IQSTAR2019-WB-AMP

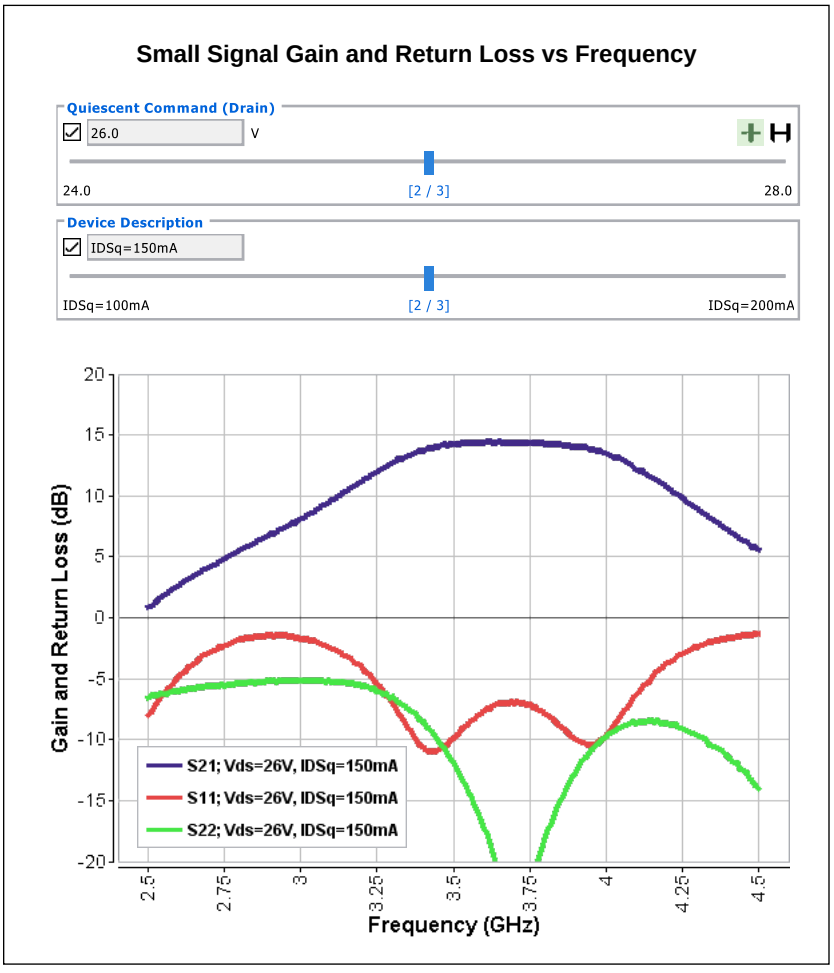
RF Power Amplifier GaN on SiC HEMT
10W, 28V, 3.4 - 4 GHz

Description

IQSTAR can generate multiple measurement data in short time. If these capabilities are combined with the sweep plan feature, the user may face some difficulties to retrieve the key information among ,all these data.The Whiteboard was developed to allow a maximum data exploration with no compromise on the flexibility.

This workspace example has be done to present the whiteboard capabilities, including differents type of measurement files, resulting from a HPA device characterization (S-Parameters, PowerSweep, 2-tones, Modulated signal and DPD evaluation))

TO-270WB-14 Plastic



Features

- Pictures
- Table
- Slider with data interpolation
- Custom data
- PDF export
- 3D Graph
- Advanced filter selection

S-Parameters Applications

1) Import *.S2P files from 'Files' tab in 'Whiteboard Tools' on the rigth side on the windows.
2) Move the sliders to select 'Quiescent Voltage' value and 'Quiescent Current' value to display.

