MMIC

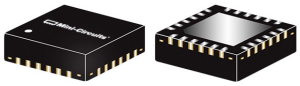
SP4T RF Switch

HSWA4-63DR+

Absorptive RF Switch with internal driver
Single Supply Voltage, +2.3V to +5.5V

THE BIG DEAL

- High Isolation, 61 dB @ 0.9 GHz
- Low insertion loss, 0.9 dB at 0.9 GHz
- High IP3, +58 dBm
- Fast switching, 255 ns typ.
- Low current consumption, 110µA
- Immune to latch-up



CASE STYLE: DG984-1

Generic photo used for illustration purposes only

+RoHS Compliant
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

APPLICATIONS

- Defense
- Test and Measurements
- Switch matrices

PRODUCT OVERVIEW

Mini-Circuits' HSWA4-63DR+ is a MMIC SP4T absorptive switch with an internal driver designed for wideband operation from 30 MHz to 6 GHz, supporting many applications requiring high performance across a wide frequency range. This model provides excellent isolation, fast switching speed and high linearity in a tiny 4x4mm 24-Lead MCLP package. Produced using a unique CMOS process on silicon, it offers the performance of GaAs with the advantages of conventional CMOS devices. HSWA4-63DR+ provides a high level of ESD protection, MSL1 moisture sensitivity rating, and excellent repeatability.

KEY FEATURES

Feature	Advantages
Wideband, 30 MHz to 6.0 GHz	One model can be used in many applications, saving component count. Also ideal for wideband applications such as military and instrumentation.
Absorptive switch	In the off condition, RF output ports which are not switched ON are terminated into 50Ω. This enables proper impedance termination of the circuitry following the RF output ports, preventing any unintended action such as oscillation.
High Isolation: • 61 dB at 0.9 GHz • **32 dB at 6 GHz**	High isolation significantly reduces leakage of power into OFF ports.
High linearity • +58 dBm IIP3 • +97 dBm IIP2 at 1.9 GHz	High linearity minimizes unwanted intermodulation products which are difficult or impossible to filter in multi-carrier environments such as CATV, or in the presence of strong interfering signal from adjacent circuitry or received by antenna.
Built-in negative voltage generator	Operates with single positive supply voltage; no need for DC blocking capacitors, unless external DC is present at the RF ports.
Built-in CMOS driver	No need for external driver, saving PCB space and cost.
Wide Supply Voltage and low current +2.3 to 5.5V and 110µA typ.	Ideal for battery operated systems consuming very low current for long battery life.
Immune to Latch-up	Unlike conventional CMOS devices, HSWA is immune to latch-up
Tiny size, 4 x 4mm QFN package	Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.

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Single Supply Voltage, +2.3V to +5.5V

RF ELECTRICAL SPECIFICATIONS1, 30 MHZ - 6 GHZ, TAMB=25°C, VDD= +3.3V

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency range		30		6000	MHz
Insertion loss[2]	30 - 900	—	0.9	1.1	dB
	900 - 2100	—	1.1	1.35	
	2100 - 2700	—	1.15	1.4	
	2700 - 4000	—	1.25	1.5	
	4000 - 6000	—	1.9	2.5	
Isolation between Common port and output ports	30 - 900	55	61	—	dB
	900 - 2100	52	55	—	
	2100 - 2700	50	52	—	
	2700 - 4000	42	43	—	
	4000 - 6000	27	32	—	
Isolation among output ports	30 - 900	56	61	—	dB
	900 - 2100	51	54	—	
	2100 - 2700	50	52	—	
	2700 - 4000	41	44	—	
	4000 - 6000	29	32	—	
Return loss (ON STATE)	30 - 4000	—	17	—	dB
	4000 - 6000	—	12	—	
Return loss (OFF STATE)	30 - 4000	—	22	—	dB
	4000 - 6000	—	19	—	
Input IP2	1900		97		dBm
Input IP3	1900	—	58	—	dBm
0.1 dB Input compression[3]	900	—	35	—	dBm
RF Input operating power, CW	30 - 6000	—	—	33	dBm
RF input power into terminated output ports, CW	30 - 6000	—	—	24	dBm

DC ELECTRICAL SPECIFICATIONS

Parameter	Min.	Typ.	Max.	Units
Supply voltage, V_{DD}	2.3		5.5	V
Supply current		110		µA
Control voltage Low	-0.3		0.6	V
Control voltage High	1.17		3.6	V
Control current		9	1	µA

SWITCHING SPECIFICATIONS

Parameter	Condition	Min.	Typ.	Max.	Units
Switching time 50% control to 90/10%RF	fFR=50 MHz fctrl =50 KHz Vctrl High=3.3V Vctrl Low=0V		255	330	nS
Video feed-through			14		mV_{P-P}
Rise/Fall time 10 to 90% or 90 to 10%			100		nS

Notes:
1. Tested on Mini-Circuits' test board TB-927+, using Agilent's N5230A network analyzer (see Characterization test circuit, Fig.1).
2. Insertion loss values are de-embedded from test board loss.
3. Do not exceed RF input power as shown in Absolute Maximum Ratings table.

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MAXIMUM RATINGS[4]

Parameter	Ratings
Operating temperature	-40°C to +105°C
Storage temperature	-65°C to 150°C
V_{DD}, Supply voltage	-0.3 to 5.5V
Voltage control	-0.3V Min. 3.6 Max.
RF Input power, CW	+34 dBm

4. Operation of this device above any of these conditions may cause permanent damage.

TRUTH TABLE - 3 PIN CONTROL

Mode	State of Control Voltage		
	Control 3	Control 2	Control 1
RF COM-RF1 ON	LOW	LOW	HIGH
RF COM-RF2 ON	LOW	HIGH	LOW
RF COM-RF3 ON	LOW	HIGH	HIGH
RF COM-RF4 ON	HIGH	LOW	LOW
	LOW	LOW	LOW
ALL OFF	HIGH	LOW	HIGH
ALL OFF	HIGH	HIGH	LOW
Unsupported	HIGH	HIGH	HIGH

TRUTH TABLE - 2 PIN CONTROL[5]

Mode	State of Control Voltage	
	Control 2	Control 1
RF COM-RF1 ON	LOW	HIGH
RF COM-RF2 ON	HIGH	LOW
RF COM-RF3 ON	HIGH	HIGH
RF COM-RF4 ON	LOW	LOW

5. Pad 19= control 3 must be grounded.

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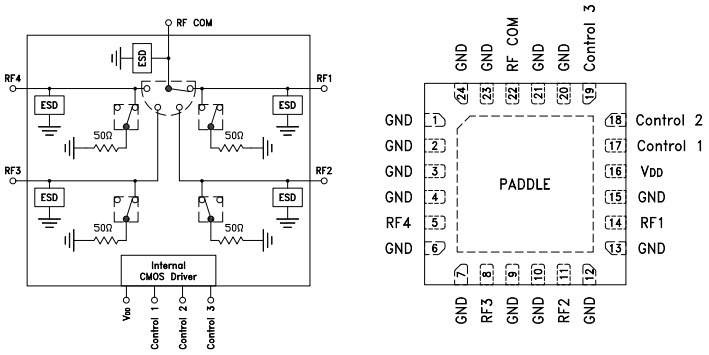
Single Supply Voltage, +2.3V to +5.5V

SIMPLIFIED SCHEMATIC AND PAD DESCRIPTION



Function	Pad Number	Description
RF COM	22	RF Common/ SUM port*
RF1	14	RF out #1/In port #1*
RF2	11	RF out #2/In port #3*
RF3	8	RF out #3/In port #2*
RF4	5	RF out #4/In port #4*
Control 1	17	CMOS Control IN #1
Control 2	18	CMOS Control IN #2
Control 3	19	CMOS Control IN #3
VDD	16	Supply voltage
GND	1-4,6,9,10,12,13,15, 20,21,23,24	RF Ground

*Must be held at 0VDC. If required add DC blocking capacitors on these ports.

CHARACTERIZATION & APPLICATION CIRCUIT

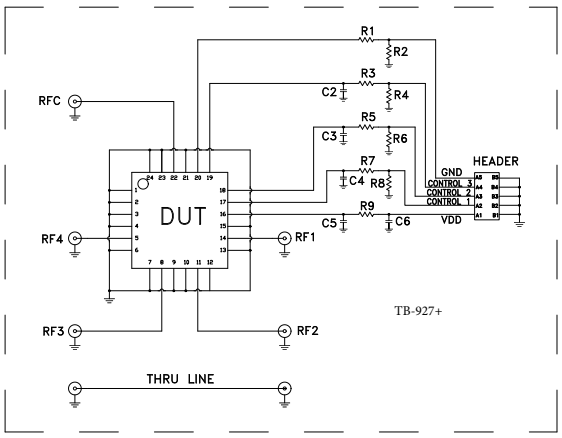
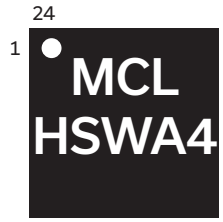


Figure 1. Block Diagram of test Circuit used for characterization (DUT soldered on Mini-Circuit's TB-927+).

