



Mini-Circuits

VNA CALIBRATION

SMA Calibration Kit

KSOLT-63-S+



FEATURES

- Precision SMA calibration kit up to 6 GHz
- Works out of the box with Mini-Circuits' [eVNA-63+](#)
- Full set of Short / Open / Load standards (m and f)
- Full set of phase-equal Thru standards (f to f, f to m, m to m)
- Torque wrench included
- Wooden storage case



PRODUCT OVERVIEW

Mini-Circuits' KSOLT-63-S+ is a complete calibration kit intended for VNA measurements of any SMA DUT (device under test). The kit is supplied in a wooden storage and display case, containing a full set of SOL standards (Short, Open & Load, each with male and female options), full set of phase-equal Thru standards (female to female, female to male, male to male) and break-over torque wrench.

KSOLT kits are supported by Mini-Circuits [eVNA-63+](#) vector network analyzer right out of the box, with all calibration definitions pre-loaded within the eVNA Studio software. The kit can also be used as a cost-effective, high-performance alternative to calibration kits from a wide range of other VNA suppliers.

KEY FEATURES

| Feature | Advantages |
|---|--|
| Cost effective kit | Complete kit containing all required standards and torque wrench for performing reliable and repeatable VNA calibrations |
| Excellent return loss, 42 dB typ | Precision calibration standards with high return loss minimize the measurement errors within a VNA system |
| Phase-equal / swap-equal Thru standards | Thru standards with different SMA gender combinations but identical phase length can be swapped into the test setup in place of each other without affecting the integrity of the calibration, providing flexibility for measurements of non-insertable DUT. |

REV. OR
ECO-011699
KSOL-63-N+
210201





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KIT CONTENTS

| Quantity | Model Name | Description |
|----------|--------------|---|
| 1 | SOL-63 SF+ | Short / Open / Load (SMA female) |
| 1 | SOL-63-SM+ | Short / Open / Load (SMA male) |
| 1 | MTH-63-SFSF+ | Phase Matched Thru (SMA female to female) |
| 1 | MTH-63-SFSM+ | Phase Matched Thru (SMA female to male) |
| 1 | MTH-63-SMSM+ | Phase Matched Thru (SMA male to male) |
| 1 | TRQ-516-08 | SMA break-over torque wrench |



ELECTRICAL SPECIFICATIONS AT 25°C

| Standard | Parameter | Min | Typ | Max | Units |
|-------------|--------------------------|-----|------|------|----------|
| | Frequency Range | DC | | 6 | GHz |
| | Impedance | | 50 | | Ω |
| OPEN, SHORT | Phase Error ¹ | | 1 | 2.5 | ° |
| LOAD | Return Loss | 36 | 42 | | dB |
| THRU | Insertion Loss | | 0.04 | 0.15 | dB |
| | Return Loss | 28 | 42 | | dB |
| | Phase Error ¹ | | 0.15 | 0.45 | °/GHz |

1. Phase error is the phase deviation from the calkit model definition

MAXIMUM RATINGS²

| Parameter | Ratings |
|------------------------------------|---------------|
| Operating Temperature ³ | 20°C to 26°C |
| Storage Temperature | -20°C to 75°C |

2. Permanent damage may occur if any of these limits are exceeded.
3. Operating temperature specified for optimal performance





CALKIT MODEL DEFINITION

| P/N | Standard Label | Parameter | Value | Units | Additional Format |
|--------------|----------------|--------------|----------|---------------------------|------------------------------|
| SOL-63-SF+ | SHORT -F- | Offset Delay | 16.7 | ps | 5.01 mm |
| | | Offset Loss | 10 | GΩ/s | 0.029 dB/√GHz |
| | | Z0 | 50 | Ω | 50 Ω |
| | | L0 | 8.000 | (1E-12) H | 8 pH |
| | | L1 | -995.000 | (1E-24) H/Hz | -0.995 pH/GHz |
| | | L2 | 33.000 | (1E-33) H/Hz ² | 0.033 pH/GHz ² |
| | OPEN -F- | L3 | -0.290 | (1E-42) H/Hz ³ | -0.00029 pH/GHz ³ |
| | | Offset Delay | 16.7 | ps | 5.01 mm |
| | | Offset Loss | 3 | GΩ/s | 0.009 dB/√GHz |
| | | Z0 | 50 | Ω | 50 Ω |
| | | C0 | 5.000 | (1e-15) F | 5 fF |
| | | C1 | 0.000 | (1e-27) F/Hz | 0 fF/GHz |
| | LOAD | C2 | 1.500 | (1e-36) F/Hz ² | 0.0015 fF/GHz ² |
| | | C3 | 0.100 | (1e-45) F/Hz ³ | 0.0001 fF/GHz ³ |
| | | Offset Delay | 0 | ps | 0 mm |
| | | Offset Loss | 0 | GΩ/s | 0 dB/√GHz |
| | | Z0 | 50 | Ω | 50 Ω |
| | | | | | |
| SOL-63-SM+ | SHORT -M- | Offset Delay | 16.7 | ps | 5.01 mm |
| | | Offset Loss | 10 | GΩ/s | 0.029 dB/√GHz |
| | | Z0 | 50 | Ω | 50 Ω |
| | | L0 | 4.000 | (1E-12) H | 4 pH |
| | | L1 | -650.000 | (1E-24) H/Hz | -0.65 pH/GHz |
| | | L2 | 39.000 | (1E-33) H/Hz ² | 0.039 pH/GHz ² |
| | OPEN -M- | L3 | -0.640 | (1E-42) H/Hz ³ | -0.00064 pH/GHz ³ |
| | | Offset Delay | 16.7 | ps | 5.01 mm |
| | | Offset Loss | 3 | GΩ/s | 0.009 dB/√GHz |
| | | Z0 | 50 | Ω | 50 Ω |
| | | C0 | 4.500 | (1e-15) F | 4.5 fF |
| | | C1 | 395.000 | (1e-27) F/Hz | 0.395 fF/GHz |
| | LOAD | C2 | -20.000 | (1e-36) F/Hz ² | -0.02 fF/GHz ² |
| | | C3 | 0.400 | (1e-45) F/Hz ³ | 0.0004 fF/GHz ³ |
| | | Offset Delay | 0 | ps | 0 mm |
| | | Offset Loss | 0 | GΩ/s | 0 dB/√GHz |
| | | Z0 | 50 | Ω | 50 Ω |
| | | | | | |
| MTH-63-S*S*+ | THRU | Offset Delay | 97.734 | ps | 29.3 mm |
| | | Offset Loss | 2.5 | GΩ/s | 0.021 dB/√GHz |
| | | Z0 | 50 | Ω | 50 Ω |

NOTES

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard. Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp