

AR201017

BLC2425M10LS250
2400-2500 MHz

v1.0 – January 22, 2020

AMPLEON

Application Report

Document information

Status	v1.0
Abstract	Measurement results of a 2400-2500 MHz demo with BLC2425M10LS250.
Demo number	AR201017

1. Revision History

Table 1 – Report revisions

Revision	Date	Description	Author
1.0	2020.01.22	Initial document	

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5. General description

This report presents the measurement results of the high efficiency 250W GEN10 LDMOS demo using the BLC2425M10LS250 transistor in the frequency range from 2400MHz to 2500MHz. The demo is matched to 50 Ω at input and output.

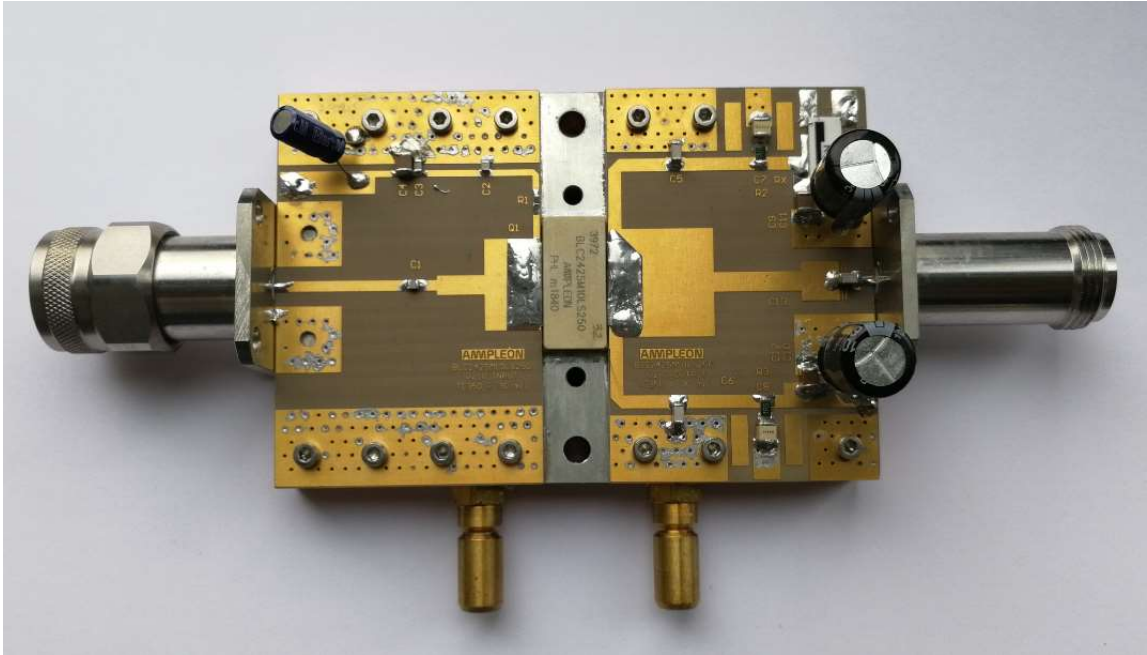


Figure 1 – Demo view of the BLC2425M10LS250

Table 2 – Demo circuit information

Parameter	Description	Unit
Input Laminate Type	TC350, 30 mils	
Output Laminate Type	TC350, 30 mils	
Overall dimensions	90 x 60	mm
IN PCB dimensions	40 x 60	mm
OUT PCB dimensions	40 x 60	mm
Cooling type	Indirect water cooling	
Device Package	SOT1270-1	

6. RF characteristics

Table 3 – RF characteristics

Test signal: CW; RF performance at $V_{DS}=32V$; $I_{Dq}=100mA$; $T_{amb}=25^{\circ}C$; $T_{cooling\ water}=25^{\circ}C$

Symbol	Parameter	Conditions	Typical	Unit
f	Frequency		2400–2500	MHz
V_{DS}	Drain-source voltage		32	V
V_{GS}	Gate-source voltage	$I_{Dq} = 100mA$	1.8	V
G_p	Power gain	$P_{1dBcp} = 281.4W$	14.8	dB
η_D	Drain efficiency	$P_{1dBcp} = 281.4W$	66.9	%

