**Required Cable Capabilities for Testing 12 V to 1.2 V / 20 A Buck Converter**

|  |  |  |
| --- | --- | --- |
| **Cable Type** | **Use** | **Required Capability / Specs** |
| **Input Power Cables** | Connect 12 V lab supply | 🔹 Minimum 20 A continuous current 🔹 Voltage rating ≥ 30 V 🔹 Low resistance (<5 mΩ/m) 🔹 Insulation temp ≥ 80 °C |
| **Output Load Cables** | Deliver 1.2 V / 20 A to load | 🔹 Support high current with low voltage drop 🔹 Length < 30 cm if possible 🔹 Use 10–12 AWG 🔹 Parallel runs OK |
| **Ground Sense Cable** | Remote sense at load ground | 🔹 Thin, shielded cable okay 🔹 Must be twisted with V+ sense line 🔹 Ideally differential input at measurement point |
| **Voltage Sense Cable** | Remote sense at 1.2 V rail | 🔹 Shielded pair (for noise immunity) 🔹 Thin (22–26 AWG is fine) 🔹 Directly connected at load pins |
| **Oscilloscope Probes / Clips** | For Vout, SW node, ripple | 🔹 Use low-inductance ground spring probes 🔹 Differential probes for precision Vout readings |
| **Current Probe Cable / Loop** | Measure Iin, Iout | 🔹 Must handle up to 20 A AC/DC 🔹 Suitable for large loop size if needed 🔹 Shielded against EMI |
| **Thermocouple / IR Probe Cable** | Thermal testing | 🔹 Must support >100 °C measurement 🔹 Electrically isolated tip preferred |
| **EMI/FFT Injection Cable** | For harmonic/EMI testing | 🔹 Coaxial (SMA/BNC) 🔹 Shielded twisted pair if using LISN 🔹 Matched impedance (50 Ω) for spectrum analyzers |
| **Banana / Binding Post Cables** | Power input/output | 🔹 Rated ≥ 20 A 🔹 Gold-plated preferred for repeatability 🔹 Secure connection at all terminals |
| **Sense Compensator / Loop Injection Cables** | Loop testing | 🔹 Coaxial or twisted pair 🔹 Shielded for low noise 🔹 Injection transformer compatible (if using AP300 or similar) |

**Practical Tips**

* **Prefer flexible silicone-insulated cables** (rated to 105 °C or more) to avoid stiffness and heat buildup.
* **Color code cables** clearly (e.g., red = VIN, black = GND, blue = Vout Sense).
* **Twisted pairs** for all low-level signals to reduce coupling noise.
* For EMI testing, **coaxial and measurement cables** are **short**, **grounded**, and follow **proper probe de-embedding techniques**.

**Suggested Cable Types**

|  |  |
| --- | --- |
| **Use Case** | **Suggested Cable Spec** |
| High current (VIN/VOUT) | 10–12 AWG silicone wire, rated 600 V / 30 A |
| Low-current signals | 22–26 AWG twisted pair (e.g., Cat5 wire) |
| Probe extensions | RG-174 coaxial or equivalent |
| Scope ground loops | Tektronix ground spring or mini loop |