

ARG81800 EMC Test Report

Allegro is not an accredited EMC laboratory location. The results obtained and communicated in this report are to be used for reference purposes only.

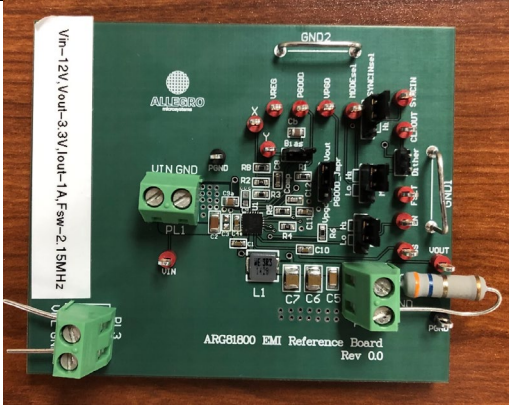
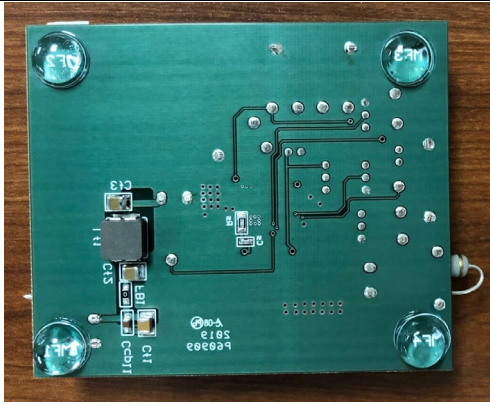
Test Result Summary

Standard	Item	Test Result
EN55025/CISPR25:2008 Class 5	Conducted (0.15-108MHz)	Passed
	Radiated (0.15-30MHz)	Passed
	*Radiated I (30-330MHz)	Passed
	**Radiated II (30-330MHz)	Passed

* The data was taken with biconical antenna oriented **horizontally**.

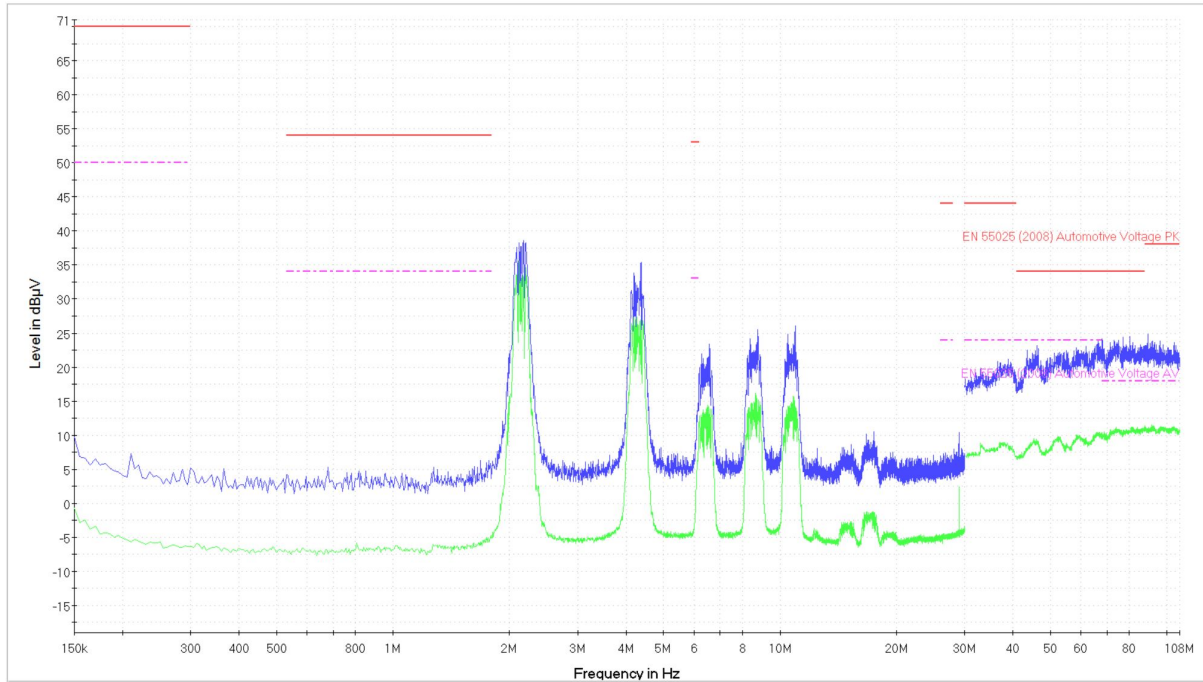
The data was taken with biconical antenna oriented **vertically.

EUT Description

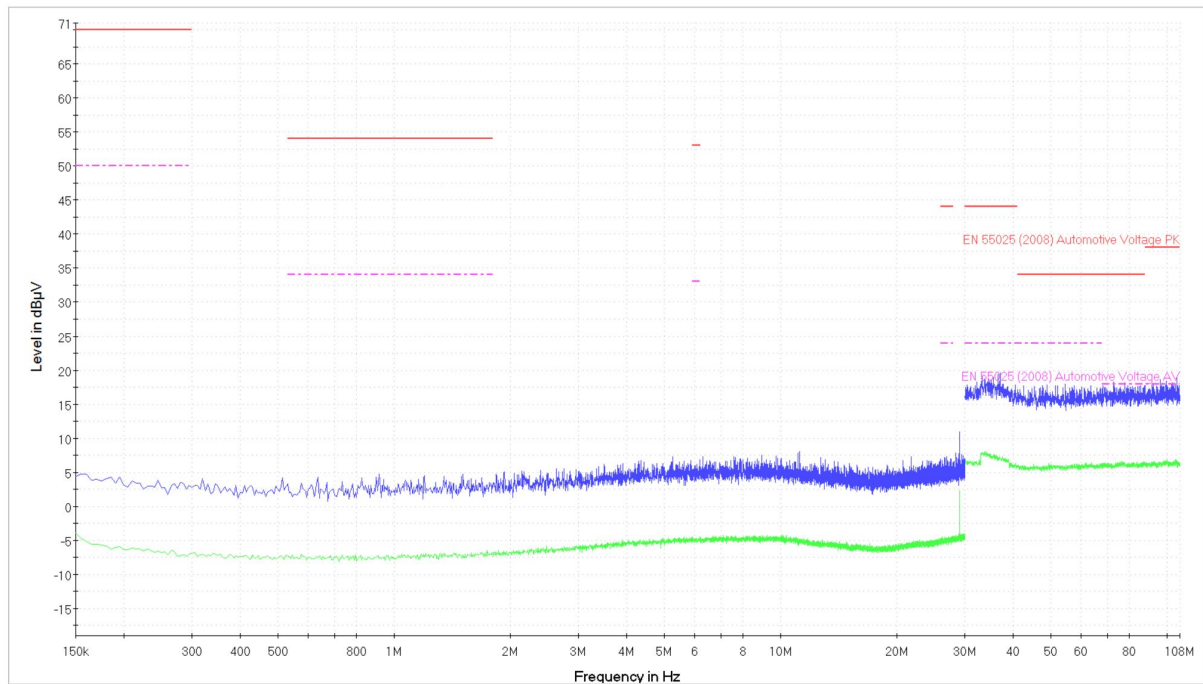
Description
ARG81800 EMI Reference Board Rev 0.0 Max Load(3.3ohm)
Operating Condition
PWM Mode with Dither enable Vin-12V, Vout-3.3V, Iout-1A, Bias-3.3V(Vout), Fsw-2.15MHz
Mechanical View
 <p style="text-align: center;"><u>Top View</u></p>
 <p style="text-align: center;"><u>Bottom View(mirrored)</u></p>

Conducted Emission Test Result (150kHz – 108MHz)

Operating Condition	PWM Mode with Dither enable Vin-12V, Vout-3.3V, Iout-1A, Bias – 3.3V(Vout), Fsw-2.15MHz
Result	Passed

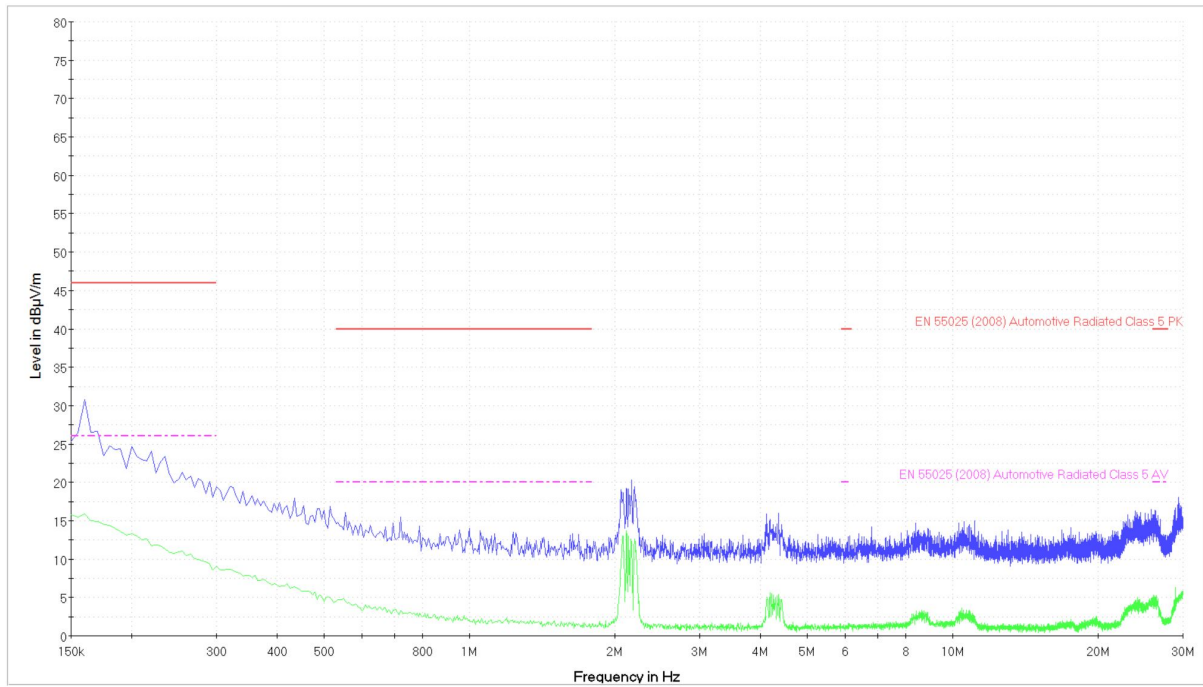


Noise Floor

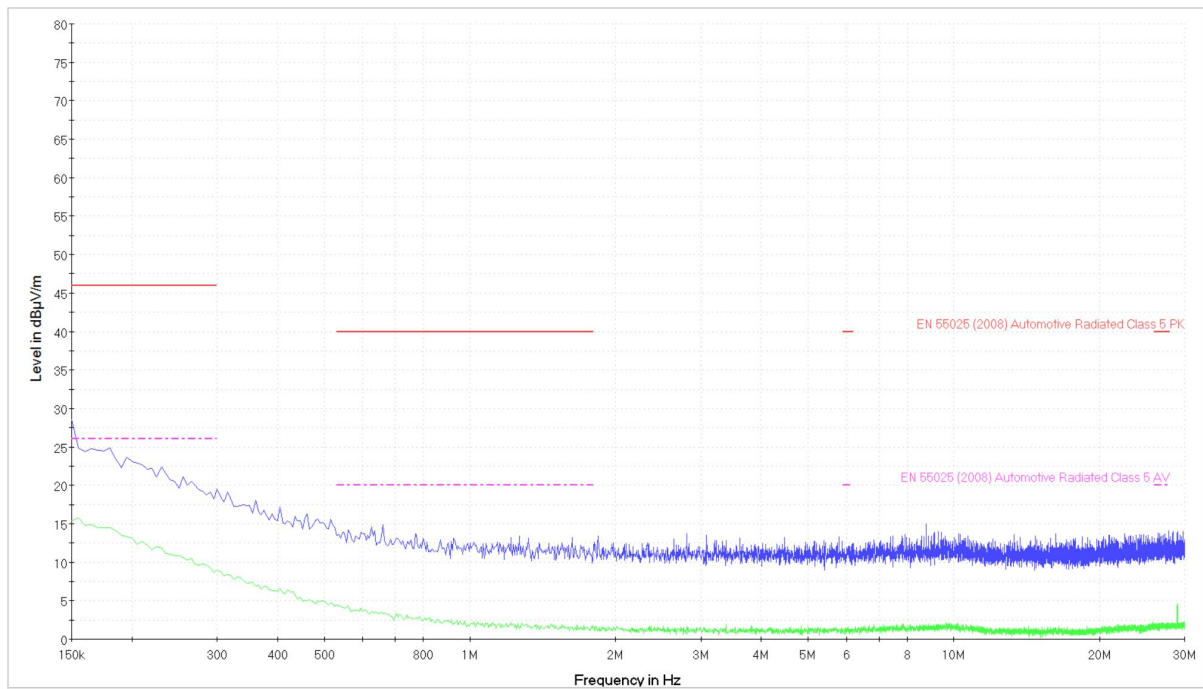


Radiated Emission Test Result (150kHz – 30MHz)

Operating Condition	PWM Mode with Dither enable Vin-12V, Vout-3.3V, Iout-1A, Bias – 3.3V(Vout), Fsw-2.15MHz
Result	Passed

