












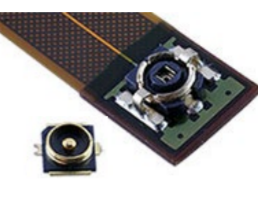
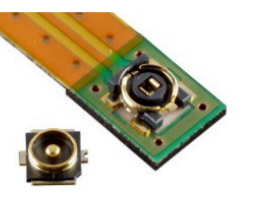
Micro RF coax connector

Click the photos below to get more detailed product information.

| Product name | | MHF® I LK | MHF® I | MHF® I | MHF® II | MHF® III | MHF® -A |
|-------------------------------------|--------------|--|---|---|---|---|---|
| Feature | |  |  |  |  |  |  |
| | | MHF I with mechanical lock | Best Insertion Loss | Most Cable O.D. options | Low profile plug for MHF I/II receptacle | low profile 1.60 mm | Shortest mated height with 3x3 mm footprint |
| Plug part number | | - | 20767-001R | 20670-001R-** | 20686-001R-08 20311-001R-10 | 20609-002R | 20428-001R |
| Receptacle part number | | | 20279-001E-** (3 pads) 20441-001E-01 (4 pads) | | | 20369-001E-** | 20429-001E |
| Maximum height (mm) | | 2.9 | 3.0 | 2.5 | 2.1 | 1.6 | 1.45 |
| Outside dimension of receptacle:mm | | | 3.0 x 3.0 | | | 2.0 x 2.0 | 3.0 x 3.0 |
| Coax O.D. (Center Conductor AWG) | 2.00 mm (26) | | ● | | | | |
| | 1.80 mm (30) | ● | | ● | | | |
| | 1.37 mm (30) | ● | | ● | | | |
| | 1.32 mm (32) | ● | | ● | | | |
| | 1.13 mm (32) | ● | | ● | | | ● |
| | 0.95 mm (33) | | | | ● | | |
| | 0.81 mm (33) | | | | | | |
| | 0.81 mm (36) | ● | | ● | ● | ● | |
| | 0.64 mm (36) | | | | | ● | |
| | 0.48 mm (38) | | | | | | |
| FPC | | | | | | | |
| Frequency | | | | | DC~6GHz | | |
| VSWR (L=100mm) | DC~3GHz | | | | 1.3 max. | | |
| | 3GHz~6GHz | | | | 1.5 max. | | |
| | 6GHz~9GHz | | | | - | | |
| | 9GHz~12GHz | | | | - | | |
| | 12GHz~15GHz | | | | - | | |
| Service temp. (Celsius) | | | | | -40 degree ~ +90 degree | | |
| Characteristic impedance | | | | | 50ohm | | |
| Rated voltage | | | | | AC60V | | |
| Contact resistance | | | | | 20m ohm max. | | |
| Withstand voltage | | | | | AC200V/min | | |
| Insulation resistance | | | | | 500M ohm min./DC100V | | |





Micro RF coax connector

↓ Click the photos below to get more detailed product information.

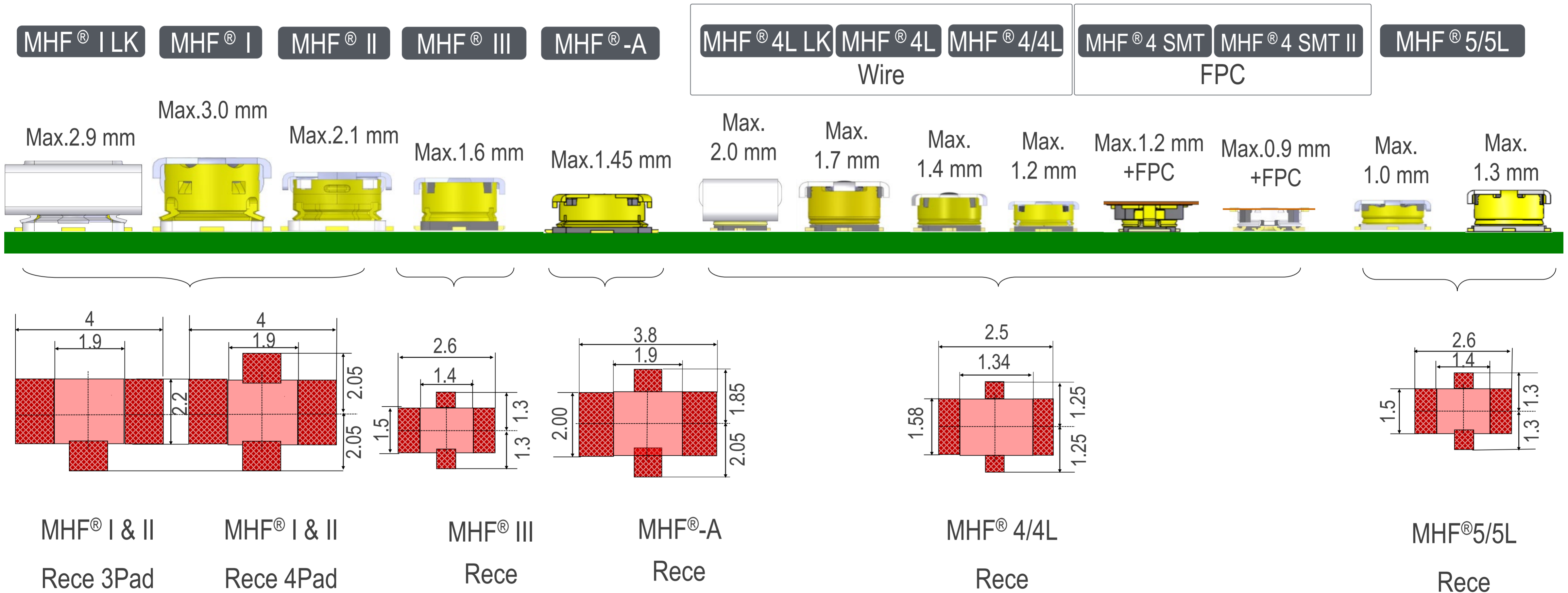
| Product name | | MHF [®] 4L LK | MHF [®] 4L | MHF [®] 4L | MHF [®] 4L | MHF [®] 4 | MHF [®] 4 SMT | MHF [®] 4 SMT II | |
|-------------------------------------|--------------|--|---|---|---|---|---|---|--|
| Appearance | |  |  |  |  |  |  |  | |
| | | MHF 4L with Mechanical lock | Best Insertion Loss and VSWR | Industry Standard for M.2 | Industry Standard for M.2 | low profile 1.20 mm | FPC solution for mobile applications | Less than 1 mm (+FPC) mated height | |
| Plug part number | | - | 20632-001R-37 | 20565-001R-13 | 20572-001R-08 | 20611-001R | 20462-001E | 20640-001E-0** | |
| Receptacle part number | | 20449-001E-**(MHF 4) 20579-001E(MHF 4L) | | | | | | | |
| Maximum height (mm) | | 2.0 | 1.7 | 1.4 | 1.2 | 1.2 | | 0.9 | |
| Outside dimension of receptacle:mm | | 2.0 x 2.0 | | | | | | | |
| Coax O.D. (Center Conductor AWG) | 2.00 mm (26) | | | | | | | | |
| | 1.80 mm (30) | | | | | | | | |
| | 1.37 mm (30) | ● | ● | | | | | | |
| | 1.32 mm (32) | | | | | | | | |
| | 1.13 mm (32) | | | ● | | | | | |
| | 0.95 mm (33) | | | ● | | | | | |
| | 0.81 mm (33) | | | | | | | | |
| | 0.81 mm (36) | | | | | ● | ● | | |
| | 0.64 mm (36) | | | | | ● | | | |
| 0.48 mm (38) | | | | | | | | | |
| FPC | | | | | | | ● | ● | |
| Frequency | | DC~12GHz | | | | DC~6GHz | | | |
| VSWR (L=100mm) | DC~3GHz | | | | | 1.3 max. | | | |
| | 3GHz~6GHz | 1.4 max. | | 1.45 max | | 1.5 max. | | | |
| | 6GHz~9GHz | 1.5 max. | | 1.6 max. | | - | | | |
| | 9GHz~12GHz | 1.6 max. | | 1.9 max. | 1.8 max. | - | | | |
| | 12GHz~15GHz | - | | | | | | | |
| Service temp. (Celsius) | | -40 degree ~ +90 degree | | | | | | | |
| Characteristic impedance | | 50ohm | | | | | | | |
| Rated voltage | | AC60V | | | | | | | |
| Contact resistance | | 20m ohm max. | | | | | | | |
| Withstand voltage | | AC200V/min | | | | | | | |
| Insulation resistance | | 500M ohm min./DC100V | | | | | | | |

Micro RF coax connector

Click the photos below to get more detailed product information.

| Product name | | MHF [®] 5L | MHF [®] 5L | MHF [®] 5 | MHF [®] 5 |
|-------------------------------------|--------------|---|---|---|---|
| Appearance | |  |  |  |  |
| | | Improved Insertion Loss and VSWR through 15GHz | Improved Insertion Loss and VSWR through 15GHz | low profile 1.00 mm | low profile 1.00 mm |
| Plug part number | | 20668-001R-13 | 20714-001R-81 | 20711-001R-81 | 20615-002R-48 |
| Receptacle part number | | 20566-001E-01 | | | |
| Maximum height (mm) | | 1.3 | | 1.0 | |
| Outside dimension of receptacle:mm | | 2.0 x 2.0 | | | |
| Coax O.D. (Center Conductor AWG) | 2.00 mm (26) | | | | |
| | 1.80 mm (30) | | | | |
| | 1.37 mm (30) | | | | |
| | 1.32 mm (32) | | | | |
| | 1.13 mm (32) | ● | | | |
| | 0.95 mm (33) | | | | |
| | 0.81 mm (33) | | ● | | |
| | 0.81 mm (36) | | | ● | |
| | 0.64 mm (36) | | | ● | |
| 0.48 mm (38) | | | | ● | |
| FPC | | | | | |
| Frequency | | DC~15GHz | | DC~12GHz | |
| VSWR (L=100mm) | DC~3GHz | 1.3 max. | | | |
| | 3GHz~6GHz | 1.4 max. | | 1.5 max. | |
| | 6GHz~9GHz | 1.5 max. | | 1.6 max. | |
| | 9GHz~12GHz | 1.5 max. | 1.8 max. | | 1.6 max. |
| | 12GHz~15GHz | 1.6 max. | - | | |
| Service temp. (Celsius) | | -40 degree ~ +90 degree | | | |
| Characteristic impedance | | 50ohm | | | |
| Rated voltage | | AC60V | | | |
| Contact resistance | | 20m ohm max. | | | |
| Withstand voltage | | AC200V/min | | | |
| Insulation resistance | | 500M ohm min./DC100V | | | |

