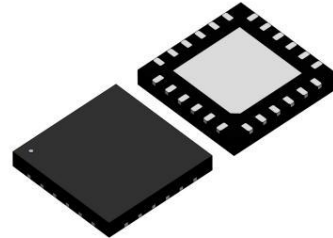


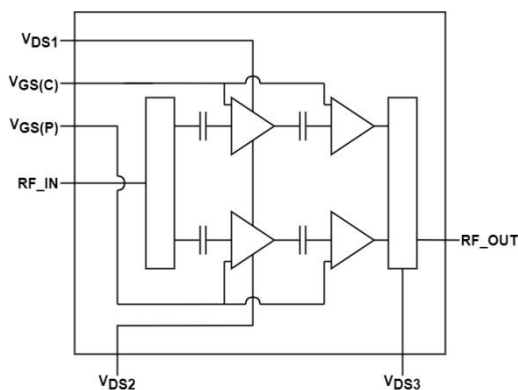
Description

The H9G2527M10Q is a LDMOS integrated Asymmetrical Doherty 2-stage Power Amplifier designed for cellular base station applications with 1.26 W average output power covering frequency range from 2.5 to 2.7 GHz.



QFN 6 x 6 x 0.85 mm, 24-pins

Block Diagram



Features

- Operating Frequency Range: 2.5 to 2.7 GHz
- Operating Drain Voltage: +28V
- P3dB: 12.5W (+41 dBm)
- 50 Ω Input matched
- Integrated Input Divider
- High Efficiency
- High Gain over the Frequency Range
- Footprint: QFN 6 x 6 x 0.85 mm, 24-pin

Applications

- 3GPP 5G NR FR1 n41 and 4G/LTE band B41.
- Power Amplifier for Small cells.
- Driver Amplifier for micro and macro base stations.
- Active antenna array for 5G mMIMO.
- Repeaters/DAS.

Order Information

Part Number	Description
H9G2527M10Q	Reel Package
H9G2527M10Q EVB	2.5 - 2.7GHz EVB

Typical Performances

RF Characteristics (Pulsed CW)

Freq(MHz)	P3dB(dBm)	Gain(dB)*	Eff(%)*	IRL(dB)*
2500	41.0	28.0	46.5	-18.0
2600	41.1	27.9	45.4	-21.5
2700	40.9	28.1	45.8	-38.0

Test conditions unless otherwise noted: 25°C, 10% Pulse, $V_{ds} = 28\text{ V}$, $I_{dq_carr} = 25\text{ mA}$, $V_{gs_peak} = V_{gs_carr} - 0.52\text{ V}$, test on Watech Application Board.

* @Pout=31dBm

RF Characteristics (WCDMA)

Freq(MHz)	Gain(dB)	Eff(%)	ACPR_5MHz(dBc)*	ACPR_10MHz(dBc)*
2500	26.9	42.9	-27.1	-40.0
2600	27.0	42.6	-28.0	-40.2
2700	27.0	42.6	-26.0	-37.3

Test conditions unless otherwise noted: 25°C, $V_{ds} = 28\text{ V}$, $I_{dq_carr} = 25\text{ mA}$, $V_{gs_peak} = V_{gs_carr} - 0.52\text{ V}$, $P_{avg} = 31\text{ dBm}$, 1C-WCDMA 5MHz Signal, 9.9 dB PAR @ 0.01% CCDF test on WATECH Application Board.

