

Description

The HTN7G09P200H(B) is an unmatched discrete LDMOS Power Amplifier with 200W saturated output power covering frequency range from 1.8 - 1000 MHz.

Features

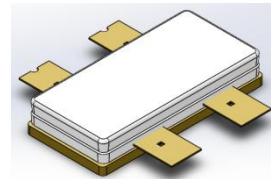
- Operating Frequency Range: 1.8 - 1000 MHz
- Operating Drain Voltage: 20-28V
- Saturation Output Power: 200W
- Internally Unmatched device
- Excellent thermal stability due to low thermal resistance package
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design

Applications

- Analog and Digital Broadcasting
- Meteorological and Aviation Radar
- Private network communication base station
- Industrial Scientific Medical (ISM)
 - Laser generation
 - Plasma generation
 - Particle accelerators
 - MRI, RF ablation and skin treatment
 - Industrial heating, welding and drying systems

Ordering Information

Part Number	Description
HTN7G09P200H(B)	Tray Package
HTN7G09P200H(B)EVB	851 - 880 MHz EVB
HTN7G09P200H(B)EVB1	30 - 678 MHz EVB

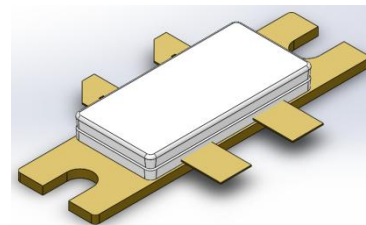


ACC2110S-4L

Earless Flanged balanced

Air Cavity Ceramic Package; 4 Leads

HTN7G09P200H



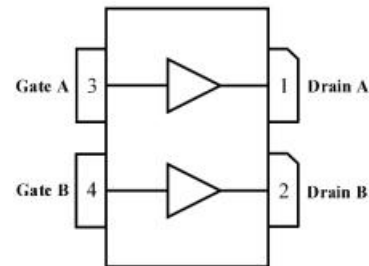
ACC2110B-4L

Flanged balanced

Air Cavity Ceramic Package; 4 Leads,

2 Mounting holes

HTN7G09P200HB



(Top View)

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

Pin Connections



HTN7G09P200H(B)

200W, 1.8 - 1000 MHz LDMOS Amplifier

Product datasheet

Typical Performance

RF Characteristics (Pulsed-CW)

Freq (MHz)	P1dB (dBm)	Eff(%) @P1dB	Gain (dB) @P1dB	P3dB (dBm)	Eff(%) @P3dB
851	53.41	62.33	21.91	54.14	67.05
860	53.14	61.81	21.93	53.75	66.03
869	52.84	62.33	21.86	53.37	66.05
880	52.45	63.89	21.83	52.95	67.71

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ =600mA, PW = 100us, DC= 10% test on WATECH Application Board

RF Characteristics (CW)

Freq (MHz)	P1dB (dBm)	Eff(%) @P1dB	Gain (dB) @P1dB	P3dB (dBm)	Eff(%) @P3dB
851	53.05	59.66	21.80	53.90	64.98
860	52.78	58.94	21.87	53.63	65.31
869	52.67	61.42	21.89	53.35	66.63
880	52.36	63.53	21.87	52.98	68.75

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ =1000mA CW test on WATECH Application Board

RF Characteristics (Pulsed-CW)

Freq (MHz)	P1dB (dBm)	Eff(%) @P1dB	Gain (dB) @P1dB	P3dB (dBm)	Eff(%) @P3dB
30	48.92	46.21	21.40	50.99	59.37
50	49.03	45.76	22.64	51.22	59.06
100	49.49	45.10	20.93	51.82	58.06
200	50.92	49.24	23.24	53.00	60.50
300	50.98	56.37	22.49	52.03	60.73
400	49.79	55.72	21.00	50.65	57.61



HTN7G09P200H(B)

200W, 1.8 - 1000 MHz LDMOS Amplifier

Product datasheet

500	50.76	44.98	18.39	51.20	46.04
600	51.90	49.15	19.00	52.48	49.42
678	50.35	48.15	19.48	51.07	48.63

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ =1200mA, PW = 100us, DC= 10% test on WATECH Application Board

