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APPLICATION NOTE

SMA COAXIAL CONNECTOR

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SMA COAXIAL CONNECTOR

Selection, PCB Integration & RF Application Design Guide



DOCUMENT NO.	REVISION	ISSUE DATE	PREPARED BY
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ENGINEERING PURPOSE A practical design-in reference for selecting a compatible SMA interface, translating the connector into a manufacturable PCB launch, preserving RF return-current continuity, and verifying the assembled interconnect.

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Engineering Application Guide • External technical reference

00 | DOCUMENT CONTROL & SCOPE

Read this note together with the latest approved drawing and specification for the selected connector part number.

FIELD	DETAIL
Document title	SMA Coaxial Connector — Selection, PCB Integration & RF Application Design Guide
Document number / revision	RHT-AN-RF-001 / Rev. A
Document status	Application guidance
Prepared by	Rick
Issue date	06 November 2026
Product scope	SMA coaxial connector interfaces and PCB-mounted implementations
Intended readers	RF, hardware, PCB layout, mechanical, validation and sourcing engineers

Purpose

This note explains the engineering decisions that determine whether an SMA connector is correctly selected and successfully integrated into an RF product. It covers interface compatibility, electrical limits, PCB transmission lines, connector launch, grounding, mechanical design, assembly, test strategy and failure analysis.

Scope boundary

This is a family-level engineering guide. It does not assign a universal frequency limit, power rating, VSWR, insertion loss, material, plating, dimension, torque or environmental rating to every RHT SMA part. Such values are part-number-specific and must be taken from the latest approved RHT drawing, specification and qualification evidence.

PRODUCT-DATA INTEGRITY No RHT part number or controlled RHT SMA datasheet was included in the source package available for this revision. Therefore, this guide deliberately avoids inventing RHT-specific ratings. The selection workflow identifies exactly which controlled data must be confirmed before design release.

How to use this guide

- Select the interface and mounting style before creating the PCB footprint.
- Obtain the exact RHT part drawing and mating-interface definition.
- Agree the PCB stack-up and impedance target with the fabricator.
- Review the connector launch and return-current path as one RF transition.
- Validate the assembled board using a documented VNA setup and the actual operating band.

01 | ENGINEERING OVERVIEW

The connector is one element in a complete RF interconnection.

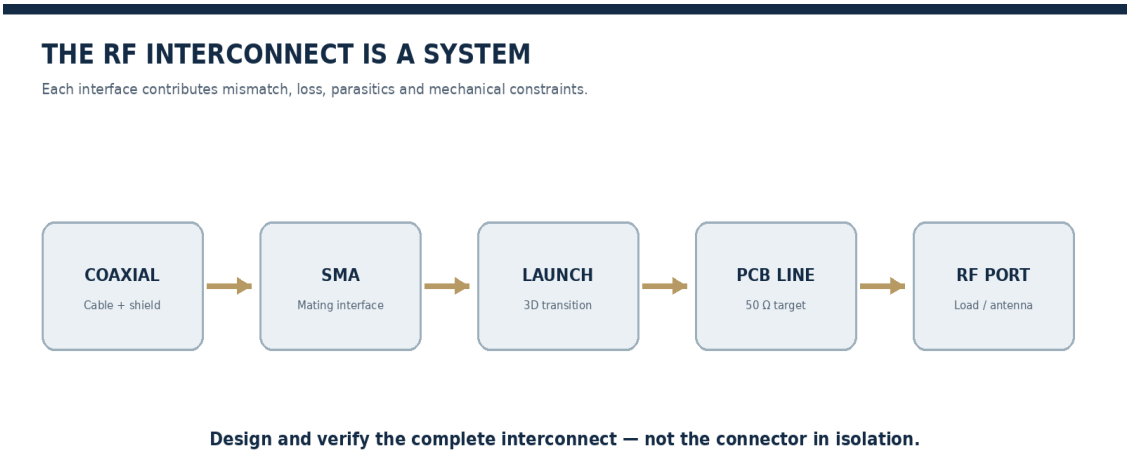


Figure 1. RF interconnect system boundary.

An RF path commonly consists of a coaxial cable, a mated SMA interface, the connector-to-PCB launch, a controlled-impedance PCB transmission line and the radio, filter, amplifier or antenna port. Each transition can introduce mismatch, conductor and dielectric loss, radiation, coupling or mechanical instability.

Design principle

KEY PRINCIPLE A connector specified as 50 Ω does not guarantee that the assembled cable–connector–PCB path is 50 Ω. The launch geometry, reference plane, grounding, PCB material and assembly quality must preserve the intended impedance.

What the engineer must control

CONTROL AREA	DESIGN QUESTION	REQUIRED EVIDENCE
Interface	Does the mating connector have the correct SMA / RP-SMA contact and coupling interface?	Mating-face drawing; interface designation
Electrical	Does the connector cover the operating band, power and environmental envelope?	Approved part specification; test data
PCB	Does the RF feed maintain the target impedance on the real stack-up?	Stack-up; field-solver output; fab review
Transition	Is the coax-to-PCB launch electrically continuous and low-discontinuity?	Footprint review; EM simulation or VNA data
Mechanical	Can the connector withstand mating, cable load and enclosure constraints?	Mechanical drawing; retention and assembly review
Validation	Is the complete assembly measured at the correct reference plane?	Calibration record; S-parameter report

02 | SMA INTERFACE & MATING COMPATIBILITY

Confirm the mating interface from the controlled drawing — never by appearance alone.

