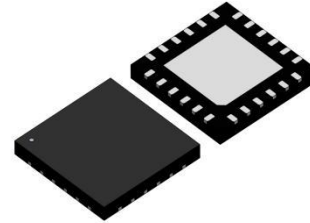


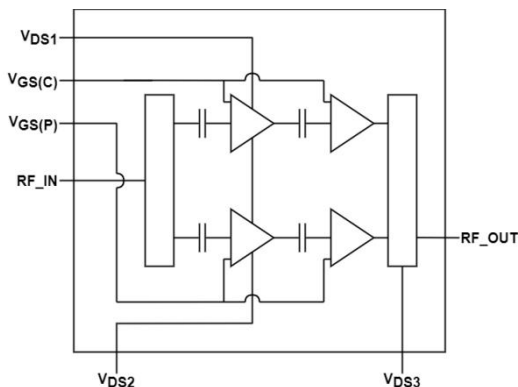
Description

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.



24 Lead QFN 6x6 mm Plastic Package

Block Diagram



Features

- Operating Frequency Range: 2.5 to 2.7 GHz
- Operating Drain Voltage: +28 V
- Saturation Output Power: 10 W
- Integrated Input Divider
- High Efficiency
- High Gain over the Frequency Range
- Small footprint package, 6mm x 6mm QFN

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
H9G2527M10QEVB	2.5 - 2.7GHz EVB

Typical Performances

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

$V_{DD}=28V_{dc}$, $I_{DQ}=25mA$, $V_{gsp}=V_{gsm}-0.52V$, $P_{out}=31\text{ dBm}$, Pulsed CW, 100 us, Duty Cycle = 10%, Test on Holto EVB.

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

$V_{DD}=28V_{dc}$, $I_{DQ}=25mA$, $V_{gsp}=V_{gsm}-0.52V$, $P_{out}=31\text{ dBm}$, 5MHz WCDMA, PAR=9.9 dB, Test on Holto EVB.

Absolute Maximum Ratings

Parameter	Range/Value	Units
Drain voltage (VDSS)	-0.5 to 65	V
Gate voltage (VGS)	-6 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	Units
IGSS_C Gate leakage Current for Carrier	Vgs=10V, Vds=0V	/	/	1.05	uA
IGSS_P Gate leakage Current for Peak	Vgs=10V, Vds=0V	/	/	1.05	uA
IDSS Drain leakage Current	Vgs=0V, Vds=28V	/	/	2	uA
BVDS Breakdown Voltage	Vgs=0V, Ids=12.02 uA	65	/	/	V
VGS(th)_C Gate-Source threshold Voltage of Carrier	Vgs=Vds, Ids=2.5 uA	1.2	/	2	V
VGS(th)_P Gate-Source threshold Voltage of Peak	Vgs=Vds, Ids=9.52 uA	1.2	/	2	V

RF Characteristics (Pulsed CW)

Parameter	Conditions	Min	Typ	Max	Units
Frequency Range	Pout=31 dBm	2.5	/	2.7	GHz
P3dB	Freq=2.7GHz	39.5	40.9	41.5	dBm

Test conditions, unless otherwise noted: 25 °C, VDD=+28Vdc, IDQ = 25 mA, Vgsp=Vgsm-0.49V, Pulse Width = 100 us, Duty Cycle = 10%,Based on FT board

RF Characteristics (WCDMA)

Parameter	Conditions	Min	Typ	Max	Units
Frequency Range	Pout=31 dBm	2.5	/	2.7	GHz
Gain	Freq=2.7GHz, Pout=31dBm	25	27.1	28.5	dB
Eff	Freq=2.7GHz, Pout=31dBm	39	42.8	/	%
ACLR@5MHz	Freq=2.7GHz, Pout=31dBm	/	-25.5	-24	dBc