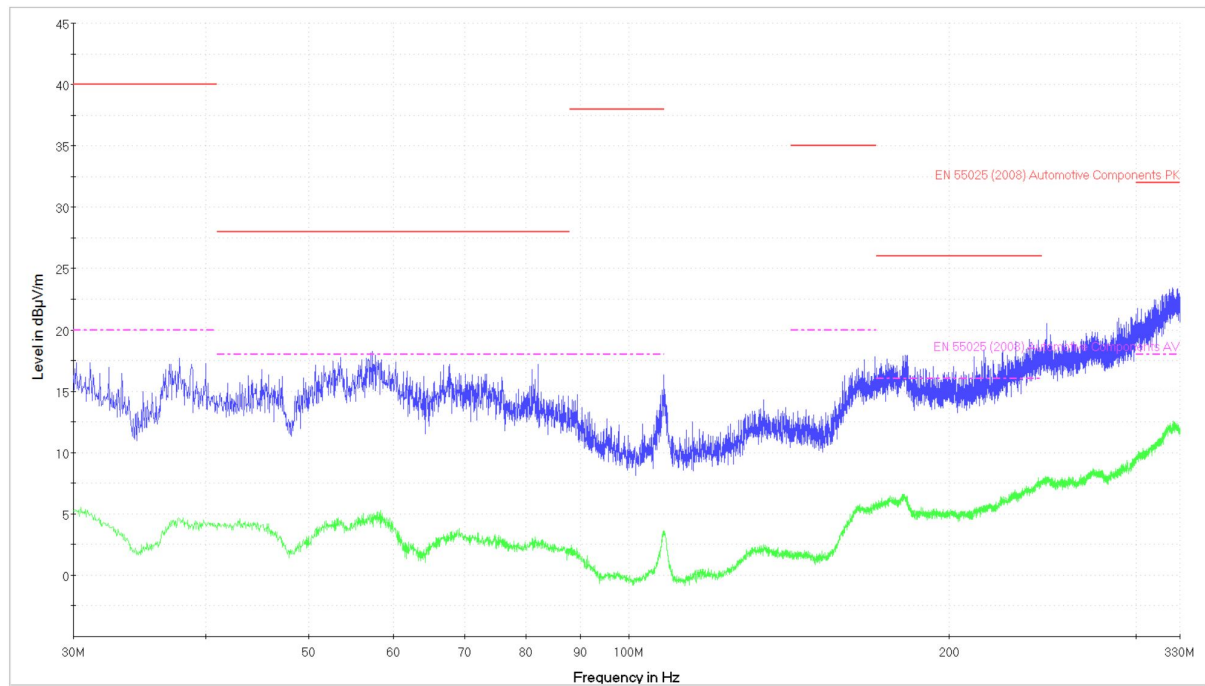


Noise Floor

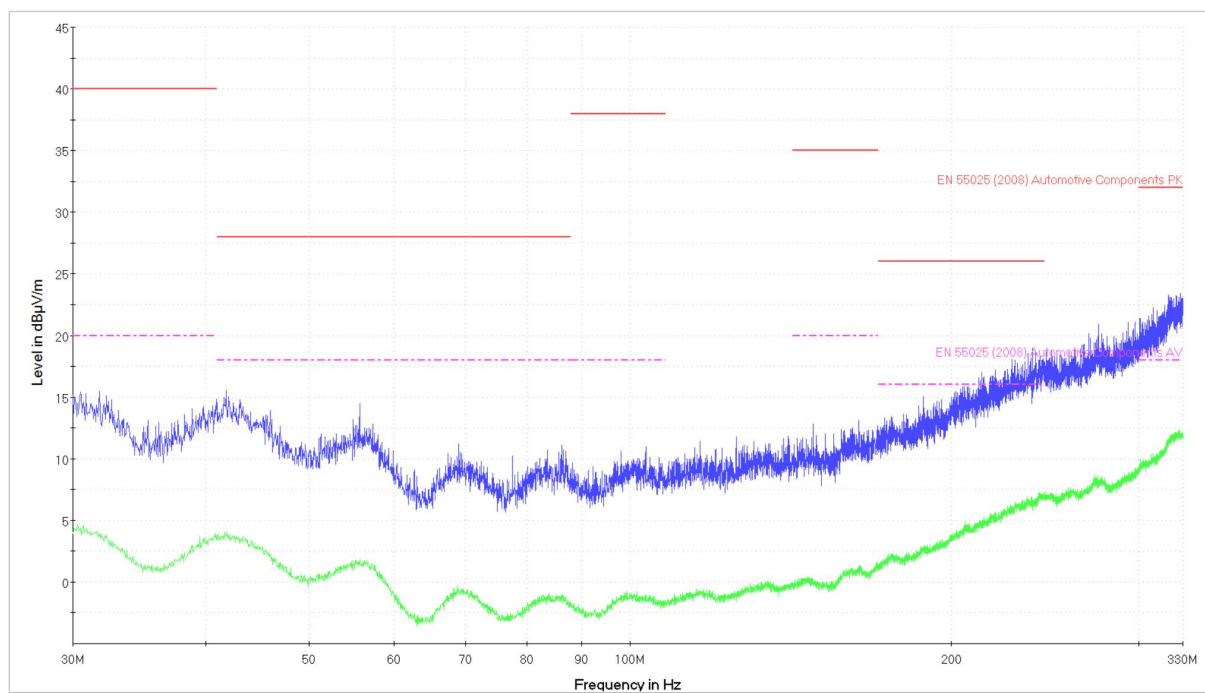


Radiated Emission Test Result (30MHz – 330MHz) horizontal orientation

Operating Condition	PWM Mode with Dither enable Vin-12V, Vout-3.3V, Iout-1A, Bias – 3.3V(Vout), Fsw-2.15MHz
Result	Passed



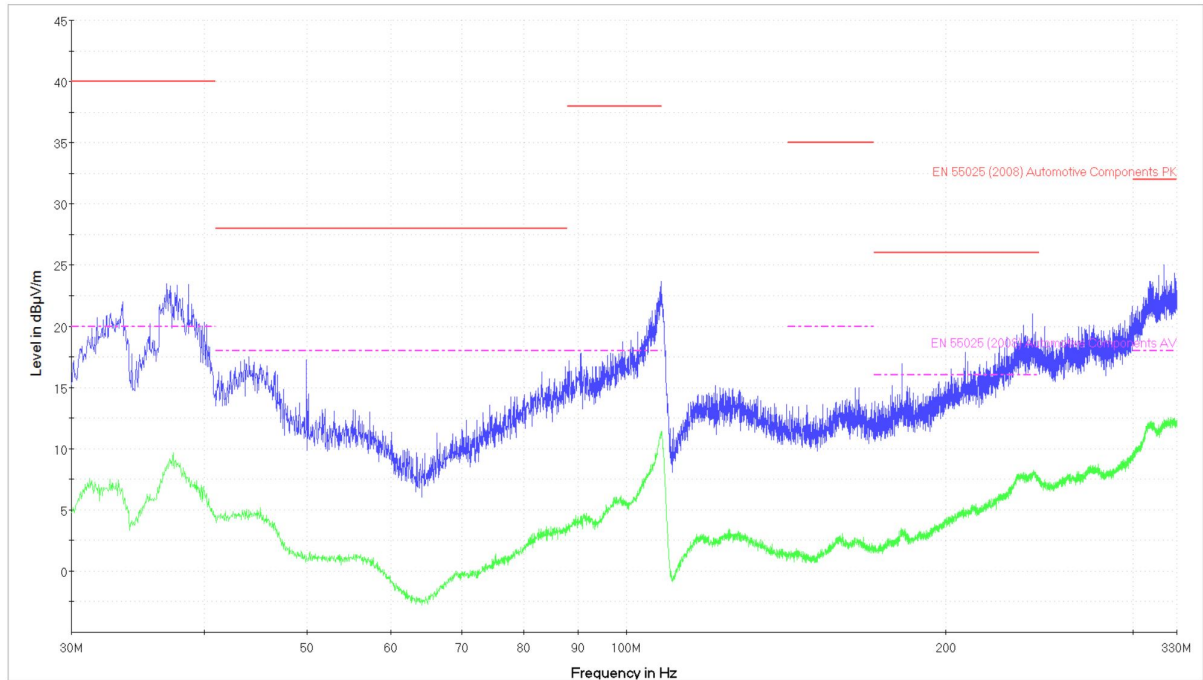
Noise Floor



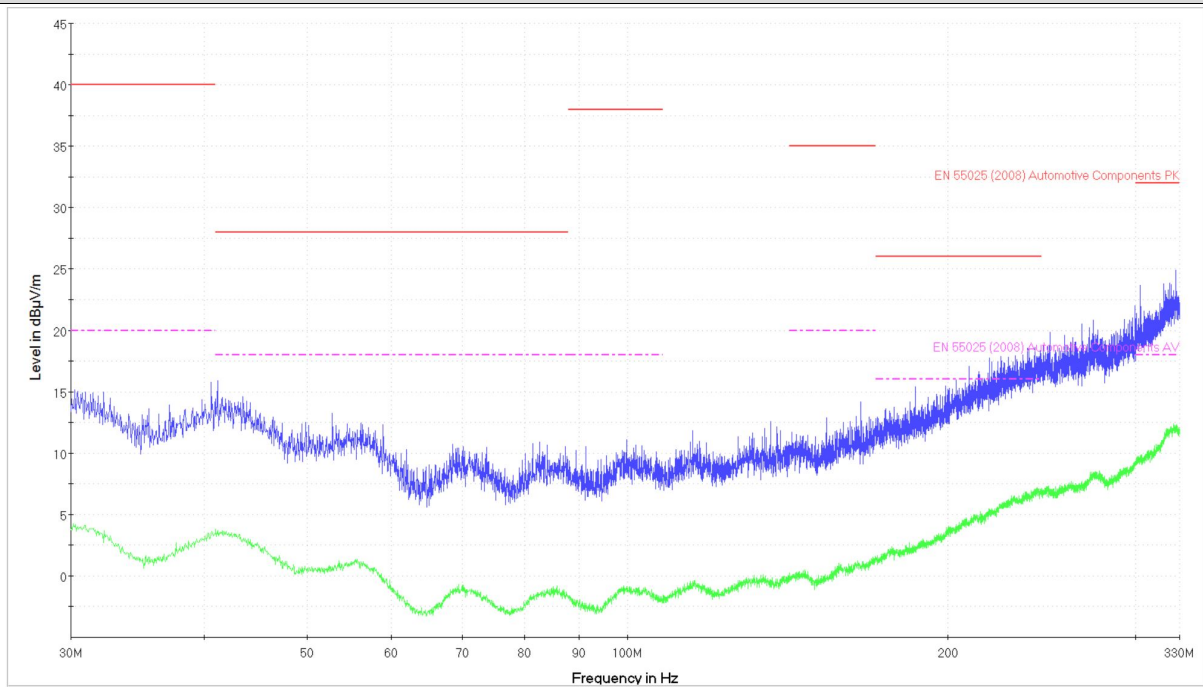
Radiated Emission Test Result (30MHz – 330MHz)

Vertical orientation

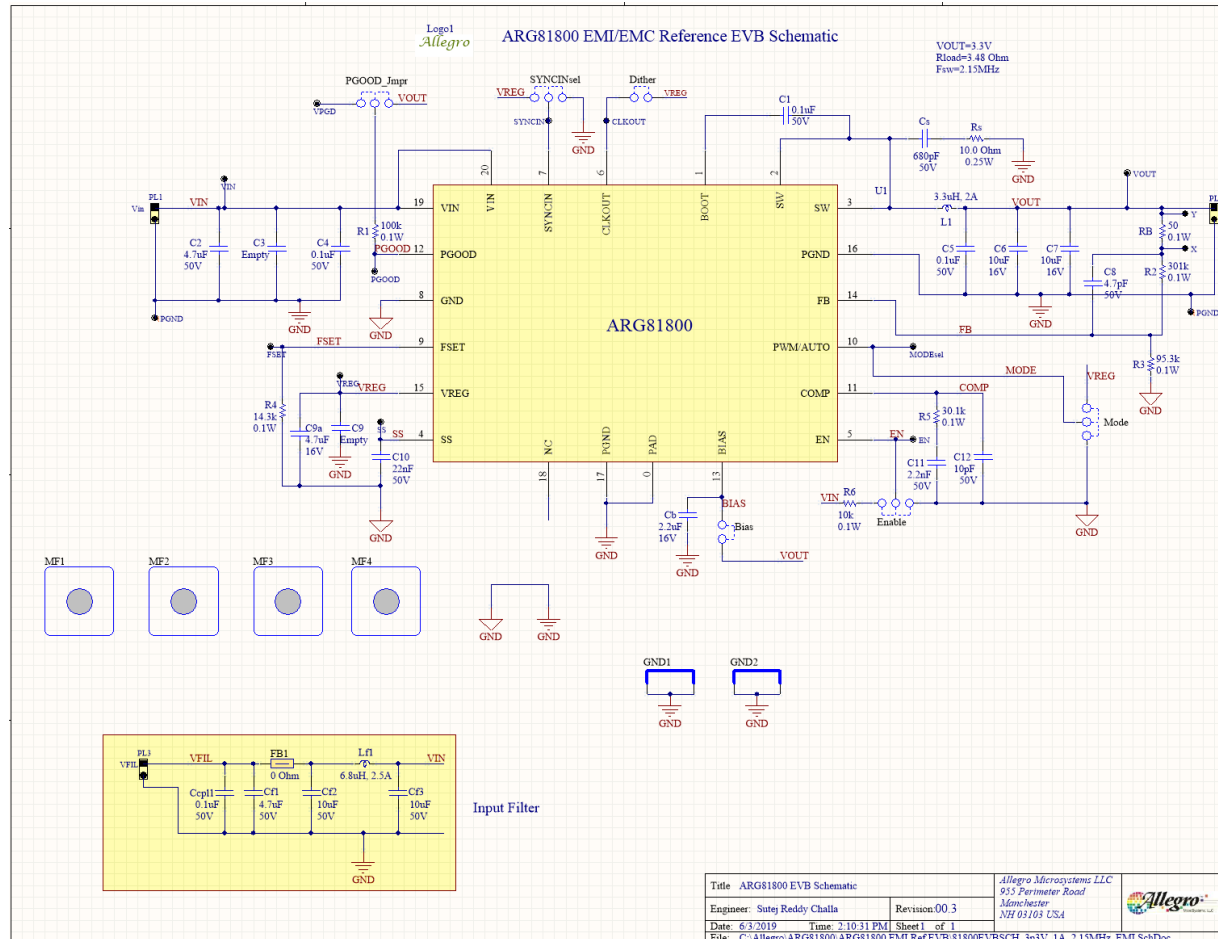
Operating Condition	PWM Mode with Dither enable Vin-12V, Vout-3.3V, Iout-1A, Bias – 3.3V(Vout), Fsw-2.15MHz
Result	Passed