SMA is a threaded coaxial connector family with a nominal 50 Ω characteristic impedance. IEC 61169-15:2021 is the sectional specification for SMA-type RF coaxial connectors. It defines mating-face dimensions, gauging information and relevant test requirements; it does not mean every SMA product has the same frequency, power or environmental rating.

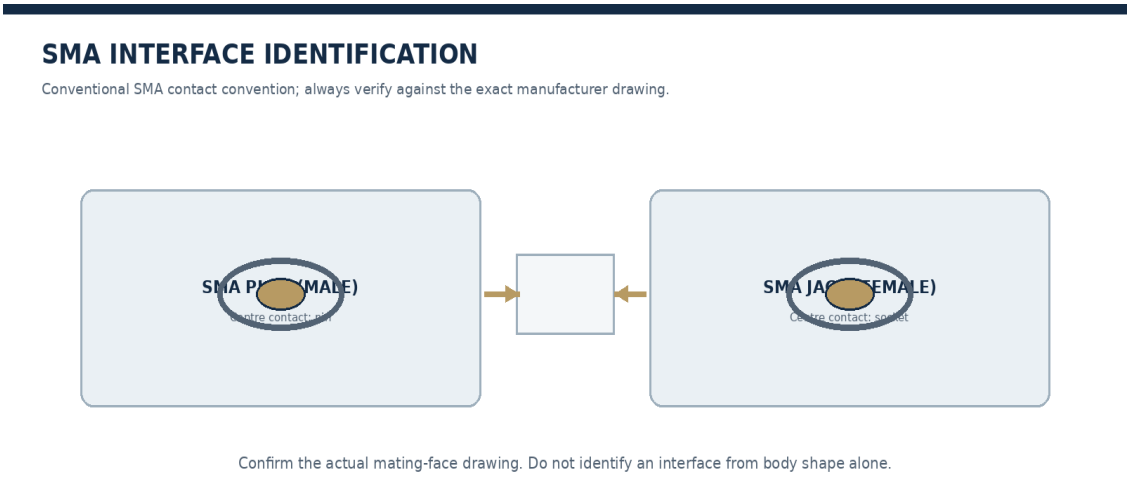


Figure 2. Simplified conventional SMA plug / jack contact convention.

INTERFACE	CENTRE CONTACT	ENGINEERING CHECK
Conventional SMA plug (male)	Pin	Confirm mating jack, pin geometry, coupling nut and interface drawing.
Conventional SMA jack (female)	Socket	Confirm mating plug and contact engagement.
RP-SMA plug / jack	Reversed centre-contact convention	Do not mate with conventional SMA based only on thread/body fit; verify exact interface.
Cable / panel / PCB versions	Varies by mounting construction	Check interface end separately from mounting end.

CRITICAL DISTINCTION SMA and RP-SMA can look mechanically similar. A wrong centre-contact combination can cause an open or unreliable RF connection, damage contacts, or create a misleading mechanical fit.

Pre-layout mating check

- ☐ Identify the exact mating part number and its interface designation.
- ☐ Compare mating-face dimensions, centre-contact type and coupling geometry.
- ☐ Confirm the connector is rated for the intended mating-cycle requirement.
- ☐ Check whether adapters are permitted and include their loss and mismatch in the RF budget.
- ☐ Do not assume 3.5 mm, 2.92 mm or other precision connector families are interchangeable unless the manufacturers explicitly approve the combination.

03 | CONNECTOR SELECTION WORKFLOW

Choose the connector from the application constraints, not from the cheapest or most familiar footprint.

SELECTION INPUT	ENGINEERING REQUIREMENT	WHAT TO RECORD
Operating frequency	Minimum / maximum frequency; harmonics and broadband test span	fmin, fmax, guard band
System impedance	Nominal impedance of radio, cable and antenna port	Typically 50 Ω in SMA RF systems; verify system
RF power	CW / peak power, duty cycle, mismatch condition and temperature	Maximum power at frequency and ambient
Mounting	Edge-launch, end-launch, vertical, right-angle, through-hole, SMT or cable	Mounting style and board thickness
Mating interface	SMA / RP-SMA; plug / jack; cable or antenna mate	Exact interface code and mate P/N
Mechanical envelope	Board edge, panel cut-out, height, wrench access and cable bend	Keep-out and tolerance stack
Environment	Temperature, vibration, corrosion, ingress and outdoor exposure	Required qualification levels
Lifecycle	Mating cycles, service access, replacement and availability	Expected cycles / service concept

Mounting-style decision matrix

STYLE	GOOD FIT WHEN	DESIGN RISKS / REVIEW
Edge-launch / end-launch	Coaxial cable enters from board edge; low-profile board-level RF port	Board thickness, edge tolerance, launch ground tabs, solder fillets and cable torque
Vertical / through-hole	Connector axis is perpendicular to PCB; robust mechanical anchoring is needed	Ground-pin inductance, hole tolerances, pad geometry, solder fill and board clearance
Right-angle PCB mount	Horizontal cable exit is needed within enclosure height constraints	Connector body overhang, lever arm, board-edge alignment and wrench access
SMT	Automated assembly and reflow are required by product process	Reflow profile, coplanarity, ground attachment, mechanical retention and inspection
Panel / bulkhead	RF port must pass through an enclosure wall	Panel thickness, sealing, washer / nut stack, chassis bonding and cable loads

SELECTION GATE Do not release a footprint until the exact part number, mating interface, approved drawing, board thickness range and mounting style are confirmed.

