EAST AND WEST COAST OFFICES

WEST COAST FACILITY:
4921 Robert J. Mathews Pkwy, Suite 1
El Dorado Hills, CA 95762 •USA•

sales@pmi-rf.com
www.pmi-rf.com/aboutus.htm

EAST COAST FACILITY:
7311-F Grove Road
Frederick, MD 21704 •USA•
Planar Monolithics Industries, Inc. (PMI), an “S” Corporation, was founded by Dr. Ash (Ashok) Gorwara on November 11th, 1989 to take advantage of the growing demand in monolithic based products using Hybrid MiC/MMIC technology. PMI offers its unique DC to 50 GHz products for applications in space, military, telecommunications, communications and consumer electronics.

Today, PMI is being directed into the 21st Century by expanding the applications of RF/Microwave components and subsystems into new, low cost, RF/Microwave receiving and transmitting systems for both civilian and military customers.

Effective April 30 2013, PMI, 7311-F Grove Road, Frederick, Maryland, USA 21704, USA, http://www.pmi-rf.com acquired 100% of all the assets & property of HARI, LLC, www.harillc.com (Formerly operating as Genesis Microwave Inc., www.genesismicrowave.com) located at 4980 Hillsdale Circle, Suite B, El Dorado Hills, CA 95762, USA.

These assets include all the test and manufacturing equipment and machinery, designs, Documentation, drawings and Intellectual property in the form of hard copies and in computer format in servers, CD's, storage areas, etc. Also included in these assets are the Office Equipment & Machinery, etc. and Computers, Office furniture, Finished goods, In-process and Raw Materials & Inventories and other Miscellaneous items. In addition to these assets, included are, all the stock in trade, merchandise, fixtures, equipment, goodwill and trade of the known business as "HARI LLC".

All the RF/MICROWAVE products, components, subsystems, etc. being designed, manufactured, serviced and produced by HARI, LLC www.harillc.com (Formerly operating as Genesis Microwave Inc., www.genesismicrowave.com) until 30th April 30 2013, will now be offered, provided, produced, manufactured and serviced by PMI, at its West Coast Facilities Operations located at 4921 Robert J. Mathews Parkway, Suite 1, El Dorado Hills, CA 95762, USA.

HISTORY

WEST COAST FACILITY:
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www.pmi-rf.com/aboutus.htm

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Frederick, MD 21704 •USA•
PMI was founded to take advantage of the growing demand in monolithic-based products using the Hybrid MIC/MMIC technology innovations that are mushrooming in a big way all over the world. High performance and reliable products can be obtained by using this technology.

A vacuum existed in the demand for state-of-the-art Hybrid MIC/MMIC Components and Subsystems. PMI has been setup to Design, Develop, Manufacture, Test, and Market complex state-of-the-art:

- Hybrid RF/Microwave and Monolithics Integrated Circuits (MIC/MMIC) and Components
- Hybrid MIC/MMIC Supercomponents and Subsystems

PMI provides its unique products for applications in space, military, communications, telecommunications and industrial electronics systems.

PMI has been set up to perform research, design, develop, manufacture and market various MIC/MMIC (Microwave Integrated Circuits and Monolithics Microwave Integrated Circuits) Components, Supercomponents, and Subsystems for applications in Telecommunications, Terrestrial, Satellite, and Mobile-Radio Communications, UAVs (Unmanned Aerial Vehicles) & Drones, Defense (ECM, ECCM, ESM, Radars, SIGINT, and Electronic Warfare), Navigation and Marine Electronics, FAA/DOT-Avionics, Ground Based Systems, and Microwave Landing Systems.

