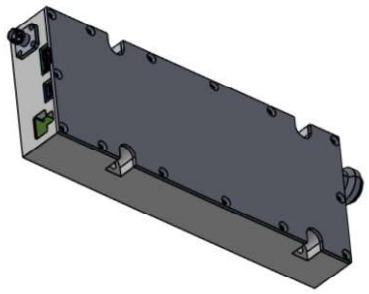
LPA Concepts

LINEAR POWER AMPLIFIER	LPA-AH11-100AB-0925M-0960M-28-00
P2980	

FEATURES

- 925-960MHz Gain 45dB
- Class AB LDMOS linearity
- Ppep=80W; Psat=130W
- 28V / 7.8A at 100W
- LTE10; -45dBc ACLR1 at 10W/28V/2.5A
- Fast On/Off, Internal ALC
- Output VSWR protection
- Overcurrent, Over temperature protection
- Visual status with LEDs
- USB monitoring & controls
- RoHS compliant

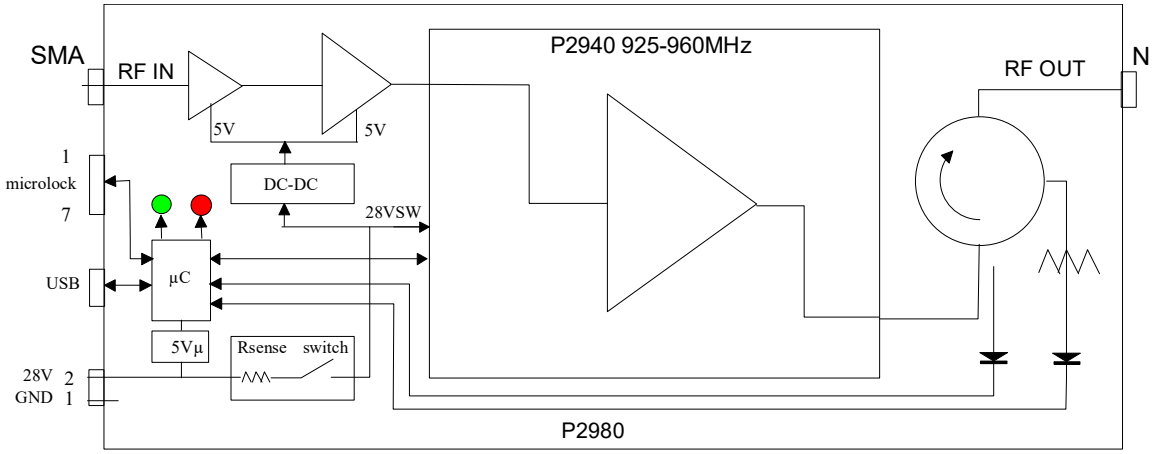
PACKAGE



APPLICATIONS

- Communications

BLOCK DIAGRAM



Electrical characteristics: 50 ohms; +28V; -25°C to +80°C (1, 2)

Ref	Parameter	Conditions	Note	Min	Typ	Max	Units
1	Bandwidth			925		960	MHz
2	Gain small signal	940 MHz; 50°C			45		dB
3	Small sig. gain flatness vs freq.	925-960 MHz				1	dBpp
4	SS gain vs temperature	-25°C to 80°C				0.5	dB
5	Power gain	940MHz; 100W output			44		dB
6	Power gain vs flatness vs freq.	925-960 MHz ;100W output				1	dBpp
7	Input return loss	50 ohms				-15	dB
8	Output return loss	50 ohms				-15	dB
9	Power saturation	60°C case temperature			130		W
10	Peak envelope power	2 tones 10MHz apart IMD< -30dBc			80		W
11	LTE 10MHz Output power	ACLR<-45dBc		8	10		W
12	Fast On/Off rise time	FAOO from 3V to 0V				1	µs
13	Fast On/Off fall time	FAOO from 0V to 3V				1	µs
14	Second harmonic	f1=940MHz; 100W output			-50		dBc
15	Spurious	Other than harmonics				-30	dBm
16	ALC rise time				300		µs
17	ALC hold time				3		ms
18	Linear ALC range	ALC level set at 40dBm, ACLR<-45dBc			7		dB
19	Current consumption	28V ; Fast On/Off=3V			0.3		A
20	Current consumption	28V ; Fast On/Off=0V; idle			1.3		A
21	Current consumption	28V ; Fast On/Off=0V; 10W LTE output			2.5		A
22	Current consumption	28V ; Fast On/Off=0V; 50W CW output			5.4		A
23	Current consumption	28V ; Fast On/Off=0V; 100W CW output			7.8		A
24	Shut down current				8.8		A