04 | ELECTRICAL & RF PERFORMANCE PARAMETERS

Every limit must be tied to a defined test method and frequency.

PARAMETER	WHAT IT MEANS	SELECTION / VERIFICATION NOTE
Characteristic impedance (Z0)	Nominal voltage-to-current travelling-wave ratio	SMA RF systems are commonly 50 Ω; verify the actual system requirement.
Frequency range	Range over which the connector is specified	Use the guaranteed range for the selected part, not the family name.
VSWR / Return Loss	Input mismatch at a defined reference plane	Require limits across frequency and stated test configuration.
Insertion loss	Power lost through the mated connector / interconnect	Check frequency, cable / fixture contribution and mated condition.
Power handling	Permitted RF power under stated conditions	Depends on frequency, VSWR, ambient, duty cycle and thermal path.
Insulation resistance / dielectric withstand	DC isolation and dielectric integrity	Use product specification and applicable test standard.
Contact resistance	Electrical resistance of centre and outer contacts	Check initial and post-environmental limits where specified.
Mating durability	Performance after specified connection cycles	Confirm cycles and post-test acceptance criteria.
Temperature range	Permitted operating / storage temperatures	Do not infer the upper limit from a partial specification.

Return loss and VSWR relationship

For a reflection coefficient magnitude $|\Gamma|$, return loss is $RL = -20 \log_{10}(|\Gamma|)$ dB and $VSWR = (1 + |\Gamma|) / (1 - |\Gamma|)$. These are related descriptions of mismatch, not independent performance guarantees.

RETURN LOSS	$\|\Gamma\|$ APPROX.	VSWR APPROX.
10 dB	0.316	1.92:1
15 dB	0.178	1.43:1
20 dB	0.100	1.22:1
25 dB	0.056	1.12:1
30 dB	0.032	1.07:1

INTERPRETATION A return-loss figure is meaningful only when its frequency span, reference plane, calibration method, connector mating condition and fixture contribution are known.

05 | PCB TRANSMISSION-LINE DESIGN

The PCB stack-up is part of the RF design specification.

The trace geometry required for a target impedance depends on the finished dielectric thickness, dielectric properties at the relevant frequency, copper thickness and profile, trace width, solder mask, nearby ground copper and routing topology. Nominal FR-4 Dk values are not a substitute for the fabricator's actual material model.

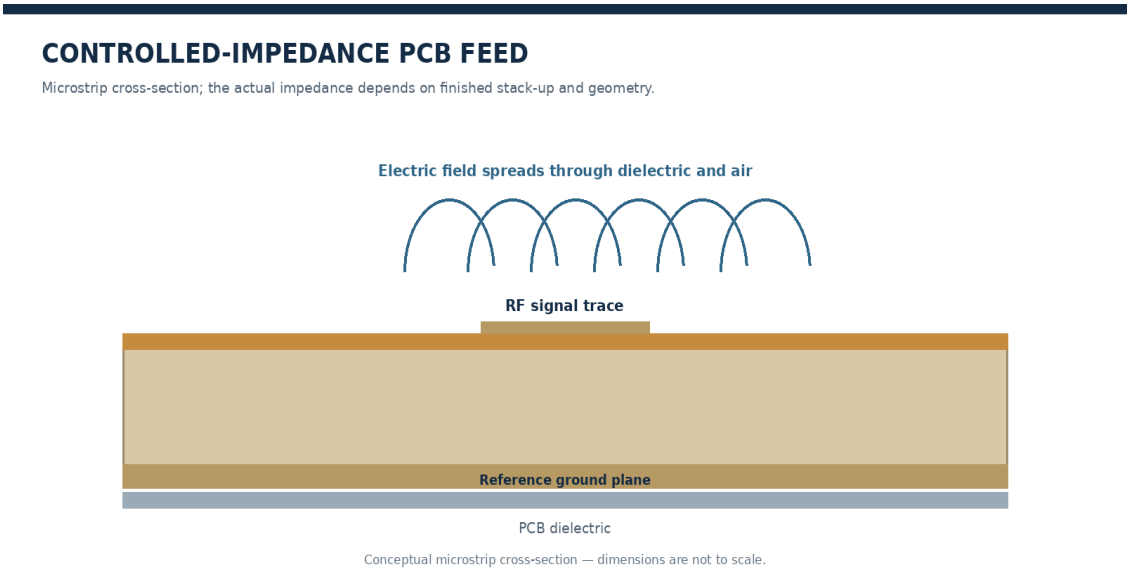


Figure 3. Conceptual microstrip cross-section.

