Nano-Second Switching

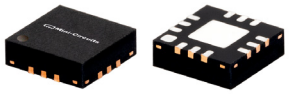
SPDT RF Switch

M3SWA2-63DRC+

Absorptive RF Switch with internal driver

The Big Deal

- High Isolation, 63 dB typ. at 1GHz
- High IIP3, +44dBm typ. at 1GHz
- Low insertion loss, 0.5 dB typ.at 1GHz
- Fast Rise/Fall time, 5.6 ns / 6 ns typ.
- Tiny Size, 3x3mm 12L MCLP



CASE STYLE: DQ1225

Product Overview

Mini-Circuits' M3SWA2-63DRC+ is a MMIC SPDT absorptive switch with an internal driver designed for wideband operation from DC to 6 GHz supporting many applications requiring nano-second switching across a wide frequency range. This model provides excellent isolation and high linearity and is packaged in a 3x3mm 12L package.

Key Features

Feature	Advantages
Wideband, DC to 6 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: • 63 dB at 1 GHz • 29 dB at 6 GHz	High isolation significantly reduces leakage of power into OFF ports.
High linearity: Pin at P1dB, 26.2dBm typ. at 1GHz	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.
Tiny size, 3 x 3 mm MCLP package	Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.

Nano-Second Switching

SPDT RF Switch

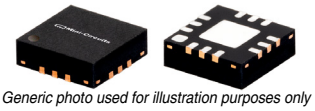
50Ω DC - 6000 MHz

Absorptive RF Switch with internal driver

M3SWA2-63DRC+

Product Features

- High Isolation, 63 dB typ. at 1GHz
- Low Insertion Loss, 0.5dB typ. at 1GHz
- Fast Rise/Fall time, 5.6ns/ 6ns typ.
- High Input IP3, +44dBm typ. at 1GHz
- Replaces M3SWA-2-50DR+



Generic photo used for illustration purposes only

CASE STYLE: DQ1225

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

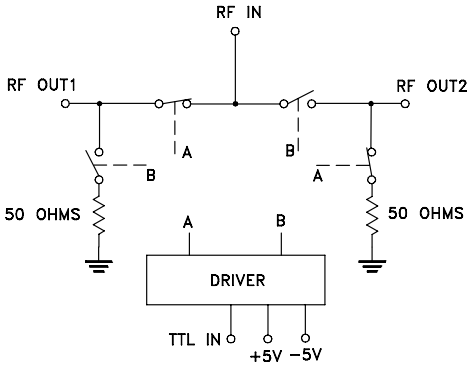
Typical Applications

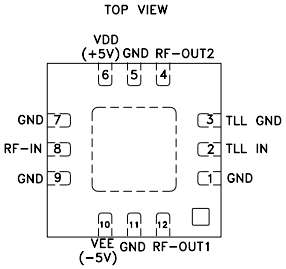
- Defense
- Communication Infrastructure
- Test and Measurements

General Description

Mini-Circuits' M3SWA2-63DRC+ is a MMIC SPDT absorptive switch with an internal driver designed for wideband operation from DC to 6 GHz supporting many applications requiring nano-second switching across a wide frequency range. This model provides excellent isolation and high linearity and is packaged in a 3x3mm 12L package.

Simplified Schematic and Pad Description





Function	Pad Number	Description
RF-IN	8	RF Common/ SUM port
RF-OUT1	12	RF Output port #1
RF-OUT2	4	RF Output port #2
TTL IN	2	TTL Compatible Control Voltage Input
TTL GND	3	TTL Ground
V_{DD}(+5V)	6	Positive Supply Voltage V_{DD}
V_{EE}(-5V)	10	Negative Supply Voltage V_{EE}
GND	1,5,7,9,11, paddle	Ground

RF Electrical Specifications[1], T_{AMB}=25°C, 50Ω, V_{DD}= +5V, V_{EE}= -5V

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency range[3]		DC		6000	MHz
Insertion loss	10 - 100	—	0.4	1.0	dB
	100 - 1000	—	0.5	1.2	
	1000 - 2000	—	0.6	1.4	
	2000 - 4500	—	0.8	2.0	
	4500 - 6000	—	1.3	2.2	
Isolation between Output Port 1 & 2	10 - 100	65	78		dB
	100 - 1000	53	63		
	1000 - 2000	45	55		
	2000 - 4500	30	46		
	4500 - 6000	29	37		
Isolation between Common Port & Output Ports	10 - 100		88		dB
	100 - 1000		77		
	1000 - 2000		56		
	2000 - 4500		42		
	4500 - 6000		32		
Input Return loss	10 - 100		30		dB
	100 - 1000		30		
	1000 - 2000		29		
	2000 - 4500		28		
	4500 - 6000		15		
Output Return loss (Both ON STATE & OFF STATE)	10 - 100		30		dB
	100 - 1000		29		
	1000 - 2000		29		
	2000 - 4500		28		
	4500 - 6000		15		
Input Power at P1dB[2]	10 - 100		16.7		dBm
	100 - 1000		24.4		
	1000 - 2000		26.2		
	2000 - 4500		25.6		
	4500 - 6000		25.6		
Input IP3 (Pout=0 dBm/Tone)	10 - 100		38.4		dBm
	100 - 1000		44.5		
	1000 - 2000		46.3		
	2000 - 4500		45.7		
	4500 - 6000		43.8		
Thermal Resistance - Junction-to-ground lead at 85°C stage temperature			34.2		°C/W

DC Electrical Specifications

Parameter	Min.	Typ.	Max.	Units
Positive Supply Voltage, V_{DD}	4.75	5	5.25	V
Negative Supply voltage, V_{EE}	-5.25	-5	-4.75	V
Positive Supply Current, I_{DD}	—	4	9	mA
Negative Supply Current, I_{EE}	—	3	9	mA
Control Voltage Low	—	0	0.8	V
Control Voltage High	2.3	—	5	V
Control Current Low	—	2	200	µA
Control Current High	—	0.4	5	mA

1. Tested on Mini-Circuits' test board TB-M3SWA2-63DRC+ (See Fig.1)
2. Input Power at P1dB compression drops to 11 dB at 10 MHz.
3. All RF-ports must be DC blocked or held at 0V DC.

Switching Specifications

Parameter	Condition	Min.	Typ.	Max.	Units
ON Time, 50% control to 90% RF	RF Pin= 0 dBm RF Freq.= 500 MHz Control Freq.= 500 KHz Control High= 2.3V Control Low= 0V		9.3		ns
OFF Time, 50% control to 10% RF			8.5		ns
Video Leakage			25		mV
Rise Time, 10% RF to 90% RF 10 to 90% or 90 to 10%			5.6		ns
Fall Time, 90% RF to 10% RF			6.0		ns
Gate Lag, ON & OFF			7.4		ns

Absolute Maximum Ratings[4]

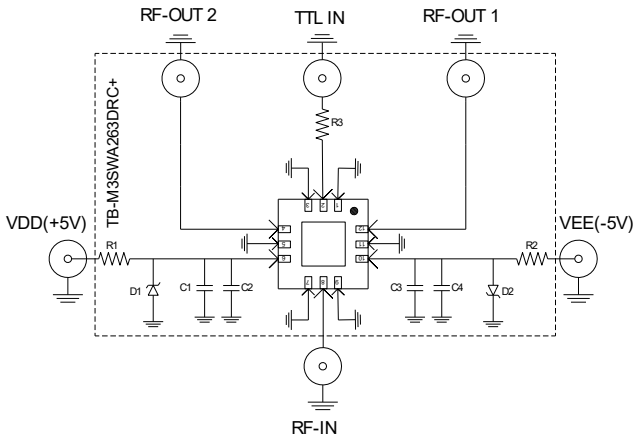
Parameter	Ratings
Operating temperature	-55°C to +100°C
Storage temperature	-55°C to +100°C
RF Power Max at Input Port	27 dBm
RF Power Max at Output Port (for each port)	24 dBm
Junction Temperature	150°C
Total Power Dissipation	0.4W
DC Voltage, Pad 6	+6V
DC Voltage, Pad 10	-6V

4. Permanent damage may occur if any of these limits are exceeded. Electrical Maximum ratings are not intended for continuous normal operation.

Truth Table

State of Control Voltage	RF-IN to RF-OUT1	RF-IN to RF-OUT 2
LOW	ON	OFF
HIGH	OFF	ON

Characterization & Application Circuit



Component	Size	Value	Part Number	Manufacturer
C2,C3	0402	0.5pF	GRM1555C1HR50BA01D	Murata
C1,C4	0402	1pF	GJM1555C1H1R0CB01D	Murata
R1,R2	0402	11.5Ohm	RP73PF1E11R5BTDF	TE Connectivity
R3	0402	100Ohm	RK73H1ETTP1000F	Koa
D1,D2	SOD-123	Vz=5.6V	SZMMSZ5232BT1G	ON Semiconductor

Note: D1&D2 are optional.

Figure 1. Characterization & Application Circuit

Note: (DUT soldered on Mini-Circuits Characterization & Application Test Board TB-M3SWA2-63DRC+). Insertion Loss, Isolation, Return Loss, Input Power at 1dB Compression (P1dB) & Input IP3 tested using E5071C microwave network analyzer.

Condition:

1. Insertion Loss, Isolation & Return Loss: Pin = 0dBm
2. Input IP3(IIP3):Two tones, spaced 1 MHz apart, 0dBm/tone output.

Product Marking

Marking may contain other features or characters for internal lot control

Additional Detailed Technical Information

additional information is available on our dash board.