*Uncorrected DPD

Absolute Maximum Ratings

Parameter	Range/Value	Units
Drain voltage (VDSS)	-0.5 to 65	V
Gate voltage (VGS)	-5 to 10	V
Storage Temperature (TSTG)	-55 to 150	°C
Case Temperature (TC)	-40 to 125	°C
Junction Temperature (TJ)	-40 to 175	°C

Electrical Specification

DC Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Breakdown Voltage V(BR) _{DSS}	V _{gs} =0V, I _{ds} =12.02 uA	65	-	-	V
Gate-Source Threshold Voltage of Carrier V _{GS(th)_C}	V _{ds} =28V, I _{ds} =2.5uA	1.2	-	2.0	V
Gate-Source Threshold Voltage of Peak V _{GS(th)_P}	V _{gs} =28V, I _{ds} =9.52uA	1.2	-	2.0	V
Drain Leakage Current I _{DSS}	V _{gs} =0V, V _{ds} =28V	-	-	2.0	uA
Gate Leakage Current I _{GSS}	V _{gs} =10V, V _{ds} =0V	-	-	2.1	uA

Test conditions unless otherwise noted: 25 °C

RF Characteristics (Pulsed CW)

Parameter	Conditions	Min	Typ	Max	Unit
Frequency Range	P _{out} =31dBm	2.5	/	2.7	GHz
P _{3dB}	Freq=2.7GHz	39.5	40.9	41.5	dBm

Test conditions unless otherwise noted: 25°C, 10% Pulse, V_{ds} = 28 V, I_{dq_carr} = 25 mA, V_{gs_peak} = V_{gs_carr} - 0.52 V, test on WATECH Production Board.

RF Characteristics (WCDMA)

Parameter	Conditions	Min	Typ.	Max	Unit
Frequency Range	P _{out} =31dBm	2.5	/	2.7	GHz
Gain	Freq=2.7GHz, P _{out} =31dBm	25	27.1	28.5	dB
Eff	Freq=2.7GHz, P _{out} =31dBm	39	42.8	/	%
IRL	Freq=2.7GHz, P _{out} =31dBm	/	/	-10	dB
ACPR@5MHz	Freq=2.7GHz, P _{out} =31dBm	/	-25.5	-24	dBc

Test conditions unless otherwise noted: 25°C, V_{ds} = 28 V, I_{dq_carr} = 25 mA, V_{gs_peak} = V_{gs_carr} - 0.52 V, P_{ave} = 31 dBm, 1C-WCDMA 5MHz Signal, 9.9 dB PAR @ 0.01% CCDF test on WATECH Production Board.