Micro RF coax connector : Foot pattern



Accessory overview

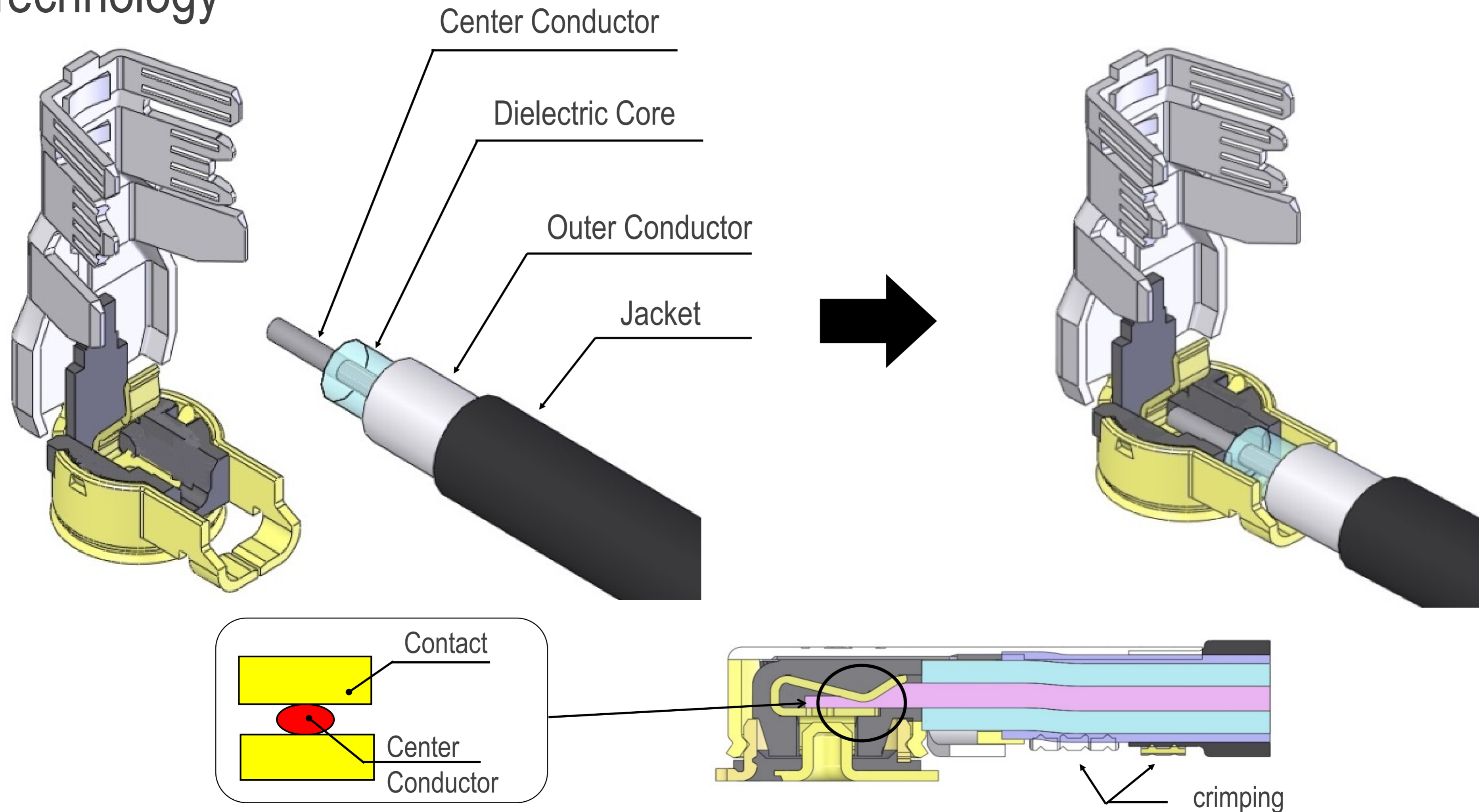
| Product | | | | MHF® I | MHF® I LK | MHF® II | MHF® III | MHF®-A | MHF® 4 SMT | MHF® 4 | MHF® 4L | MHF® 4L LK | MHF® 5 | |
|------------------------------|----------------|---|-----------|---|---|--|-----------|-----------|------------|--|--------------|---|------------|------------|
| SMA adapter | for Plug | Durability (cycles) | | | | | | | | | | | | |
| | | for electrical performance check | 3K |  | 90193-001 | 90193-001 | 90285-001 | 90413-001 | - | | 90449-001 | | 90543-0001 | |
| | | for voltage check | 10K |  | 90194-001 | 90194-001 | 90286-001 | - | - | | 90449-003-01 | | 90586-0001 | |
| | for Receptacle | for electrical performance check | | 500 |  | 90193-002 | 90193-002 | 90285-002 | 90413-002 | - | | 90449-002 | | 90543-0002 |
| | | Normal | | 10K |  | 90539-001 | 90539-001 | 90491-001 | 90539-001 | | 90698-0001 | | | 90793-0001 |
| | | High cycle | Wire | 100 |  | 90577-0100 (100mm) 90577-0350 (350mm) | | - | | 90577-0100 (100mm) 90577-0350 (350mm) | | | | |
| | | | Probe | 10K |  | 90575-0001 | | - | 90575-0001 | | 90576-0001 | | | 90847-0001 |
| | | Detachable | Base | 200K |  | 90684-0001 | | | | | | | | |
| | Probe | | 10K |  | 90416-001 | | - | 90416-001 | | 90683-0001 | | | 90690-0001 | |
| | Hand tool | Mating and unmating tool | |  | 90224-001 90885-0001 (for 20767-001R) | - | - | - | - | - | 90435-001 | 90609-0001 (for 20572-001R-08 / 20565-001R-13) 90873-0001 (for 20632-001R-37) | - | 90612-0001 |
| Unmating tool | |  | 90192-001 | - | 90192-001 | 90287-001 | 90411-001 | - | - | - | - | - | | |
| Mating tool | |  | - | - | - | - | - | - | - | - | - | - | 90624-0001 | |
| Mating and unmating tweezers | |  | - | - | - | 90501-001 | - | - | 90482-001 | 90616-0008 90615-0013 | - | - | | |
| Locking and unlocking tool | |  | - | 91026-0001 | - | - | - | - | - | - | - | 91166-0001 | - | |



MHF[®] Harnesses

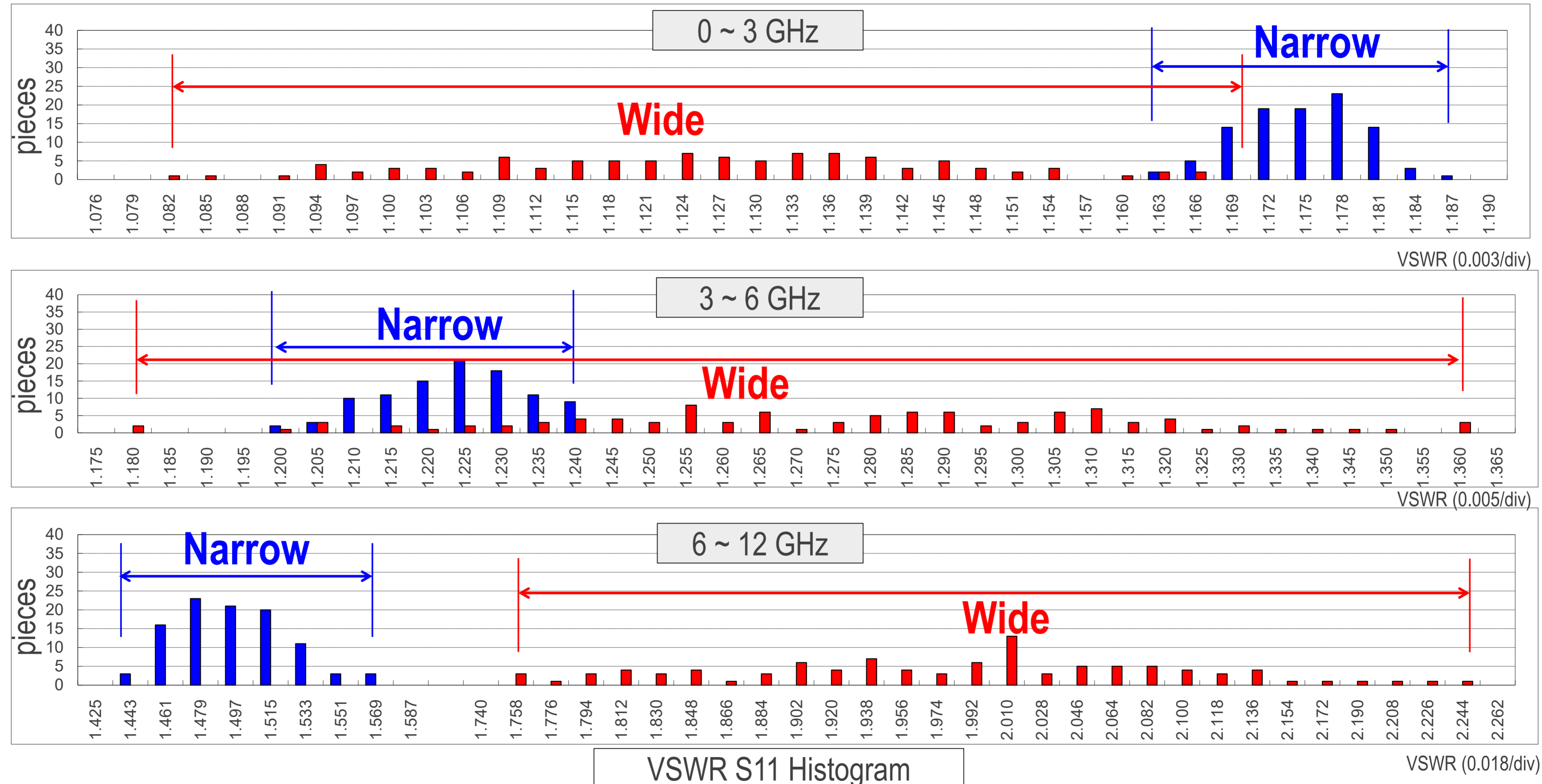
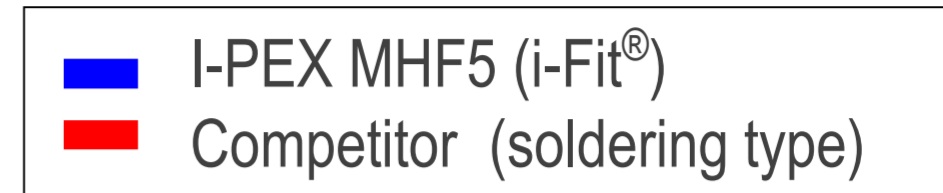
Micro RF coax connector : Wire crimp termination technology

i-Fit[®] Technology



Solder-less crimp “i-Fit[®]” advantage versus soldering types

i-Fit[®] offers consistently tight range of performance

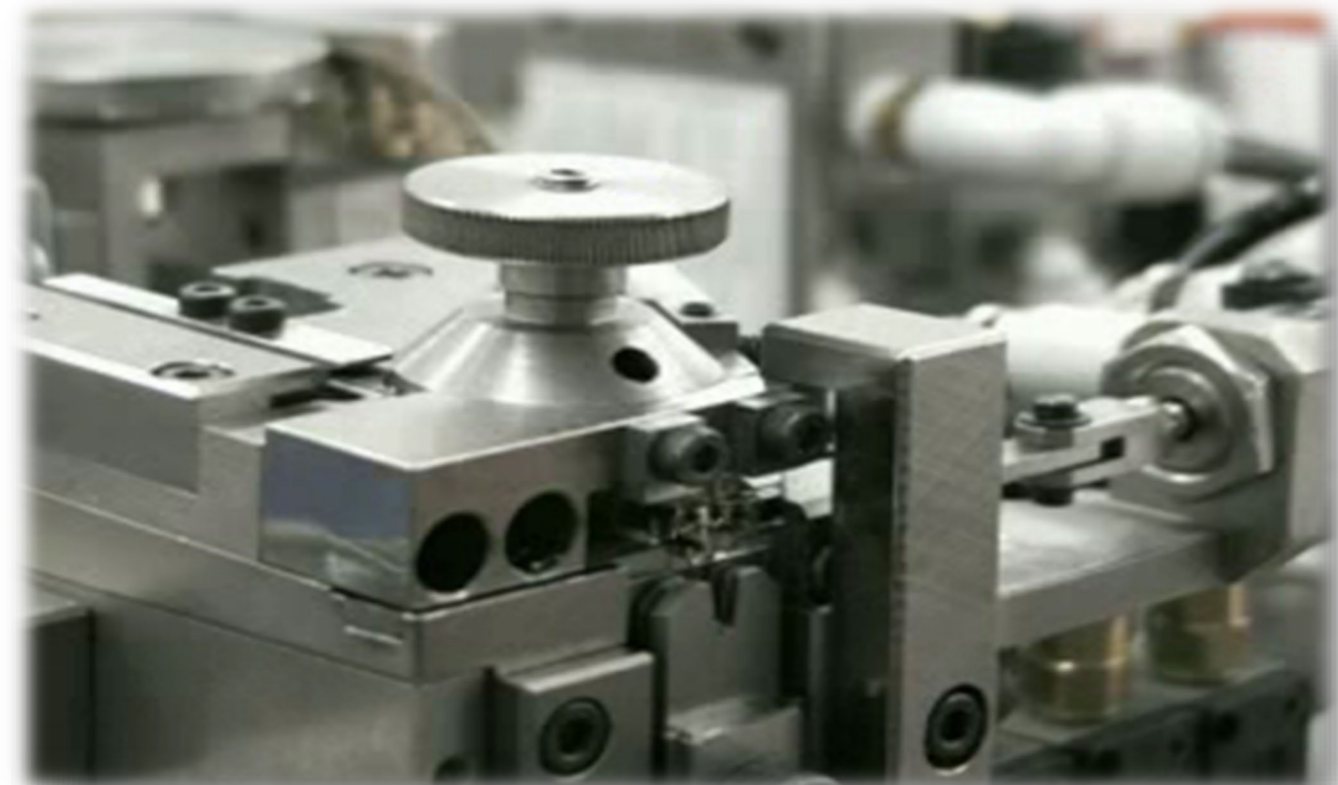


Solder-less crimp “i-Fit®” advantage versus manual soldering types

Significantly reduced tact time with i-Fit®

| | | I-PEX MHF "i-Fit" | Manual Soldering |
|---|------------------------|----------------------|-----------------------|
| Tact time | Wire strip | Same tact time | |
| | Termination | 6 seconds/ea. | 30 seconds/ea. |
| Qty of cable assemblies a worker can make per month | | 105,600 assemblies | 21,120 assemblies |
| # of operator needed | 1M cable assemblies/mo | 10 | 48 |
| | 2M cable assemblies/mo | 19 | 95 |

