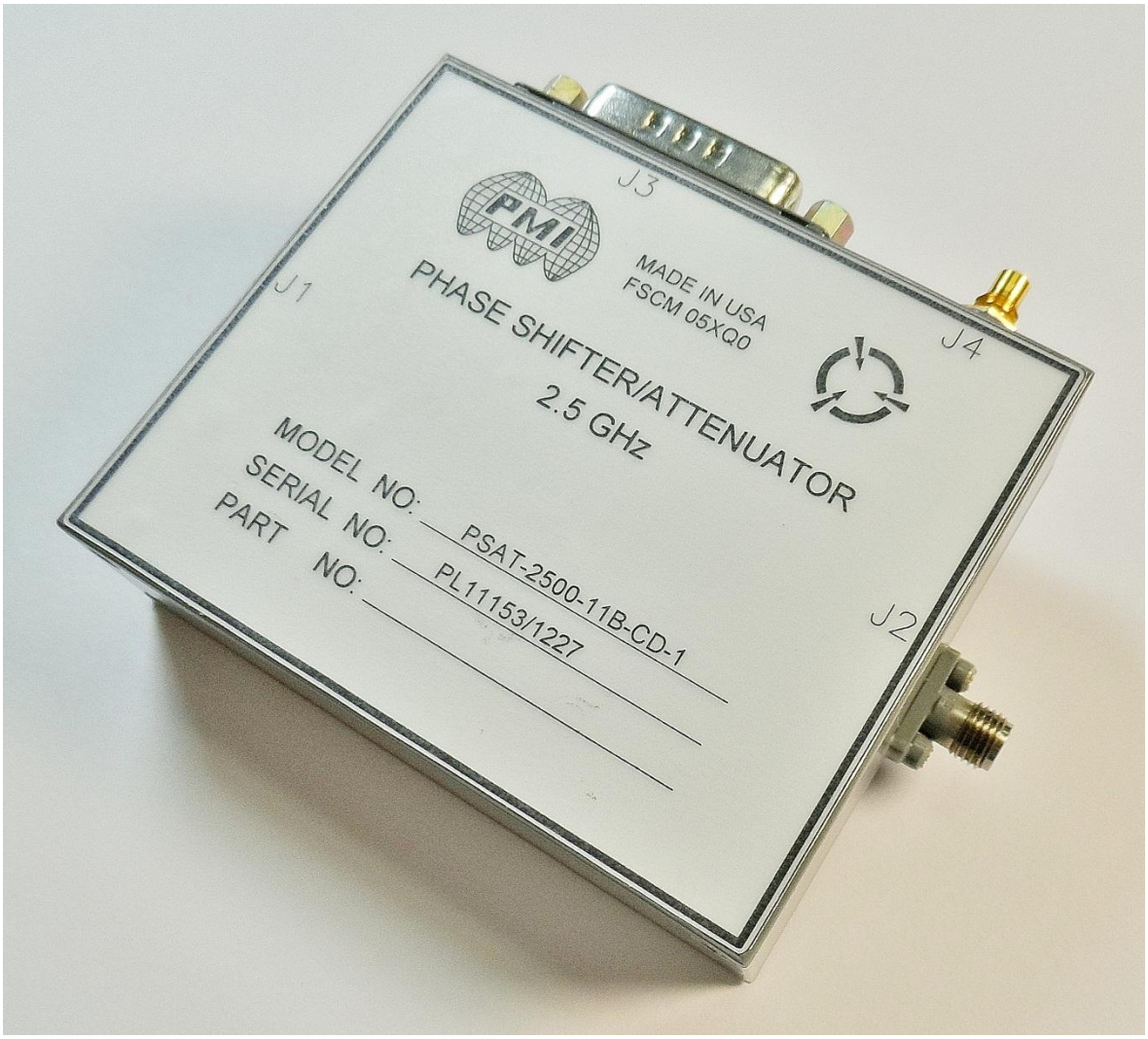
TYPICAL CHARACTERISTICS
ON
PSAT-2500-11B-CD-1



July 16, 2012

Designed by: Paul Kuhn

Drafting by: Nick Ackermann & Paul Kuhn

Testing by: Kevin Mansfield & Paul Kuhn

Report by Paul Kuhn

7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

SUMMARY TEST DATA @ 25˚C

Customer:
Job No:
Model No: PSAT-2500-11B-CD-1
Serial No: PL11153/1227

Tested By: Paul Kuhn / Kevin Mansfield
Date: Monday, July 16, 2012
Time: 6:01 PM
Temp: 25°C

TEST. ITEM NO	PARAMETERS	SPECIFIED VALUE	PASS/FAIL	QA QC
1	Frequency:	2.5 GHz	2.5 GHz	
2	Bandwidth (10MHz):	0.1dB Max	0.08 dB	
3	Bandwidth (55MHz):	0.5dB Max	0.40 dB	
4	Bandwidth (220MHz):	3.0dB Max	0.8 dB	
5	Insertion loss:	10.0 dB Max	7.95 dB	
6	VSWR:	1.5 :1 Max	1.38 :1	
7	Spurious: Harmonic & Non-Harmonic	60 dBc	> 65dBc	
8	PM/AM (Peak-To-Peak)	0.8dB Max Over Full 360°	0.17 dB	
9	AM/PM (Peak-To-Peak)	4° Max Attenuation 0-40dB	2.32 °	
10	+15 Volt Supply	150 mA	75.00 mA	
	-15 Volt Supply	-60 mA	47.00 mA	
	PHASE SHIFTER			
11	Phase Shift:	360° Min 5 Volts (-4V to -9V)	378.15 °	
12	Control Speed:	50 ns to within 10%	45 ns	
13	Monotonicity:	Monotonic	Pass By Design	
14	Deviation Unit-to-Unit:	2.0° Max (-4V to -9V)	First Unit	
15	Slope Ratio	4:1 Max	1.33 :1	
16	Frequency Variation 0.88% Bandwidth (22MHz)	±1° Max	0.67 °	
17	Frequency Variation 2.2% Bandwidth (55MHz)	±3° Max	0.66 °	
18	Frequency Variation 8.8% Bandwidth (220MHz)	±7° Max	1.79 °	
19	Deviation From Linear 2.2% Bandwidth (55MHz)	±1° Max	0.53 °	
20	Deviation From Linear 8.8% Bandwidth (220MHz)	±5° Max	0.53 °	
21	Absolute Phase Temperature Stability	8° Max	4 °	

7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

SUMMARY TEST DATA @ 25˚C

Customer:		Tested By:	Paul Kuhn / Kevin Mansfield
Job No:		Date:	Monday, July 16, 2012
Model No:	PSAT-2500-11B-CD-1	Time:	6:01 PM
Serial No:	PL11153/1227	Temp:	25°C

TEST. ITEM NO	PARAMETERS	SPECIFIED VALUE	PASS/FAIL	QA QC
ATTENUATOR				
1	Attenuation Range:	60.0 dB Min	Pass By Design	
2	Monotonicity:	Monotonic	Pass By Design	
3	Attenuation Control speed	1.0 us Max To Within 0.1 dB	0.75 us	
4	Accuracy At Center Frequency	±0.1 dB Max, 0 - 1.0 dB	0.02 dB	
5	Accuracy At Center Frequency	±0.5 dB Max, 0 - 30 dB	0.12 dB	
6	Accuracy At Center Frequency	±1.0 dB Max, 30 - 50 dB	0.09 dB	
7	Deviation Between Any 2 Devices:	1.25 dB Max	First Unit	
21	Absolute Attenuation Temperature Stability	1.4 dB Max	0.50 dB	

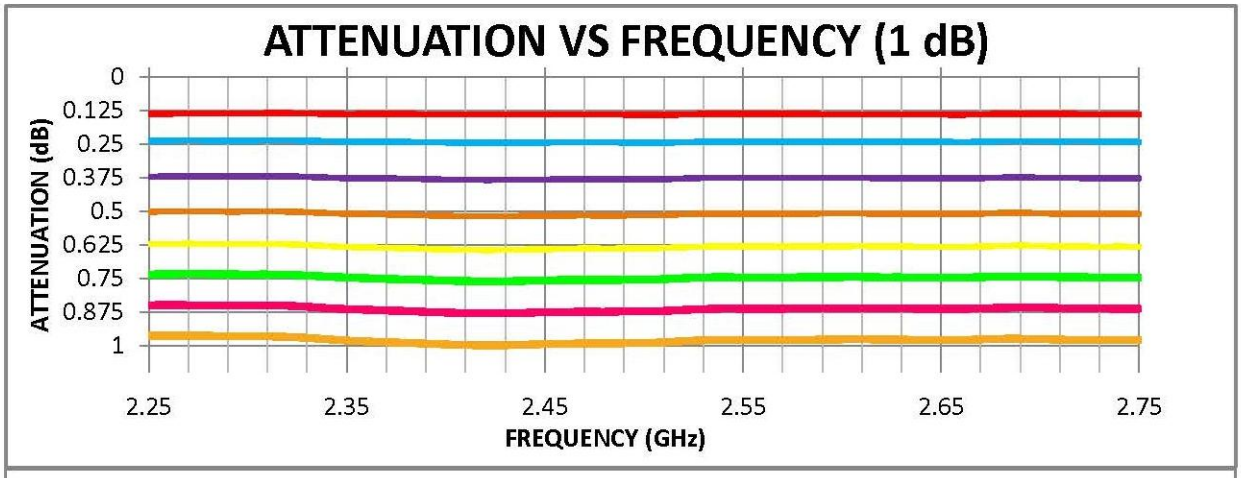
Programmed Attenuation	Attenuation	Accuracy of Attenuation	
dB	dB	dB	
0.125	0.14	-0.02	
0.25	0.25	0.00	
0.38	0.38	-0.01	
0.50	0.52	-0.02	
0.63	0.64	-0.01	
0.75	0.75	0.00	
0.88	0.87	0.00	
1.00	0.99	0.01	
10.00	9.93	0.07	
20.00	19.88	0.12	
30.00	30.00	0.00	
40.00	39.93	0.07	
50.00	49.91	0.09	
60.00	60.06	-0.06	