Worldwide demand exists for High Reliability, Low Cost systems. Such needs can be satisfied by PMI by using its unique Hybrid MIC/MMIC Technologies and products that the team has developed called Application Specific Hybrid Microwave/Monolithics Integrated Circuits (ASHMIC/ASHMMIC*). *Trademark of PMI.
As a manufacturer PMI utilizes our own designs for all components, integrated modules and subsystems:

- RF/MIROWAVE MILITARY, COMMUNICATIONS & DRONE SYSTEMS CUSTOMERS
- RF/MIROWAVE INTEGRATED MODULES
- RF/MIROWAVE SUB-SYSTEMS
- DC to 50GHz
- MMIC Technology & Processes
- HYBRID Technology & Processes
- DISCRETE Technology & Processes
- Analog & Digital Technology & Processes
- In-House Machine Shop Capability

**Amplifiers** – Solid State
**Attenuators** – Variable/Programmable
**Couplers** (Quadrature, 180° & Directional)
**Detectors** – RF/Microwave
**DLVAs, ERDLVAs & SDLVAs**
**DTOs, VCos, PLO, DROs, & Frequency Synthesizers**
**Filters & Switched Filter Banks**
**Form, Fit, Functional Products & Services**
**Frequency Discriminators & IFMs**
**Integrated MIC/MMIC Assemblies (IMAs)**
**IQ Vector Modulators**
**Limiters – RF/Microwave**
**Log Amplifiers**
**Millimeter Wave Components (Up to 50 GHz)**
**Miscellaneous Products**
**Multifunction Integrated Assemblies (MIAs)**
**Phase Shifters & Bi-Phase Modulators**
**Power Dividers/Combiners (Passive & Active)**
**Pulse Modulators (SPST)**
**Rack & Chassis Mount Products**
**Receiver Front Ends & Transceivers**
**SDLVAs, ERDLVAs & DLVAs**
**Single Side Band Modulators**
**SMT & QFN Products**
**Switch Matrices**
**Switched Filter Banks**
**Switches – Solid State Systems** - Radar Sense & Avoid
**Systems – Fly Eye Radars**
**Threshold Detectors**
**USB Products**

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Application of PMI DC to 50 GHz Components & Sub-Systems

Planar Monolithics Industries, Inc. has been in business for over 25 years as a manufacturer of electronic components for defense applications. Applications such as Receiver Front-Ends, Synthesizers and Transceivers. As well as a large variety of RF components that compliment this target market. Our technical goal is to produce the finest products available that resolve this mathematical statement:

\[ V_{\text{input}} = A \cos(\omega_c t + \phi_t) \]

- AMPLITUDE
- FREQUENCY
- PHASE & MODULATION
Application of PMI DC to 50 GHz Components & Sub-Systems

TYPICAL EW, ECM, ESM RECEIVER FRONT-END

\[ V_{\text{input}} = A \cos(\omega_c t + \phi_t) \]

- AMPLITUDE
- FREQUENCY
- PHASE & MODULATION

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Application of PMI DC to 50 GHz Components & Sub-Systems

TUNER / SUPERHETRODYNE FRONT-END

Amplifiers – Solid State
Attenuators – Variable/Programmable
Couplers (Quadrature, 180° & Directional)
Detectors – RF/Microwave
DLVAs, ERDLVAs & SDLVAs
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Threshold Detectors
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Application of PMI DC to 50 GHz Components & Sub-Systems

TYPICAL TRANSCEIVER / TRANSPONDER BLOCK DIAGRAM

Amplifiers – Solid State
Attenuators – Variable/Programmable
Couplers (Quadrature, 180° & Directional)
Detectors – RF/Microwave
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Application of PMI DC to 50 GHz Components & Sub-Systems

TYPICAL RADAR WARNING RECEIVER FRONT-END OR DIRECTION FINDING RECEIVER FRONT-END SUB-SYSTEM
PMI specializes in replacing obsolete parts on old systems. We offer Form-Fit-Functional replacement Parts for any system. If a Source Control Drawing (SCD) is available we can offer a complete solution to meet all of the given electrical, mechanical and environmental specifications. PMI has designed, manufactured and delivered many of these replacement components such as:

- **IF & RF LOG AMPLIFIERS, SDLVAs & DLVAs**
- **LOW NOISE AMPLIFIERS, VARIABLE GAIN AMPLIFIERS & LIMITING AMPLIFIERS**
- **LIMITERS, DETECTORS, HYBRID COUPLERS & POWER DIVIDERS**
- **PHASE SHIFTERS & BI-PHASE MODULATORS**
- **I & Q VECTOR & SINGLE SIDE-BAND MODULATORS**
- **FILTERS AND SWITCH FILTER BANKS**
- **SWITCHES AND ATTENUATORS**
PMI PRODUCTS