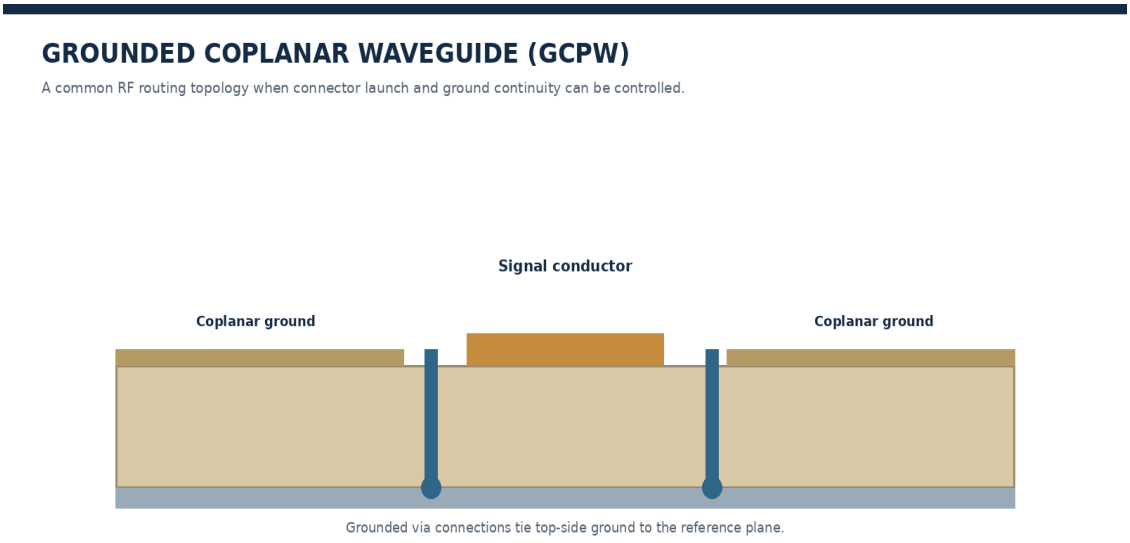


Figure 4. Conceptual grounded coplanar waveguide cross-section.

TOPOLOGY	STRUCTURE	PRACTICAL CONSIDERATIONS
Microstrip	Surface signal trace over a reference plane	Simple routing; fields occupy dielectric and air; sensitive to mask and nearby structures.
Grounded coplanar waveguide (GCPW)	Surface signal trace with coplanar grounds and a backing ground plane	Useful for compact RF launches; ground-via stitching and gap geometry matter.
Stripline	Signal conductor embedded between reference planes	Well-shielded; requires layer transitions to surface-mounted connector and careful via design.

PCB fabricator data to obtain

- ☐ Finished dielectric thickness between the RF layer and its reference plane.
- ☐ Actual laminate designation and frequency-relevant design Dk / loss tangent.
- ☐ Finished copper thickness, foil type and etch compensation assumptions.
- ☐ Solder-mask coverage / thickness over the RF line and launch.
- ☐ Impedance-control capability, tolerance and coupon measurement method.
- ☐ Copper pour, plane clearance, via plating and layer-to-layer connectivity.

DO NOT COPY A GENERIC 50 Ω WIDTH A trace width copied from another board or online calculator is not transferable unless stack-up, material, copper, mask and topology match. Obtain a field-solver result or impedance calculation based on the fabricator's controlled stack-up.

06 | CONNECTOR-TO-PCB LAUNCH DESIGN

The launch is a three-dimensional electromagnetic transition.

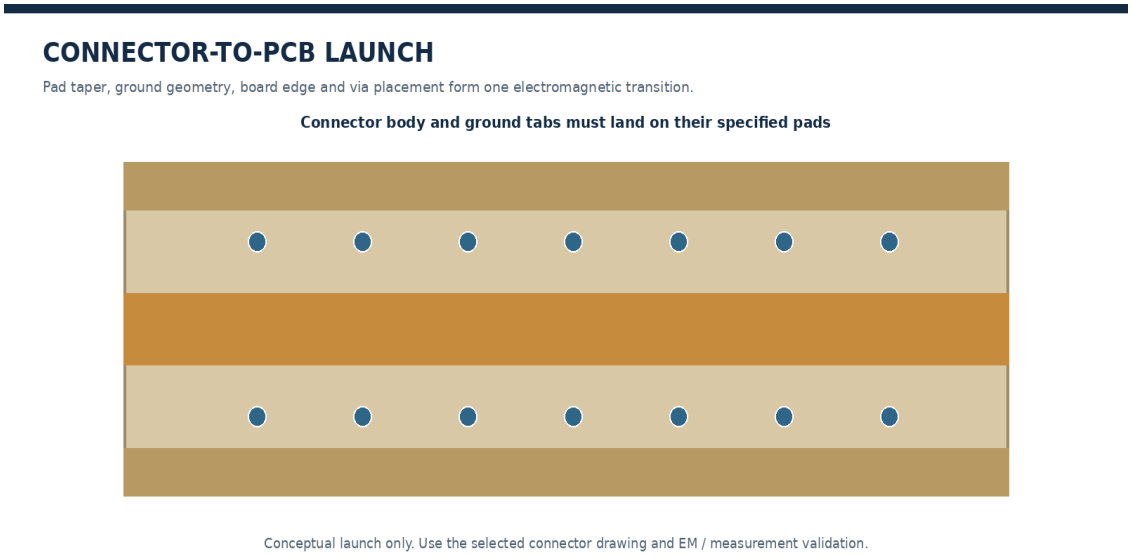


Figure 5. Conceptual edge-launch transition; not a manufacturing footprint.