1. Unless otherwise specified
2. Hot spot temperature given by temp sensor close to final transistor

Maximum ratings

Ref	Parameter	Conditions	Note	Min	Nom	Max	Units
1	Operating temperature	Hot spot temperature	3	-25°C		+80	°C
2	Supply voltage			26	28	33	V
3	Voltage on Alarm pin					10	V
4	Input CW power	In band	5			+10	dBm
5	Maximum reverse power	>2s	4			100	W
6	Maximum reverse power	continuous				40	W

3. Shuts down at 80°C resume operation at 70°C
4. Will automatically shut down after 2s
5. Will shut down at I>8.7A (~100W-120W depending on frequency)

Protections

Ref	Parameter	Description	Remarks
1	Overvoltage	Shut down if supply > 33 V	
2	Under voltage	Shut down if supply < 20 V	
3	Overcurrent	Shut down if current > 8.8 A (6)	Output power > +51dBm CW
4	Temperature	Shut down if temp > 80°C (7)	Auto recovery (at 75°C)
5	Max reverse power	Shut down if Prev > 40W	Shuts down after 2s for Pout>40W

6. Limits current to 8.7A during 1ms before shutting down
7. When temp sensor is at 80°C , housing temperature is approximately 65°C

Analog monitoring & controls

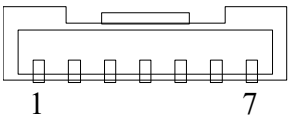
Ref	Characteristic	Description	Remarks
1	Temperature	Analog output	-40°C to +100°C (TMP20)
2	Alarm	Open drain (0V on alarm)	Multiplexed with analog temp
3	PA On/Off	<Amplifier Off when PAOO > 3V	28V switches off
4	Fast On/Off	Amplifier On when FAOO = 0V	

USB Monitoring & controls (8)

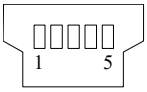
Ref	Characteristic	Description	Remarks
1	Temperature	Hot spot temperature	Digital sensor
2	Supply voltage	Voltage applied by user	
3	Current	Through sense resistor	
4	ON/OFF	Shut down amplifier	
5	Alarm	Provide state of amplifier	

8. Use Interface program PRSI25001V0.2.

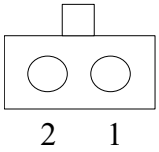
Communication DC Connector Molex Microlock Plus 505567 0771

Pin description			PINOUT
Pin 1 : Fast On/Off			7 circuits Pitch 1.25mm
Pin 2 : PA ONOff		Mate with 505565 0701 505431 crimp terminals AWG 26 wire	
Pin 3 : ALA			
Pin 4 : Temperature			
Pin 5 : Current sense			
Pin 6 : forward power			
Pin 7 : Gnd			

Communication USB 54819-0589

Pin description			PINOUT
Pin 1 : Vbus			Mini USB b
Pin 2 : Data-			
Pin 3 : Data+			
Pin 4 : NC			
Pin 5 : Gnd			

Power Supply DC Connector Molex Minifit Jr 172648-0102

Pin description			PINOUT
Pin 2 : Supply +28V		Mate with 39-01-4020 with 45750-3211 inserts and AWG16 wires	2ckts 4.2mm pitch
Pin 1 : Gnd			
			2 1