SOLID STATE PIN DIODE
& FET SWITCHES

20 MHz – 18 GHz SP8T
24 – 40 GHz SPST
50 MHz – 40 GHz SP4T

SP3T PIN DIODE SWITCH

DC – 40 GHz SPST

GPO OR CONVENTIONAL CONNECTORS

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Systems – Fly Eye Radars Threshold Detectors
USB Products

ULTRA HIGH SPEEDS

SP6T MINIATURE DESIGN

20 WATT SURFACE MOUNT SPDT

CUSTOM DESIGNS

SP32T

20 MHz – 18 GHz SP8T
24 – 40 GHz SPST
50 MHz – 40 GHz SP4T

SP3T PIN DIODE SWITCH

DC – 40 GHz SPST

GPO OR CONVENTIONAL CONNECTORS

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PMI PRODUCTS

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500 MHz – 18 GHz 20 dB SWITCHED BIT ATTENUATOR

1 – 18 GHz 60 dB DIGITAL ATTENUATOR

DC -2 GHz SWITCHED BIT ATTENUATOR

2 – 4 GHz VOLTAGE VARIABLE ATTENUATOR

8 – 18 GHz 8-BIT DIGITAL ATTENUATOR

DIGITALLY TUNED ATTENUATORS

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Switch Matrices
Switched Filter Banks

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PMI PRODUCTS

1 – 2 GHz LNA w/35 dB Gain & 1.4 dB NF

9 – 10 GHz LNA w/37 dB Gain & 3 dB NF

1.6 – 2.7 GHz Limiting Amplifier w/40 dB Gain & Limited RF Output of +15 dBm

2 – 18 GHz LNA w/30 dB Gain & 4 dB NF

2 – 18 GHz Limiting Amplifier with +21 dBm Limited Output

4-WAY POWER DIVIDER WITH QUAD PHASE OUTPUT OF J2=0°, J3=90°, J4=180° & J5=270°

6 – 19 GHz 2-WAY POWER DIVIDER

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PMI PRODUCTS

10 GHz INTEGRATED PHASE SHIFTER
DIELECTRIC RESONANTOR
OSCILLATOR (DRO) MODULE

21 GHz BEAM FORMING
MONOPULSE CIRCUIT

2 – 18 GHz DIGITALLY TUNED
OSCILLATOR (DTO)

6 – 18 GHz SYNTHESIZER

2 – 18 GHz FREQUENCY DISCRIMINATOR

6 – 18 GHz SYNTHESIZER

30 MHz FREQUENCY DISCRIMINATOR

10 GHz INTEGRATED PHASE SHIFTER and
DIELECTRIC RESONANTOR OSCILLATOR (DRO) MODULE (INSIDE)

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PMI PRODUCTS

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Amplifiers – Solid State
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Switch Matrices
Switched Filter Banks
Systems – Fly Eye Radars Threshold Detectors
USB Products
PMI PRODUCTS

100 MHz – 18 GHz Transceiver (Phase II)

500 MHz – 40 GHz USB Powered LNA

Vector Modulator

Double Sided 100 MHz – 18 GHz Switch Filter Bank

100 MHz – 18 GHz Transceiver (Phase III)

500 MHz – 40 GHz USB Powered SP2T Switch

85 MHz – 2 GHz 8 bit 360° Phase Shifter

4 – 18 GHz Up/Down Converter

2 – 6 GHz 8 bit 360° Phase Shifter

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PLANAR MONOLITHICS INDUSTRIES, Inc.
FACILITIES INFORMATION

7311-F GROVE ROAD, FREDERICK, MD:
- 5,000 sq. ft. Facility
- Components Manufacturing
- Sub-Assembly Manufacturing
- Hybrid Assembly
- Filter Manufacturing
- 1,000 sq. ft. Class 10,000 Clean Room
- Engineering Department
- Test Department
- Production Officer
- QA/QC Office
- Sales & Marketing
- Executive Offices
- Conference Room

4921 Robert J. Mathews Pkwy, El Dorado Hills, CA:
- 5,100 sq. ft. Facility
- Components Manufacturing
- Hybrid Assembly
- Test and Engineering Departments
- Production and Quality Departments
- Continued Manufacturing Previous HARI, LLC
  (formally Genesis Microwave)
  Products as listed at www.harillc.com
  and www.genesismicrowave.com

