TSF Library - OnedBCompressionTest

Schema Name:- OnedBCompressionTest
Version:- 1.6
Schema Location:- OnedBCompressionTest.xsd
namespace:- OnedBCompressionTest
prefix:- this
Description:-
Compression test for Mini-Circuits ZJL-3G amplifier.
To determine the 1dB compression point of a unit under test, a suitable algorithm must be derived to traverse a range of input power levels; using the HI, LO and GO attributes of the ONE_DB_COMPRESSION_POINT TSF, until the 1dB compression point is found.

GAIN

Definition

Used to calculate the linear gain of a UUT, by applying a CW signal of a particular power and measuring the output power.

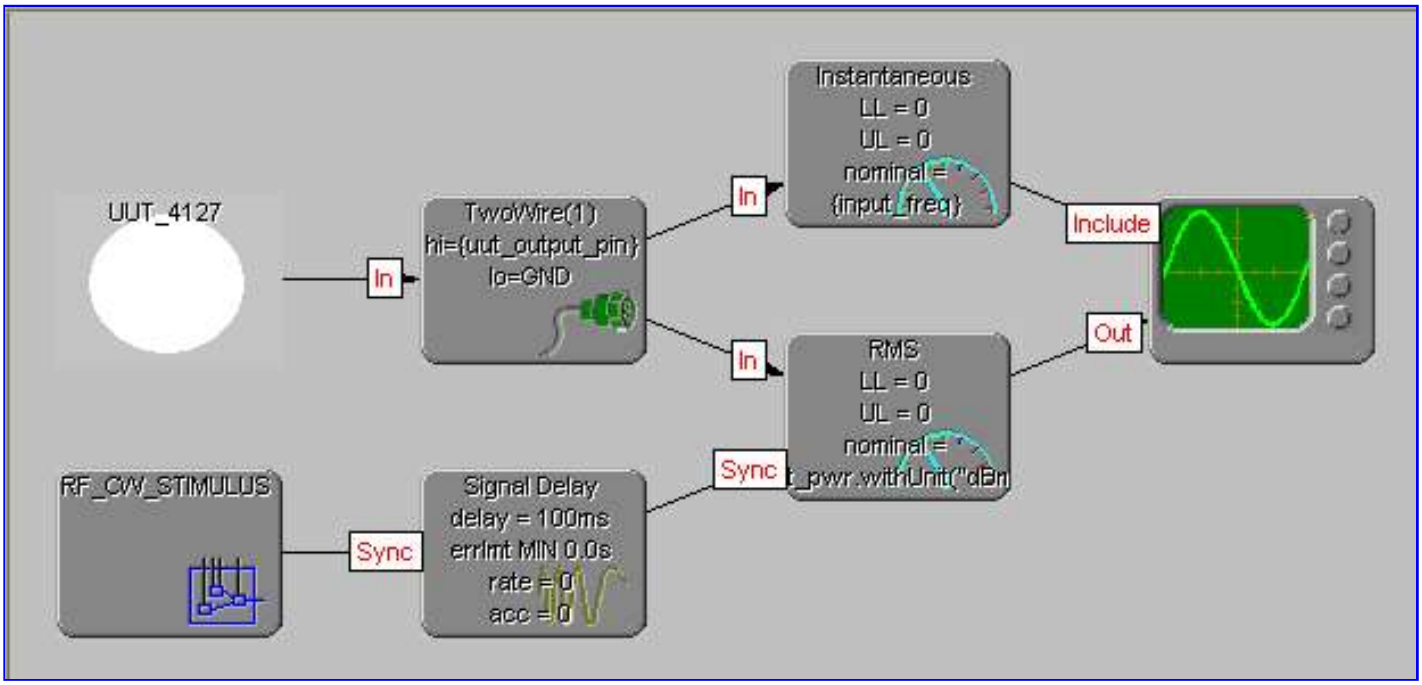

Figure 1-TSF GAIN(GAIN)