*Calculated based on operation hours of 22days/mo (8hours/day)

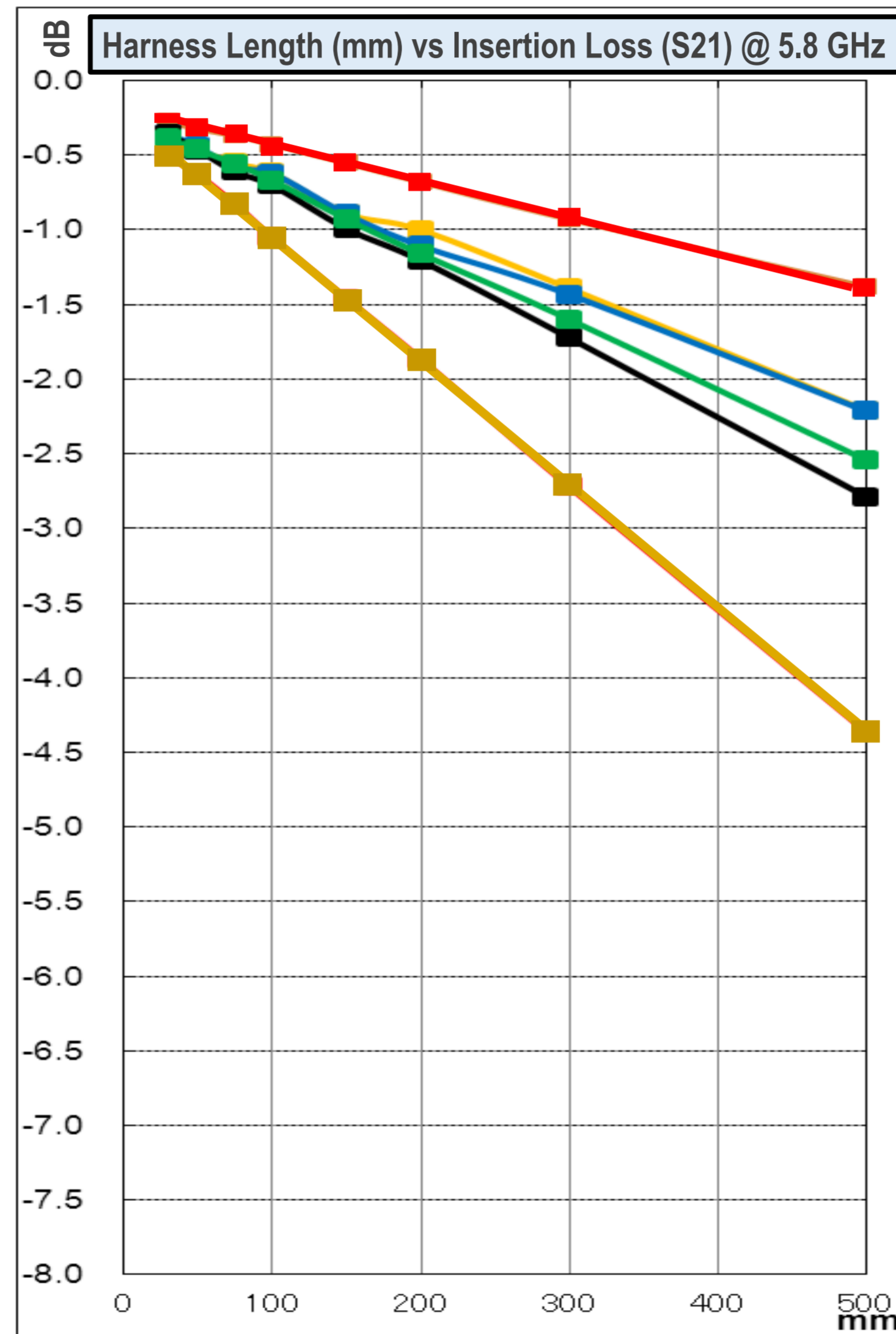
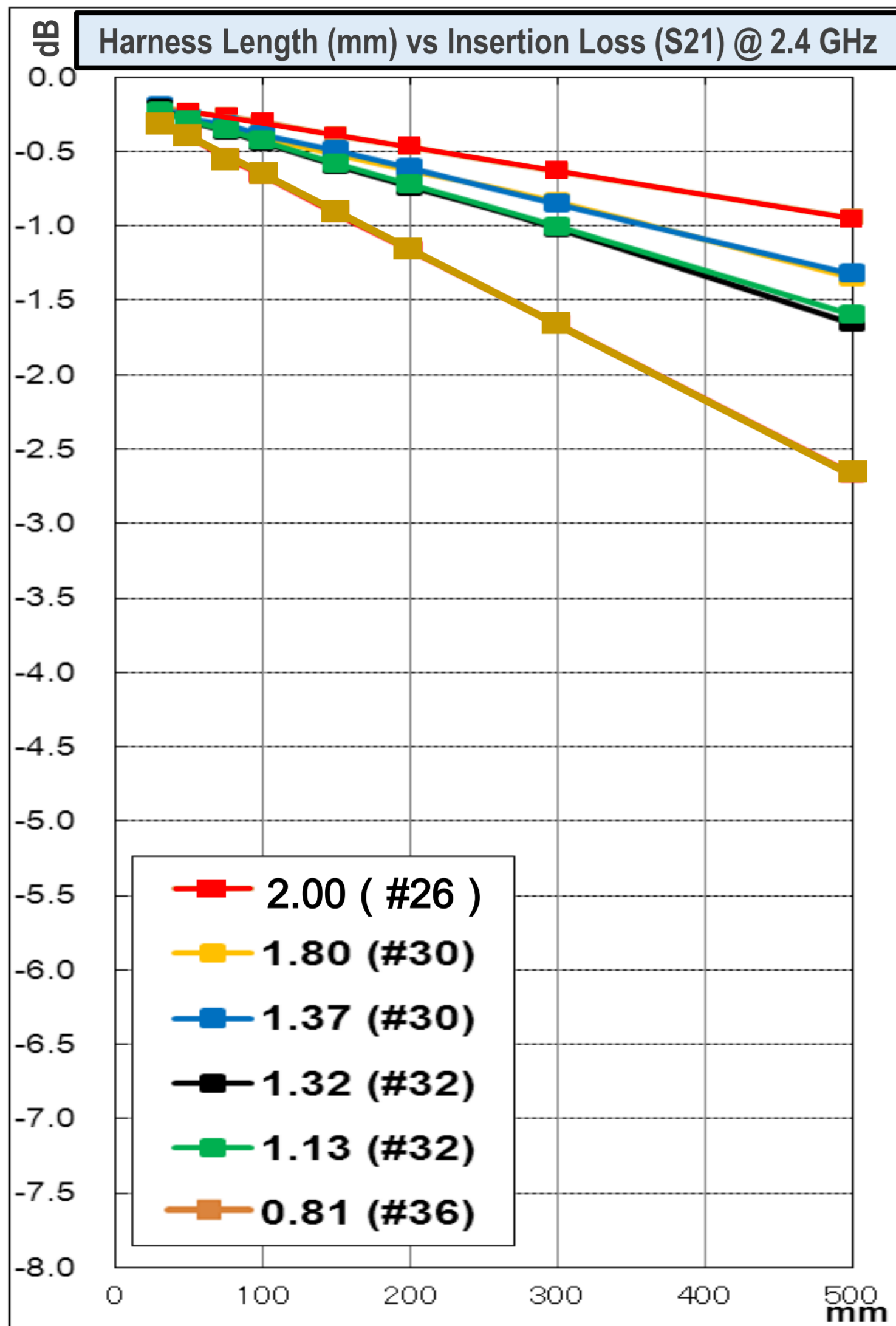


i-Fit Semi-Auto crimp tool :

I-PEX has sold over 500 units of i-Fit crimping tool.