Noise Floor



Schematics



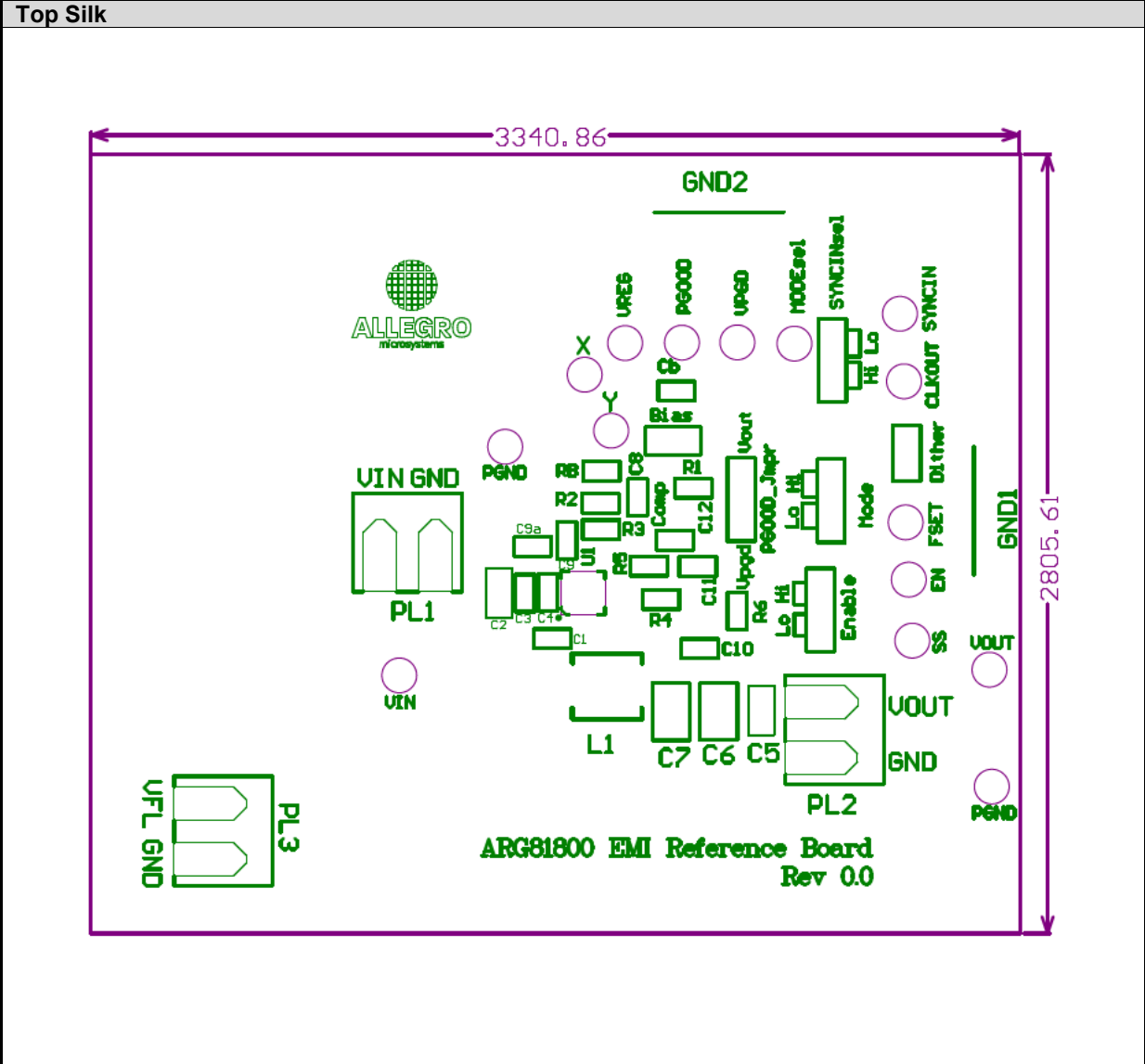
Bill of Materials

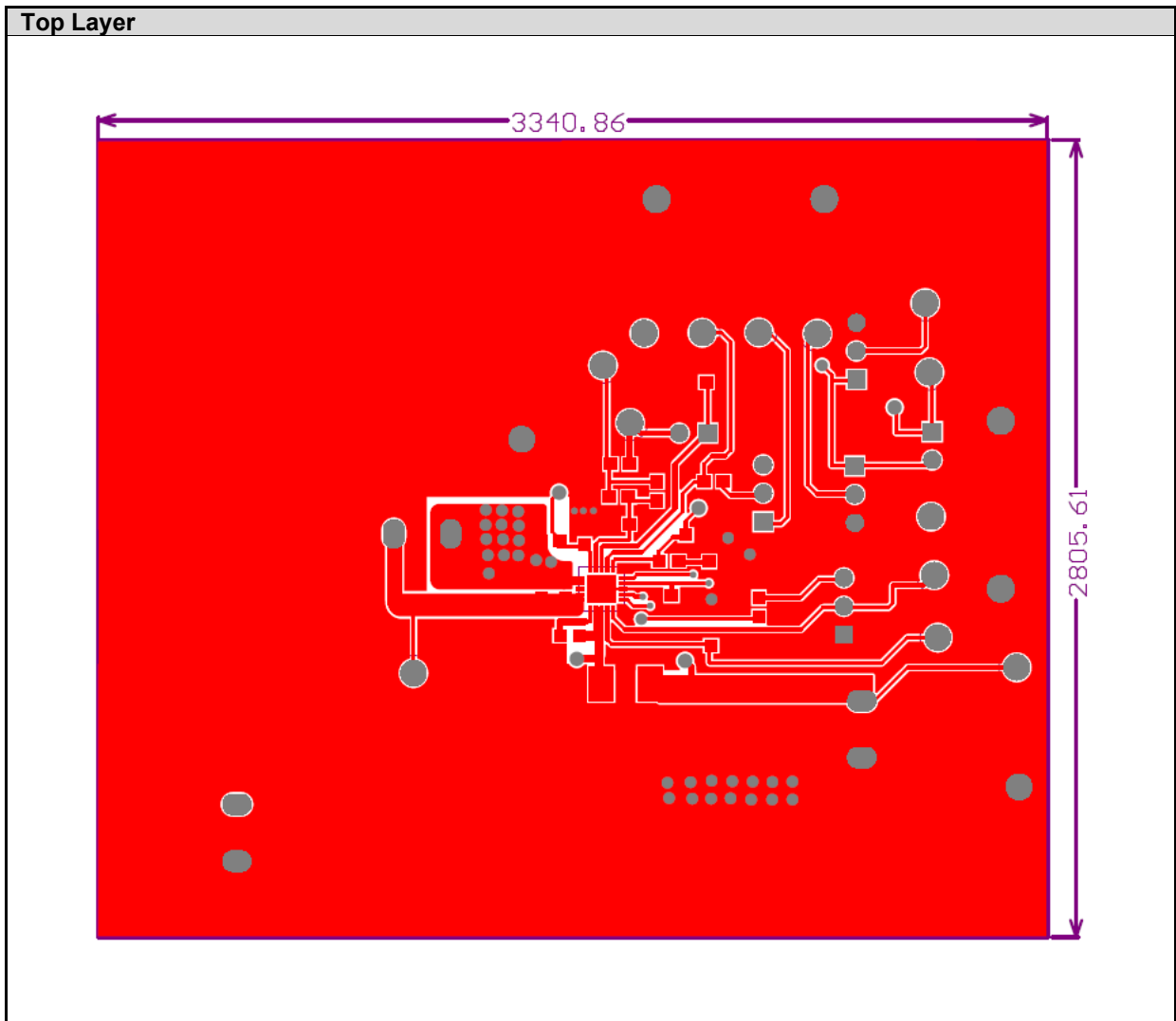
ARG81800 EMI Reference EVB BOM
 VIN = 12V, VOUT = 3.3V, Iout = 1A, Fsw = 2.15MHz

Designator	Description	Value	Footprint	Quantity	Manufacturer	Manufacturer P/N	Source	Purchase P/N
C1	Capacitor, X7R	0.1uF, 50V	0603	1	Murata	GCM188R71H104KA57D	Digikey	490-4779-2-ND
C2	Capacitor, X7R	4.7uF, 50V	1206	1	Murata	GRJ31CR71H475KE11L	Digikey	490-10944-1-ND
C3	Capacitor, X7R	DNP	0603	0				
Cs	Capacitor, X7R	680pF, 50V	0603	1	Kemet	C0603C681K5RACTU	Digikey	399-1077-1-ND
Cb	Capacitor, X7R	2.2uF, 16V	0603	1	Taiyo Yuden	EMK1078B7225KA-T	Digikey	587-5835-1-ND
C4	Capacitor, X7R	0.1uF, 50V	0603	1	Murata	GCM188R71H104KA57D	Digikey	490-4779-2-ND
C5	Capacitor, X7R	0.1uF, 50V	1206	1	Murata	GCM316R71H104KA37J	Digikey	490-14745-2-ND
C6	Capacitor, X7R	10uF, 16V	1210	1	Murata	GRM32DR71C106KA01L	Digikey	490-1875-2-ND
C7	Capacitor, X7R	10uF, 16V	1210	1	Murata	GRM32DR71C106KA01L	Digikey	490-1875-2-ND
Cf2, Cf3	Capacitor, X7R	10uF, 50V	1210	2	Murata	GRM32ER71H106KA12L	Digikey	490-6544-1-ND
C8	Capacitor, COG (NP0)	4.7pF, 50V	0603	1	Murata	GCM1885C1H4R7BA16D	Digikey	490-14430-2-ND
C9	Capacitor, X7R	DNP	0603	0				
C9a	Capacitor, X7R	4.7uF, 16V	0805	1	Murata	GCJ21BR71C475KA01L	Digikey	490-10557-1-ND
C10	Capacitor, X7R	22nF, 50V	0603	1	Murata	GRM188R71H223KA01D	Digikey	490-5851-1-ND
C11	Capacitor, X7R	2.2nF, 50V	0603	1	Murata	GCM188R71H222KA37D	Digikey	490-4931-2-ND
C12	Capacitor, COG (NP0)	10pF, 50V	0603	1	Kemet	C0603C100J5GACTU	Digikey	399-1049-1-ND
Cepl1	Capacitor, X7R	0.1uF, 50V	0805	1	Murata	GCE21BR71H104KA01L	Digikey	490-16495-1-ND
Cf1	Capacitor, X7R	4.7uF, 50V	1210	1	Murata	GCM32ER71H475KA55K	Digikey	490-8066-1-ND
Bias, Dither, Enable	Jumper Header : Male 2-pin		0.1" pitch	3	Omron	XJ8B-0211	Mouser	653-XJ8B-0211
Mode, PGOOD_Jmpr, SYNCINsel	Jumper Header : Male 3-pin		0.1" pitch	3	Molex	22-28-5030	Mouser	653-XJ8B-0211
Bias, Dither, Enable, Mode, PGOOD_Jmpr, SYNCINsel	Jumper Shunt: 2 positions		0.1" pitch	6	TE Connectivity	382811-6	Mouser	571-382811-6
BOOT, CLKOUT, EN, FSET, MODEsel, PGOOD, SS, SW, SYNCIN, VIN, VOUT, VPGD, VREG, X, Y	Test Points - Red		0.063", diameter	15	Keystone Electronics	5010	Digikey	36-5010-ND
PGND	Test Points - Black		0.063", diameter	2	Keystone Electronics	5011	Digikey	36-5011-ND
FB1	Ferrite Bead : Chip Impeder	0Ω	0805	1	Vishay Dale	CRCW08050000020EA	Digikey	541-0.0ACT-ND
GND1, GND2	Ground Bar : Tinned Copper Wire		GROUND BAR_15MMP_20 SWG	2				
L1	Inductor	3.3uH, 2A	6mmx6mm	1	Würth Electronics	74437334033	Digikey	732-6153-2-ND
Lf1	Inductor	6.8uH, 2.5A	8.2mmx8.2mm	1	Bourns Inc	SRU8028-6R8Y	Digikey	SRU8028-6R8YCT-ND
MF1, MF2, MF3, MF4	Mount Foot : Adhesive Rubber		Clear	4	3M	SJ-5303 (CLEAR)	Digikey	SJ5303-7-ND
PL1, PL2, PL3	Terminal Block		5.08mm pitch, Vertical, 2 position	3	Phoenix Contact	1715721	Digikey	277-1263-ND
R1	Resistor, 1%, 1/10W	10kΩ	0603	1	Panasonic	ERJ-3EKF1002V	Digikey	P10.0KHCT-ND
R2	Resistor, 1%, 1/10W	301kΩ	0603	1	Panasonic	ERJ-3EKF3013V	Digikey	P30.1KHCT-ND
R3	Resistor, 1%, 1/10W	95.3kΩ	0603	1	Panasonic	ERJ-3EKF9532V	Digikey	P95.3KHCT-ND
R4	Resistor, 1%, 1/10W	14.3kΩ	0603	1	Panasonic	ERJ-3EKF1432V	Digikey	P14.3KHCT-ND
R5	Resistor, 1%, 1/10W	30.1kΩ	0603	1	Panasonic	ERJ-3EKF3012V	Digikey	P30.1KHCT-ND
R6	Resistor, 1%, 1/10W	10kΩ	0603	1	Panasonic	ERJ-3EKF1002V	Digikey	P10.0KHCT-ND
R7	Resistor, 1%, 1/10W	0Ω	0603	1	Panasonic	ERJ-3GEY0R00V	Digikey	P0.0GCT-ND
RB	Resistor, 1%, 1/10W	49.9Ω	0603	1	Panasonic	ERJ-3EKF49R9V	Digikey	P49.9HCT-ND
Rs	Resistor, 1%, 0.25W	10Ω	1206	1	Panasonic	ERJ-6ENF10R0V	Digikey	P10.0FCT-ND
U1	Allegro IC	ARG81800	QFN20_4x4	1	Allegro	ARG81800KESJSR		
	Label: 3.3Vout, 1A, 2.15MHz							