Interface Properties

Table 1-TSF GAIN Interface

Description	Name	Type	Default	Range
Input power to the UUT.	input_pwr	Power	0 W	
Gain of the UUT.	measurement	Ratio	{{MeasOutputPower.measurement.withUnits("dBm").magnitude - input_pwr.withUnits("dBm").magnitude} dB}	
UUT input pin name.	uut_input_pin	string	IN	
UUT output pin name.	uut_output_pin	string	OUT	
Determines whether a valid gain value is available to be read.	measurement_complete	boolean	{MeasOutputPower.samples >= MeasOutputPower.count}	
This nominal gain is used to calculate the nominal value of the power output from the UUT and may be used by an instrument to select an appropriate range, such that the desired accuracy can be achieved.	nominal	Ratio		
The frequency at which the gain should be calculated.	input_freq	Frequency		

Notes

Model Description

Table 2-TSF GAIN Model

Name	Type	Terminal	Inputs	Output	Formula
MeasOutputPwr	RMS	[Out]			
		measuredVariable	DEPENDENT		
		measurement			0
		samples			1

		count			0
		gateTime			1
		nominal			{input_pwr.withUnit("dBm").magnitude + nominal.withUnit("dB").magnitude} dBm load 50 Ohm
		condition	NONE		
		GO	false		
		NOGO	false		
		HI	false		
		LO	false		
		UL			0
		LL			0
		Signal [In]	UUTOuput		
		Sync[In]	UUTSettlingTime		
UUTSettlingTime	SignalDelay	Signal [Out]		MeasOutputPwr	
		acceleration			0
		delay			100ms errlmt MIN 0.0s
		rate			0
		Sync[In]	RF_CW3		
RF_CW3	RF_CW_STIMULUS	Signal [Out]		UUTSettlingTime	
		ampl			0 W
		uut_input_pin	IN		
FrequencyCapability	Instantaneous	[Out]			
		measuredVariable	DEPENDENT		
		measurement			0
		samples			0
		count			0
		gateTime			1
		nominal	{input_freq}		
		condition	NONE		
		GO	false		
		NOGO	false		
		HI	false		
		LO	false		
		UL			0
		LL			0
		Signal [In]	UUTOuput		
UUTOuput	TwoWire	Signal [Out]		MeasOutputPwr FrequencyCapability	
		lo	GND		
		hi	{uut_output_pin}		
		channelWidth			1
		Signal [In]	UUT		
UUT	In	Signal [Out]		UUTOuput	

Rules

RF_CW_STIMULUS

Definition

A CW stimulus signal for Mini-Circuits ZJL-3G amplifier.

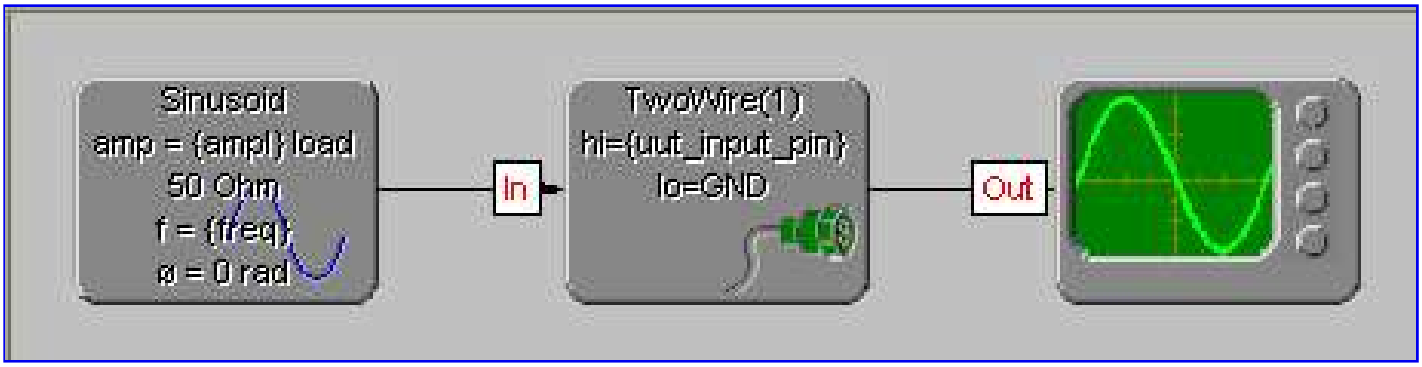

Figure 2-TSF RF_CW_STIMULUS(RF_CW_STIMULUS)