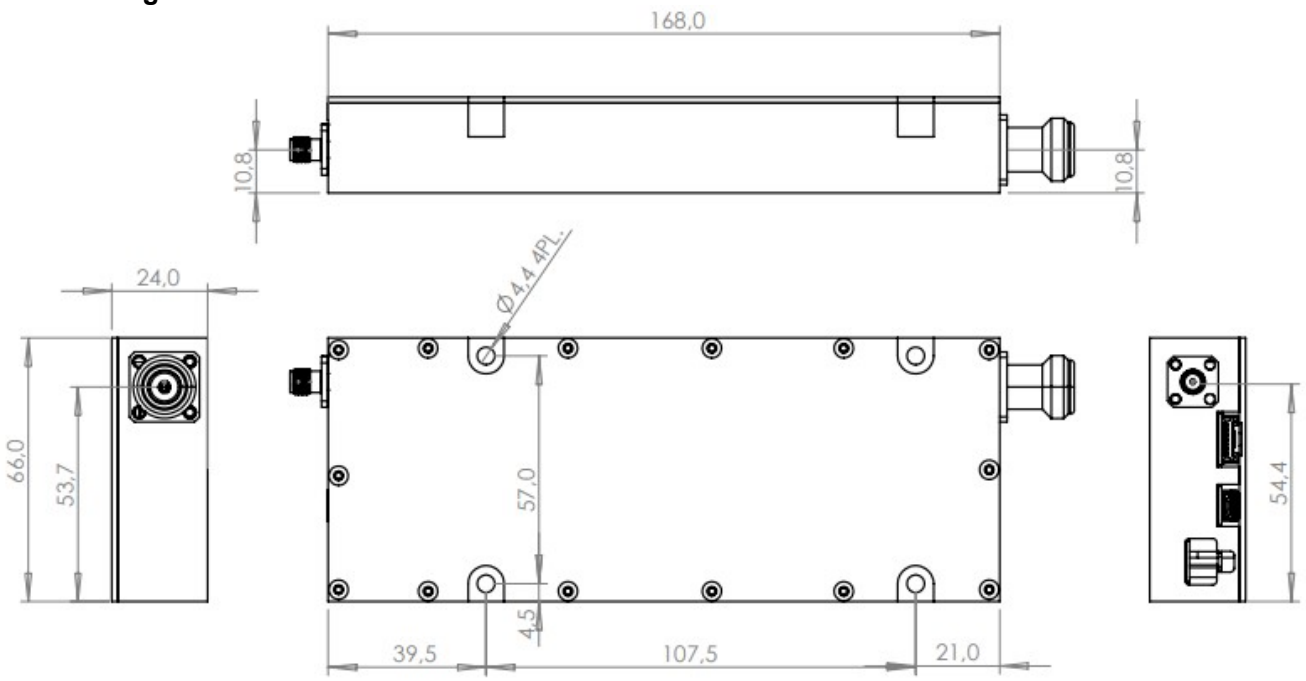
LED significations

LED 1 (green)	LED 2 (red/orange)	Signification
OFF	OFF	Power supply not applied
ON	OFF	Amplifier ON
Blinking	OFF	Amplifier Muted by operator
ON	Orange	Temperature warning, amplifier ON
OFF	Red	Amplifier OFF (Under voltage, over voltage, over temp….)