Test conditions, unless otherwise noted: 25 °C, VDD=+28Vdc, IDQ = 25 mA, Vgsp=Vgsm-0.49V, single-carrier, 5MHz WCDMA signal with 9.9 dB PAR @ 0.01% CCDF Based on FT board

RF Characteristics (Small-Signal)

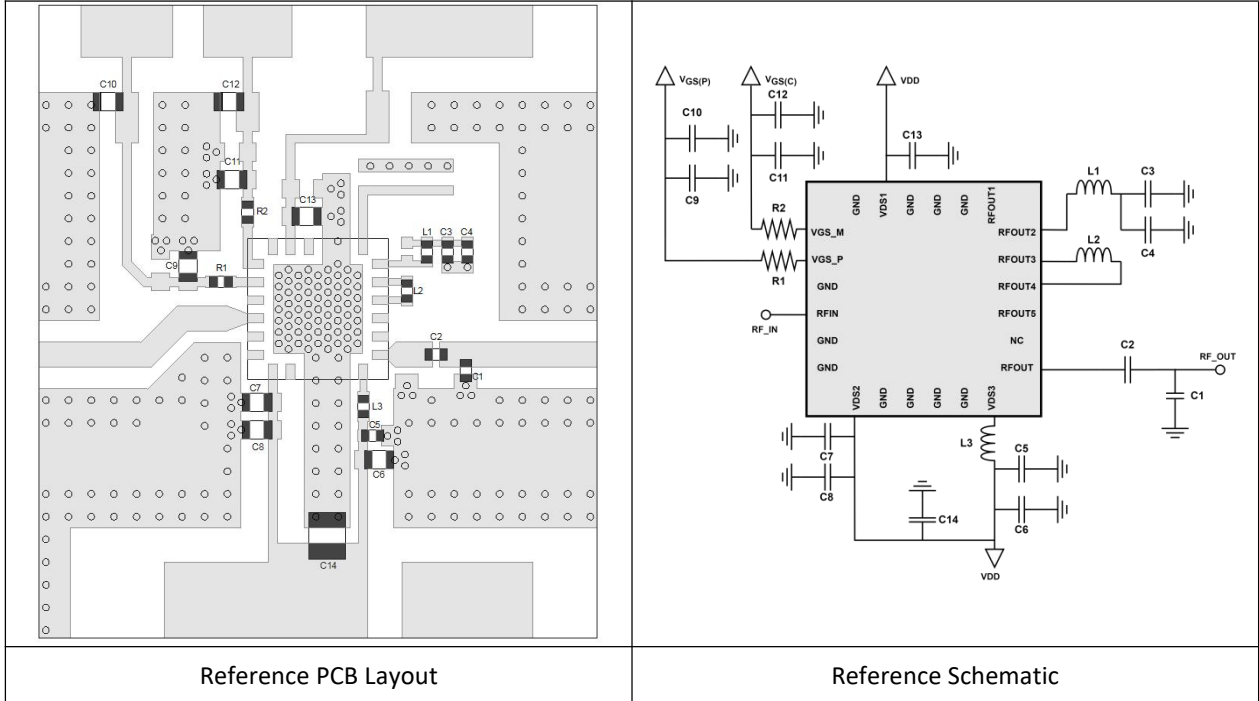
Parameter	Conditions	Min	Typ	Max	Units
Input Return Loss	Freq=2.7GHz	/	/	-10	dB

Test conditions, unless otherwise noted: 25 °C, VDD=+28Vdc, IDQ = 25 mA, Vgsp=Vgsm-0.49V, CW, Based on FT board

Thermal Information

Parameter	Condition	Value (Typ)	Units
Thermal Resistance Junction to Case (RTH)	T _{case} = 90°C, WCDMA single-carrier, P _{avg} = 31 dBm	8.1	C/W