Interface Properties

Table 3-TSF RF_CW_STIMULUS Interface

Description	Name	Type	Default	Range
Amplitude of this RF stimulus signal (dBm)	ampl	Power	0 W	
Frequency of this RF stimulus signal.	freq	Frequency		
UUT pin, to which to apply the signal.	uut_input_pin	string	IN	

Notes

Model Description

Table 4-TSF RF_CW_STIMULUS Model

Name	Type	Terminal	Inputs	Output	Formula
UUTInput	TwoWire	Signal [Out]			
		lo	GND		
		hi	{uut_input_pin}		
		channelWidth			1
		Signal [In]	CWSignal		
CWSignal	Sinusoid	Signal [Out]		UUTInput	
		amplitude	{ampl} load 50 Ohm		
		frequency	{freq}		
		phase			0 rad

Rules

ONE_DB_COMPRESSION_POINT

Definition

1 dB compression point test for Mini-Circuits ZJL-3G RF amplifier.
This TSF defines the conditions under which the 1dB compression point occurs for this class of amplifier. NB The test should be carreid out with the unit powered on.

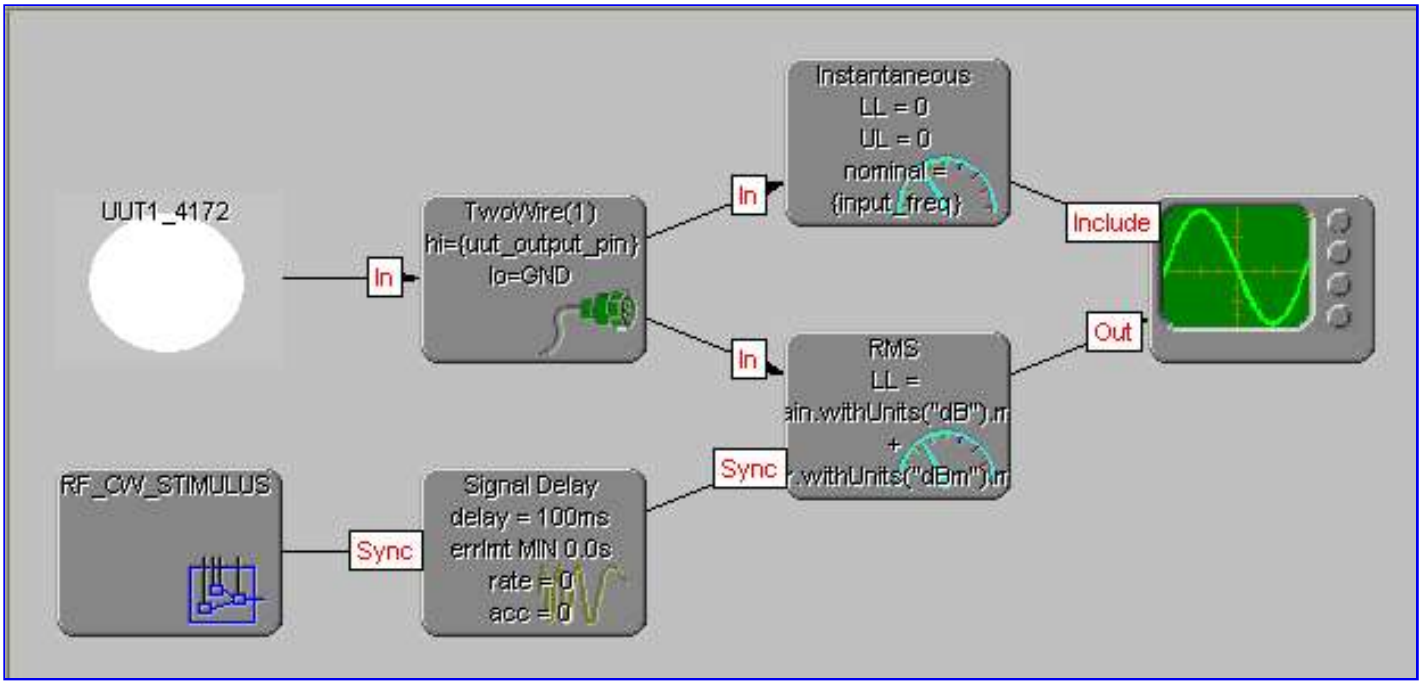

Figure 3-TSF ONE_DB_COMPRESSION_POINT(ONE_DB_COMPRESSION_POINT)

Interface Properties

Table 5-TSF ONE_DB_COMPRESSION_POINT Interface

Description	Name	Type	Default	Range
Power level to apply to the unit under test, to determine the 1 dB compression point.	input_pwr	Power	0 W	
True if the compression point is found.	GO	boolean	{MeasOutputPwr.GO}	
True if the measured output power is above the 1 dB compression point.	HI	boolean	{MeasOutputPwr.HI}	
True if the measured output power is below the 1 dB compression point.	LO	boolean	{MeasOutputPwr.LO}	
The required tolerance for the compression point location.	errlmt	Ratio		
Linear region (small signal) gain for the unit under test.	linear_gain	Ratio		
Measured output power for the last measurement.	measurement	Power	{MeasOutputPower.measurement}	
UUT input pin name.	uut_input_pin	string	IN	
UUT output pin name.	uut_output_pin	string	OUT	