Component	Value	Size
DUT	HSWA4-63DR+	4x4 mm
C2, C3, C4, C5	100pF	0402
C6	1uF	
R1, R2, R3, R5, R7, R9	0 Ohm	
R4, R6, R8	1 MOhm	

PRODUCT MARKING



Parameter	Conditions V_{DD}=+2.3V and 5.5V Control= 0V and 3.3V	Test Equipment
Insertion loss, Isolation, Return loss and DC current	Pin=0 dBm	Keysight N5242A Network Analyzer, E3631A power supply. Cblock: Internal to network Analyzer.
Switching time and DC Current	RF frequency: 50 MHz at 0 dBm, Control frequency: 50 KHz	Keysight 54832B oscilloscope, 81110A pulse generator and E3631A power supply
Input IP3	+15 dBm / tone	Keysight ES257D signal generators, E4416A power meter, N9020A Signal analyzer and E3631A power supply
Compression	—	Keysight N5242A Network Analyzer, E3631A power supply

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ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS CLICK HERE

Performance Data	Data Table Swept Graphs
Case Style	DG984-1 Plastic package, exposed paddle , termination finish=NiPdAu
Tape & Reel **Standard quantities available on reel**	F68 7" reels with 20, 50, 100, 200, 500, 1000 & 3000 devices
Suggested Layout for PCB Design	PL-514
Evaluation Board	TB-927+
Environmental Ratings	ENV84

ESD RATING

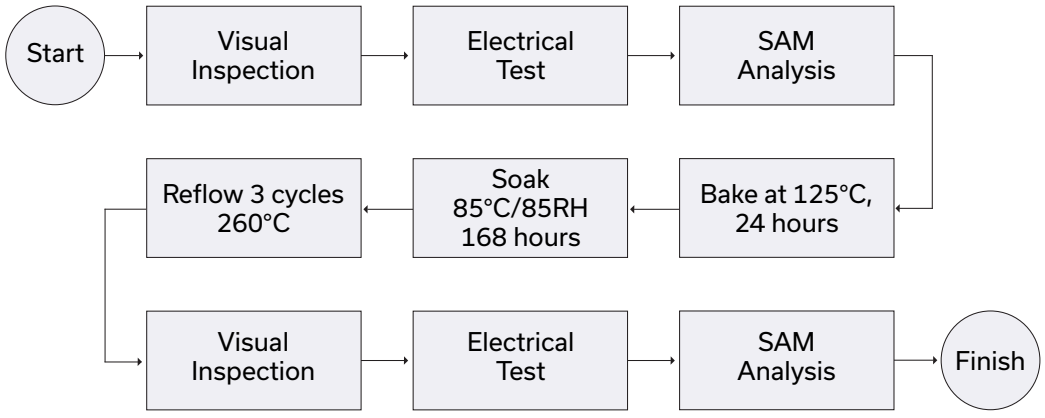
Human Body Model (HBM): Class 2 (Pass 2000V) in accordance with MIL-STD-883, Method 3015

Charge Device Model (CDM): Class C1 (Pass 250V) in accordance with JESD22-C101

MSL RATING

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020D

MSL TEST FLOW CHART



NOTES

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard. Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html

Typical Performance Data

RF FREQ (MHz)	INSERTION LOSS (dB)			
	VDD=+3.3V			
	RF COM-RF1	RF COM-RF2	RF COM-RF3	RF COM-RF4
10	0.74	0.77	0.76	0.74
30	0.75	0.78	0.77	0.75
50	0.75	0.78	0.77	0.75
100	0.76	0.79	0.79	0.76
500	0.80	0.86	0.86	0.80
1000	0.88	0.96	0.96	0.87
1200	0.92	1.01	1.00	0.91
1400	0.95	1.04	1.04	0.94
1600	0.98	1.06	1.05	0.96
1800	0.99	1.03	1.02	0.98
2000	0.99	0.99	0.97	0.96
2200	0.94	0.96	0.96	0.94
2400	0.92	1.01	1.02	0.91
2600	0.91	1.13	1.12	0.91
2800	0.93	1.18	1.16	0.91
3000	0.94	1.15	1.11	0.91
3200	0.95	1.08	1.04	0.91
3400	1.00	1.04	1.01	0.94
3600	1.05	1.05	1.03	0.99
3800	1.14	1.10	1.08	1.06
4000	1.17	1.15	1.15	1.08
4200	1.13	1.24	1.25	1.07
4400	1.04	1.38	1.37	1.03
4600	1.06	1.55	1.49	1.10
4800	1.25	1.62	1.57	1.31
5000	1.64	1.69	1.63	1.70
5200	2.00	1.77	1.79	2.04
5400	2.16	1.88	2.00	2.24
5600	2.16	1.99	2.11	2.23
5800	2.02	2.06	2.13	2.16
6000	1.90	2.10	2.11	2.08

RF FREQ (MHz)	ISOLATION (dB)									
	VDD=+3.3V				VDD=+3.3V					
	RF COM-RF1	RF COM-RF2	RF COM-RF3	RF COM-RF4	RF1-RF2	RF1-RF3	RF1-RF4	RF2-RF3	RF2-RF4	RF3-RF4
10	81.68	81.36	79.88	81.49	67.86	70.65	69.42	70.79	71.04	70.33
30	82.09	81.60	80.65	82.31	70.49	73.52	72.39	74.33	74.64	72.75
50	82.46	81.67	80.22	83.36	72.58	77.69	76.01	79.30	76.75	74.25
100	81.92	80.53	78.15	82.31	73.34	80.59	78.47	80.18	77.14	73.28
500	73.71	68.33	67.37	70.42	64.10	69.09	68.87	69.73	67.29	63.18
1000	66.88	62.28	61.72	63.19	58.72	62.81	63.56	63.86	61.95	58.22
1200	63.72	60.84	60.66	61.61	57.21	61.24	62.42	62.40	60.67	56.95
1400	62.47	59.82	59.64	60.04	56.20	60.41	61.64	60.87	59.91	56.08
1600	61.40	58.86	59.07	58.40	55.34	59.52	61.20	59.08	59.27	55.21
1800	59.96	58.17	58.61	57.02	54.59	58.98	60.84	57.21	59.26	54.79
2000	58.95	57.42	57.76	56.21	53.88	58.27	60.29	55.25	59.34	54.37
2200	57.39	56.95	57.08	54.66	53.42	58.24	60.29	54.02	58.53	53.52
2400	55.16	56.89	57.26	53.13	53.94	57.16	61.22	52.41	56.63	53.00
2600	53.39	56.00	56.35	51.44	53.97	56.59	61.91	51.48	55.77	52.35
2800	52.09	55.81	54.66	50.02	53.34	55.20	63.38	50.21	54.19	52.08
3000	50.44	55.54	52.98	49.00	53.24	54.54	63.17	49.05	53.26	52.10
3200	49.32	55.05	52.59	47.54	52.51	53.13	62.36	47.77	51.79	52.14
3400	47.91	53.47	50.63	46.40	52.38	51.92	61.97	46.45	50.48	52.72
3600	46.68	52.58	49.08	45.02	51.69	50.41	56.99	45.39	49.28	52.05
3800	45.22	51.31	47.79	43.56	51.19	48.63	52.76	44.28	47.99	51.78
4000	44.12	48.98	46.32	42.59	50.43	47.42	50.50	43.18	46.78	51.00
4200	43.27	47.46	44.96	41.65	48.09	45.20	46.17	41.83	44.86	47.35
4400	42.23	46.26	43.45	40.54	46.69	43.73	44.57	40.77	43.52	46.00
4600	41.47	44.71	42.09	39.55	44.35	41.70	41.59	39.29	41.88	42.72
4800	40.36	43.48	41.38	38.55	43.34	40.51	40.34	37.85	40.77	41.01
5000	38.75	42.82	40.62	36.95	41.13	38.94	38.40	36.29	38.77	38.63
5200	37.65	41.44	39.10	35.22	39.96	38.08	37.38	35.16	37.50	37.29
5400	36.37	40.75	38.00	34.10	38.25	36.90	35.96	34.00	35.99	35.76
5600	35.13	40.27	37.24	33.18	37.13	35.72	34.87	32.99	35.10	34.85
5800	34.38	38.94	35.92	32.30	36.08	34.42	33.53	32.04	33.95	33.69
6000	33.59	37.54	34.35	31.23	35.13	33.15	32.30	31.14	32.88	32.63

State	State of Control Voltage		Mode
	Conrol 1	Control 2	
1	HIGH	LOW	RF COM - RF1
2	LOW	HIGH	RF COM - RF2
3	HIGH	HIGH	RF COM - RF3
4	LOW	LOW	RF COM - RF4

Typical Performance Data

RF FREQ (MHz)	VSWR (:1) VDD=+3V				
	RF COM	RF1 (ON)	RF2 (ON)	RF3 (ON)	RF4 (ON)
10	1.20	1.16	1.17	1.17	1.16
30	1.18	1.16	1.17	1.17	1.16
50	1.17	1.16	1.17	1.17	1.16
100	1.17	1.17	1.17	1.17	1.17
500	1.18	1.17	1.20	1.21	1.17
1000	1.14	1.19	1.24	1.24	1.17
1200	1.17	1.21	1.26	1.26	1.18
1400	1.25	1.25	1.30	1.31	1.24
1600	1.32	1.34	1.34	1.33	1.31
1800	1.35	1.41	1.33	1.34	1.40
2000	1.35	1.48	1.31	1.30	1.44
2200	1.31	1.44	1.29	1.30	1.44
2400	1.22	1.36	1.37	1.39	1.35
2600	1.26	1.29	1.52	1.53	1.29
2800	1.28	1.27	1.58	1.57	1.24
3000	1.24	1.32	1.55	1.50	1.25
3200	1.22	1.36	1.43	1.37	1.27
3400	1.18	1.41	1.29	1.24	1.29
3600	1.11	1.40	1.16	1.11	1.28
3800	1.16	1.48	1.11	1.09	1.33
4000	1.25	1.53	1.23	1.26	1.37
4200	1.37	1.54	1.48	1.52	1.40
4400	1.62	1.44	1.76	1.75	1.36
4600	1.83	1.32	1.92	1.84	1.33
4800	1.86	1.37	1.78	1.70	1.41
5000	1.99	1.64	1.54	1.43	1.65
5200	2.33	1.93	1.40	1.40	1.87
5400	2.51	2.08	1.50	1.67	2.05
5600	2.53	2.12	1.73	1.88	2.07
5800	2.36	1.97	1.88	1.95	2.01
6000	2.19	1.74	1.87	1.86	1.85