Performance Data	Data Table
	Swept Graphs
Case Style	DQ1225 *Plastic package, exposed paddle , lead finish=Matte-Tin*
Tape & Reel **Standard quantities available on reel**	F66 *7" reels with 20, 50, 100, 200, 500, or 1K devices*
Suggested Layout for PCB Design	PL-682
Evaluation Board	TB-M3SWA2-63DRC+
Environmental Ratings	ENV16

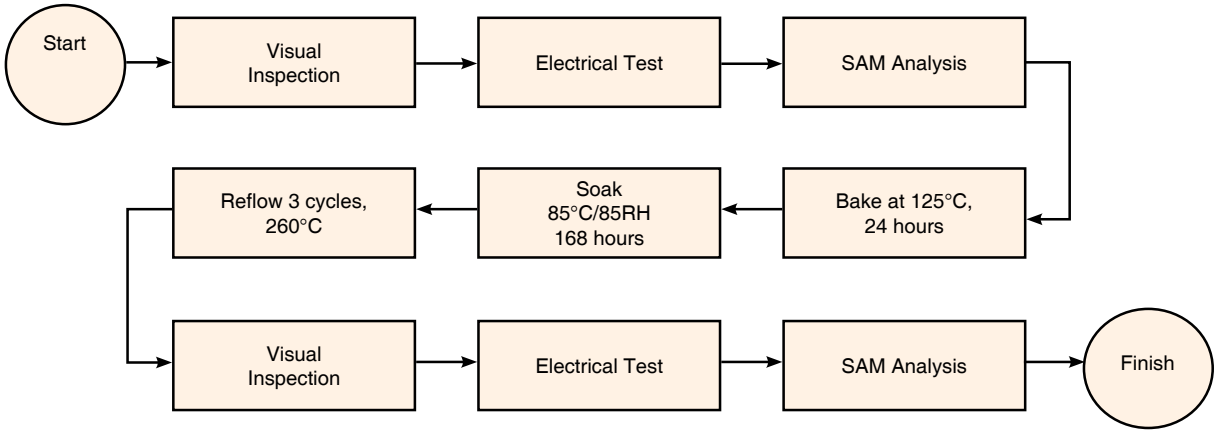
ESD Rating

Human Body Model (HBM): Class 1A (Pass 300V) in accordance with ESD STM5.1-2001

MSL Rating

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

MSL Test Flow Chart



Additional 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/MCLStore/terms.jsp

Typical Performance Data

FREQ (MHz)	INSERTION LOSS @ VDD=+4.75V, VEE =-4.75V OVER TEMPERATURE					
	RF COM-RF1 (dB) *STATE 2**			RF COM-RF2 (dB) *STATE 1**		
	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C
10	0.45	0.38	0.38	0.46	0.37	0.38
20	0.50	0.41	0.41	0.50	0.40	0.40
30	0.51	0.42	0.42	0.52	0.41	0.41
40	0.53	0.43	0.43	0.53	0.42	0.42
50	0.53	0.44	0.43	0.54	0.43	0.42
60	0.53	0.44	0.43	0.54	0.43	0.42
70	0.54	0.44	0.43	0.55	0.44	0.42
80	0.54	0.44	0.43	0.55	0.44	0.42
90	0.54	0.45	0.43	0.55	0.44	0.42
100	0.54	0.45	0.44	0.55	0.44	0.42
500	0.58	0.50	0.49	0.58	0.48	0.45
1000	0.61	0.54	0.54	0.60	0.52	0.49
1500	0.65	0.58	0.59	0.62	0.55	0.52
2000	0.68	0.62	0.63	0.64	0.58	0.55
2500	0.72	0.67	0.68	0.66	0.61	0.58
3000	0.76	0.71	0.73	0.68	0.65	0.62
3500	0.82	0.77	0.80	0.73	0.69	0.67
4000	0.92	0.87	0.92	0.83	0.76	0.75
4500	1.05	1.02	1.09	0.94	0.87	0.88
5000	1.17	1.16	1.28	1.04	1.00	1.05
5500	1.28	1.30	1.43	1.10	1.12	1.18
6000	1.41	1.43	1.56	1.20	1.26	1.32

FREQ (MHz)	ISOLATION @ VDD=+4.75V, VEE =-4.75V OVER TEMPERATURE											
	RF COM-RF1 (dB) *STATE 1**			RF COM-RF2 (dB) *STATE 2**			RF1-RF2 (dB) *STATE 2**			RF1-RF2 (dB) *STATE 1**		
	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C
10	84.85	80.89	93.64	72.71	74.57	74.21	70.46	74.44	69.86	74.95	70.92	71.17
20	90.14	86.82	84.45	82.68	82.07	80.58	82.33	81.87	86.19	84.25	93.85	87.85
30	85.33	84.71	89.89	81.56	80.79	87.02	88.97	85.37	92.70	82.80	94.95	94.33
40	79.47	77.46	83.93	80.04	79.01	77.47	82.02	90.10	90.24	88.01	86.46	97.91
50	78.86	80.15	81.35	77.30	80.88	80.67	83.03	92.20	92.62	85.35	84.42	95.74
60	76.79	77.49	78.48	74.82	77.38	76.50	82.79	85.10	85.33	87.76	85.09	99.20
70	74.64	76.94	77.00	74.00	75.85	76.89	79.47	90.10	94.78	81.74	91.46	97.02
80	74.62	75.41	77.73	72.58	74.57	76.25	79.90	87.24	93.17	80.29	85.89	90.22
90	72.74	74.26	75.90	72.34	75.03	73.63	78.52	86.32	96.90	84.10	83.95	94.77
100	72.00	72.92	74.35	71.18	73.00	75.58	78.92	86.52	91.63	81.25	87.97	93.79
500	61.78	62.67	63.14	61.00	62.39	63.13	75.26	89.96	76.79	80.70	79.12	74.18
1000	56.06	58.13	58.27	56.62	58.00	58.24	65.12	64.42	62.52	61.84	63.04	61.57
1500	53.26	54.59	54.52	53.32	54.62	54.44	56.18	56.59	55.44	55.27	56.37	55.37
2000	50.15	52.33	52.05	50.10	52.26	51.93	50.05	51.07	50.18	49.46	50.82	50.06
2500	46.95	50.08	49.59	47.06	50.05	49.52	45.50	46.68	45.93	45.04	46.53	45.86
3000	43.73	47.57	46.94	44.08	47.48	46.76	41.93	43.22	42.49	41.51	43.08	42.44
3500	40.83	44.83	44.09	41.43	44.86	44.02	39.01	40.30	39.59	38.59	40.14	39.49
4000	38.40	42.09	41.21	39.00	42.18	41.24	36.48	37.68	36.95	36.03	37.51	36.84
4500	36.59	39.46	38.56	36.90	39.80	38.82	34.26	35.29	34.59	33.89	35.18	34.51
5000	35.19	37.46	36.57	35.19	37.88	36.94	32.29	33.17	32.51	31.84	32.96	32.33
5500	33.57	35.34	34.52	33.67	36.21	35.29	30.41	31.15	30.53	29.80	30.81	30.23
6000	32.09	33.84	33.07	32.83	34.85	33.89	28.36	28.94	28.36	27.65	28.49	27.93

STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

Typical Performance Data

FREQ (MHz)	RETURN LOSS @ Vdd=+4.75V OVER TEMPERATURE																	
	RF COM (dB) STATE 2*			RF COM (dB) STATE 1*			RF1 (dB) STATE 2*			RF1 (dB) STATE 1*			RF2 (dB) STATE 2*			RF2 (dB) STATE 1*		
	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C
10	26.89	29.10	28.72	26.61	28.97	28.73	27.08	29.39	28.88	23.90	52.58	43.76	22.48	52.54	43.17	26.81	29.31	28.97
20	27.32	29.36	29.20	26.96	29.47	29.43	27.54	29.66	29.56	24.16	50.20	42.95	22.83	49.68	42.25	26.94	29.62	29.62
30	27.79	29.94	29.57	27.42	29.98	29.78	27.79	29.96	29.60	24.47	47.26	41.77	23.17	46.87	40.83	27.54	29.97	29.76
40	28.05	30.33	29.77	27.72	30.30	29.97	27.98	30.21	29.64	24.89	45.41	40.87	23.58	45.09	39.92	27.82	30.24	29.87
50	28.11	30.44	29.73	27.76	30.26	29.86	28.03	30.28	29.58	25.32	44.15	40.17	24.05	43.93	39.28	27.80	30.33	29.81
60	28.17	30.52	29.71	27.88	30.33	29.91	28.11	30.39	29.60	25.67	43.26	39.62	24.47	42.85	38.73	27.85	30.44	29.83
70	28.23	30.55	29.72	28.00	30.41	30.01	28.21	30.49	29.66	25.94	42.47	39.21	24.83	42.20	38.35	27.94	30.54	29.87
80	28.27	30.55	29.73	28.09	30.49	30.12	28.31	30.58	29.75	26.15	42.00	38.90	25.11	41.79	38.14	27.94	30.60	29.92
90	28.31	30.55	29.74	28.27	30.63	30.29	28.42	30.67	29.85	26.36	41.53	38.58	25.36	41.48	37.93	27.87	30.61	29.93
100	28.34	30.52	29.74	28.37	30.68	30.37	28.43	30.64	29.83	26.50	41.13	38.33	25.57	41.28	37.83	27.74	30.53	29.85
500	28.06	29.94	28.86	28.16	30.26	28.97	28.64	30.71	29.94	26.98	40.22	37.33	25.93	43.55	40.78	26.38	30.51	29.25
1000	27.77	29.12	28.10	28.38	28.84	27.77	28.46	30.19	29.18	25.90	39.21	36.78	27.47	38.56	35.23	25.67	30.71	30.08
1500	27.78	29.08	27.80	30.57	29.18	27.65	29.36	30.96	29.88	25.10	38.88	36.04	26.31	37.81	33.97	25.74	30.56	29.47
2000	29.12	30.70	28.85	31.03	30.45	28.90	30.49	32.05	30.56	25.25	38.51	35.34	25.56	42.52	36.78	26.15	31.65	29.41
2500	31.59	33.14	30.67	29.33	32.96	29.97	30.71	32.52	30.90	27.07	36.55	33.95	28.55	35.61	33.18	30.32	33.11	31.32
3000	31.71	31.75	29.62	28.13	32.46	30.37	32.17	33.22	31.12	30.26	30.31	29.35	29.27	30.71	29.42	49.73	30.92	28.61
3500	24.58	25.21	24.33	22.61	26.32	25.90	27.46	27.77	26.51	27.04	25.23	24.61	29.11	27.35	27.07	26.63	28.11	26.39
4000	19.14	19.53	18.75	17.62	20.34	19.61	20.63	20.79	19.90	21.45	21.37	20.72	23.52	21.89	21.30	18.23	21.20	20.53
4500	15.74	15.61	14.66	14.92	16.49	15.43	17.26	16.75	15.80	18.16	18.71	17.95	20.42	20.08	18.87	15.01	17.38	16.13
5000	14.44	13.88	12.79	14.07	14.35	13.18	15.82	14.82	13.75	16.46	16.99	16.18	18.71	18.19	16.99	14.63	15.40	14.01
5500	13.91	13.10	12.11	14.29	13.55	12.43	15.06	13.87	12.93	15.47	15.89	15.11	16.70	16.28	15.31	15.10	13.81	12.70
6000	13.11	12.49	11.91	13.44	12.43	11.80	14.50	13.55	12.98	14.52	15.23	14.63	14.68	14.82	13.97	15.35	12.88	12.12

Note:

STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

Typical Performance Data

FREQ (MHz)	INSERTION LOSS @ VDD=+5V, VEE =-5V OVER TEMPERATURE					
	RF COM-RF1 (dB) *STATE 2**			RF COM-RF2 (dB) *STATE 1**		
	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C
10	0.45	0.38	0.38	0.47	0.37	0.38
20	0.50	0.41	0.41	0.51	0.40	0.40
30	0.51	0.42	0.42	0.53	0.41	0.41
40	0.52	0.43	0.43	0.54	0.42	0.42
50	0.53	0.44	0.43	0.54	0.43	0.42
60	0.53	0.44	0.43	0.55	0.43	0.42
70	0.54	0.44	0.43	0.55	0.44	0.42
80	0.54	0.44	0.43	0.55	0.44	0.42
90	0.54	0.45	0.44	0.55	0.44	0.42
100	0.54	0.45	0.44	0.56	0.44	0.42
500	0.58	0.50	0.49	0.58	0.49	0.46
1000	0.61	0.54	0.54	0.60	0.52	0.49
1500	0.64	0.58	0.59	0.62	0.56	0.52
2000	0.68	0.63	0.64	0.64	0.59	0.55
2500	0.72	0.67	0.69	0.66	0.62	0.58
3000	0.76	0.71	0.74	0.68	0.65	0.62
3500	0.81	0.77	0.81	0.72	0.70	0.67
4000	0.90	0.87	0.93	0.83	0.77	0.75
4500	1.03	1.01	1.10	0.94	0.88	0.89
5000	1.15	1.16	1.28	1.04	1.00	1.05
5500	1.25	1.30	1.43	1.10	1.12	1.18
6000	1.38	1.42	1.55	1.20	1.26	1.31

FREQ (MHz)	ISOLATION @ VDD=+5V, VEE =-5V OVER TEMPERATURE											
	RF COM-RF1 (dB) *STATE 1**			RF COM-RF2 (dB) *STATE 2**			RF1-RF2 (dB) *STATE 2**			RF1-RF2 (dB) *STATE 1**		
	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C
10	87.16	86.55	87.77	74.56	72.62	78.76	69.72	71.60	74.06	70.07	69.68	73.31
20	80.21	92.15	81.08	84.42	81.00	94.33	80.11	80.16	83.76	80.87	96.15	85.04
30	83.36	84.15	81.52	82.81	82.82	87.38	84.46	86.70	90.06	86.67	96.85	92.20
40	79.74	80.45	86.38	82.32	78.60	87.11	85.25	88.19	88.28	85.14	86.97	91.22
50	78.32	79.40	79.79	77.80	78.83	78.53	83.64	90.11	87.81	82.38	97.35	89.24
60	76.33	77.84	76.78	75.46	79.60	79.80	80.57	87.51	96.37	87.80	85.93	97.99
70	75.35	77.80	76.44	76.19	76.56	78.66	80.44	91.41	99.19	83.32	97.63	90.18
80	74.67	74.89	77.97	72.25	75.55	76.08	82.37	82.84	95.87	81.29	95.33	111.43
90	73.98	73.89	76.18	72.41	74.80	76.53	81.90	90.78	93.94	81.70	95.39	99.50
100	72.40	75.22	75.71	71.50	74.49	75.45	81.10	90.15	104.58	80.68	92.37	105.58
500	62.23	62.65	63.32	61.06	62.71	63.28	76.25	82.94	76.34	78.62	76.63	73.72
1000	56.15	58.15	58.32	56.77	58.09	58.20	65.99	64.11	62.37	60.86	62.55	61.56
1500	52.91	54.61	54.42	53.76	54.59	54.41	56.99	56.52	55.44	54.63	56.25	55.29
2000	49.77	52.31	52.10	50.79	52.31	51.93	50.75	51.09	50.18	49.04	50.80	50.06
2500	46.53	50.20	49.63	48.05	50.18	49.61	46.22	46.79	45.98	44.73	46.60	45.91
3000	43.34	47.64	46.95	45.16	47.61	46.80	42.62	43.31	42.54	41.23	43.13	42.46
3500	40.44	44.97	44.13	42.57	45.08	44.09	39.75	40.44	39.64	38.37	40.23	39.50
4000	38.02	42.24	41.30	40.12	42.39	41.34	37.16	37.81	37.02	35.80	37.58	36.89
4500	36.20	39.59	38.62	38.03	39.99	38.94	34.94	35.44	34.65	33.66	35.29	34.55
5000	34.83	37.59	36.63	36.39	38.12	37.04	32.88	33.32	32.59	31.62	33.06	32.38
5500	33.20	35.48	34.58	34.86	36.41	35.40	31.00	31.30	30.60	29.59	30.89	30.28
6000	31.72	33.94	33.14	33.79	35.12	34.00	28.96	29.11	28.44	27.47	28.59	27.97

STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

Typical Performance Data

FREQ (MHz)	RETURN LOSS @ Vdd=+5V OVER TEMPERATURE																	
	RF COM (dB) *STATE 2**			RF COM (dB) *STATE 1**			RF1 (dB) *STATE 2**			RF1 (dB) *STATE 1**			RF2 (dB) *STATE 2**			RF2 (dB) *STATE 1**		
	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C
10	27.02	29.12	28.78	26.45	28.96	28.75	27.22	29.38	28.96	23.59	49.19	43.72	26.92	48.44	43.13	26.64	29.30	29.00
20	27.26	29.36	29.06	26.80	29.47	29.37	27.49	29.67	29.42	23.89	47.84	42.87	27.13	47.31	42.08	26.80	29.61	29.54
30	27.78	29.94	29.48	27.23	29.99	29.75	27.77	29.96	29.51	24.24	45.62	41.75	27.38	45.25	40.70	27.36	29.99	29.73
40	28.11	30.33	29.71	27.50	30.29	29.94	28.01	30.22	29.60	24.69	44.10	40.83	27.67	43.84	39.80	27.61	30.25	29.85
50	28.25	30.44	29.73	27.52	30.24	29.87	28.11	30.29	29.60	25.11	43.01	40.12	27.96	42.82	39.11	27.58	30.34	29.82
60	28.34	30.53	29.76	27.62	30.32	29.92	28.25	30.41	29.64	25.47	42.15	39.60	28.22	41.96	38.57	27.64	30.46	29.85
70	28.40	30.57	29.77	27.73	30.40	30.02	28.36	30.52	29.71	25.73	41.55	39.16	28.44	41.36	38.19	27.69	30.56	29.89
80	28.42	30.57	29.76	27.82	30.47	30.12	28.47	30.62	29.79	25.95	41.09	38.85	28.60	40.97	37.95	27.69	30.62	29.93
90	28.43	30.56	29.76	27.99	30.61	30.29	28.56	30.69	29.85	26.13	40.68	38.54	28.74	40.68	37.80	27.62	30.63	29.94
100	28.42	30.53	29.74	28.09	30.65	30.37	28.55	30.64	29.82	26.26	40.36	38.30	28.83	40.53	37.70	27.52	30.53	29.85
500	28.18	29.95	28.82	28.01	30.27	28.96	28.84	30.78	29.97	26.70	39.66	37.36	28.51	40.94	40.79	26.09	30.65	29.27
1000	27.94	29.19	28.00	28.08	28.92	27.77	28.44	30.26	29.28	25.66	38.96	36.83	30.57	38.77	35.34	25.46	30.68	30.13
1500	27.86	29.17	27.82	30.21	29.24	27.69	29.64	31.00	30.07	24.88	38.80	36.21	28.95	38.61	34.21	25.59	30.69	29.58
2000	29.25	30.79	29.06	30.75	30.52	28.96	30.45	32.22	30.75	24.96	38.54	35.58	28.00	41.87	37.32	26.02	31.82	29.50
2500	31.99	33.36	31.15	29.22	33.22	30.19	30.24	32.60	30.86	26.76	36.44	34.14	32.04	35.74	33.31	30.22	33.07	31.40
3000	31.92	32.12	30.06	27.78	32.74	30.63	32.62	33.45	31.00	29.79	30.26	29.39	31.87	30.95	29.41	46.87	31.12	28.63
3500	24.84	25.45	24.34	22.40	26.51	25.98	27.47	28.02	26.39	26.79	25.23	24.64	30.06	27.11	27.00	26.51	28.28	26.38
4000	19.44	19.64	18.67	17.49	20.44	19.62	20.92	20.91	19.83	21.27	21.40	20.74	23.48	22.09	21.31	18.11	21.31	20.55
4500	15.90	15.70	14.62	14.78	16.57	15.44	17.39	16.83	15.77	18.03	18.74	17.99	20.58	20.25	18.93	14.91	17.48	16.15
5000	14.62	13.96	12.79	13.98	14.42	13.20	15.98	14.90	13.76	16.35	17.05	16.21	18.98	18.28	17.08	14.56	15.46	14.04
5500	14.08	13.20	12.19	14.21	13.62	12.47	15.23	13.96	13.01	15.37	15.96	15.16	16.94	16.44	15.40	15.05	13.88	12.74
6000	13.28	12.59	12.08	13.36	12.50	11.87	14.67	13.63	13.13	14.42	15.30	14.70	14.89	15.02	14.06	15.32	12.96	12.18

***Note:**

STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

Typical Performance Data

FREQ (MHz)	INSERTION LOSS @ VDD=+5.25V, VEE =-5.25V OVER TEMPERATURE					
	RF COM-RF1 (dB) *STATE 2**			RF COM-RF2 (dB) *STATE 1**		
	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C
10	0.45	0.38	0.39	0.46	0.37	0.38
20	0.49	0.41	0.42	0.50	0.40	0.41
30	0.51	0.42	0.43	0.52	0.41	0.41
40	0.52	0.43	0.43	0.53	0.42	0.42
50	0.53	0.44	0.44	0.54	0.43	0.42
60	0.53	0.44	0.44	0.54	0.43	0.42
70	0.54	0.44	0.44	0.55	0.43	0.43
80	0.54	0.44	0.44	0.55	0.43	0.43
90	0.54	0.44	0.44	0.55	0.44	0.43
100	0.54	0.45	0.44	0.55	0.44	0.43
500	0.58	0.50	0.50	0.58	0.48	0.46
1000	0.61	0.54	0.55	0.60	0.51	0.50
1500	0.65	0.58	0.60	0.61	0.54	0.53
2000	0.68	0.62	0.65	0.64	0.57	0.56
2500	0.72	0.67	0.69	0.66	0.60	0.59
3000	0.76	0.71	0.74	0.68	0.63	0.63
3500	0.81	0.77	0.81	0.73	0.67	0.67
4000	0.90	0.87	0.93	0.83	0.74	0.76
4500	1.02	1.01	1.10	0.95	0.85	0.89
5000	1.14	1.15	1.29	1.05	0.97	1.05
5500	1.25	1.29	1.44	1.11	1.09	1.17
6000	1.37	1.41	1.55	1.22	1.23	1.30

