

TSQA-1X8PF

8 Channel 5 W Precise RF Power Source, 1700 MHz...9800 MHz

Features

- compact 19", 3 U design
- high level dynamic range
- very high level accuracy and stability by ALC (Automatic Level Control)
- internal CW signal source
- LAN and USB remote interface
- GUI (Graphical User Interface)
- adapted power consumption
- opt. pulse modulator



Applications

- quality assurance
- research and development (R&D)

At a Glance

TSQA-1X8PF is a compact, high power multi source with 8 output channels suitable for the frequency range 1700 ... 9800 MHz. The TSQA-1X8PF offers an output power capability of up to 5 W per channel. Each channel has an ALC for precise output power stability over long periods. The TSQA-1X8PF is equipped with an internal CW RF signal source. A typical application of this system is to perform RF stress in HTOL (High Operating Lifetime testing) of RF components.

Optimized Power Consumption

The power consumption and efficiency are adapted to the required RF output power level in 3 power classes. Dependant on the chosen RF output power the supply voltages of the power amplifier stages is varied. This minimizes heat generation and cooling needs.

High Output-to Output Isolation

A mismatch of impedance at one or more outputs should not have any influence to the other outputs. The TSQA-1X8PF offers very high isolation of typical 85 dB between ports to avoid this effect.

High RF Level Precision

Each output channel provides a very precise RF output level with closed-loop level control (ALC), and virtually no visible steps. As a consequence, the symmetry between the 8 outputs as well as the long stability is guaranteed. Also, the control loop's smooth characteristic guarantees avoidance of

overshoot. The output level range is large to cover a big variety of application categories.

Harmonic Suppression

The RF energy should be concentrated in the fundamental. TSQA-1X8PF has an adaptive harmonic filter for effective suppression of harmonics.

Option Pulse Modulator

With option pulse modulator installed the TSQA-1X8PF is able to generate CW and pulse modulated signals.

Input for External Generator

For feeding the multi power source with other signals as CW or pulsed signals, the device offers an RF input for the connection of external RF sources.

Flexible Control Interfaces

Physical remote interfaces: LAN or USB. TSQA-1X8PF is controllable via GUI (Graphic User Interface) without any additional effort of application software development and regardless of location. Alternatively, the system offers the control via an SCPI inspired ASCII string protocol for ATE (Automatic test Equipment) applications.

System self-monitoring

The system can run without human intervention during entire test periods of multiple months. It contains automatic self-checking like current consumption, module temperature and logging of errors.

Higher number of channels

Often batches of 77 DUTs are tested simultaneously in a HTOL test. Higher number of test channels can be provided by stacking TSQA-1X8PME subsystems in a 19" system rack. 10 subsystems are needed to realize an 80 channel HTOL system and can be provided in just 42 U, which is extremely compact. Becker Nachrichtentechnik GmbH offers turnkey solutions with higher number of channels on customer demand.

Entry of frequency and desired output level

The TSQA-1X8PF software allows the entry of up to 5 different frequencies, corresponding output levels and boundaries. The SW automatically cycles through the frequencies during the test.

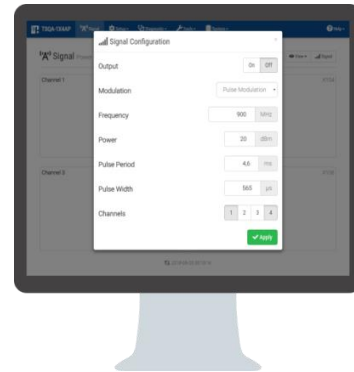
Status Read-Out

At any time during the test, the software allows to display the current status, including insertion loss/gain per channel and failure statistics.

Software Functionalities

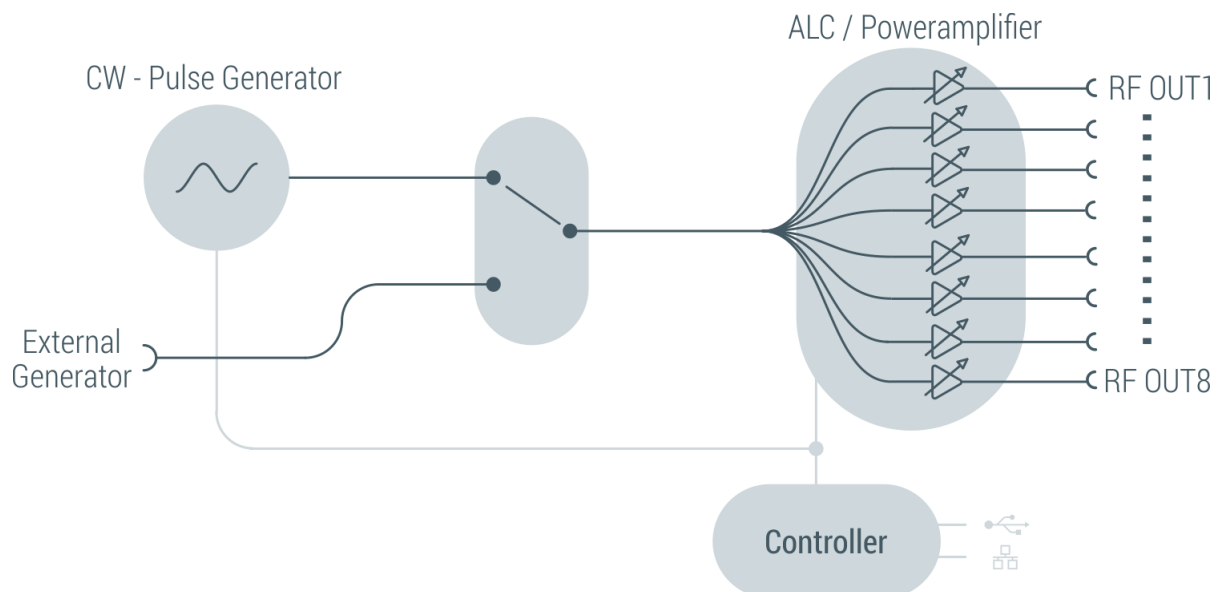
GUI (Graphic User Interface)

Additional to commanding via remote interface parameters like operating frequency, output level and are settable via a GUI. With the pulse option pulse length and period are also settable via the GUI.



For taking into account losses of external RF connecting cables, type and length of the cables can be entered. The software calculates the output power level related to the end of the cable.

Block Diagram



RF Specification

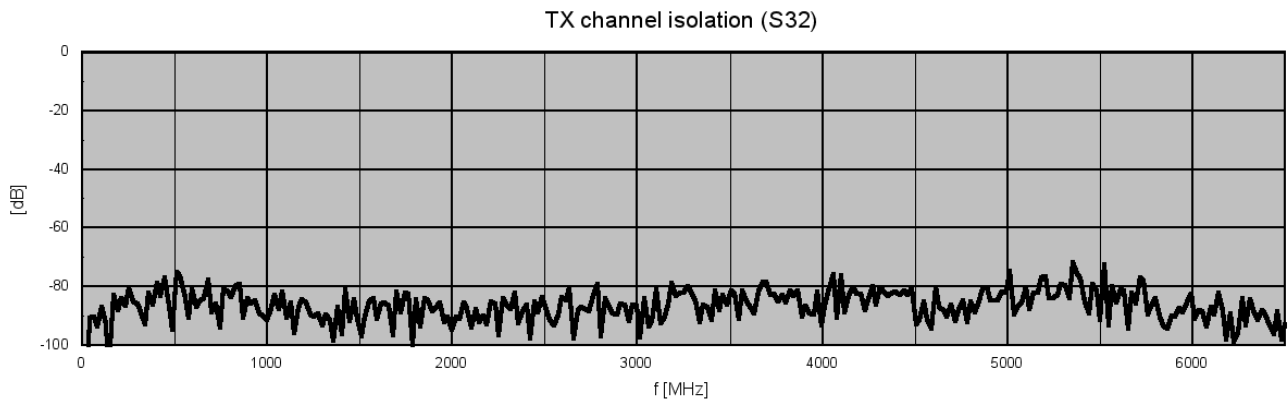
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z _{IN} /Z _{OUT}		50		Ω	
number of outputs	n _{OUT}		8			
low frequency	f _{MIN}		1700	2000	MHz	
high frequency	f _{MAX}	8500	9800		MHz	
min. output power	P _{TX_MIN}			+20.0	dBm	
max. output power	P _{TX_MAX}		+37.0		dBm	f < 2 GHz
	P _{TX_MAX}	+37.0	+38.0		dBm	2 GHz ≤ f < 2.4GHz
	P _{TX_MAX}	+38.0	+39.0		dBm	2.4 GHz ≤ f ≤ 4 GHz
	P _{TX_MAX}	+36.5	+38.0		dBm	4 GHz < f ≤ 8.5 GHz
	P _{TX_MAX}		+36.0		dBm	f > 8.5 GHz
ALC resolution	ΔP _{TX}			0.05	dB	
output power accuracy	dP _{TX}		±0.3		dB	CW, RMS detection
harmonics	HD		-25		dBc	f = 2.7 GHz, P _{TX} = + 37 dBm
output isolation	S ₂₃		-80		dB	full gain
number of inputs	n _{RX}		8			power measurement
RF connectors	X _{RFI}	SMA female				RF outputs and inputs
CW signal source						
low frequency	f _{MIN}			1700	MHz	
high frequency	f _{MAX}	9800			MHz	
frequency resolution	Δf _{GEN}		10		kHz	
frequency accuracy	df _{GEN}		±2.5		ppm	
Ext. Generator Input						
impedance	Z _{IN} /Z _{OUT}		50		Ω	
low frequency	f _{MIN}			1700	MHz	
high frequency	f _{MAX}	9800			MHz	
input power	P _{RF}		0		dBm	nominal
maximum input power	P _{RF}			+10	dBm	
Option Pulse Modulator						
pulse lenght	t _w	577		2300	ms	
period	t _p	4.6		1000	ms	
detection		RMS and peak power				

Common Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
power supply	U_{AC}	90	230	260	V	50 / 60 Hz
power consumption	P		780		W	full RF power
power socket	X_{AC}	IEC-60320 C14				country specific power cable
dimensions	W x H x D	approx. 483 x 133 x 431			mm	19", 3 U
weight			14		kg	
remote interface		RJ45 10/100BaseT				ASCII commands
operating temp. range	T_o	+ 20		+ 30	°C	within specification
storage temp. range	T_s	- 40		+ 70	°C	
EMC		EN61326-1:2013				according directions: 2014/30/EU
safety		EN61010-1:2010				according directions: 2014/35/EU
ordering information	P/N	1804.6502.1	TSQA-1X8PF			
	P/N	1804.6502.4	TSQA-1X8PF			Variant with medium power extension
	P/N	1804.6502.O1	TSQA-1X8PME-O1			Option: pulse generator extension



TX Output Isolation High Power (typical response)



Appearances



TSQA-1X8PF with RF ports on right side
(Similar appearance)



TSQA-1X8PF with RF ports and power/remote
(Similar appearance)

Related Products

Product	Description	P/N
TSQA-80PMF	80 Channel, 5 W Precise Automatic HTOL RF Test System 1700 MHz ... 9800 MHz	2003.6302
TSQA-1X8PMF	8 Channel, 5 W Precise Automatic HTOL RF Sub System 1700 MHz ... 9800 MHz	2003.6202
TSQA-80PME	80 Channel 10 W Precise Automatic HTOL RF Test System 300 MHz...6000 MHz	1804.6302
TSQA-1X8PME	8 Channel, 10 W Precise Automatic HTOL RF Sub System 300 MHz...6000 MHz	1804.6202
TSQA-80XME	80 Channel, 500 mW Precise Automatic HTOL RF Test System 300 MHz...6000 MHz	1804.6002
TSQA-1X8XME	8 Channel, 500 mW Precise Automatic HTOL RF Sub System 300 ... 6000 MHz	1804.6002
TSQA-1X80PM	80 Channel 2.5 W Precise Automatic HTOL RF Test System 20 MHz...3000 MHz	1606.1012
TSQA-1X16PM	16 Channel 2.5 W Precise Automatic HTOL RF Test System 20 MHz...3000 MHz	1606.1027