (-)
12	Input 27 (+)	31	Input 27 (-)
13	Input 28 (+)	32	Input 28 (-)
14	**GND**	33	**GND**
15	Input 29 (+)	34	Input 29 (-)
16	Input 30 (+)	35	Input 30 (-)
17	Input 31 (+)	36	Input 31 (-)
18	Input 32 (+)	37	Input 32 (-)
19	**GND**		

Connector J4: (Inputs 17-32)

Pin	Signal	Pin	Signal
1	Output 17 (+)	20	Output 17 (-)
2	Output 18 (+)	21	Output 18 (-)
3	Output 19 (+)	22	Output 19 (-)
4	Output 20 (+)	23	Output 20 (-)
5	Output 21 (+)	24	Output 21 (-)
6	Output 22 (+)	25	Output 22 (-)
7	**GND**	26	**GND**
8	Output 23 (+)	27	Output 23 (-)
9	Output 24 (+)	28	Output 24 (-)
10	Output 25 (+)	29	Output 25 (-)
11	Output 26 (+)	30	Output 26 (-)
12	Output 27 (+)	31	Output 27 (-)
13	Output 28 (+)	32	Output 28 (-)
14	**GND**	33	**GND**
15	Output 29 (+)	34	Output 29 (-)
16	Output 30 (+)	35	Output 30 (-)
17	Output 31 (+)	36	Output 31 (-)
18	Output 32 (+)	37	Output 32 (-)
19	**GND**		

Dual Slot Configurations

Shown on these two pages are the pin assignment for connectors J1 to J8 for the dual slot versions. All connectors have the same layout. For versions that do not include a certain connector position, that connector is covered with a filler plate.



TYPICAL INPUT CONNECTOR
37 POSITION D-SUB MALE
(DC-37P)

Connector J1: (Inputs 1-16)

Pin	Signal	Pin	Signal
1	Input 1 (+)	20	Input 1 (-)
2	Input 2 (+)	21	Input 2 (-)
3	Input 3 (+)	22	Input 3 (-)
4	Input 4 (+)	23	Input 4 (-)
5	Input 5 (+)	24	Input 5 (-)
6	Input 6 (+)	25	Input 6 (-)
7	**GND**	26	**GND**
8	Input 7 (+)	27	Input 7 (-)
9	Input 8 (+)	28	Input 8 (-)
10	Input 9 (+)	29	Input 9 (-)
11	Input 10 (+)	30	Input 10 (-)
12	Input 11 (+)	31	Input 11 (-)
13	Input 12 (+)	32	Input 12 (-)
14	**GND**	33	**GND**
15	Input 13 (+)	34	Input 13 (-)
16	Input 14 (+)	35	Input 14 (-)
17	Input 15 (+)	36	Input 15 (-)
18	Input 16 (+)	37	Input 16 (-)
19	**GND**		

Connector J2: (Inputs 17-32)

Pin	Signal	Pin	Signal
1	Input 17 (+)	20	Input 17 (-)
2	Input 18 (+)	21	Input 18 (-)
3	Input 19 (+)	22	Input 19 (-)
4	Input 20 (+)	23	Input 20 (-)
5	Input 21 (+)	24	Input 21 (-)
6	Input 22 (+)	25	Input 22 (-)
7	**GND**	26	**GND**
8	Input 23 (+)	27	Input 23 (-)
9	Input 24 (+)	28	Input 24 (-)
10	Input 25 (+)	29	Input 25 (-)
11	Input 26 (+)	30	Input 26 (-)
12	Input 27 (+)	31	Input 27 (-)
13	Input 28 (+)	32	Input 28 (-)
14	**GND**	33	**GND**
15	Input 29 (+)	34	Input 29 (-)
16	Input 30 (+)	35	Input 30 (-)
17	Input 31 (+)	36	Input 31 (-)
18	Input 32 (+)	37	Input 32 (-)
19	**GND**		

Connector J3: (Inputs 33-48)