FREQ (MHz)	ISOLATION @ VDD=+5.25V, VEE =-5.25V OVER TEMPERATURE											
	RF COM-RF1 (dB) *STATE 1**			RF COM-RF2 (dB) *STATE 2**			RF1-RF2 (dB) *STATE 2**			RF1-RF2 (dB) *STATE 1**		
	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C
10	79.84	83.82	96.31	74.48	73.85	73.48	71.28	70.28	71.53	73.17	70.47	69.32
20	87.56	85.41	91.92	81.32	81.52	92.37	78.71	81.66	78.10	78.61	91.37	93.01
30	80.77	84.50	81.46	83.38	84.16	80.64	82.99	83.35	93.60	82.84	86.12	87.20
40	79.04	78.82	82.90	79.98	85.73	81.84	90.84	93.04	92.84	81.59	84.81	86.80
50	78.15	78.03	83.28	78.43	80.81	80.94	89.64	101.41	87.18	78.78	93.98	95.12
60	76.27	80.78	78.85	76.51	77.86	77.51	83.84	99.69	95.95	80.17	93.01	89.94
70	76.20	76.91	77.93	75.16	78.12	78.94	80.68	90.55	101.29	77.66	95.55	93.36
80	74.82	75.72	76.75	74.88	75.60	76.29	85.11	87.17	91.24	76.77	89.43	88.29
90	74.14	74.87	75.87	73.46	75.04	76.71	83.94	91.95	105.15	75.82	99.75	96.61
100	72.32	74.37	75.62	72.48	75.65	75.24	81.26	90.05	94.09	76.22	91.01	101.23
500	62.51	62.79	63.25	61.35	62.79	63.41	79.82	80.04	74.96	74.73	75.85	73.36
1000	56.03	58.16	58.39	57.03	57.97	58.13	65.90	63.63	62.20	59.95	62.48	61.43
1500	52.29	54.49	54.48	53.91	54.55	54.40	57.07	56.47	55.42	53.74	56.22	55.26
2000	49.10	52.37	52.08	51.10	52.33	51.95	51.06	51.03	50.18	48.33	50.78	50.03
2500	45.72	50.14	49.68	48.50	50.20	49.59	46.52	46.78	46.02	44.13	46.58	45.91
3000	42.57	47.71	47.02	45.70	47.66	46.83	42.99	43.34	42.57	40.62	43.15	42.48
3500	39.66	44.99	44.15	43.17	45.11	44.13	40.12	40.45	39.68	37.80	40.22	39.55
4000	37.26	42.29	41.33	40.74	42.43	41.38	37.53	37.85	37.05	35.22	37.63	36.93
4500	35.45	39.64	38.70	38.65	40.04	38.98	35.30	35.46	34.69	33.14	35.29	34.60
5000	34.09	37.66	36.73	37.01	38.21	37.10	33.23	33.35	32.63	31.09	33.07	32.42
5500	32.50	35.52	34.67	35.51	36.45	35.45	31.36	31.34	30.64	29.14	30.93	30.29
6000	31.04	34.03	33.17	34.50	35.19	34.07	29.32	29.15	28.47	27.03	28.61	27.98

STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

Typical Performance Data

FREQ (MHz)	RETURN LOSS @ Vdd=+5.25V OVER TEMPERATURE																	
	RF COM (dB) STATE 2*			RF COM (dB) STATE 1*			RF1 (dB) STATE 2*			RF1 (dB) STATE 1*			RF2 (dB) STATE 2*			RF2 (dB) STATE 1*		
	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C	-55°C	+25°C	+100°C
10	27.01	29.11	28.80	26.59	28.98	28.75	27.21	29.35	29.03	19.83	48.20	43.56	29.76	47.69	43.23	26.78	29.31	29.06
20	27.29	29.39	29.03	26.96	29.50	29.23	27.50	29.71	29.37	20.27	46.88	42.76	29.92	46.54	42.17	26.95	29.65	29.35
30	27.79	29.96	29.45	27.38	30.02	29.65	27.77	29.99	29.47	20.68	44.97	41.53	30.13	44.63	40.82	27.49	30.02	29.60
40	28.11	30.33	29.72	27.66	30.33	29.88	27.99	30.23	29.60	21.27	43.62	40.58	30.38	43.27	39.89	27.74	30.28	29.78
50	28.23	30.45	29.76	27.68	30.29	29.83	28.09	30.29	29.61	21.91	42.68	39.95	30.58	42.31	39.19	27.72	30.34	29.80
60	28.33	30.53	29.78	27.77	30.36	29.89	28.21	30.41	29.67	22.48	41.88	39.40	30.81	41.49	38.64	27.77	30.44	29.87
70	28.39	30.57	29.80	27.88	30.46	29.99	28.32	30.51	29.74	22.84	41.23	39.02	30.96	40.91	38.27	27.83	30.53	29.94
80	28.41	30.57	29.79	27.98	30.55	30.09	28.44	30.60	29.81	23.19	40.83	38.71	31.07	40.56	38.02	27.83	30.60	29.97
90	28.41	30.56	29.78	28.14	30.71	30.24	28.54	30.68	29.87	23.48	40.41	38.42	31.15	40.32	37.88	27.77	30.61	29.97
100	28.41	30.53	29.75	28.24	30.77	30.30	28.53	30.65	29.83	23.68	40.07	38.20	31.20	40.15	37.77	27.64	30.52	29.87
500	28.18	29.99	28.86	28.16	30.25	29.02	28.88	30.78	29.98	24.67	39.43	37.46	30.45	42.30	41.11	26.21	30.39	29.11
1000	27.99	29.22	28.03	28.17	28.91	27.80	28.45	30.30	29.30	23.85	38.86	36.64	32.92	38.00	35.54	25.55	30.95	30.03
1500	27.95	29.25	27.85	30.31	29.33	27.90	29.70	31.13	30.06	23.37	38.88	36.05	30.79	37.81	34.46	25.72	30.60	29.59
2000	29.33	30.94	29.11	31.09	30.63	29.24	30.43	32.21	30.72	23.35	38.73	35.51	29.74	43.37	37.76	26.25	31.61	29.55
2500	31.99	33.48	31.26	29.50	33.12	30.52	30.14	32.58	30.87	24.98	36.45	34.32	34.68	35.49	33.54	30.69	33.38	31.75
3000	32.20	32.30	30.17	27.91	32.95	30.40	32.55	33.56	31.05	27.58	30.19	29.56	33.00	30.66	29.47	46.39	31.11	28.91
3500	25.14	25.57	24.39	22.35	26.61	25.36	27.80	28.20	26.45	26.38	25.20	24.72	30.05	27.35	26.96	26.21	28.30	26.22
4000	19.64	19.75	18.71	17.40	20.51	19.29	21.13	21.01	19.88	21.19	21.42	20.79	23.32	21.93	21.30	17.98	21.36	20.21
4500	16.05	15.76	14.65	14.70	16.61	15.40	17.54	16.91	15.80	17.92	18.78	18.01	20.66	20.19	18.95	14.83	17.43	16.08
5000	14.75	14.01	12.83	13.90	14.45	13.34	16.10	14.96	13.80	16.21	17.08	16.22	19.08	18.35	17.14	14.50	15.48	14.20
5500	14.22	13.25	12.23	14.12	13.65	12.72	15.35	14.00	13.05	15.23	15.98	15.15	17.06	16.43	15.48	15.01	13.87	13.02
6000	13.42	12.64	12.13	13.28	12.51	12.06	14.79	13.68	13.18	14.31	15.33	14.67	14.99	14.95	14.16	15.27	12.92	12.44

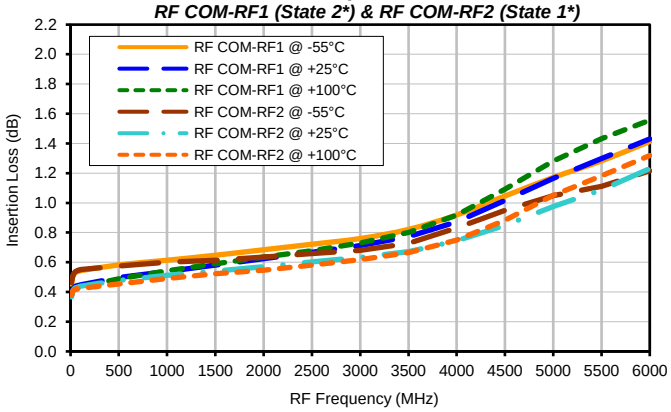
Note:

STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

Typical Performance Curves

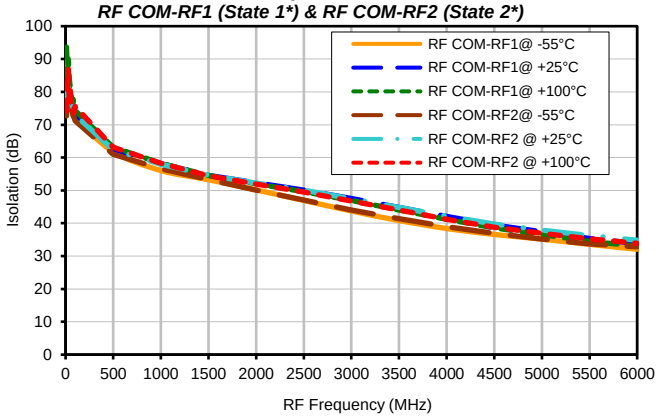
Insertion Loss @ VDD=+4.75V,VEE =-4.75V over Temperature

RF COM-RF1 (State 2*) & RF COM-RF2 (State 1*)



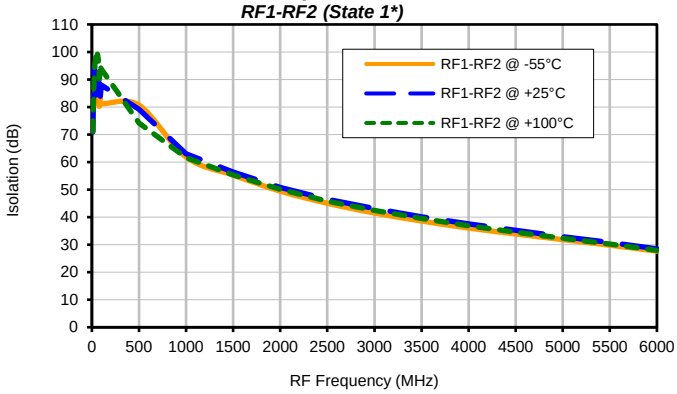
Isolation @ VDD=+4.75V, VEE =-4.75Vover Temperature

RF COM-RF1 (State 1*) & RF COM-RF2 (State 2*)