Frequency to apply to the unit under test, to determine the 1 dB compression point.	input_freq	Frequency		
Determines the measurement status.	measurement_complete	boolean	{MeasOutputPower.Count >= MeasOutputPower.samples}	

Notes

Model Description

Table 6-TSF ONE_DB_COMPRESSION_POINT Model

Name	Type	Terminal	Inputs	Output	Formula
MeasOutputPwr	RMS	[Out]			
		measuredVariable	DEPENDENT		
		measurement			0
		samples			1
		count			0
		gateTime			1
		nominal			{input_pwr.withUnits("dBm").magnitude + linear_gain.withUnits("dB").magnitude} dBm load 50 Ohm
		condition	NONE		
		GO	false		
		NOGO	false		
		HI	false		
		LO	false		
		UL			{linear_gain.withUnits("dB").magnitude + input_pwr.withUnits("dBm").magnitude - 1 dB + errlmt.withUnits("dB").magnitude}
		LL			{linear_gain.withUnits("dB").magnitude + input_pwr.withUnits("dBm").magnitude - 1 dB - errlmt.withUnits("dB").magnitude}
		Signal [In]	UUTOutput		
		Sync[In]	SignalDelay15		
SignalDelay15	SignalDelay	Signal [Out]		MeasOutputPwr	
		acceleration			0
		delay			100ms errlmt MIN 0.0s
		rate			0
		Sync[In]	UUTInputPwr		
UUTInputPwr	RF_CW_STIMULUS	Signal [Out]		SignalDelay15	
		ampl	{input_pwr}		
		freq	{input_freq}		
		uut_input_pin	{uut_input_pin}		
FrequencyCapability	Instantaneous	[Out]			
		measuredVariable	DEPENDENT		
		measurement			0
		samples			0
		count			0
		gateTime			1
		nominal	{input_freq}		
		condition	NONE		
		GO	false		
		NOGO	false		
		HI	false		
		LO	false		
		UL			0
		LL			0
		Signal [In]	UUTOutput		
UUTOutput	TwoWire	Signal [Out]		FrequencyCapability MeasOutputPwr	
		lo	GND		
		hi	{uut_output_pin}		
		channelWidth			1
		Signal [In]	UUT1		
UUT1	In	Signal [Out]		UUTOutput	

Rules

UUT_PSU

Definition

A power supply for the Mini-Circuits ZJL-3G amplifier, to power the unit during the associated tests.