Pin	Signal	Pin	Signal
1	Input 33 (+)	20	Input 33 (-)
2	Input 34 (+)	21	Input 34 (-)
3	Input 35 (+)	22	Input 35 (-)
4	Input 36 (+)	23	Input 36 (-)
5	Input 37 (+)	24	Input 37 (-)
6	Input 38 (+)	25	Input 38 (-)
7	**GND**	26	**GND**
8	Input 39 (+)	27	Input 39 (-)
9	Input 40 (+)	28	Input 40 (-)
10	Input 41 (+)	29	Input 41 (-)
11	Input 42 (+)	30	Input 42 (-)
12	Input 43 (+)	31	Input 43 (-)
13	Input 44 (+)	32	Input 44 (-)
14	**GND**	33	**GND**
15	Input 45 (+)	34	Input 45 (-)
16	Input 46 (+)	35	Input 46 (-)
17	Input 47 (+)	36	Input 47 (-)
18	Input 48 (+)	37	Input 48 (-)
19	**GND**		

Connector J4: (Inputs 49-64)

Pin	Signal	Pin	Signal
1	Input 49 (+)	20	Input 49 (-)
2	Input 50 (+)	21	Input 50 (-)
3	Input 51 (+)	22	Input 51 (-)
4	Input 52 (+)	23	Input 52 (-)
5	Input 53 (+)	24	Input 53 (-)
6	Input 54 (+)	25	Input 54 (-)
7	**GND**	26	**GND**
8	Input 55 (+)	27	Input 55 (-)
9	Input 56 (+)	28	Input 56 (-)
10	Input 57 (+)	29	Input 57 (-)
11	Input 58 (+)	30	Input 58 (-)
12	Input 59 (+)	31	Input 59 (-)
13	Input 60 (+)	32	Input 60 (-)
14	**GND**	33	**GND**
15	Input 61 (+)	34	Input 61 (-)
16	Input 62 (+)	35	Input 62 (-)
17	Input 63 (+)	36	Input 63 (-)
18	Input 64 (+)	37	Input 64 (-)
19	**GND**		

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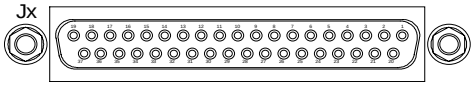


TYPICAL OUTPUT CONNECTOR
37 POSITION D-SUB FEMALE
(DC-37S)

Connector J5: (Outputs 1-16)

Pin	Signal	Pin	Signal
1	Output 1 (+)	20	Output 1 (-)
2	Output 2 (+)	21	Output 2 (-)
3	Output 3 (+)	22	Output 3 (-)
4	Output 4 (+)	23	Output 4 (-)
5	Output 5 (+)	24	Output 5 (-)
6	Output 6 (+)	25	Output 6 (-)
7	**GND**	26	**GND**
8	Output 7 (+)	27	Output 7 (-)
9	Output 8 (+)	28	Output 8 (-)
10	Output 9 (+)	29	Output 9 (-)
11	Output 10 (+)	30	Output 10 (-)
12	Output 11 (+)	31	Output 11 (-)
13	Output 12 (+)	32	Output 12 (-)
14	**GND**	33	**GND**
15	Output 13 (+)	34	Output 13 (-)
16	Output 14 (+)	35	Output 14 (-)
17	Output 15 (+)	36	Output 15 (-)
18	Output 16 (+)	37	Output 16 (-)
19	**GND**		

Connector J6: (Outputs 17-32)

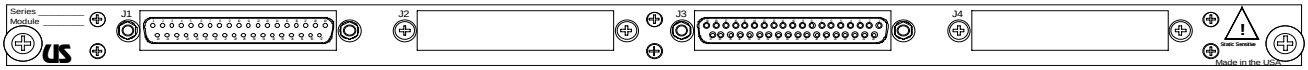
Pin	Signal	Pin	Signal
1	Output 17 (+)	20	Output 17 (-)
2	Output 18 (+)	21	Output 18 (-)
3	Output 19 (+)	22	Output 19 (-)
4	Output 20 (+)	23	Output 20 (-)
5	Output 21 (+)	24	Output 21 (-)
6	Output 22 (+)	25	Output 22 (-)
7	**GND**	26	**GND**
8	Output 23 (+)	27	Output 23 (-)
9	Output 24 (+)	28	Output 24 (-)
10	Output 25 (+)	29	Output 25 (-)
11	Output 26 (+)	30	Output 26 (-)
12	Output 27 (+)	31	Output 27 (-)
13	Output 28 (+)	32	Output 28 (-)
14	**GND**	33	**GND**
15	Output 29 (+)	34	Output 29 (-)
16	Output 30 (+)	35	Output 30 (-)
17	Output 31 (+)	36	Output 31 (-)
18	Output 32 (+)	37	Output 32 (-)
19	**GND**		