H9G2527M10Q 2.5-2.7 GHz Reference Design

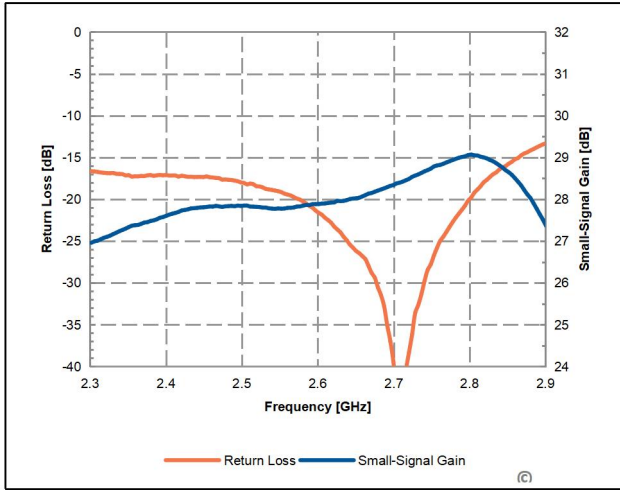


Rogers 4350B, thickness=20mil
PCB is soldered on a 25 mm by 28 mm copper base plate with 10 mm thickness

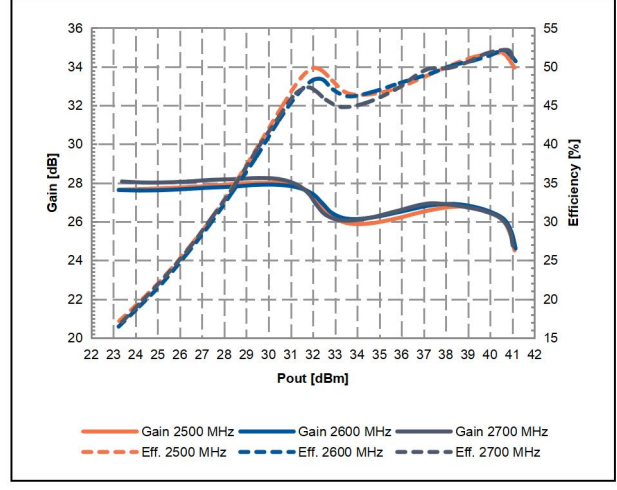
BOM-H9G2527M10Q 2.5 – 2.7 GHz Reference Design

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

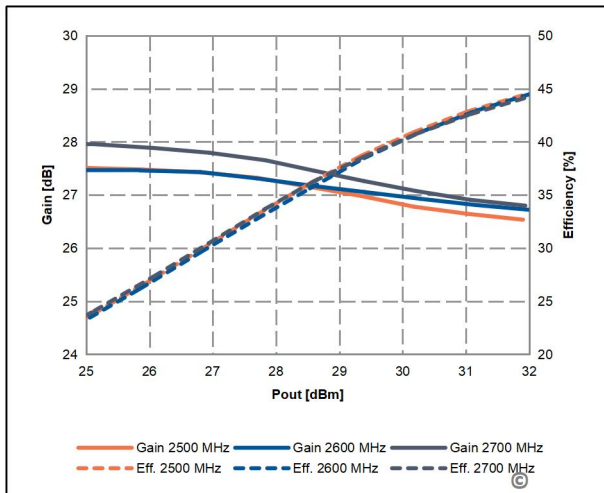


S-Parameter

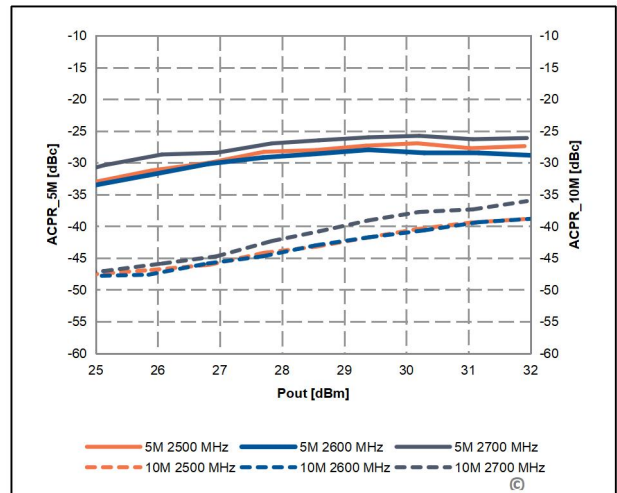


Pulsed-CW performance(Gain+Eff vs Pout)

