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Safecom – CATV Power Booster (EU)

61V -15A AC/AC Stabilizer –Zero Crossing technology & RF-PASS 5-1000MHz

The Scoop:
Safecom's Power booster was designed to increase voltage, over RF coaxial (or electric) cables at remote optical nodes & amplifier cascades, maintaining active to optimal voltage levels. Unit controller monitors the input voltage level online, and operates Power Booster Zero Crossing gears in order to ensure optimal voltage output , 87V (US) or 60 V(EU).

Patented Power Booster solves the power distribution problem in a CATV network caused by high-resistance and low energy-efficient coax or electric cables.
Passive, standalone element, **life time operation & ONLINE (Zero Crossing patented technology**). 15A 30-87Vac (US) / 15A 30-64Vac (EU).
The unit ensures the optimal voltage levels required at remote locations by optical nodes, trunk amplifiers, and line extenders overcoming voltage drop along the power or coaxial cable. Increasing the distance between remote power sources leads to a reduction in the number of power insertion points across the network, less power supply (especially under-loaded power supplies are unnecessary), less street cabinets and permits are needed and less flat fees to the utility company for each of the power supply (even if it was never used).
Safecom's cost-saving patented Power Booster compensate the voltage drop over coax cable and enables to utilize the DPS remote backup technology between distant locations. The Power Booster can be seamlessly connected via cable to the DPS4 enabling robust power redundancy system and overcome the range limitation of the previous DPS generations. In addition to HFC networks, the power booster now enables back up to Deep Fiber networks with central powering using existing coax infrastructure between powering centers.

- ✓ RF Pass 5-1000MHz.
- ✓ Europe 60V & US 90V Standard.
- ✓ Support full 15A rms input /output.
- ✓ Smooth transfer between gears –Zero Crossing Technology.
- ✓ Lifetime operation.
- ✓ Top-efficiency -Genius Toroidal Transformer.
- ✓ Electronic 15A Overload Protection.
- ✓ Weatherproof Enclosure.
- ✓ Wall or Pole Mounted.
- ✓ Automatic Standby mode.
- ✓ Opposite connection protected.
- ✓ Input & Out Surge Protection
- ✓ Protecting downstream network failure caused by inrush current, low voltage and overload.

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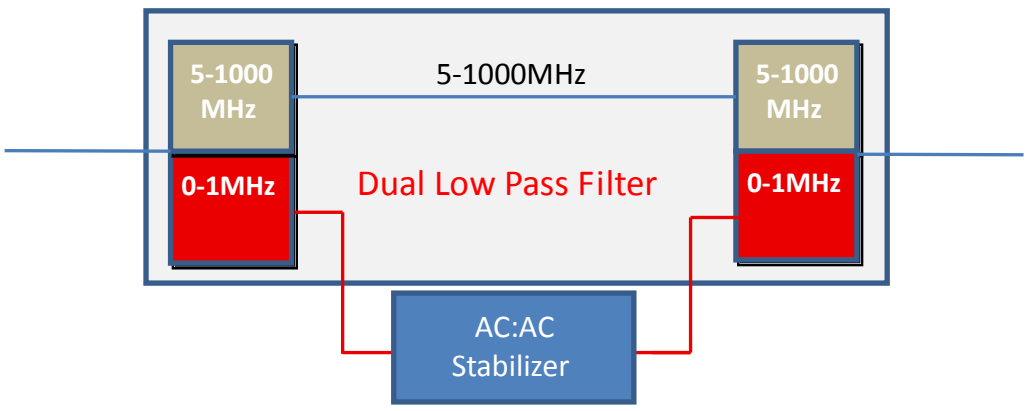
Electronic		
Input Frequency (Hz)		50/60 Hz
Max Output Current (A)		15A
Max Input Current		15A
Self current Load		190mA
US	Input operating Voltage range (Vac)	30÷ 90 Vac (US)
	Optimal Voltage range	51-90Vac
	Voltage gain ratio (input 78-90 Vac)	1:1.01
	Voltage gain ratio (68-78)	1:1.15
	Voltage gain ratio(58.5-68Vac)	1:1.33
	Voltage gain ratio (input below 58.5Vac)	1:1.52
EU	Input operating Voltage range (Vac)	30÷ 65 Vac (EU)
	Optimal Voltage range	37-65 Vac
	Voltage gain ratio (input 56-64 Vac)	1:1.01
	Voltage gain ratio (49-56 Vac)	1:1.14
	Voltage gain ratio (42-49 Vac)	1:1.36
	Voltage gain ratio (30-42 Vac)	1:1.57
Load Regulation (%)		<2%
Efficiency (%)		>96%
Transfer time (0 Sec)		ONLINE
Standard Features		
Direct Connection In / Out 5/8 inch		√
Electronic Overload protection		√
Power Booster indication Green /Red LED		√
Auto Standby mode		√