Absolute Maximum Ratings

Parameter	Range/Value	Unit
Drain voltage (V _{DSS})	-0.5 to +65	V
Gate voltage (V _{GS})	-5 to +10	V
Storage Temperature (T _{STG})	-55 to +150	°C
Junction Temperature (T _J)	-40 to +225	°C

Electrical Specification

DC Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Breakdown Voltage V _{(BR)DSS}	V _{gs} =0V, I _{ds} =108uA	65	-	-	V
Gate-Source Threshold Voltage V _{GS(th)}	V _{ds} =V _{gs} , I _{ds} =108uA	-	1.5	-	V
Drain Leakage Current I _{DSS}	V _{gs} =0V, V _{ds} =65V	-	-	10	uA
Gate Leakage Current I _{GSS}	V _{gs} =5V, V _{ds} =0V	-	-	1	uA

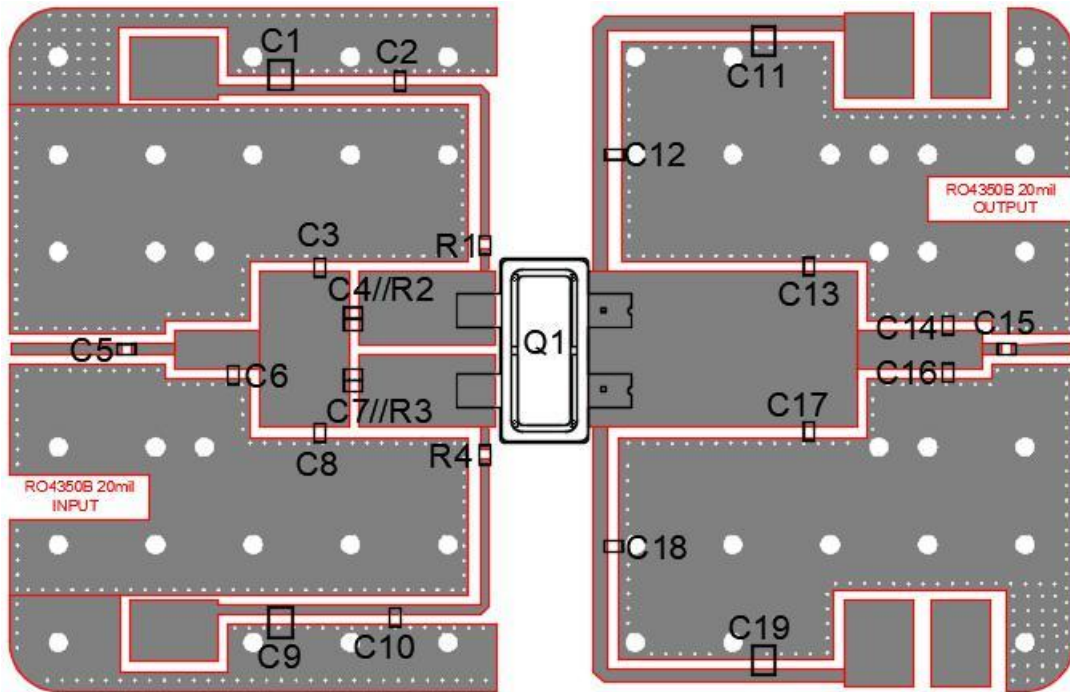
Load Mismatch Test

Condition	Test Result
VSWR=10:1 at all Phase Angles, V _{DD} = +28Vdc, I _{DQ} =600mA, P _{PEAK} = 200W, P _{AVG} =20W, PW = 100us, DC= 10%, freq@860MHz	No Device Degradation

Thermal Information

Parameter	Condition	Value (Typ)	Unit
Thermal Resistance Junction to Case (R _{TH})	T _{FLANGE} = 80°C, V _{DD} = +28Vdc, I _{DQ} =600mA, CW 200W , freq@860MHz	0.4	°C /W