RF FREQ (MHz)	VSWR (:1) VDD=+3V			
	RF1 (OFF)	RF2 (OFF)	RF3 (OFF)	RF4 (OFF)
10	1.13	1.14	1.14	1.13
30	1.13	1.13	1.14	1.13
50	1.13	1.13	1.14	1.13
100	1.13	1.13	1.13	1.13
500	1.11	1.09	1.09	1.11
1000	1.05	1.05	1.05	1.08
1200	1.04	1.10	1.10	1.08
1400	1.07	1.16	1.16	1.12
1600	1.13	1.20	1.20	1.17
1800	1.18	1.24	1.25	1.23
2000	1.24	1.24	1.23	1.29
2200	1.29	1.21	1.18	1.33
2400	1.29	1.14	1.12	1.35
2600	1.29	1.04	1.06	1.34
2800	1.24	1.07	1.12	1.31
3000	1.18	1.18	1.22	1.27
3200	1.12	1.27	1.33	1.22
3400	1.05	1.36	1.37	1.19
3600	1.10	1.38	1.39	1.21
3800	1.19	1.36	1.36	1.27
4000	1.30	1.28	1.25	1.35
4200	1.38	1.18	1.13	1.44
4400	1.46	1.04	1.03	1.49
4600	1.50	1.09	1.16	1.52
4800	1.50	1.24	1.29	1.52
5000	1.46	1.35	1.43	1.46
5200	1.36	1.41	1.47	1.39
5400	1.26	1.44	1.46	1.29
5600	1.16	1.39	1.38	1.19
5800	1.06	1.34	1.25	1.11
6000	1.08	1.20	1.13	1.12

State	State of Control Voltage		Mode
	Conrol 1	Control 2	
1	HIGH	LOW	RF COM - RF1
2	LOW	HIGH	RF COM - RF2
3	HIGH	HIGH	RF COM - RF3
4	LOW	LOW	RF COM - RF4

The truth table is based on that control 3 is grounded.

Typical Performance Data

RF FREQ (MHz)	INSERTION LOSS (dB) @ VDD=+3.3V OVER TEMPERTURE											
	RF COM-RF1			RF COM-RF2			RF COM-RF3			RF COM-RF4		
	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C
10	0.67	0.74	0.87	0.69	0.77	0.90	0.69	0.76	0.90	0.67	0.74	0.87
30	0.67	0.75	0.87	0.69	0.78	0.91	0.69	0.77	0.90	0.67	0.75	0.87
50	0.67	0.75	0.87	0.70	0.78	0.91	0.69	0.77	0.90	0.67	0.75	0.87
100	0.68	0.76	0.88	0.70	0.79	0.92	0.70	0.79	0.91	0.67	0.76	0.88
500	0.68	0.80	0.95	0.74	0.86	1.02	0.73	0.86	1.01	0.68	0.80	0.95
1000	0.72	0.88	1.05	0.80	0.96	1.15	0.79	0.96	1.14	0.72	0.87	1.05
1200	0.75	0.92	1.10	0.83	1.01	1.20	0.81	1.00	1.19	0.74	0.91	1.09
1400	0.77	0.95	1.13	0.85	1.04	1.24	0.85	1.04	1.23	0.76	0.94	1.13
1600	0.79	0.98	1.17	0.87	1.06	1.25	0.84	1.05	1.24	0.77	0.96	1.16
1800	0.80	0.99	1.18	0.84	1.03	1.22	0.82	1.02	1.21	0.79	0.98	1.16
2000	0.80	0.99	1.17	0.79	0.99	1.19	0.76	0.97	1.18	0.77	0.96	1.15
2200	0.75	0.94	1.13	0.74	0.96	1.17	0.74	0.96	1.17	0.75	0.94	1.13
2400	0.71	0.92	1.12	0.78	1.01	1.24	0.77	1.02	1.25	0.71	0.91	1.12
2600	0.70	0.91	1.13	0.89	1.13	1.34	0.87	1.12	1.35	0.70	0.91	1.13
2800	0.69	0.93	1.15	0.94	1.18	1.39	0.90	1.16	1.39	0.67	0.91	1.15
3000	0.70	0.94	1.18	0.91	1.15	1.37	0.86	1.11	1.34	0.67	0.91	1.15
3200	0.70	0.95	1.20	0.82	1.08	1.33	0.76	1.04	1.29	0.65	0.91	1.16
3400	0.74	1.00	1.25	0.76	1.04	1.30	0.73	1.01	1.28	0.68	0.94	1.20
3600	0.78	1.05	1.32	0.77	1.05	1.33	0.73	1.03	1.30	0.72	0.99	1.26
3800	0.86	1.14	1.41	0.80	1.10	1.38	0.76	1.08	1.37	0.78	1.06	1.33
4000	0.90	1.17	1.44	0.83	1.15	1.44	0.82	1.15	1.46	0.80	1.08	1.36
4200	0.85	1.13	1.40	0.92	1.24	1.52	0.92	1.25	1.54	0.78	1.07	1.35
4400	0.73	1.04	1.33	1.06	1.38	1.64	1.02	1.37	1.65	0.71	1.03	1.33
4600	0.74	1.06	1.35	1.23	1.55	1.82	1.16	1.49	1.77	0.77	1.10	1.41
4800	0.92	1.25	1.58	1.27	1.62	1.96	1.20	1.57	1.90	0.97	1.31	1.64
5000	1.31	1.64	1.95	1.32	1.69	2.03	1.24	1.63	1.97	1.37	1.70	2.01
5200	1.60	2.00	2.35	1.36	1.77	2.16	1.35	1.79	2.18	1.65	2.04	2.40
5400	1.79	2.16	2.52	1.47	1.88	2.25	1.57	2.00	2.39	1.84	2.24	2.61
5600	1.76	2.16	2.56	1.56	1.99	2.37	1.67	2.11	2.53	1.81	2.23	2.65
5800	1.63	2.02	2.41	1.67	2.06	2.47	1.71	2.13	2.55	1.76	2.16	2.58
6000	1.50	1.90	2.35	1.68	2.10	2.52	1.68	2.11	2.54	1.67	2.08	2.54

State	State of Control Voltage		Mode
	Conrol 1	Control 2	
1	HIGH	LOW	RF COM - RF1
2	LOW	HIGH	RF COM - RF2
3	HIGH	HIGH	RF COM - RF3
4	LOW	LOW	RF COM - RF4

The truth table is based on that control 3 is grounded.

Typical Performance Data

RF FREQ (MHz)	ISOLATION (dB) @ VDD=+3.3V OVER TEMPERTURE											
	RF COM-RF1			RF COM-RF2			RF COM-RF3			RF COM-RF4		
	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C
10	84.11	81.68	80.05	83.68	81.36	84.90	86.12	79.88	79.96	83.15	81.49	84.32
30	84.85	82.09	81.35	83.30	81.60	83.32	84.45	80.65	79.57	84.29	82.31	84.38
50	85.1	82.5	82.3	82.8	81.7	81.6	82.8	80.2	79.2	85.2	83.4	84.2
100	83.6	81.9	82.3	81.2	80.5	78.9	79.0	78.2	77.6	81.7	82.3	83.4
500	72.0	73.7	76.6	68.3	68.3	68.2	67.6	67.4	67.0	69.4	70.4	72.0
1000	65.6	66.9	69.2	62.2	62.3	62.2	61.8	61.7	61.4	62.3	63.2	64.5
1200	62.7	63.7	65.5	60.8	60.8	60.7	60.7	60.7	60.4	60.8	61.6	62.9
1400	61.3	62.5	63.9	59.7	59.8	59.6	59.6	59.6	59.4	59.3	60.0	61.1
1600	60.4	61.4	62.7	58.8	58.9	58.7	59.1	59.1	58.8	57.7	58.4	59.3
1800	59.1	60.0	61.0	58.1	58.2	58.0	58.6	58.6	58.3	56.4	57.0	57.9
2000	58.3	58.9	60.0	57.4	57.4	57.2	57.7	57.8	57.5	55.8	56.2	56.8
2200	56.8	57.4	58.1	56.8	57.0	57.1	56.9	57.1	57.0	54.3	54.7	55.3
2400	54.8	55.2	55.7	56.7	56.9	56.5	57.1	57.3	57.2	52.7	53.1	53.4
2600	53.0	53.4	53.9	56.0	56.0	55.8	56.1	56.3	56.1	51.3	51.4	51.8
2800	51.8	52.1	52.4	55.7	55.8	55.0	54.8	54.7	54.3	49.8	50.0	50.3
3000	50.2	50.4	50.6	55.8	55.5	54.7	53.2	53.0	52.9	48.7	49.0	49.0
3200	49.1	49.3	49.4	55.5	55.1	53.9	52.5	52.6	52.1	47.5	47.5	47.5
3400	47.9	47.9	48.0	53.9	53.5	52.3	50.7	50.6	49.9	46.4	46.4	46.6
3600	46.6	46.7	46.7	53.2	52.6	51.6	49.4	49.1	48.7	44.9	45.0	44.9
3800	45.0	45.2	45.1	52.9	51.3	51.0	48.3	47.8	47.7	43.6	43.6	43.5
4000	43.9	44.1	44.0	49.5	49.0	48.1	46.6	46.3	45.8	42.5	42.6	42.5
4200	43.1	43.3	43.1	48.0	47.5	46.8	45.0	45.0	44.4	41.7	41.6	41.6
4400	42.4	42.2	42.2	46.6	46.3	45.4	43.6	43.4	42.9	40.7	40.5	40.5
4600	41.4	41.5	41.1	45.2	44.7	44.1	42.4	42.1	41.9	39.6	39.6	39.3
4800	40.3	40.4	40.1	43.6	43.5	42.7	41.5	41.4	40.8	38.6	38.5	38.3
5000	39.0	38.7	38.6	43.3	42.8	42.0	41.0	40.6	40.2	37.1	36.9	36.7
5200	37.8	37.6	37.5	42.1	41.4	40.7	39.4	39.1	38.5	35.2	35.2	35.0
5400	36.5	36.4	36.3	41.3	40.8	40.1	38.3	38.0	37.7	34.0	34.1	34.1
5600	35.1	35.1	35.0	40.7	40.3	39.5	37.5	37.2	36.7	33.1	33.2	33.1
5800	34.4	34.4	34.3	39.5	38.9	38.2	36.1	35.9	35.5	32.3	32.3	32.4
6000	33.6	33.6	33.5	38.0	37.5	36.9	34.5	34.3	34.0	31.2	31.2	31.3

State	State of Control Voltage		Mode
	Conrol 1	Control 2	
1	HIGH	LOW	RF COM - RF1
2	LOW	HIGH	RF COM - RF2
3	HIGH	HIGH	RF COM - RF3
4	LOW	LOW	RF COM - RF4

The truth table is based on that control 3 is grounded.

