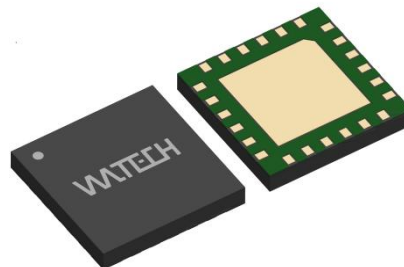


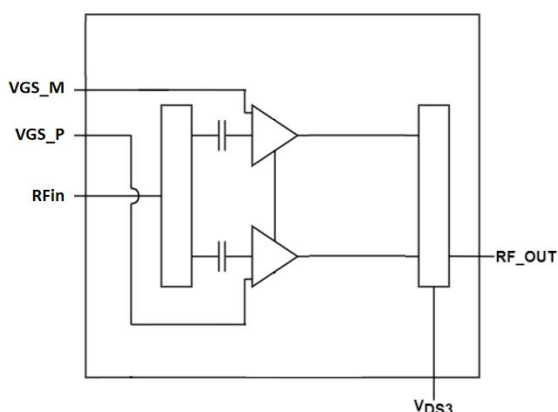
Description

The H9G0810M06P is a LDMOS integrated Asymmetrical Doherty 1-stage Power Amplifier designed for cellular base station applications with 0.63 W average output power covering frequency range from 859 to 960 MHz.



LGA 6 x 6 x 0.85 mm, 24-pins

Block Diagram



Features

- Operating Frequency Range: 859 to 960 MHz
- Operating Drain Voltage: +28V
- P3dB: 5.0W (+37 dBm)
- Integrated Input Divider
- 50 Ω Input matched
- High Efficiency
- High Gain over the Frequency Range
- Footprint: LGA 6 x 6 x 0.85 mm, 24-pin

Applications

- 3GPP 5G NR FR1 n5/8/18/26 and 4G-LTE band B5/8/18/26.
- 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
H9G0810M06P	Reel Package
H9G0810M06P EVB	859 - 960MHz EVB

Typical Performances

RF Characteristics (Pulsed CW)

Freq(MHz)	P3dB(dBm)	Gain(dB)*	Eff(%)*	IRL(dB)*
859	36.98	19.23	44.69	-16.80
869	37.31	19.46	44.87	-17.80
910	37.33	19.69	46.87	-26.47
960	37.37	19.57	48.53	-22.10

Test conditions unless otherwise noted: 25°C, 10% Pulse, $V_{ds} = 28\text{ V}$, $I_{dq_carr} = 18\text{ mA}$, $V_{gs_peak} = V_{gs_carr} - 0.80\text{ V}$, test on Watech Application Board.

* @Pout=28dBm

RF Characteristics (WCDMA)

Freq(MHz)	Gain(dB)	Eff(%)	ACPR_5MHz(dBc)*	ACPR_10MHz(dBc)*
859	19.02	45.08	-31.99	-51
869	19.29	45.49	-32.14	-52.08
910	19.44	46.83	-33.53	-52.50
960	19.32	47.32	-35.65	-53.05

Test conditions unless otherwise noted: 25°C, $V_{ds} = 28\text{ V}$, $I_{dq_carr} = 18\text{ mA}$, $V_{gs_peak} = V_{gs_carr} - 0.80\text{ V}$, $P_{avg} = 28\text{ dBm}$,

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	Vgs=0V, Ids=5.2 uA	65	-	-	V
Gate-Source Threshold VGS(th)	Vds=28V, Ids=5.2uA	1.2	-	2.0	V
Drain Leakage Current IDSS	Vgs=0V, Vds=28V	-	-	0.5	uA
Gate Leakage Current IGSS	Vgs=10V, Vds=0V	-	-	0.05	uA

Test conditions unless otherwise noted: 25 °C

RF Characteristics (Pulsed CW)

Parameter	Conditions	Min	Typ	Max	Unit
Frequency Range	Pout=28dBm	0.859	-	0.960	GHz
P3dB	Freq=0.821GHz	36	37	-	dBm

Test conditions unless otherwise noted: 25°C, 10% Pulse, Vds = 28 V, Idq_carr = 18 mA, Vgs_peak = Vgs_carr - 0.80 V, test on WATECH Production Board.

