

Standard Coupling Unit SCF-0600-6G

MTS-No.: 26600-01

Application

With the MTS Standard Coupling Unit you can emulate mobile radio coverage in your test lab. It works with most types of mobile communication standard such as GSM, UMTS, LTE or LTE advanced as well as with WIFI connections. To avoid the influence from the live-net, the signals have to be connected with cables directly from the different signal sources, as for example BTS, eNodeB or signal generators etc. over the MTS SCF to mobile devices.

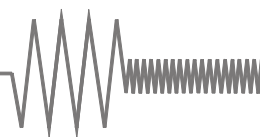
Description

The MTS Standard Coupling Unit series SCF-0600 is a special development in the series of our Air Interface Adapters. It combines the general function of two single SCF-0300 devices with the aim to cover all possible frequency ranges in the field of mobile communication. The SCF-0600 emulates the radio coverage with 2x 6 inputs and 2x 5 outputs. Each path can be controlled by variable attenuators. Additionally 2x 3 hybrid couplers are integrated for individual use of combining or splitting the RF-signals. Further details and schematics as follow.



Characteristics

- ▶ 2x 1 path, each with 2 inputs coupled to 1 output through 95 dB attenuators
- ▶ 2x 4 path, each with 1 inputs coupled to 1 output through 95 dB attenuators
- ▶ Frequency range from 700 MHz to 6000 MHz (usable from 500 MHz with reduced specifications)
- ▶ Attenuation range from 0 dB to 95 dB in 1 dB steps at each attenuator
- ▶ On request attenuation in 0.5 dB steps (up to 95 dB) or in 0.25 dB steps (up to 32 dB)
- ▶ LEDs at the front panel show the power level indication for 700 to 6000 MHz (≤ -45 dBm, > -45 dBm, $> +10$ dBm)
- ▶ 2x 3 integrated hybrid couplers (3 dB)
- ▶ Switching time up to 10 ms (within broadcast of commands)
- ▶ Integrated power supply 100 V - 240 V AC
- ▶ Manual control (seven-segment displays with UP/DOWN-keys)
- ▶ Remote control by RS-232, LAN and USB (other interfaces or web control on request)
- ▶ On request independent remote control for left and right part (second IP-address)
- ▶ On request with integrated LAN-switch (4 ports)
- ▶ 19" rack mount case with 6 HU inclusive 4x desktop bed-plate
- ▶ Windows control programs can be offered
- ▶ High quality materials and components for extended durability
- ▶ Coupling Units can be designed according to customers individual requirements



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Configuration:

2 paths each with 2 variable attenuators connected by hybrid couplers (3 dB) to 1 output (4 inputs, 2 outputs sum),
2x 4 paths each with 1 variable attenuators as well as
power level indication for each attenuator input at the front panel
and additional 2x 3 additional hybrid couplers (3 dB)

Technical data:

1 RF-specifications (paths with attenuators):

| | | | |
|--|--|--|--|
| 1.1 Impedance | 50 Ω | | |
| 1.2 Input power | 33 dBm max. | | |
| 1.3 Frequency range | 700 MHz - 6000 MHz | | |
| 1.4 RF-connections | N female | | |
| 1.5 Attenuation @ attenuator paths | 0 dB - 95 dB in 1 dB steps 0.5 / 0.25 dB on request | | |
| | min. | typ. | max. |
| 1.6 VSWR in @ 700 - 5850 MHz @ 5850 - 6000 MHz | | 1.3 1.5 | 1.9 2.1 |
| VSWR out | | 1.2 | 1.7 |
| 1.7 Insertion loss (IL) pure attenuator path @ 700 MHz @ 6000 MHz | | 4.0 dB 9.5 dB | 10.0 dB |
| with hybrid @ 700 MHz @ 6000 MHz | | 7.5 dB 13.5 dB | 15.0 dB |
| 1.8 IL derating / 100 MHz pure attenuator path | | 0.1 dB | 0.2 dB |
| 1.9 Relative phase | | 165 ° | |
| 1.10 Phase balance 90 ° with hybrid on both identical attenuation | | ± 3 ° | |
| 1.11 Input IP3 | | 55 dBm | |
| 1.12 Isolation with hybrid | (without attenuation) 32 dB | 42 dB | |
| 1.13 Switching time | | 10 ms | |
| 1.14 Attenuation accuracy @ 700 - 3000 MHz @ 0 - 30 dB @ 31 - 60 dB @ 61 - 95 dB | | ± 0.1 dB ± 0.4 dB ± 0.8 dB | ± 0.8 dB $\pm 1.5/-0.8$ dB $\pm 2.5/-1.5$ dB |
| @ 3000 - 6000 MHz @ 0 - 30 dB @ 31 - 60 dB @ 61 - 85 dB @ 86 - 95 dB | | -0.7 dB -2.6 dB -5.2 dB -5.2 dB | +0.8/-1.5 dB +0.8/-3.0 dB +1.5/-6.0 dB +1.5/-9.0 dB |

