HTN8G24S060HB

60W, 2.3 - 2.4 GHz LDMOS Amplifier

Product datasheet

Description

The HTN8G24S060HB is a matched discrete LDMOS Power Amplifier with 60W saturated output power covering frequency range from 2.3 - 2.4 GHz.

Features

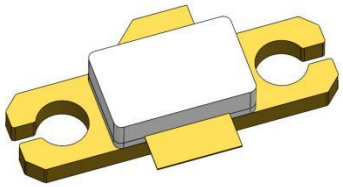
- Operating Frequency Range: 2.3 - 2.4 GHz
- Operating Drain Voltage: 28V
- Saturation Output Power: 60W
- Excellent thermal stability due to low thermal resistance package
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design

Applications

- Private network communication base station

Ordering Information

Part Number	Description
HTN8G24S060HB	Reel Package
HTN8G24S060HB EVB	2400MHz EVB

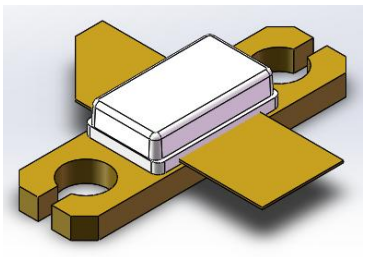


ACC0906B-2S

Flanged balanced

Air Cavity Ceramic Package; 2 Short Leads

2 Mounting Holes

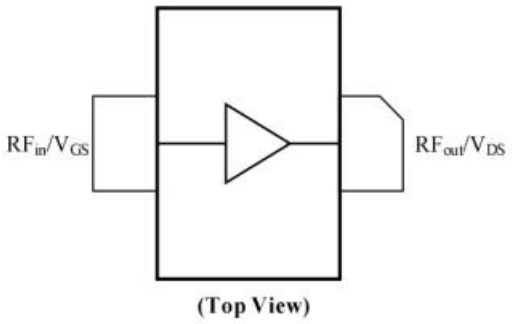


ACC0906B-2L

Flanged balanced

Air Cavity Ceramic Package; 2 Leads

2 Mounting Holes



(Top View)

Note: Exposed backside of the package is the source terminal for the transistor

Pin Connections

Typical Performance

RF Characteristics (CW)

Freq (MHz)	Gain (dB)	P1dB (dBm)	Eff (%)@P1dB	P3dB (dBm)	Eff(%)@P3dB
2300	19.26	47.44	48.69	48.26	52.01
2350	19.92	47.49	56.22	48.41	60.64
2400	21.21	46.91	57.68	47.71	59.84

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ = 200mA CW test on WATECH Application Board

Absolute Maximum Ratings

Parameter	Range/Value	Unit
Drain voltage (V_{DSS})	-0.5 to +28	V
Gate voltage (V_{GS})	-6 to +10	V
Storage Temperature (T_{STG})	-55 to +150	°C
Junction Temperature (T_J)	+230.5	°C

Electrical Specification

DC Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Breakdown Voltage $V_{(BR)DSS}$	Vgs=0V, Ids=200uA	66	-	80	V
Gate-Source Threshold Voltage $V_{GS(th)}$	Vgs=Vds, Ids=62uA	1.1	-	1.9	V
Drain Leakage Current I_{DSS}	Vgs=0V, Vds=28V	-100	-	300	nA
Gate Leakage Current I_{GSS}	Vgs=5V, Vds=0V	-100	-	10	nA

Load Mismatch Test

Condition	Test Result
VSWR=65:1, at all Phase Angles, V_{DD} = +28Vdc, $I_{DQ_Carrier}$= 200mA, CW P_{AVG} = 60W, Frequency 2400MHz test on WATECH Application Board	No Device Degradation

Thermal Information

Parameter	Condition	Value (Typ)	Unit
Thermal Resistance Junction to Case (R_{TH})	V_{DD}=28V,I_{DQ}=4.67A,T_{case}=116.7°C,Tj=230.5°C,measured under DC condition。	0.87	°C /W