RF Characteristics (WCDMA)

Parameter	Conditions	Min	Typ.	Max	Unit
Frequency Range	Pout=28dBm	0.859	-	0.960	GHz
Gain	Freq=960 MHz, Pout=28dBm	18	19	21	dB
Eff	Freq=859 MHz, Pout=28dBm	41.5	45	-	%
Eff	Freq=960 MHz, Pout=28dBm	42.5	47	-	%
IRL	Freq=960 MHz, Pout=28dBm	-	-15	-9	dB
ACPR@5MHz	Freq=960 MHz, Pout=28dBm	-	-32	-24	dBc

Test conditions unless otherwise noted: 25°C, Vds = 28 V, Idq_carr = 18 mA, Vgs_peak = Vgs_carr - 0.80 V, Pave = 28 dBm, 1C-WCDMA 5MHz Signal, 9.9 dB PAR @ 0.01% CCDF test on WATECH Production Board.

*Uncorrected DPD



H9G0810M06P
5W, 859-960 MHz Doherty Amplifier
Product Datasheet

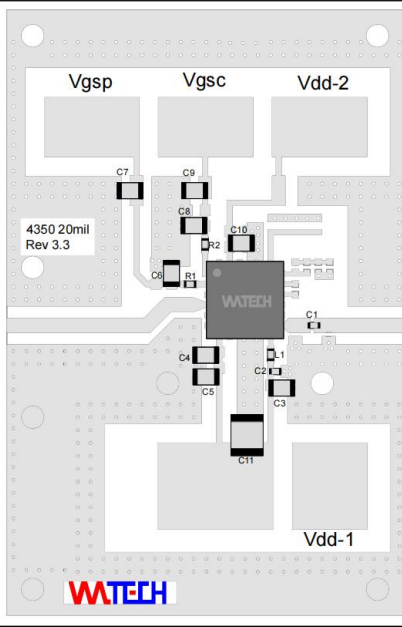
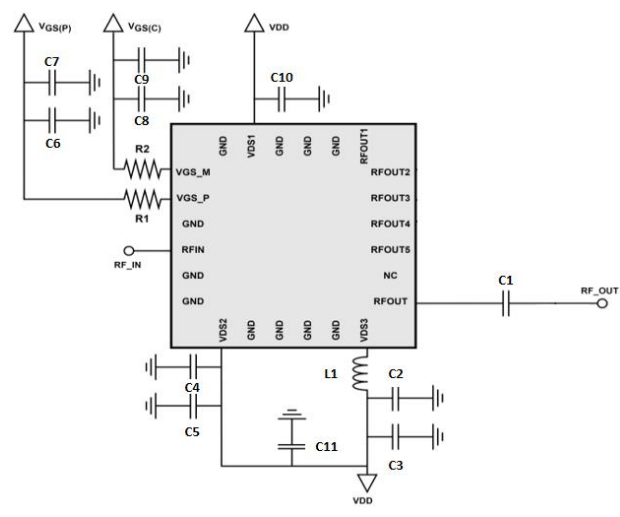
Load Mismatch Test

Condition	Test Result
VSWR=10:1, at all Phase Angles, Vds=+28Vdc, Idq_carr = 18mA, Vgs_peak = Vgs_carr - 0.80 V, Pave = 28 dBm, Frequency = 0.960 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 = 28dBm	8.5	°C /W