7. Performance Details

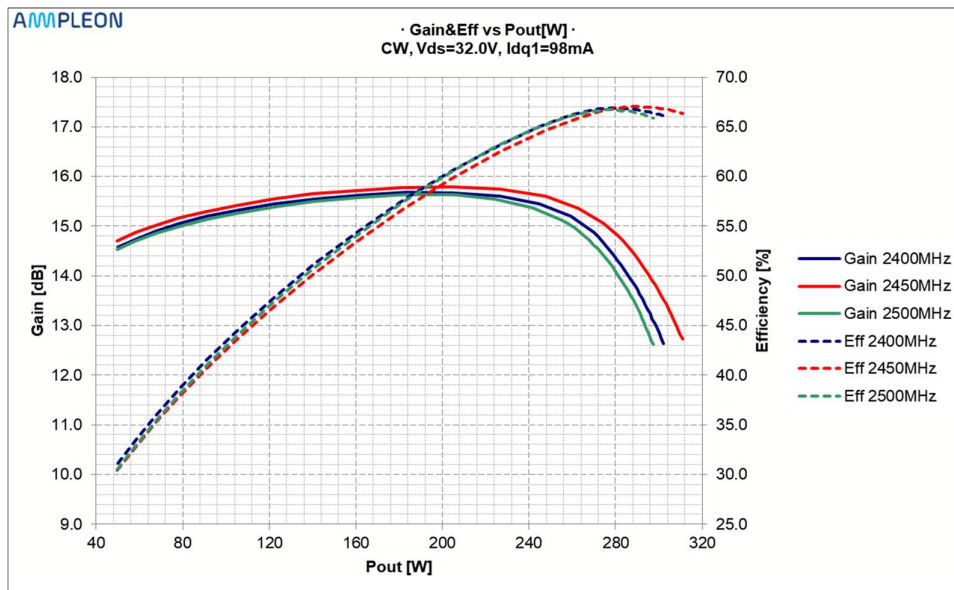


Figure 2 – BLC2425M10LS250 demo board performance

Table 4 – RF Performance overview

Freq [MHz]	Gmax [dB]	Pout@Gmax [W]	P1dB [W]	P2dB [W]	P3dB [W]	Effmax [%]	Pout@Effmax [W]	Eff P1dB [%]	Eff P2dB [%]	Eff P3dB [%]
2400	15.7	183.2	274.1	290.6	301.9	66.9	282.6	66.8	66.7	66.1
2450	15.8	204.5	281.4	298.7	310.2	67	289	66.9	66.9	66.4
2500	15.6	205	269.6	286.6	297.1	66.7	277.2	66.6	66.6	65.9