Load Pull Performance

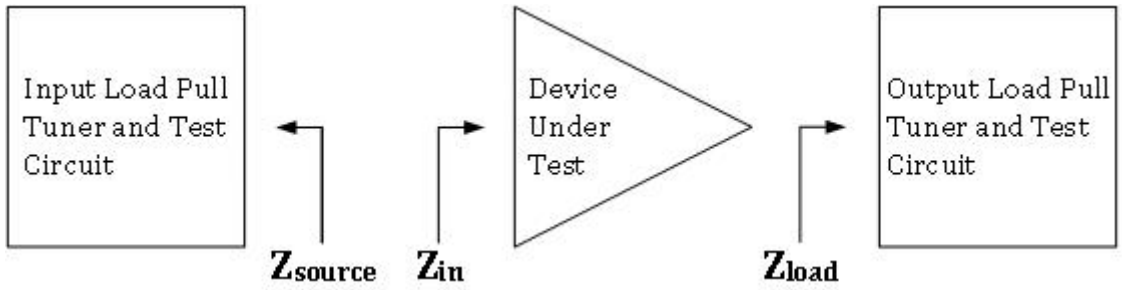
Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ= 200mA, PW = 40us, DC= 4%

Max Output Power						
Freq (MHz)	**Z_source (Ω)**	**Z_load [1] (Ω)**	**Gain (dB)**	**P3dB (dBm)**	**P3dB (W)**	**Eff (%)**
2300	2-j*7	1.9-j*2.5	20.00	48.90	77.63	59.40
2400	3.4-j*8.2	1.9-j*2.7	20.50	48.80	75.86	59.30

[1] Load impedance for optimum P3dB pout

Max Drain Efficiency						
Freq (MHz)	**Z_source (Ω)**	**Z_load [2] (Ω)**	**Gain (dB)**	**P3dB (dBm)**	**P3dB (W)**	**Eff (%)**
2300	2-j*7	1.3-j*1.8	21.80	47.70	58.88	65.00
2400	3.4-j*8.2	1.2-j*2	22.80	47.50	56.23	63.90

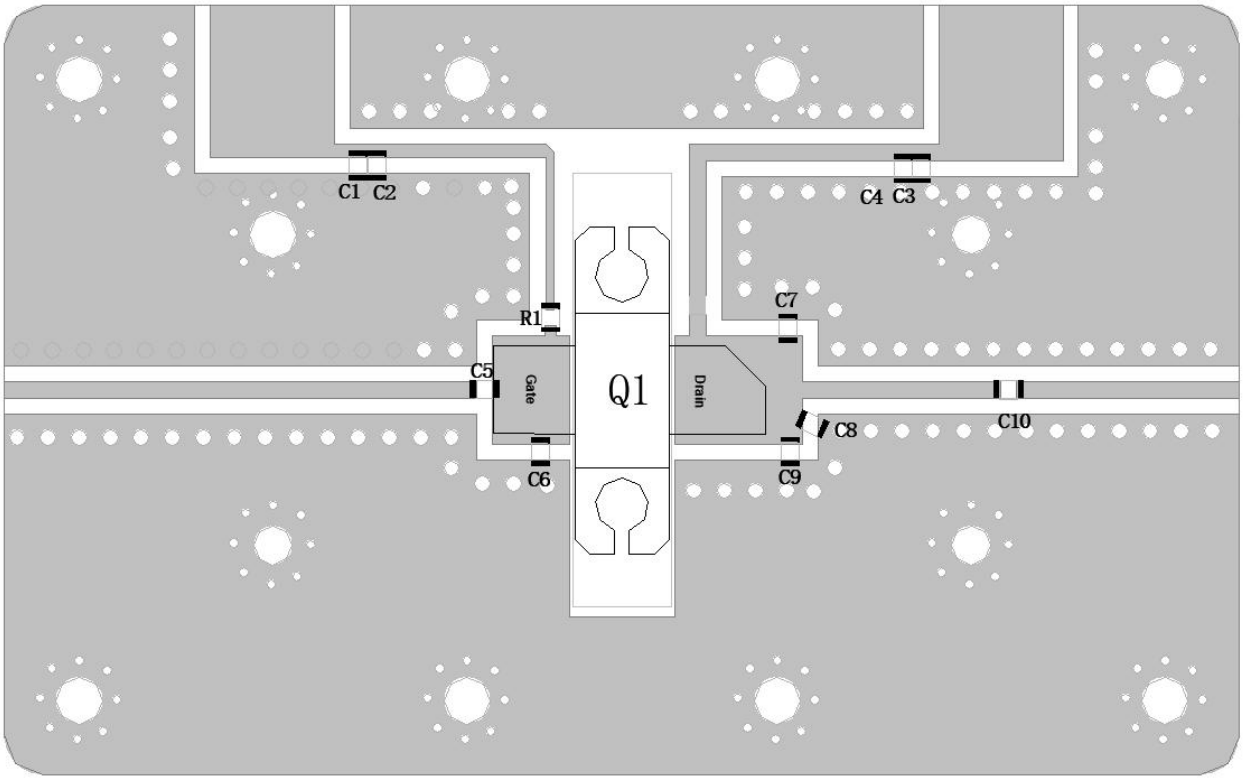
[2] Load impedance for optimum P3dB efficiency