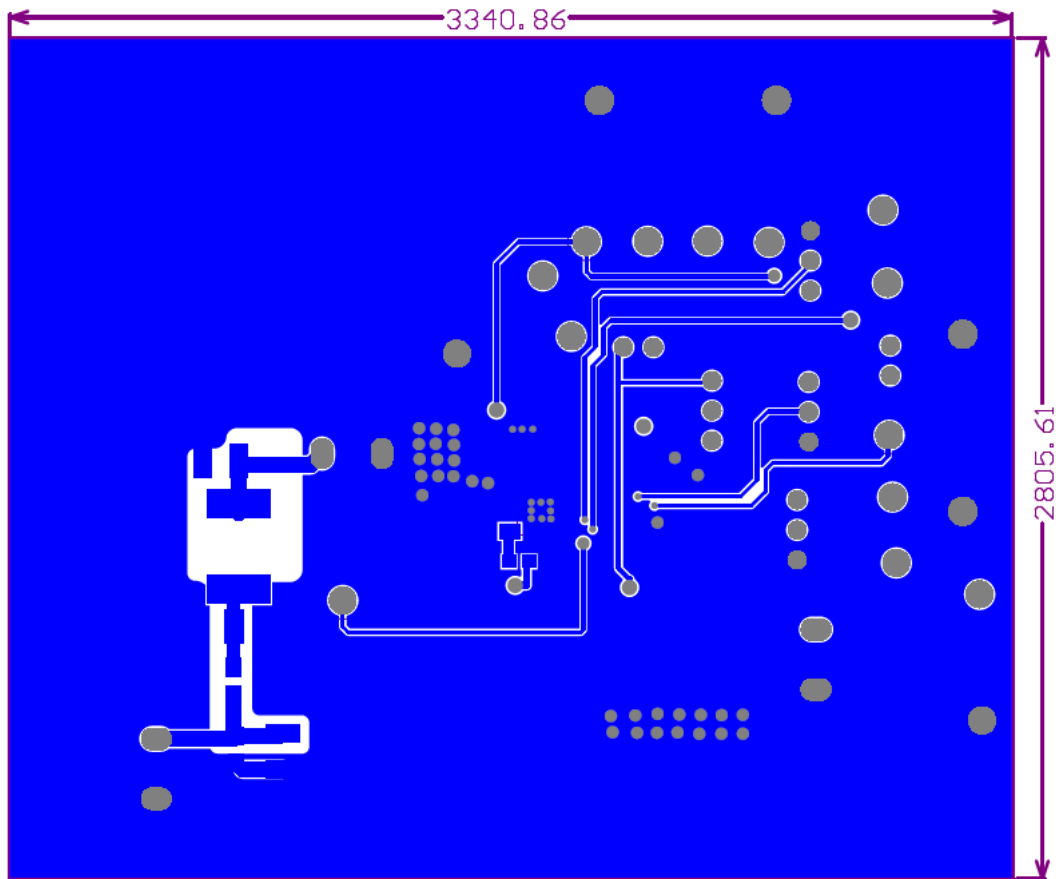
DNP - Do Not Populate

PCB Layout

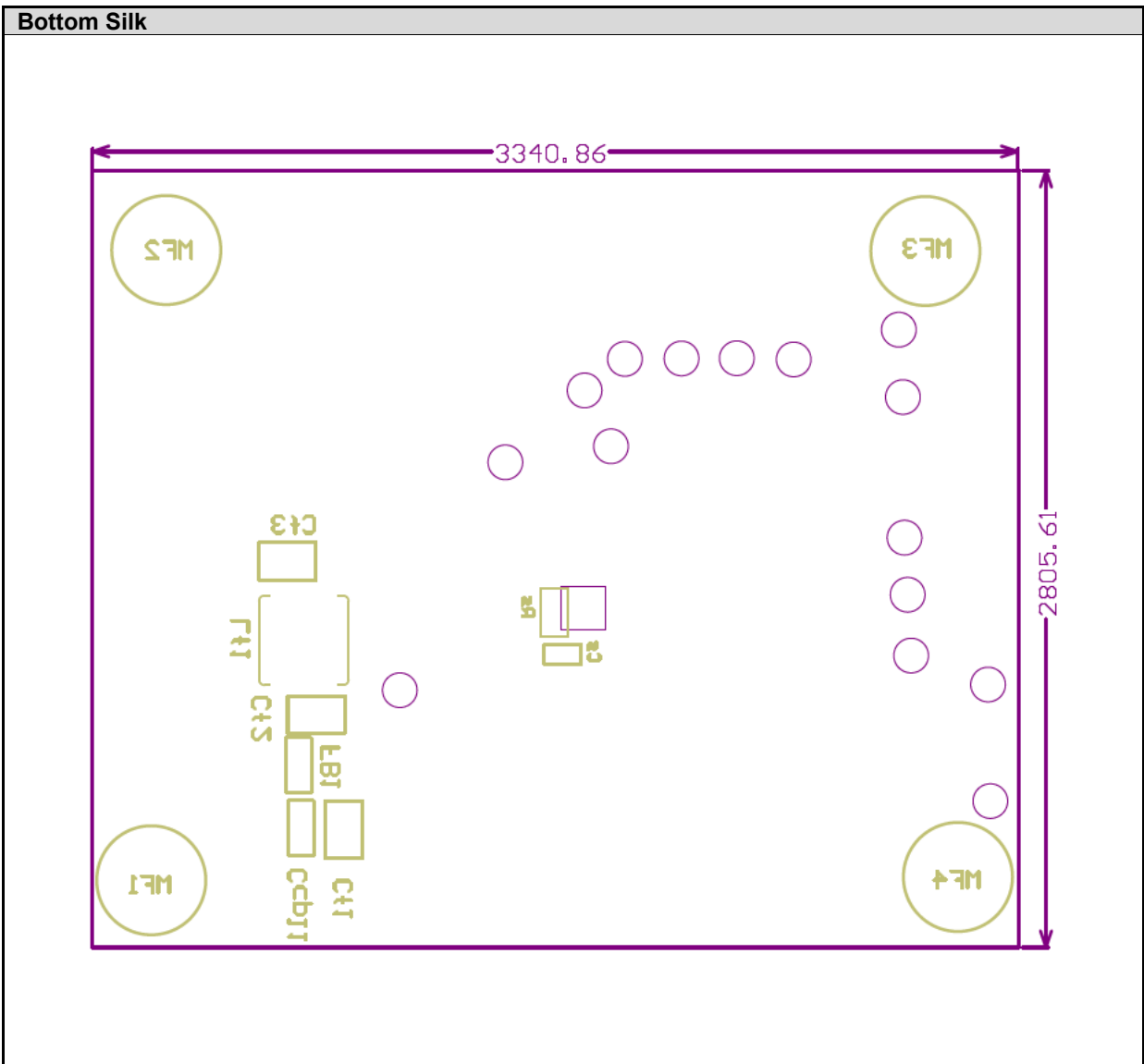




Bottom Layer

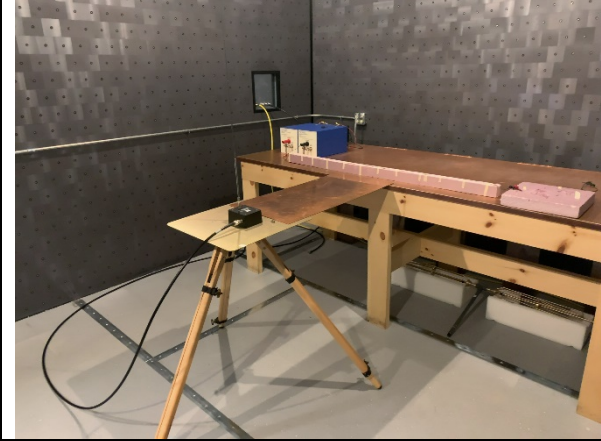


Bottom Silk

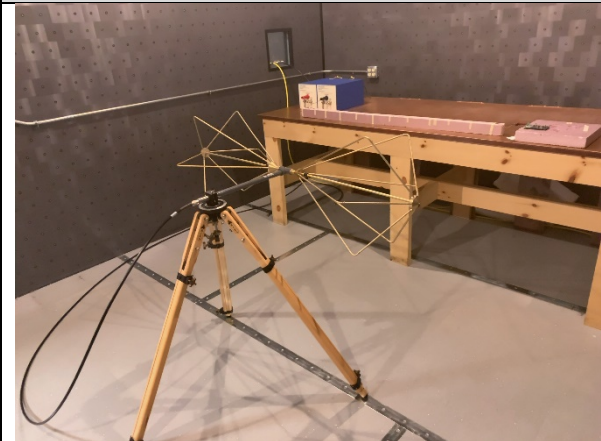


The conditions of experiment

Rod antenna



Biconical antenna



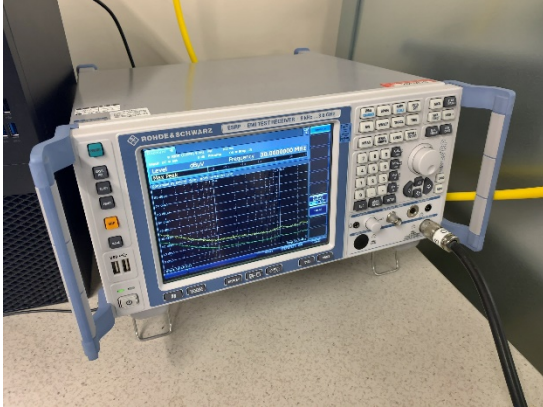
[horizontal orientation](#)



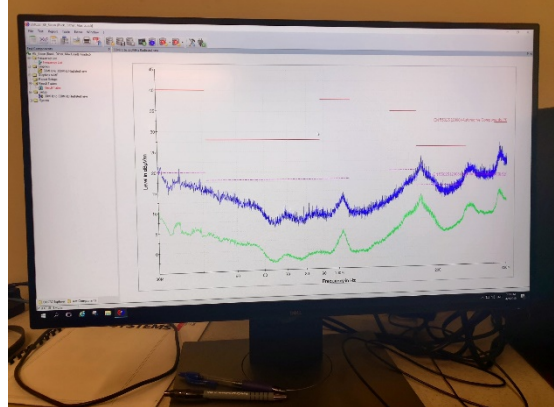
[Vertical orientation](#)

EMC Test Equipment

EMI Test Receiver

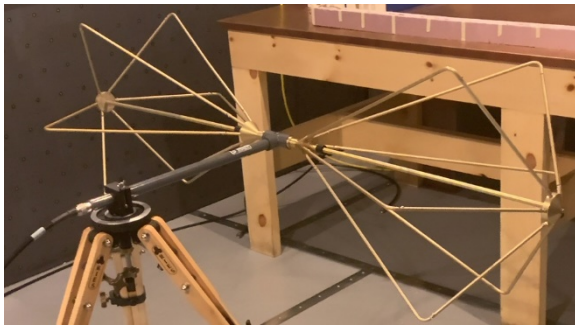


ROHD&SCHWARZ
ESRP3 EMI Test Receiver, 9 kHz to 3.6 GHz



ROHD&SCHWARZ
EMC32 Measurement Software

Antenna



Biconical antenna
A.H systems, inc.
MODEL:SAS-542



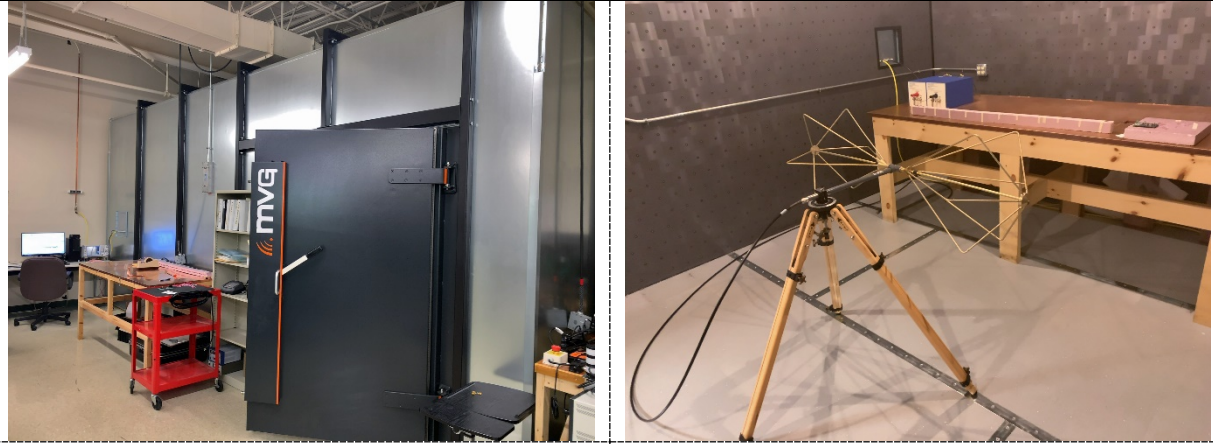
Rod antenna + Preamplifier
A.H systems, inc.
MODEL:SAS-550-1B

Preamplifier



For biconical antenna
A.H systems, inc.
MODEL:PAM-0202

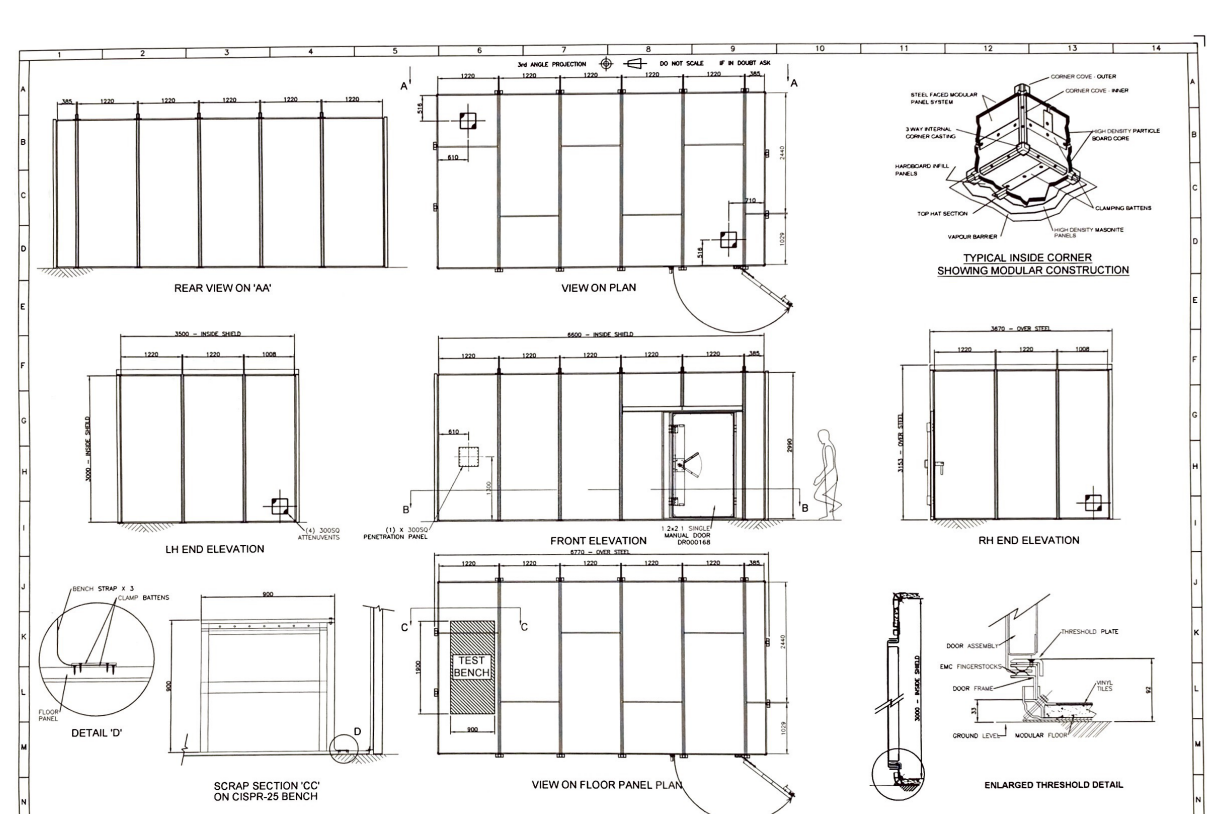
EMC Chamber



Outside view

inside view

Detail of EMC Chamber



Allegro is not an accredited EMC laboratory location. The results obtained and communicated in this report are to be used for reference purposes only.