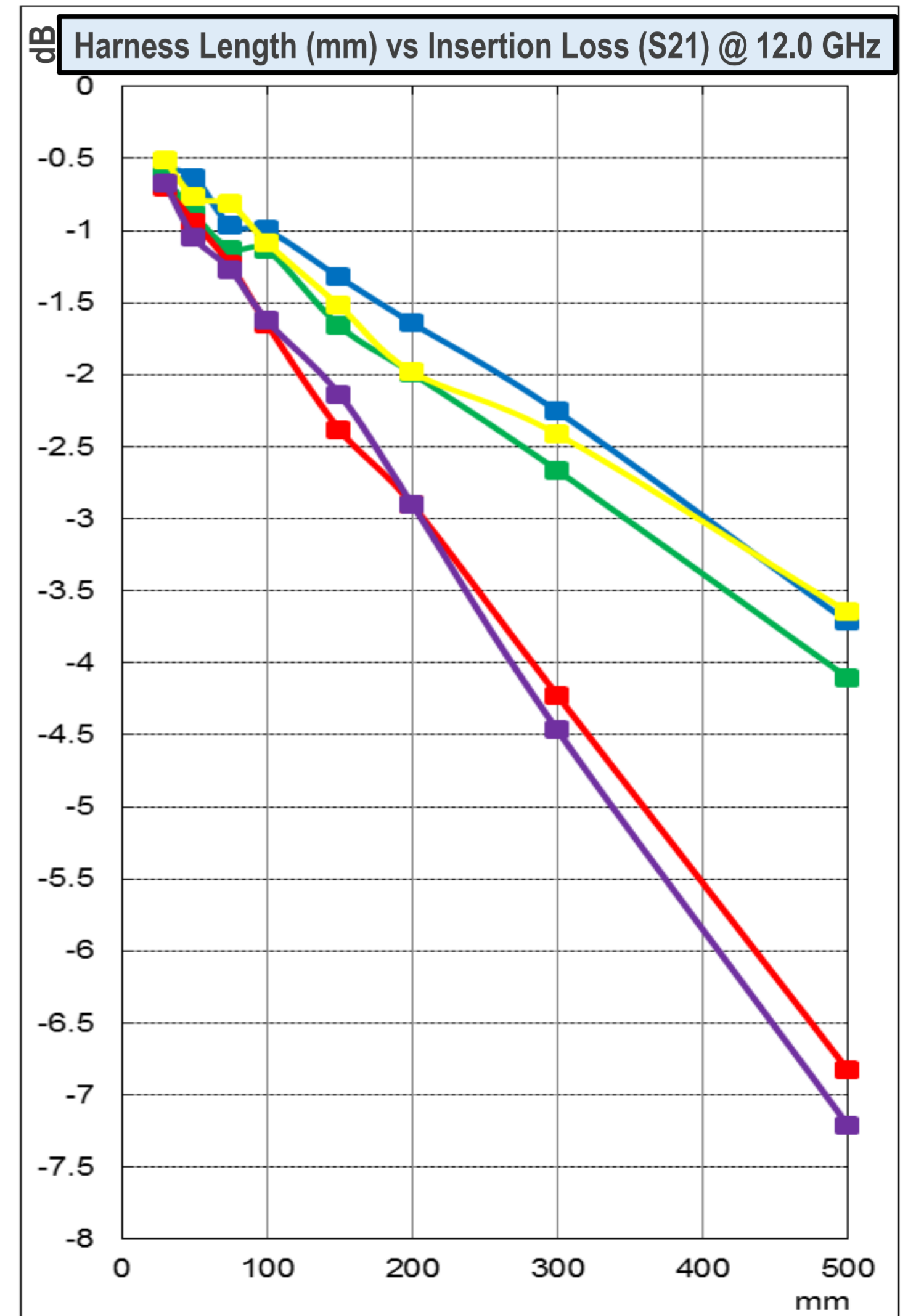
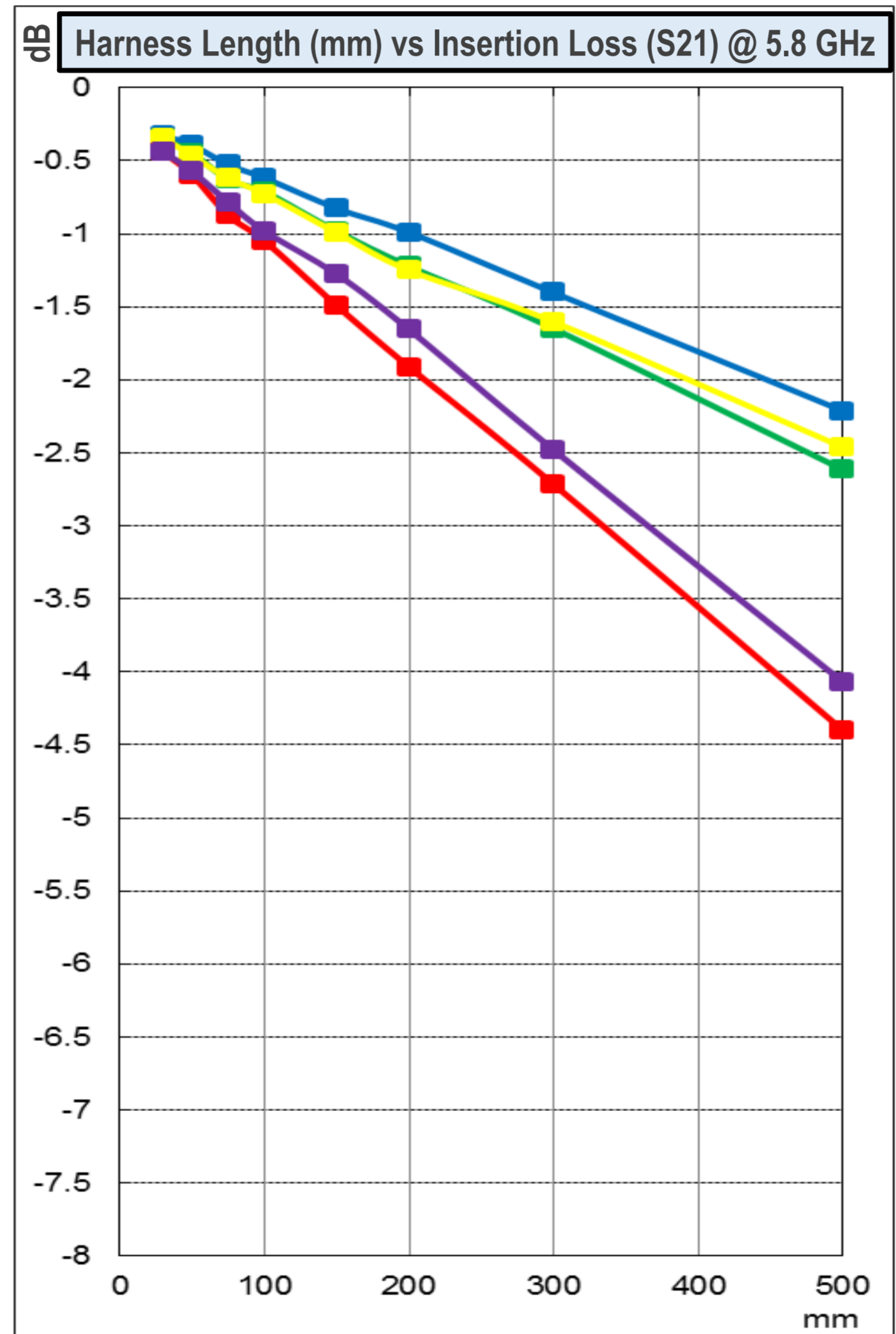
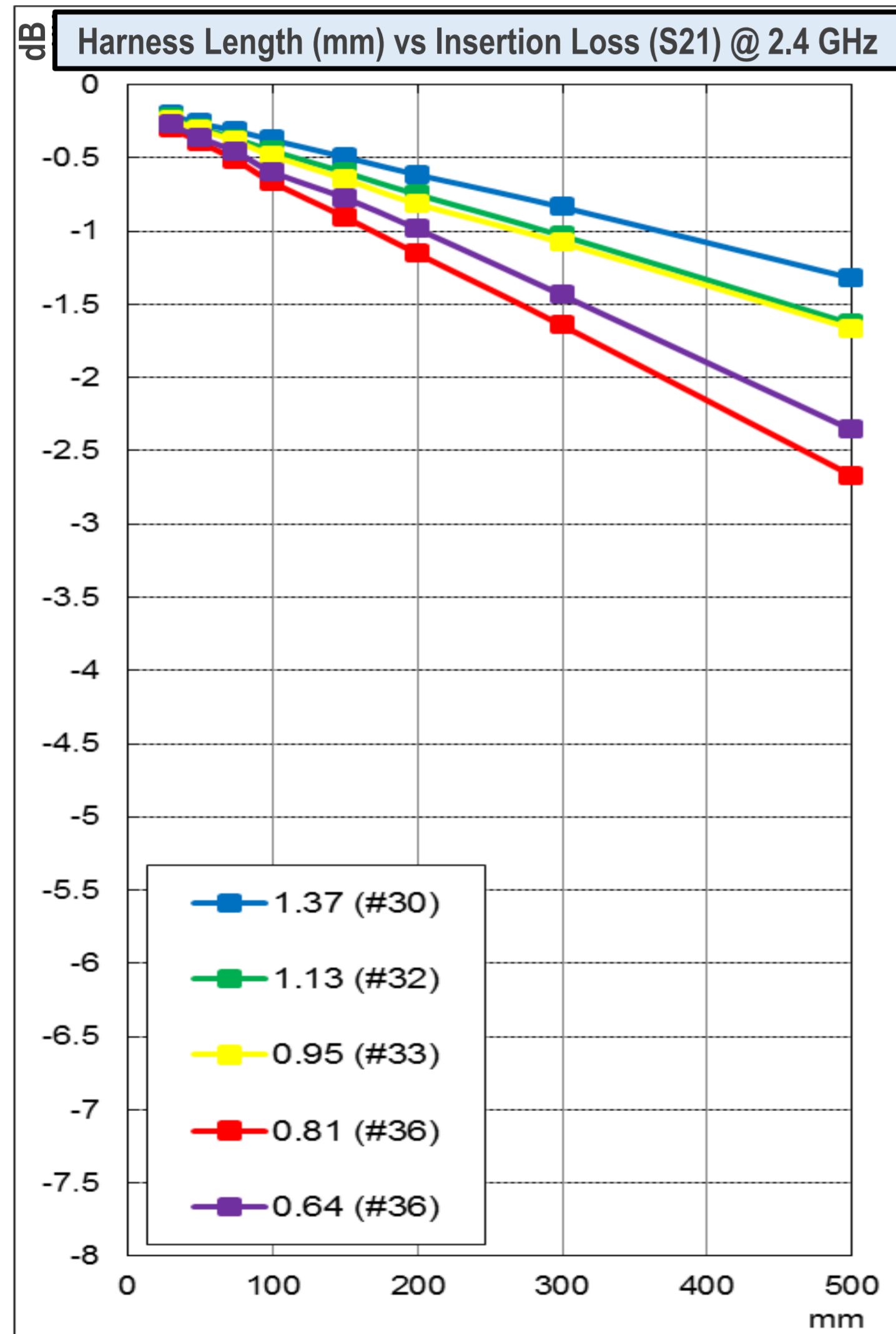
These are working in many antenna / harness makers around the world.