*Uncorrected DPD



H9G2527M10Q
10W, 2.5-2.7 GHz Doherty Amplifier
Product Datasheet

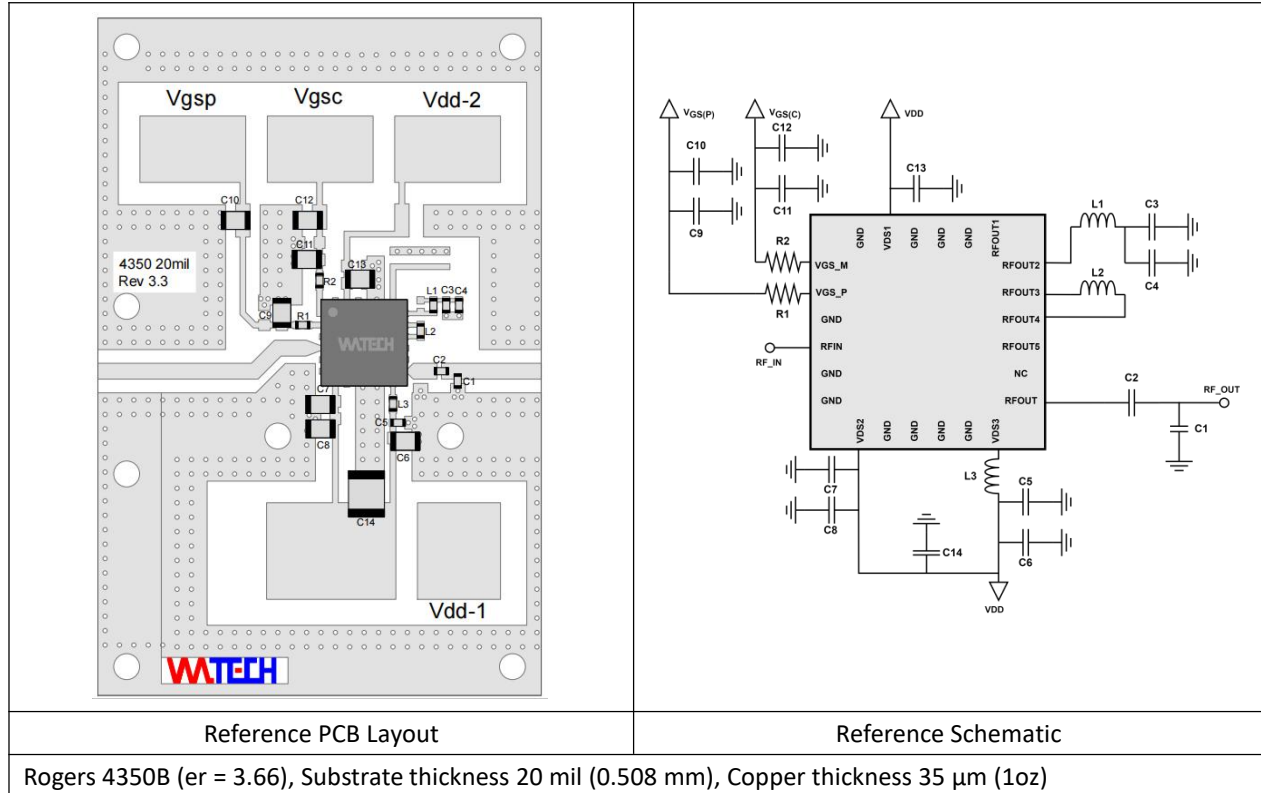
Load Mismatch Test

Condition	Test Result
VSWR=10:1, at all Phase Angles, Vds=+28Vdc, Idq_carr = 25mA, Vgs_peak = Vgs_carr - 0.52 V, Pave = 31 dBm, Frequency = 2.7 GHz, test on WATECH Application Board	Pass

Thermal Information

Parameter	Condition	Value (Typ)	Unit
Thermal Resistance Junction to Case (R _{TH})	T _{CASE} = 90°C, 1C-WCDMA 5MHz Signal, 9.9dB PAR, Pave = 31dBm	8.1	°C /W