Mechanical	
Dimensions (L , W , H) mm	250 X 200 X 152
Weight (Kg/lbs)	6/13.2
Connector 5/8 inch	√
Environment	
Operating Temperature	-40ºC ÷ +65ºC
Storage Temperature	-40ºC ÷ +70ºC
Humidity (waterproof) IPX8	0 ÷ 100%
Corrosion	ASTM B 336Hr
Finishes	Chromate Conversion
RF	
Bandwidth	5-1000MHz
Impedance	75 Ohm
Through loss 5-250 MHz	< 0.5 dB
Through loss 250-500 MHz	< 0.7 dB
Through loss 500-700 MHz	< 0.9 dB
Through loss 700-800 MHz	< 1.0 dB
Through loss 800-900 MHz	< 1.2 dB
Through loss 900-1000 MHz	< 1.5 dB
Return Loss	> 20 dB
RFI	130 dB
Hum Modulation	> 65dB

LPF1000M-D



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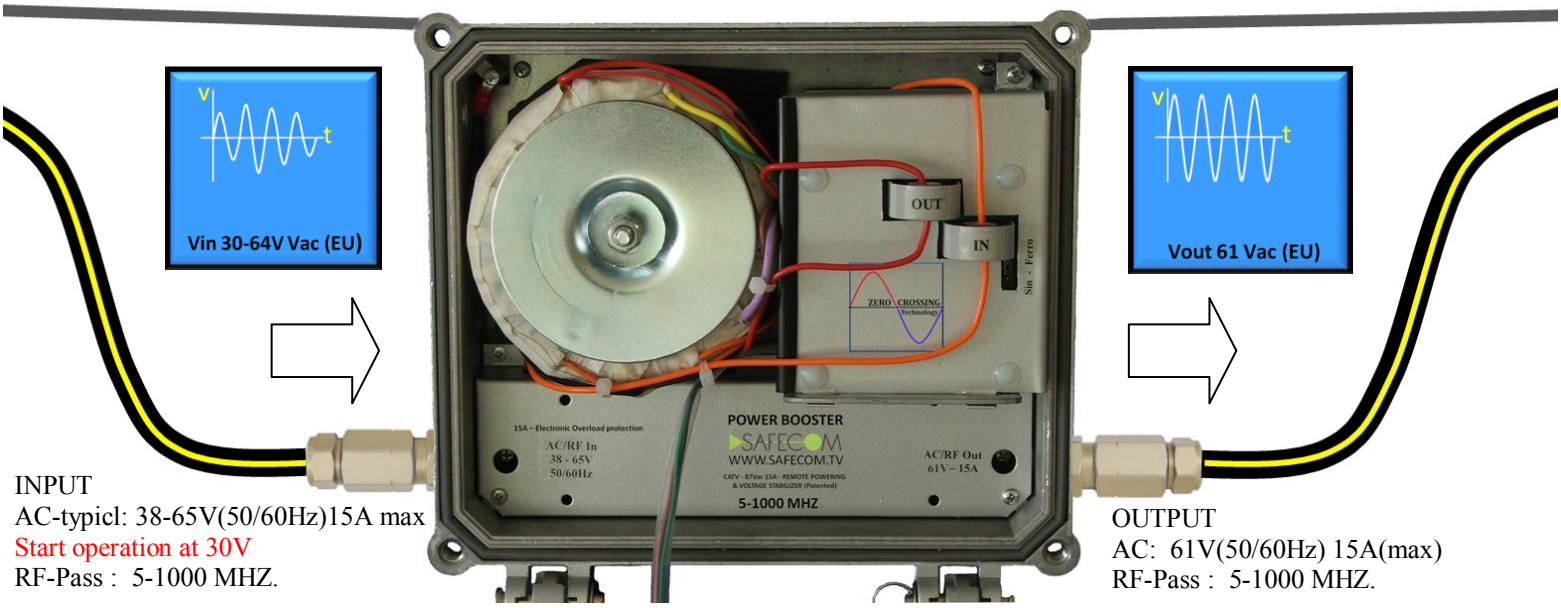
Test report for Power Booster 60V-15A (EUROPE) PB60V15A4