2 RF-specifications (hybrid couplers):

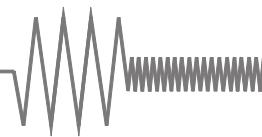
| | | | |
|--|--------------------|--------------|--------------|
| 2.1 Impedance | 50 Ω | | |
| 2.2 Input power | 33 dBm max. | | |
| 2.3 Frequency range | 700 MHz - 6000 MHz | | |
| 2.4 RF-connections | N female | | |
| | min. | typ. | max. |
| 2.5 VSWR (at all ports) | | 1.2 | 1.5 |
| 2.6 Insertion loss / Coupling (+3 dB) | | 0.6 dB | 2.0 dB |
| 2.7 Isolation | 18 dB | 24 dB | |
| 2.8 Amplitude balance | | ± 0.5 dB | ± 0.9 dB |
| 2.9 Phase balance 90 ° | | ± 1 ° | ± 5 ° |

3 RF-specifications (power level indication):

| | | | |
|---|-----------------------------|-------------------------------|-------------------------------|
| 3.1 Frequency range | 700 MHz - 6000 MHz | | |
| | min. | typ. | max. |
| 3.2 Green LED on low border (excl.) @ 700 - 5500 MHz @ 5500 - 6000 MHz | -50 dBm -50 dBm | -45 dBm -45 dBm | -40 dBm -35 dBm |
| 3.3 Green LED on high border (incl.) Red LED on low border (excl.) @ 700 - 3000 MHz @ 3000 - 5500 MHz @ 5500 - 6000 MHz | 0 dBm + 5 dBm + 5 dBm | +10 dBm +10 dBm +10 dBm | +10 dBm +15 dBm +25 dBm |

4 Connections:

| | |
|----------------|---|
| 4.1 Front side | RF-connections Seven-segment displays UP/DOWN-keys LEDs for power level indication |
| 4.2 Rear side | RF-connections Control card Appliance plug with the integrated fuses F1 and F2 Ground connector Control interfaces |



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2x 4 paths each with 1 variable attenuators as well as
power level indication for each attenuator input at the front panel
and additional 2x 3 additional hybrid couplers (3 dB)

Technical data:

5 General specifications:

| | |
|--|--|
| 5.1 Power supply | 100 V - 240 V 50 Hz / 60 Hz |
| 5.2 Internal voltage | +5 V DC / +28 V DC |
| 5.3 Control displays | Control lamp in the power switch Seven-segment displays LEDs for power level indication |
| 5.4 Control interfaces | UP/DOWN-keys RS-232 LAN USB |
| 5.5 Power consumption primarily | 200 mA max. @ 230 V |
| 5.6 Voltage supply | Standard rubber connector |
| 5.7 Operating temperature | 0 °C - +50 °C |
| 5.8 Reference temperature for specifications | +25 °C |

| | |
|----------------|---|
| 5.9 Dimensions | 19"-unit x 6 HU x 310 mm incl. 4x desktop bed-plate (dimensions without handles and connections) |
| 5.10 Colour | Front side colourless anodized Rear side colourless anodized |
| 5.11 Weight | 15 kg |

6 Delivered parts:

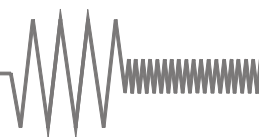
SCF-0600-6G
Power cable
CD with operating manual

7 Comments:

| | |
|----------------|-----------|
| Warranty | 12 months |
| RoHS-compliant | Yes |

8 Recommended accessories:

Shielding box of the series
MSB-02xx or MSB-01xx
RF-cables
Control software



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Typical measurements (paths with attenuators):

