

HTOL RF Series

Innovative High Temperature Operating Life RF Test System

Preface

The TRUMPF Hüttinger system is designed to provide and measure RF power in forward and return paths to active or passive electronic components such as SAW Filters and other semiconductor devices during HTOL stress tests.

Test Technology

AUTOMATIC LEVEL CONTROL (ALC)

Power level of input and return path of the device under test (DUT) is monitored continuously. This allows to precisely provide the defined power level at the DUT. Optimized power regulation avoids overshoots during power up.

INSERTION LOSS TOLERANCES OF DUT

An insertion loss "window" with individual limits can be specified for each DUT in the control software. Upper and lower limits can be set for different frequency profiles to offset the losses. Every data point outside the tolerance band is being logged by the system software.

COMPENSATION OF CABLE LOSSES

Power loss in the RF cables to the DUT can be compensated by the software to ensure accurate control of the set power at the DUT. The insertion loss of both, cables and measurement structure can be normalized with 0 dB attenuators (through-connectors). The software allows to normalize the levels compared to the reference to evaluate for example the long-term stability of DUTs.

AUTOMATIC TEST STOP

Once the specified test time has been reached, all RF signals to the DUTs will switch off. In the event of a DUT drop out or failure only the affected path is switched off.



Figure 1: Single 2-Channel HTOL Module

Modular System

The modular system setup allows to control up to 160 individual RF channels. Due to this modularity, the test rack can be configured just as needed to build a cost and space efficient system. Each channel can be set to individual frequencies and power levels to cover all relevant power levels for mobile communications devices such as Diplexers, Filters or Switches. The unit used for mass production testing is typically integrated in a 19" rack with up to 80 channels in a 35HU configuration or 160 channels in a 52HU configuration. For development and evaluation purposes, the system can be also configured as a desktop device with up to 16 channels.

Small Footprint System

This TRUMPF Hüttinger HTOL Test system allows the installation as close to the ovens as possible. All required measurement components (e.g. temperature sensors, voltage and current sensors, impedance measurement) are fully integrated in each module to ensure the fastest reaction time.