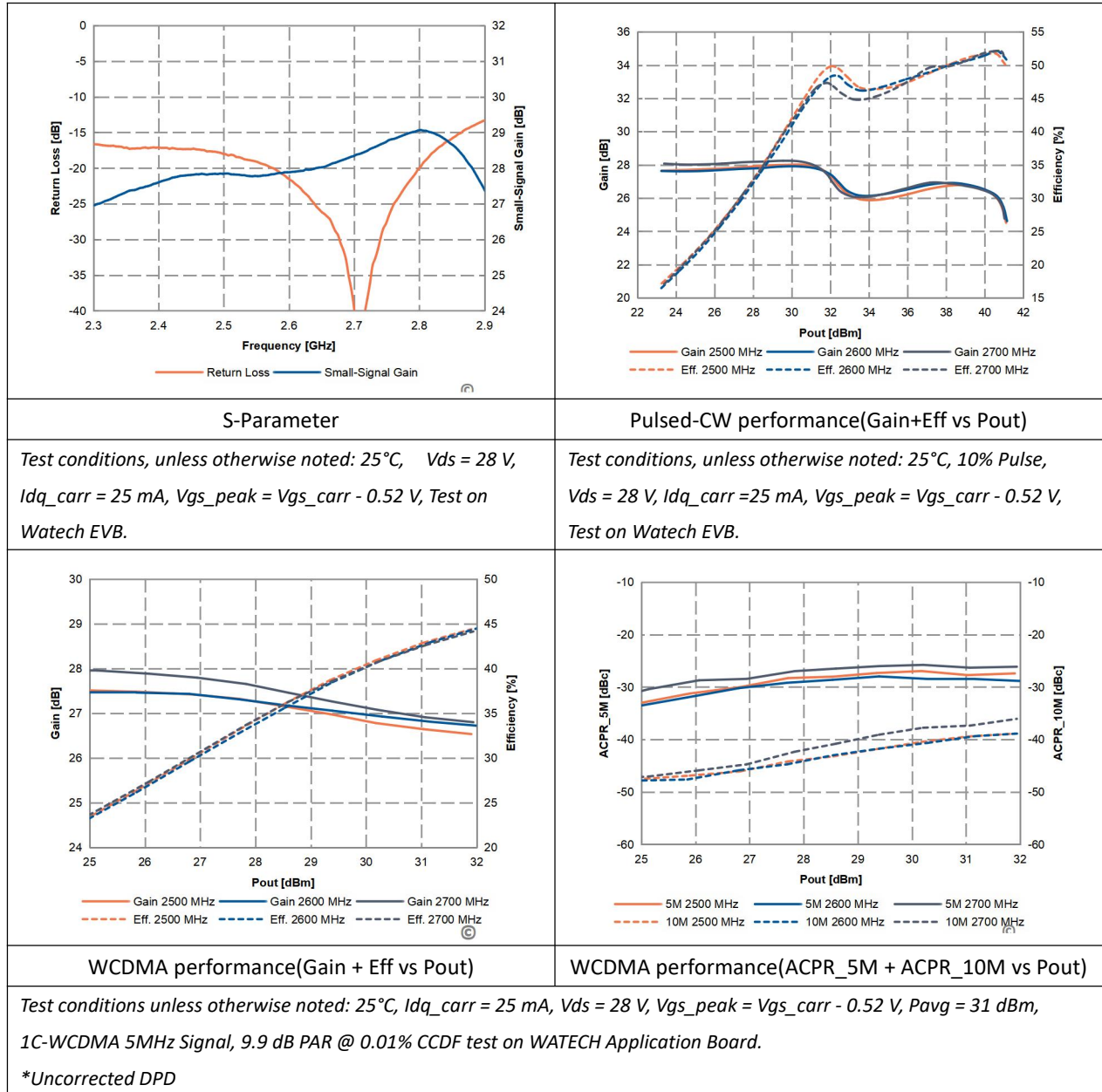
H9G2527M10Q 2.5-2.7 GHz Reference Design



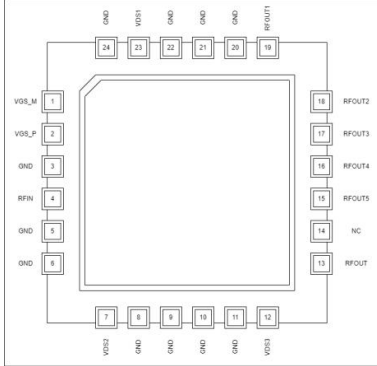
Bill of Materials (BoM) - H9G2527M10Q 2.5-2.7 GHz Reference Design

Component	Type	Value	Description	P/N
C1	Capacitor	0.9pF	Multi-layer ceramic capacitor	GQM1555C2D0R9BB01D
C2	Capacitor	6.2pF	Multi-layer ceramic capacitor	GQM1555C2D6R2BB01D
C3, C5	Capacitor	30pF	Multi-layer ceramic capacitor	GQM1555C2D300GB01D
C4	Capacitor	100nF	Multi-layer ceramic capacitor	GRM155B31E104KE14
C6 - C13	Capacitor	1 uF	Multi-layer ceramic capacitor	GRM21BC72A105KE01L
C14	Capacitor	10 uF	Multi-layer ceramic capacitor	GRM32EC72A106KE05L
L1	Inductor	3.9nH	HQ inductor	LQW15AN3N9B80D
L2	Inductor	5.3nH	HQ inductor	LQW15AN5N3B80D
L3	Inductor	5.1nH	HQ inductor	LQW15AN5N1B80D
R1, R2	Resistor	0ohm	Resistor	RC0402FR-070RL