At the connector, the coaxial TEM field structure transitions into a planar PCB field structure. The centre pin / signal pad, ground tabs, solder geometry, board edge and return plane jointly determine the transition. A footprint that merely matches the mechanical outline can still produce an electrically poor launch.

Launch review checklist

- ☐ Use the manufacturer's recommended land pattern for the exact connector part number and board thickness.
- ☐ Match the signal pad to the centre-contact geometry; avoid abrupt width changes and unnecessary stubs.
- ☐ Keep the connector ground tabs / body bonded to the intended PCB ground with short, broad connections.
- ☐ Confirm board-edge position, edge plating requirements (if any), cut-out and tolerance stack.
- ☐ Avoid solder-mask openings or mask dams that conflict with the connector drawing or assembly process.
- ☐ Review the launch in 3D EM simulation when bandwidth, frequency, power or performance requirements justify it.
- ☐ Measure a representative assembled coupon or product board to validate the transition.

Common launch discontinuities

OBSERVED GEOMETRY	POSSIBLE RF EFFECT	ENGINEERING ACTION
Signal pad too wide / abrupt step	Local capacitive discontinuity	Tune pad taper / width with EM simulation and VNA.
Long exposed centre pin	Series inductance and radiation	Use approved footprint; minimise unsupported pin length.
Poor ground-tab soldering	High return-path inductance / asymmetry	Improve pad design, process control and inspection.
Ground-plane gap at board edge	Return-current detour	Review plane continuity and connector ground attachment.
Uncontrolled stub / via transition	Resonance or mismatch	Remove unused stubs; model layer transitions.

07 | GROUNDING & RETURN-CURRENT CONTROL

At RF, ground is a current path — not merely a schematic symbol.

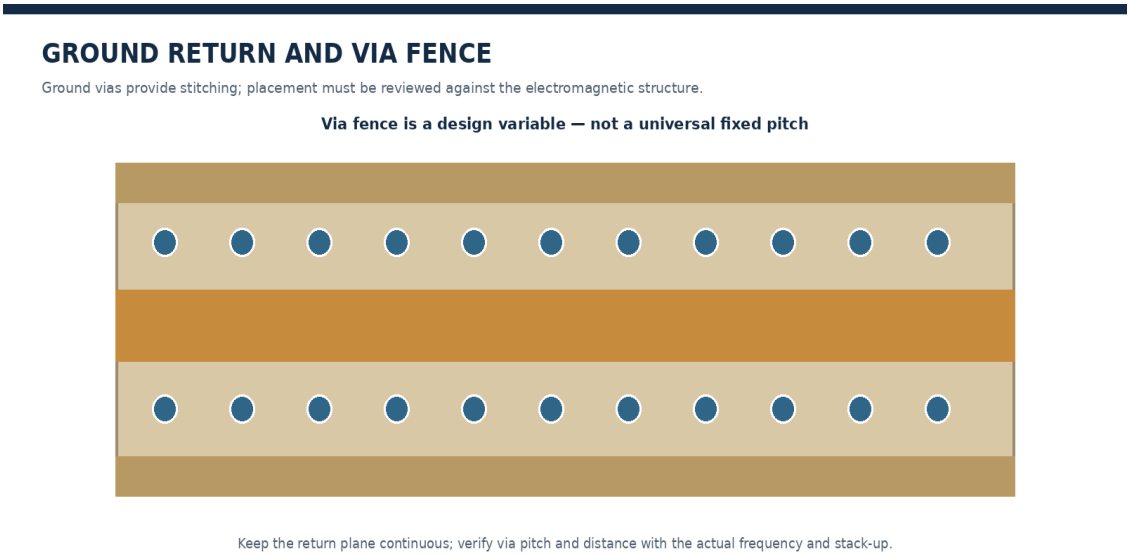


Figure 6. Conceptual via-fence arrangement; pitch is application-dependent.

The outer conductor of the coaxial connector carries the return current. At the PCB launch, current must transfer smoothly into the PCB reference structure. A broken plane, narrow ground neck, sparse or poorly connected vias, or a long return detour can increase inductance and create common-mode radiation or coupling.

Grounding practices

- Maintain a continuous reference plane beneath the RF feed wherever the chosen topology requires it.
- Connect connector ground pads to the reference plane with short, low-inductance paths.
- Place stitching vias close to the connector ground pads and along GCPW ground regions as required.
- Ensure vias connect to the intended ground layer; check antipads, plane splits and thermal reliefs.
- Avoid routing high-speed digital lines, switching nodes or noisy clocks through the RF launch / antenna region.
- Do not use a universal via-fence pitch. Establish spacing from the highest frequency, guided wavelength, topology and EM review.

VIA PITCH AS A STARTING POINT ONLY A fraction of guided wavelength (for example, λg/10) is sometimes used as an initial layout heuristic, not as a guaranteed design rule. The acceptable spacing depends on frequency, geometry, substrate, via inductance and the required suppression of leakage / modes. Validate it.