HTN7G09P200H(B) 851 - 880 MHz Reference Design

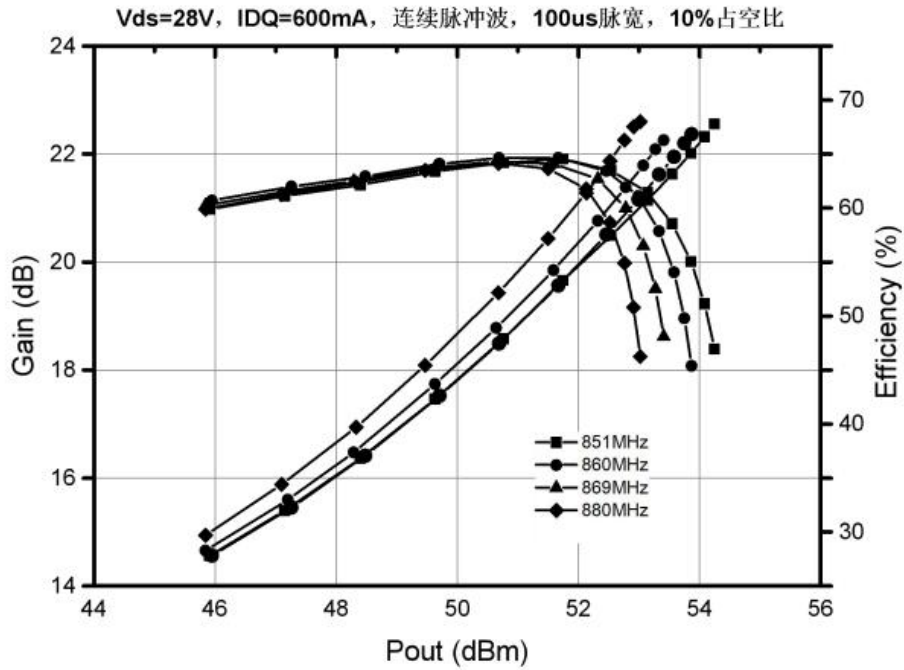


EVB Layout

Bill of Materials (BoM) - HTN7G09P200H(B) 851 - 880 MHz Reference Design

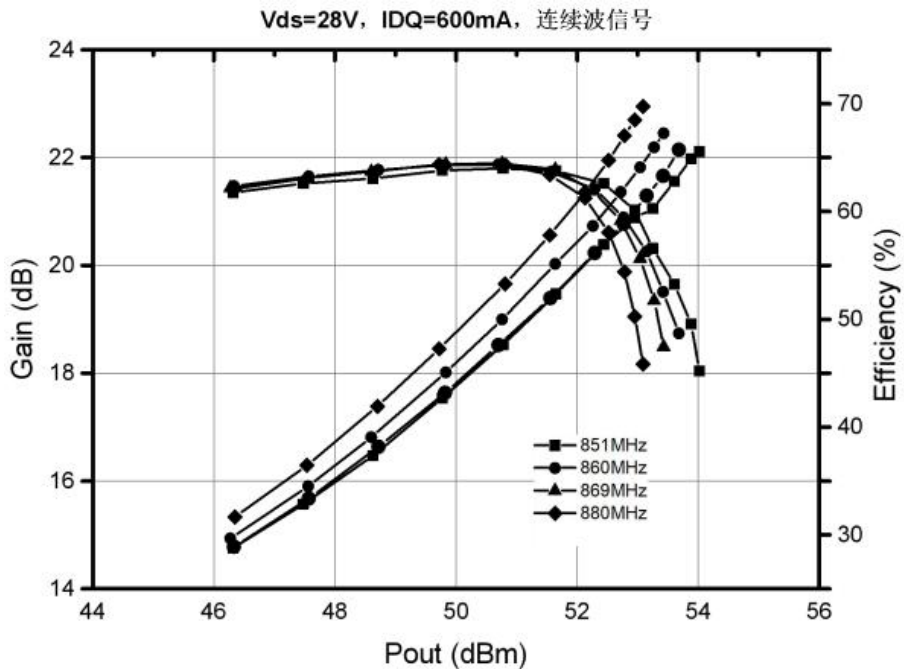
Reference	Value	Description	Manufacturer	P/N
Q1	-	200W, 1.8 - 1000 MHz LDMOS PA	Watech	HTN7G09P200H(B)
C14,C16	2pF	MLCC	Murata	GQM2195G2E2R0BB12
C6	2p7F	MLCC	Murata	GQM2195G2E2R7BB12
C3,C8	5p6F	MLCC	Murata	GQM2195G2E5R6BB12
C13,C17	7p5F	MLCC	Murata	GQM2195G2E7R5BB12
C2,C10,C12, C15,C18	24pF	MLCC	Murata	GQM2195C2E240JB12
C4,C5,C7	5p6F	MLCC	Murata	GQM2195C2E520JB12
C1,C9,C11,C19	4u7F	MLCC	Murata	GCM32DC72A475KE02L
R1, R2	10 Ω/0805	Thick Film Resistor	-	-
R1, R2	4.7 Ω/0805	Thick Film Resistor	-	-
PCB	RF35 (er = 3.5), 20 mil (0.508 mm), 35 μm (1oz)			