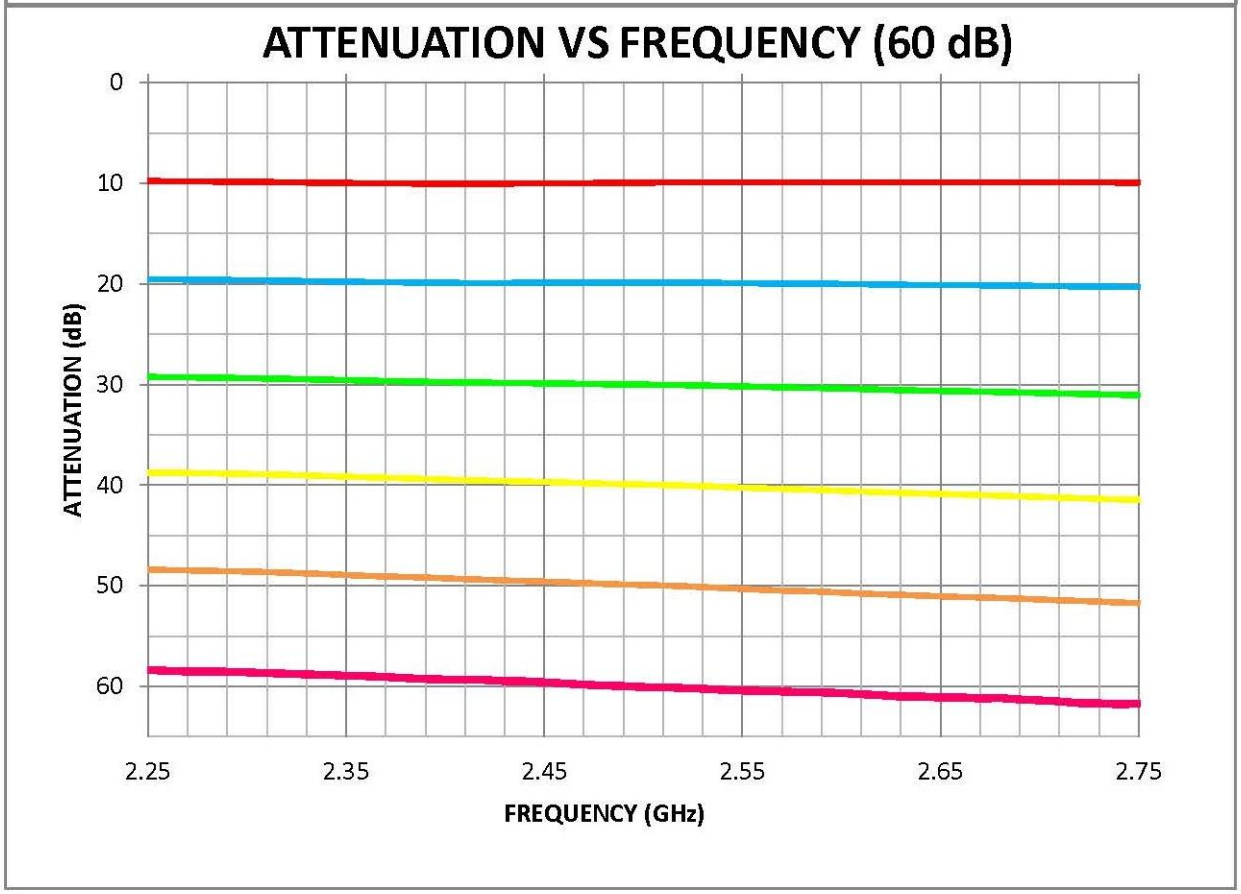
Programmed Phase Shift	Phase Shift	Accuracy of Phase Shift	
Volts	DEG	DEG	
-4.00	0.00	0.00	
-5.00	79.38	0.00	
-6.00	162.41	0.00	
-7.00	241.68	0.00	
-8.00	315.48	0.00	
-9.00	378.15	0.00	