Typical Performance Data

RF FREQ (MHz)	ISOLATION (dB) @ VDD=+3.3V OVER TEMPERTURE																	
	RF1-RF2			RF1-RF3			RF1-RF4			RF2-RF3			RF2-RF4			RF3-RF4		
	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C
10	69.04	67.86	68.67	71.31	70.65	69.16	69.64	69.42	70.57	69.55	70.79	69.41	69.59	71.04	70.50	70.41	70.33	69.01
30	71.25	70.49	71.01	74.25	73.52	73.38	72.95	72.39	73.48	73.41	74.33	74.64	72.83	74.64	73.69	72.81	72.75	71.50
50	73.7	72.6	73.0	79.0	77.7	76.1	76.6	76.0	76.2	77.8	79.3	77.6	75.6	76.8	75.8	74.4	74.2	73.2
100	74.4	73.3	73.4	81.0	80.6	78.6	79.1	78.5	77.6	79.9	80.2	80.4	77.1	77.1	76.7	73.4	73.3	73.0
500	63.7	64.1	64.5	68.5	69.1	69.3	68.7	68.9	69.0	68.8	69.7	70.5	67.0	67.3	67.5	63.1	63.2	63.5
1000	58.3	58.7	59.0	62.5	62.8	63.2	63.3	63.6	63.8	63.1	63.9	64.7	61.6	62.0	62.3	57.9	58.2	58.6
1200	56.8	57.2	57.6	60.9	61.2	61.6	62.0	62.4	62.7	61.6	62.4	62.5	60.2	60.7	61.1	56.5	56.9	57.3
1400	55.8	56.2	56.7	60.0	60.4	60.8	61.2	61.6	62.0	60.4	60.9	60.3	59.4	59.9	60.3	55.6	56.1	56.6
1600	54.9	55.3	55.8	59.1	59.5	60.0	60.6	61.2	61.8	59.4	59.1	58.5	58.7	59.3	59.9	54.7	55.2	55.7
1800	54.2	54.6	55.0	58.4	59.0	59.2	60.4	60.8	61.0	57.4	57.2	56.8	58.6	59.3	59.9	54.2	54.8	54.9
2000	53.5	53.9	54.3	57.8	58.3	58.7	59.9	60.3	60.4	55.4	55.2	55.0	58.5	59.3	59.6	54.0	54.4	54.3
2200	53.0	53.4	53.8	58.0	58.2	58.3	60.0	60.3	60.4	54.1	54.0	53.7	58.4	58.5	58.0	53.6	53.5	53.5
2400	53.6	53.9	54.3	57.4	57.2	56.5	61.2	61.2	61.2	52.5	52.4	52.2	56.9	56.6	56.4	53.0	53.0	52.8
2600	53.5	54.0	53.8	57.1	56.6	56.1	61.9	61.9	61.3	51.6	51.5	51.3	55.9	55.8	55.6	52.4	52.3	52.3
2800	53.3	53.3	53.1	55.5	55.2	54.5	64.0	63.4	61.9	50.2	50.2	49.9	54.3	54.2	53.7	52.0	52.1	51.9
3000	53.2	53.2	53.1	55.0	54.5	53.9	64.6	63.2	61.0	49.1	49.1	48.7	53.3	53.3	52.8	52.1	52.1	52.0
3200	52.5	52.5	52.0	53.6	53.1	52.3	64.4	62.4	59.4	47.9	47.8	47.5	52.3	51.8	51.5	52.0	52.1	51.5
3400	52.3	52.4	51.8	52.4	51.9	51.1	61.8	62.0	60.3	46.4	46.5	46.1	50.6	50.5	50.1	52.6	52.7	51.5
3600	51.9	51.7	50.8	50.9	50.4	49.7	58.0	57.0	54.8	45.5	45.4	45.0	49.6	49.3	48.7	52.7	52.1	51.1
3800	52.5	51.2	51.1	49.4	48.6	48.3	52.8	52.8	52.0	44.6	44.3	44.0	48.3	48.0	47.6	52.9	51.8	51.0
4000	51.3	50.4	49.6	47.9	47.4	46.8	51.0	50.5	49.6	43.4	43.2	42.8	47.0	46.8	46.2	52.4	51.0	49.5
4200	48.6	48.1	47.4	45.7	45.2	44.8	46.0	46.2	45.7	42.0	41.8	41.4	45.3	44.9	44.5	47.5	47.3	46.8
4400	47.3	46.7	46.0	44.1	43.7	43.2	44.9	44.6	44.1	40.9	40.8	40.4	43.9	43.5	43.2	46.4	46.0	45.1
4600	44.8	44.4	43.8	41.9	41.7	41.2	42.0	41.6	41.4	39.4	39.3	38.9	42.1	41.9	41.4	43.1	42.7	42.2
4800	44.0	43.3	42.8	40.8	40.5	40.1	40.6	40.3	40.0	38.2	37.9	37.7	41.1	40.8	40.4	41.3	41.0	40.5
5000	41.7	41.1	40.4	39.2	38.9	38.4	38.5	38.4	38.1	36.4	36.3	35.9	38.9	38.8	38.4	38.9	38.6	38.2
5200	40.3	40.0	39.2	38.4	38.1	37.7	37.5	37.4	37.1	35.4	35.2	34.9	37.8	37.5	37.3	37.6	37.3	37.0
5400	38.5	38.2	37.7	37.1	36.9	36.4	36.1	36.0	35.8	34.1	34.0	33.7	36.0	36.0	35.7	35.9	35.8	35.5
5600	37.4	37.1	36.7	36.0	35.7	35.3	34.8	34.9	34.7	33.1	33.0	32.7	35.2	35.1	34.8	34.8	34.8	34.5
5800	36.2	36.1	35.8	34.5	34.4	34.1	33.5	33.5	33.5	32.1	32.0	32.0	33.9	34.0	33.8	33.7	33.7	33.6
6000	35.1	35.1	34.9	33.1	33.2	32.8	32.3	32.3	32.3	31.1	31.1	31.0	32.8	32.9	32.8	32.6	32.6	32.6

State	State of Control Voltage		Mode
	Conrol 1	Control 2	
1	HIGH	LOW	RF COM - RF1
2	LOW	HIGH	RF COM - RF2
3	HIGH	HIGH	RF COM - RF3
4	LOW	LOW	RF COM - RF4

The truth table is based on that control 3 is grounded.

Typical Performance Data

RF FREQ (MHz)	VSWR (:1) @ VDD= +3.3V Over Temperature														
	RF COM			RF1 (ON)			RF2 (ON)			RF3 (ON)			RF4 (ON)		
	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C
10	1.16	1.20	1.21	1.15	1.16	1.19	1.15	1.17	1.20	1.15	1.17	1.20	1.15	1.16	1.19
30	1.15	1.18	1.20	1.15	1.16	1.19	1.15	1.17	1.20	1.15	1.17	1.20	1.15	1.16	1.19
50	1.15	1.17	1.20	1.15	1.16	1.19	1.15	1.17	1.20	1.15	1.17	1.20	1.15	1.16	1.19
100	1.15	1.17	1.20	1.15	1.17	1.19	1.16	1.17	1.20	1.15	1.17	1.20	1.15	1.17	1.19
500	1.16	1.18	1.20	1.15	1.17	1.20	1.18	1.20	1.23	1.19	1.21	1.24	1.15	1.17	1.20
1000	1.12	1.14	1.17	1.17	1.19	1.21	1.22	1.24	1.27	1.23	1.24	1.26	1.15	1.17	1.20
1200	1.14	1.17	1.21	1.19	1.21	1.24	1.24	1.26	1.28	1.23	1.26	1.29	1.16	1.18	1.21
1400	1.23	1.25	1.27	1.24	1.25	1.28	1.28	1.30	1.31	1.30	1.31	1.32	1.22	1.24	1.26
1600	1.32	1.32	1.33	1.31	1.34	1.36	1.34	1.34	1.33	1.31	1.33	1.32	1.29	1.31	1.33
1800	1.35	1.35	1.33	1.41	1.41	1.42	1.35	1.33	1.31	1.36	1.34	1.33	1.40	1.40	1.40
2000	1.37	1.35	1.32	1.49	1.48	1.47	1.33	1.31	1.31	1.31	1.30	1.31	1.44	1.44	1.43
2200	1.35	1.31	1.26	1.47	1.44	1.41	1.29	1.29	1.31	1.31	1.30	1.30	1.47	1.44	1.40
2400	1.25	1.22	1.17	1.38	1.36	1.35	1.34	1.37	1.40	1.36	1.39	1.41	1.37	1.35	1.33
2600	1.30	1.26	1.20	1.31	1.29	1.27	1.53	1.52	1.51	1.54	1.53	1.54	1.32	1.29	1.27
2800	1.32	1.28	1.21	1.27	1.27	1.27	1.60	1.58	1.55	1.58	1.57	1.55	1.23	1.24	1.25
3000	1.30	1.24	1.16	1.32	1.32	1.33	1.59	1.55	1.51	1.54	1.50	1.45	1.26	1.25	1.26
3200	1.24	1.22	1.19	1.35	1.36	1.38	1.44	1.43	1.43	1.38	1.37	1.40	1.25	1.27	1.28
3400	1.21	1.18	1.15	1.41	1.41	1.42	1.30	1.29	1.29	1.25	1.24	1.24	1.30	1.29	1.30
3600	1.12	1.11	1.11	1.40	1.40	1.44	1.17	1.16	1.20	1.13	1.11	1.11	1.27	1.28	1.30
3800	1.18	1.16	1.12	1.48	1.48	1.47	1.11	1.11	1.14	1.07	1.09	1.14	1.34	1.33	1.32
4000	1.28	1.25	1.22	1.55	1.53	1.51	1.21	1.23	1.27	1.25	1.26	1.33	1.38	1.37	1.35
4200	1.39	1.37	1.32	1.58	1.54	1.49	1.49	1.48	1.46	1.53	1.52	1.47	1.43	1.40	1.35
4400	1.66	1.62	1.56	1.45	1.44	1.40	1.79	1.76	1.69	1.75	1.75	1.69	1.36	1.36	1.34
4600	1.90	1.83	1.74	1.33	1.32	1.30	1.99	1.92	1.85	1.92	1.84	1.82	1.35	1.33	1.32
4800	1.89	1.86	1.84	1.39	1.37	1.36	1.82	1.78	1.75	1.76	1.70	1.65	1.44	1.41	1.40
5000	2.03	1.99	1.93	1.69	1.64	1.58	1.59	1.54	1.53	1.47	1.43	1.37	1.71	1.65	1.59
5200	2.31	2.33	2.31	1.93	1.93	1.87	1.42	1.40	1.41	1.40	1.40	1.38	1.90	1.87	1.81
5400	2.56	2.51	2.43	2.14	2.08	2.02	1.51	1.50	1.45	1.70	1.67	1.67	2.09	2.05	1.97
5600	2.57	2.53	2.49	2.18	2.12	2.06	1.77	1.73	1.68	1.93	1.88	1.84	2.13	2.07	2.01
5800	2.44	2.36	2.28	2.01	1.97	1.89	1.96	1.88	1.83	2.01	1.95	1.84	2.07	2.01	1.94
6000	2.27	2.19	2.16	1.78	1.74	1.72	1.92	1.87	1.81	1.95	1.86	1.82	1.89	1.85	1.80