Absolute Maximum Ratings

Parameter	Rating	Units
Breakdown Voltage, BVdg	120	V
Gate Voltage (VGS)	-10 to +2	V
Drain Voltage (VDS)	+28	V
RF Input Power	+32	dBm
VSWR Mismatch, P1dB Pulse (10% duty cycle, 100u width), T25°C	10:1	

DC Characteristics

Parameter	Conditions	Min	Typ	Max	Units
Gate Threshold Voltage	VDS=10V, Id=3.6mA	-3.6	-3.0	-2.4	V
Gate Quiescent Voltage	VDS=28V, ID=200mA		-2.7		V
Saturated Drain Current	VDS=6.0V, VGS=2.0V	2.59	3.5		A
Drain-Source Breakdown Voltage	VGS=-5V, IDS=3.6mA	120			V

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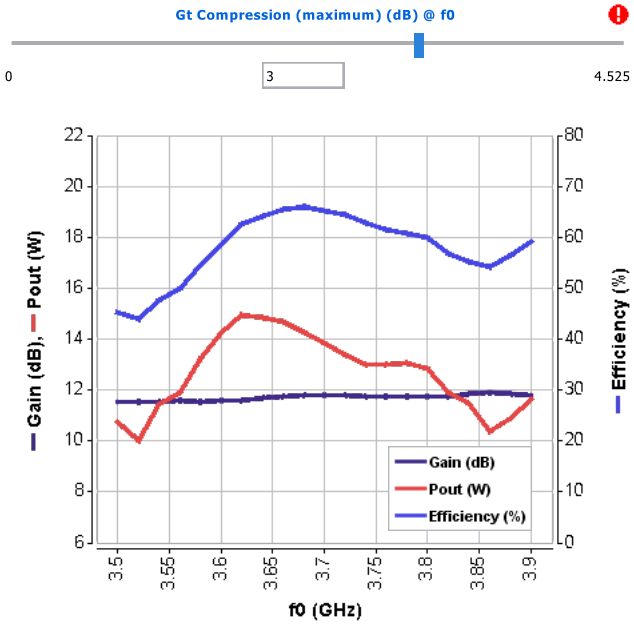
1-Tone Power Sweep vs Frequency Sweep Application

1) Import '1-tone.imx' file from 'Files' tab in 'Whiteboard Tools' on the rigth side on the windows.
2) Move the sliders to select 'Gain compression level' value and/or 'Frequency' value to display the associated results.

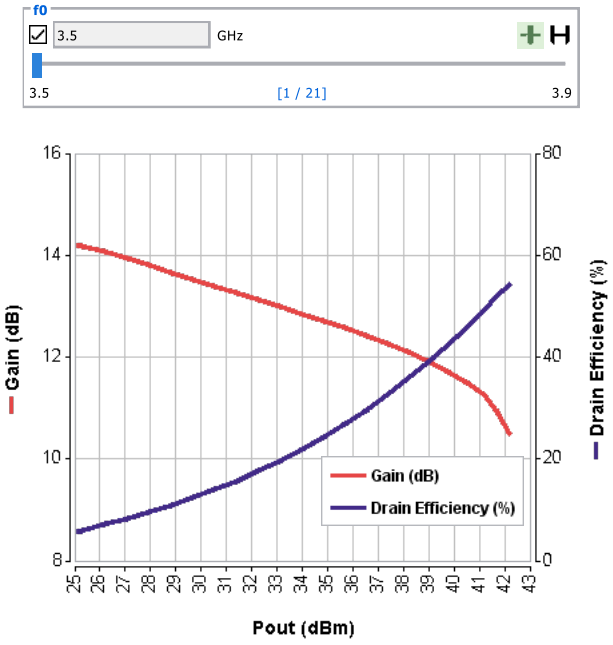
Output Power, Gain and Drain Efficiency at XdB Gain compression vs Frequency V_{DD}=28V, I_{DQ}=100mA