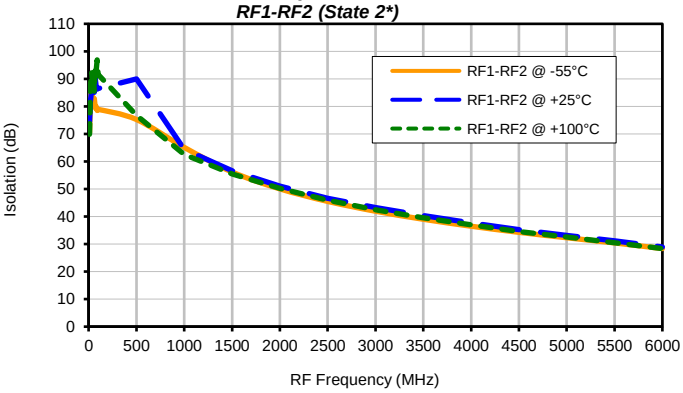
Isolation @ VDD=+4.75V, VEE =-4.75V over Temperature

RF1-RF2 (State 1*)



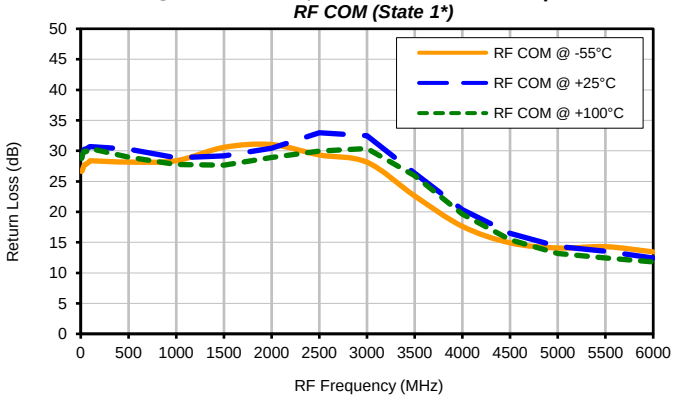
Isolation @ VDD=+4.75V, VEE =-4.75V over Temperature

RF1-RF2 (State 2*)



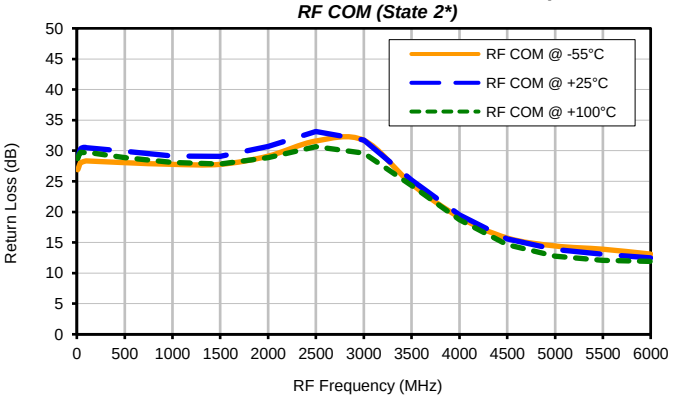
RL @ VDD=+4.75V, VEE =-4.75V over Temperature

RF COM (State 1*)



RL @ VDD=+4.75V, VEE =-4.75V over Temperature

RF COM (State 2*)

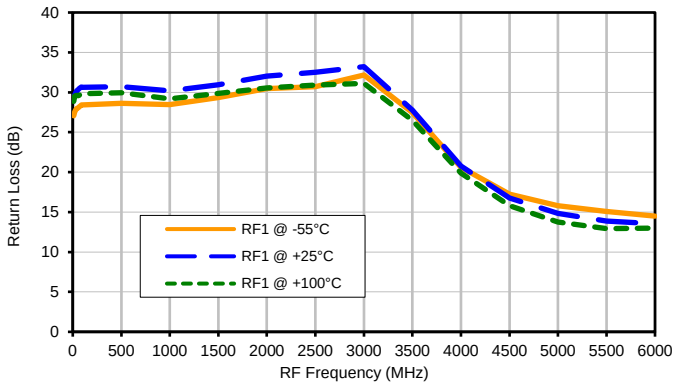


***Note:**

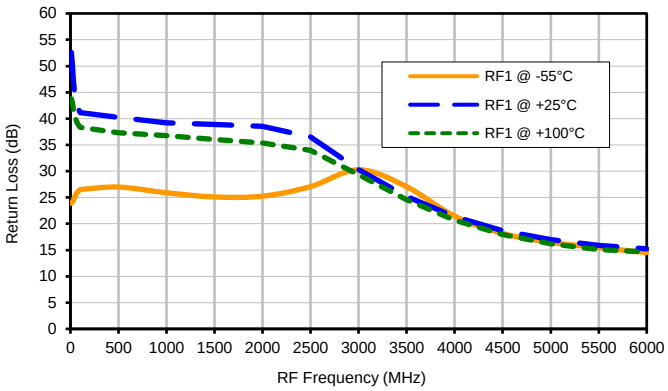
STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

Typical Performance Curves

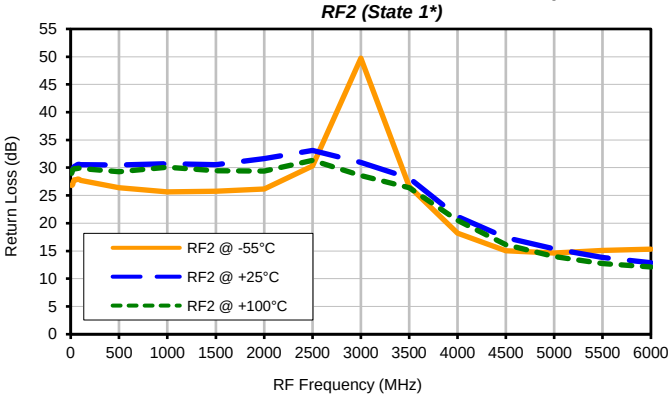
RL @ VDD=+4.75V, VEE =-4.75V over Temperature
RF1 (State 2*)



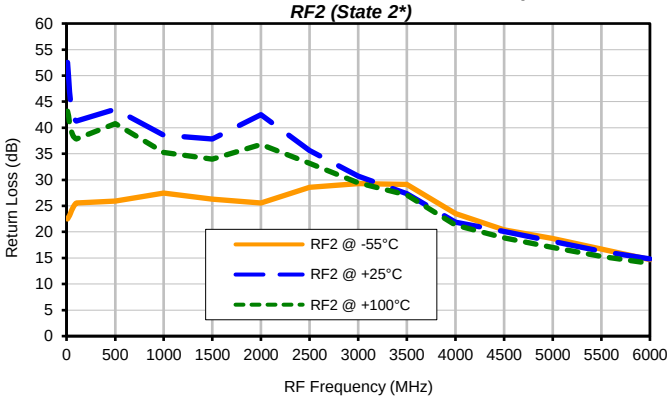
RL @ VDD=+4.75V, VEE =-4.75V over Temperature
RF1 (State 1*)



RL @ VDD=+4.75V, VEE =-4.75V over Temperature
RF2 (State 1*)



RL @ VDD=+4.75V, VEE =-4.75V over Temperature
RF2 (State 2*)

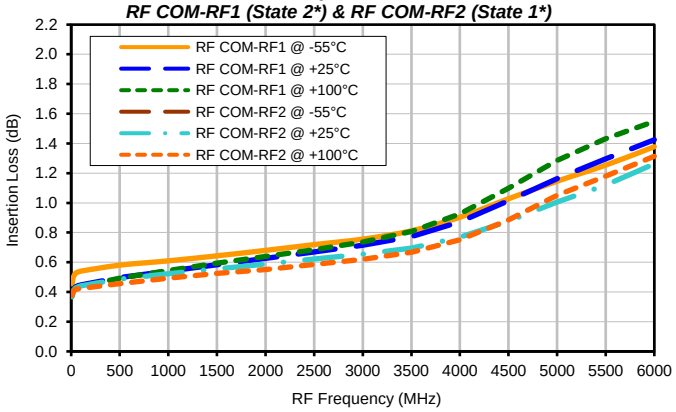


***Note:**

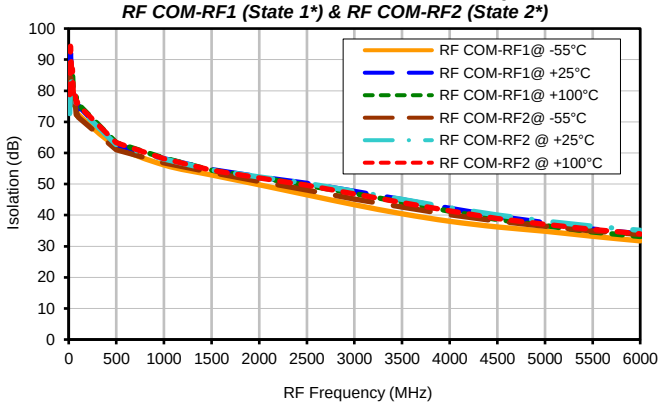
STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

Typical Performance Curves

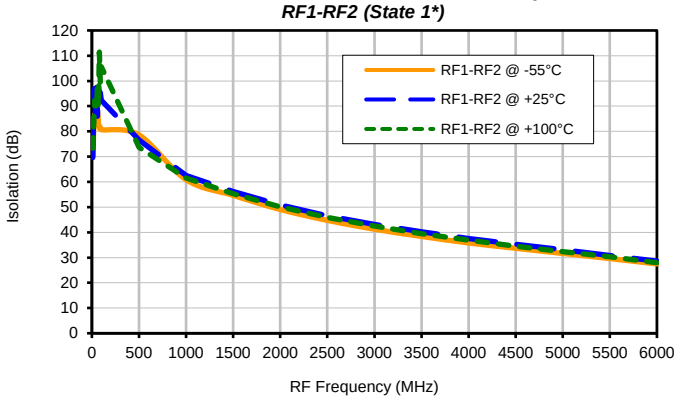
Insertion Loss @ VDD=+5V,VEE =-5V over Temperature
RF COM-RF1 (State 2*) & RF COM-RF2 (State 1*)



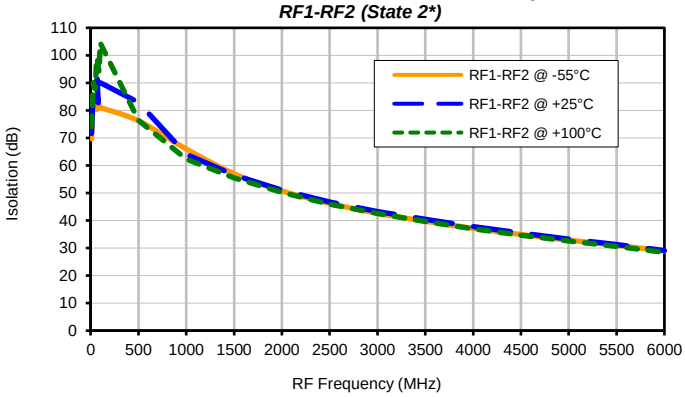
Isolation @ VDD=+5V, VEE =-5Vover Temperature
RF COM-RF1 (State 1*) & RF COM-RF2 (State 2*)