ARG81800-1 EMC Test Report

Allegro is not an accredited EMC laboratory location. The results obtained and communicated in this report are to be used for reference purposes only.


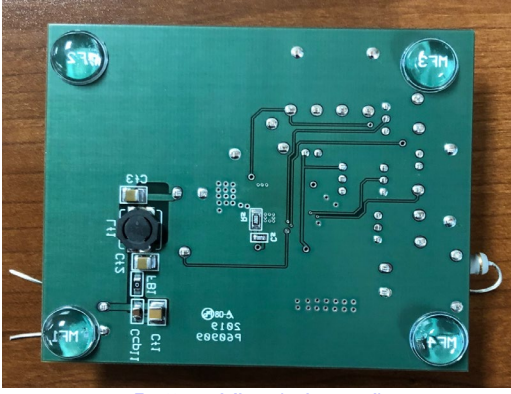
Test Result Summary

Standard	Item	Test Result
EN55025/CISPR25:2008 Class 5	Conducted (0.15-108MHz)	Passed
	Radiated (0.15-30MHz)	Passed
	*Radiated I (30-330MHz)	Passed
	**Radiated II (30-330MHz)	Passed

* The data was taken with biconical antenna oriented **horizontally**.

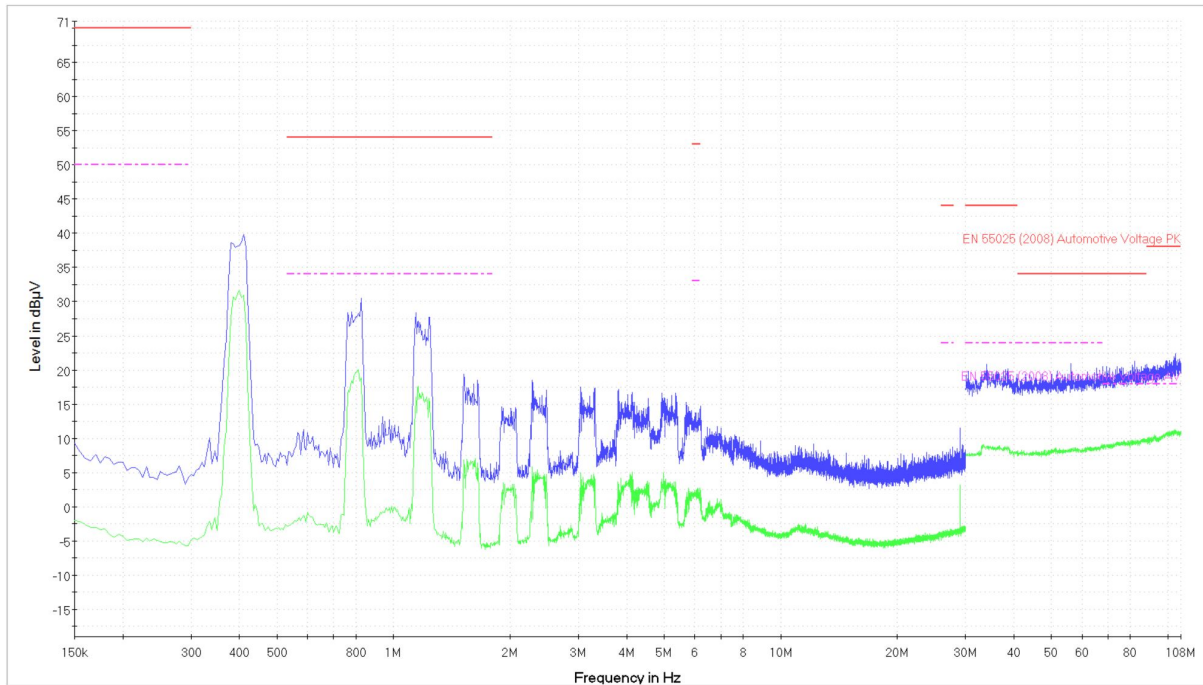
The data was taken with biconical antenna oriented **vertically.

EUT Description

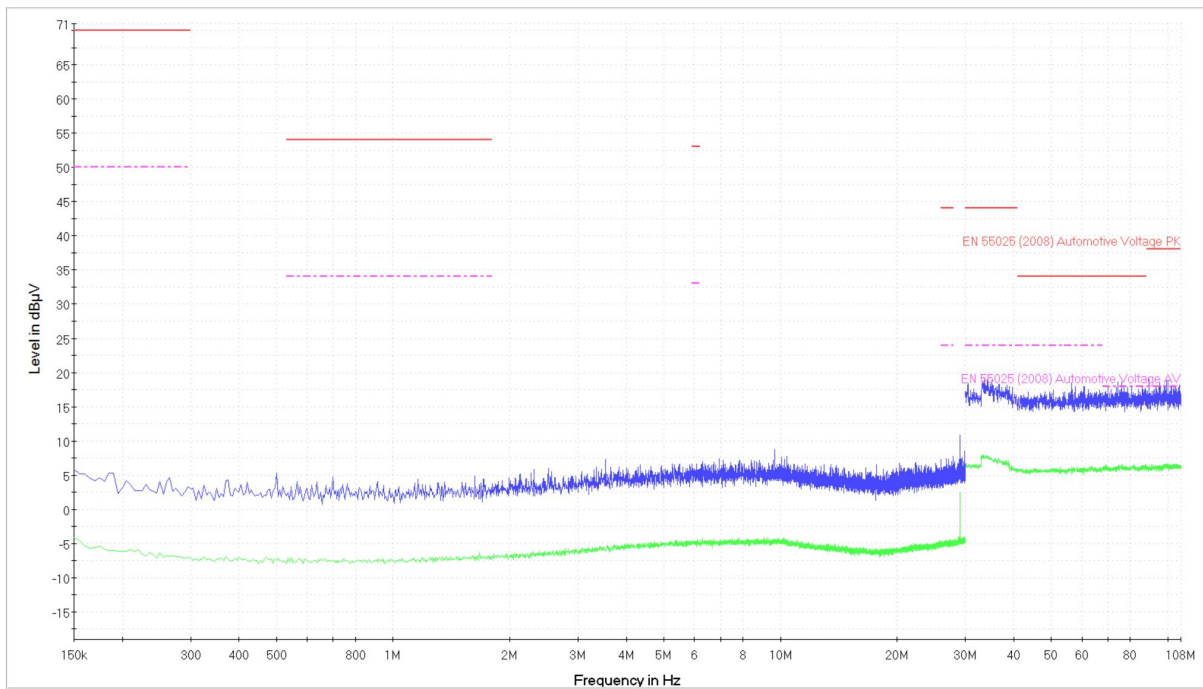
Description
ARG81800 EMI Reference Board Rev 0.0 Max Load(10ohm)
Operating Condition
PWM Mode with Dither enable Vin-12V, Vout-5.0V, Iout-0.5A, Bias-5.0V(Vout), Fsw-400kHz
Mechanical View
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p><u>Top View</u></p> </div> <div style="text-align: center;">  <p><u>Bottom View(mirrored)</u></p> </div> </div>

Conducted Emission Test Result (150kHz – 108MHz)

Operating Condition	PWM Mode with Dither enable Vin-12V, Vout-5.0V, Iout-0.5A, Bias-5.0V(Vout), Fsw-400kHz
Result	Passed

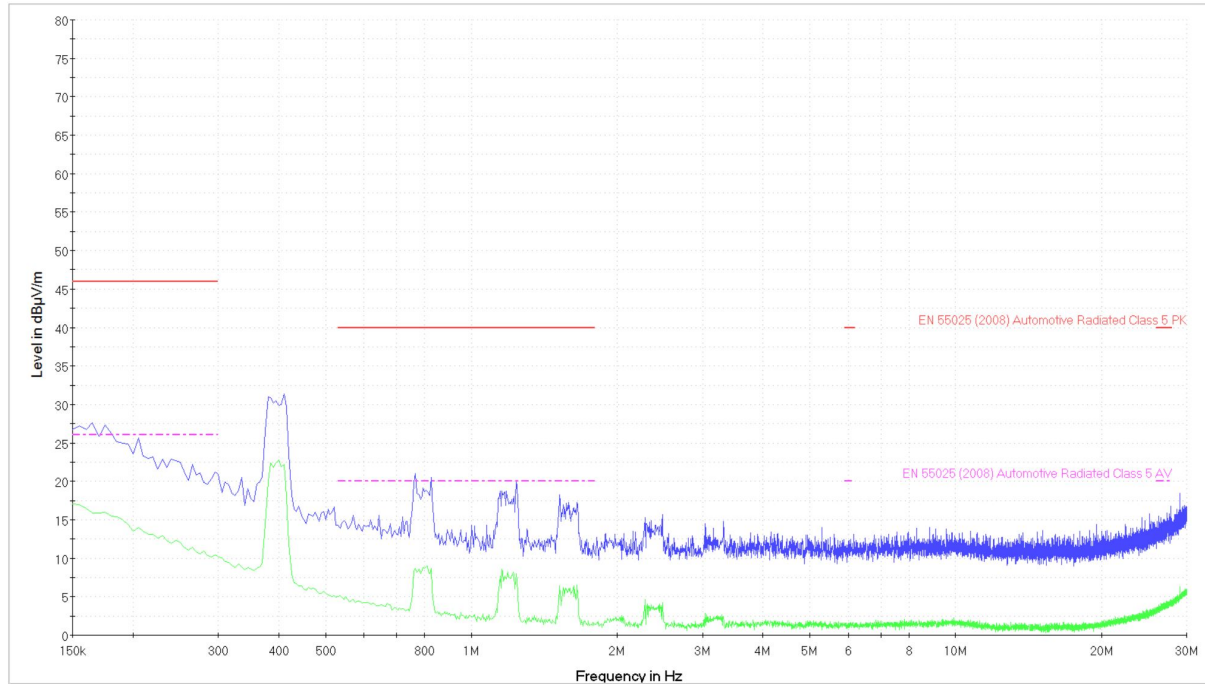


Noise Floor

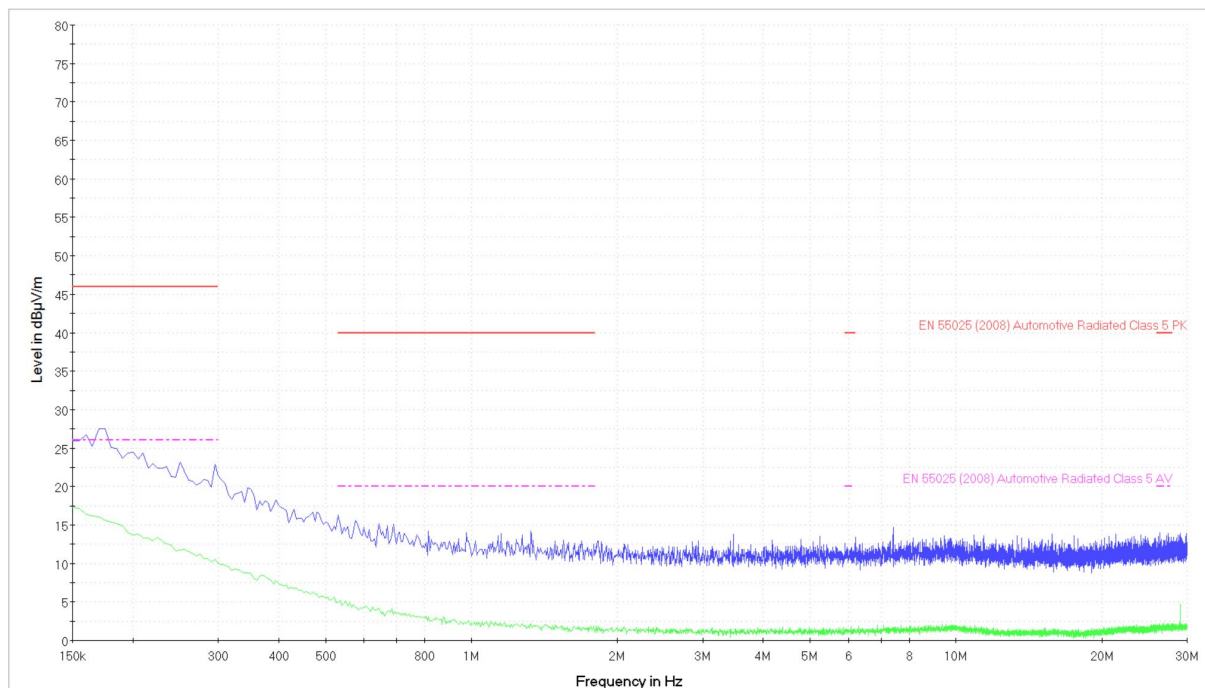


Radiated Emission Test Result (150kHz – 30MHz)

Operating Condition	PWM Mode with Dither enable Vin-12V, Vout-5.0V, Iout-0.5A, Bias-5.0V(Vout), Fsw-400kHz
Result	Passed