Frequency (GHz)	Max Efficiency (%)
3.68	66.01

Gain (dB) @MaxEff	Pout (W) @MaxEff	IRL (dB) @MaxEff
11.77	14.28	-6.42

Swept CW Data vs. Output Power at X GHz V_{DD}=28V, I_{DQ}=100mA



Small Signal Gain	Small Signal Return Loss
14.54	-11

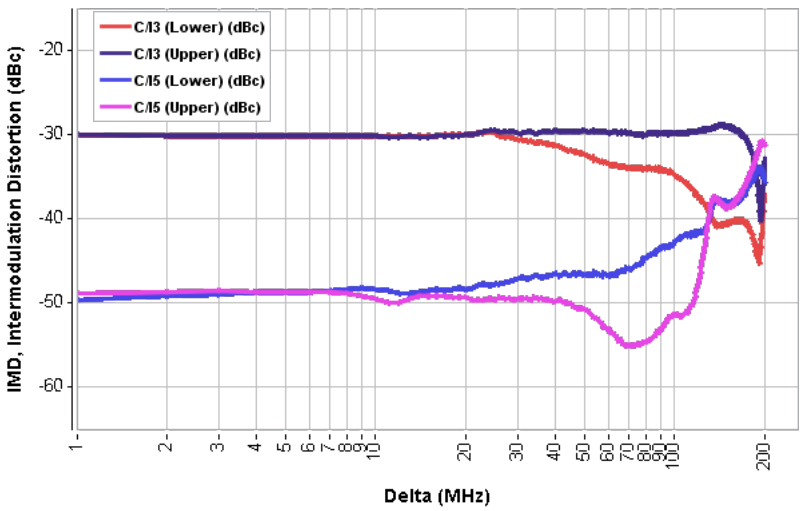
Max Drain Efficiency (%)	Psat (W)
54.17	16.45

Video Bandwidth Application

1) Import 'VBW.imx' file from 'Files' tab in 'Whiteboard Tools' on the rigth side on the windows

Intermodulation Distortion Products vs Two-Tone Spacing V_{DD}=28V, I_{DQ}=100mA

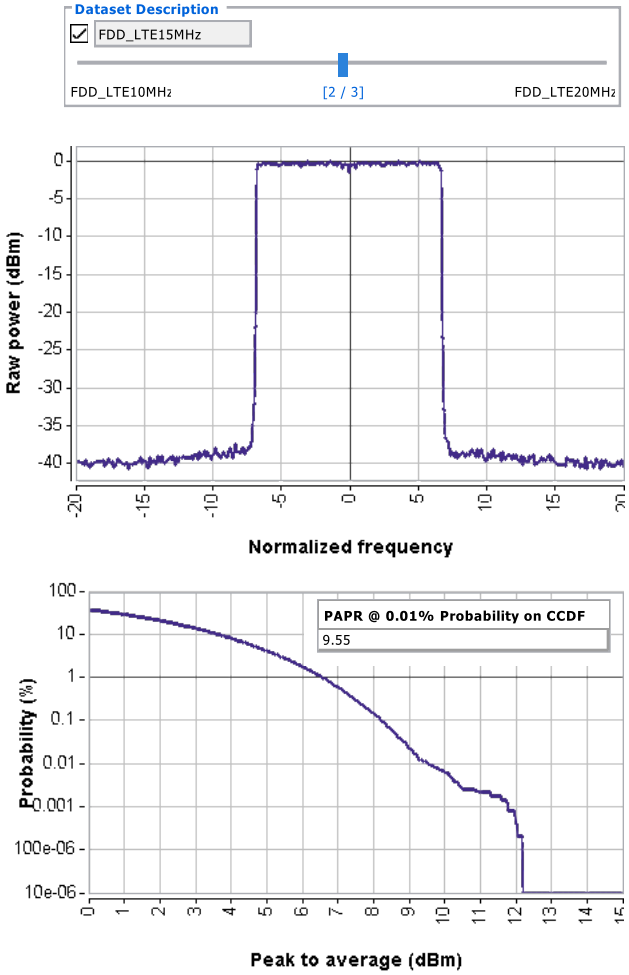
(f1 + f2)/2 + Center Frequency of 3.6 GHz