08 | MECHANICAL INTEGRATION & ENCLOSURE

The cable and mating torque must not be transferred into a fragile PCB launch.

MECHANICAL ITEM	DESIGN REVIEW
Connector envelope	Body length / width / height, coupling-nut clearance, wrench access and adjacent-component spacing.
Board thickness	Confirm supported PCB thickness and any seating / shoulder constraints.
Board edge	Check edge position, routing tolerance, chamfer, cut-out and connector seating.
Panel interface	If bulkhead-mounted, verify panel thickness, hole, washer, nut, sealing and chassis bonding.
Cable bend radius	Use cable supplier's static / dynamic bend-radius limits; avoid sharp bends at the connector.
Cable strain relief	Support the cable so vibration, pull and repeated movement do not load solder joints.
Mating torque	Use the torque specified by the connector manufacturer / applicable interface instruction; do not guess.
Mating cycles	Confirm the rated cycles and replacement strategy for serviceable equipment.

Mechanical failure modes

- PCB cracking or pad lift caused by cable leverage.
- Connector rotation or movement caused by inadequate mechanical anchoring.
- Intermittent centre contact due to cross-threading, damaged pin or incomplete mating.
- Corrosion / fretting at contacts due to environment or unsuitable plating.
- Enclosure interference that side-loads the connector or prevents correct mating.

09 | ASSEMBLY, SOLDERING & INSPECTION

The process must be compatible with the connector construction and the selected mounting technology.

Do not apply a generic soldering temperature profile or torque value to all SMA connectors. Connector materials, plating, insulator type, mounting style and thermal mass differ. Use the supplier's process recommendation and qualify the actual board assembly.

PROCESS STAGE	CONTROL / ACCEPTANCE EVIDENCE
Incoming inspection	Part number, revision, interface, plating / finish, dimensions, packaging and damage check.
PCB preparation	Board thickness, edge quality, pad finish, solder-mask registration and cleanliness.
Placement	Connector seating, alignment, board-edge position and coplanarity.
Soldering	Approved hand-solder / reflow process; thermal exposure compatible with insulator and finish.
Visual inspection	Centre pin wetting, ground-tab joints, voids / bridges, solder fillet, seating and contamination.
Mechanical inspection	No movement, lifted pads, cracked laminate or connector body distortion.
Electrical / RF test	Continuity and isolation as applicable; VNA check on defined sample / lot plan.
Traceability	Record supplier lot, connector P/N, PCB revision, process, date and test evidence.

INSPECTION CAUTION A visually acceptable solder joint does not prove RF performance. Conversely, a VNA anomaly must be investigated for calibration, cable, fixture and DUT setup errors before assigning a product defect.

10 | RF CHARACTERIZATION & VNA TESTING

Measure the DUT at a controlled reference plane.

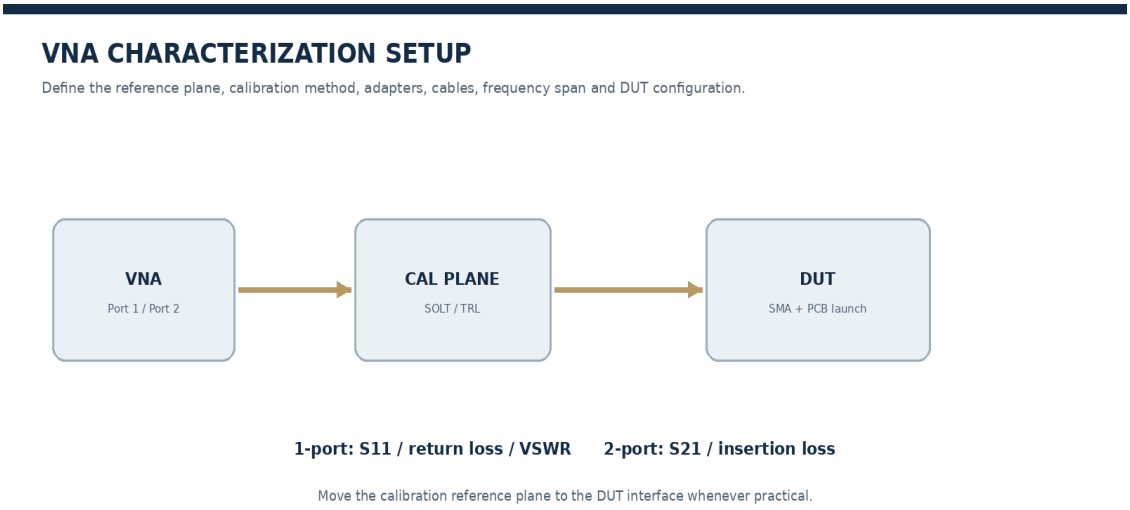


Figure 7. Simplified VNA measurement chain.

MEASUREMENT	WHAT IT SHOWS	WHEN TO USE
S11 / Return Loss	Reflected wave at port 1; input match	Connector, launch and antenna-port matching.
VSWR	Mismatch expressed as standing-wave ratio	Quick engineering interpretation of input match.
S21 / Insertion Loss	Forward transmission between ports	Cable / connector / feed-path loss with a suitable two-port fixture.
TDR / time-domain transform	Location and nature of impedance discontinuities	Finding launch, cable, connector or via-transition anomalies.
Continuity / isolation	DC connection and unintended shorts	Incoming, assembly and fault isolation; not a substitute for RF test.