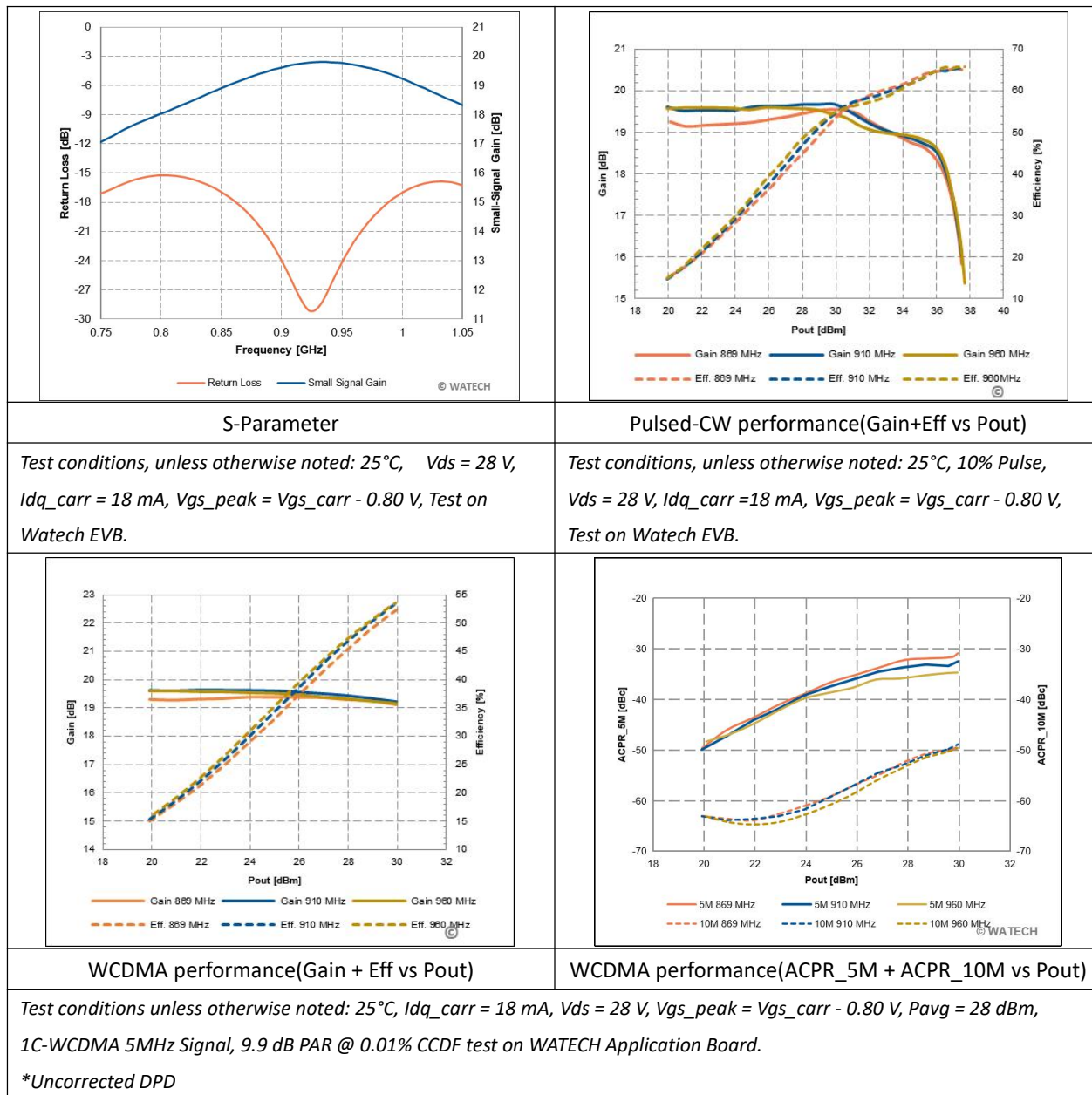
H9G0810M06P 859-960 MHz Reference Design

	
Reference PCB Layout	Reference Schematic
Rogers 4350B (er = 3.66), Substrate thickness 20 mil (0.508 mm), Copper thickness 35 μ m (1oz)	

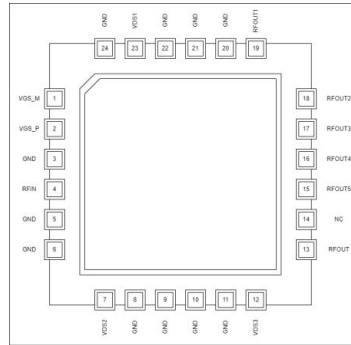
Bill of Materials (BoM) - H9G0810M06P 859-960 MHz Reference Design

Component	Type	Value	Description	P/N
C1	Capacitor	20pF	Multi-layer ceramic capacitor	GQM1555C2D200GB01D
C2 - C10	Capacitor	1 uF	Multi-layer ceramic capacitor	GRM21BC72A105KE01L
C11	Capacitor	10 uF	Multi-layer ceramic capacitor	GRM32EC72A106KE05L
L1	Inductor	18nH	HQ inductor	LQW15AN18NG80D
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

Marking Spec No.
H9G0810M06P Markingspec_A

Marking Spec

marking sample ↓

Line1: fixed : Device name

Line2 :unfixed: The last eight digits of Marking Lot No (Sample:EEYY0001)

Line3 :unfixed : Date Code+ JY

2D Code : Line2+Sub Lot No+Strip No+XXYY(Coordinates on Strip)