7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS
ON
PSAT-2500-11B-CD-1

ATTENUATION PLOTS @ 25˚C

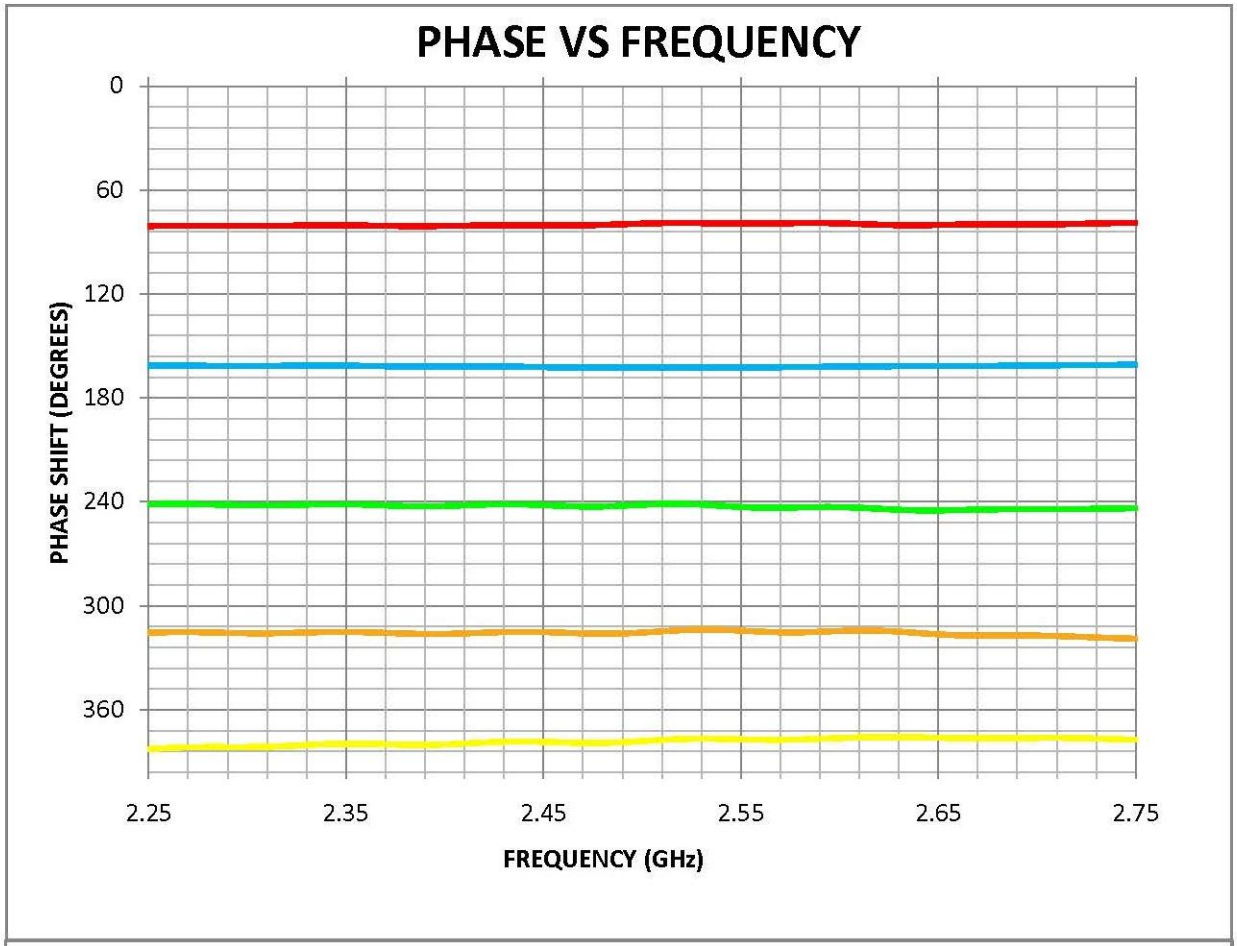


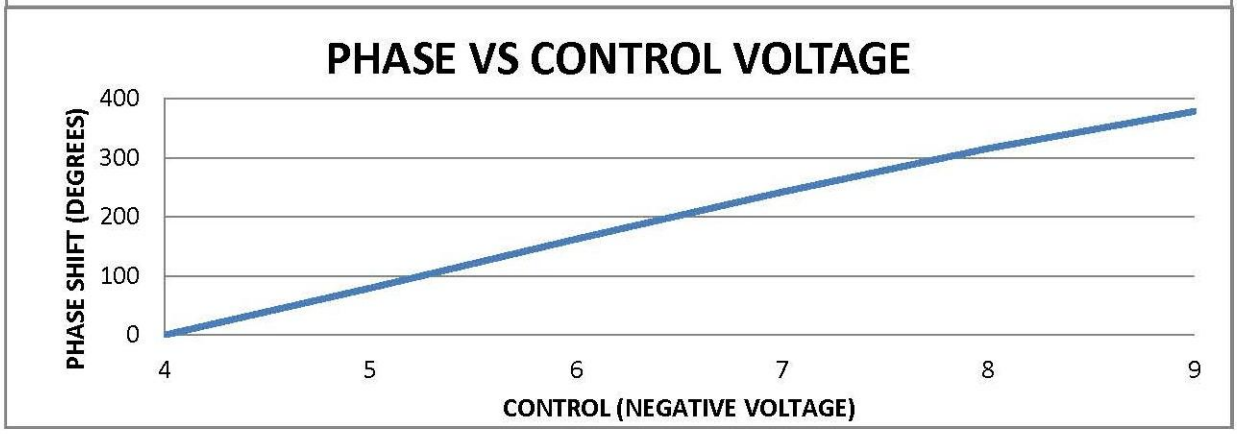


7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS
ON
PSAT-2500-11B-CD-1

PHASE PLOTS @ 25˚C





7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

SUMMARY TEST DATA @ 0˚C

Customer:
Job No:
Model No: PSAT-2500-11B-CD-1
Serial No: PL11153/1227

Tested By: Paul Kuhn / Kevin Mansfield
Date: Monday, July 16, 2012
Time: 5:42 PM
Temp: 0°C

TEST. ITEM NO	PARAMETERS	SPECIFIED VALUE	PASS/FAIL	QA QC
1	Frequency:	2.5 GHz	2.5 GHz	
2	Bandwidth (10MHz):	0.1dB Max	0.10 dB	
3	Bandwidth (55MHz):	0.5dB Max	0.46 dB	
4	Bandwidth (220MHz):	3.0dB Max	0.8 dB	
5	Insertion loss:	10.0 dB Max	7.90 dB	
6	VSWR:	1.5 :1 Max	1.37 :1	
7	Spurious: Harmonic & Non-Harmonic	60 dBc	> 65dBc	
8	PM/AM (Peak-To-Peak)	0.8dB Max Over Full 360°	0.16 dB	
9	AM/PM (Peak-To-Peak)	4° Max Attenuation 0-40dB	2.08 °	
10	+15 Volt Supply	150 mA	76.00 mA	
	-15 Volt Supply	-60 mA	46.00 mA	
	PHASE SHIFTER			
11	Phase Shift:	360° Min 5 Volts (-4V to -9V)	378.85 °	
12	Control Speed:	50 ns to within 10%	45 ns	
13	Monotonicity:	Monotonic	Pass By Design	
14	Deviation Unit-to-Unit:	2.0° Max (-4V to -9V)	First Unit	
15	Slope Ratio	4:1 Max	1.32 :1	
16	Frequency Variation 0.88% Bandwidth (22MHz)	±1° Max	0.69 °	
17	Frequency Variation 2.2% Bandwidth (55MHz)	±3° Max	0.70 °	
18	Frequency Variation 8.8% Bandwidth (220MHz)	±7° Max	2.00 °	
19	Deviation From Linear 2.2% Bandwidth (55MHz)	±1° Max	0.53 °	
20	Deviation From Linear 8.8% Bandwidth (220MHz)	±5° Max	0.53 °	
21	Absolute Phase Temperature Stability	8° Max	4 °	

7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

SUMMARY TEST DATA @ 0˚C

Customer:
Job No:

Tested By: Paul Kuhn / Kevin Mansfield
Date: Monday, July 16, 2012

Model No: PSAT-2500-11B-CD-1
Serial No: PL11153/1227

Time: 5:42 PM
Temp: 0°C

TEST. ITEM NO	PARAMETERS	SPECIFIED VALUE	PASS/FAIL	QA QC
		ATTENUATOR		
1	Attenuation Range:	60.0 dB Min	Pass By Design	
2	Monotonicity:	Monotonic	Pass By Design	
3	Attenuation Control speed	1.0 us Max To Within 0.1 dB	0.75 us	
4	Accuracy At Center Frequency	±0.1 dB Max, 0 - 1.0 dB	0.04 dB	
5	Accuracy At Center Frequency	±0.5 dB Max, 0 - 30 dB	0.11 dB	
6	Accuracy At Center Frequency	±1.0 dB Max, 30 - 50 dB	0.21 dB	
7	Deviation Between Any 2 Devices:	1.25 dB Max	First Unit	
21	Absolute Attenuation Temperature Stability	1.4 dB Max	0.50 dB	

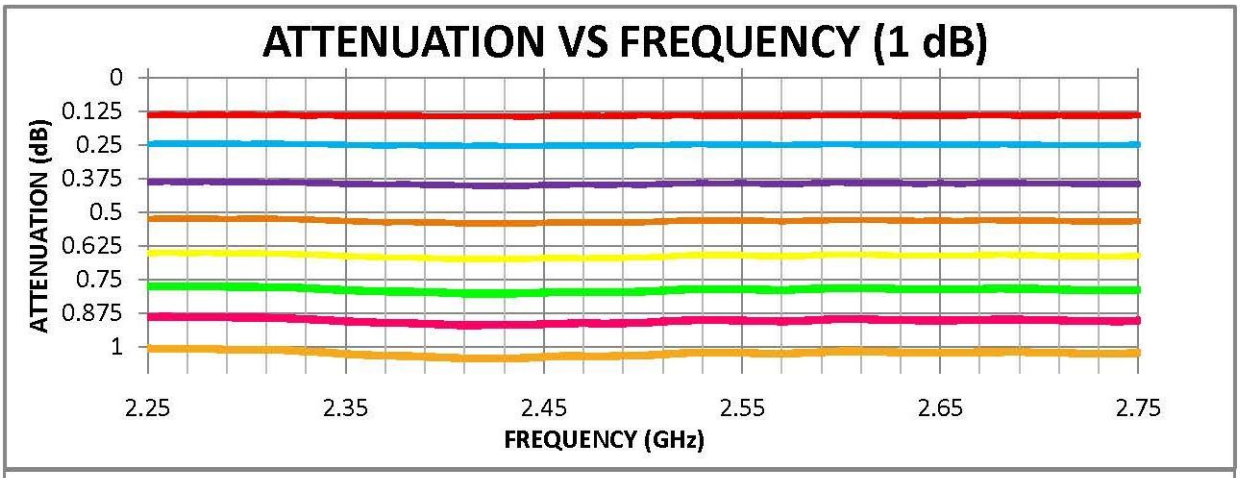
Programmed Attenuation	Attenuation	Accuracy of Attenuation	
dB	dB	dB	
0.125	0.14	-0.02	
0.25	0.25	0.00	
0.38	0.40	-0.02	
0.50	0.54	-0.04	
0.63	0.67	-0.04	
0.75	0.79	-0.04	
0.88	0.91	-0.04	
1.00	1.03	-0.03	
10.00	9.94	0.06	
20.00	19.89	0.11	
30.00	30.02	-0.02	
40.00	39.91	0.09	
50.00	49.79	0.21	
60.00	59.84	0.16	