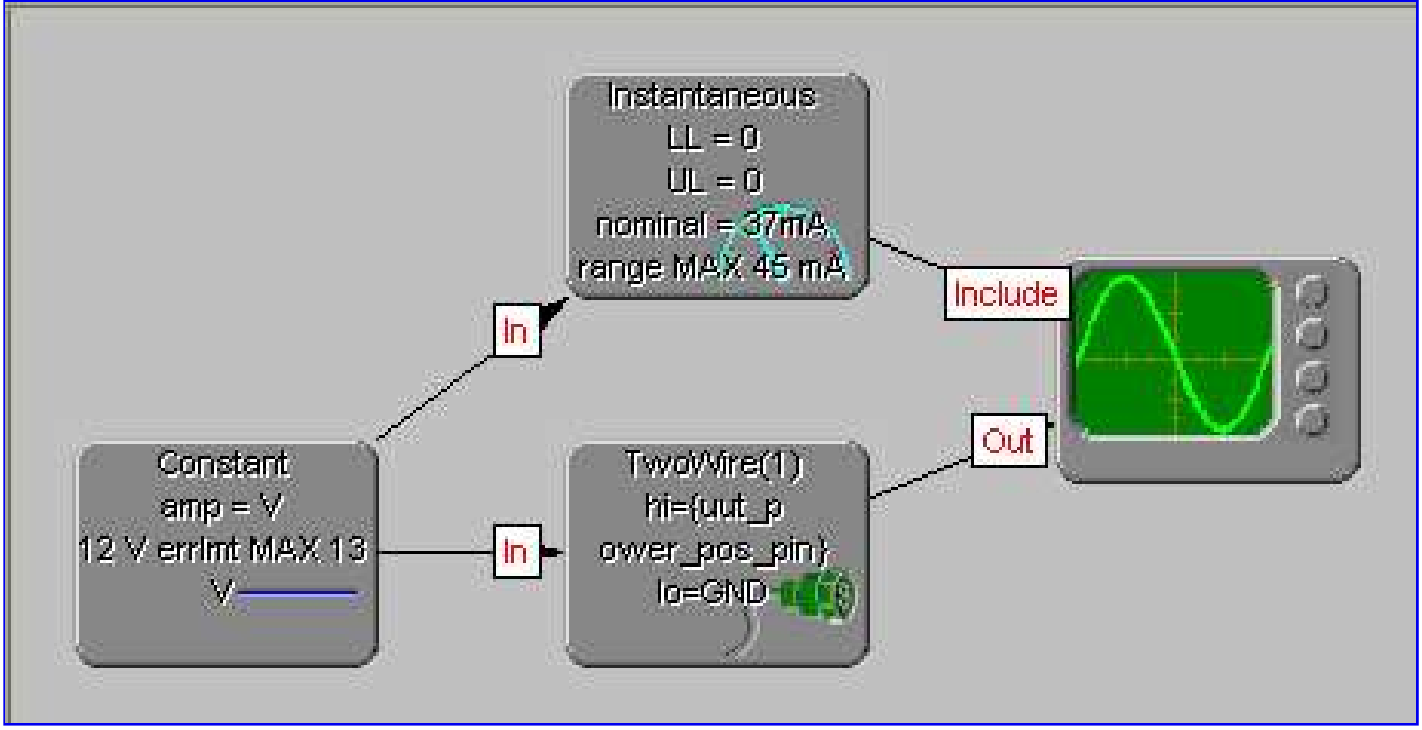

Figure 4-TSF UUT_PSU(UUT_PSU)

Interface Properties

Table 7-TSF UUT_PSU Interface

Description	Name	Type	Default	Range
Power pin name on the UUT	uut_power_pos_pin	string	+12V	

Notes

Model Description

Table 8-TSF UUT_PSU Model

Name	Type	Terminal	Inputs	Output	Formula
UUTPwrConnector	TwoWire	Signal [Out]			
		lo	GND		
		hi	{uut_power_pos_pin}		
		channelWidth			1
		Signal [In]	PSUVoltage		
CurrentCapability	Instantaneous	[Out]			
		measuredVariable	DEPENDENT		
		measurement			0
		samples			0
		count			0
		gateTime			1
		nominal			37mA range MAX 45 mA
		condition	NONE		
		GO	false		
		NOGO	false		
		HI	false		
		LO	false		
		UL			0
		LL			0
		Signal [In]	PSUVoltage		
PSUVoltage	Constant	Signal [Out]		UUTPwrConnector CurrentCapability	
		amplitude			12 V errlmt MAX 13 V

