

FIELD TECHNICIAN QUICK-REFERENCE CHECKLIST

SIW C-Band Resonator Dielectric Sensor Checklist

TECHNICIAN NAME:	Kadeem Manning	DATE / TIME:	___ / ___ / 2026 __:__
LOCATION / STATION:	_____	SENSOR MODEL:	Substrate Integrated Waveguide / Keysight N9918A
SERIAL NUMBER:	S/N: _____	WEATHER / AMBIENT:	Temp: ____°C RH: ____%

Step	Verification Procedure	Operational Target / Criteria	Status
1. VNA Warm-Up	Power on VNA for internal oscillator stabilization.	30 minutes warm-up time	☐ Pass ☐ Fail
2. Sweep Configuration	Set span 4.0–8.0 GHz, 1601 pts, 100 Hz IFBW.	IFBW 100 Hz, power 0 dBm	☐ Pass ☐ Fail
3. 2-Port SOLT Cal	Calibrate VNA test cables with SOLT standards.	$S_{11}, S_{22} < -45\text{ dB}$	☐ Pass ☐ Fail
4. Connector Mating	Torque SMA launches using precision wrench.	$5.0 \pm 0.2\text{ in-lbs}$ torque	☐ Pass ☐ Fail
5. Unloaded Baseline	Measure S_{21} response with empty channel.	$f_0 \approx 5.80\text{ GHz}$, $S_{21} \geq -3.5\text{ dB}$	☐ Pass ☐ Fail
6. Quality Factor Q_0	Calculate unloaded Quality Factor $Q_0 = f_0 / \Delta f_0$.	$Q_0 \geq 250$	☐ Pass ☐ Fail
7. Sample Injection	Inject $15.0\text{ }\mu\text{L}$ liquid sample into channel.	Zero bubbles in sensing slot	☐ Pass ☐ Fail
8. Resonant Shift	Record shifted frequency f_r and S_{21} peak.	Clear single resonance dip	☐ Pass ☐ Fail
9. Thermal Correction	Record ambient temperature and apply quadratic offset.	$T = 25.0 \pm 1.0^\circ\text{C}$	☐ Pass ☐ Fail
10. Channel Flush	Flush with methanol; verify f_0 returns to baseline.	$f_0 \pm 2\text{ MHz}$ recovery	☐ Pass ☐ Fail

FIELD NOTES & OBSERVATIONS:

FIELD TECHNICIAN SIGN-OFF & APPROVAL

Lead Specialist: Kadeem Manning Role: Field Calibration & Maintenance Specialist Document: Standalone Quick-Reference Checklist	Signature: _____ Sign Date: _____
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