Connector J7: (Outputs 33-48)

Pin	Signal	Pin	Signal
1	Output 33 (+)	20	Output 33 (-)
2	Output 34 (+)	21	Output 34 (-)
3	Output 35 (+)	22	Output 35 (-)
4	Output 36 (+)	23	Output 36 (-)
5	Output 37 (+)	24	Output 37 (-)
6	Output 38 (+)	25	Output 38 (-)
7	**GND**	26	**GND**
8	Output 39 (+)	27	Output 39 (-)
9	Output 40 (+)	28	Output 40 (-)
10	Output 41 (+)	29	Output 41 (-)
11	Output 42 (+)	30	Output 42 (-)
12	Output 43 (+)	31	Output 43 (-)
13	Output 44 (+)	32	Output 44 (-)
14	**GND**	33	**GND**
15	Output 45 (+)	34	Output 45 (-)
16	Output 46 (+)	35	Output 46 (-)
17	Output 47 (+)	36	Output 47 (-)
18	Output 48 (+)	37	Output 48 (-)
19	**GND**		

Connector J8: (Outputs 49-64)

Pin	Signal	Pin	Signal
1	Output 49 (+)	20	Output 49 (-)
2	Output 50 (+)	21	Output 50 (-)
3	Output 51 (+)	22	Output 51 (-)
4	Output 52 (+)	23	Output 52 (-)
5	Output 53 (+)	24	Output 53 (-)
6	Output 54 (+)	25	Output 54 (-)
7	**GND**	26	**GND**
8	Output 55 (+)	27	Output 55 (-)
9	Output 56 (+)	28	Output 56 (-)
10	Output 57 (+)	29	Output 57 (-)
11	Output 58 (+)	30	Output 58 (-)
12	Output 59 (+)	31	Output 59 (-)
13	Output 60 (+)	32	Output 60 (-)
14	**GND**	33	**GND**
15	Output 61 (+)	34	Output 61 (-)
16	Output 62 (+)	35	Output 62 (-)
17	Output 63 (+)	36	Output 63 (-)
18	Output 64 (+)	37	Output 64 (-)
19	**GND**		



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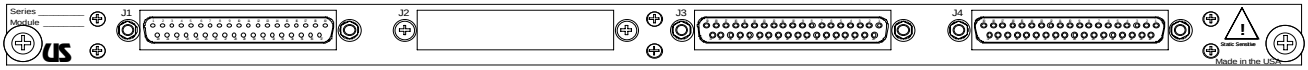

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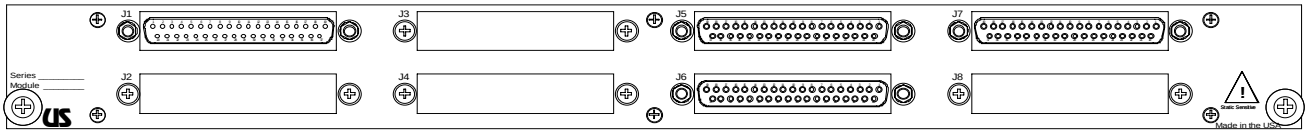

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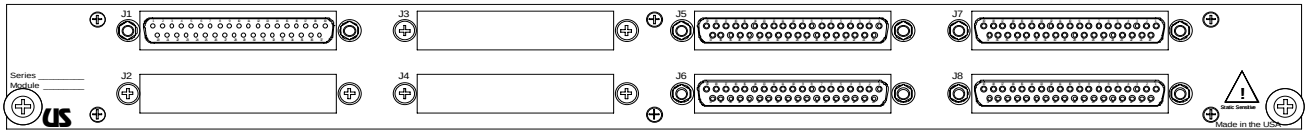