Scope:
To perform the test of Power Booster performance over a full input voltage range with variable load from the no-load condition and up to the Current Limit range.

Identification:

The appliance had the following marking plate:



INPUT
AC-typicl: 38-65V(50/60Hz)15A max
Start operation at 30V
RF-Pass : 5-1000 MHZ.

OUTPUT
AC: 61V(50/60Hz) 15A(max)
RF-Pass : 5-1000 MHZ.

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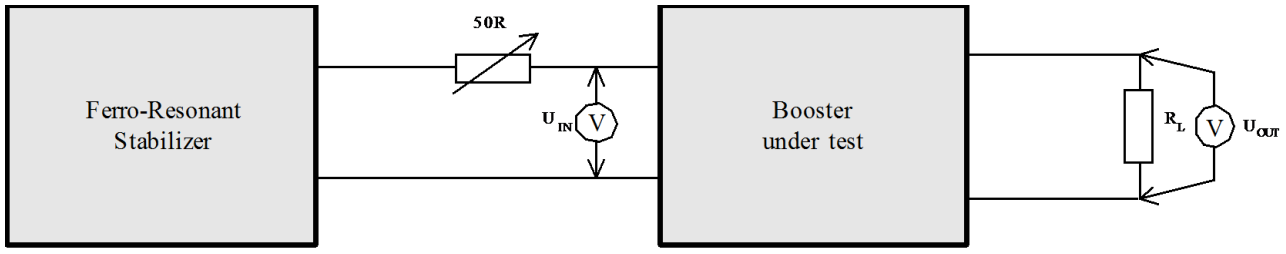
Lab test procedure:

1. Connect Unit Under Test (UUT) to a ferroresonant or Pure Sine Power Supply through a variable resistor (simulating a coax cable).
2. Connect a True RMS Volt Meter to the input and to the output of the UUT.
3. Set the resistor to minimize resistance.
4. Turn on the power supply, the indicator LED should light in Red for two seconds and turns to the green indicating presence of regular output voltage.
5. Change the input variable resistor to obtain input voltage of 30Vac and record the output voltage, calculate the gear gain.
6. Change the input variable resistor to obtain input voltage that would cause transition from the 1st to the 2nd gear, record input and output voltage before and after the transition and calculate the gear gain.
7. Repeat step 6 for all the designed input voltage range up to 64Vac.
8. Measure & record no-load input current.
9. Turn off the power supply and connect a variable load resistor (10Ω – 1KW) to the UUT output.
10. Turn on the UUT.
11. Perform Load Regulation; maintain a constant input voltage of 55V and change the load to achieve load current between no-load & up to the current that would cause the input current limit.
12. Repeat steps 6 & 7 with an output load of 8A.
13. Check & record input current limit for all input voltage ranges.
14. Turn off the Power Supply & disconnect UUT from the test bench.

Test bench:



Do not use a Variac for input voltage.

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Test report:

Voltage & Current Measurments:

No-Load Test:

	U_{IN}	U_{OUT}	Gain	Gear Transfer
	30.0V (Min)	46.7V	1.57	4
Optimal Range(EU standard)	37.3V	58.5V	1.57	4
	41.1V	64.9V	1.57	4
	41.2V	60.7V	1.36	3
	48.3V	64.9V	1.36	3
	48.4V	58.5V	1.14	2
	57.0V	65.0V	1.14	2
	57.1V	57.6V	1.01	1
	64.3V	65.0V	1.01	1

No load input current: ~80mA @ 50Hz

Load Regulation:

U_{IN}	U_{OUT}	Iout
55.0V	62.8V	0A
55.0V	63.4V	2.0A
55.0V	62.1V	4.0A
55.0V	62.0V	6.0A
55.0V	54.3V	8.0A
55.0V	61.2V	10.0A
55.0V	61.2V	12.0A
55.0V	61.6V	12.8A (1)