Wire insertion loss (MHF[®] I) & Minimum bend radius

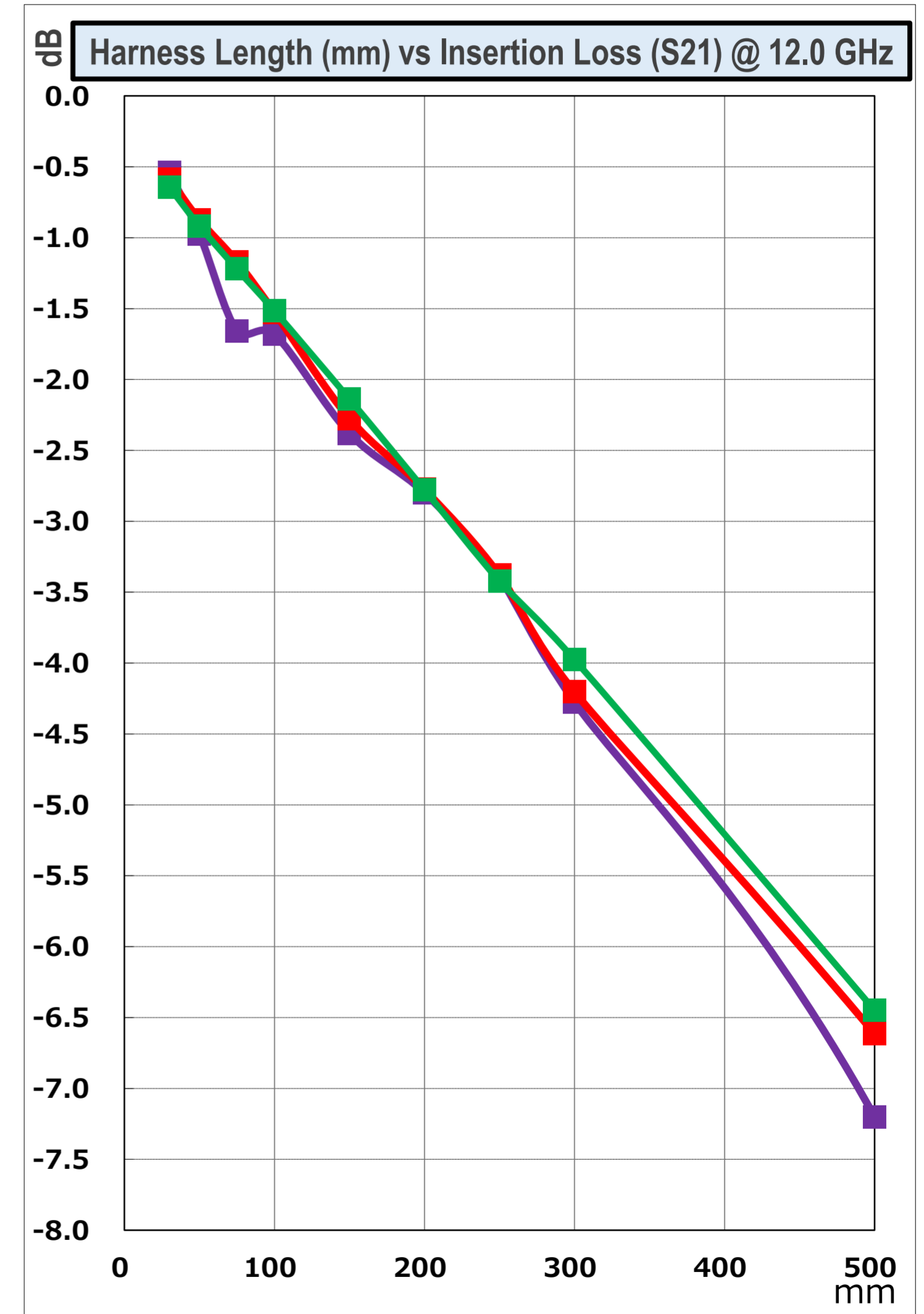
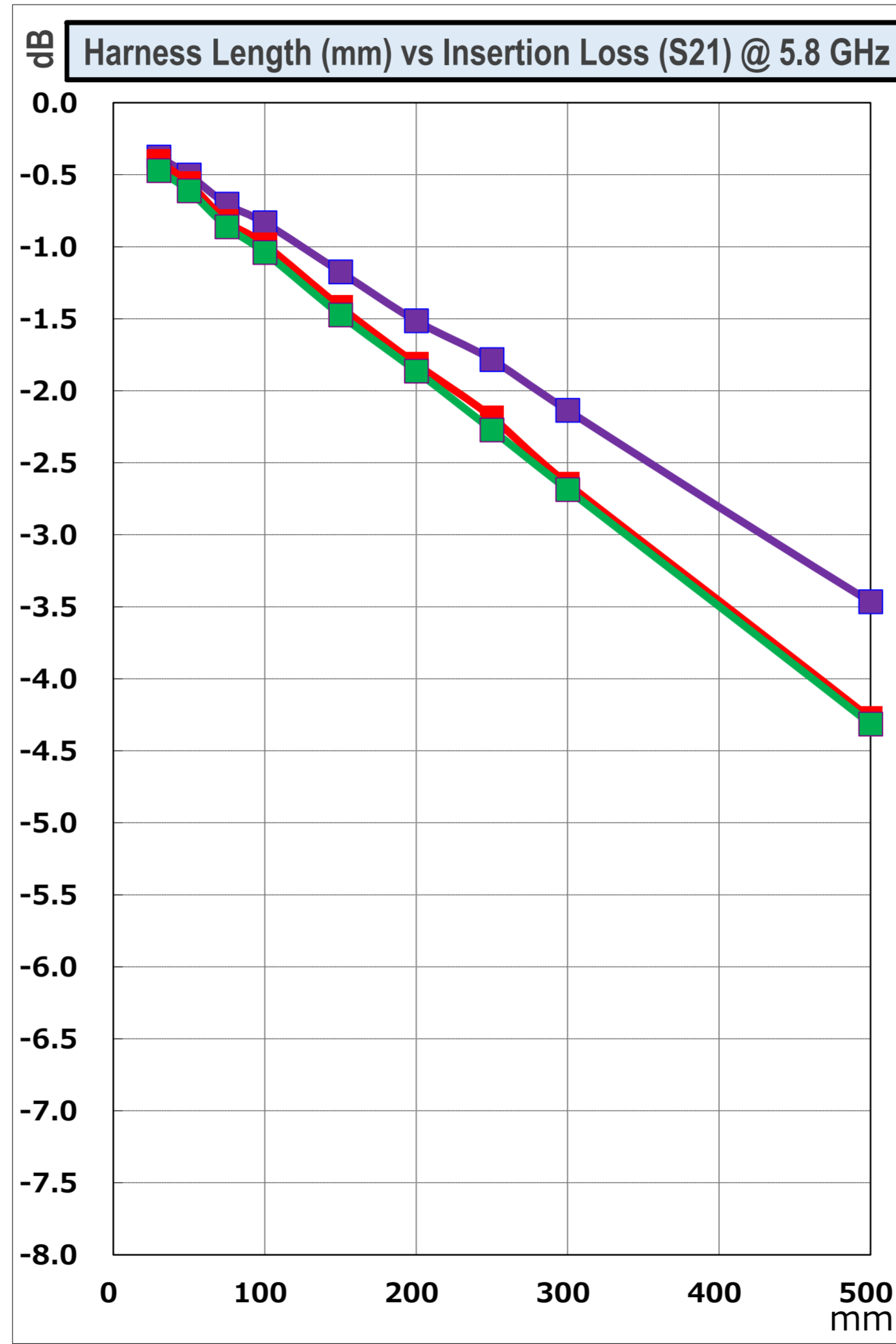
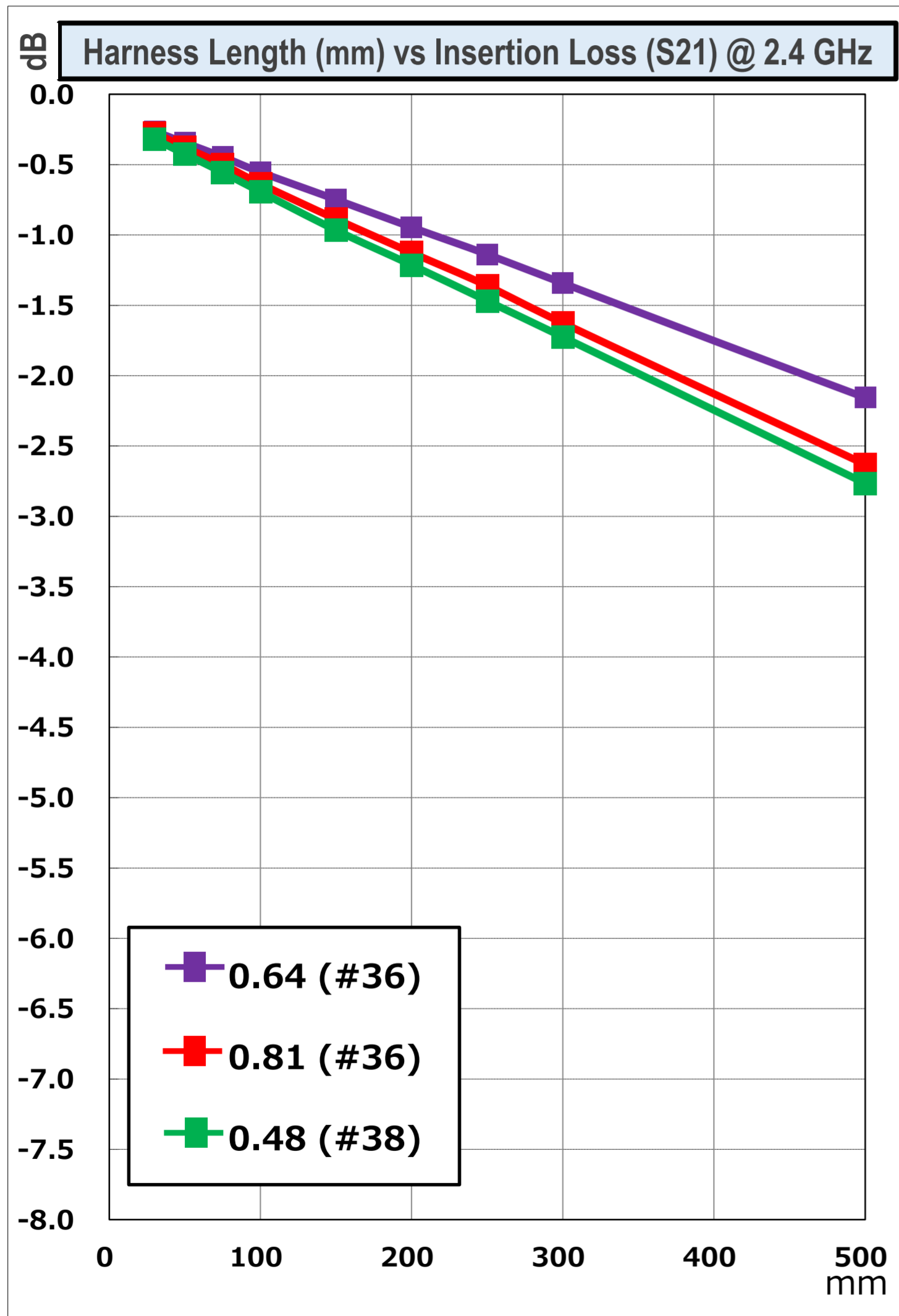


| Coax O.D. (Center Conductor AWG) | Minimum bend radius (90 degrees) |
|-------------------------------------|-------------------------------------|
| 2.00 mm (26) | 2.0mm |
| 1.80 mm (30) | 1.8mm |
| 1.37 mm (30) | 1.3mm |
| 1.32 mm (32) | 1.3mm |
| 1.13 mm (32) | 1.1mm |
| 0.95 mm (33) | 1.0mm |
| 0.81 mm (33) | 0.8mm |
| 0.81 mm (36) | 0.6mm |
| 0.64 mm (36) | 0.5mm |
| 0.48 mm (38) | 0.3mm |
| 0.34 mm (42) | 0.3mm |