Performance Plots 851 - 880 MHz



Pulsed CW, Gain and Efficiency vs Pout

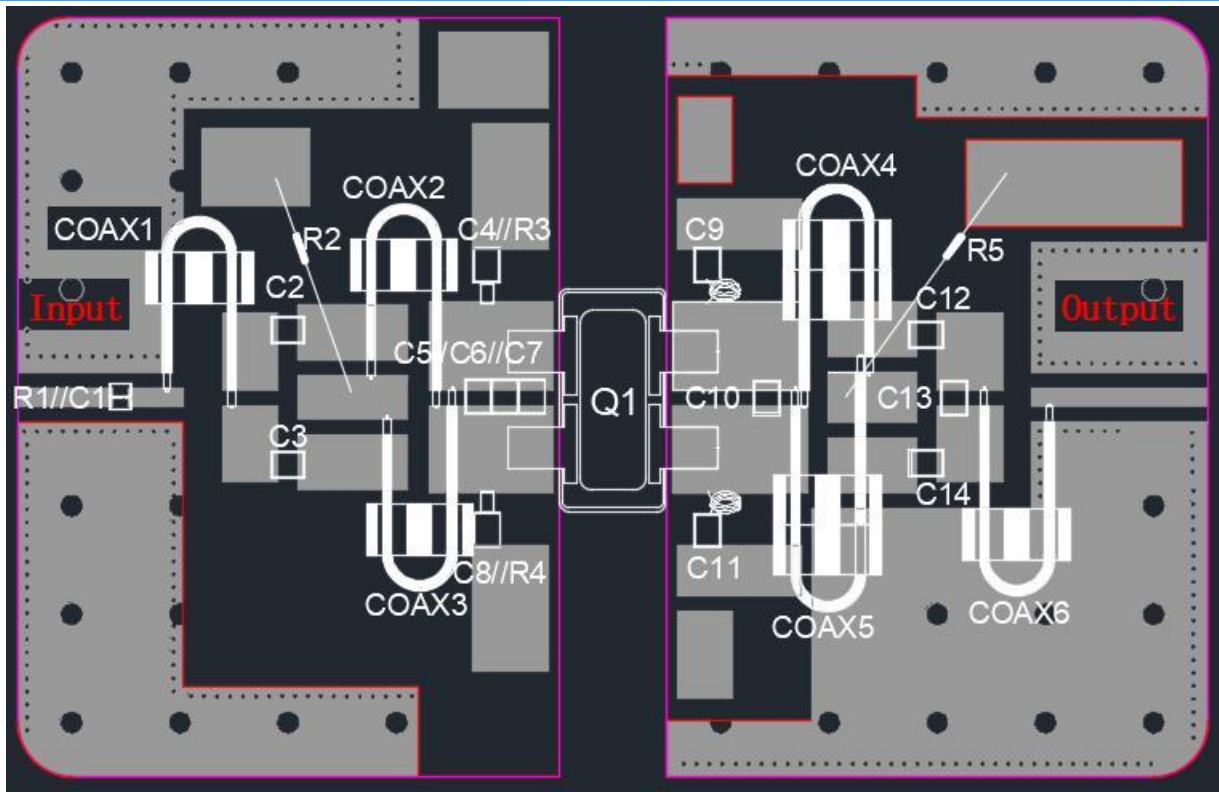
Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ= 600mA, PW = 100us, DC= 10% test on WATECH Application Board



CW, Gain and Efficiency vs Pout

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ= 600mA test on WATECH Application Board

HTN7G09P200H(B) 30 - 678 MHz Reference Design



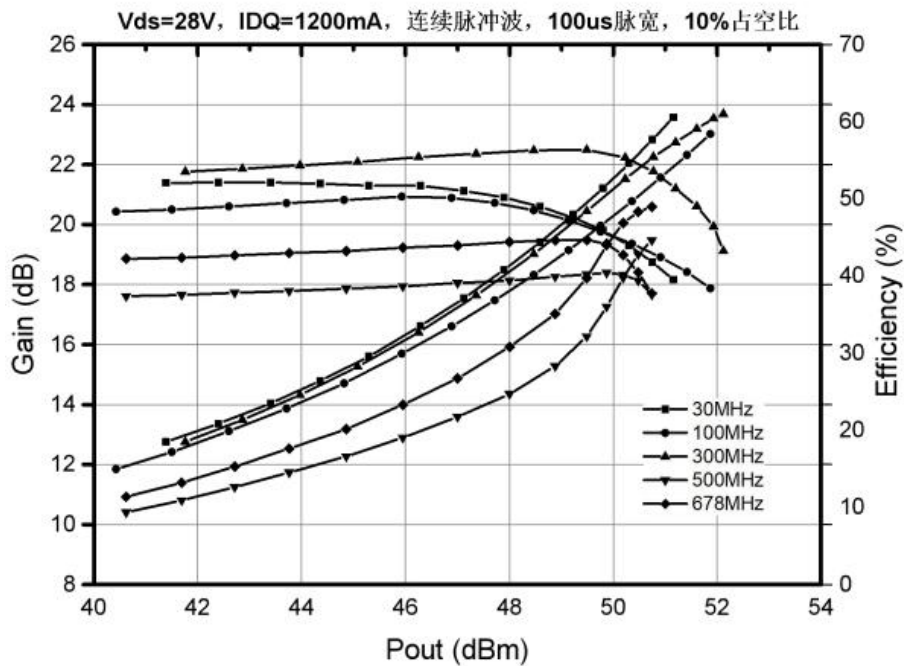
EVB Layout

Bill of Materials (BoM) - HTN7G09P200H(B) 30 - 678 MHz Reference Design

Reference	Value	Description	Manufacturer	P/N
Q1	-	200W, 1.8 - 1000 MHz LDMOS PA	Watech	HTN7G09P200H(B)
C1	100pF	MLCC	Murata	GQM2195C2E101JB12D
C2,C3	180pF	MLCC	Murata	GQM2195C2A181GB12D
C5	6p8F	MLCC	Murata	GQM2195G2E6R8BB12
C6	12pF	MLCC	Murata	GQM2195C2E120JB12
C7	15pF	MLCC	Murata	GQM2195C2E150JB12
C4,C8,C9,C11, C12,C14	1nF	MLCC	Murata	GRM3195C2A102JA01D
C10	18pF	MLCC	Murata	GQM2195C2E180JB12
C13	1p2F	MLCC	Murata	GQM2195G2E1R2BB12

Reference	Value	Description	Manufacturer	P/N
R1, R3, R4	51 Ω/0805	Thick Film Resistor	-	-
R2, R5	10 Ω/0805	Thick Film Resistor	-	-
Coax1	50 Ω SR Coax, 80 mm,2:1		-	-
Coax2,3	16.7 Ω SR Coax, 80 mm,2:1		-	-
Coax4, 5	16.7 Ω SR Coax, 80 mm,2:1		-	-
Coax6	50 Ω SR Coax, 80 mm,2:1		-	-
PCB	RF35 (er = 3.5), 20 mil (0.508 mm), 35 μm (1oz)			

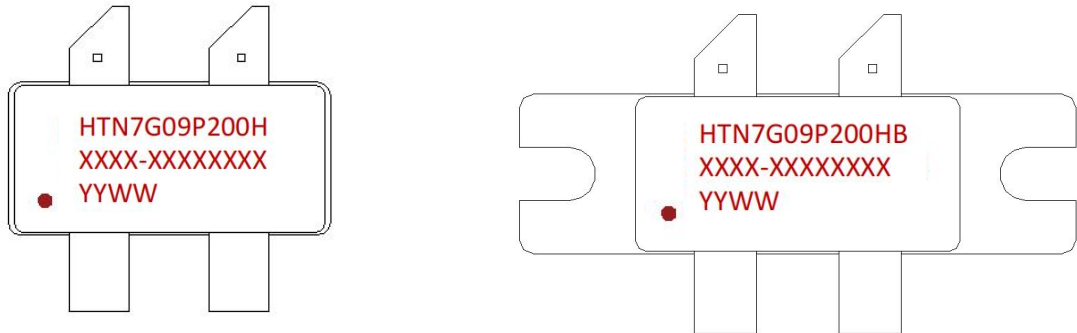
Performance Plots 30 - 678 MHz



Pulsed CW, Gain and Efficiency vs Pout

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ= 1200mA, PW = 100us, DC= 10% test on WATECH Application Board