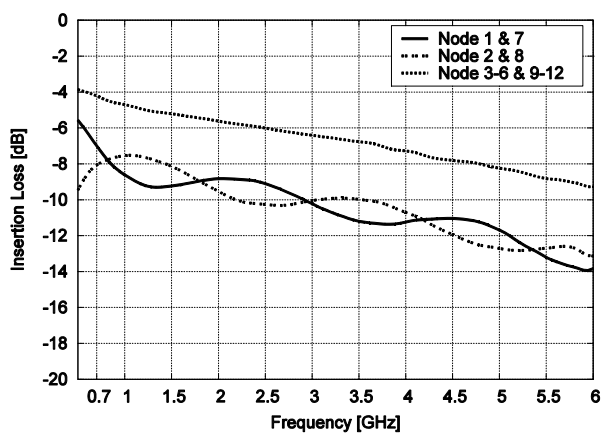


Fig. 1: Input port to output port insertion loss

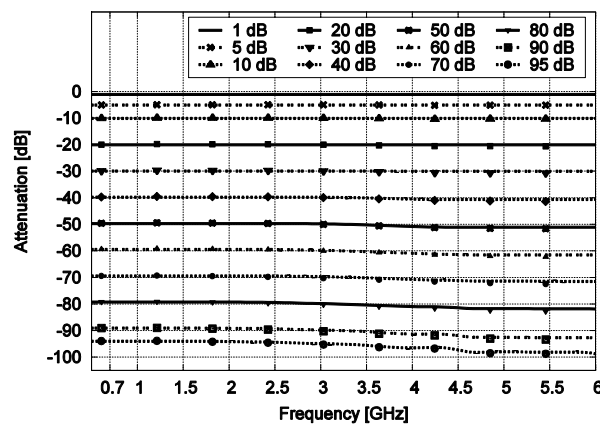


Fig. 2: Attenuation relative to insertion loss

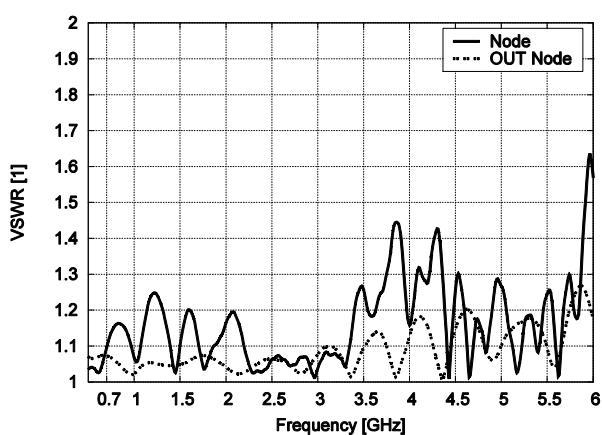


Fig. 3: VSWR for input and output ports

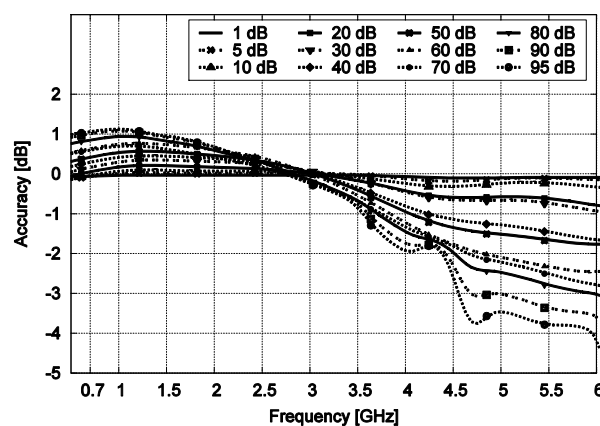


Fig. 4: Attenuation accuracy

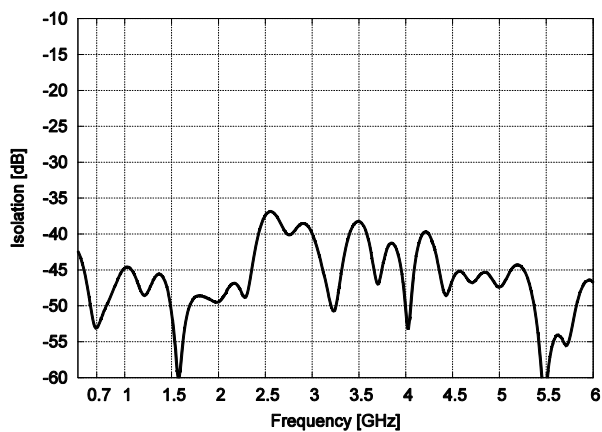
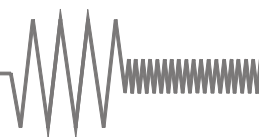


Fig. 5: Isolation between input ports (Node 1/2 & 7/8)



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Typical measurements (hybrid couplers):