ACCOUNTING & CORPORATE INFO:
- Type “S” Corporation, Pennsylvania
- Peachtree Sage 50, 2013
- EXACT Alliance MRP
- Accrual Basis Accounting Practice
- Fiscal Year is December 31st
- GAAP Guidelines Followed
- Monthly Internal Financial Reports
- Weekly Cash Flow Analysis Reports

7310 GROVE ROAD, FREDERICK, MD:
- 1,000 sq. ft. Facility
- Accounting Offices

5715 INDUSTRY LANE, FREDERICK, MD:
- 2,500 sq. ft. Facility
- High Power Equipment Test Laboratory
- Clean Room
- Conference Room
- 600 sq. ft. 10,000 Clean Room

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6590 WATERS EDGE CT, NEW MARKET, MD:
- 4,000 sq. ft. Facility
- CORPORATE HQ
- Conference Rooms & Executive Offices

EAST COAST FACILITY:
7311-F Grove Road
Frederick, MD 21704 •USA•
# PROGRAMS

<table>
<thead>
<tr>
<th>CUSTOMER</th>
<th>PROGRAM</th>
</tr>
</thead>
</table>
| NORTHROP GRUMMAN CORPORATION | CABIN FEVER  
Baltimore, MD & Rolling Meadows, IL  
Corvair  
EA-18G  
ICAP-III  
LR-100  
Falcon Edge  
ALQ-188  
PDF |
| BAE SYSTEMS, NH | DEWS, F15  
EPAWSS  
Knight Program  
U2 Program |
| TRANSFORMATIONAL SECURITY | CUSTOM THRESHOLD DETECTORS |
| MITSUBISHI-MELCO (JAPAN) | SUCCESSIVE DETECTION LOG VIDEO AMPLIFIERS (SDLVAs), F-2 |
| NAVAL RESEARCH LAB, WASH, DC | AMPLIFIER DETECTOR PRE-AMPLIFIER  
RF MONITOR FOR ANACHOIC CHAMBER  
100 MHz-18 GHz TRANSCIEVER |
| RAYTHEON MISSILE SYSTEMS, AZ | SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVAs) |
| L-3 COMMUNICATIONS, TX | SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVAs) |
| LOCKHEED MARTIN CO, FL | MK92 FIRE CONTROL SYSTEM (FORM, FIT & FUNCTION SPARES) |
| MIKES, TURKEY | SPEWS-II (F16) Turkey |
| ARGONST, VA | RF DISTRIBUTION UNIT |
| IDF (ISRAELI AIR FORCE) | GUNN DIODE OSCILLATORS |
| WARNER ROBINS AFF, GA | IF LOG AMPLIFIERS (FORM, FIT & FUNCTION SPARES), B-1B |
| L-3 COMMUNICATIONS, UT | CUSTOM LIMITERS |
| MECTRON, BRAZIL | SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVAs)  
MARS-1, BRAZILIAN AF |

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**EAST COAST FACILITY:**  
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PMI EAST COAST OPERATIONS

Amplifiers – Solid State
Attenuators – Variable/Programmable
Couplers (Quadrature, 180° & Directional)
Detectors – RF/Microwave
DLVs, ERDLVs & SDLVs
DTOs, VCOs, PLO, DROs, & Frequency Synthesizers
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EAST COAST FACILITY:
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Network Analyzers:
- (3) Agilent N5230A PNA (10 MHz to 40 GHz)
- (2) Agilent N5230A PNA (10 MHz to 20 GHz)
- (1) Agilent N4691 E-CAL (10 MHz to 20 GHz)
- (1) Agilent N4692 E-CAL (10 MHz to 40 GHz)
- (1) HP Network Analyzer (10 kHz to 300 MHz)
- (1) HP 5100 Network Analyzer (0.5 to 26.5 GHz)
- (1) Agilent N5230C-420 PNA Network Analyzer (10 MHz to 40 GHz)
- (1) Keysight E8364B PNA Network Analyzer (10 MHz to 40 GHz)
- (1) Keysight N5234A PNA-L Network Analyzer (10 MHz to 50 GHz)
- (1) Keysight N4692A E-CAL (10 MHz to 50 GHz)