●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	Dimension in mm			Dimension in inch		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.760	0.860	0.960	0.030	0.034	0.038
c	0.150	0.180	0.210	0.006	0.007	0.008
D	5.900	6.000	6.100	0.232	0.236	0.240
E	5.900	6.000	6.100	0.232	0.236	0.240
D1	3.800	3.900	4.000	0.150	0.154	0.157
E1	3.800	3.900	4.000	0.150	0.154	0.157
H	---	0.286	---	---	0.011	---
H1	---	0.286	---	---	0.011	---
L	0.350	0.400	0.450	0.014	0.016	0.018
L1	0.025	0.100	0.175	0.001	0.004	0.007
L2	0.975	1.050	1.125	0.038	0.041	0.044
L3	0.975	1.050	1.125	0.038	0.041	0.044
e	---	0.800	---	---	0.031	---
b	0.250	0.300	0.350	0.010	0.012	0.014
aaa	0.150	---	---	---	0.006	---
bbb	0.150	---	---	---	0.006	---
ccc	0.100	---	---	---	0.004	---
ddd	0.080	---	---	---	0.003	---
eee	0.150	---	---	---	0.006	---

Top View

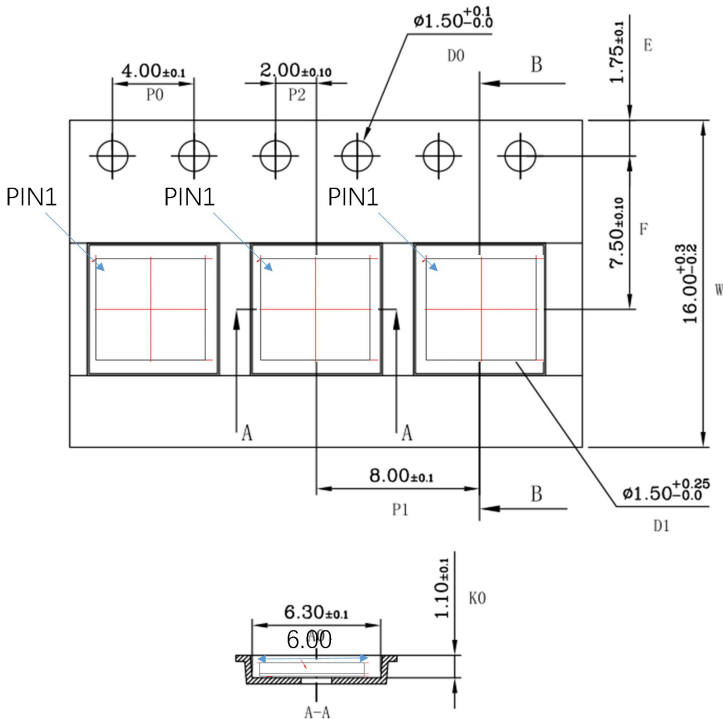
Bottom View

Side View

Package Dimensions

Packing Information

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



The diagram illustrates the dimensions for the LGA 6x6x0.85, 24-pin package in a carrier tape. Key dimensions include:

- Carrier Tape Dimensions:** Total width is 16.00±0.2 mm, and the pitch between carrier holes is 8.00±0.1 mm.
- Pin Dimensions:** Pin diameter is 0.150±0.01 mm (D0 and D1), and the pin length is 1.10±0.1 mm (KO).
- Pin Spacing:** The distance between the first and second pin is 4.00±0.1 mm (P0), and the distance between the second and third pin is 2.00±0.10 mm (P2).
- Other Dimensions:** The distance from the first pin to the edge is 1.75±0.1 mm (E), the distance between the third and fourth pin is 7.50±0.10 mm (F), and the distance from the fourth pin to the edge is 1.10±0.1 mm (KO).

Tape & Reel Packaging Descriptions

Handling Precautions

Parameter	Grade	
Moisture Sensitivity Level MSL	MSL3	
Parameter	Rating	Standard
ESD – Human Body Model (HBM)	1B	JESD22-A114
ESD – Charged Device Model (CDM)	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



H9G0810M06P
5W, 859-960 MHz Doherty Amplifier
Product Datasheet

Revision History

Document ID	Datasheet status	Release date	Version revision record
Rev 1.0	Preliminary	April 2024	Preliminary Version
Rev 2.0	Product	May 2024	Product release
Rev 3.0	Product	May 2024	Freq(MHz) from 869 to 859
Rev 3.1	Product	Sept 2024	Update the format
Rev 3.2	Product	2024/10	Update Reference PCB Layout



Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations and information about WATECH:

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- Email: MKT@watechelectronics.com

For technical questions and application information:

- Email: MKT@watechelectronics.com

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