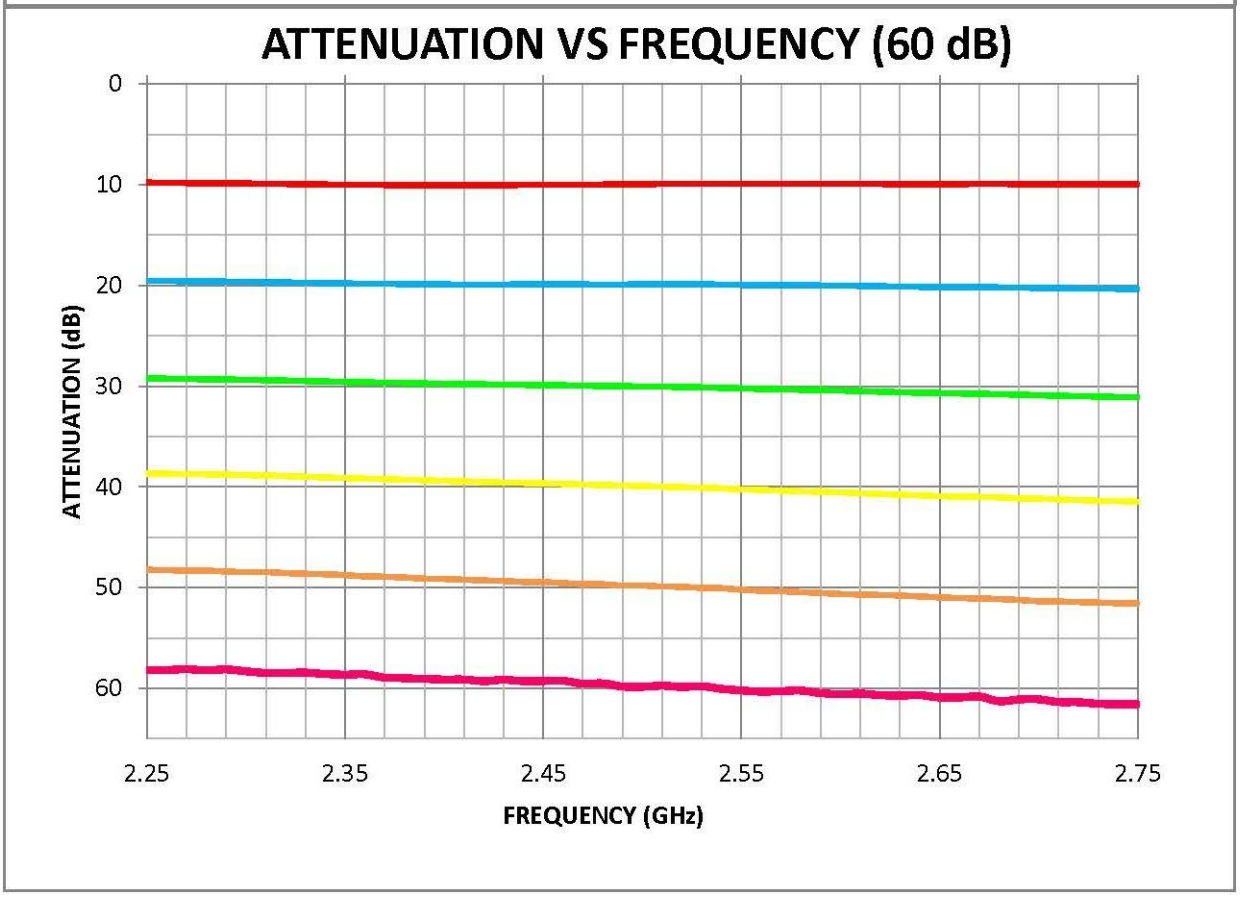
Programmed Phase Shift	Phase Shift	Accuracy of Phase Shift	
Volts	DEG	DEG	
-4.00	0.00	0.00	
-5.00	76.39	0.00	
-6.00	160.39	0.00	
-7.00	240.86	0.00	
-8.00	315.46	0.00	
-9.00	378.85	0.00	

7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS
ON
PSAT-2500-11B-CD-1

ATTENUATION PLOTS @ 0˚C

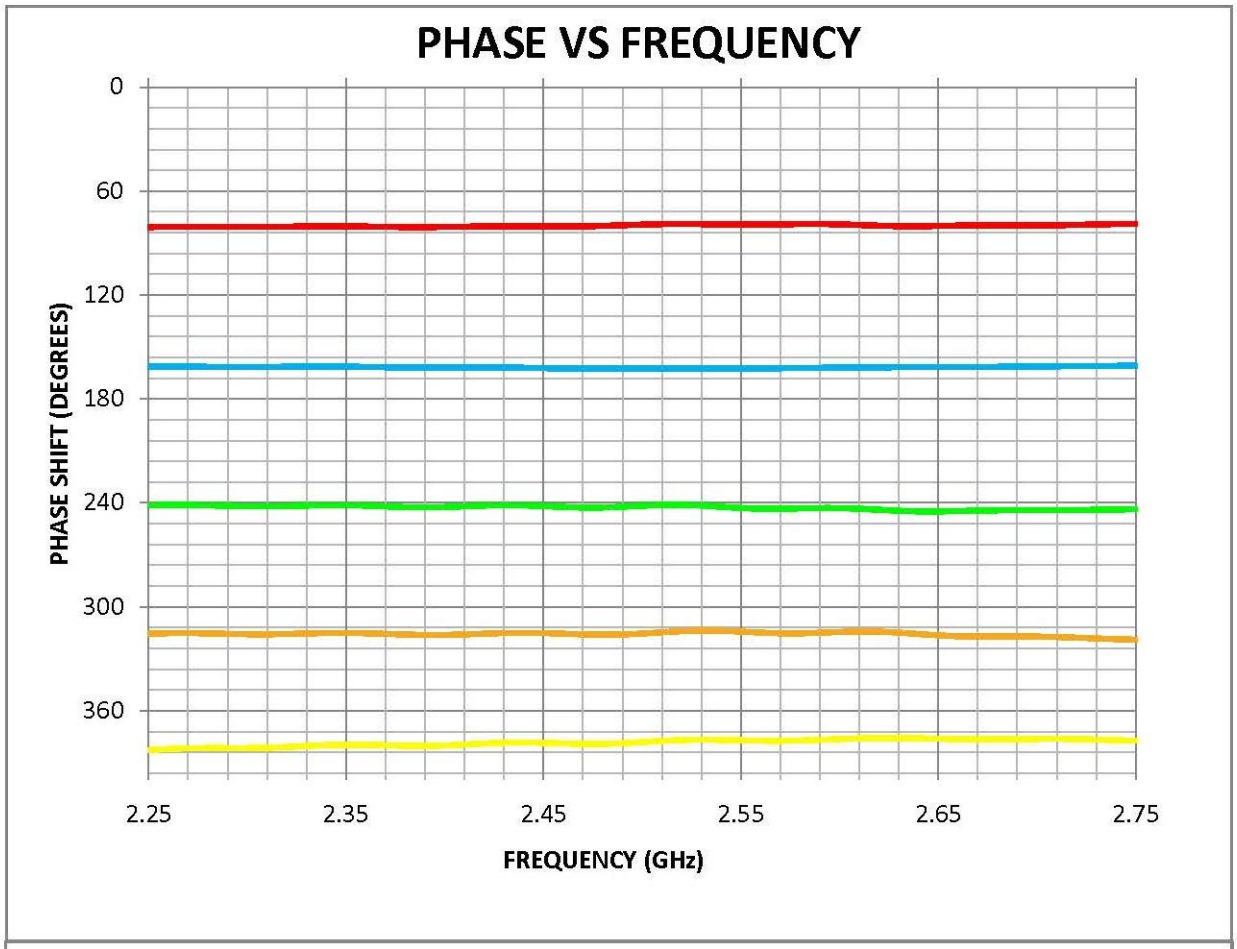


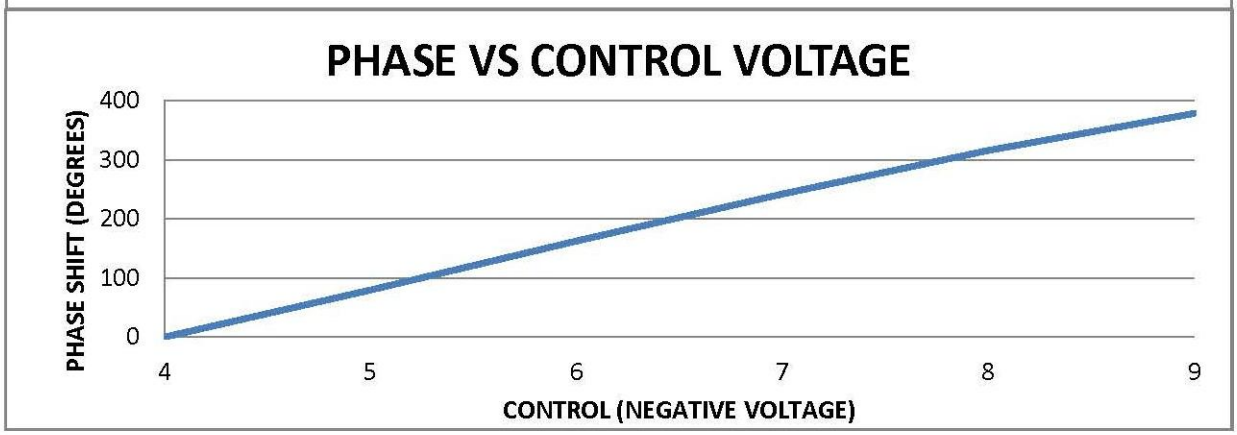


7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

PHASE PLOTS @ 0˚C





7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

SUMMARY TEST DATA @ 70˚C

Customer:
Job No:
Model No: PSAT-2500-11B-CD-1
Serial No: PL11153/1227

Tested By: Paul Kuhn / Kevin Mansfield
Date: Monday, July 16, 2012
Time: 6:18 PM
Temp: 70°C