Notes:

1. UUT was in Gear #2, input overload current limit of 15A was activated.

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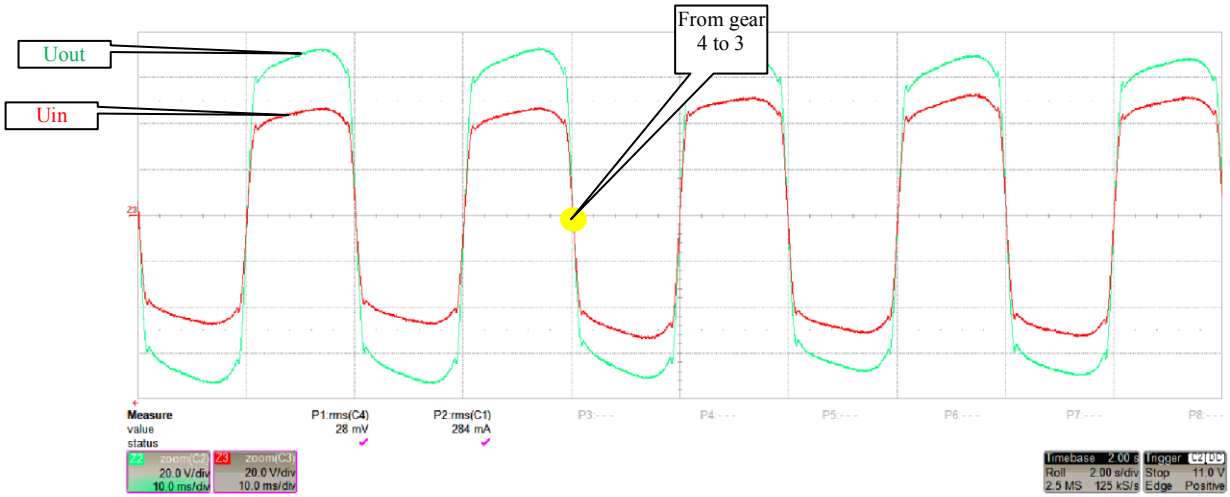
Input current limit: 15A±0.5A

Gear transitions under load:

U_{IN}	U_{OUT}	Iout
30.0V	44.3V	8.0A
40.9V	61.8V	8.0A
47.5V	62.3V	8.0A
55.7V	62.9V	8.0A
65.0V	64.5V	8.0A

Waveforms: ZERO CROSSING TECHNOLOGY

Transition from the 4st to the 3nd gear (at 2.7A load)