Test conditions, unless otherwise noted: 25 °C, VDD=28 Vdc, IDQ = 25 mA, Vgsp=Vgsm-0.52V, Pulse Width = 100 us, Duty Cycle = 10%, test on HOTLO EVB.



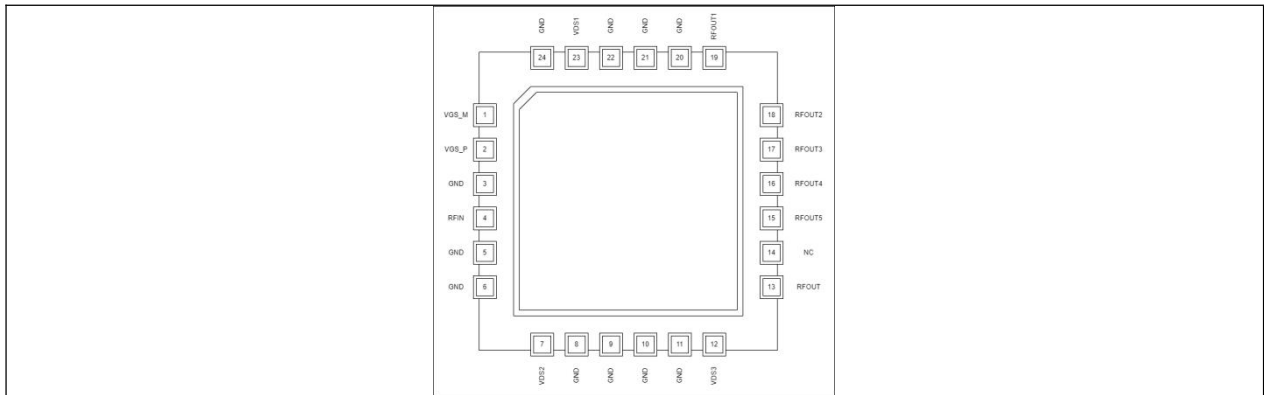
WCDMA performance(Gain+Eff vs Pout)



WCDMA performance(ACPR_5M+ACPR_10M vs Pout)

Test conditions, unless otherwise noted: 25 °C, VDD=+28Vdc, IDQ = 25 mA, Vgsp=Vgsm-0.52V, 1-carrier WCDMA, PAR=7.6 dB, test on HOTLO EVB