State	State of Control Voltage		Mode
	Conrol 1	Control 2	
1	HIGH	LOW	RF COM - RF1
2	LOW	HIGH	RF COM - RF2
3	HIGH	HIGH	RF COM - RF3
4	LOW	LOW	RF COM - RF4

The truth table is based on that control 3 is grounded.

Typical Performance Data

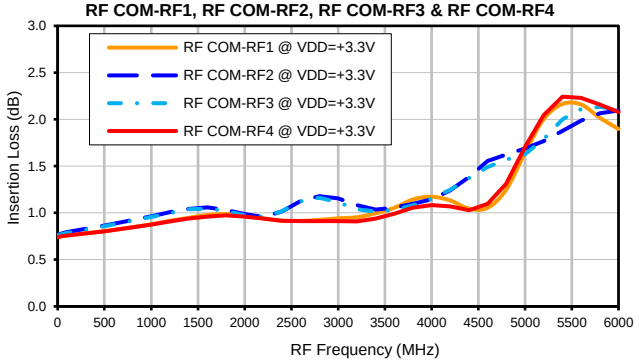
RF FREQ (MHz)	VSWR (:1) @ VDD= +3.3V Over Temperature											
	RF1 (OFF)			RF2 (OFF)			RF3 (OFF)			RF4 (OFF)		
	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C	-40°C	+25°C	+105°C
10	1.25	1.13	1.01	1.26	1.14	1.01	1.26	1.14	1.01	1.25	1.13	1.01
30	1.25	1.13	1.01	1.26	1.13	1.01	1.26	1.14	1.01	1.25	1.13	1.01
50	1.25	1.13	1.01	1.25	1.13	1.01	1.26	1.14	1.01	1.25	1.13	1.01
100	1.24	1.13	1.01	1.25	1.13	1.00	1.25	1.13	1.00	1.24	1.13	1.01
500	1.23	1.11	1.02	1.21	1.09	1.04	1.21	1.09	1.04	1.23	1.11	1.03
1000	1.16	1.05	1.07	1.14	1.05	1.12	1.13	1.05	1.11	1.18	1.08	1.09
1200	1.14	1.04	1.11	1.16	1.10	1.14	1.17	1.10	1.16	1.17	1.08	1.11
1400	1.14	1.07	1.13	1.21	1.16	1.17	1.21	1.16	1.17	1.18	1.12	1.16
1600	1.17	1.13	1.17	1.28	1.20	1.15	1.28	1.20	1.16	1.21	1.17	1.19
1800	1.23	1.18	1.20	1.34	1.24	1.15	1.34	1.25	1.17	1.28	1.23	1.23
2000	1.31	1.24	1.21	1.37	1.24	1.10	1.37	1.23	1.09	1.35	1.29	1.25
2200	1.38	1.29	1.22	1.35	1.21	1.05	1.31	1.18	1.04	1.42	1.33	1.26
2400	1.40	1.29	1.18	1.28	1.14	1.01	1.26	1.12	1.04	1.46	1.35	1.25
2600	1.42	1.29	1.16	1.17	1.04	1.08	1.16	1.06	1.12	1.47	1.34	1.22
2800	1.37	1.24	1.11	1.11	1.07	1.14	1.16	1.12	1.16	1.45	1.31	1.19
3000	1.32	1.18	1.04	1.19	1.18	1.21	1.24	1.22	1.24	1.40	1.27	1.15
3200	1.25	1.12	1.01	1.32	1.27	1.23	1.38	1.33	1.29	1.35	1.22	1.14
3400	1.14	1.05	1.10	1.46	1.36	1.27	1.47	1.37	1.24	1.28	1.19	1.15
3600	1.14	1.10	1.16	1.52	1.38	1.24	1.53	1.39	1.27	1.28	1.21	1.19
3800	1.21	1.19	1.23	1.51	1.36	1.21	1.53	1.36	1.19	1.33	1.27	1.25
4000	1.35	1.30	1.30	1.44	1.28	1.12	1.39	1.25	1.08	1.42	1.35	1.30
4200	1.44	1.38	1.34	1.31	1.18	1.07	1.25	1.13	1.07	1.53	1.44	1.35
4400	1.57	1.46	1.37	1.15	1.04	1.06	1.14	1.03	1.12	1.62	1.49	1.38
4600	1.64	1.50	1.36	1.10	1.09	1.16	1.17	1.16	1.22	1.67	1.52	1.37
4800	1.64	1.50	1.34	1.27	1.24	1.23	1.32	1.29	1.25	1.66	1.52	1.36
5000	1.62	1.46	1.30	1.42	1.35	1.30	1.54	1.43	1.38	1.60	1.46	1.30
5200	1.49	1.36	1.21	1.53	1.41	1.29	1.62	1.47	1.33	1.54	1.39	1.24
5400	1.36	1.26	1.15	1.60	1.44	1.31	1.61	1.46	1.29	1.40	1.29	1.16
5600	1.25	1.16	1.14	1.53	1.39	1.23	1.54	1.38	1.26	1.32	1.19	1.06
5800	1.09	1.06	1.14	1.49	1.34	1.23	1.37	1.25	1.13	1.24	1.11	1.03
6000	1.07	1.08	1.18	1.29	1.20	1.14	1.21	1.13	1.16	1.23	1.12	1.10

State	State of Control Voltage		Mode
	Conrol 1	Control 2	
1	HIGH	LOW	RF COM - RF1
2	LOW	HIGH	RF COM - RF2
3	HIGH	HIGH	RF COM - RF3
4	LOW	LOW	RF COM - RF4

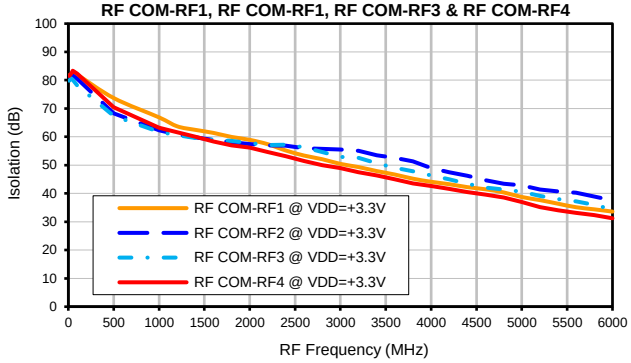
The truth table is based on that control 3 is grounded.