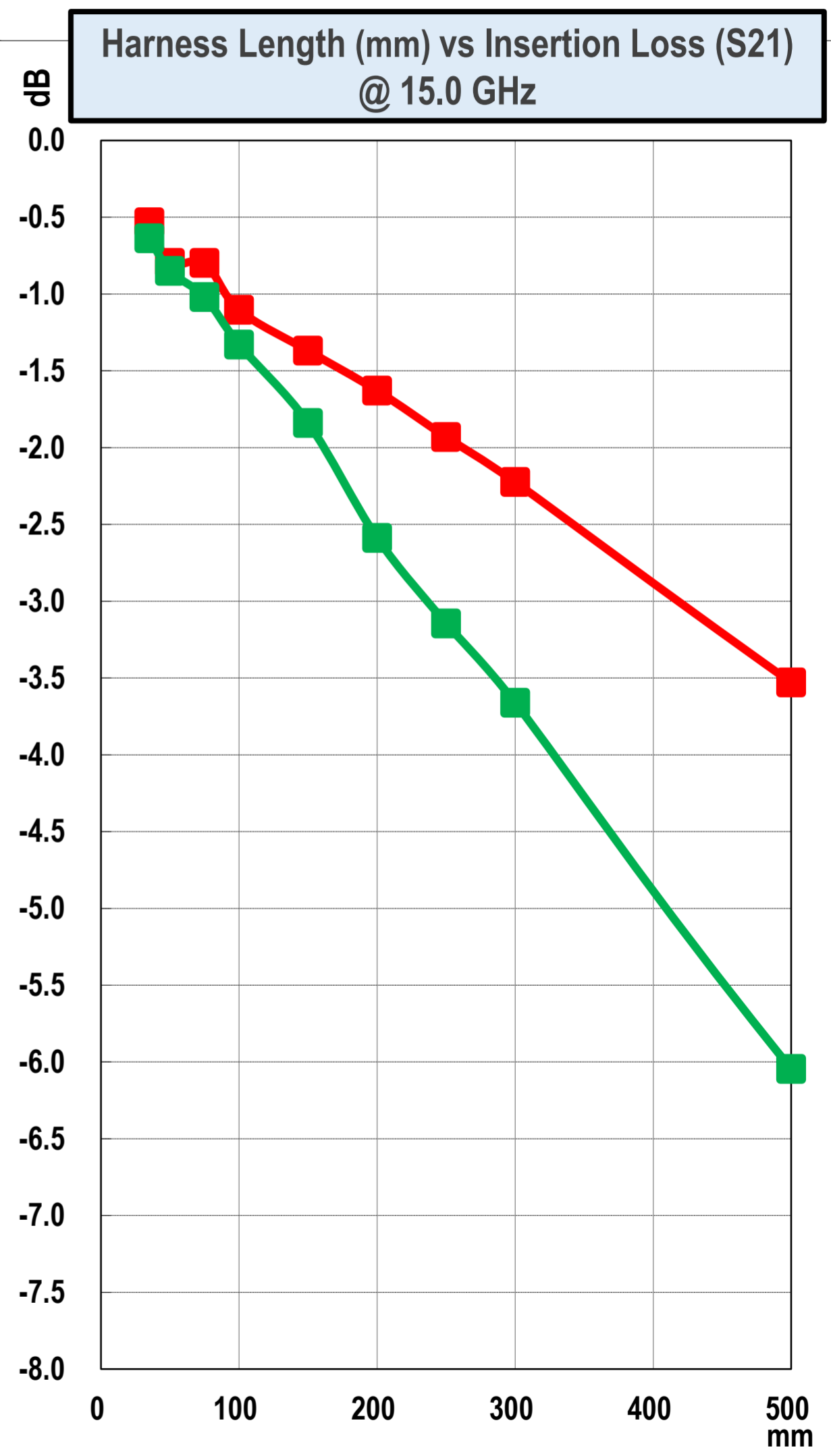
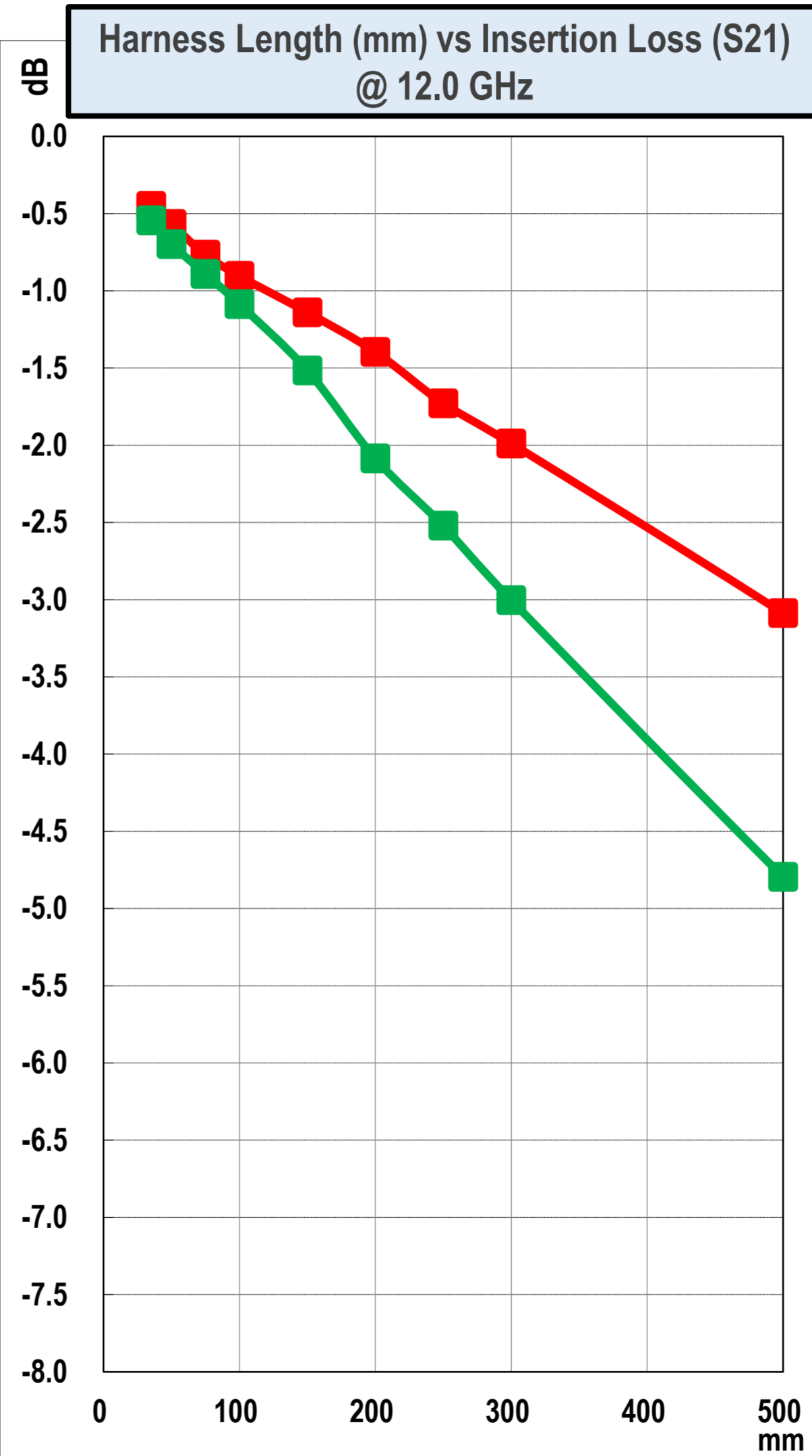
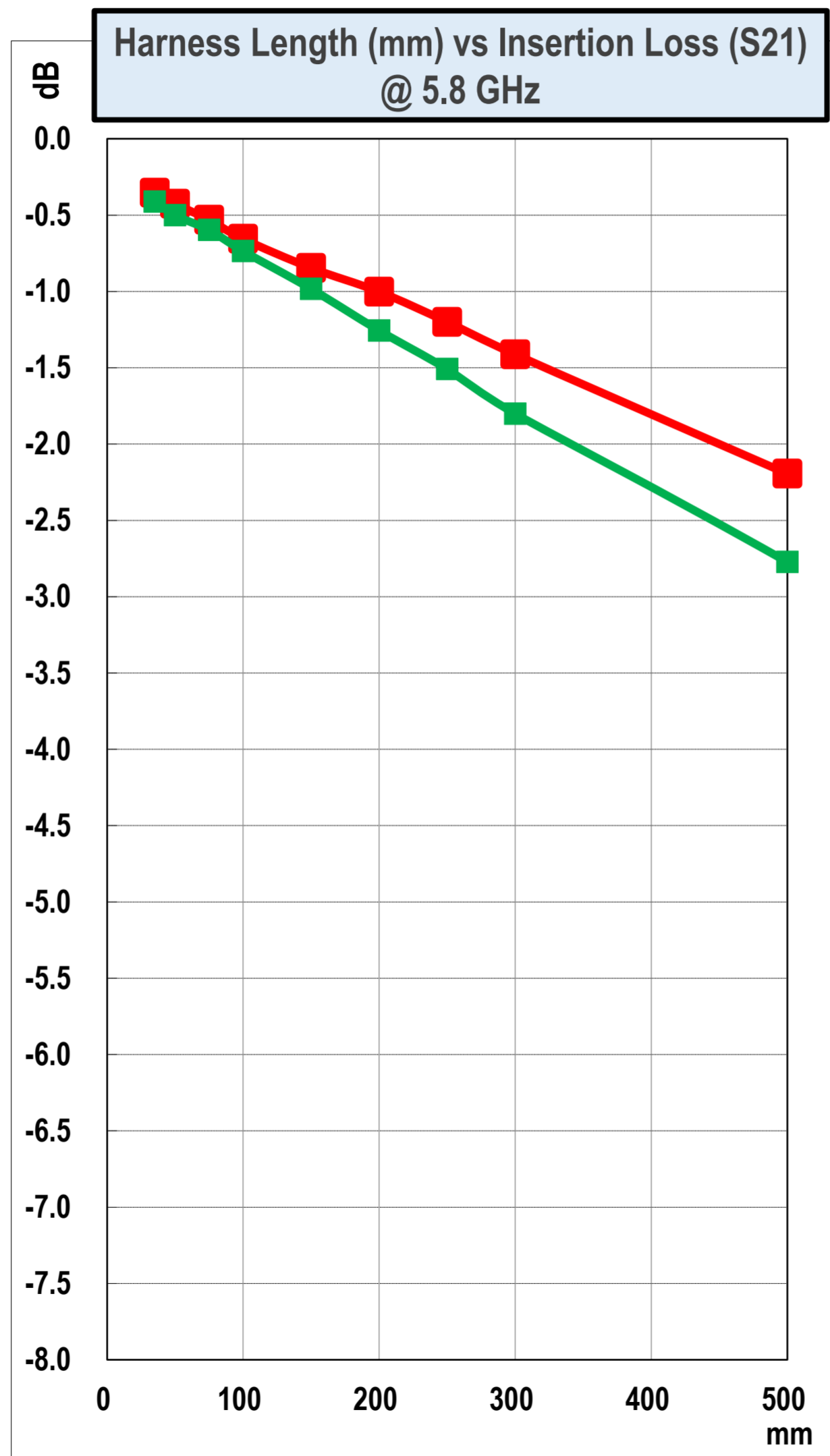
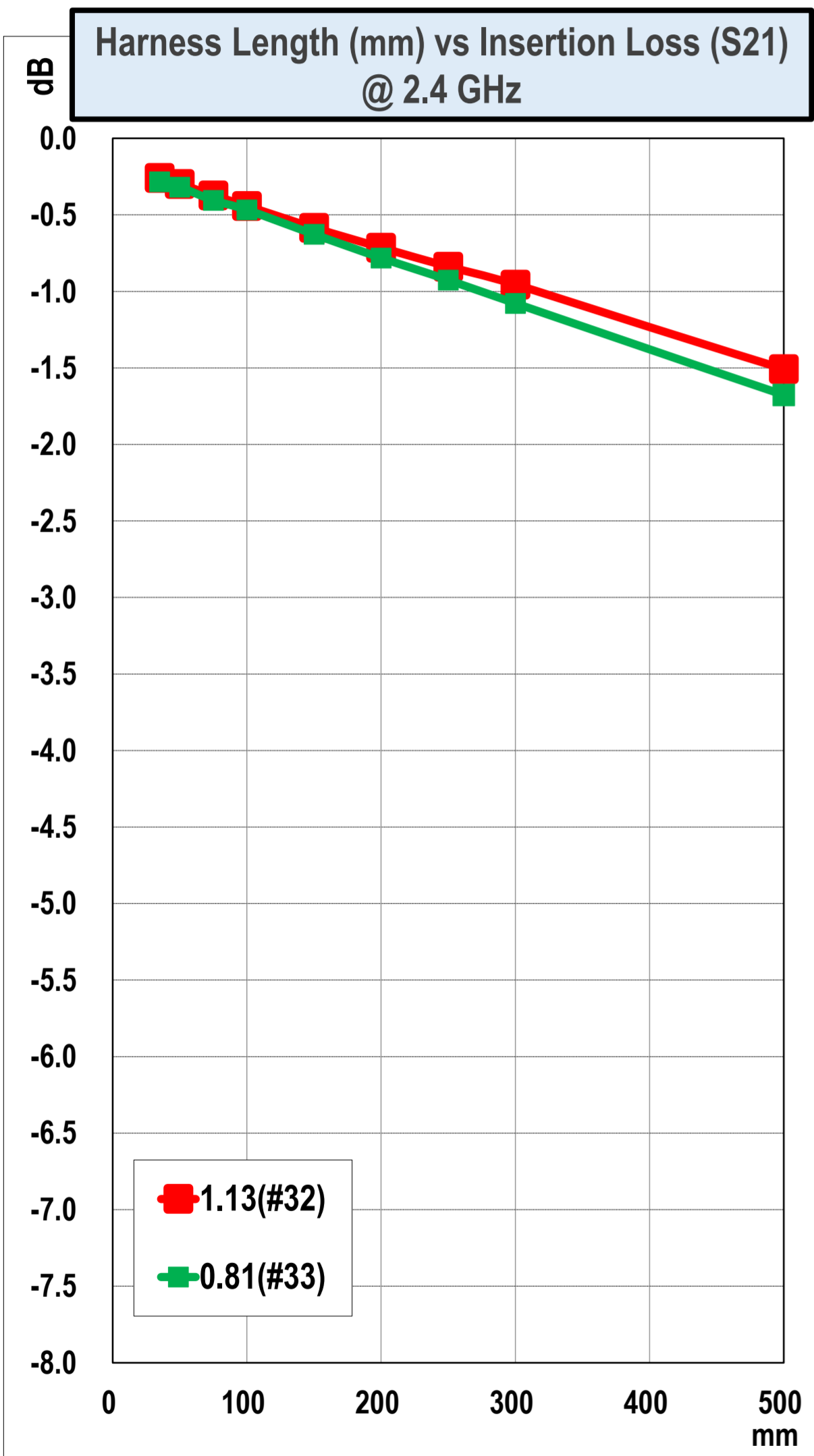
Wire insertion loss (MHF[®] 4L)



Wire insertion loss (MHF[®] 5)

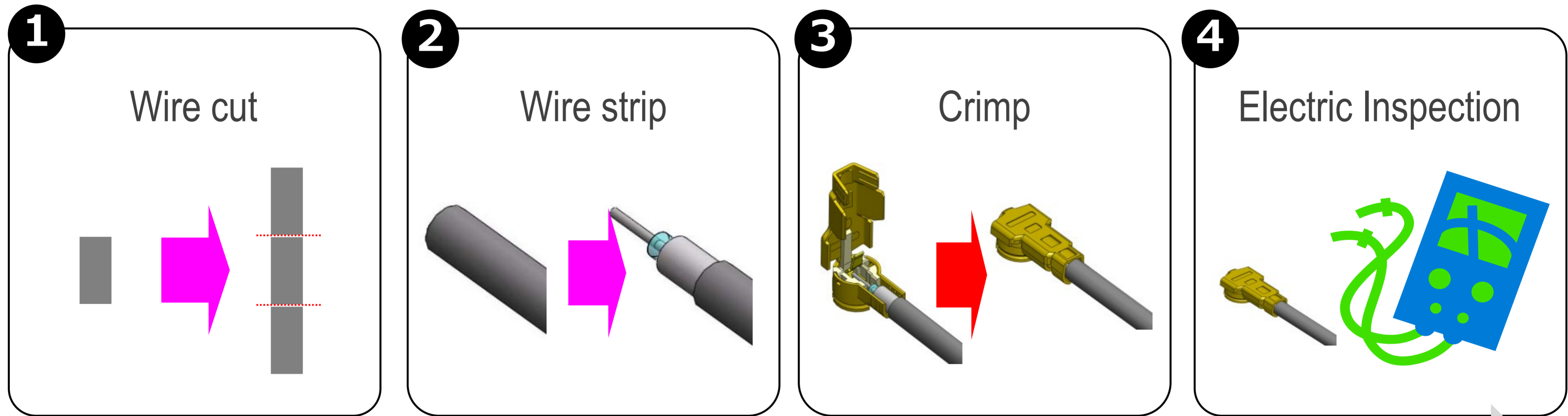


Wire insertion loss (MHF[®] 5L)



Yes, I-PEX provides harness assemblies!