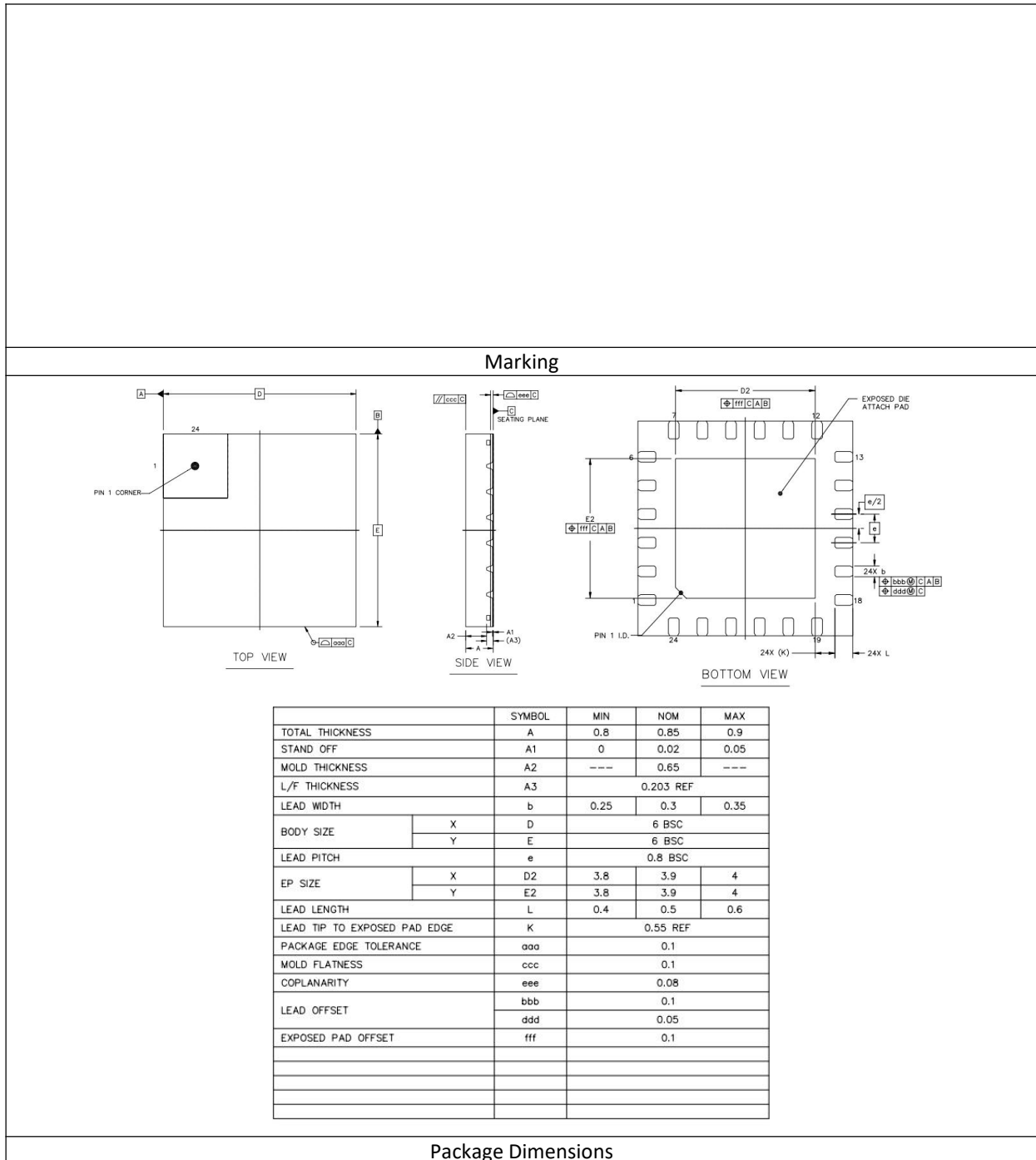
Pin Configuration and Description



Pin Configuration

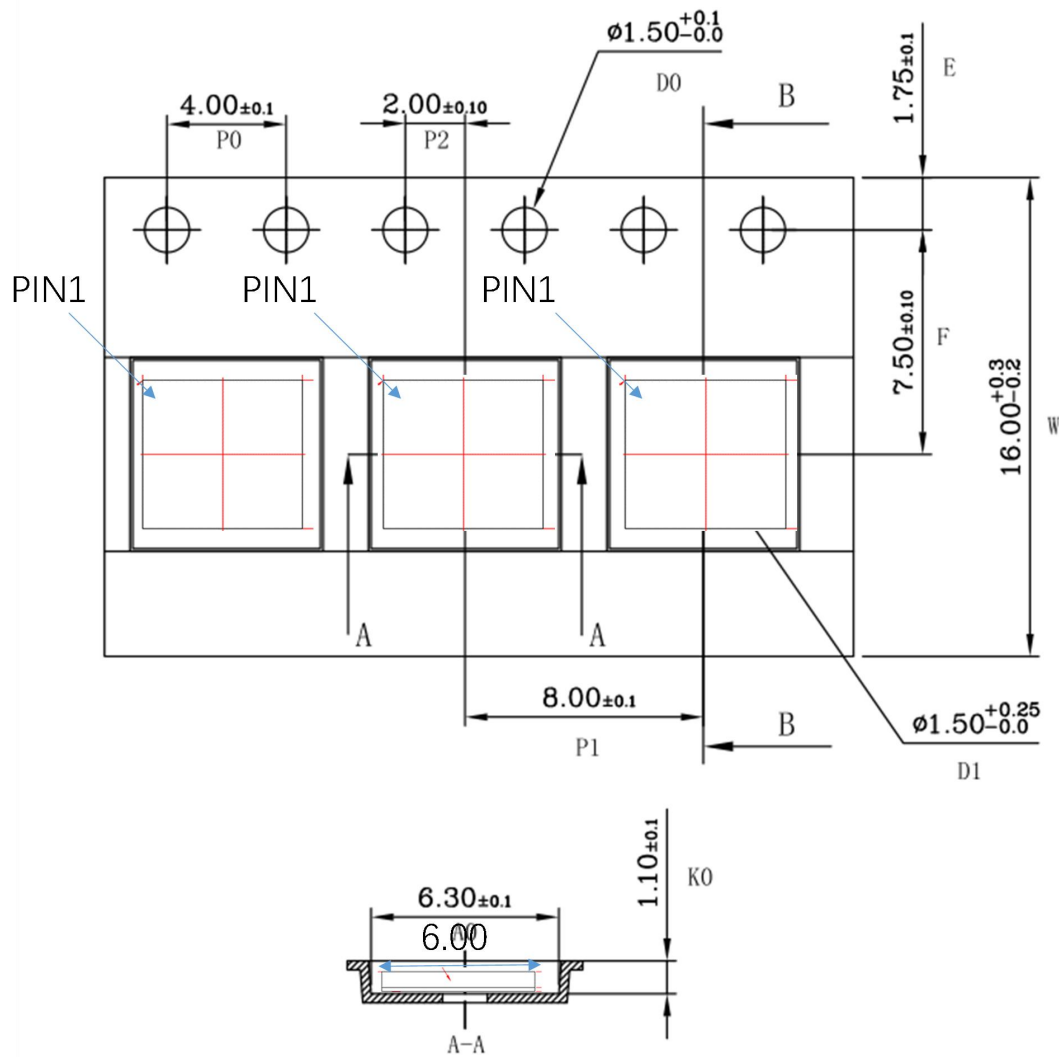
Pin Number	Label	Description
1	VGS_M	Gate-source voltage of main
2	VGS_P	Gate-source voltage of peak
3	GND	Ground
4	RFIn	RF input
5	GND	Ground
6	GND	Ground
7	VDS2	Drain-source voltage of peak driver
8	GND	Ground
9	GND	Ground
10	GND	Ground
11	GND	Ground
12	VDS3	Drain-source voltage of final stage
13	RFout	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




Packing Information

Package Type	Reel Size(inch)	Qty/Reel(pcs)	Qty/Box(pcs)	Qty/Carton(pcs)
QFN 6X6X0.85 24	13	3000	3000	15000



Handling Precautions

Parameter	Rating	Standard	
ESD – Human Body Model (HBM)	1B	ANSI/ESDA/JEDEC Standard JS-001	
ESD – Charged Device Model (CDM)	C1	ANSI/ESDA/JEDEC Standard JS-002	
MSL – 260°C Convection Reflow	MSL3	IPC/JEDEC Standard J-STD-020	

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

Revision history

Document ID	Datasheet status	Release date	Version revision record
H9G2527M10Q	Preliminary	2023/03	Preliminary Version
H9G2527M10Q	Product	2023/07	Product Version

Abbreviations

Acronym	Definition
LD MOS	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

Contact Information

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

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