Red – input voltage
Blu – output voltage

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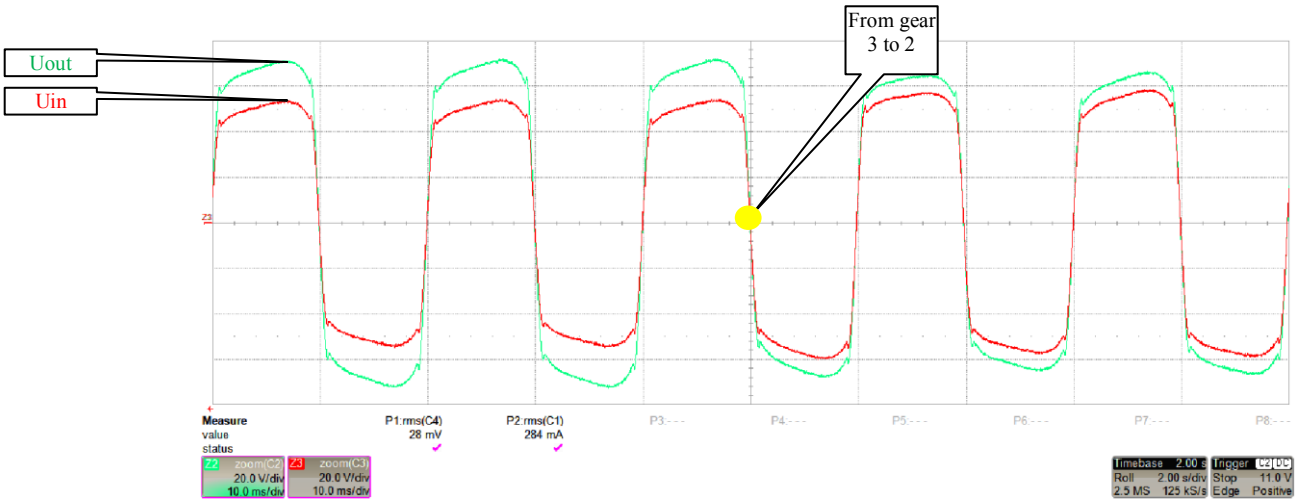
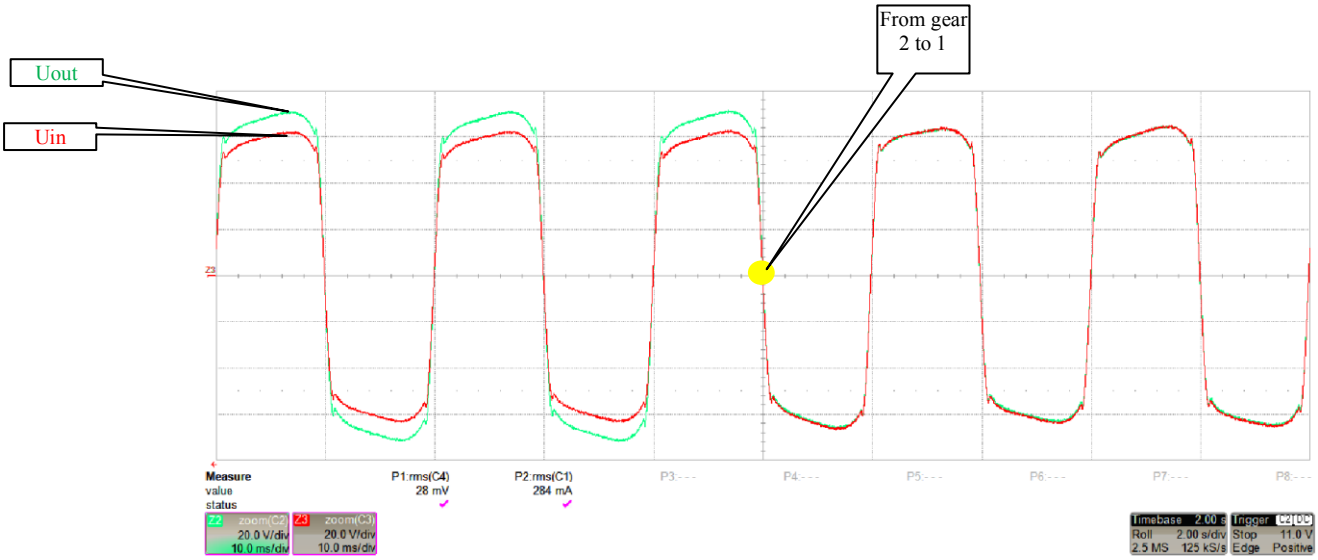
Transition from the 3nd to the 2d gear (at 2.7A load) **ZERO CROSSING TECHNOLOGY**