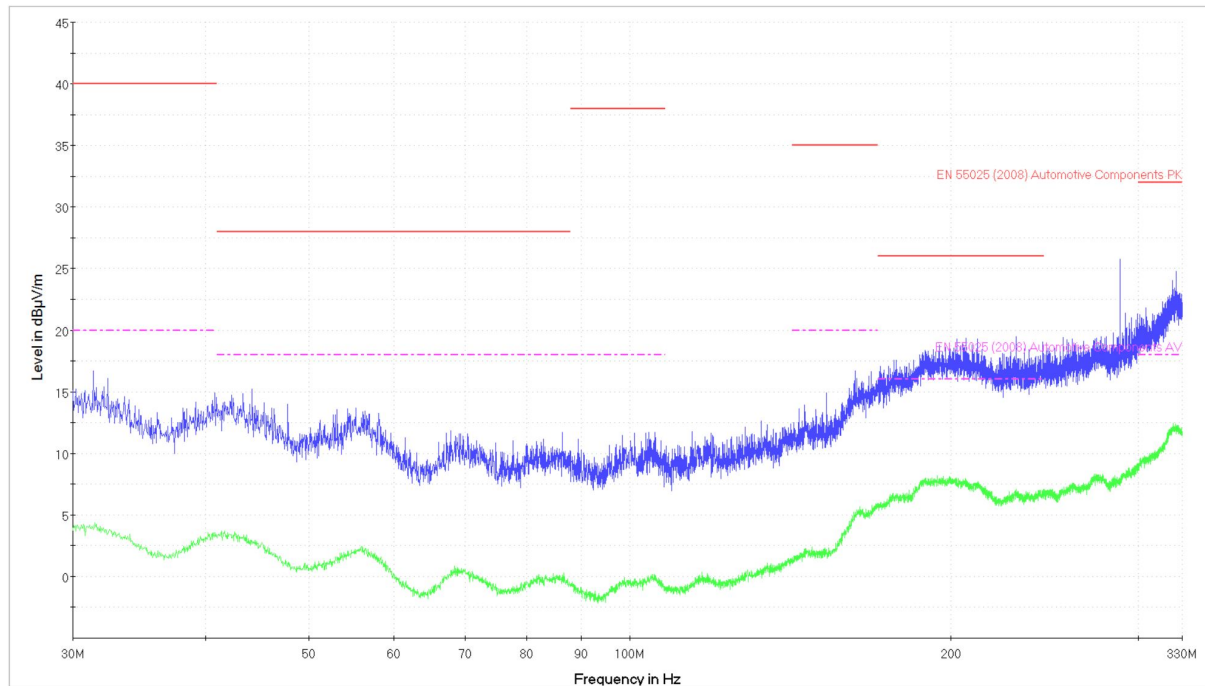


Noise Floor

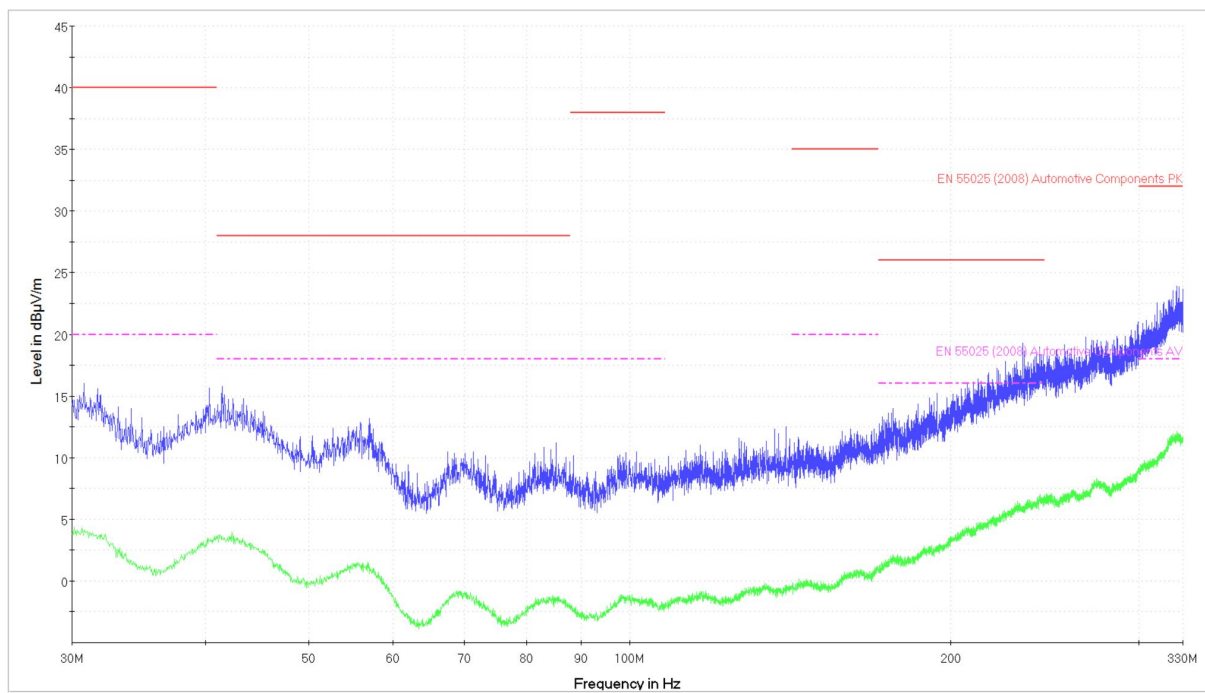


Radiated Emission Test Result (30MHz – 330MHz) horizontal orientation

Operating Condition	PWM Mode with Dither enable Vin-12V, Vout-5.0V, Iout-0.5A, Bias-5.0V(Vout), Fsw-400kHz
Result	Passed



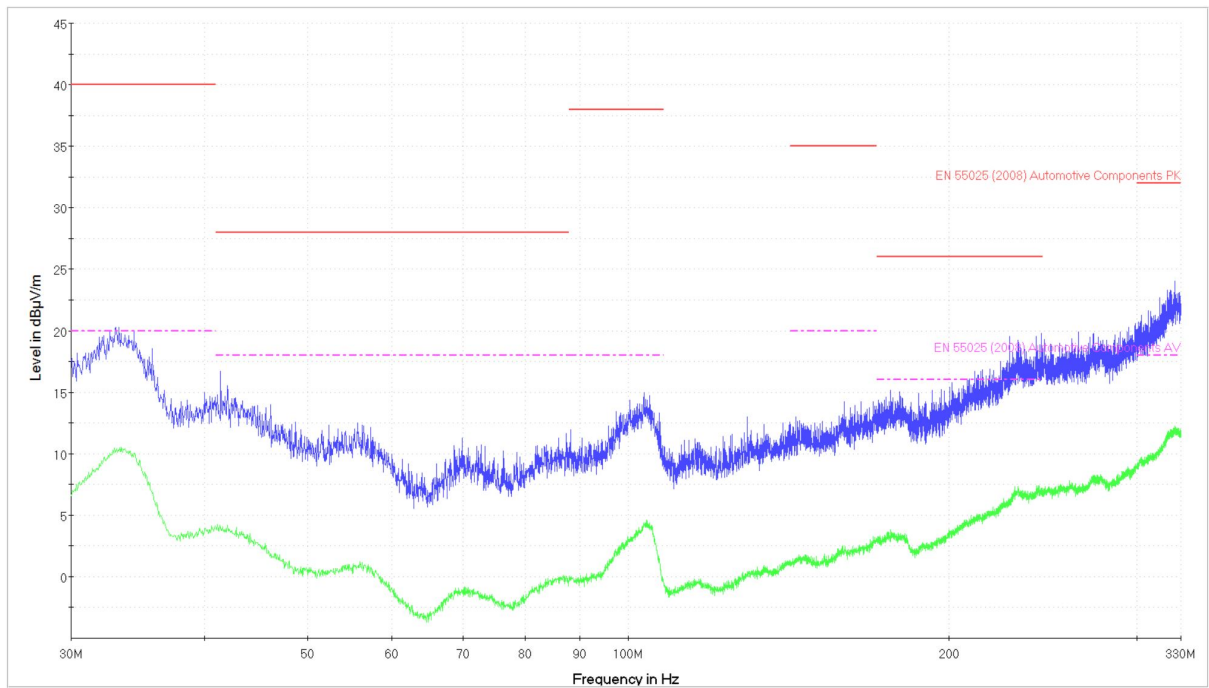
Noise Floor



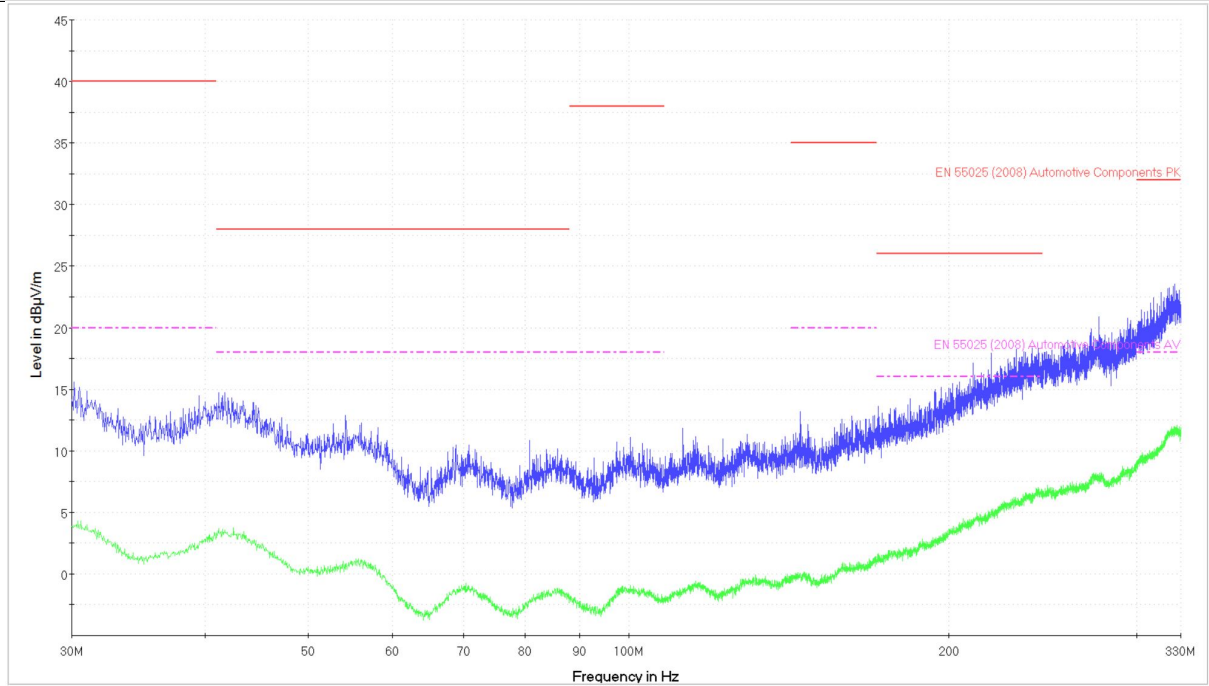
Radiated Emission Test Result (30MHz – 330MHz)

Vertical orientation

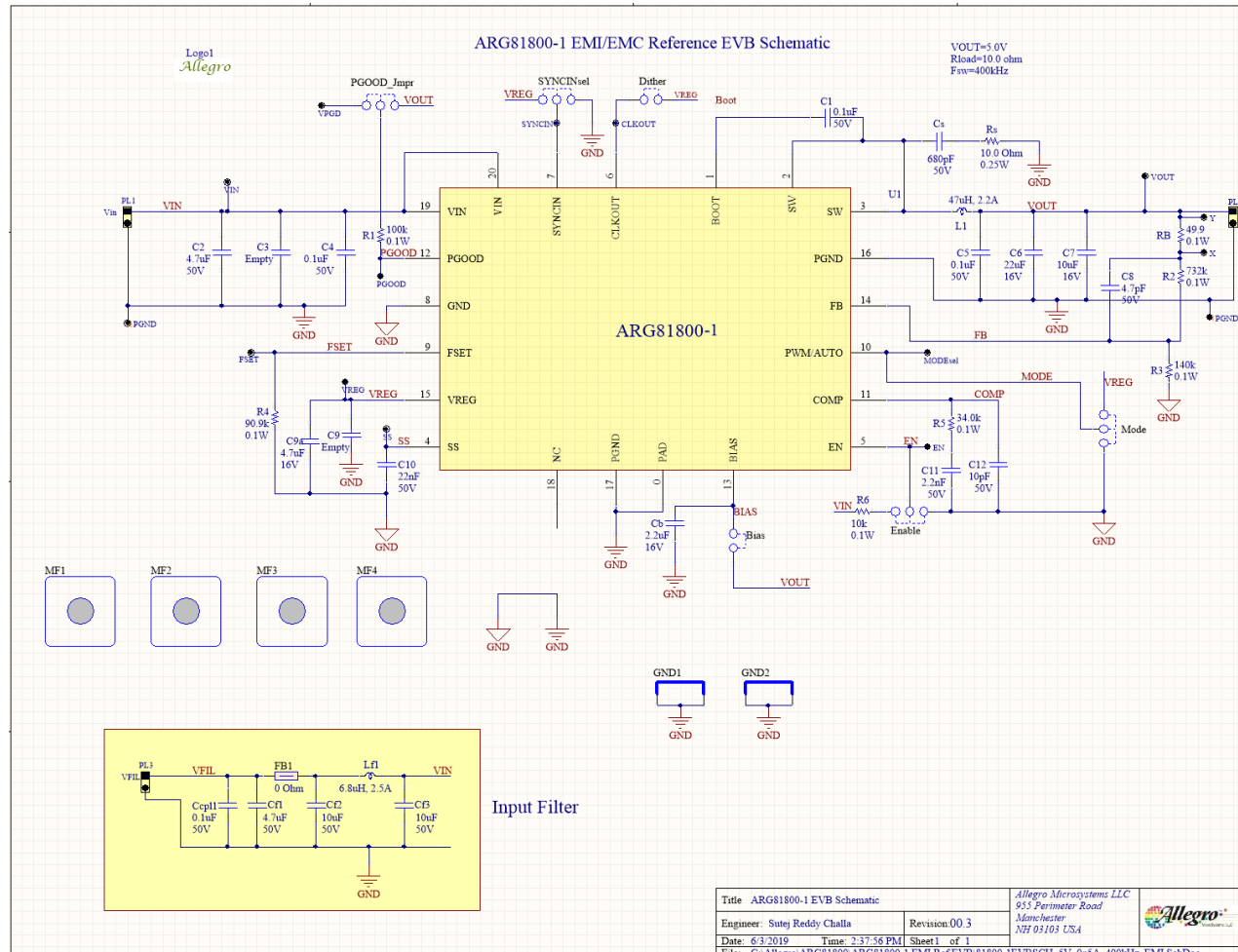
Operating Condition	PWM Mode with Dither enable Vin-12V, Vout-5.0V, Iout-0.5A, Bias-5.0V(Vout), Fsw-400kHz
Result	Passed