Rules

ODCP_COMPLETE

Definition

1 dB compression point test for Mini-Circuits ZJL-3G RF amplifier.
This TSF defines the conditions under which the 1dB compression point occurs for this class of amplifier. This measurement is determined in terms of the inverse transform of the 'detected' condition.
Input power is to be applied in the pattern defined by the Parameter1 component.
NB The test should be carreid out with the unit powered on.

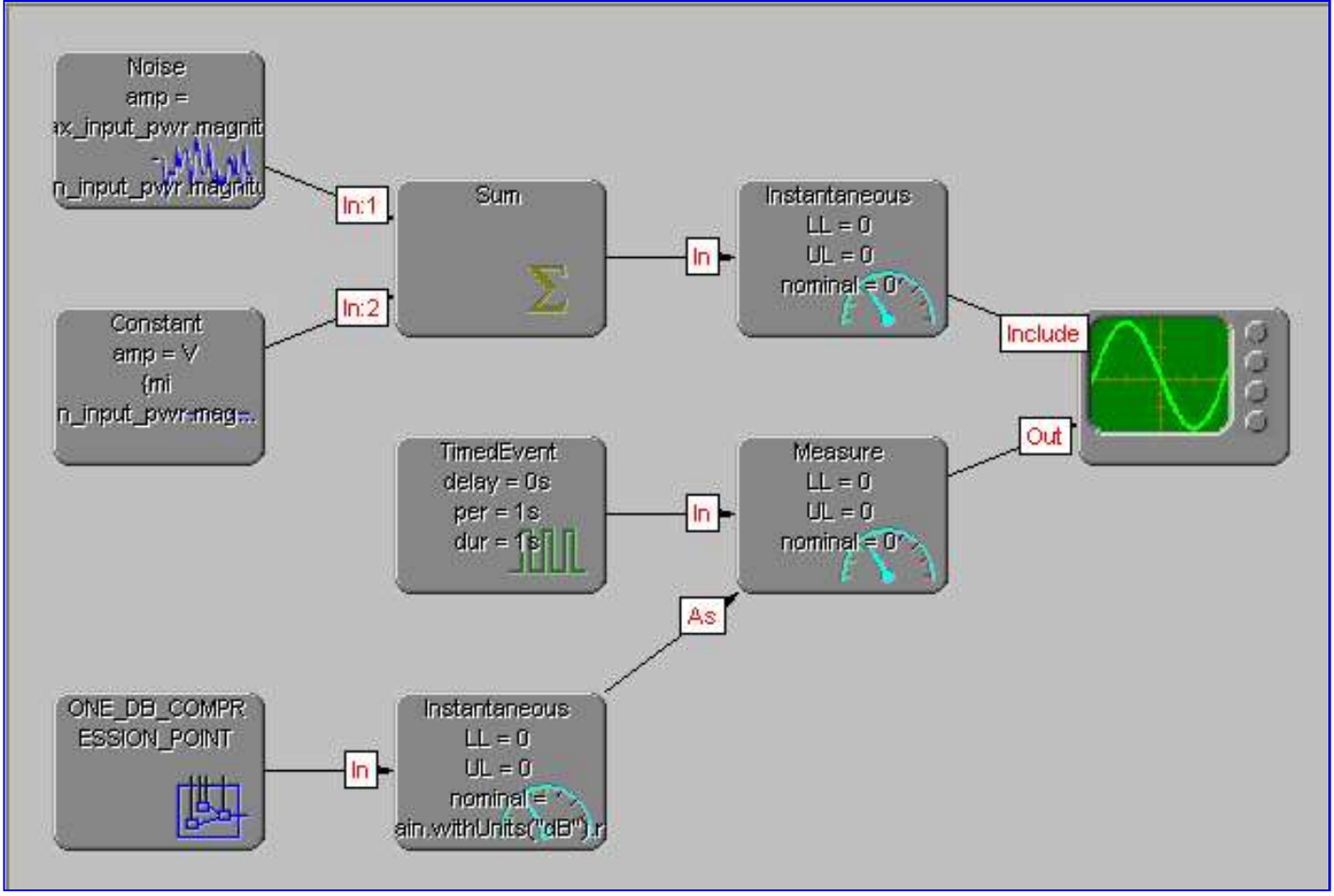

Figure 5-TSF ODCP_COMPLETE(ODCP_COMPLETE)

Interface Properties

Table 9-TSF ODCP_COMPLETE Interface

Description	Name	Type	Default	Range
Maximum input power to the UUT.	max_input_pwr	Power		
Minimum input power to the UUT.	min_input_pwr	Power		
Frequency at which to test the UUT.	freq	Frequency		
The measured out output power from the UUT at the 1 dB compression point.	measurement	Power	{InverseTransform.measurement}	
The accuracy with which the 1 dB compression point is to be measured.	errlmt	Ratio		
The small signal gain of the UUT.	gain	Ratio		
UUT output pin name.	uut_output_pin	string	OUT	
UUT input pin name.	uut_input_pin	string	IN	

Notes

Model Description

Table 10-TSF ODCP_COMPLETE Model

Name	Type	Terminal	Inputs	Output	Formula
InverseTransform	Measure	[Out]			
		measuredVariable	DEPENDENT		
		measurement			0
		samples			0
		count			0
		gateTime			1
		nominal			0
		condition	NONE		
		GO	false		
		NOGO	false		
		HI	false		
		LO	false		
		UL			0
		LL			0
		attribute	ONE_DB_COMPRESSION_POINT14.measurement		