Z_source : Measured impedance presented to the input of the device at the package reference plane

Z_load : Measured impedance presented to the output of the device at the package reference plane

HTN8G24S060HB 2400MHz Reference Design

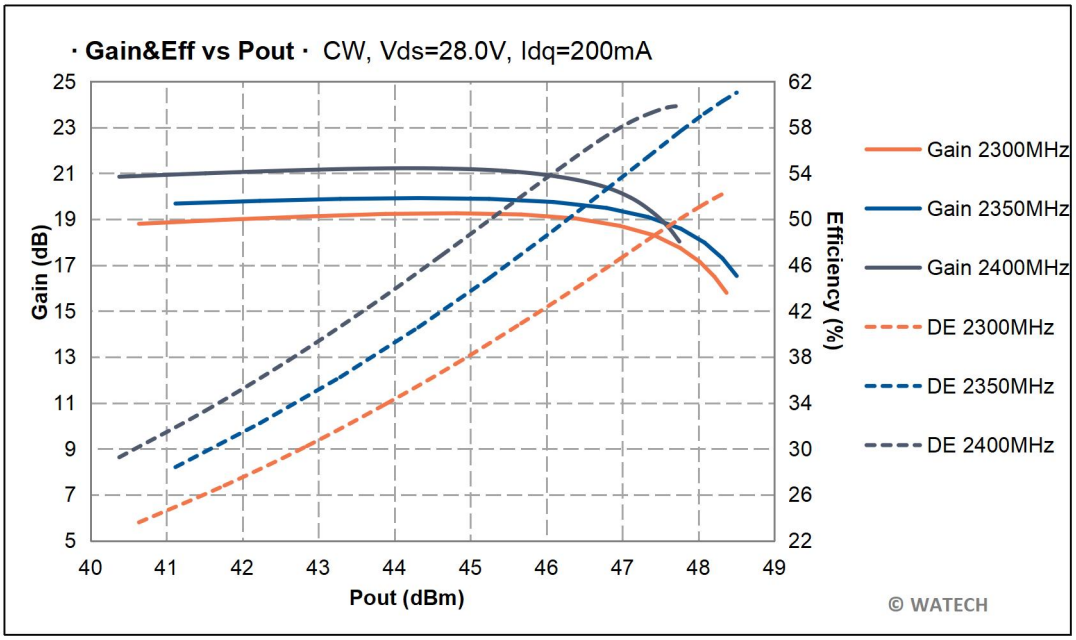


EVB Layout

Bill of Materials (BoM) - HTN8G24S060HB 2400MHz Reference Design

Reference	Value	Description	Manufacturer	P/N
Q1		LDMOS transistor	WATECH	HTN8G24S060HB
C1 C3	4.7 µF	1210 Chip Capacitor	Murata	GRJ32DC72A475KE11L
C2 C4 C5 C10	11pF	0805 Chip Capacitor	Murata	GRJ32DC72A110KE11L
C6	2pF	0805 Chip Capacitor	Murata	GRJ32DC72A2R0KE11L
C7C8	1.3pF	0805 Chip Capacitor	Murata	GRJ32DC72A1R3KE11L
C9	1.2pF	0805 Chip Capacitor	Murata	GRJ32DC72A1R2KE11L
R1	27Ω	0603 Chip Resistor	KOA	
PCB	Rogers 4350B (er = 3.5), 20 mil, 35 µm (1oz)			

Performance Plots



CW, Gain and Efficiency vs Pout

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ = 200mA ,Vgs=2.00V CW test on WATECH Application Board