Mechanical characteristics

Ref	characteristic	description	remarks
1	Housing dimensions	168mm x 66mm x 24mm	
2	Housing cover finish	Electroless nickel	
3	Mounting	4 M4 screws	It is recommended to use a thermal interface material under housing
4	Input RF connectors	SMA	female
5	Output RF connector	N	female
5	DC supply connector	Molex 172648-0102	Male type
6	DC controls connector	Molex 505567-0771	Male type
7	USB connectors	Mini USB B	
8	Weight	460 grams	

Package outline:



Thermal information

Ref	Parameter	temperature	Condition	Note
1	Temp sensor reading		Hot spot close to final transistor	
2	Housing temperature at 200W CW output	65°C (Shut down condition)	Temp sensor = 80°C (Shut down condition)	9

9. Housing attached to heatsink with thermal interface material

Part numbering:

LPA-AH11-100AB-0925M-0960M-28-00

Housing

Peak power (W)

Class of operation	
AA	Class A
AB	Class AB
DO	Doherty

Frequency band lower edge

Frequency band upper edge

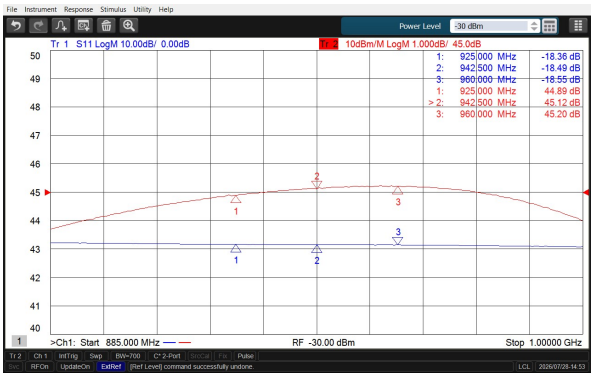
Supply Voltage	
28	28V Supply
48	48V Supply

Other options

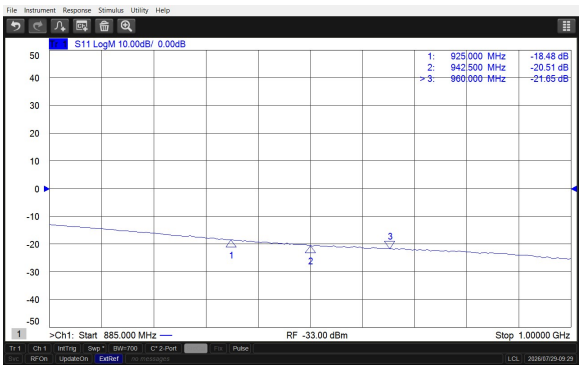
Support material:

Ref	Document type	Document number	Title	Date
1	USB Cable		USB to mini USB B	
2	Interface program	PRSI25001 V0.2.		2025