Noise Floor



Schematics



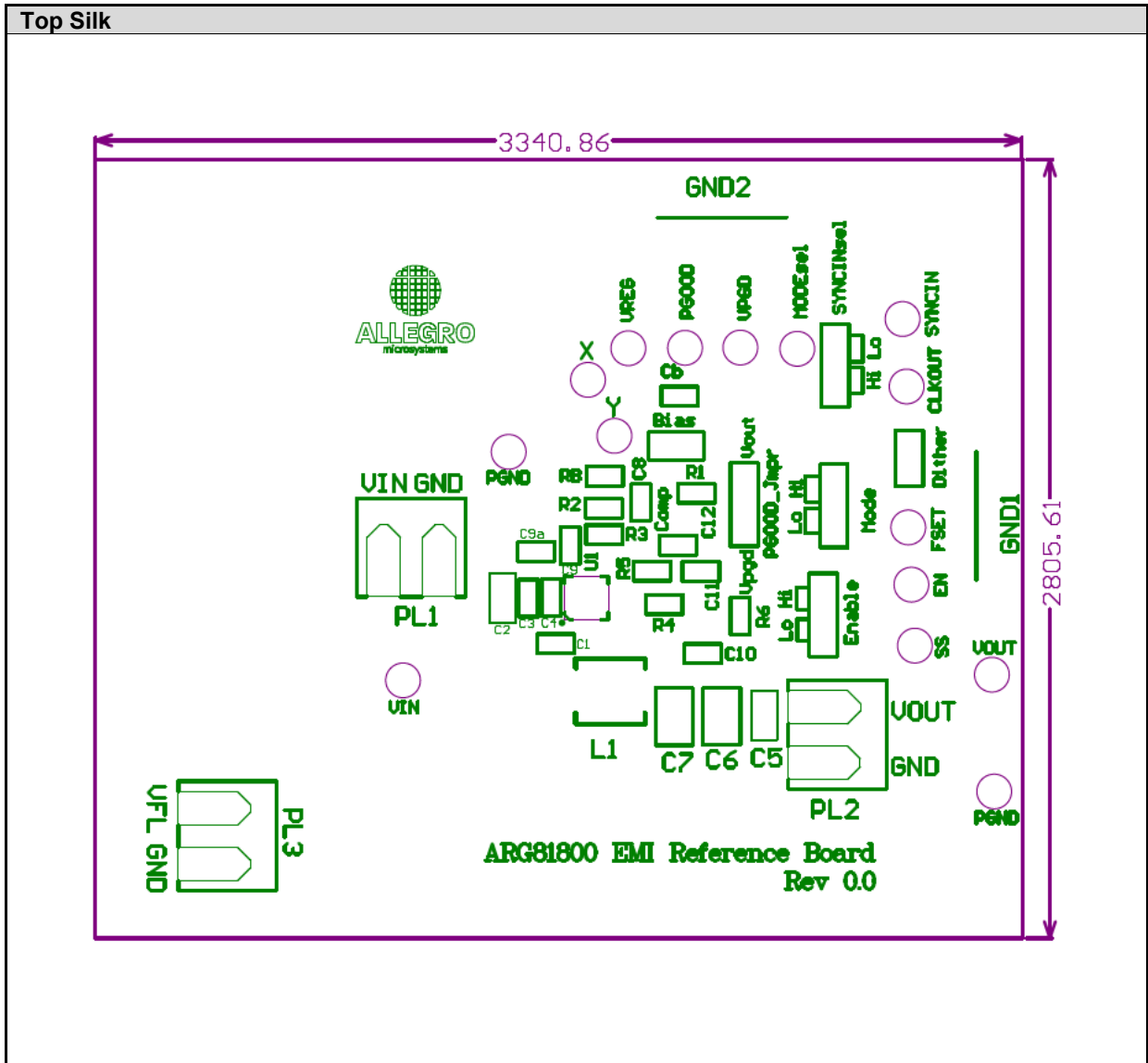
Bill of Materials

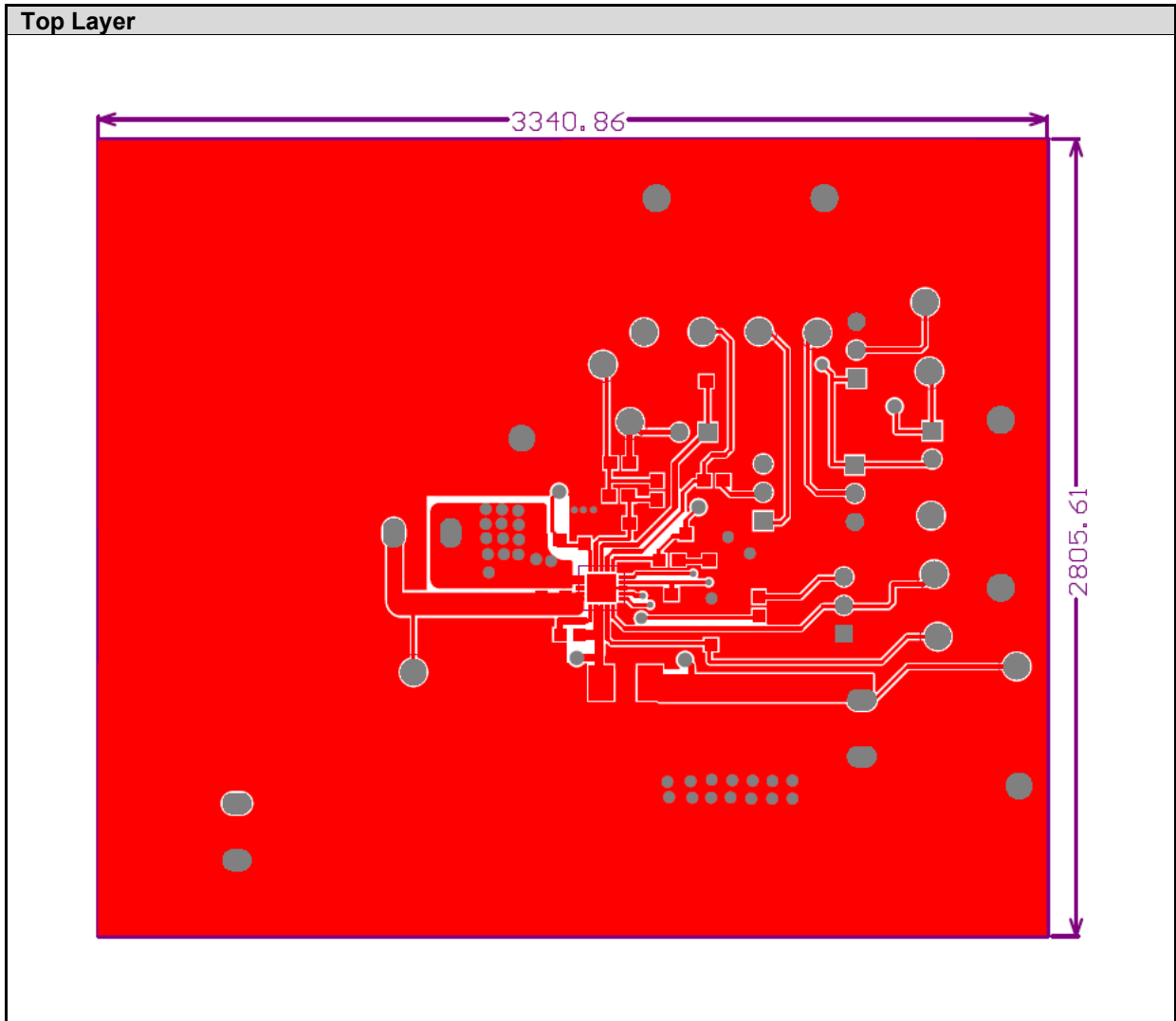
ARG81800-1 EMI Reference EVB BOM
VIN = 12V, VOUT = 5.0V, Iout = 0.5A, Fsw = 400kHz

Designator	Description	Value	Footprint	Quantity	Manufacturer	Manufacturer P/N	Source	Purchase P/N
C1	Capacitor, X7R	0.1uF, 50V	0603	1	Murata	GCM188R71H104KA57D	Digikey	490-4779-2-ND
C2	Capacitor, X7R	4.7uF, 50V	1206	1	Murata	GRJ31CR71H475KE11L	Digikey	490-10944-1-ND
C3	Capacitor, X7R	DNP	0603	0				
Cs	Capacitor, X7R	680pF, 50V	0603	1	Kemet	C0603C681K5RACTU	Digikey	399-1077-1-ND
Cb	Capacitor, X7R	2.2uF, 16V	0603	1	Taiyo Yuden	EMK107BB7225KA-T	Digikey	587-5835-1-ND
C4	Capacitor, X7R	0.47uF, 50V	0603	1	Taiyo Yuden	UMK107B7474KA-TR	Digikey	587-3170-1-ND
C5	Capacitor, X7R	0.1uF, 50V	1206	1	Murata	GCM319R71H104KA37J	Digikey	490-14745-2-ND
C6	Capacitor, X7R	22uF, 16V	1210	1	Murata	GRM32ER71C226MEA8L	Digikey	490-14539-1-ND
C7	Capacitor, X7R	10uF, 16V	1210	1	Murata	GRM32DR71C106KA01L	Digikey	490-1875-2-ND
C2, Cf3	Capacitor, X7R	10uF, 50V	1210	2	Murata	GRM32ER71H106KA12L	Digikey	490-6544-1-ND
C8	Capacitor, C0G (NP0)	4.7pF, 50V	0603	1	Murata	GCM1885C1H4R7BA16D	Digikey	490-14430-2-ND
C9	Capacitor, X7R	DNP	0603	0				
C9a	Capacitor, X7R	4.7uF, 16V	0805	1	Murata	GCJ21BR71C475KA01L	Digikey	490-10557-1-ND
C10	Capacitor, X7R	22nF, 50V	0603	1	Murata	GRM188R71H223KA01D	Digikey	490-5851-1-ND
C11	Capacitor, X7R	2.2nF, 50V	0603	1	Murata	GCM188R71H222KA37D	Digikey	490-4931-2-ND
C12	Capacitor, C0G (NP0)	10pF, 50V	0603	1	Kemet	C0603C100J5GACTU	Digikey	399-1049-1-ND
Copl1	Capacitor, X7R	0.1uF, 50V	0805	1	Murata	GCE21BR71H104KA01L	Digikey	490-16485-1-ND
Cf1	Capacitor, X7R	4.7uF, 50V	1210	1	Murata	GCM32ER71H475KA56K	Digikey	490-8066-1-ND
Bias, Dither, Enable	Jumper Header : Male 2-pin		0.1" pitch	3	Omron	XJ8B-0211	Mouser	653-XJ8B-0211
Mode, PGOOD_Jmpr, SYNCINsel	Jumper Header : Male 3-pin		0.1" pitch	3	Molex	22-28-5030	Mouser	653-XJ8B-0211
Bias, Dither, Enable, Mode, PGOOD_Jmpr, SYNCINsel	Jumper Shunt: 2 positions		0.1" pitch	6	TE Connectivity	382811-6	Mouser	571-382811-6
BOOT, CLKOUT, EN, FSET, MODEsel, PGOOD, SS, SW, SYNCIN, VIN, VOUT, VPGD, VREG, X, Y	Test Points - Red		0.063", diameter	15	Keystone Electronics	5010	Digikey	36-5010-ND
PGND	Test Points - Black		0.063", diameter	2	Keystone Electronics	5011	Digikey	36-5011-ND
FB1	Ferrite Bead : Chip Impeder	0Ω	0805	1	Vishay Dale	CRCW0805000020EA	Digikey	541-0.0ACT-ND
GND1, GND2	Ground Bar : Tinned Copper Wire		GROUND BAR_15MMP_20 SWG	2				
L1	Inductor	47uH, 1.45A	7.3mmx6.6mm	1	Würth Electronics	74437349470	Digikey	732-11453-1-ND
Lf1	Inductor	6.8uH, 2.5A	8.2mmx8.2mm	1	Bourns Inc	SRU8028-6R8Y	Digikey	SRU8028-6R8YCT-ND
MF1, MF2, MF3, MF4	Mount Foot : Adhesive Rubber		Clear	4	3M	SJ-5303 (CLEAR)	Digikey	SJ5303-7-ND
PL1, PL2, PL3	Terminal Block		5.08mm pitch, Vertical, 2 position	3	Phoenix Contact	1715721	Digikey	277-1263-ND
R1	Resistor, 1%, 1/10W	10kΩ	0603	1	Panasonic	ERJ-3EKF1002V	Digikey	P10.0KHCT-ND
R2	Resistor, 1%, 1/10W	732k	0603	1	Panasonic	ERJ-3EKF7323V	Digikey	P732KHCT-ND
R3	Resistor, 1%, 1/10W	140k	0603	1	Panasonic	ERJ-3EKF1403V	Digikey	P140KHCT-ND
R4	Resistor, 1%, 1/10W	90.9k	0603	1	Panasonic	ERJ-3EKF7152V	Digikey	P71.5KHCT-ND
R5	Resistor, 1%, 1/10W	34.0k	0603	1	Panasonic	ERJ-3EKF3402V	Digikey	P34.0KHCT-ND
R6	Resistor, 1%, 1/10W	10kΩ	0603	1	Panasonic	ERJ-3EKF1002V	Digikey	P10.0KHCT-ND
R7	Resistor, 1%, 1/10W	0Ω	0603	1	Panasonic	ERJ-3GEY0R00V	Digikey	P0.0GCT-ND
R8	Resistor, 1%, 1/10W	49.9Ω	0603	1	Panasonic	ERJ-3EKF49R9V	Digikey	P49.9HCT-ND
Rs	Resistor, 1%, 0.25W	10Ω	1206	1	Panasonic	ERJ-8ENF10R0V	Digikey	P10.0FCT-ND
U1	Allegro IC	ARG81800-1	QFN20_4x4	1	Allegro	ARG81800KESJSR-1		
	Label: 5.0Vout, 0.5A, 400kHz							