...And they are made with Fully Automated Machines and our patented i-Fit[®] technology!!!



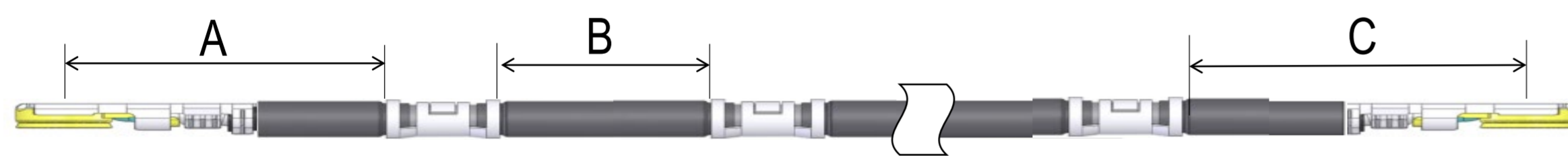
Fully Automated Process



Wire clamp and surface mount clip for grounding

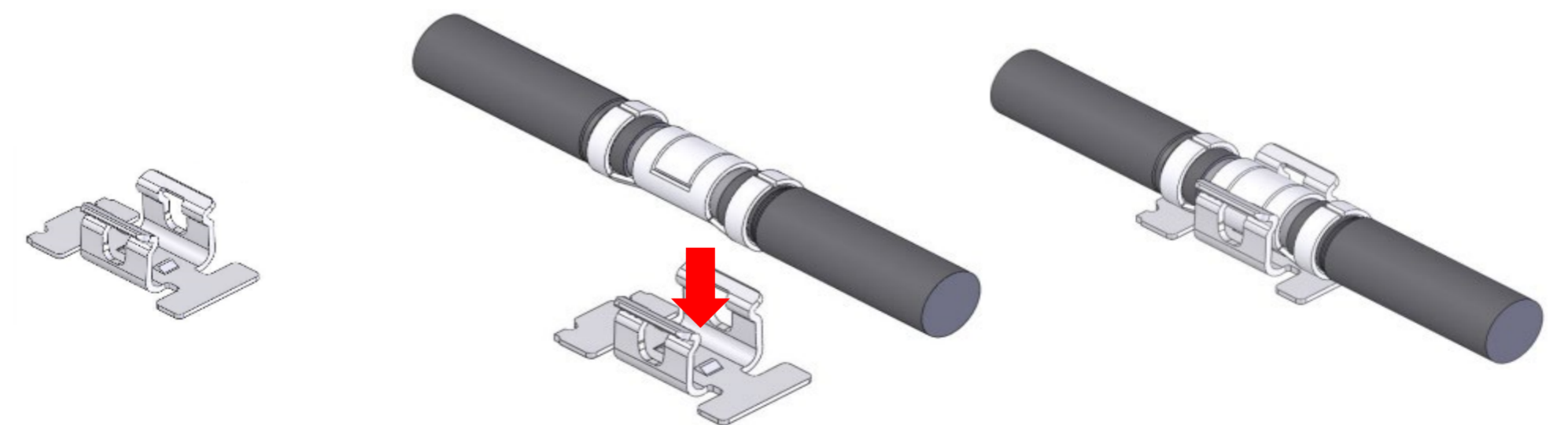
| | | Grounding clamp 3mm length | Grounding clamp 6mm length | Clip for grounding clamp MP-A series |
|--|--------------|---|---|---|
| Appearance | |  |  |  |
| Coax O.D. (Center Conductor AWG) | 1.37 mm (30) | | ● | ● MP-A04 (P/N 3224-0001) |
| | 1.13 mm (32) | ● | ● | ● MP-A02 (P/N 3182-0001) |
| | 0.81 mm (36) | ● | ● | ● MP-A01 (P/N 3096-0001) |
| | 0.64 mm (36) | ● | ● | ● MP-A03 (P/N 3186-0001) |

Minimum distance between clamps



| A | B | C |
|-----------|-----------|-----------|
| 12mm min. | 10mm min. | 10mm min. |

Clips are packaged in tape and reel for surface mount.

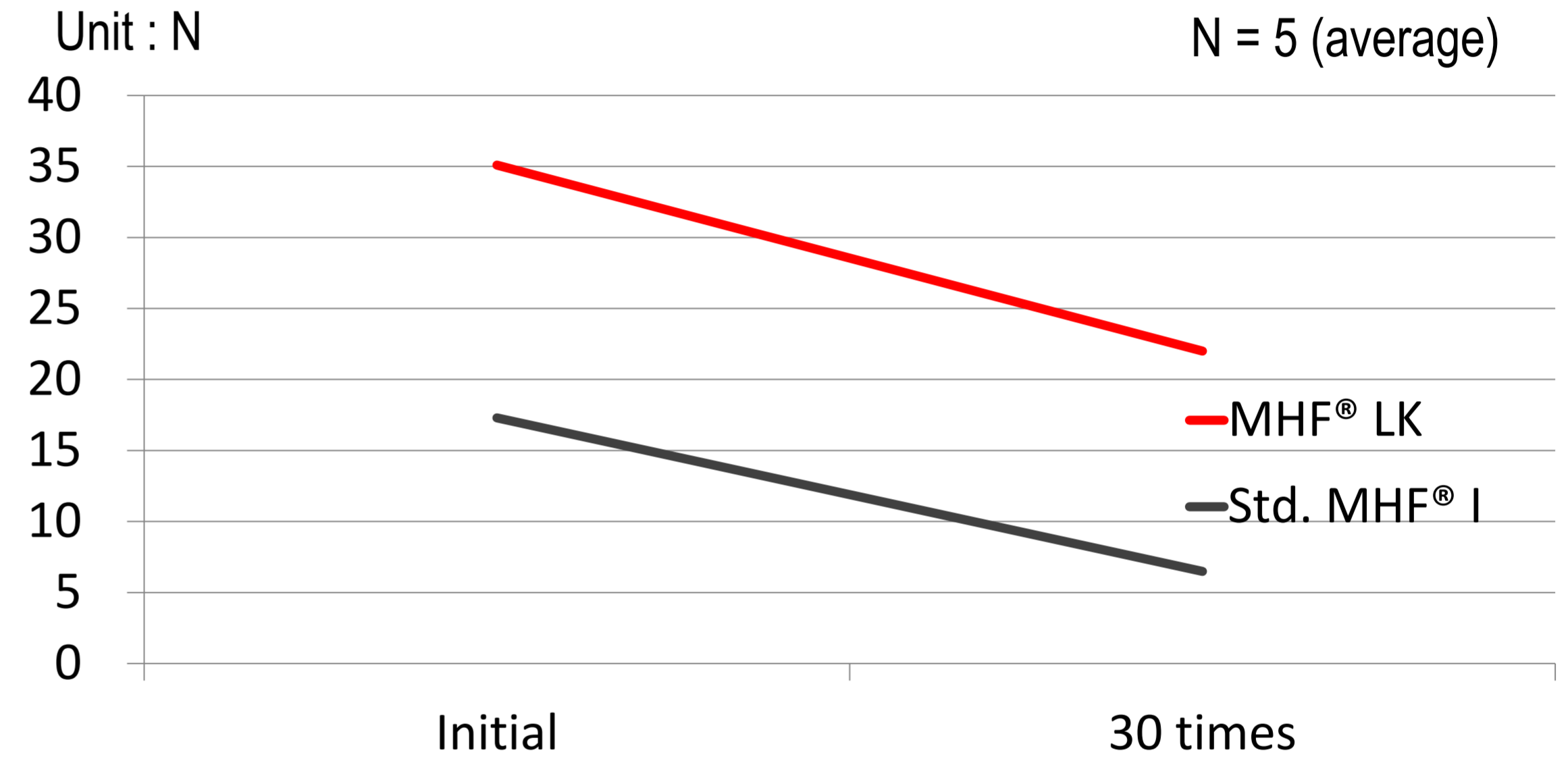


MHF[®] I LK

Built-in locking function for MHF I



Disengagement Force Comparison



| Series | MHF [®] I LK | | Standard MHF [®] I | |
|--------|-----------------------|-----------|-----------------------------|----------|
| | Initial | 30 times* | Initial | 30 times |
| SPEC. | 20 MIN. | 10 MIN. | 5 MIN. | 3 MIN. |




* Reference Value



MHF[®] SW Series


MHF[®]-SW series product overview

↓ Click the photos below to get more detailed product information.