TYPICAL PERFORMANCE



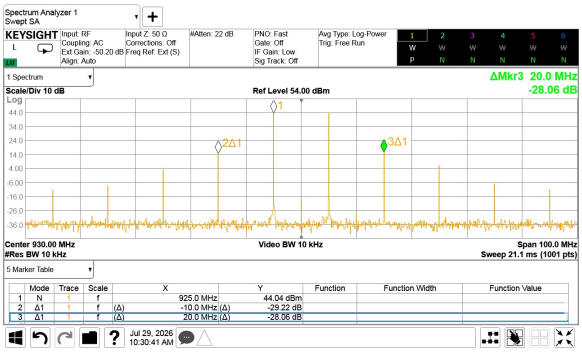
Gain / IRL vs frequency



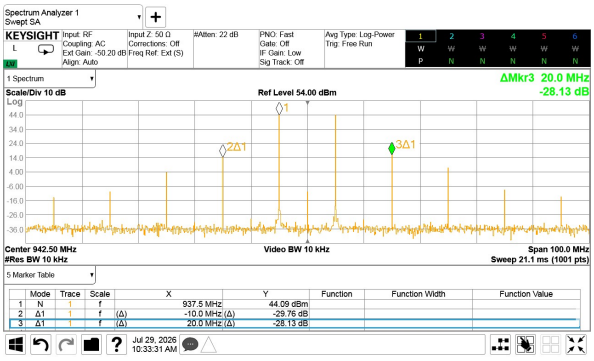
Output return loss vs frequency



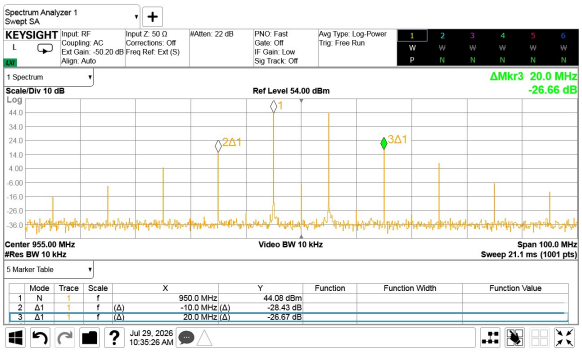
Wideband response (10-3000MHz)



2 tones 47dBm ave / 50dBm peak at 925MHz



2 tones 47dBm ave / 50dBm peak at 942.5MHz



2 tones 47dBm ave / 50dBm peak at 960MHz

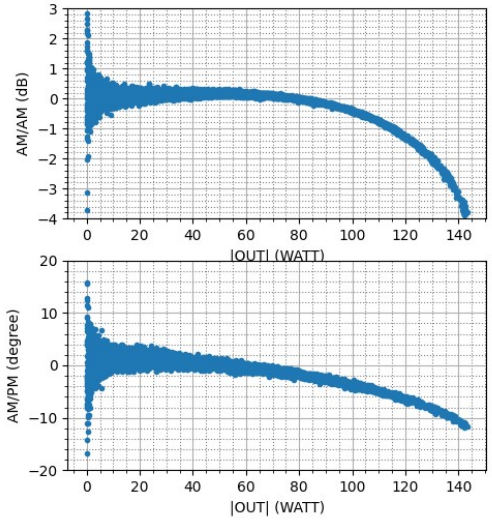
TYPICAL PERFORMANCE (continued)