Noise Figure Meter:
- (1) Agilent N8975A (10 MHz to 26.5 GHz) & Downconverter (40 GHz)

Spectrum Analyzer:
- (1) HP 8593E
- (1) HP E4448A PSA Spectrum Analyzer (3 Hz to 50 GHz)
- (1) Keysight N9030A Spectrum Analyzer (3 Hz to 50 GHz)

Power Meter:
- (3) Gigatronics 8541B/C, 8542C
- (4) Agilent E4418B
- (1) Agilent N1913A

Pulse/Signal Generators:
- Agilent E8257D
- HP 8015A
- HP 8350B Sweep Oscillator
- HP Arbitrary Waveform Generator 33120A
- Agilent 33522A Arbitrary Waveform Generator
- (2) Keysight E8257A PSG Analog Signal Generator
- (2) Agilent E8257D PSG Analog Signal Generator

Oscilloscopes:
- Tektronix TES 210 (60 MHz BW)
- (5) Agilent DSO6034A (300 MHz BW)
- (1) Keysight (2 GHz BW)

TWT Power Amplifiers:
- Varian TWTA 7 – 18 GHz, 20W
- CPI TWT Amplifier (2-8 & 8-18 GHz) 300 W CW

Manufacturing Equipment:
- TSE-11-A ESPEC Thermal Shock Chamber
- JEN410 IR Reflow Oven
- Thermo Electron Oven
- Anatech Plasma Cleaner
- Metallurgical Microscope MT1000
- (4) Westbond 74767E Convertible Wire Bonder
- (4) Westbond 747630E-79 Wire Bonder
- (2) Westbond 7400A Welder
- (1) Westbond Bond Pull Center
- (2) Dage Bond Puller
- (1) Unitek Unibond-II Parallel Gap Welder
- (1) HAAS VF0 CNC Milling Machine
- (1) HAAS DT1 CNC Milling Machine
- (1) Hardinge Turret Lathe
- (1) Di-Acro Power Shear
- (1) Brady Label Machine BP-THT-600-11
- (4) Thermal Hot/Cold Plates
- Random Vibration Setup

Software:
- Keysight - Genesys S/Filter Synthesis and Simulation
- Ansys – HFSS, High Frequency Structural Simulator
- Exact MAX – MRP/ERP Software
- AutoCAD 2005
- AutoCAD 2013
- Altium Designer
- Microwave Office
- SolidWorks 2014
- Gibbs Cam

Standards:
- ISO9001
- MIL-STD-454
- MIL-STD-202
- MIL-STD-883
- MIL-E-5400
- MIL-SD-45208
- IPC-A-610 Workmanship Standard
- IPC-J-STD-001 Soldering Standard
- MIL-STD-45662 Calibration Standard
PMI West Coast Operations

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Integrated MIC/MMIC Assemblies (IMAs)
IQ Vector Modulators
Limiters – RF/Microwave
Log Amplifiers
Millimeter Wave Components (Up to 50 GHz)
Miscellaneous Products
Multifunction Integrated Assemblies (MIAs)
Phase Shifters & Bi-Phase Modulators
Power Dividers/Combiners (Passive & Active)
Pulse Modulators (SPST)
Rack & Chassis Mount Products
Receiver Front Ends & Transceivers
SDLVs, ERDLVs & DLVs
Single Side Band Modulators
SMT & QFN Products
Switch Matrices
Switched Filter Banks
Switches – Solid State Systems - Radar Sense & Avoid
Systems – Fly Eye Radars Threshold Detectors
USB Products
Network & Spectrum Analyzers:
- (5) HP 8757D Scalar Analyzers
- (1) HP 8720D Network Analyzer
- (1) HP 8563E Spectrum Analyzer
- (1) HP 8592L Spectrum Analyzer
- (2) Keysight N5234A PNA-L Network Analyzer (10 MHz to 50 GHz)

Noise Figure Meters:
- (1) HP 8970A Noise Meter
- (1) HP 8970B Noise Meter
- (1) Agilent 346C Noise Source