		AS [In]	EventFromMeasurement		
		Signal [In]	EventActive		

EventFromMeasurement	Instantaneous	[Out]			
		measuredVariable	DEPENDENT		
		measurement			0
		samples			0
		count			0
		gateTime			1
		nominal			{{linear_gain. + input_pwr.with 1 dB} errlmt {errlmt.withU
		condition	NONE		
		GO	false		
		NOGO	false		
		HI	false		
		LO	false		
		UL			0
		LL			0
		Signal [In]	ONE_DB_COMPRESSION_POINT13		
EventActive	TimedEvent	Event [Out]		InverseTransform	
		delay			0s
		duration			1s
		period			1s
		repetition			0
ONE_DB_COMPRESSION_POINT13	ONE_DB_COMPRESSION_POINT	Signal [Out]		EventFromMeasurement	
		input_pwr	{Parameter1.measurement}		
		GO	{MeasOutputPwr.GO}		
		HI	{MeasOutputPwr.HI}		
		LO	{MeasOutputPwr.LO}		
		errlmt	{errlmt}		
		linear_gain	{gain}		
		measurement	{MeasOutputPower.measurement}		
		uut_input_pin	{uut_input_pin}		
		uut_output_pin	{uut_output_pin}		
		input_freq	{freq}		
		measurement_complete	{MeasOutputPower.Count >= MeasOutputPower.samples}		
Parameter1	Instantaneous	[Out]			
		measuredVariable	DEPENDENT		
		measurement			0
		samples			0
		count			0
		gateTime			1
		nominal			0
		condition	NONE		
		GO	false		
		NOGO	false		
		HI	false		
		LO	false		
		UL			0
		LL			0
		Signal [In]	Sum20		
Sum20	Sum	Signal [Out]		Parameter1	
		Signal [In]	NoiseVoltage9		
		Signal [In]	ConstantVoltage17		
ConstantVoltage17	Constant	Signal [Out]		Sum20	
		amplitude	{min_input_pwr.magnitude}		
NoiseVoltage9	Noise	Signal [Out]		Sum20	
		amplitude			{{max_input_ min_input_pw resolution {err
		seed			0
		frequency			50 Hz

Rules