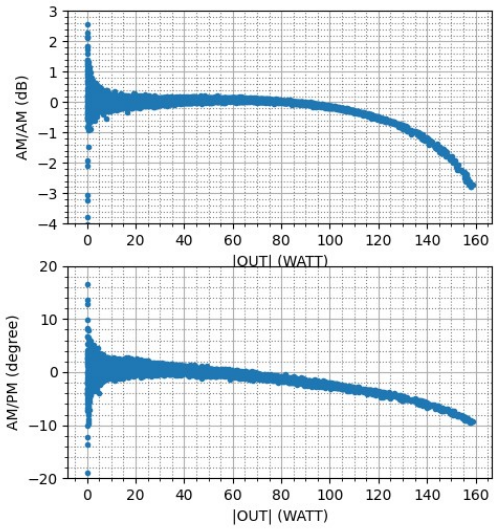
LTE10; 10Wave; 942.5MHz; 28V/2.52A



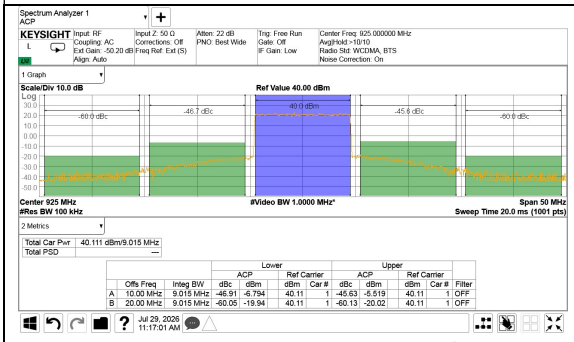
LTE10; 14Wave; 942.5MHz; 32V/2.85A



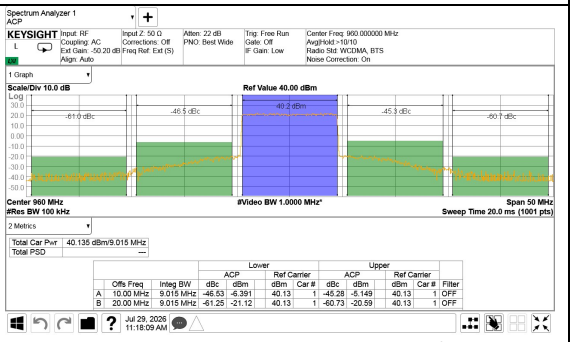
AMAM/AMPM ; LTE10; 28V



AMAM/AMPM ; LTE10; 32V

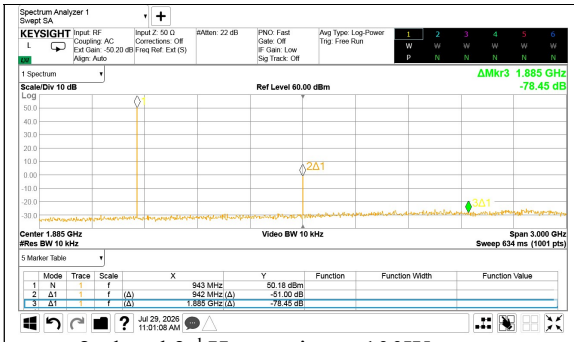


LTE10; 10Wave; 925MHz; 28V/2.66A

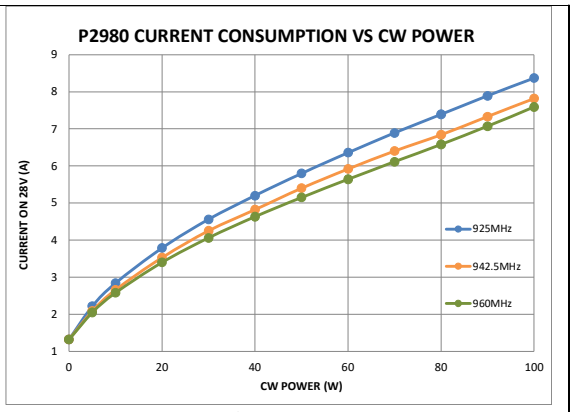


LTE10; 10Wave; 960MHz; 28V/2.44A

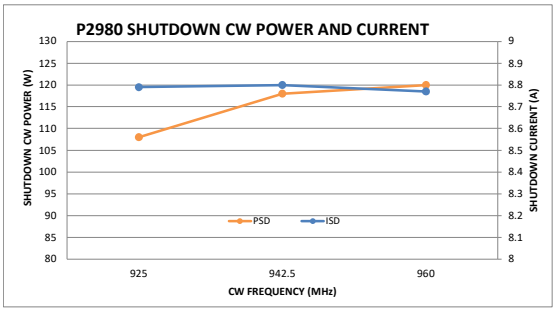
TYPICAL PERFORMANCE (continued)