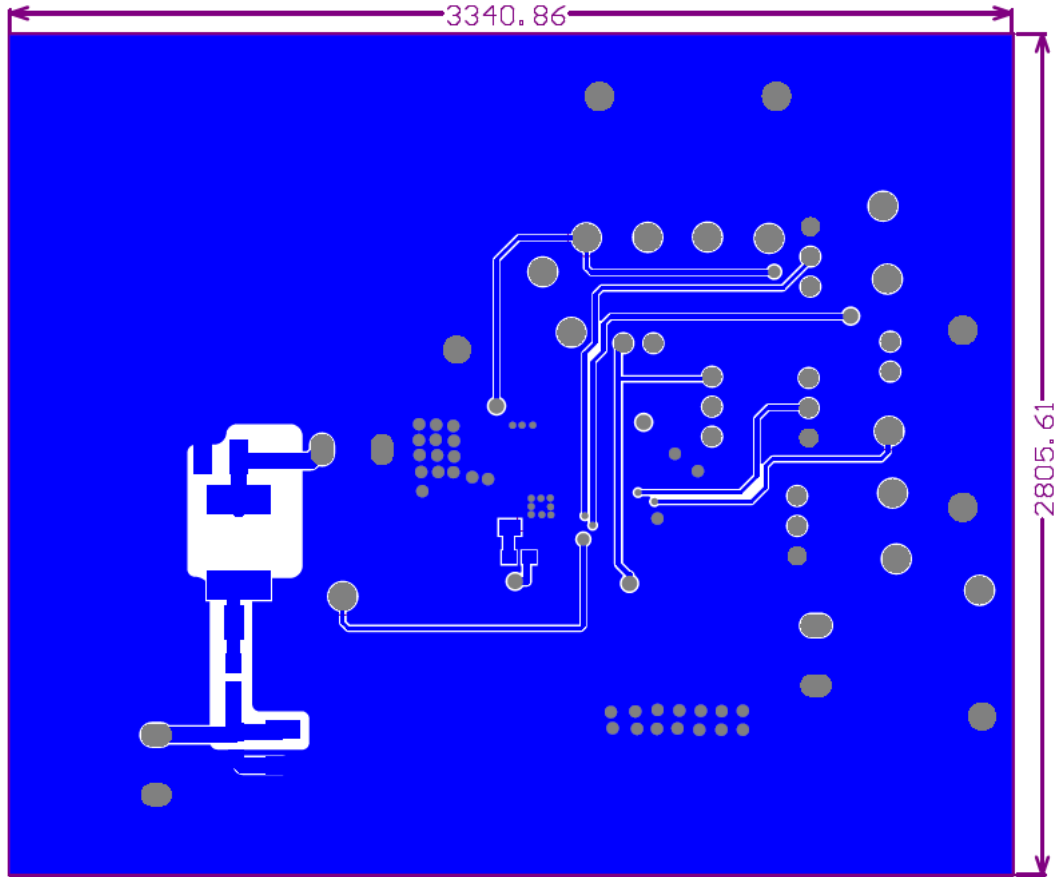
DNP - Do Not Populate

PCB Layout

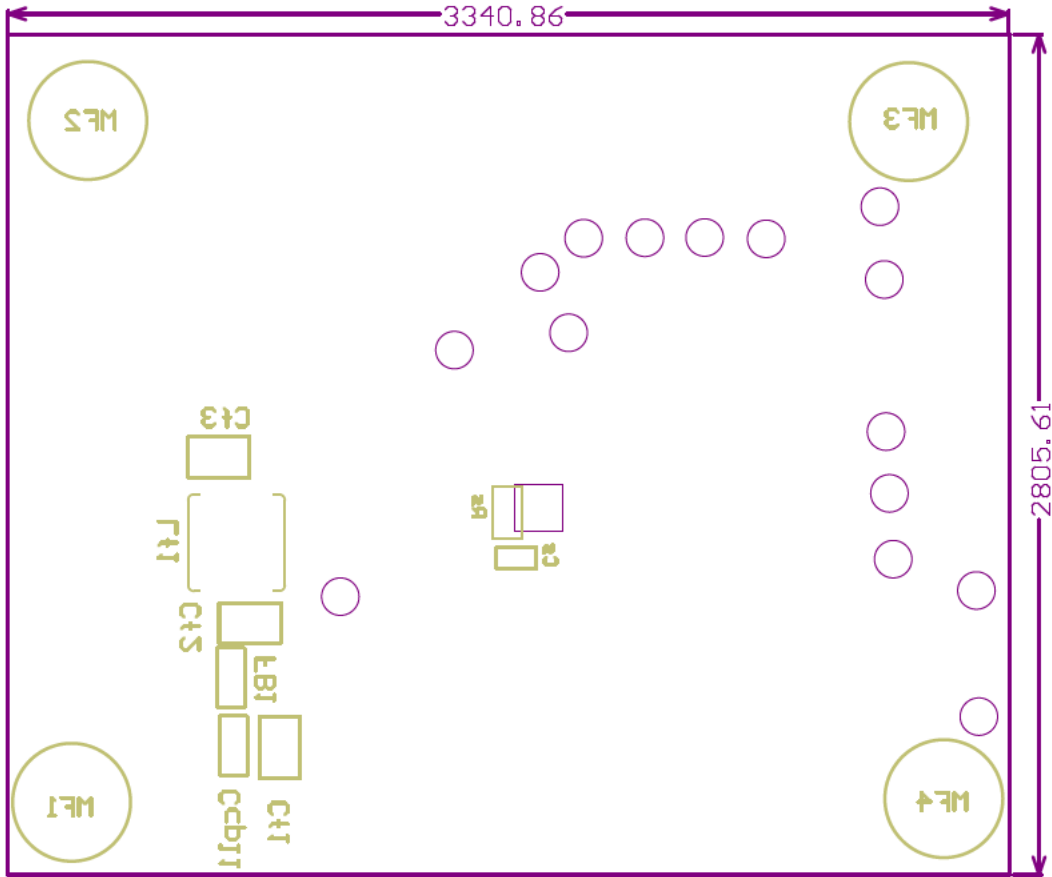




Bottom Layer

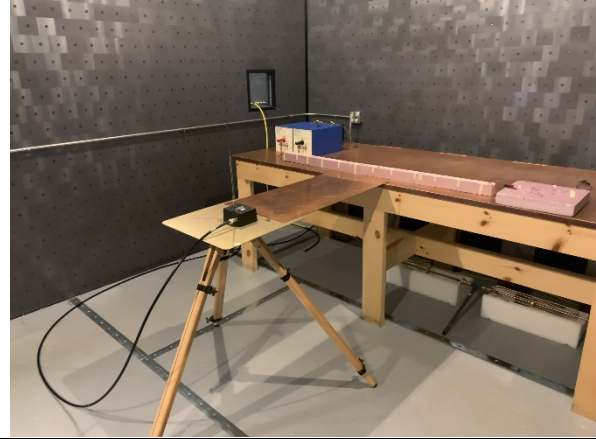


Bottom Silk

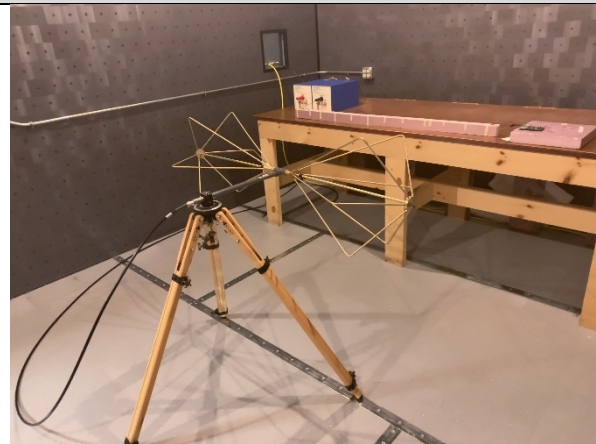


The conditions of experiment

Rod antenna

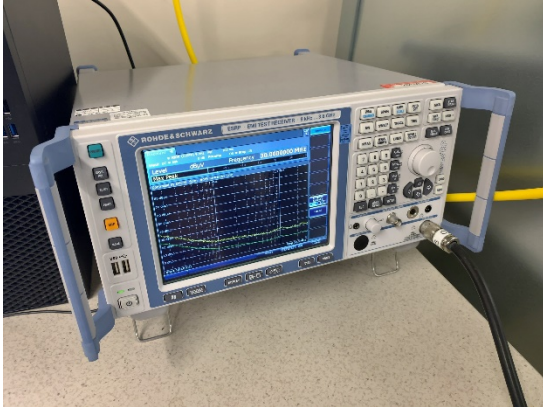


Biconical antenna

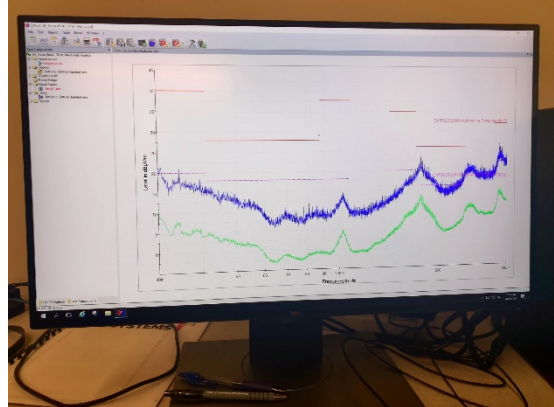


EMC Test Equipment

EMI Test Receiver

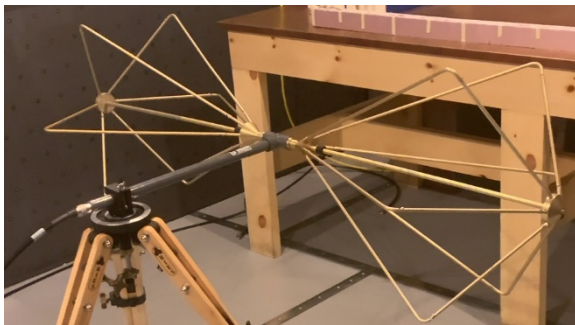


ROHD&SCHWARZ
ESRP3 EMI Test Receiver, 9 kHz to 3.6 GHz



ROHD&SCHWARZ
EMC32 Measurement Software

Antenna



Biconical antenna
A.H systems, inc.
MODEL:SAS-542



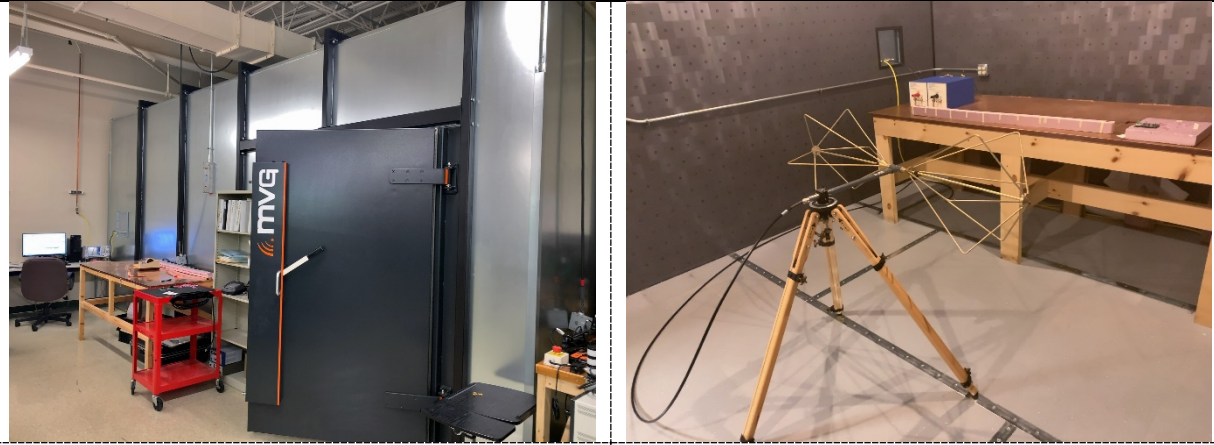
Rod antenna + Preamplifier
A.H systems, inc.
MODEL:SAS-550-1B

Preamplifier



For biconical antenna
A.H systems, inc.
MODEL:PAM-0202

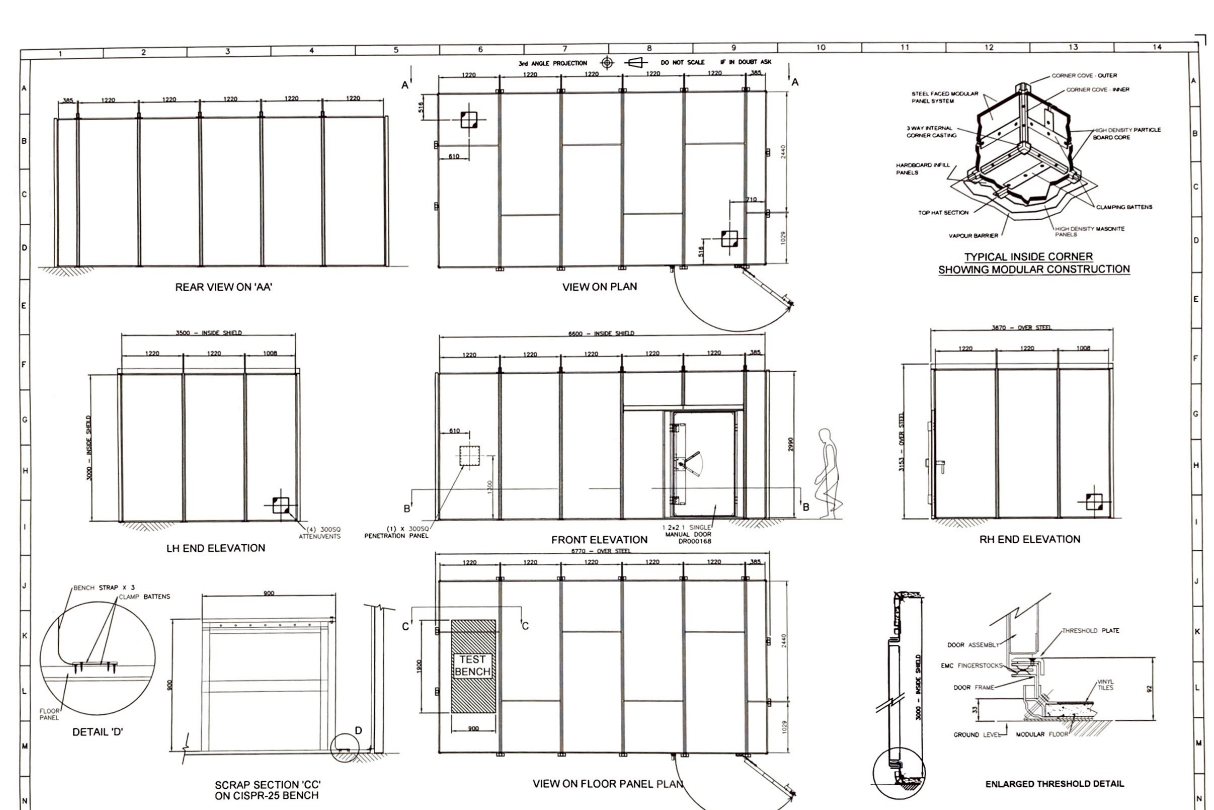
EMC Chamber



Outside view

inside view

Detail of EMC Chamber



REV		DATE	BY	CHKD	APP'D	DESCRIPTION
1		11.02.15				ISSUE FOR CONSTRUCTION
2		11.02.15				ISSUE FOR CONSTRUCTION
3		11.02.15				ISSUE FOR CONSTRUCTION
4		11.02.15				ISSUE FOR CONSTRUCTION
5		11.02.15				ISSUE FOR CONSTRUCTION
6		11.02.15				ISSUE FOR CONSTRUCTION
7		11.02.15				ISSUE FOR CONSTRUCTION
8		11.02.15				ISSUE FOR CONSTRUCTION
9		11.02.15				ISSUE FOR CONSTRUCTION
10		11.02.15				ISSUE FOR CONSTRUCTION
11		11.02.15				ISSUE FOR CONSTRUCTION
12		11.02.15				ISSUE FOR CONSTRUCTION
13		11.02.15				ISSUE FOR CONSTRUCTION
14		11.02.15				ISSUE FOR CONSTRUCTION

Allegro is not an accredited EMC laboratory location. The results obtained and communicated in this report are to be used for reference purposes only.