Typical Performance Curves

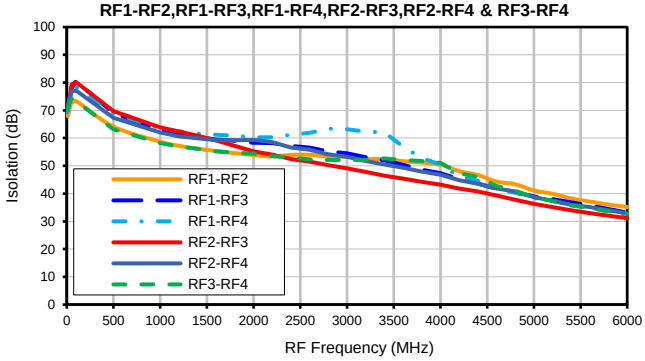
INSERTION LOSS
RF COM-RF1, RF COM-RF2, RF COM-RF3 & RF COM-RF4



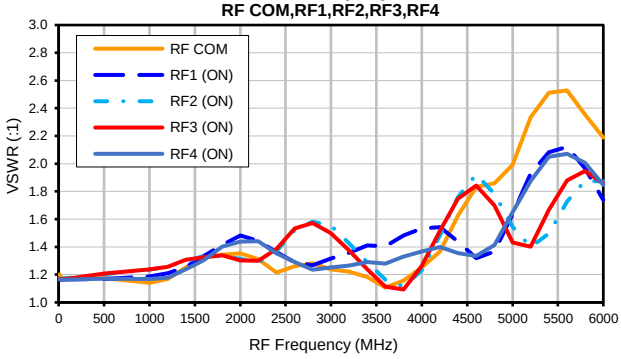
ISOLATION
RF COM-RF1, RF COM-RF1, RF COM-RF3 & RF COM-RF4



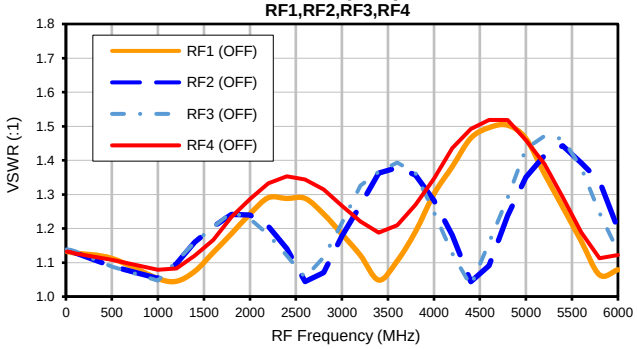
ISOLATION
RF1-RF2,RF1-RF3,RF1-RF4,RF2-RF3,RF2-RF4 & RF3-RF4



VSWR (ON)
RF COM,RF1,RF2,RF3,RF4



VSWR (OFF)
RF1,RF2,RF3,RF4

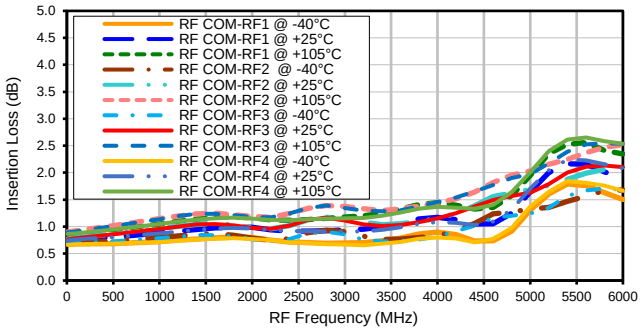


State	State of Control Voltage		Mode
	Conrol 1	Control 2	
1	HIGH	LOW	RF COM - RF1
2	LOW	HIGH	RF COM - RF2
3	HIGH	HIGH	RF COM - RF3
4	LOW	LOW	RF COM - RF4

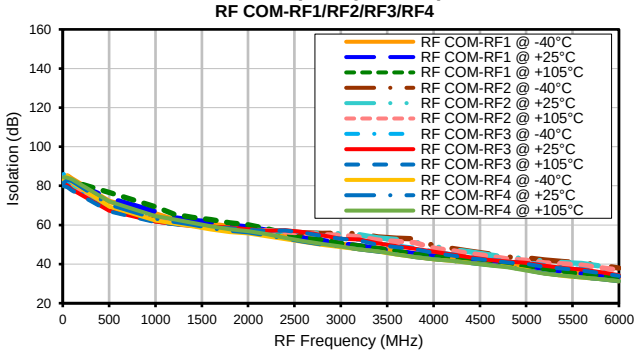
The truth table is based on that control 3 is grounded.

Typical Performance Curves

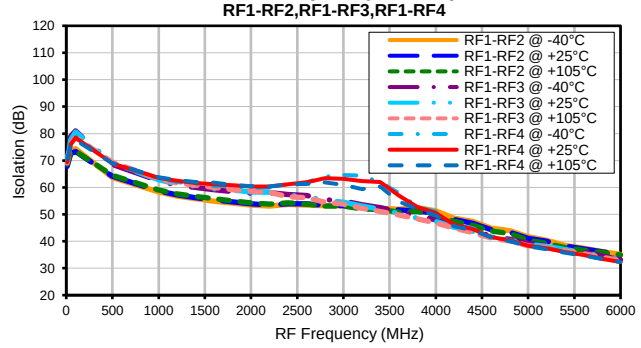
Insertion Loss vs. Frequency & Temperature
RF COM-RF1/RF2/RF3/RF4



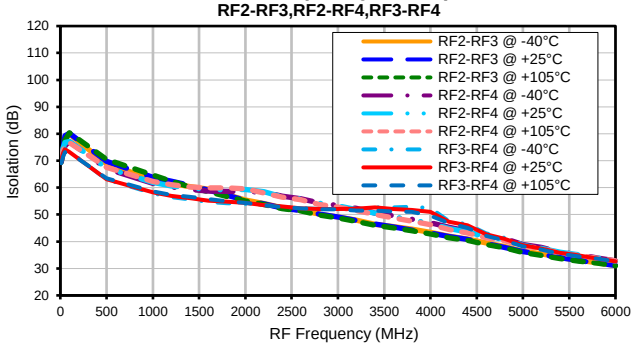
Isolation vs. Frequency & Temperature
RF COM-RF1/RF2/RF3/RF4



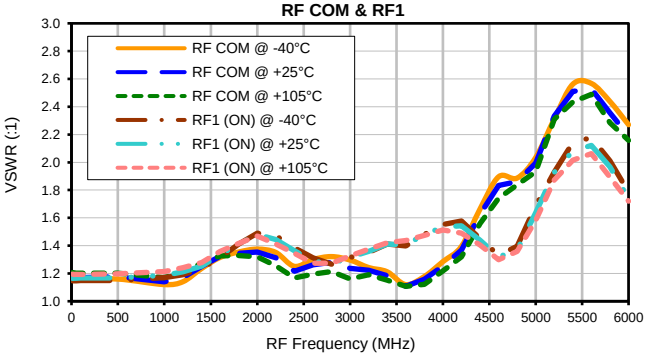
Isolation vs. Frequency & Temperature
RF1-RF2,RF1-RF3,RF1-RF4



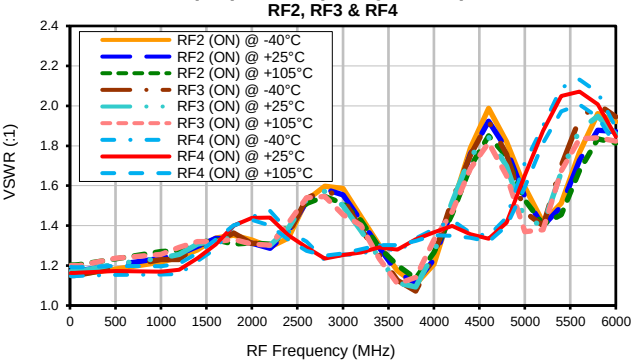
Isolation vs. Frequency & Temperature
RF2-RF3,RF2-RF4,RF3-RF4



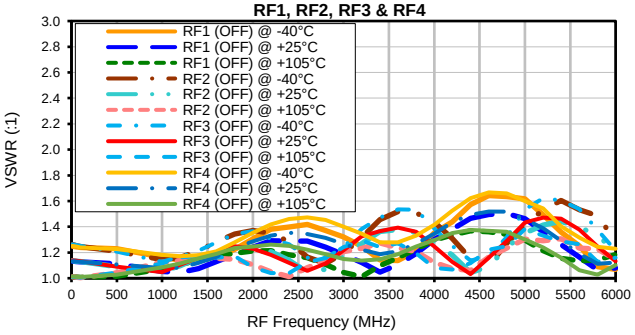
VSWR (ON) vs. Frequency & Temperature
RF COM & RF1



VSWR (ON) vs. Frequency & Temperature
RF2, RF3 & RF4



VSWR (OFF) vs. Frequency & Temperature
RF1, RF2, RF3 & RF4

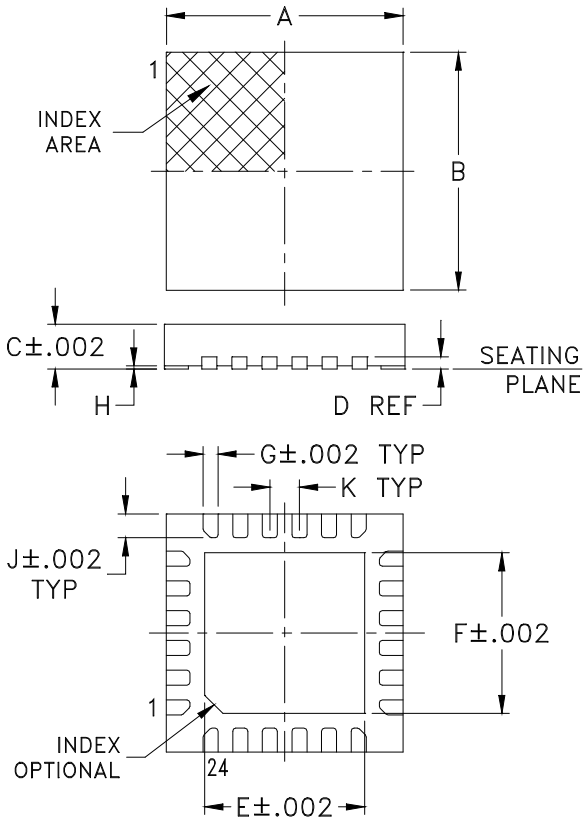


State	State of Control Voltage		Mode
	Conrol 1	Control 2	
1	HIGH	LOW	RF COM - RF1
2	LOW	HIGH	RF COM - RF2
3	HIGH	HIGH	RF COM - RF3
4	LOW	LOW	RF COM - RF4

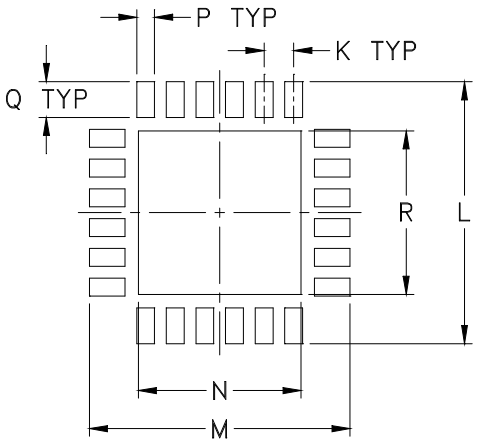
The truth table is based on that control 3 is grounded.