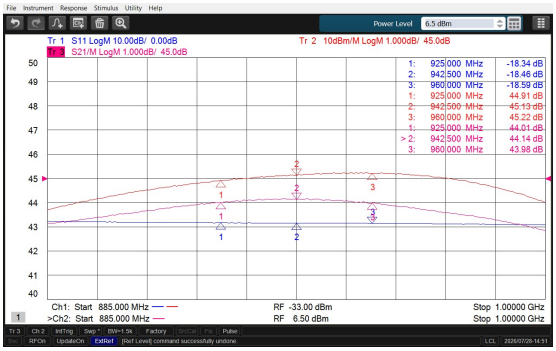
2nd and 3rd Harmonics at 100W output



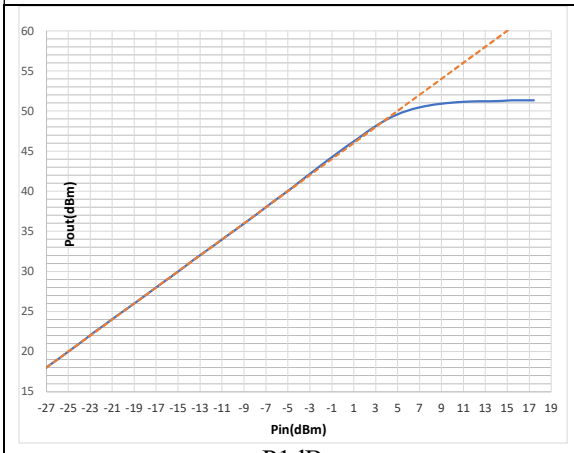
Current consumption on 28V vs CW power



Shutdown current and CW power vs frequency

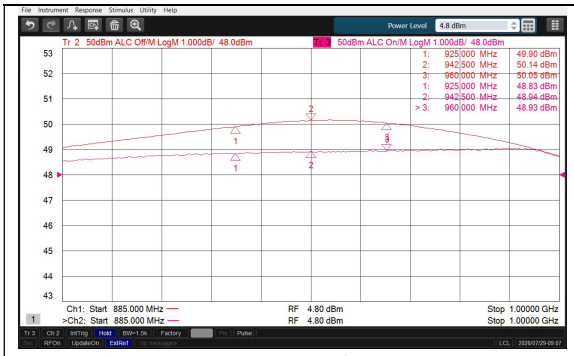


Gain compression @104Woutput
pulse width : 1ms, pulse period : 10ms

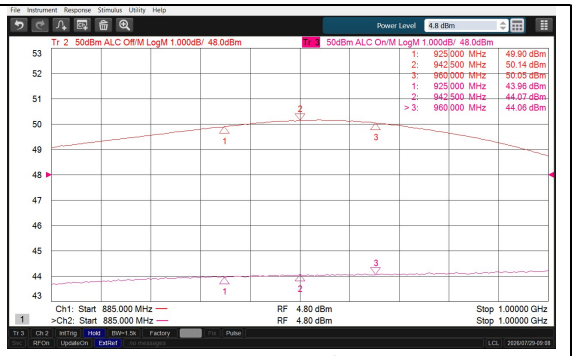


P1dB

TYPICAL PERFORMANCE (continued)



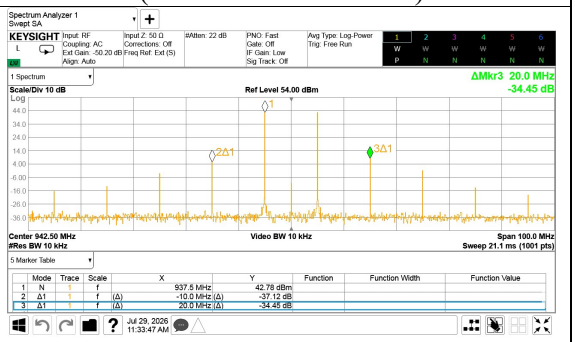
Output power vs frequency
ALC level set at 49dBm, Pout=48.9dBm
(50dBm with ALC Off)



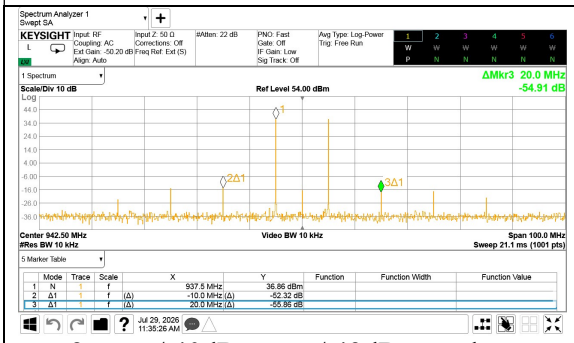
Output power vs frequency
ALC level set at 44dBm, Pout=44.1dBm
(50dBm with ALC Off)