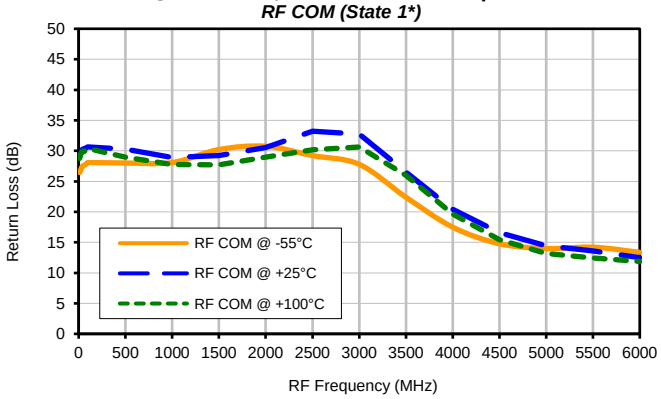
Isolation @ VDD=+5V, VEE =-5V over Temperature
RF1-RF2 (State 1*)



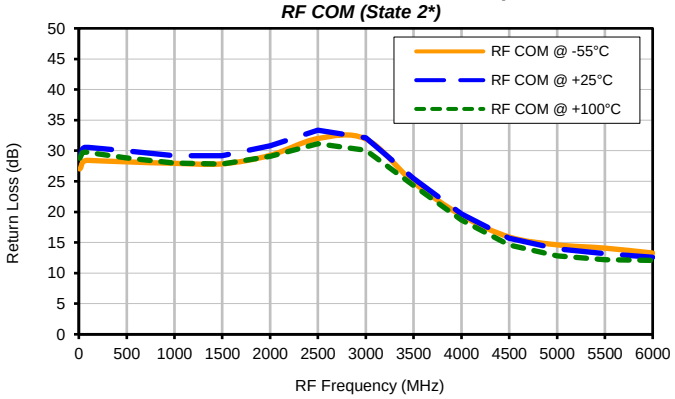
Isolation @ VDD=+5V, VEE =-5V over Temperature
RF1-RF2 (State 2*)



RL @ VDD=+5V, VEE =-5V over Temperature
RF COM (State 1*)



RL @ VDD=+5V, VEE =-5V over Temperature
RF COM (State 2*)

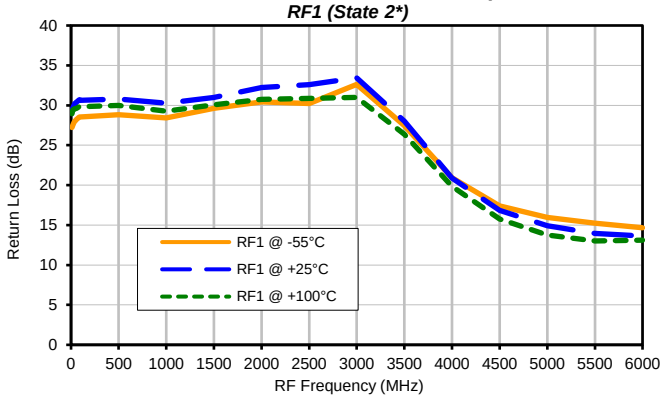


***Note:**

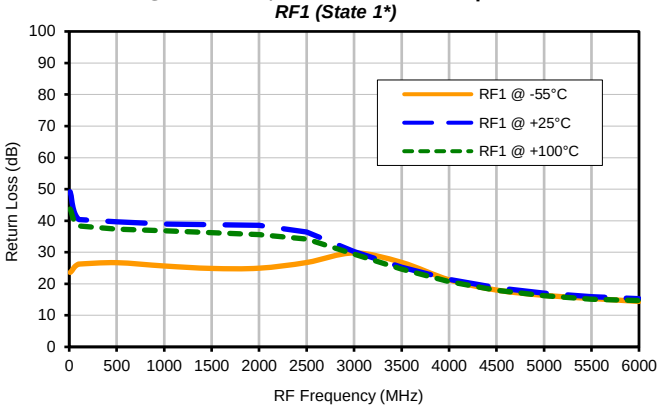
STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

Typical Performance Curves

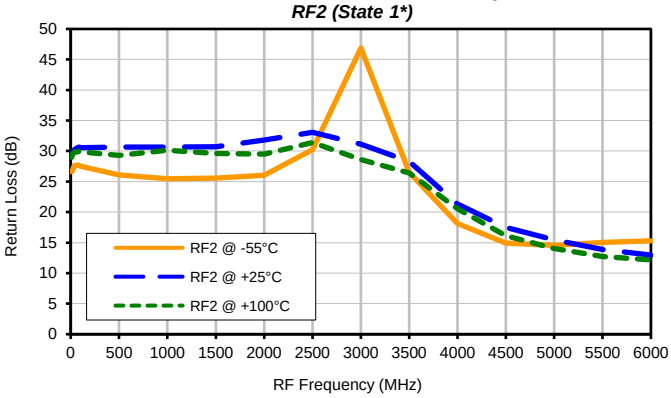
RL @ VDD=+5V, VEE =-5V over Temperature
RF1 (State 2*)



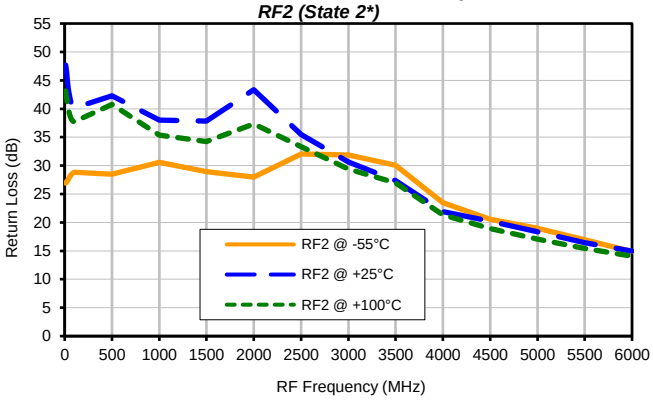
RL @ VDD=+5V, VEE =-5V over Temperature
RF1 (State 1*)



RL @ VDD=+5V, VEE =-5V over Temperature
RF2 (State 1*)



RL @ VDD=+5V, VEE =-5V over Temperature
RF2 (State 2*)

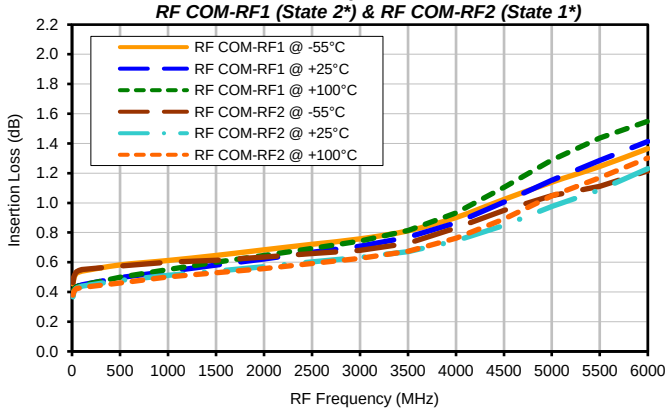


***Note:**

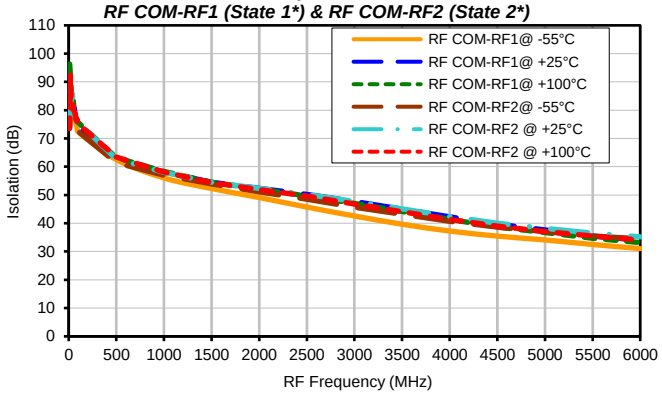
STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

Typical Performance Curves

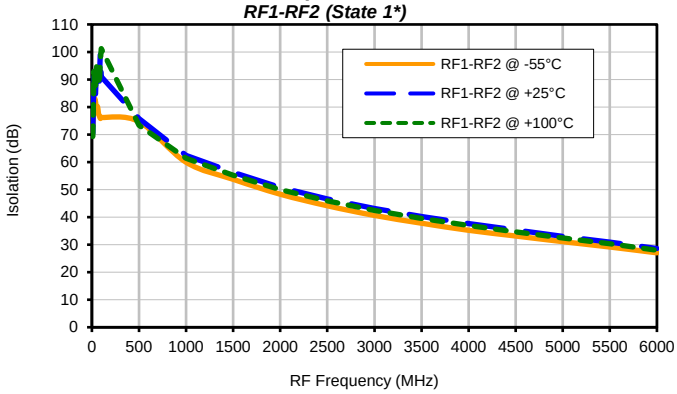
Insertion Loss @ VDD=+5.25V,VEE =-5.25V over Temperature
RF COM-RF1 (State 2*) & RF COM-RF2 (State 1*)



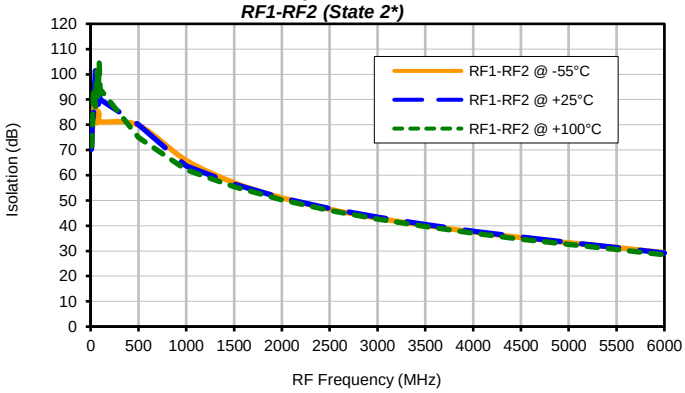
Isolation @ VDD=+5.25V, VEE =-5.25Vover Temperature
RF COM-RF1 (State 1*) & RF COM-RF2 (State 2*)