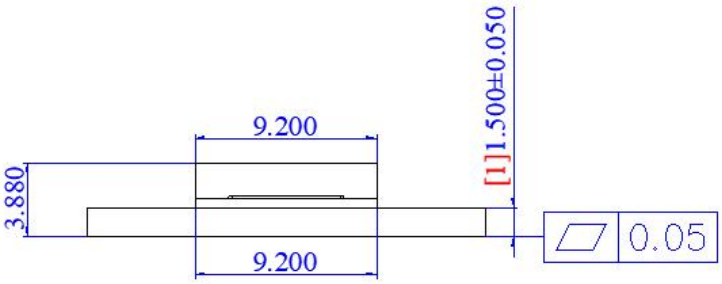
Package Marking and Dimensions

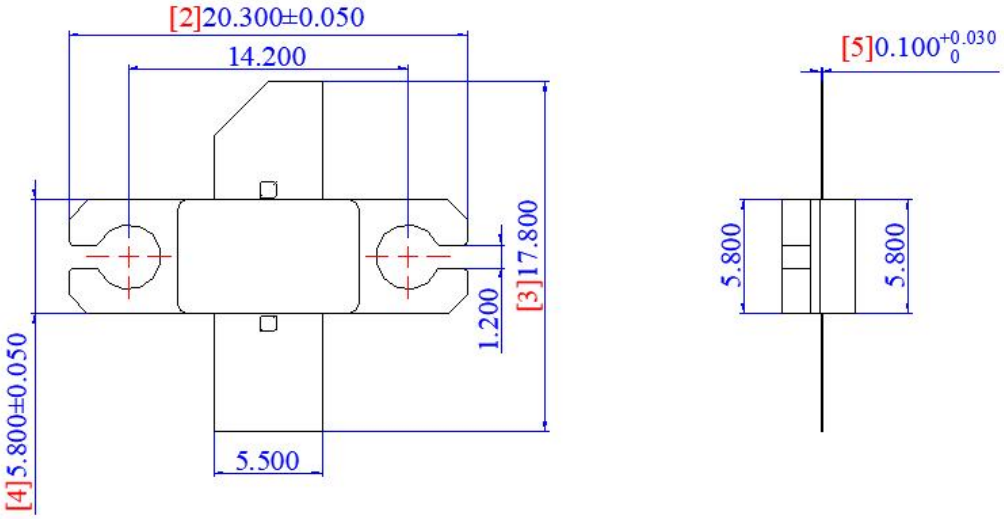
HTN8G24S060HB
HTYYWW

- Line1 (fixed): Device name in W/O
- Line2 (unfixed): HT+Date Code

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"

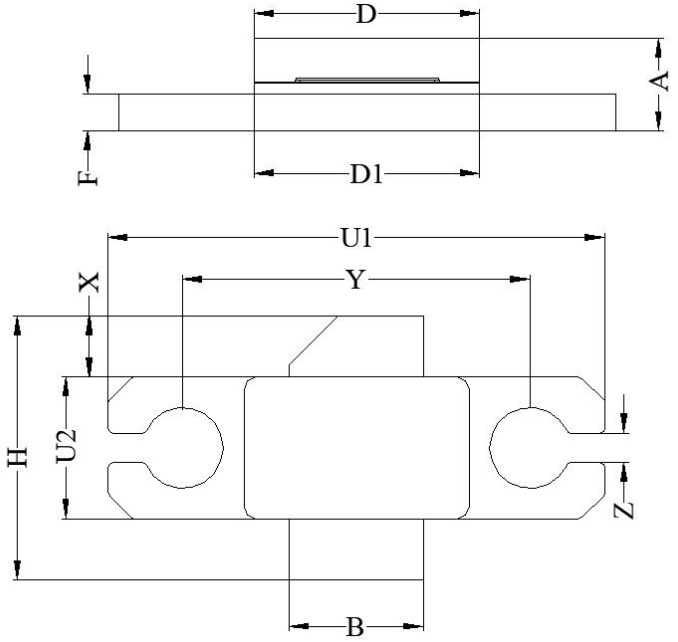
Marking





Package Dimensions

ACC0906B-2L Flanged balanced Air Cavity Ceramic Package; 2 Leads; 2 Mounting Holes