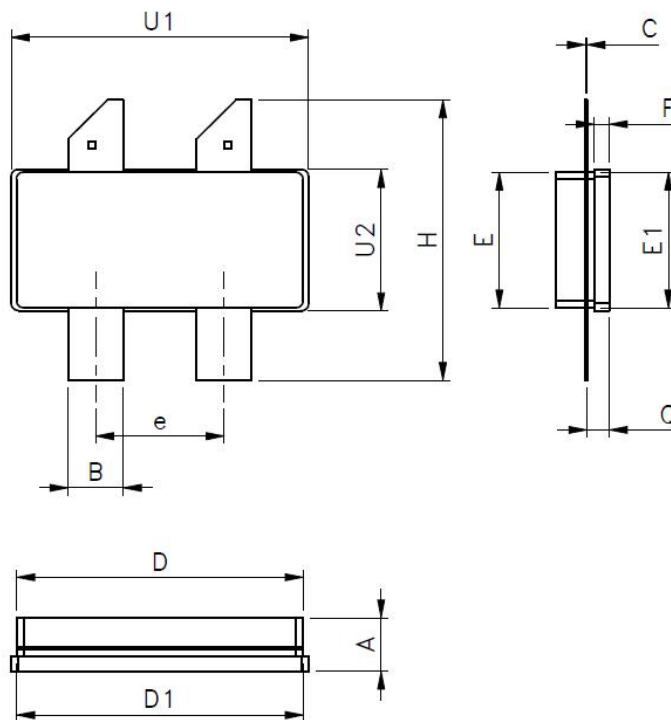
Package Marking and Dimensions



- Line1 (fixed): Device name in W/O
- Line2 (unfixed): Marking Lot No in W/O (Sample: E596-EERA0001)
- Line3 (unfixed): 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

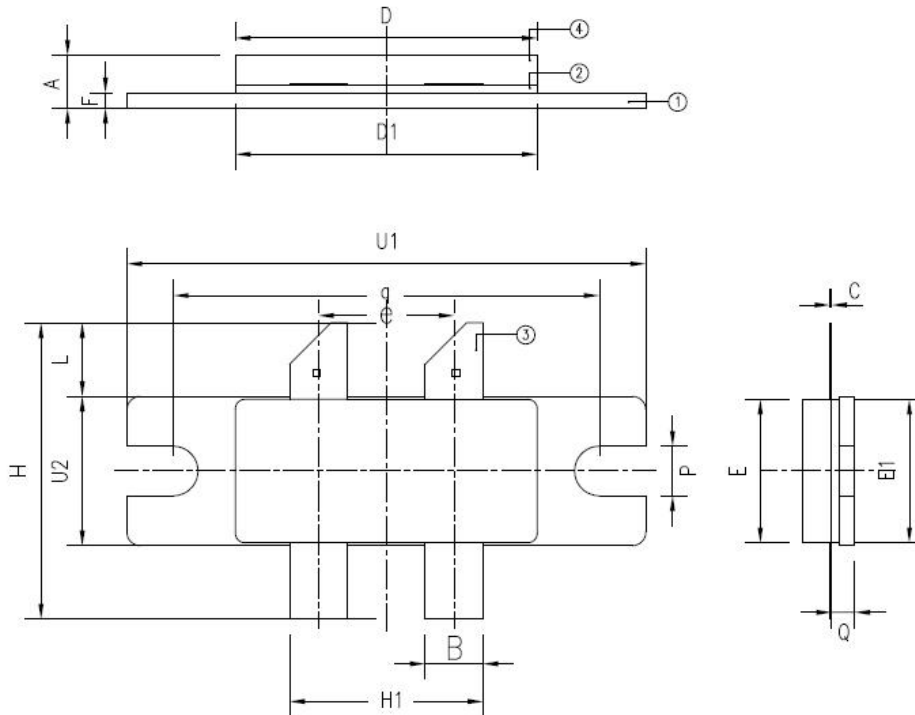


Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Mon.	Max.	Min.	Mon.	Max.
A	3.12	3.69	4.26	0.123	0.145	0.168