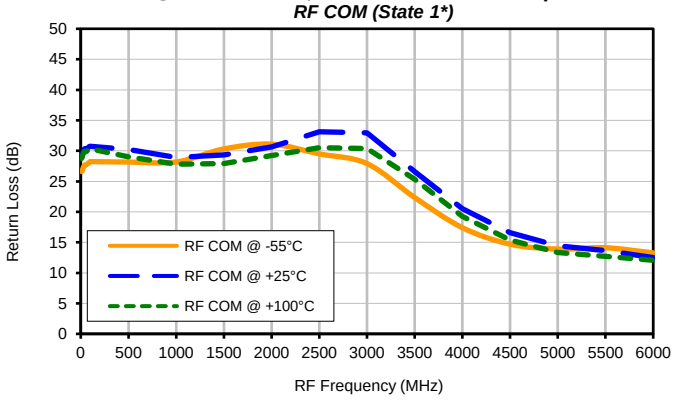
Isolation @ VDD=+5.25V, VEE =-5.25V over Temperature
RF1-RF2 (State 1*)



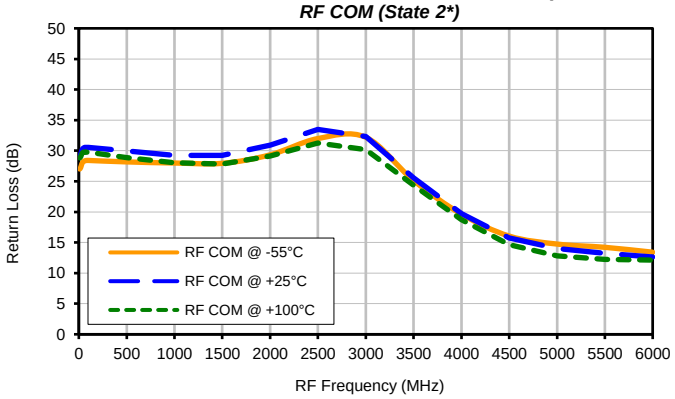
Isolation @ VDD=+5.25V, VEE =-5.25V over Temperature
RF1-RF2 (State 2*)



RL @ VDD=+5.25V, VEE =-5.25V over Temperature
RF COM (State 1*)



RL @ VDD=+5.25V, VEE =-5.25V over Temperature
RF COM (State 2*)

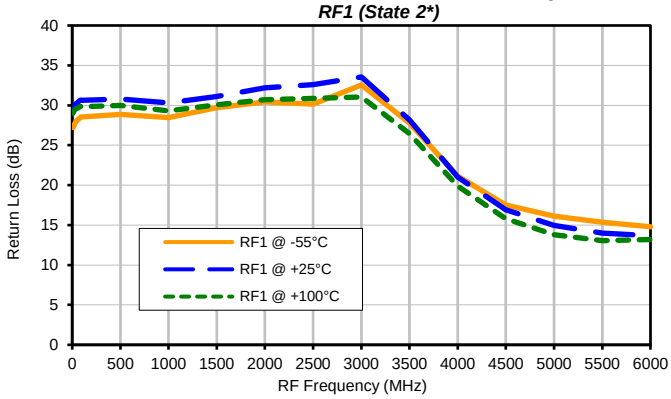


***Note:**

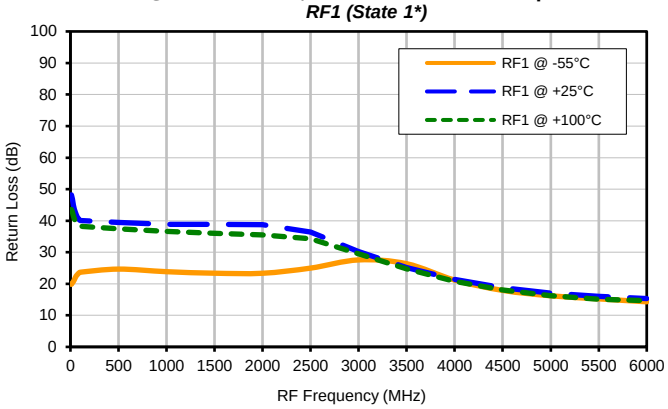
STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

Typical Performance Curves

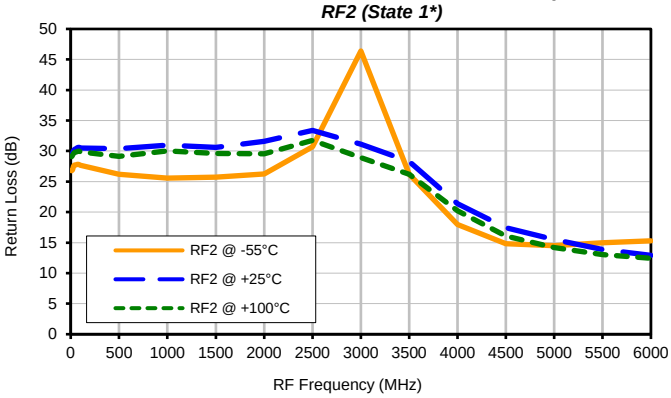
RL @ VDD=+5.25V, VEE =-5.25V over Temperature
RF1 (State 2*)



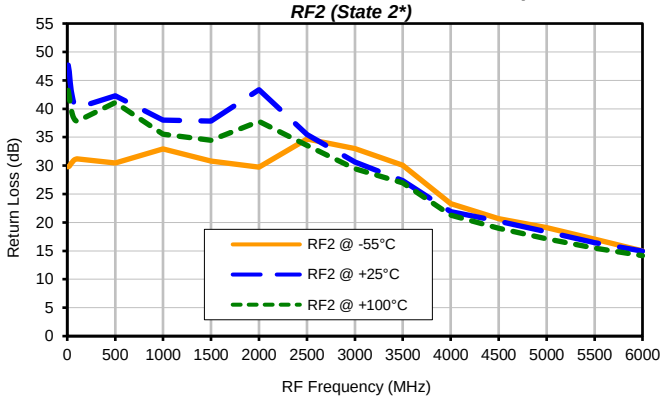
RL @ VDD=+5.25V, VEE =-5.25V over Temperature
RF1 (State 1*)



RL @ VDD=+5.25V, VEE =-5.25V over Temperature
RF2 (State 1*)



RL @ VDD=+5.25V, VEE =-5.25V over Temperature
RF2 (State 2*)



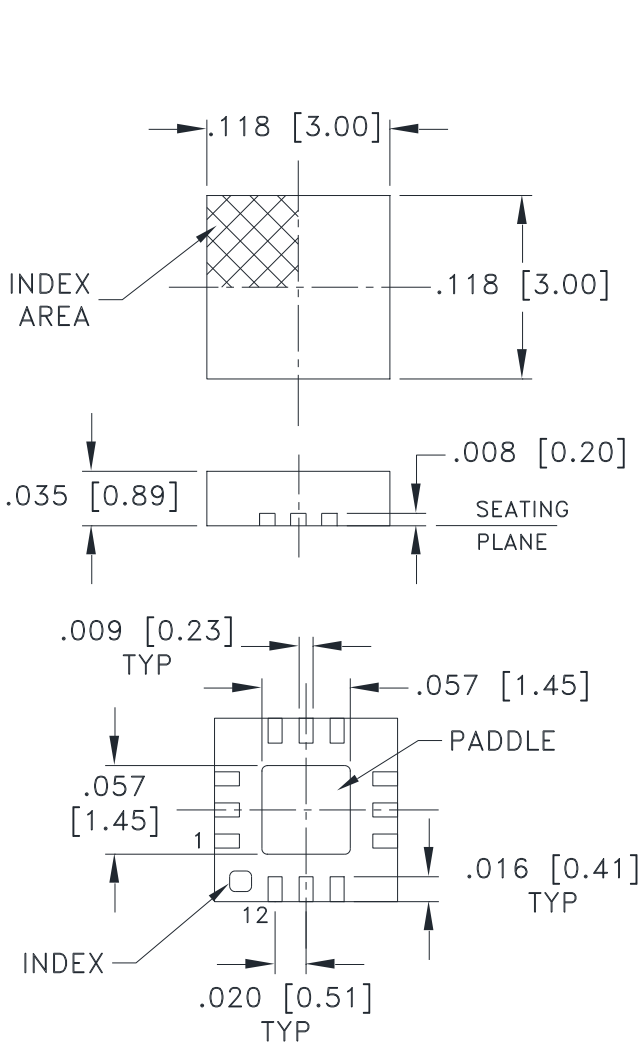
***Note:**

STATE	TTL-IN	RF Com to RF1	RF Com to RF2
1	High	OFF	ON
2	Low	ON	OFF

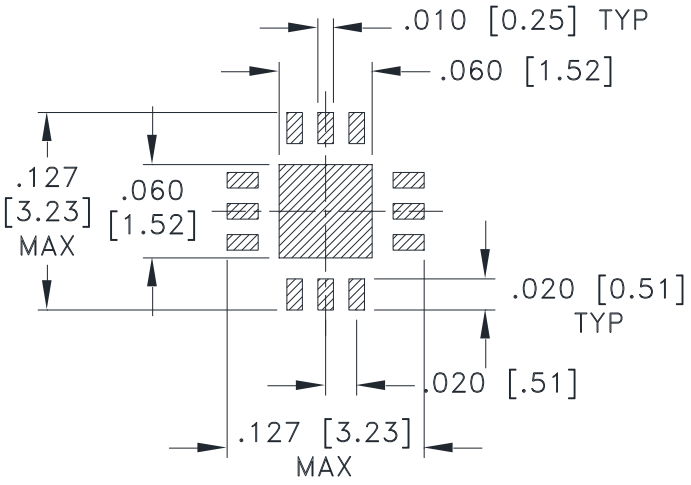
Case Style DQ

DQ1225

Outline Dimensions



PCB Land Pattern



SUGGESTED LAYOUT,
TOLERANCE TO BE WITHIN ±.002

Weight: .02 Grams

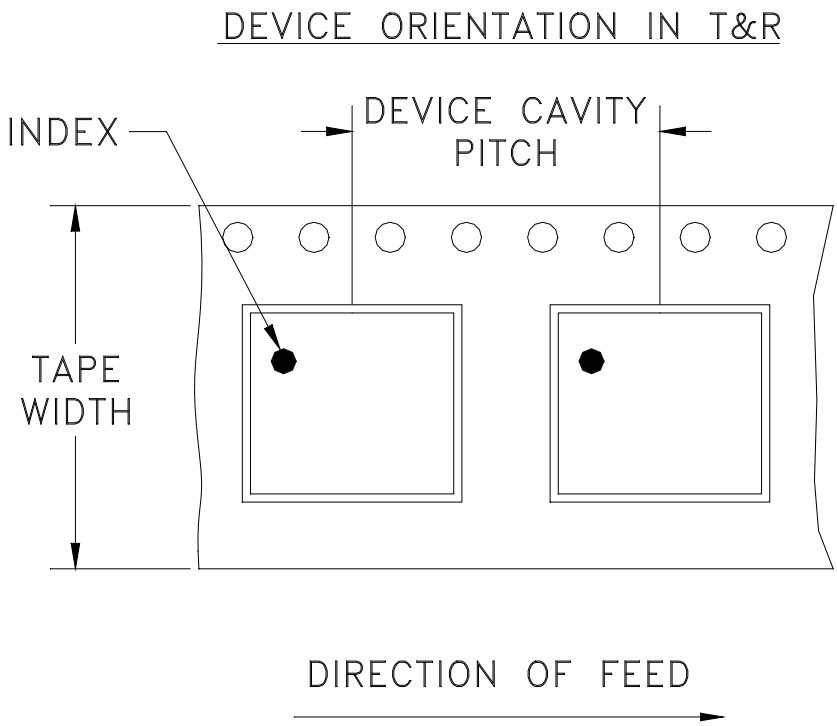
Dimensions are in inches (mm). Tolerances: 2Pl. ± .01; 3 Pl. ± .004