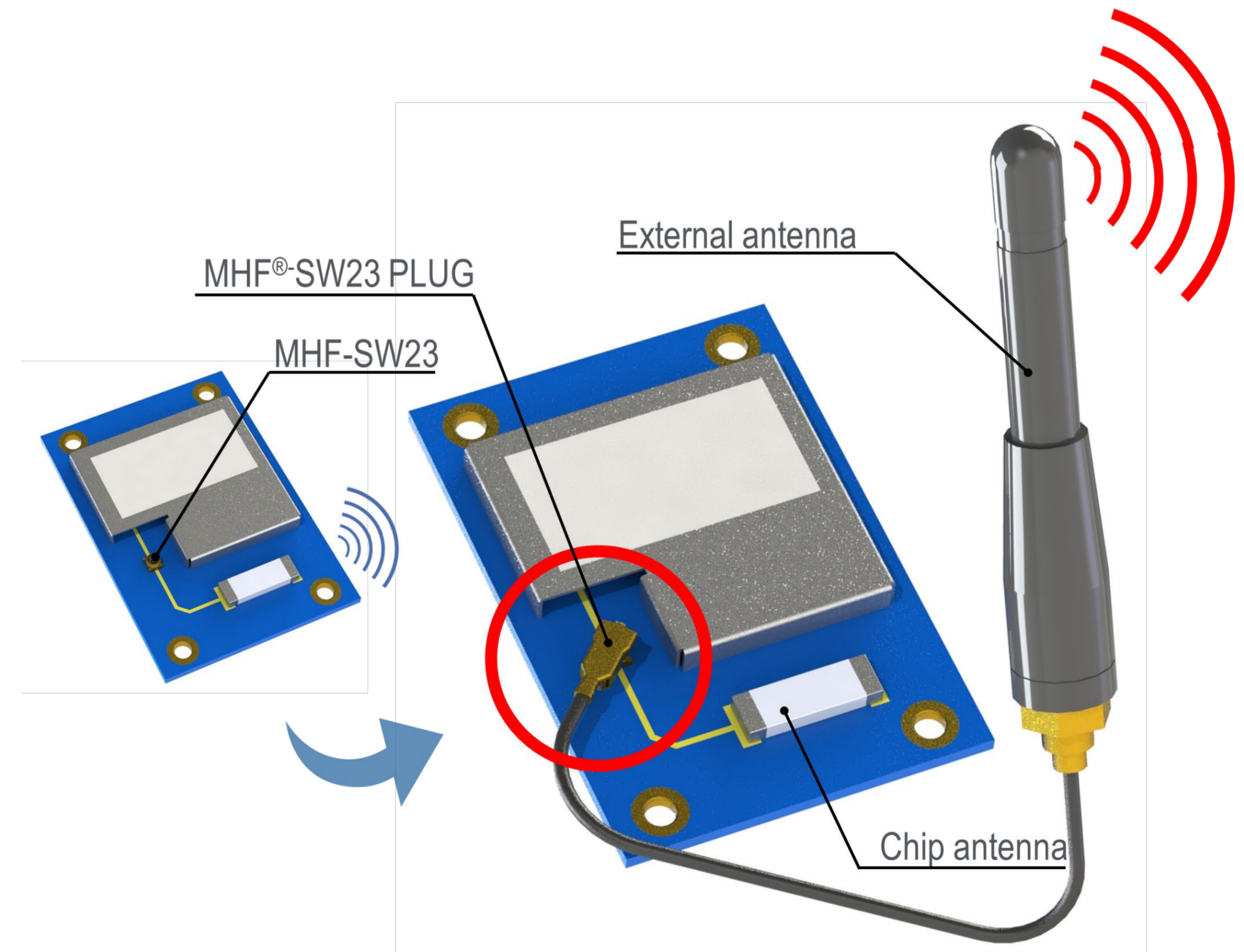
| Product name | | MHF [®] -SW23 | MHF [®] -SW20 | MHF [®] -SW18 |
|--------------------------|----------------|---|---|---|
| Feature | |  |  |  |
| | | Contaminant discontinuity resistant design 2.3 x 2.3 mm footprint | Contaminant discontinuity resistant design 2.0 x 2.0 mm footprint | Contaminant discontinuity resistant design 1.8 x 1.8 mm footprint |
| Part number | | 20549-001E/-01 | 20623-001E | 20608-001E/-01 |
| Dimension (mm) | | 2.3 x 2.3 x 1.35 (H) | 2.0x 2.0 x 0.90 (H) | 1.8 x 1.8 x 0.85 (H) |
| Rated power | | 2W max. | | |
| Frequency | | DC~11.0GHz | | |
| V.S.W.R. | DC~3.0GHz | 1.2 max. (DC ~ 2.5GHz) | 1.2 max. | |
| | 3.0GHz~6.0GHz | 1.3 max. (2.5 ~ 6.0GHz) | 1.3 max. | |
| | 6.0GHz~11.0GHz | 1.5 max. | 1.5 max. | 1.4 max. |
| Insertion loss | DC~3.0GHz | 0.15 dB max. (DC ~ 2.5GHz) | 0.10 dB max. | |
| | 3.0GHz~6.0GHz | 0.20 dB max. (2.5 ~ 6.0GHz) | 0.20 dB max. | |
| | 6.0GHz~11.0GHz | 0.40 dB max. | 0.50 dB max. | 0.30 dB max. |
| Isolation | DC~3.0GHz | 20 dB Max. (DC ~ 2.5GHz) | 20 dB max. | 25 dB max. |
| | 3.0GHz~6.0GHz | 15 dB max. | 15 dB max. | 20 dB max. |
| | 6.0GHz~11.0GHz | 12 dB max. | 10 dB max. | 12 dB max. |
| Service temp. (Celsius) | | 40 degree ~ +85 degree | | |
| Characteristic impedance | | 50 ohm | | |
| Contact resistance | Signal contact | 100m ohm | 75m ohm (initial) / 150m ohm | 100m ohm |
| | Ground contact | 100m ohm | 75m ohm (initial) / 150m ohm | 100m ohm |
| Insulation resistance | | DC100 1000M ohm min :Initial 10M ohm min :After test | DC 250V 500M ohm min :Initial 10M ohm min :After test | DC100V 1000M ohm min :Initial 10M ohm min :After test |
| Withstand voltage | | AC 100V: 1min | AC 300V :1 min | AC 100V: 1min |

MHF[®]-SW 23 Plug







Click the photo below to get more detailed product information.

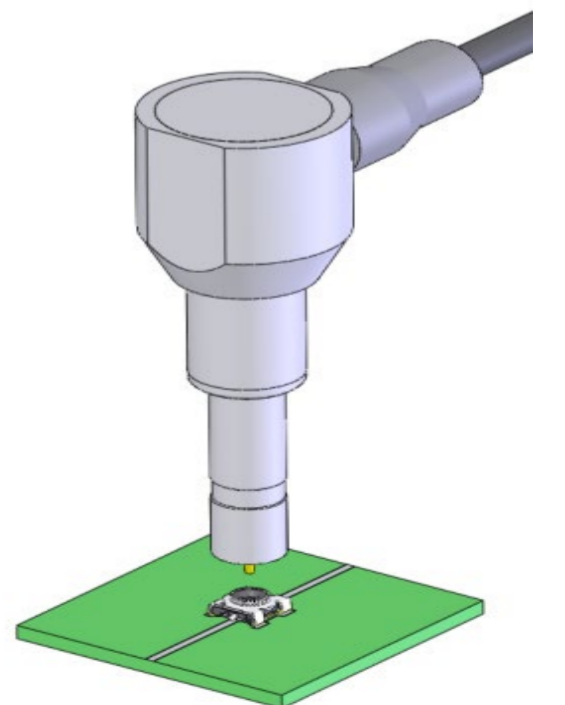
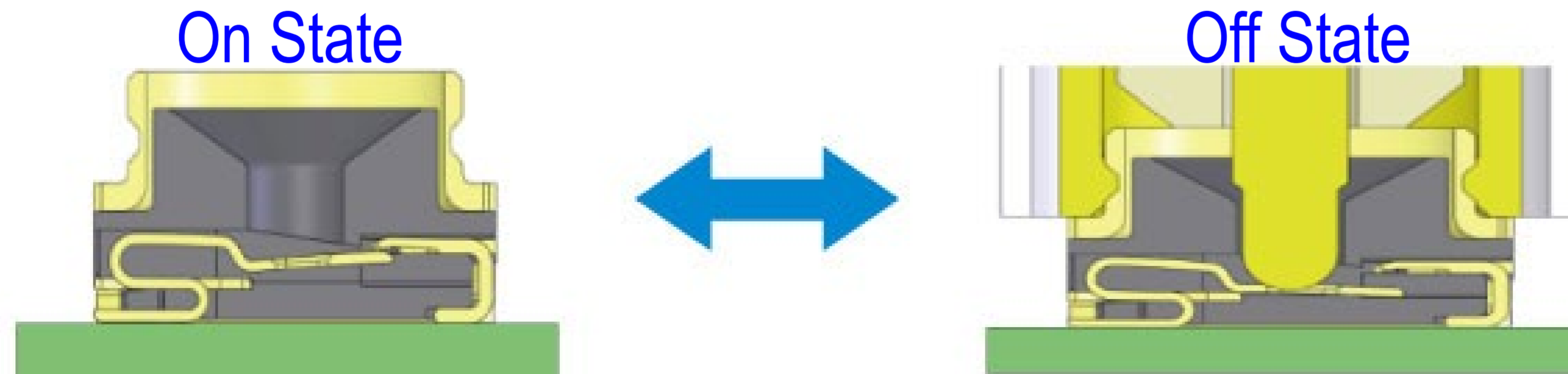
| | | |
|---------------------------------------|---|--------------------------|
| Product name | | MHF [®] 23 Plug |
| Appearance |  | |
| | Mating with switch connector | |
| Plug part number | 20851-001R | |
| Switch connector part number | 20549-001E/-01 (MHF-SW 23) | |
| Maximum height (mm) | 3.7 | |
| Outside dimension of switch connector | 2.3 x 2.3 | |
| Coax O.D. (Center Conductor AWG) | 2.00 mm (26) | |
| | 1.80 mm (30) | |
| | 1.37 mm (30) | |
| | 1.32 mm (32) | |
| | 1.13 mm (32) | ● |
| | 0.95 mm (33) | |
| | 0.81 mm (33) | |
| | 0.81 mm (36) | |
| | 0.64 mm (36) | |
| 0.48 mm (38) | | |
| FPC | | |
| Frequency | DC~6GHz | |
| VSWR (L=100mm) | DC~3GHz | 1.4 max. |
| | 3GHz~6GHz | 1.6 max. |
| | 6GHz~9GHz | - |
| | 9GHz~12GHz | - |
| | 12GHz~15GHz | - |
| Service temp. (Celsius) | -40 degree ~ +90 degree | |
| Characteristic impedance | 50ohm | |
| Rated voltage | AC60V | |
| Contact resistance | 20m ohm max. | |
| Withstand voltage | AC200V/min | |
| Insulation resistance | 500M ohm min./DC100V | |

Flexibility to use PCB antenna or external, higher gain antenna.




MHF[®]-SW series product overview

| Product name | | | MHF [®] -SW23 | MHF [®] -SW20 | MHF [®] -SW18 | |
|--------------|--------------|--|---|---|---|----------------------------|
| Appearance | | |  |  |  | |
| Probe | Manual probe |  | Friction lock | 90582-**** *(0300/0400) | 90795-0300 | 90708-**** *(0300/0500) |
| | | | Mechanical lock | - | 90704-0300 | - |
| | Durability | | - | 1K Cycles | 2K Cycles | 0.5K Cycles |
| | High cycle | without floating |  | 90604-0001 | 90705-0001 | 90709-0001 |
| | | Durability | | 10K Cycles | 1,000K Cycles | 10K Cycles |
| | | with floating |  | 90605-0001 | 90706-0001 | 90710-0001 |
| | | Durability | | 200K Cycles | 1,000K Cycles | 100K Cycles |



Appendix : I-PEX Connectors Series

 Click icon below to see latest product information



MHF®



High-Frequency
Micro **RF**
Connectors



CABLINE®
FPL®



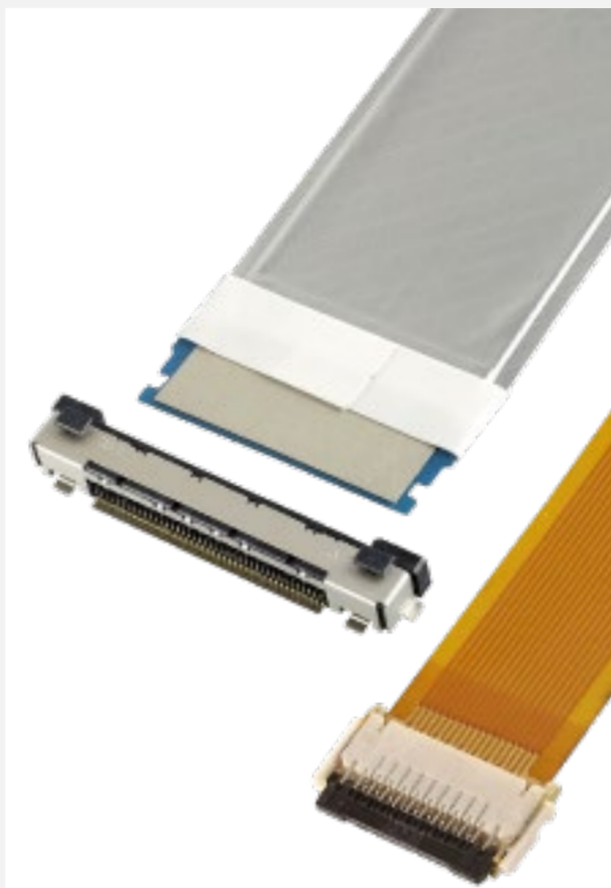
High-Speed
Micro-Coaxial
Connectors



NOVASTACK®



High-Density
Board-to-Board
Connectors



MINIFLEX
EVAFLEX®



High-Density
FFC/FPC
Connectors



ISH®



High-Power
Wire-to-Board
Connectors



CUSTOM





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