TEST. ITEM NO	PARAMETERS	SPECIFIED VALUE	PASS/FAIL	QA QC
1	Frequency:	2.5 GHz	2.5 GHz	
2	Bandwidth (10MHz):	0.1dB Max	0.07 dB	
3	Bandwidth (55MHz):	0.5dB Max	0.36 dB	
4	Bandwidth (220MHz):	3.0dB Max	0.7 dB	
5	Insertion loss:	10.0 dB Max	8.10 dB	
6	VSWR:	1.5 :1 Max	1.33 :1	
7	Spurious: Harmonic & Non-Harmonic	60 dBc	> 65dBc	
8	PM/AM (Peak-To-Peak)	0.8dB Max Over Full 360°	0.22 dB	
9	AM/PM (Peak-To-Peak)	4° Max Attenuation 0-40dB	3.56 °	
10	+15 Volt Supply	150 mA	74.00 mA	
	-15 Volt Supply	-60 mA	48.00 mA	
	PHASE SHIFTER			
11	Phase Shift:	360° Min 5 Volts (-4V to -9V)	375.25 °	
12	Control Speed:	50 ns to within 10%	45 ns	
13	Monotonicity:	Monotonic	Pass By Design	
14	Deviation Unit-to-Unit:	2.0° Max (-4V to -9V)	First Unit	
15	Slope Ratio	4:1 Max	1.38 :1	
16	Frequency Variation 0.88% Bandwidth (22MHz)	±1° Max	0.66 °	
17	Frequency Variation 2.2% Bandwidth (55MHz)	±3° Max	0.59 °	
18	Frequency Variation 8.8% Bandwidth (220MHz)	±7° Max	1.61 °	
19	Deviation From Linear 2.2% Bandwidth (55MHz)	±1° Max	0.47 °	
20	Deviation From Linear 8.8% Bandwidth (220MHz)	±5° Max	0.47 °	
21	Absolute Phase Temperature Stability	8° Max	4 °	

7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

SUMMARY TEST DATA @ 70˚C

Customer: _____
Job No: _____

Tested By: Paul Kuhn / Kevin Mansfield
Date: Monday, July 16, 2012

Model No: PSAT-2500-11B-CD-1
Serial No: PL11153/1227

Time: 6:18 PM
Temp: 70°C

TEST. ITEM NO	PARAMETERS	SPECIFIED VALUE	PASS/FAIL	QA QC
ATTENUATOR				
1	Attenuation Range:	60.0 dB Min	Pass By Design	
2	Monotonicity:	Monotonic	Pass By Design	
3	Attenuation Control speed	1.0 us Max To Within 0.1 dB	0.75 us	
4	Accuracy At Center Frequency	±0.1 dB Max, 0 - 1.0 dB	0.02 dB	
5	Accuracy At Center Frequency	±0.5 dB Max, 0 - 30 dB	0.39 dB	
6	Accuracy At Center Frequency	±1.0 dB Max, 30 - 50 dB	0.39 dB	
7	Deviation Between Any 2 Devices:	1.25 dB Max	First Unit	
21	Absolute Attenuation Temperature Stability	1.4 dB Max	0.50 dB	

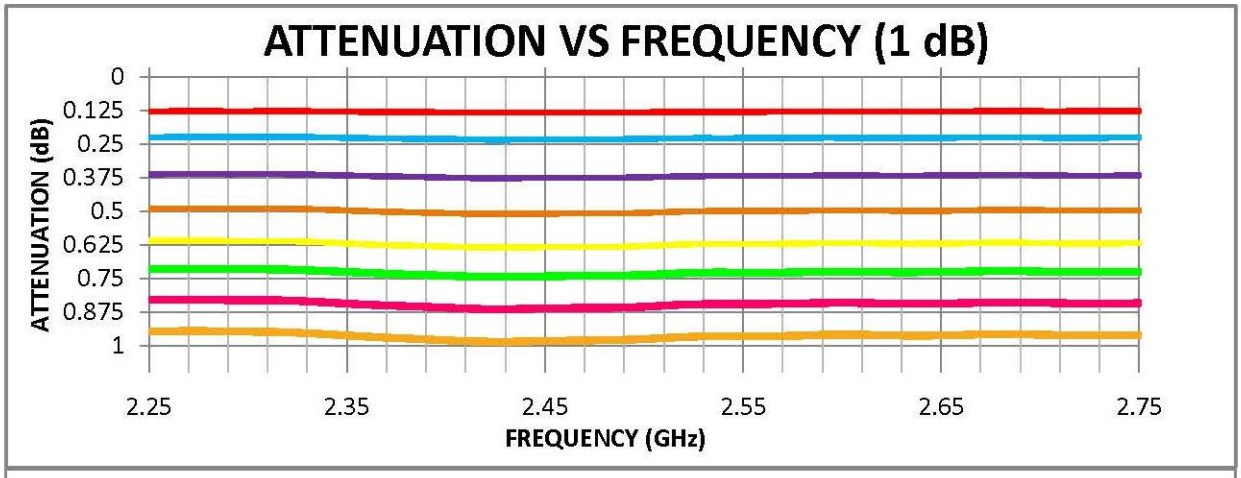
Programmed Attenuation	Attenuation	Accuracy of Attenuation	
dB	dB	dB	
0.125	0.13	-0.01	
0.25	0.23	0.02	
0.38	0.37	0.00	
0.50	0.51	-0.01	
0.63	0.63	0.00	
0.75	0.74	0.01	
0.88	0.86	0.02	
1.00	0.98	0.02	
10.00	10.30	-0.30	
20.00	20.36	-0.36	
30.00	30.39	-0.39	
40.00	40.26	-0.26	
50.00	50.21	-0.21	
60.00	60.18	-0.18	

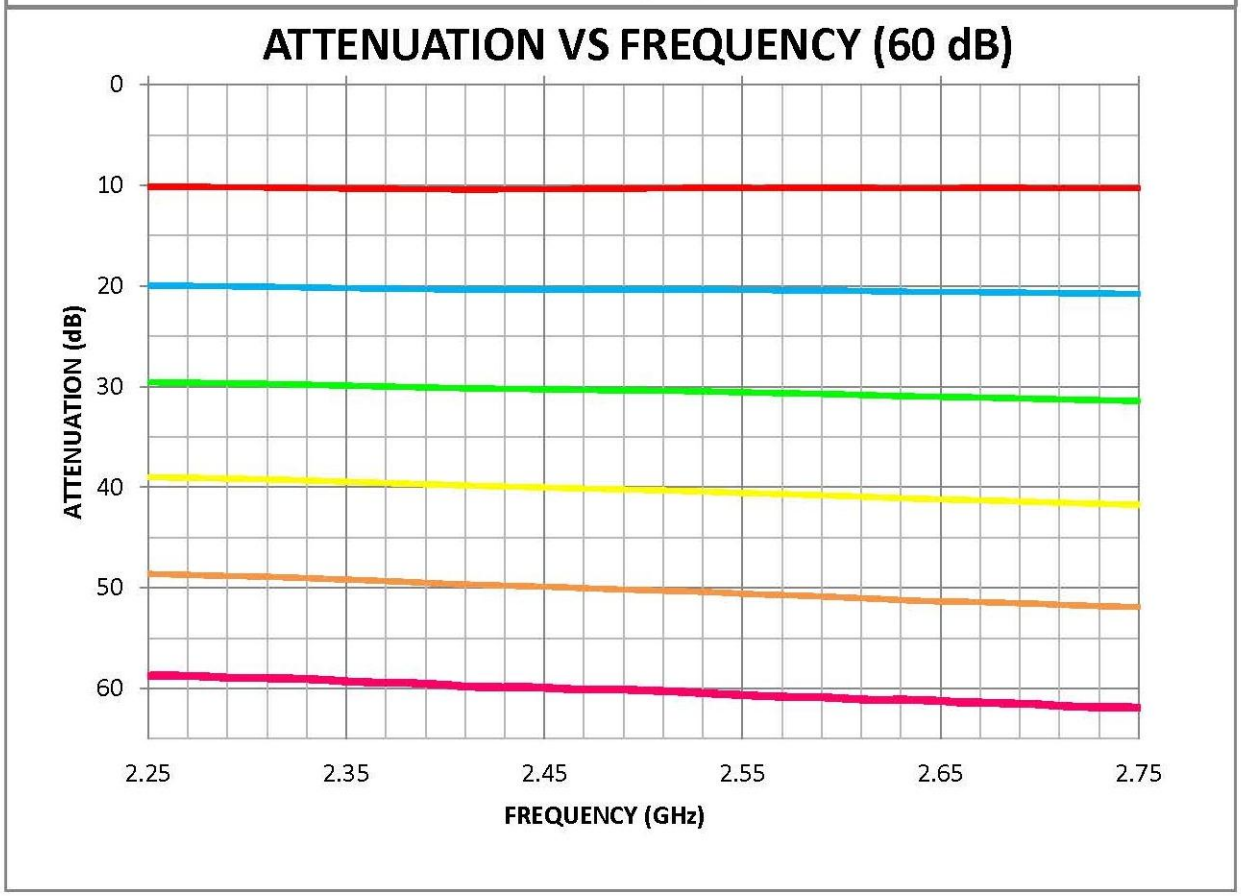
Programmed Phase Shift	Phase Shift	Accuracy of Phase Shift	
Volts	DEG	DEG	
-4.00	0.00	0.00	
-5.00	83.09	0.00	
-6.00	165.14	0.00	
-7.00	242.82	0.00	
-8.00	315.06	0.00	
-9.00	375.25	0.00	