DG984-1

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K
DG984-1	.157 (4.00)	.157 (4.00)	.029 (0.75)	.008 (0.20)	.106 (2.70)	.106 (2.70)	.010 (0.25)	.002 (0.05)	.016 (0.40)	.020 (0.50)

CASE #	L	M	N	P	Q	R	WT. GRAM
DG984-1	.173 (4.40)	.173 (4.40)	.108 (2.75)	.012 (0.30)	.024 (0.60)	.108 (2.75)	.04

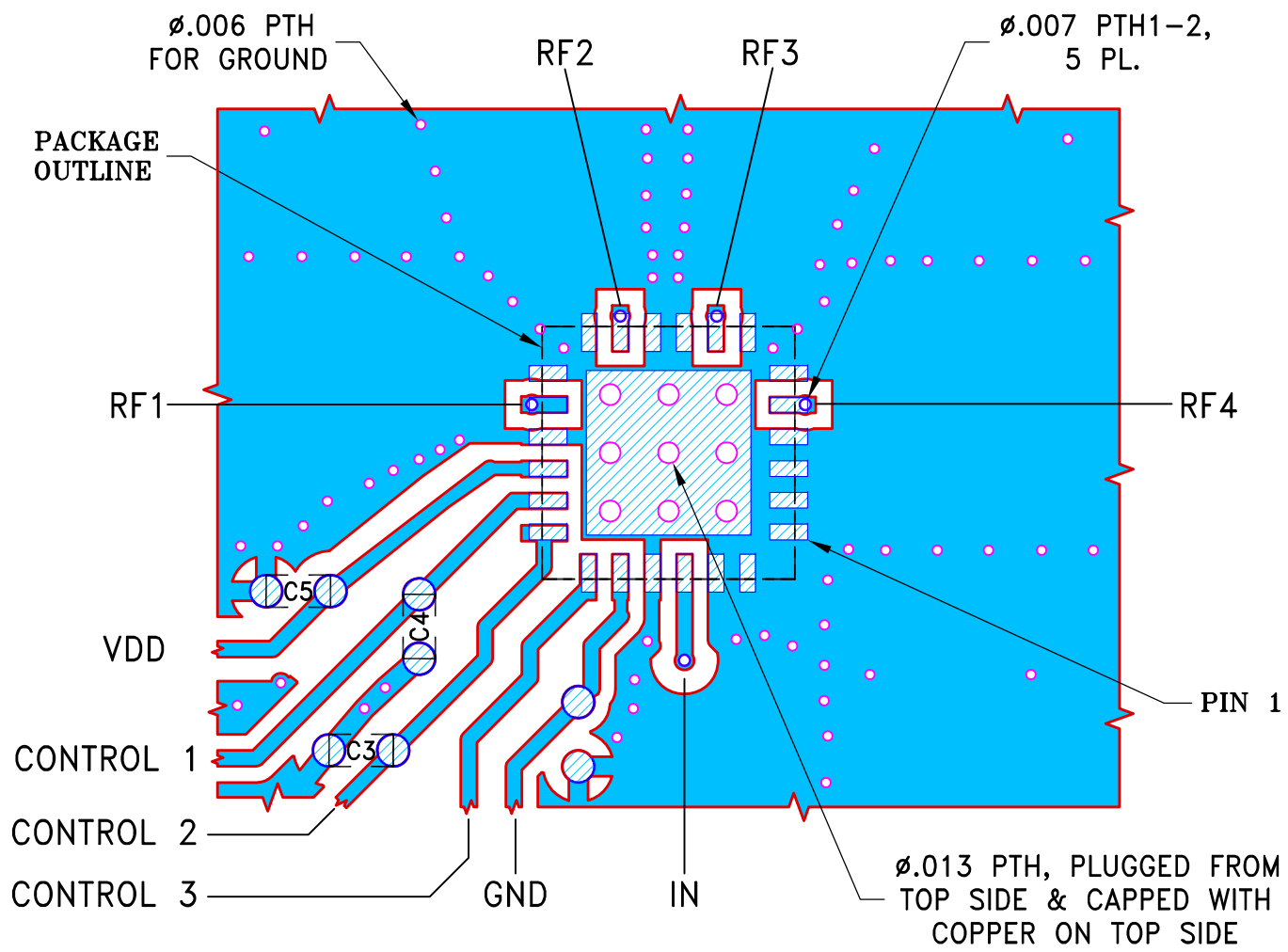
Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

Notes:

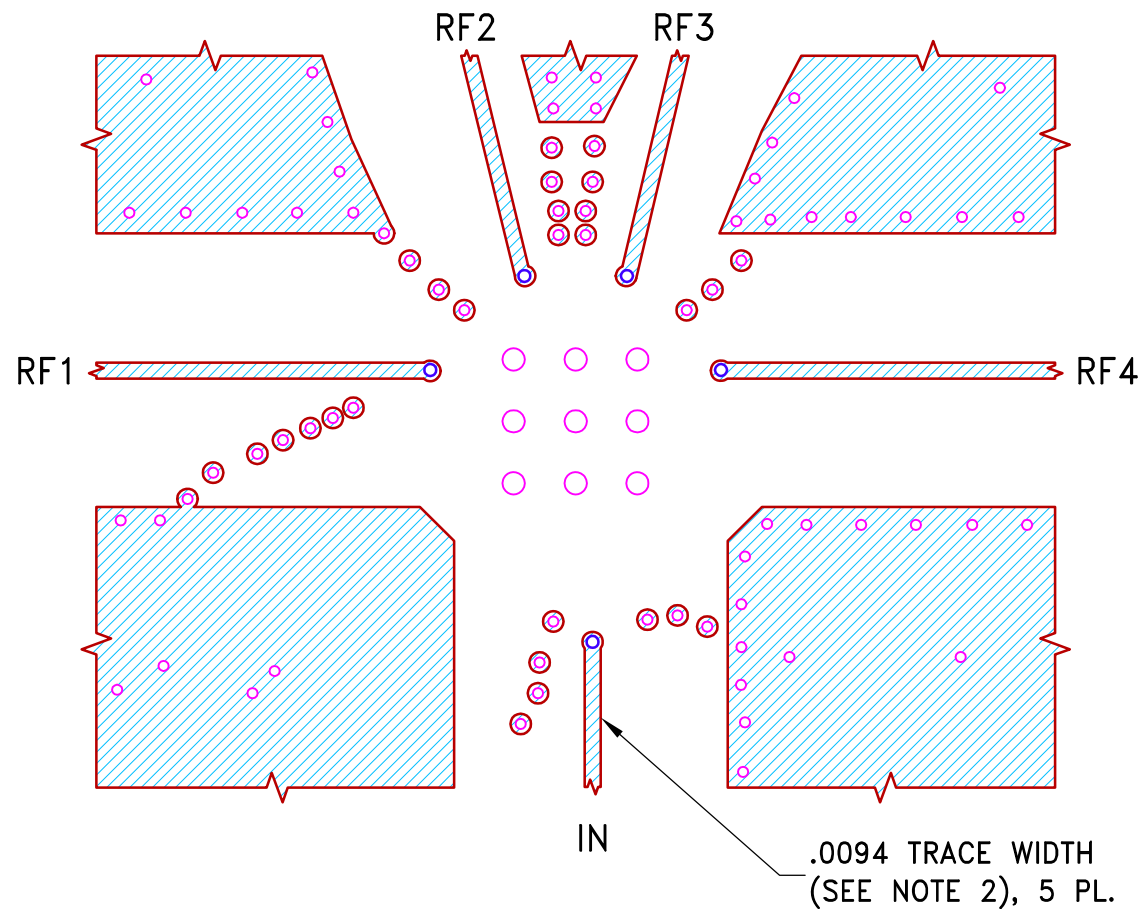
1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: NiPdAu. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

SUGGESTED MOUNTING CONFIGURATION FOR DG984-1 CASE STYLE, "24SW01" PIN CODE

COMPONENT	SIZE
DUT	4x4mm 24 LEAD MCLP
C3,C4,C5	0402

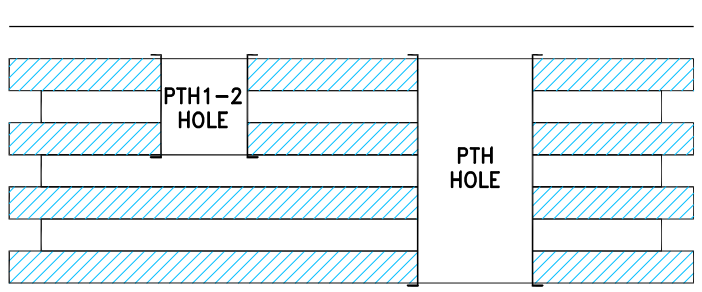


TOP VIEW



COPPER LAYER 2

STACK-UP DIAGRAM



-TOP SOLDER MASK
-COPPER LAYER 1 (TOP SIDE, 1.0 OZ)
-CORE, .008", ROGERS RO4003C
-COPPER LAYER 2 (RF TRACES, 1.0 OZ)
-PREPREG, ROGERS RO4450F (THICKNESS AS REQUIRED)
-COPPER LAYER 3 (GROUND PLANE, 1.0 OZ)
-CORE, .008", ROGERS RO4003C
-COPPER LAYER 4 (BOTTOM SIDE, GROUND PLANE, 1.0 OZ)

1. TOTAL FINISHED THICKNESS 0.035"±10%.
2. PTH HOLES PRESENT FROM COPPER LAYER 1 TO 4.
3. PTH1-2 HOLES PRESENT FROM COPPER LAYER 1 TO 2.