unit：mm

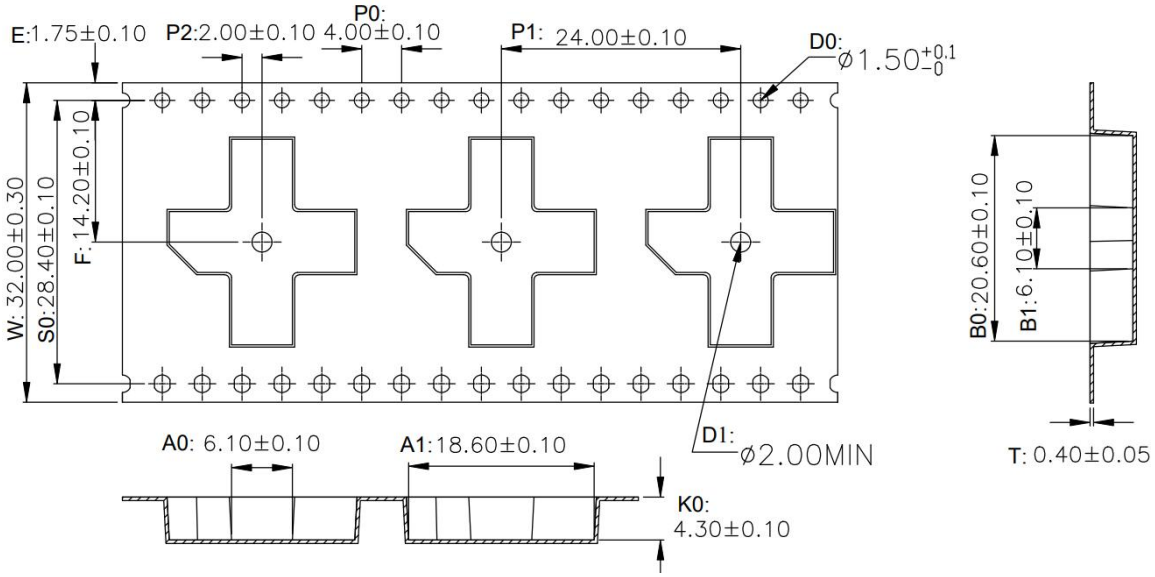
	A	B	C	D	D1	E	E1	F	H	Q	U1	U2	X	Y	Z	V	W1	W2	M
max	4.180	5.550	0.120	9.200	9.330	5.800	5.930	1.550	11.300	2.100	20.400	5.900	2.630	14.330	1.300	0.500	0.500	0.500	0.100
nom	3.880	5.500	0.100	9.200	9.200	5.800	5.800	1.500	10.800	2.000	20.300	5.800	2.500	14.200	1.200	/	/	/	/
min	3.580	5.450	0.080	9.070	9.070	5.670	5.670	1.450	10.300	1.900	20.200	5.700	2.370	14.070	1.100	/	/	/	/

Package Dimensions

ACC0906B-2S Flanged balanced Air Cavity Ceramic Package; 2 Short Leads; 2 Mounting Holes

Tape and Reel Information

Package Type	Reel Size(inch)	Qty/Reel(pcs)	Qty/Box(pcs)	Qty/Carton(pcs)
ACC0906B-2L ACC0906B-2S	13inch	500	500	1000



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 – Human Body Model (MM)	Class A	EIA/JESD22-A115
ESD – Charged Device Model (CDM)	Class III	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
CW	Continuous Waveform

Revision history

Document ID	Datasheet Status	Release Date	Revision Version
Rev 1.0	Product	Dec. 2024	New product version
Rev 1.1	Product	Mar. 2025	Update Qty/Reel
Rev 1.2	Product	Mar. 2025	Add ACC0906B-2S package

Contact Information

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

- Web: www.watechelectronics.com
- Email: MKT@huatai-elec.com

For technical questions and application information:

- Email: MKT@huatai-elec.com

Important Notice

Information in this document is believed to be accurate and reliable. However, WATECH does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

“Typical” parameters are the average values expected by WATECH in large quantities and are provided for information purposes only. All information and specifications contained herein are subject to change without notice and customers should obtain and verify the latest relevant information before placing orders for WATECH products.

The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information.

Applications that are described herein for any of these products are for illustrative purposes only. WATECH makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification. Customers are responsible for the design and operation of their applications and products using WATECH products, and WATECH accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the WATECH product is suitable and fit for the customer’s applications and products planned, as well as for the planned application and use of customer’s third-party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

WATECH products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety- critical systems or equipment, nor in applications where failure or malfunction of a WATECH product can reasonably be expected to result in personal injury, death or severe property or environmental damage.This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.