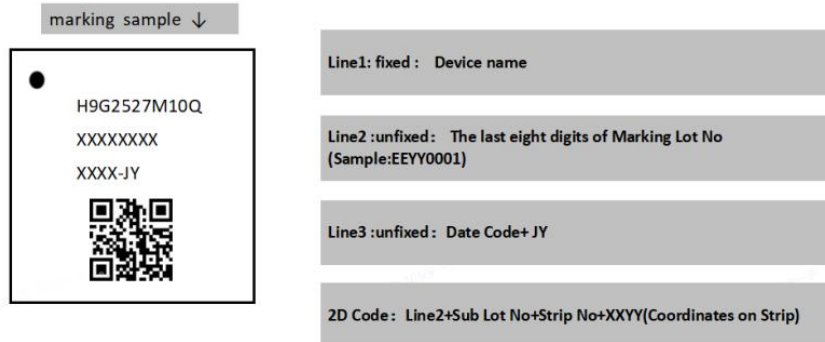
Performance Plots



Pin Configuration and Description

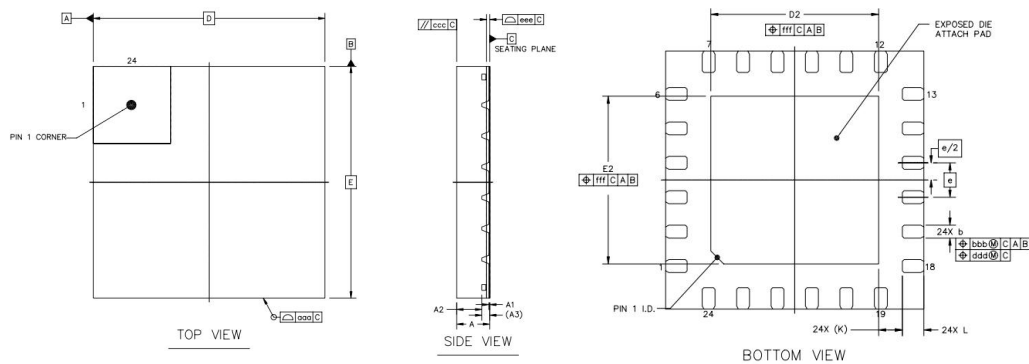
		
Pin Configuration		
Pin Number	Label	Description
1	VGS_M	Gate-source voltage of main
2	VGS_P	Gate-source voltage of peak
3	GND	Ground
4	RFin	RF input
5	GND	Ground
6	GND	Ground
7	VDS2	Drain-source voltage of peak driver
8	GND	Ground
9	GND	Ground
10	GND	Ground
11	GND	Ground
12	VDS3	Drain-source voltage of final stage
13	RFout	RF output
14	NC	NOT CONNECTED
15	RFout5	RF output5
16	RFout4	RF output4
17	RFout3	RF output3
18	RFout2	RF output2
19	RFout1	RF output1
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	VDS1	Drain-source voltage of main driver
24	GND	Ground

Package Marking and Dimensions



●This Marking SPEC only stipulates the content of Marking. For marking requirements such as font and size, please refer to the latest version of "Watech Product Printing Specification".