7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS
ON
PSAT-2500-11B-CD-1

ATTENUATION PLOTS @ 70˚C

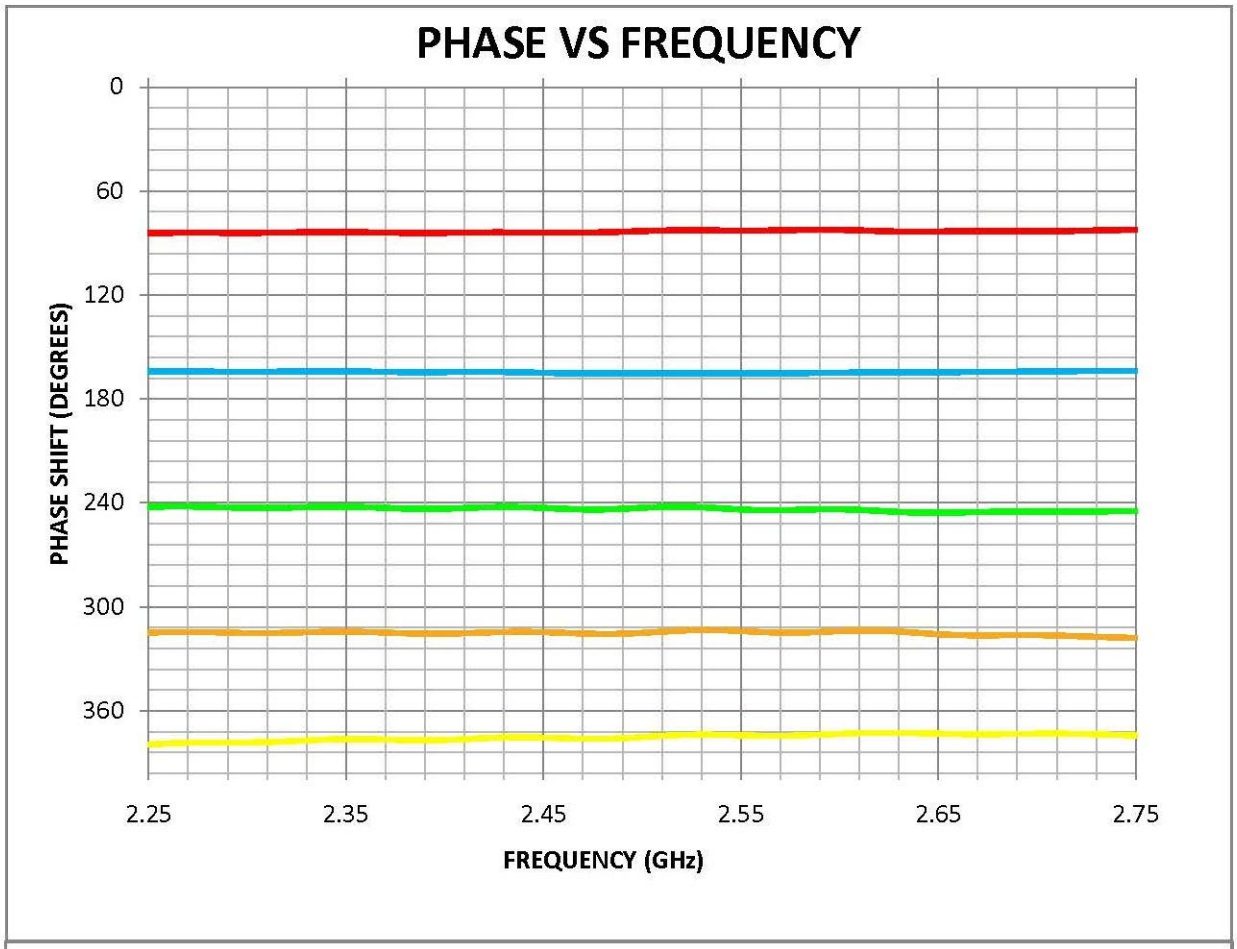


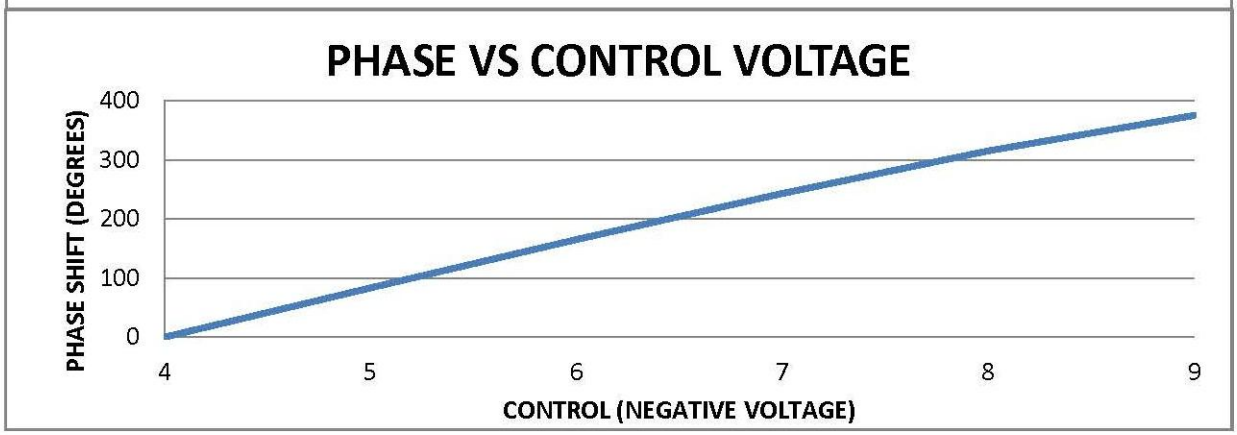


7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS
ON
PSAT-2500-11B-CD-1

PHASE PLOTS @ 70˚C

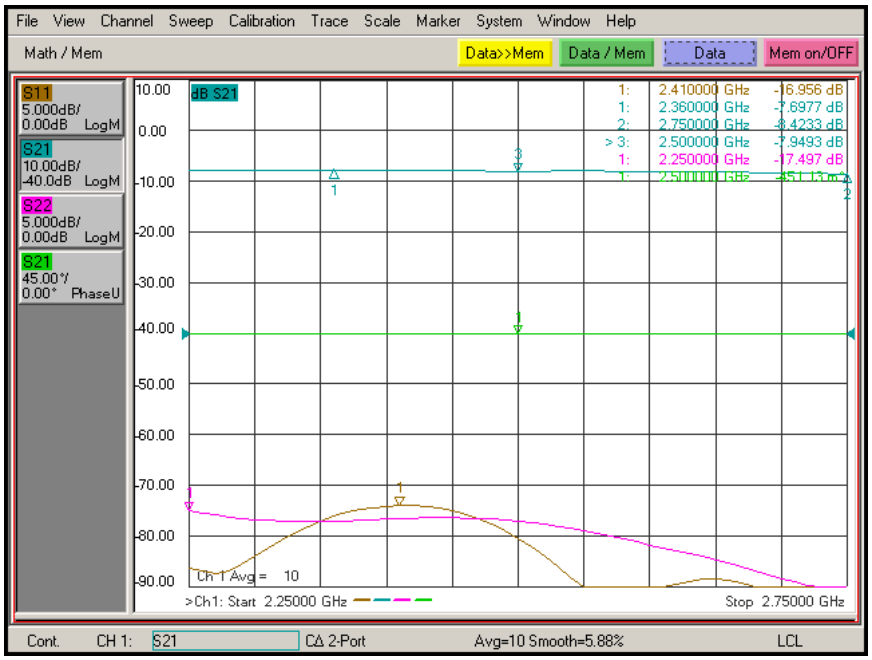




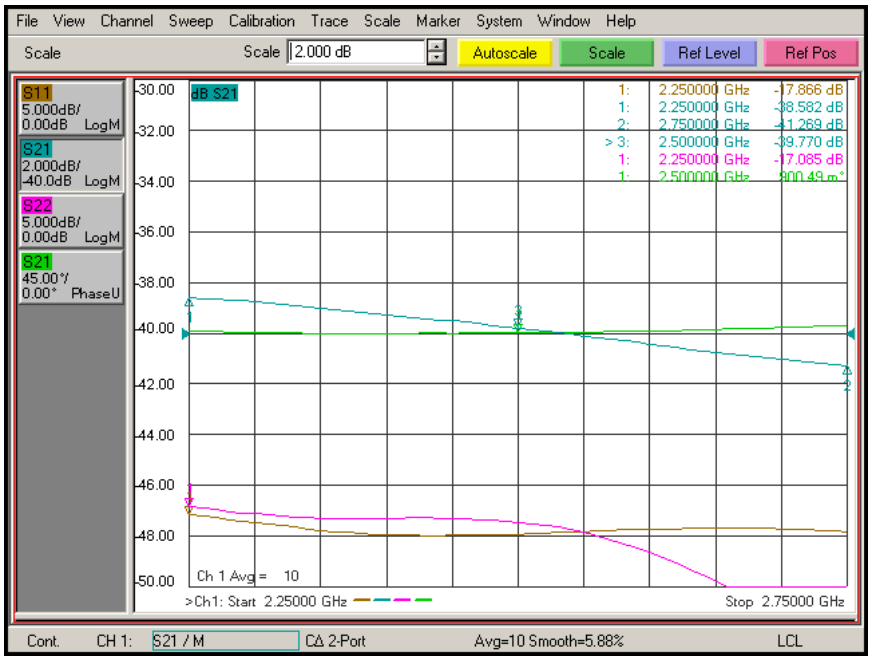
7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

INSERTION LOSS & VSWR @ 25°C



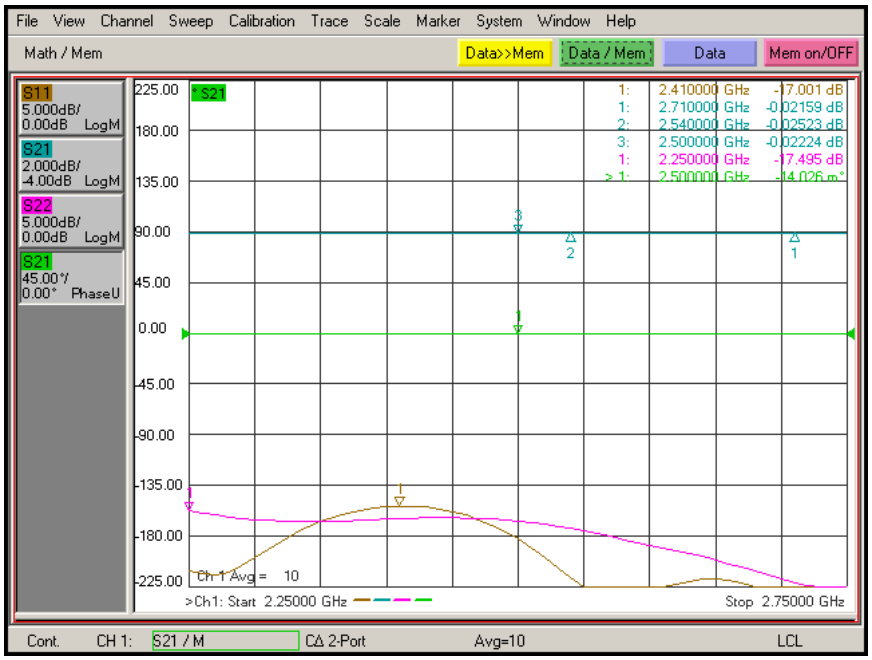