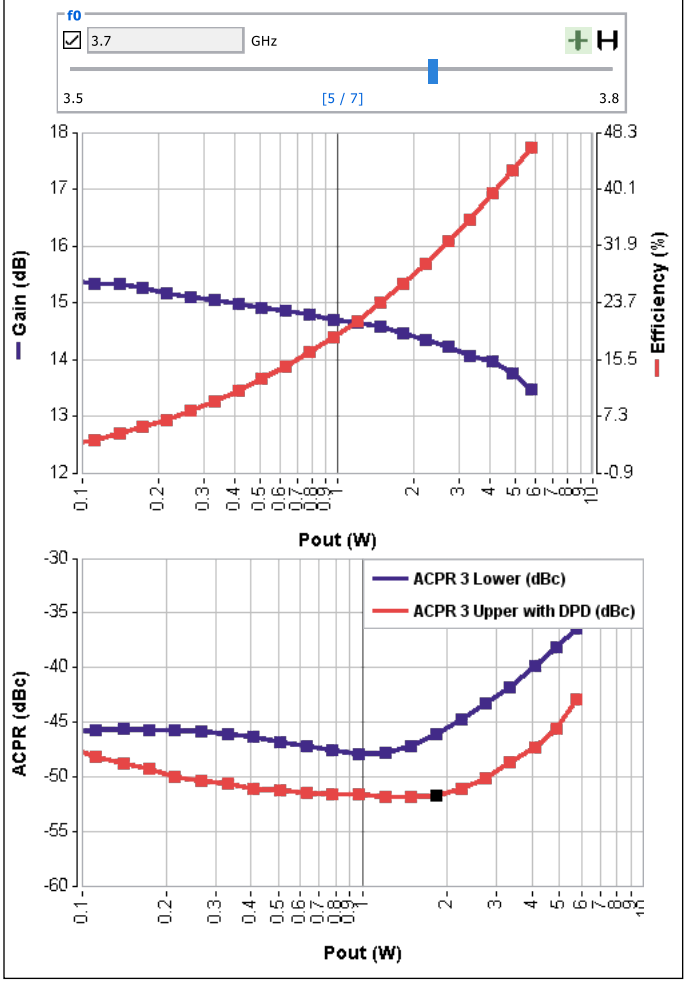
LTE Power Sweep vs Frequency Sweep Application

1) Import 'Modulated_LTEXMHzDPD.imx' files from 'Files' tab in 'Whiteboard Tools' on the rigth side on the windows
2) Move the sliders to select 'Modulation signal shape' and/or 'Frequency' value to display the associated results.

Single-Carrier LTE FDD Uplink QPSK X MHz Channel Bandwidth

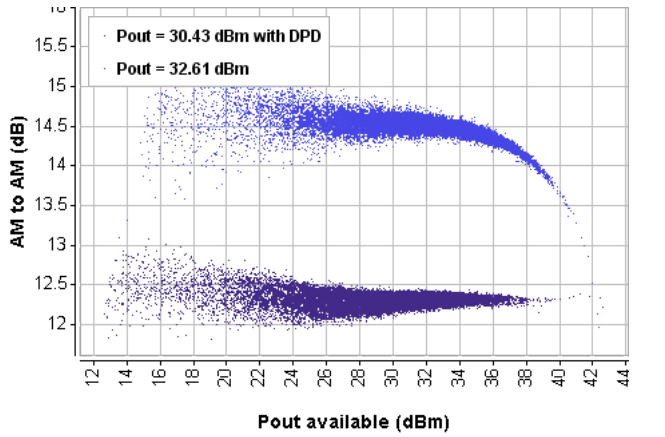


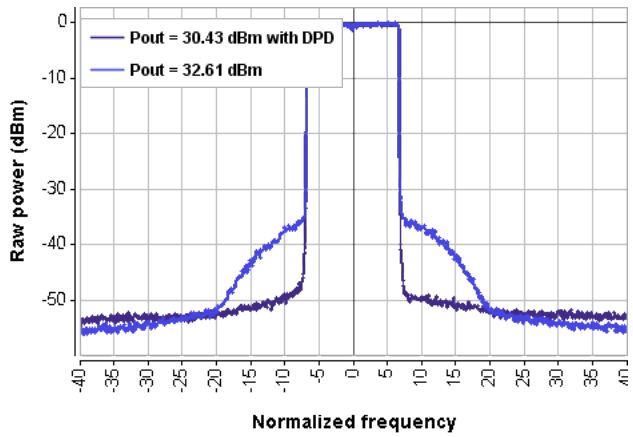
Swept LTE FDD X MHz Data vs. Output Power at X GHz V_{DD}=28V, I_{DQ}=100mA



Digital Pre-distortion evaluation

1) Select a point in the ACPR(dBc) vs Pout(W) plot above to display the DPD results corresponding to this power level poin





Gain (dB)	Efficiency (%)	Pout (W)	ACPR (dBc)	EVM (%)	PAPR Compression (dBc)
15.57	1.449	0.039	-44.47	2.474	-0.00978

Gain with DPD (dB)	Efficiency with DPD (%)	Pout with DPD (W)	ACPR with DPD (dBc)	EVM with DPD (%)
15.17	1.311	0.0356	-44.24	2.199