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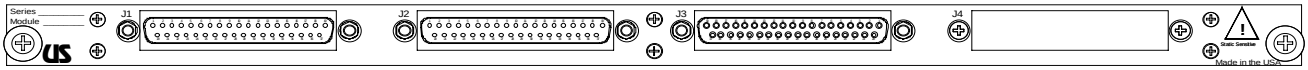

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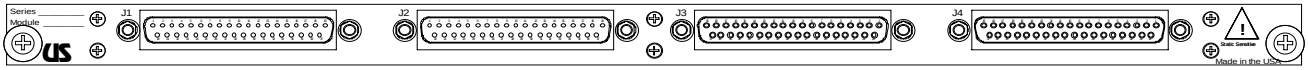

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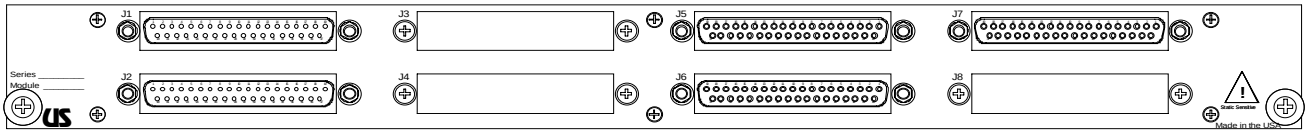

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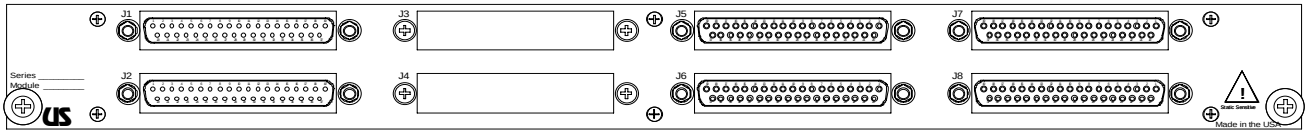

MODEL G2S02-9664-20

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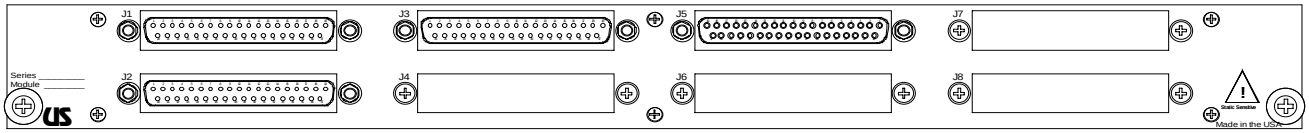

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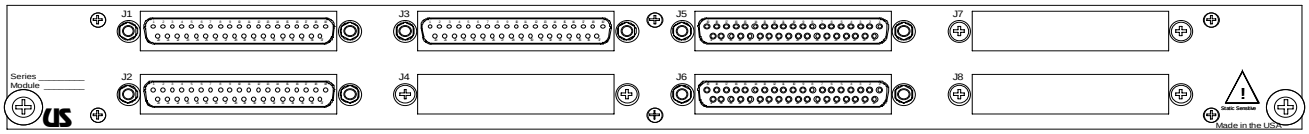
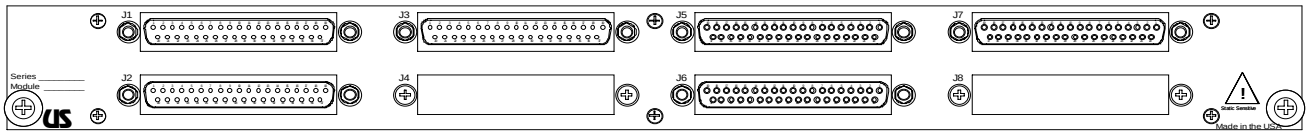


MODEL G2S02-8032-20



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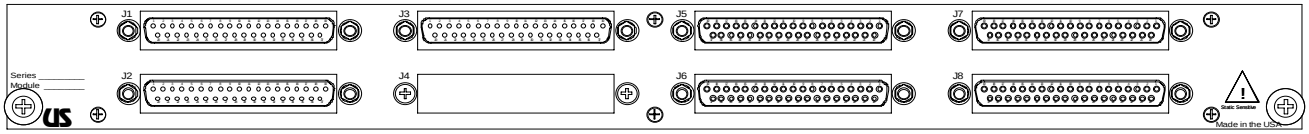