The transitions were tested @ I_{OUT} = $3A_{RMS}$

Inspected by: Michael Militinsky

Signature: _____

Date: 07.11.2013

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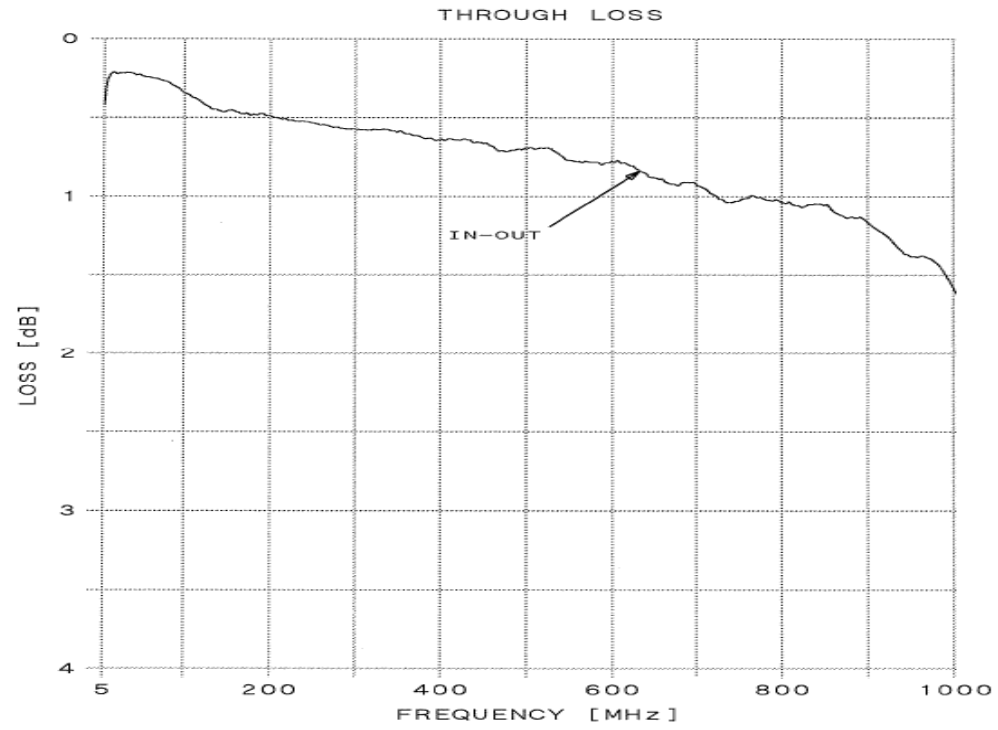
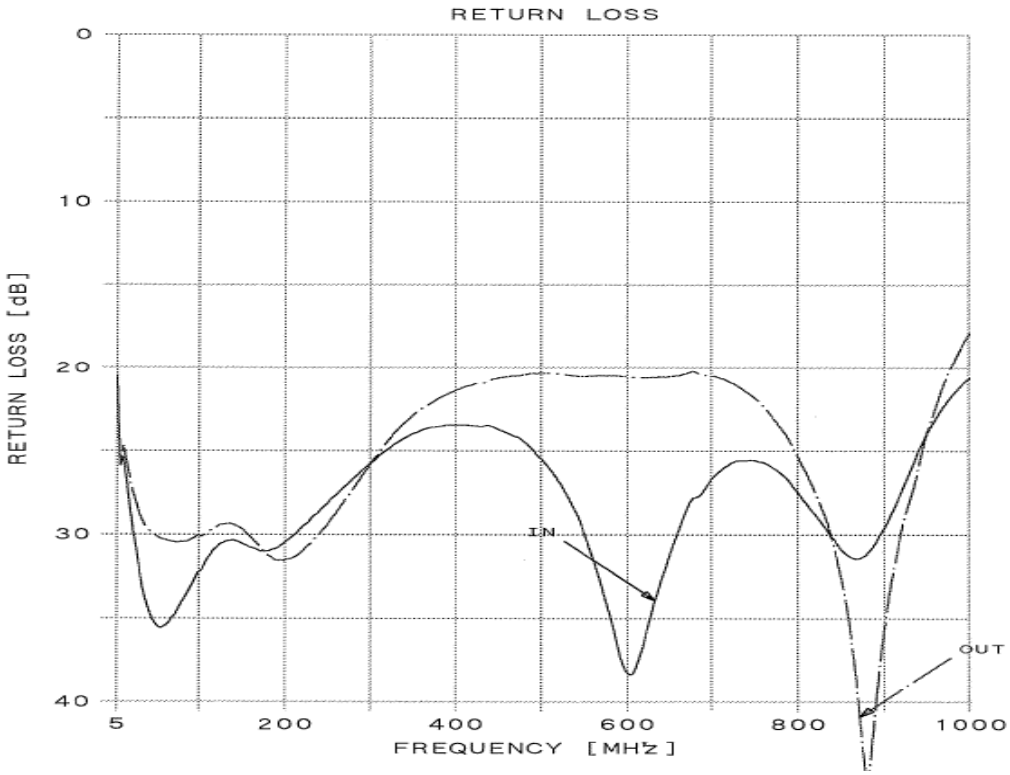
B. RF test / Insertion & Rutun Loss 5-1000 MHz.





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