Marking

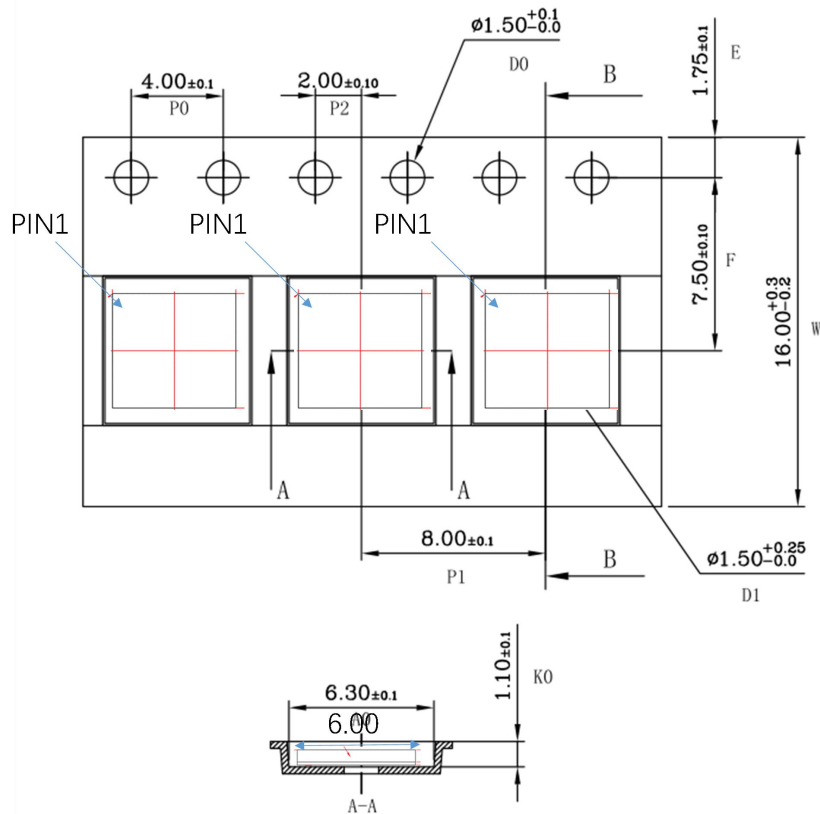


		SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS		A	0.8	0.85	0.9
STAND OFF		A1	0	0.02	0.05
MOLD THICKNESS		A2	---	0.65	---
L/F THICKNESS		A3	0.203 REF		
LEAD WIDTH		b	0.25	0.3	0.35
BODY SIZE	X	D	6 BSC		
	Y	E	6 BSC		
LEAD PITCH		e	0.8 BSC		
EP SIZE	X	D2	3.8	3.9	4
	Y	E2	3.8	3.9	4
LEAD LENGTH		L	0.4	0.5	0.6
LEAD TIP TO EXPOSED PAD EDGE		K	0.55 REF		
PACKAGE EDGE TOLERANCE		aaa	0.1		
MOLD FLATNESS		ccc	0.1		
COPLANARITY		eee	0.08		
LEAD OFFSET		bbb	0.1		
		ddd	0.05		
EXPOSED PAD OFFSET		fff	0.1		

Package Dimensions


Packing Information

Package Type	Reel Size(inch)	Qty/Reel(pcs)	Qty/Box(pcs)	Qty/Carton(pcs)
QFN 6x6x0.85, 24-pins	13	3000	3000	15000



Tape & Reel Packaging Descriptions

Handling Precautions

Parameter	Grade		
Moisture Sensitivity Level MSL	3		
Parameter	Rating	Standard	
ESD – Human Body Model (HBM)	Class 1B	JESD22-A114	
ESD – Charged Device Model (CDM)	Class C1	JESD22-C101	

RoHS Compliance

This product is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

Datasheet Status

Document status	Product status	Definition
Objective Datasheet	Design simulation	Product objective specification
Preliminary Datasheet	Customer sample	Engineering samples and first test results
Product Datasheet	Mass production	Final product specification

Abbreviations

Acronym	Definition
LDMOS	Laterally-diffused metal-oxide semiconductor
GaN	Gallium Nitride
CW	Continuous Waveform
VSWR	Voltage Standing Wave Ratio



H9G2527M10Q
10W, 2.5-2.7 GHz Doherty Amplifier
Product Datasheet

Revision History

Document ID	Datasheet status	Release date	Version revision record
Rev 0.1	Preliminary	2023/03	Preliminary Version
Rev 0.1	Product	2023/07	Product Version
Rev 0.2	Product	2024/08	Update format
Rev 0.3	Product	2024/10	Update Reference PCB Layout



Contact Information

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