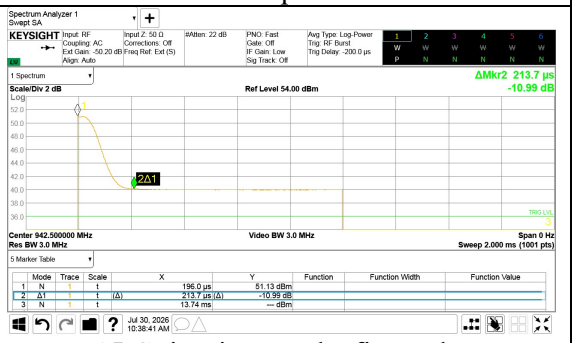
2 tones / 47dBm ave / 50dBm peak at 942.5MHz
ALC Off



2 tones / 46dBm ave / 49dBm peak at 942.5MHz
ALC On 1dB depth : 46dBm ave

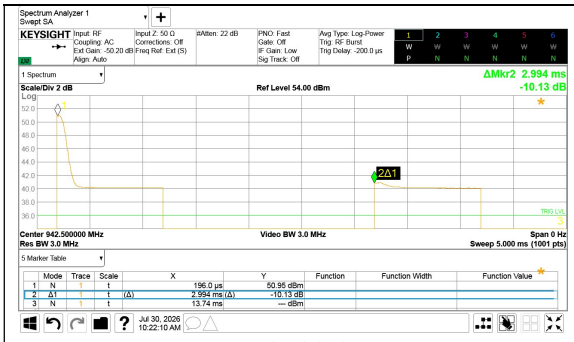


2 tones/ 40dBm ave / 43dBm peak at 942.5MHz
ALC On 7dB depth: 40dBm ave

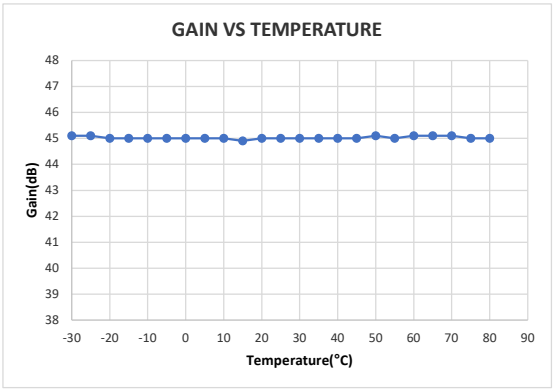


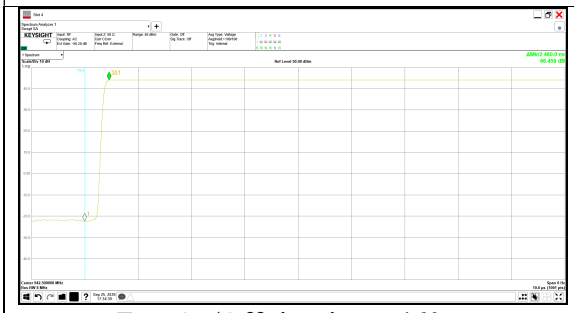
ALC rise time on the first pulse
ALC level set at 40dBm (Pout with ALC Off : 51dBm)
Pulse width : 1ms, pulse period : 3ms

TYPICAL PERFORMANCE (continued)

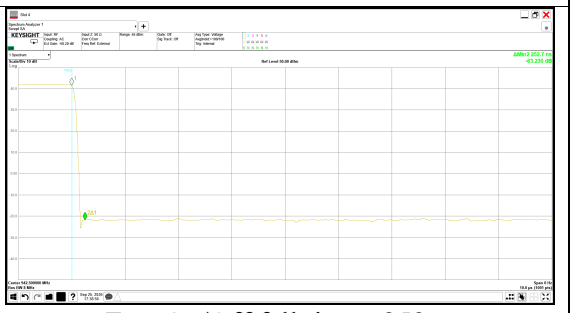


ALC hold time
ALC level set at 40dBm (Pout with ALC Off : 51dBm)
Pulse width : 1ms, pulse period : 3ms





Fast On/Off rise time : 460ns



Fast On/Off fall time : 253ns