40 dB ATTENUATION & VSWR @ 25°C



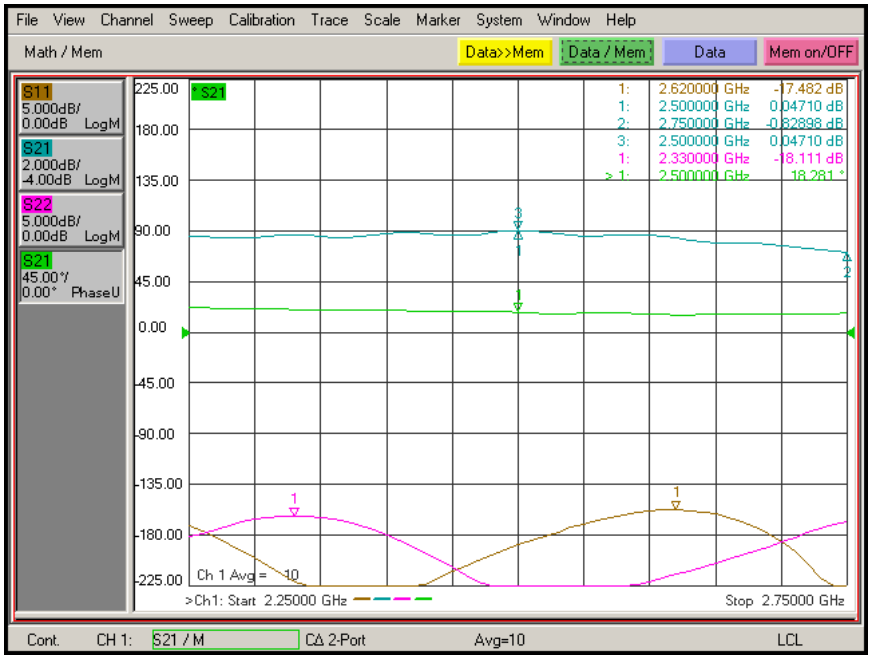
7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

AMPLITUDE & PHASE SET TO ZERO @ -4 VOLTS, 25°C



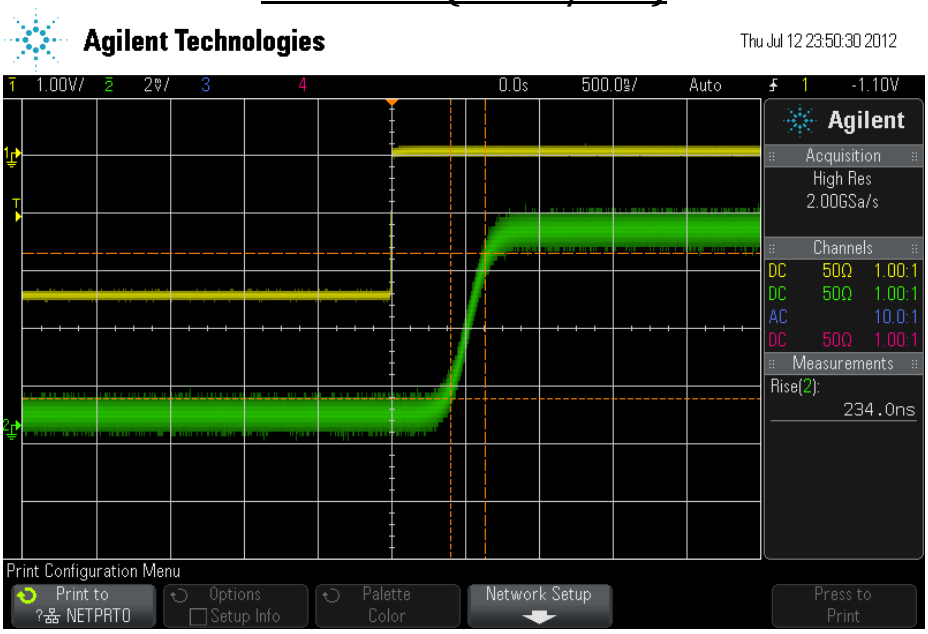
AMPLITUDE & PHASE (378.28°) @ -9 VOLTS, 25°C



7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

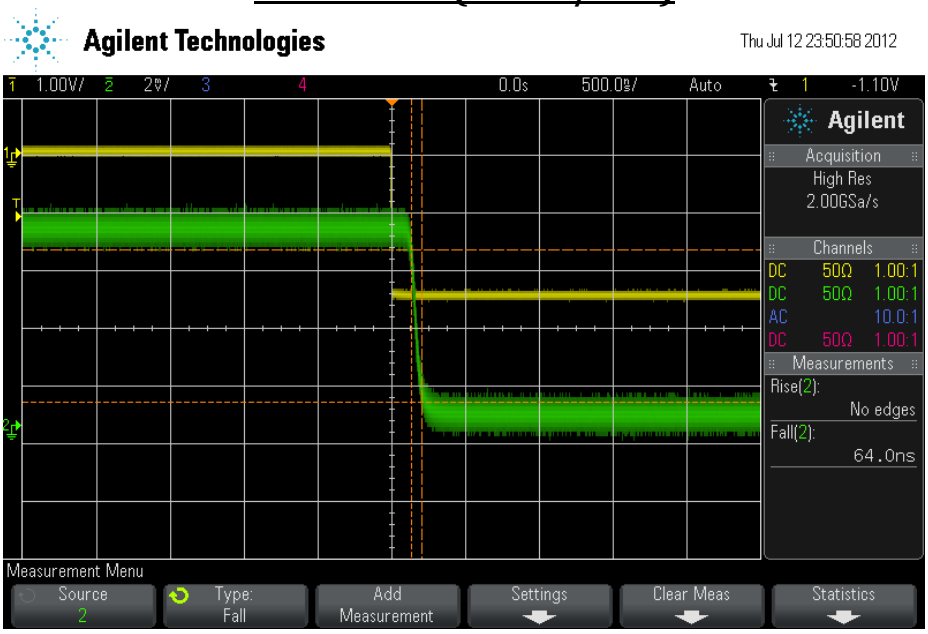
TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

ATTENUATION SWITCHING SPEED, 2dB to 40dB @ 25˚C DELAY ON (500ns/Div.)