Power Meters:
- (1) HP EPM-442 Power Meter
- (2) HP E4412A Power Meter
- (1) HP 437B Power Meter

Pulse/Signal Generators:
- (1) HP 83731B Signal Generator
- (1) HP 83620A Signal Generator
- (1) HP 8013B Pulse Generator
- (4) HP 83620A Sweep Generators

Oscilloscopes:
- (1) HP 54503A Digital Scope & Probe
- (1) Agilent 54624A 100 MHz BW
- (1) Tektronix 2246 100 MHz BW
- (1) Tektronix 2465A 350 MHz BW

Manufacturing Equipment:
- (1) Quincy Model 40 Oven
- (1) Sym-Tek P162PSJ Oven
- (1) Cole/Parm 05015-50 Oven
- (1) Bransonic 821D Ultrasonic Cleaner
- (1) Pronto 474 Label Maker
- (4) UNITEK Gap Welders
- (1) March Plasmod Plasma Cleaner
- (4) Westbond 7400A Wedge Bonders
- (1) Westbond 70PT-M Bond Pull Center
- (4) Westbond 1200A Die Attach Stations
- (1) HAAS DT1 CNC Milling Machine
- (1) Westbond Bond Pull Center
- (1) Westbond 747677E Convertible Wire Bonder

Software:
- Keysight – Genesys S/Filter Synthesis and Simulation
- Ansys – HFSS, High Frequency Structural Simulator
- Exact MAX – MRP/ERP Software
- AutoCAD 2005
- AutoCAD 2013

Standards:
- ISO9001
- MIL-STD-454
- MIL-STD-202
- MIL-STD-883
- MIL-E-5400
- MIL-I-45208
- IPC-A-610 Workmanship Standard
- IPC-J-STD-001 Soldering Standard
- MIL-STD-45662 Calibration Standard
International Traffic in Arms Regulations
ITAR

- Trained and Experienced ITAR/Export Administrator
- Export Compliance Manual
- AES (Automated Export System) certified export staff
- Long Term Relationships with both DDTC and SNAP-R Personnel
- U.S. Government Registration Numbers:
  - Cage Code: 05XQ0 (East Coast)
  - Cage Code: 71A34 (West Coast)
  - DUNS Number: 829998517
  - SAM (CCR) Registration: 1998E211401
  - Federal Tax ID (TIN): 52-1756966
  - DDTC Registrant Code: M16913
  - DSS Cleared Facility

WEST COAST FACILITY:
4921 Robert J. Mathews Pkwy, Suite 1
El Dorado Hills, CA 95762 •USA•
sales@pmi-rf.com
www.pmi-rf.com/aboutus.htm

EAST COAST FACILITY:
7311-F Grove Road
Frederick, MD 21704 •USA•
PMI ISO9001 REGISTRATION

International Quality Registrars
Corporation

International Quality Registrars (IQR) Corporation here with certifies that

Planar Monolithics Industries, Inc.
Headquarters: 7311-F Grove Road, Frederick, MD 21704 USA
Site 2: Machine Shop: 5715 Unit 11 Industry Lane, Frederick, MD 21704 USA
Site 3: Design & Mfg. 4921 Robert J. Mathews Parkway, Suite # 1, El Dorado Hills, CA 95762 USA

Additional Site Information: X, No. Yes, See Appendix A for additional information

has demonstrated a Quality Management System (QMS) which conforms with the requirements of the standard:

ISO 9001:2008
Quality Management System - Registration

The organization's QMS has been evaluated according to the International Quality Registrars (IQR) Corporation QMS certification scheme for the following scope:

"Design, Development and Manufacture of Microwave Frequency Components, Sub-Systems and Systems, and Contract Manufacturing Services"

Exclusion(s): Service Provision (7.5)

This QMS certification is subject to periodic audits by International Quality Registrars (IQR) Corporation

Registration No: 15-120853.9Q
Client ID: PMI09
Cert. Expiration Date: 09/18/18
Cert. Issued Date: 09/18/15

IQR QMS Certification Signature

Last Cert. Revision Date: 09/18/15
Initial Cert. Issue Date: 02/24/09
Sheet No: 1 of 1

FORM IQR-2511 Rev. A
FORM IQR-2505 Rev. C