8. User Guide

8.1 Biasing

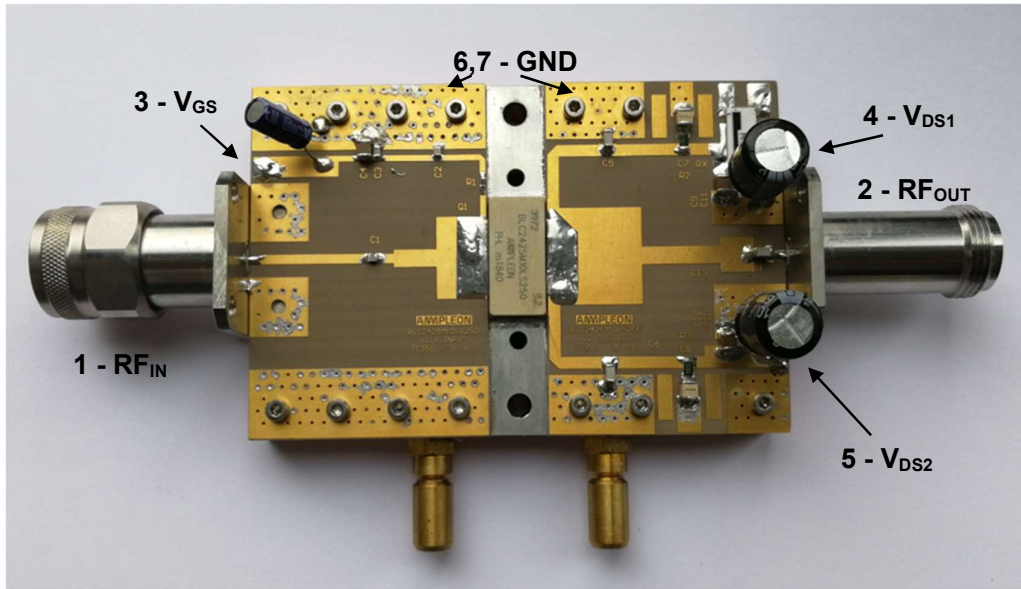


Figure 3 – BLC2425M10LS250 demo board pin configuration

Table 5 – Pin description

Symbol	Pin	Description
RF_{IN}	1	RF input
RF_{OUT}	2	RF output
V_{GS}	3	Gate-source voltage
V_{DS1}	4	Drain-source voltage
V_{DS2}	5	Drain-source voltage
GND	6, 7	Negative supply terminal for V_{GS} and V_{DS} respectively

Remark: Use an electrolytic capacitor, 470 μ F/63V or 1000 μ F/63V, external to the demo circuit but close to supply pin 4 ,7 for usage in Pulsed mode.

8.2 Bill of Materials

Table 6 – Bill of Materials

Part	Description	Part number	Value/Remark
C1, C2	Chip capacitor	800A220JT250XT	22 pF
C3, C9 C10	Chip capacitor	MCMT21N102F101CT	1000 pF
C4	Chip capacitor	CL31B105KBHNNNE	1 μ F/50V
C5, C6, C13	Chip capacitor	800B220JT500XT	22 pF
C7, C8	Chip capacitor	100B561JT100XT	560 pF
C11, C12	Chip capacitor		4.7 μ F/100V
C14, C15	Electrolytic capacitor		100uF/63V
C16	Electrolytic capacitor		22uF/63V
C17	Electrolytic capacitor	470 μ F/63V	External to demo (In Pulsed mode)
R1	Chip resistor	RC1608J100CS	10 Ohm
R2, R3	Chip resistor	RC3216F1R5CS	1.5 Ohm
RX	Shunt resistor	FCL110R010FER	10 m Ω (Ohmite)
T1	LDMOS transistor	BLC2425M10LS250	Ampleon
Input PCB	Rogers TC350		30 mil thickness
Output PCB	Rogers TC350		30 mil thickness

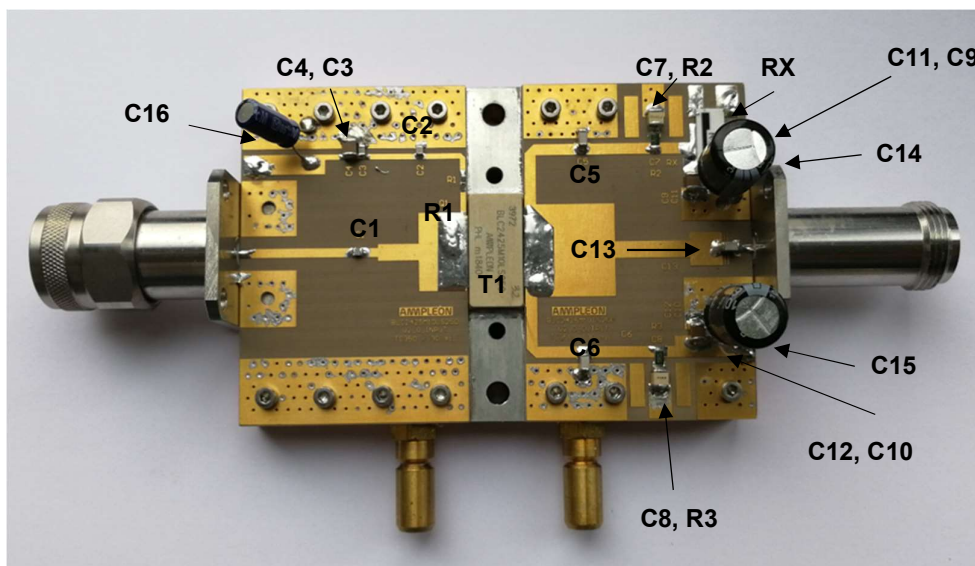


Figure 4 – BLC2425M10LS250 demo board component description

8.3 Temperature behavior

For operation of this demo board water cooling should be applied.
Water temperature should be kept below 65 °C.

8.4 Device markings

Table 7 – Module specifics

Parameter	Value
Manufacturer	Ampleon
Device	BLC2425M10LS250
Comments	Engineering sample

9. Legal information

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