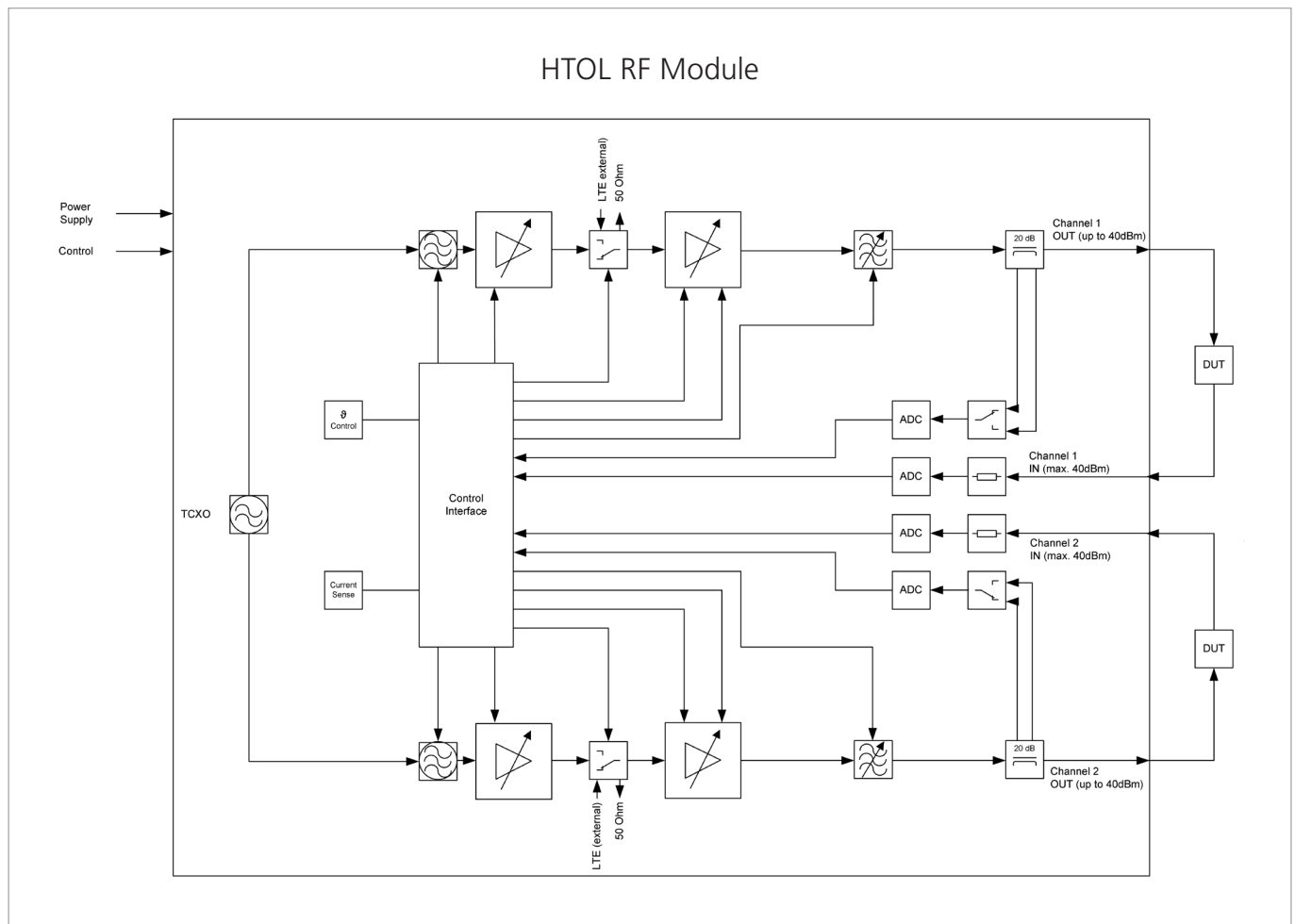
Features

- Minimized setup time
- Automated calibration of the test system and test cables
- Individual frequency and power configuration for each channel settable via GUI
- Continuous monitoring of all relevant parameters for each DUT
- Realtime monitoring of all measurement values via control software
- Full protocol and summary for each finished test
- Integrated signal generation for each channel
- Wide frequency range (400 - 8000 MHz)
- External input for modulated signals
- High output level accuracy with up to 37 dBm at DUT
- High measurement accuracy (down to 0.2 dB)
- Scalable system from 2 - 160 channels
- Local or remote control via Ethernet
- Integrated Panel-PC with touchscreen (optional)
- High temperature cables for up to 150 °C



Figure 2: Complete 80-Channel HTOL Rack

Block Diagram



System Parameters

RF Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Impedance (in/out)			50		Ohm	
Number of channels	DUT	2	80	160		Rack
		2	16	16		Desktop Device
Low frequency	fmin			400	MHz	Different frequency ranges available
High frequency	fmax	8000			MHz	Different frequency ranges available
Output power accuracy	dPout		± 0.2		dB	
Measurement accuracy	dMeas		± 0.4	± 1	dB	
Output power (forward path)	Psat	36	37		dBm	
Dynamic range (output)	dPout		30		dB	
Input power (return path)	Pin			37	dBm	
Dynamic range (input)	dPin		40		dB	
Output power back off (with ext. LTE source, avg. power over 20 MHz range)			10		dB	
Harmonics	d		-30		dBc	Depending on frequency range
RF Connectors		SMA female				

Common Specifications (Rack System)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Power supply		350	400	460	V	50 / 60 Hz, 3-phases International options available
Power consumption	P			15	kW	Depending on channel number and frequency range
Power plug		CEE 32				International options available
Dimensions	W x H x D	600 x 1600 x 800			mm	19", 35U
Weight			350		kg	
Remote interface		RJ45 (Ethernet)				ASCII commands; SCPI
Operating temp. range	To	20		30	°C	
Storage temp. range	Ts	-40		70	°C	

Common Specifications (Desktop Device)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Power supply		200	230	265	V	50 / 60 Hz, 1-phase International options available
Power consumption	P			3	kW	Depending on channel number and frequency range
Power plug		CEE 7/7 (Schuko)				International options available
Dimensions	W x H x D	530 x 440 x 660			mm	19", 5U
Weight			35		kg	
Remote interface		RJ45 (Ethernet)				ASCII commands; SCPI
Operating temp. range	To	20		30	°C	
Storage temp. range	Ts	-40		70	°C	



TRUMPF Hüttinger
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