Recommended measurement sequence

1. Define the test frequency span, source power, IF bandwidth, sweep points and acceptance criteria.
2. Select a calibration method appropriate to the fixture (e.g., SOLT for coaxial standards; TRL where suitable planar standards are available).
3. Calibrate at the intended DUT reference plane; include the test cable and adapters that would otherwise contaminate the result.
4. Verify calibration with a known standard and inspect cable / connector condition.
5. Mate the DUT using the correct interface and controlled procedure; avoid repeated unnecessary mating.
6. Record S11, and S21 if the test fixture supports a valid two-port measurement.
7. Save Touchstone data where possible, plots, calibration kit / serial, test cable, adapter, PCB revision and DUT identification.

REFERENCE-PLANE DISCIPLINE Calibration corrects systematic measurement errors up to the plane where standards are connected. If adapters or fixtures remain beyond that plane, they remain part of the measured network unless properly de-embedded.

11 | PRACTICAL APPLICATION — 2.4 GHz EXTERNAL ANTENNA LINK

Illustrative system example only. The radio module shown is a third-party reference device, not an RHT product.



Figure 8. Example NRF24L01+PA+LNA module with external antenna from the supplied reference material. This photograph is not evidence of an RHT connector part number or qualification.

An external SMA antenna interface is common in embedded 2.4 GHz radio systems. The design task is to preserve the intended 50 Ω RF path from the module port through the mating interface and cable to the antenna, while controlling power integrity, antenna placement and enclosure effects.

Example system considerations

ELEMENT	DESIGN-IN ACTION
Module RF port	Confirm exact connector interface, pin / socket, board mounting and RF port impedance from the current module drawing.
SMA mating component	Confirm conventional SMA vs RP-SMA, contact gender and approved mate.
Cable / pigtail	Use a 50 Ω cable assembly; account for insertion loss, bend radius, shielding and length.
Antenna	Use the antenna's frequency band, gain, VSWR, ground / keep-out and mounting requirements.
Host PCB	Keep the RF feed short and controlled impedance; preserve reference ground through the launch.
Power integrity	The supplied module reference lists 3.0–3.6 V supply and 115 mA peak TX current; validate the actual module revision and measure rail droop during transmission.
Enclosure	Test the antenna in the final housing and installation orientation; nearby metal, batteries, displays and the user's hand can detune it.
Regulatory	Evaluate conducted power, antenna gain, EIRP, spurious emissions and regional radio requirements for the final product.

THIRD-PARTY DATA BOUNDARY The source material describes an NRF24L01+PA+LNA module and reports certain supplier-stated figures. Those values belong to that module reference only; they are not RHT SMA connector ratings and must not be used as connector qualification data.

12 | RF BUDGET & ANTENNA SYSTEM CONSIDERATIONS

Do not confuse connector power handling with system radiated power.

The available link margin is affected by transmitter output, cable loss, connector loss, antenna gain, propagation loss, receiver sensitivity, installation and interference. A connector with a high nominal power rating does not compensate for a poor antenna match or excessive feed loss.

BUDGET ITEM	ENGINEERING TREATMENT
Transmitter output	Use the conducted output at the specified reference plane and operating mode.
Cable loss	Use the cable manufacturer's loss-versus-frequency data at actual length and bend condition.
Connector / adapter loss	Use verified data for the exact connector, adapter count and frequency.
Antenna gain	Use realized gain in the final installation where available; peak free-space gain may not represent installed performance.
Mismatch	Account for antenna and interconnect mismatch; verify S11 at the relevant reference plane.
EIRP	Calculate from conducted power, losses and antenna gain; confirm regulatory limits for the market.
Receiver performance	Use sensitivity at the actual data rate, packet format and test conditions.

Antenna placement

- Follow the antenna supplier's keep-out and ground-plane instructions.
- Keep the antenna away from metal frames, batteries, display shields and high-current switching circuitry where possible.
- Avoid routing digital clocks and switching-regulator nodes near the antenna feed.
- Test multiple orientations and realistic user / enclosure conditions.
- Do not treat an open-space range claim as a guaranteed product range.

13 | COMMON DESIGN FAILURES & TROUBLESHOOTING

Diagnose the complete measurement chain before changing the connector.

SYMPTOM	LIKELY CAUSES	DIAGNOSTIC ACTION
Poor S11 across the band	Wrong interface, poor launch, discontinuous ground, incorrect trace impedance	Verify mating interface; inspect launch; compare with a calibrated reference DUT.
Narrow deep notch / resonance	Stub, via transition, launch pad capacitance, enclosure coupling	Use TDR / time-domain transform; inspect geometry and nearby structures.
Unexpectedly high insertion loss	Cable loss, damaged contact, poor solder, excessive adapter count, PCB dielectric loss	Measure cable and connector separately; inspect joints; compare fixture baseline.
Performance changes after mating	Worn / damaged contact, cross-threading, contamination, inconsistent torque	Inspect mating faces; use known-good mate; control mating procedure.
Intermittent RF link	Power droop, loose cable, antenna detuning, interference, marginal link budget	Monitor module supply during TX; secure cable; test antenna in final enclosure.
Board-to-board variation	Stack-up / etch variation, connector placement, solder variation, ground via connectivity	Correlate VNA data with PCB lot, assembly lot and fab impedance coupons.
VNA results not repeatable	Calibration drift, cable movement, poor adapters, dirty connector, wrong reference plane	Recalibrate; secure cables; inspect standards and repeat with traceable setup.

Fault-isolation order

8. Confirm the exact DUT, connector interface and mating component.
9. Inspect connector and cable for mechanical damage, contamination or cross-threading.
10. Verify VNA calibration and reference plane with a known standard.
11. Measure cable / adapter baseline independently.
12. Check DC continuity and unintended shorts where appropriate.
13. Inspect PCB launch, ground vias, board edge and solder joints.
14. Compare the measured trace with simulation / known-good board and revise one variable at a time.

14 | DESIGN-IN RELEASE CHECKLIST

Use this checklist at schematic, layout, fabrication and production release.

- ☐ Exact RHT SMA part number selected and latest approved drawing / specification obtained.
- ☐ Conventional SMA or RP-SMA interface confirmed; mating plug / jack and centre contact verified.
- ☐ Operating frequency, impedance, RF power, temperature and mating-cycle requirements documented.
- ☐ Mounting style, board thickness, connector orientation and mechanical envelope confirmed.
- ☐ PCB stack-up, laminate data, finished dielectric thickness, copper and solder mask confirmed with fabricator.
- ☐ RF trace topology and target impedance agreed; geometry checked using actual stack-up.
- ☐ Connector land pattern and board-edge location checked against the approved drawing.
- ☐ Ground return path, plane continuity, ground pads and via stitching reviewed.
- ☐ Enclosure clearance, wrench access, cable bend radius and strain relief reviewed.
- ☐ Assembly process and inspection criteria qualified for connector construction.
- ☐ VNA test span, calibration method, reference plane and acceptance limits defined.
- ☐ Representative assembled hardware tested in the final enclosure and antenna configuration.
- ☐ Test data, Touchstone files, calibration record, PCB revision and connector lot retained.

RELEASE RULE Do not release the design based only on a nominal SMA label or a copied footprint. The controlled connector drawing, actual PCB stack-up and measured assembly must agree.

15 | PART-SPECIFIC DATA REQUIRED FOR AN RHT DESIGN-IN

Complete this engineering data set for the exact selected RHT item before customer design approval.

DATA FIELD	REQUIRED CONTROLLED INFORMATION
RHT part number / revision	Exact orderable P/N and drawing revision
Interface designation	SMA / RP-SMA; plug / jack; mating-face standard
Mounting construction	Edge / end launch, vertical, right-angle, SMT, through-hole, panel or cable
Dimensions	Body, centre contact, ground tabs, board thickness, board edge and keep-out
Electrical impedance	Nominal impedance and tolerance, if specified
Frequency range	Guaranteed frequency range and test method
VSWR / return loss	Limit versus frequency and measurement reference plane
Insertion loss	Limit versus frequency, test fixture and mated condition
Power handling	CW / peak, frequency, VSWR, ambient and duty-cycle conditions
Materials / finish	Body, contact, plating system and insulator
Mechanical ratings	Mating cycles, retention / torque instructions and cable-load limits
Environmental ratings	Operating temperature, vibration, corrosion / salt mist and other applicable tests
Compliance	Applicable RoHS / REACH and material declarations, where available
Qualification evidence	Inspection report, test report, reliability data and change-control status

Engineering owner: Rick | RHT Electronics | rhtconn.com

16 | REFERENCES & TECHNICAL NOTES

Use current editions and the exact part manufacturer's controlled documents.

1. IEC 61169-15:2021. Radio-frequency connectors — Part 15: Sectional specification — RF coaxial connectors with threaded coupling, characteristic impedance 50 Ω (type SMA). https://webstore.iec.ch/en/publication/62310

2. Rogers Corporation. PCB design and fabrication concerns for high-frequency circuits; discussion of microstrip, GCPW, effective dielectric environment and material effects. https://rogerscorp.com/-/media/project/rogerscorp/documents/articles/english/advanced-connectivity-solutions/pcb-design-and-fabrication-concerns-for-millimeter-wave-circuits.pdf

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5. Keysight Technologies. Accurate Measurement Calibrations; calibration quality and reference-plane placement. https://helpfiles.keysight.com/csg/pxivna/S3_Cals/Accurate.htm

Engineering assumptions and limitations

The diagrams in this note are conceptual engineering illustrations and are not manufacturing drawings, recommended footprints or simulation results. Any example values are explanatory only. Final design decisions must be validated against the selected RHT part, mating component, PCB fabrication stack-up, assembly process, operating environment and applicable regulatory requirements.

Where this note conflicts with the latest approved RHT product drawing or specification, the controlled product document takes precedence. No statement in this note expands a product rating or creates a product warranty.

Document identification

DOCUMENT	REVISION	DATE	PREPARED BY
RHT-AN-RF-001	A	06 November 2026	Rick

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