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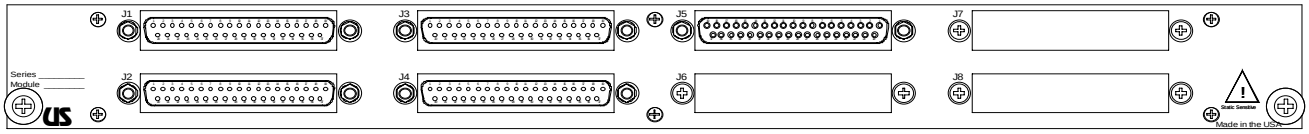
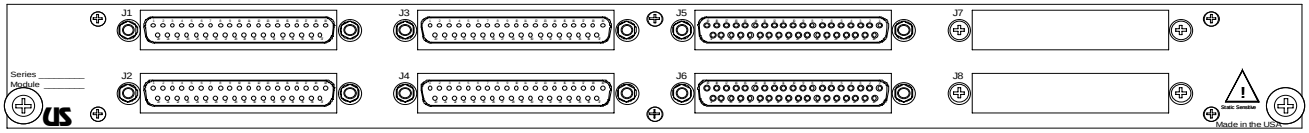


MODEL G2S02-7216-20



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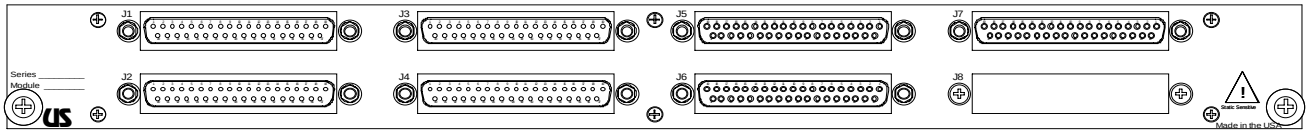
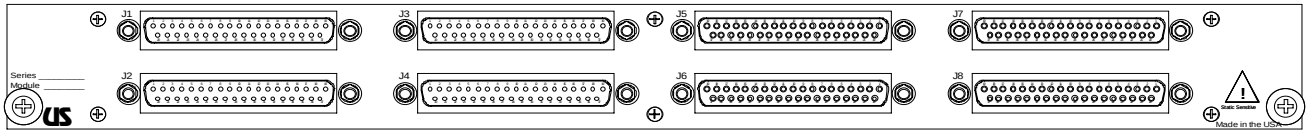


MODEL G2S02-11248-20



MODEL G2S02-12864-20

Signal Specifications

Switching elements . . . . . .Solid-State
Number of inputs . . . . . .16, 32, 48 or 64
Number of outputs . . . . . .16, 32, 48 or 64
Type of array . . . . . .Non-blocking with broadcast
Frequency range . . . . . .DC-100kHz (500kHz -3dB)
Crosstalk isolation . . . . . .>70dB
THD (%) 0.02 (1Vrms)
SNR 74dB (1Vrms)
Common mode voltage . .<10V
Common mode rejection .74dB min, 90dB typ
Maximum input 2.1Vrms
Signal I/O type . . . . . .Differential
Input impedance . . . . . .50K ohm (standard)
Output impedance . . . . . .100 ohms differential (standard)
Switching speed . . . . . .<250uS (plus control time)
Input signal connector . . .D-Type (DC-37P)
Output signal connector . .D-Type (DC-37S)

Universal Switching's policy is one of continuous development, and consequently the company reserves the right to vary from the descriptions and specifications shown in this publication.

General Specifications

Module size . . . . . .1 or 2 slot height (see table)
Control type . . . . . .G2 compatible
Sparing . . . . . .Hot-swappable
Construction . . . . . .Shielded aluminum case
DC power . . . . . .-200 or -D200 configuration
Weight . . . . . .<3lbs (largest unit)
Operating temp . . . . . .0 to +70C
Non-operating temp . . . . .-20 to +85C
Humidity . . . . . .0 to 95% (NC @ +25C)
MTBF . . . . . .>125,000 hours
(per MIL-HDBK-217F, N1
ground benign @ +25C)

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