NOTES:

1. PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
2. TRACE WIDTH IS SHOWN FOR ROGERS RO4003C WITH DIELECTRIC THICKNESS .008"±.001"; COPPER: SEE STACK-UP DIAGRAM. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
3. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-927+.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

THIRD ANGLE PROJECTION

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
A	M167882	CHANDED LABEL ON PIN 20 (WAS VDD)	05/16/18	ITG	IL
OR	M161976	NEW RELEASE	06/22/17	ITG	RS

REVISIONS

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ±	DRAWN	ITG	06/15/17
	CHECKED	IL	06/22/17
	APPROVED	RS	06/22/17

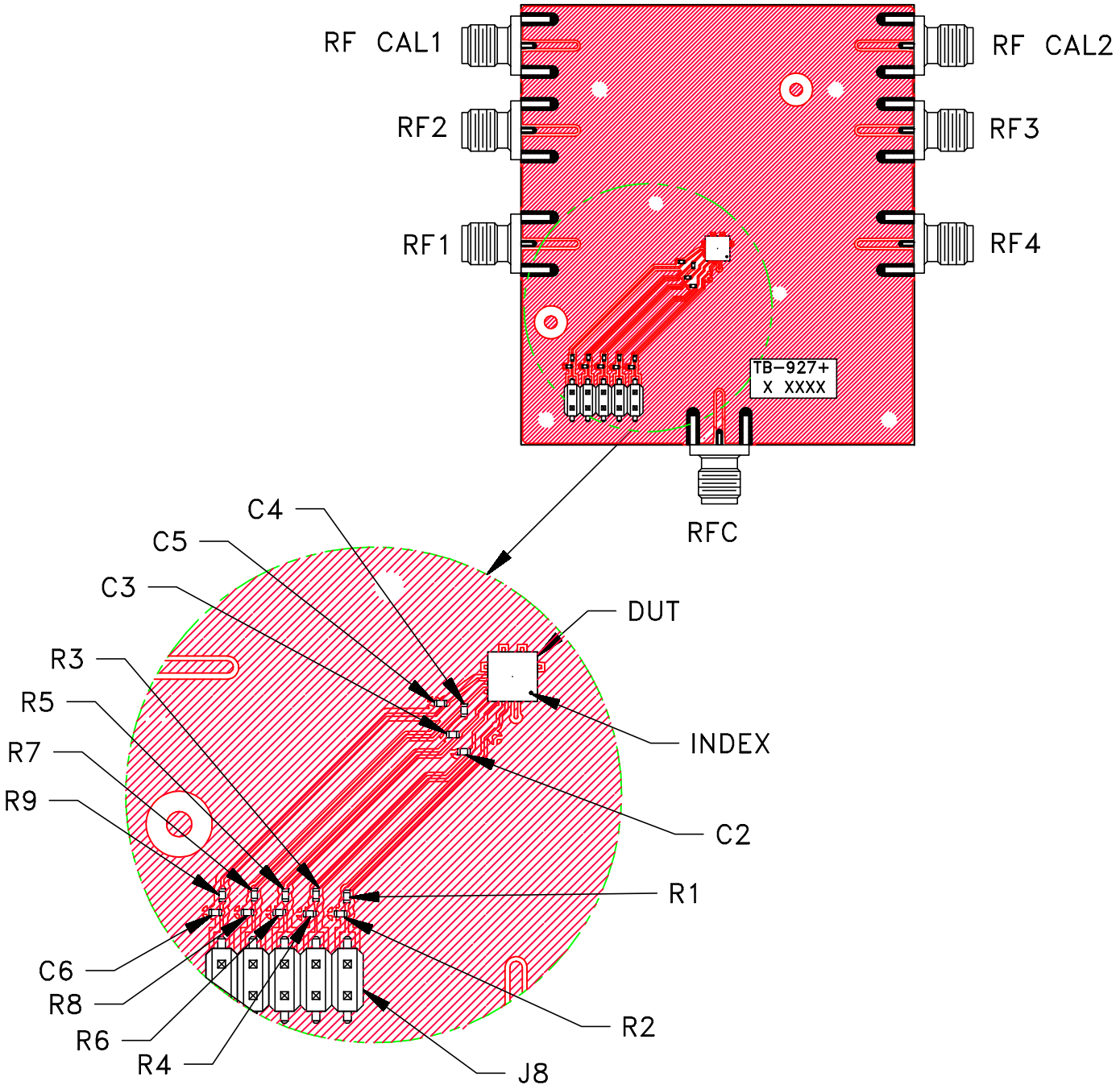
BSHEETA1.DWG REV:A DATE:01/12/94

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 24SW01, DG984-1, TB-927+

SIZE	CODE IDENT	DRAWING NO:	REV:
B	15542	98-PL-514	A
FILE: 98PL514	SCALE: 8:1	SHEET: 1 OF 1	

Evaluation Board and Circuit

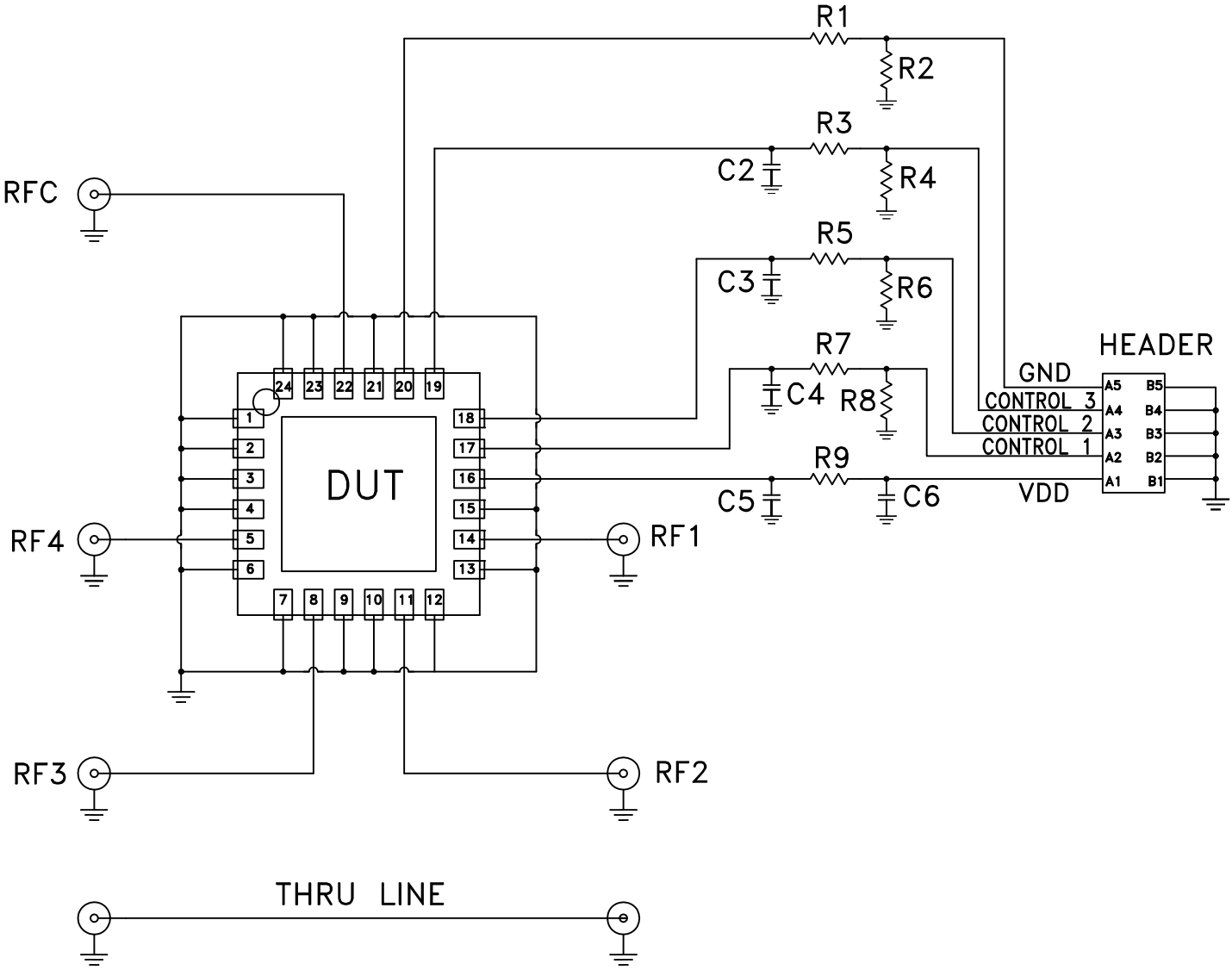


Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4003C or equivalent, Dielectric Constant=3.5, Thickness=.035 inch.

Mini-Circuits®

Evaluation Board and Circuit



COMPONENT	VALUE	SIZE
DUT	HSWA4-63DR+	4X4 MM
C2,C3,C4,C5	100 pF	0402
C6	1 uF	
R1,R2,R3,R5,R7,R9	0 Ohm	
R4,R6,R8	1 MOhm	

SCHEMATIC DIAGRAM

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV84

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85° C or -40° to 105° C Ambient Environment	Refer to Individual Model Data Sheet
Storage Temperature	-55° to 100° C or -65° to 150° C Ambient Environment	Refer to Individual Model Data Sheet
Temperature Humidity Bias	85°C, 85% RH, 168 hours	J-STD-020
Temperature Cycling	-65° to +150°C, 500 cycles	MIL-STD-883, Method 1010.8 / JESD22-A104
High Temp Storage	150°C, 1000 hours	MIL-STD-883, Method 1008.2 / JESD22-A103
Solder Reflow Heat	Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Solderability	Per Standard	MIL-STD-883, Method 2003.9 / JESD22-B102
Marking Resistance to Solvents	Laser marked, visual observation	Mini-Circuits D4-Q4T0-04