Notes:

1. Case material: Plastic.
2. Termination finish:
   - For RoHS Case Styles: Tin-Silver alloy plate over Nickel barrier or Matte-Tin. All models, (+) suffix. See Data sheet.
   - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

Tape & Reel Packaging TR-F66



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
8	4	7	Small quantity standard	20
				50
				100
				200
				500
		7	Standard	1000, 2000, 3000

Note: Please consult individual model data sheet to determine device per reel availability.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

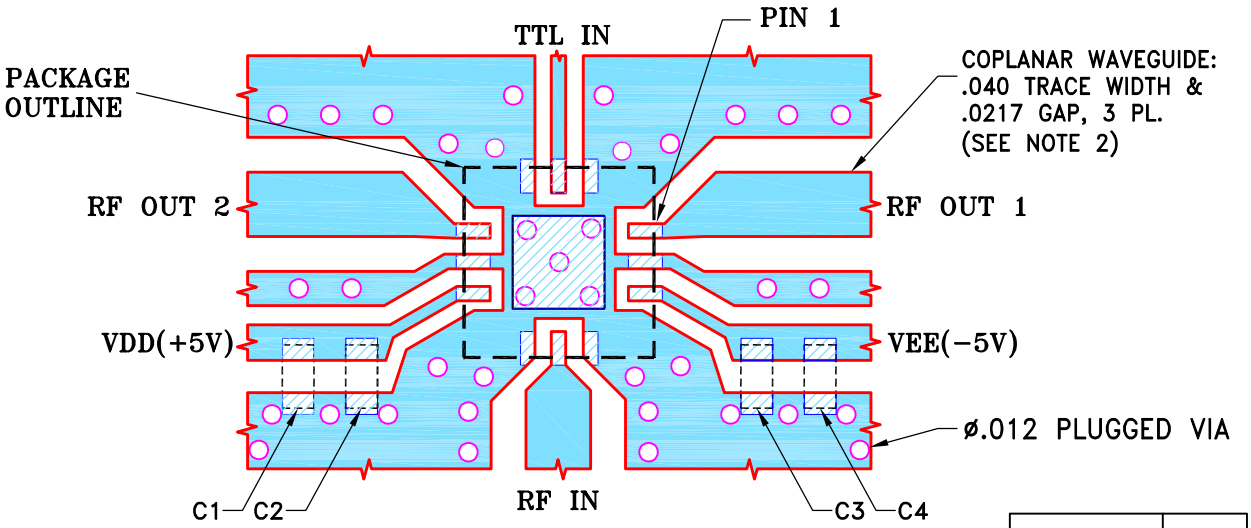
Go to: www.minicircuits.com/pages/pdfs/tape.pdf

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-003662	NEW RELEASE	08/14/20	ITG	IL

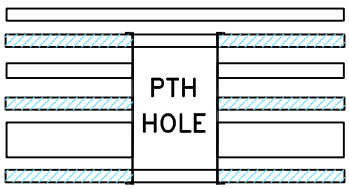
SUGGESTED MOUNTING CONFIGURATION FOR DQ1225 CASE STYLE



TOP VIEW

COMPONENT	SIZE
C1...C4	0402

STACK-UP DIAGRAM



-TOP SOLDER MASK
-COPPER LAYER 1, 0.5 OZ.
-CORE, 0.020", ROGERS RO4350B
-COPPER LAYER 2, 0.5 OZ.
-CORE+PREPREG, FR4 (THICKNESS AS REQUIRED)
-COPPER LAYER 3, 0.5 OZ.

1. TOTAL FINISHED THICKNESS 0.056" ± 10%.
2. PTH HOLES PRESENT FROM COPPER LAYER 1 TO 3.

NOTES:

1. PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
2. TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020±.0015"; COPPER: 1/2 OZ. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
3. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-M3SWA263DRC+.
4. UNIT LAND PATTERN WAS OPTIMIZED FOR BETTER PERFORMANCE.
5. COPPER LAYERS L2 & L3 OF THE PCB ARE CONTINUOUS GROUND PLANES.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	ITG	08/11/20
TOLERANCES ON:	CHECKED	GF	08/11/20
2 PL DECIMALS ±	APPROVED	IL	08/14/20
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

ASHEETA1.DWG REV:A DATE:01/12/95

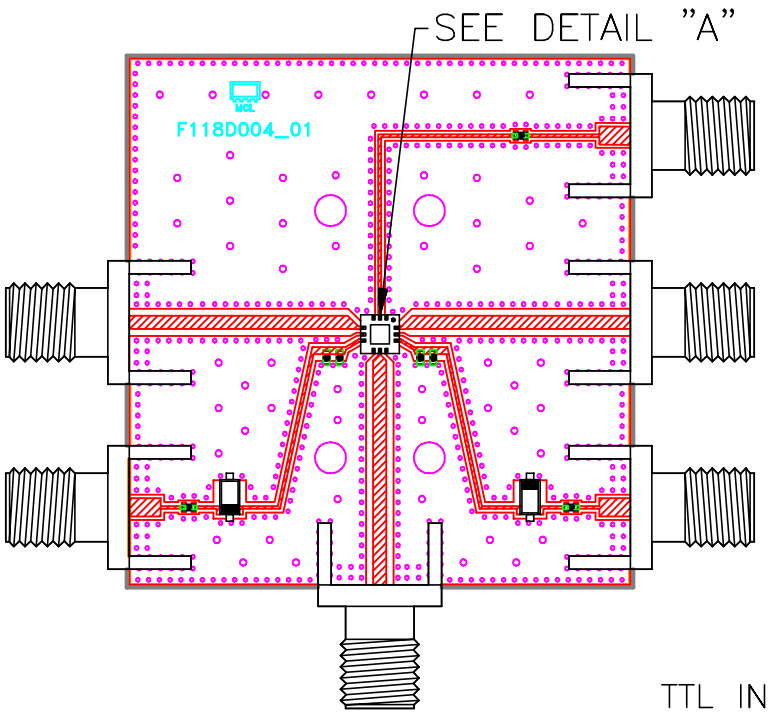
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

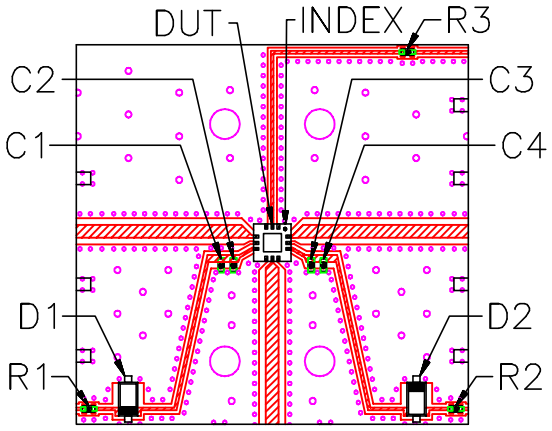
PL, DQ1225, TB-M3SWA263DRC+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-682	OR

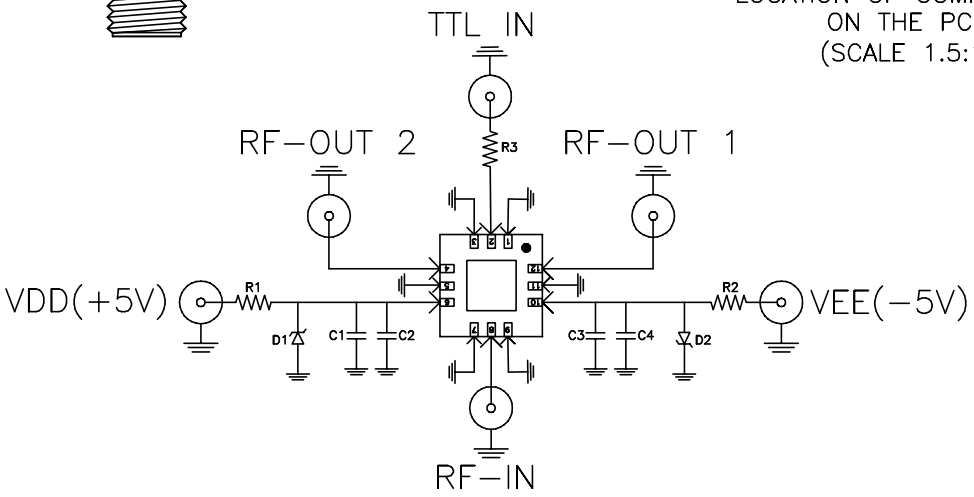
FILE:	SCALE:	SHEET:
98PL682	8:1	1 OF 1

Evaluation Board and Circuit





DETAIL "A"
LOCATION OF COMPONENTS
ON THE PCB
(SCALE 1.5:1)



SCHEMATIC DIAGRAM
(SCALE 3:1)

Component	Size	Value	Part Number	Manufacturer
C2,C3	0402	0.5pF	GRM1555C1HR50BA01D	Murata
C1,C4	0402	1pF	GJM1555C1H1R0CB01D	Murata
R1,R2	0402	11.5Ohm	RP73PF1E11R5BTDF	TE Connectivity
R3	0402	100Ohm	RK73H1ETTP1000F	Koa
D1,D2	SOD-123	Vz=5.6V	SZMMSZ5232BT1G	ON Semiconductor

Notes:

1. 50 Ohm SMA Female Connectors.
2. PCB Material: Roger RO4350B or equivalent, Dielectric constant=3.5, Thickness=0.020 inch

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV08T1

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 -45° to 85° C or -55° to 105° C or -40° to 105° C or -40° to 95° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C or -65° to 150° Ambient Environment	Individual Model Data Sheet
HTOL	1000 hours at 125°C	MIL-STD-883, Method 1005, Condition B
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Mechanical Shock	1.5Kg, 0.5 ms, 5 shock pulses, Y1 direction only	MIL-STD-883, Method 2002, Condition B, except Y1 direction only
Vibration (Variable Frequency)	50g peak	MIL-STD-883, Method 2007, Condition B
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102, Condition C
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 260°C peak	J-STD-020

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
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215