B	3.69	3.81	3.93	0.145	0.150	0.155
C	-	0.11	-	-	0.004	-
D	19.61	19.81	20.01	0.772	0.780	0.788
D1	19.66	19.81	19.96	0.774	0.780	0.786
E	9.273	9.4	9.527	0.365	0.370	0.375
E1	9.28	9.4	9.52	0.365	0.370	0.375
F	0.95	1.02	1.09	0.037	0.040	0.043
H	19.38	19.43	19.48	0.763	0.765	0.767
Q	1.46	1.53	1.6	0.057	0.060	0.063
U1	20.51	20.58	20.65	0.807	0.810	0.813
U2	9.71	9.78	9.85	0.382	0.385	0.388
e	8.77	8.89	9.01	0.345	0.350	0.355

Package Dimensions

ACC2110S-4L Earless Flanged Ceramic Package; 4 leads



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Mon.	Max.	Min.	Mon.	Max.
A	3.55	3.71	3.86	0.140	0.146	0.152
B	3.68	3.81	3.94	0.145	0.150	0.155
C	0.04	0.11	0.18	0.002	0.004	0.007
D	19.61	19.81	20.01	0.772	0.780	0.788
D1	19.61	19.81	20.01	0.772	0.780	0.788

E	9.28	9.40	9.52	0.365	0.370	0.375
E1	9.28	9.40	9.52	0.365	0.370	0.375
F	0.95	1.02	1.09	0.037	0.040	0.043
H	18.93	19.43	19.93	0.745	0.765	0.785
H1	12.57	12.70	12.83	0.495	0.500	0.505
L	4.71	4.83	4.95	0.185	0.190	0.195
P	3.12	3.25	3.38	0.123	0.128	0.133
Q	1.43	1.53	1.63	0.056	0.060	0.064
q	-	27.94	-	-	1.10	-
U1	33.91	34.04	34.16	1.335	1.340	1.345
U2	9.71	9.78	9.85	0.382	0.385	0.388
e	-	8.89	-	-	0.35	-