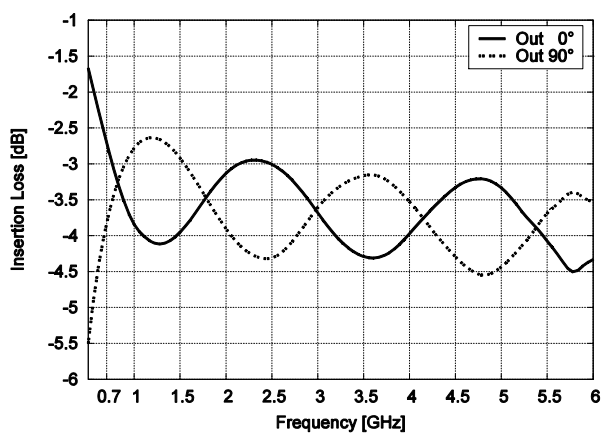


Fig. 1: Through (0°) and coupled line insertion loss

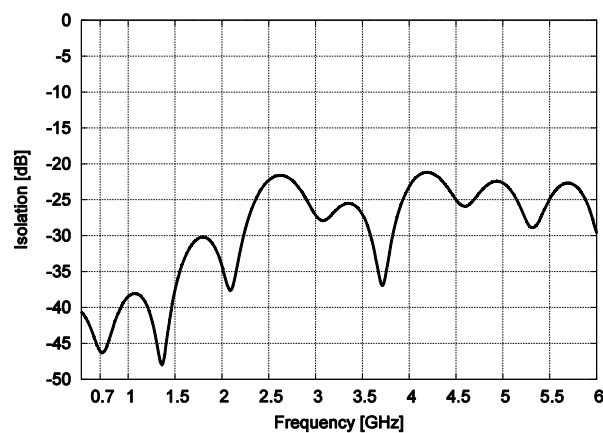


Fig. 2: Isolation between output ports

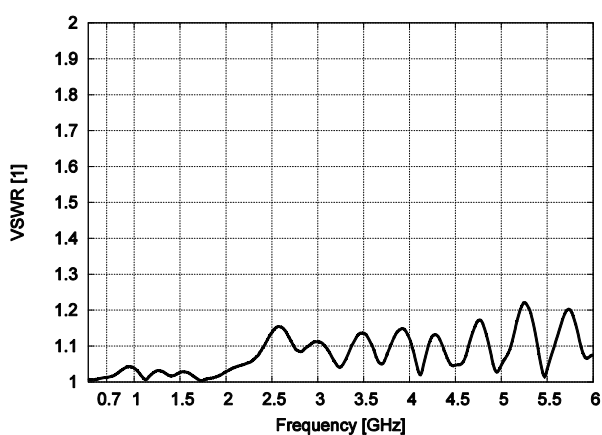


Fig. 3: VSWR at all ports

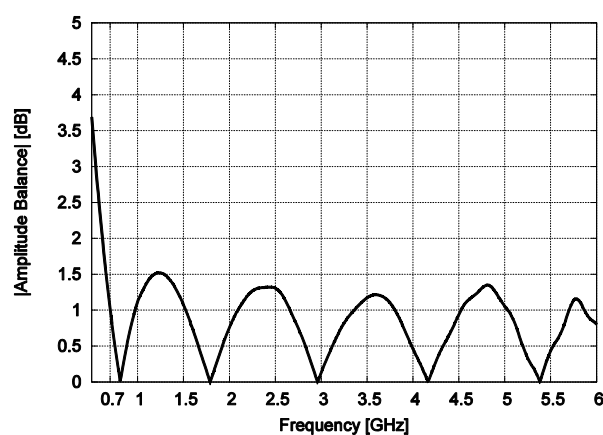


Fig. 4: Amplitude balance between output ports

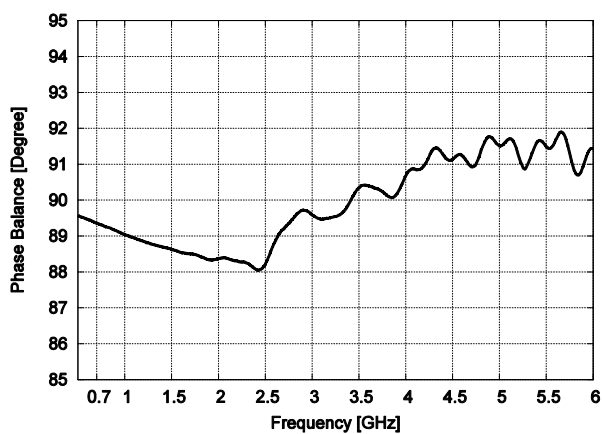


Fig. 5: Phase balance between output ports

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Views:

