

Field Technician Quick-Reference Checklist

Field Service & Verification Form | Lead Specialist: Kadeem Manning | Instrument: Interdigital Capacitor (IDC) Microstrip Dielectric Cell

Technician Name:	Kadeem Manning	Date / Time:	____ / ____ / 2026
Station / Location:	_____	Unit Serial #:	_____ _____
Weather Conditions:	Temp: ____°C RH: ____%	Target BAC / Permittivity:	_____ _____

Step / Item	Procedure & Acceptance Criteria	Target Range	Pass / Fail
1. Substrate Inspection	Verify RT/Duroid laminate for scratches, oxidation, or copper finger damage.	Trace Intact / Clean	[] Pass [] Fail
2. Finger Geometry Audit	Measure finger count (\$N\$), width (\$W\$), and end-gap (\$GE\$) under microscope.	Nominal Design Size	[] Pass [] Fail
3. Connector Torque	Attach SMA launch connectors with calibrated torque wrench.	5.0 in-lbs ± 0.2	[] Pass [] Fail
4. Instrument Calibration	Perform 1-port \$S_{11}\$ reflection calibration on VNA/LCR meter at 600 MHz.	Cal Plane at SMA	[] Pass [] Fail
5. Air Baseline \$C_0\$	Record baseline air capacitance \$C_0\$ across open finger array.	1.5–5.0 pF (by design)	[] Pass [] Fail
6. Quality Factor \$Q_0\$	Verify unloaded air Quality Factor (\$Q_0\$) peak at 600 MHz.	\$Q_0 \ge 150\$	[] Pass [] Fail
7. Sample Application	Dispense microliter sample or register dielectric film evenly over fingers.	Full Fringing Coverage	[] Pass [] Fail
8. Loaded Capacitance \$C_m\$	Measure loaded capacitance shift (\$C_m\$) and resonant frequency drop.	Shift > 0.20 pF	[] Pass [] Fail
9. Permittivity Extraction	Calculate sample relative permittivity \$ \epsilon_r \$ via \$ C = (\epsilon_r + 1) [(N - 3) A_1 + A_2] \$.	Model Fit Error < 2.5%	[] Pass [] Fail
10. Post-Test Cleaning	Rinse copper traces with isopropyl alcohol and blow dry with clean dry air.	Zero Residue / Dry	[] Pass [] Fail

FIELD NOTES & SAMPLE CHARACTERIZATION LOG:

FIELD TECHNICIAN SIGN-OFF I attest that all calibration verification steps listed above have been executed strictly according to published SOP guidelines and quality assurance protocols.	Prepared & Verified By: Kadeem Manning Lead Field Specialist Signature: _____ Date: _____
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