Yellow Trace: TTL Input
Green Trace: RF (Measured with a Crystal Detector)

DELAY OFF (500ns/Div.)

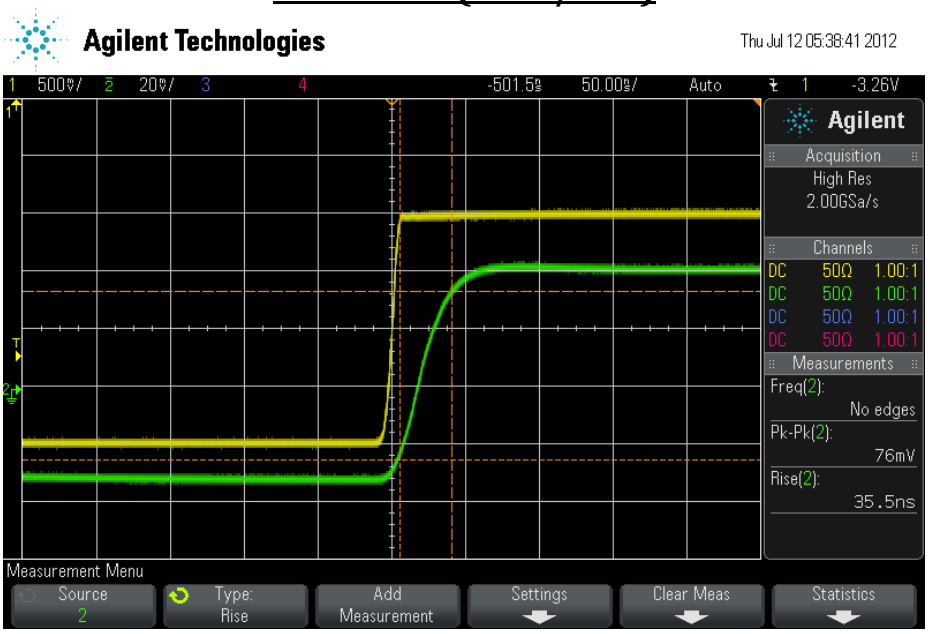


Yellow Trace: TTL Input
Green Trace: RF (Measured with a Crystal Detector)

7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

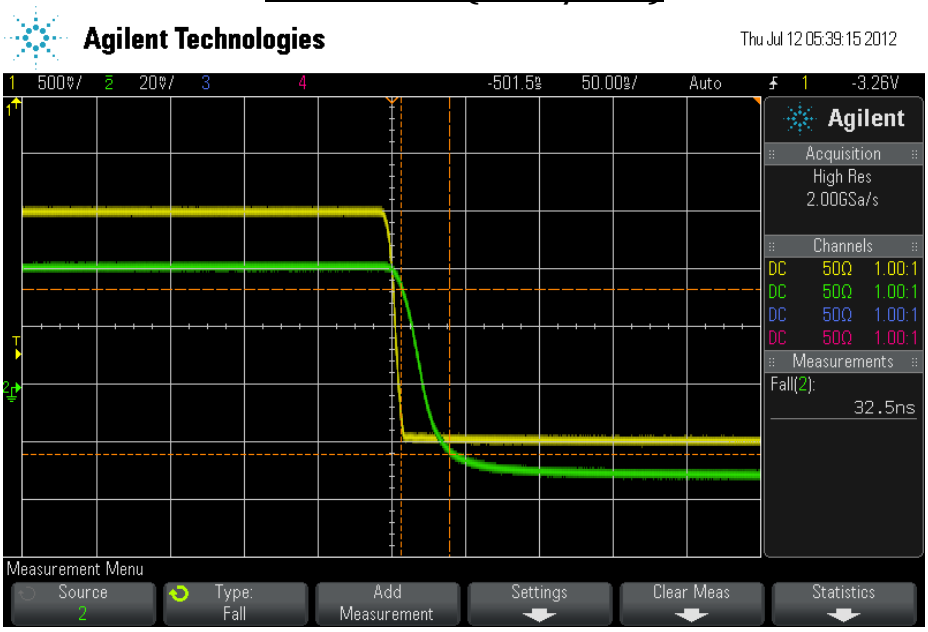
TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

PHASE SWITCHING SPEED, 0° to 180° @ 25°C
DELAY ON (50ns/Div.)



Yellow Trace: TTL Input
Green Trace: RF (Measured with a Crystal Detector)

DELAY OFF (50ns/Div.)

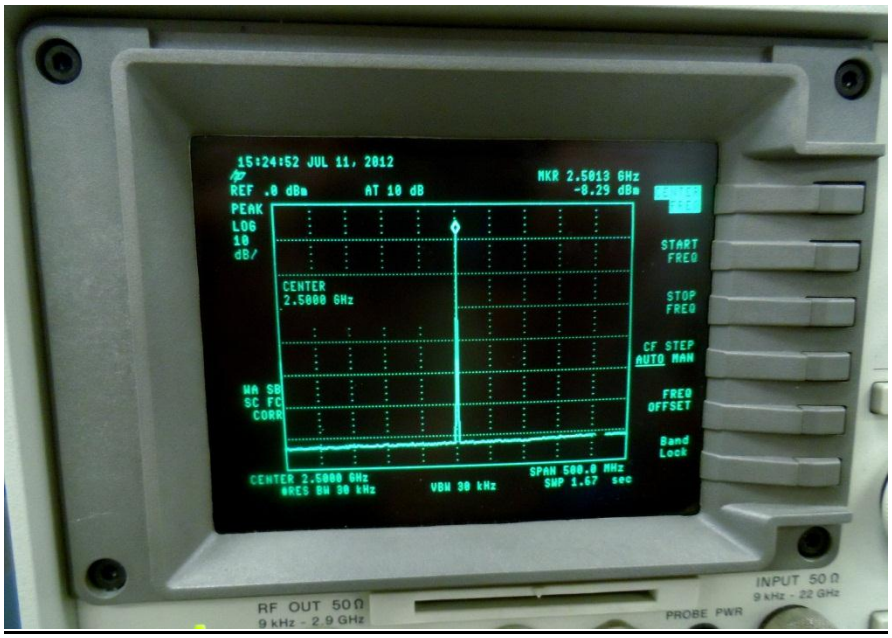


Yellow Trace: TTL Input
Green Trace: RF (Measured with a Crystal Detector)

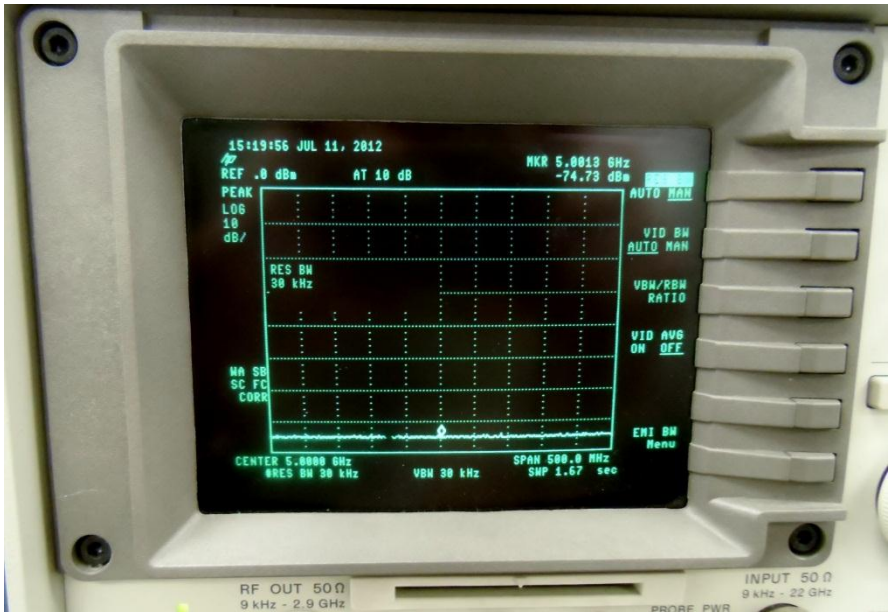
7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com

TYPICAL CHARACTERISTICS ON PSAT-2500-11B-CD-1

SPECTRAL ANALYSIS
CARRIER



HARMONIC AND NON-HARMONIC



7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com