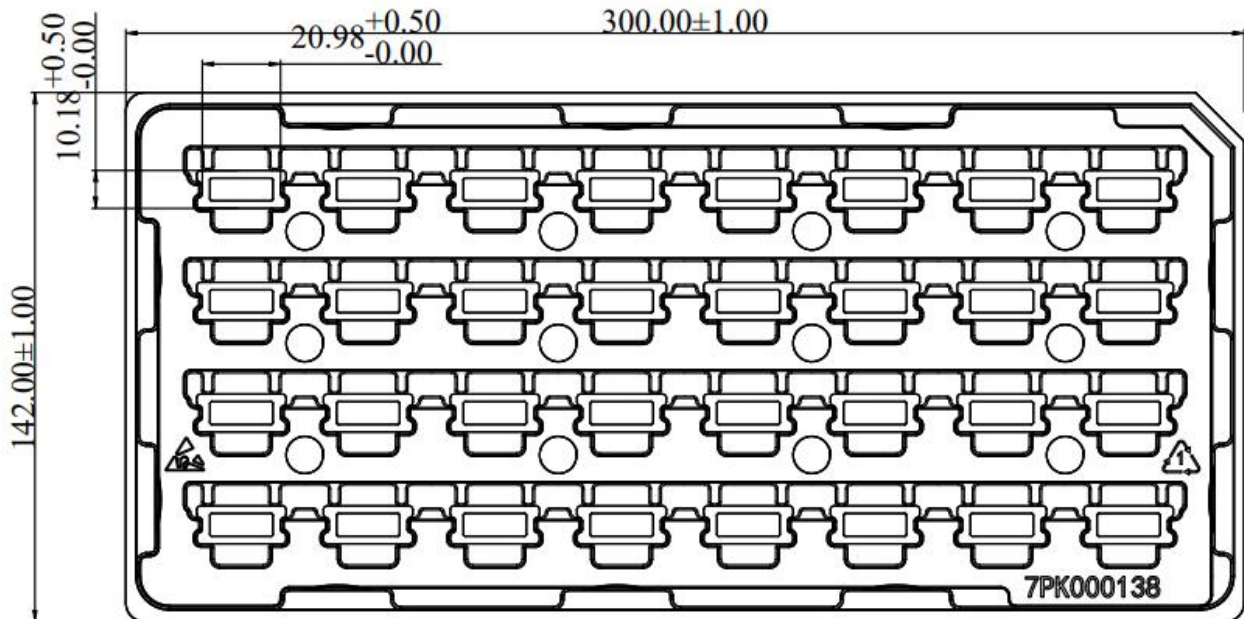
Package Dimensions

ACC2110B-4L Flanged Ceramic Package; 2 mounting holes; 4 leads

Packing Information

HTN7G09P200H:

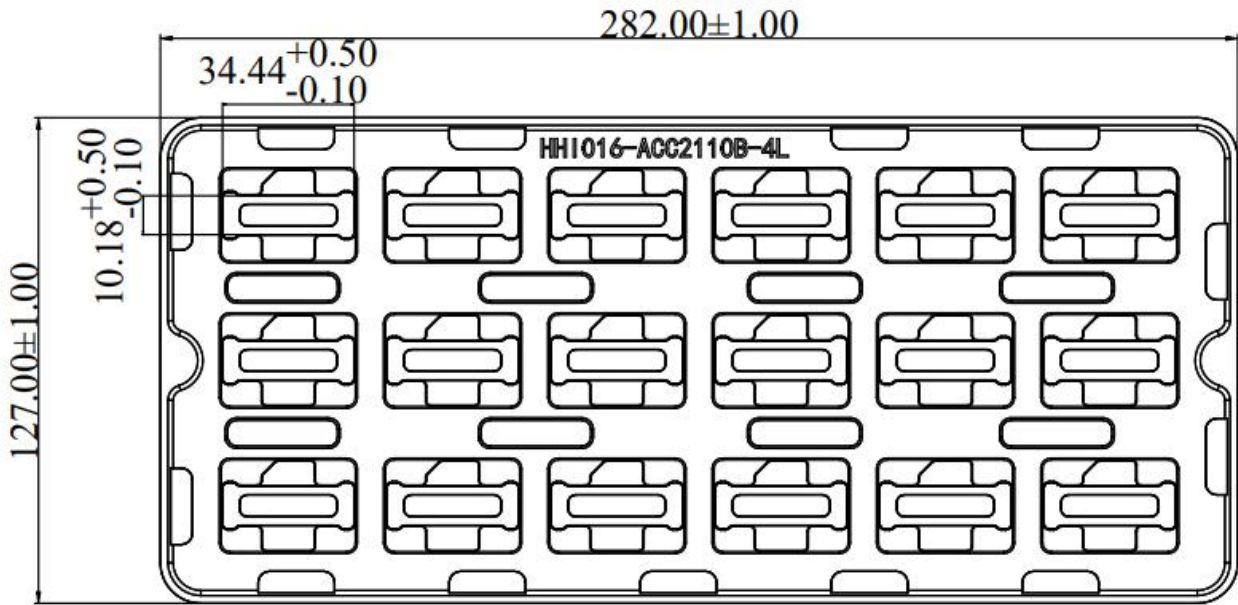
Package Type	Qty/Tray(pcs)	Qty/Box(pcs)	Qty/Carton(pcs)
ACC2110S-4L	32	160	960



Tray Packaging Descriptions

HTN7G09P200HB:

Package Type	Qty/Tray(pcs)	Qty/Box(pcs)	Qty/Carton(pcs)
ACC2110B-4L	18	90	540



Tray 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	Preliminary	Spet. 2021	Initial Version
Rev 1.1	Product	Oct. 2021	Package Update
Rev 1.2	Product	March 2023	New format based on English version datasheet
Rev 2.0	Product	Oct.2023	Update TBD information
Rev 2.1	Product	March 2024	Version released after re review



HTN7G09P200H(B) 200W, 1.8 - 1000 MHz LDMOS Amplifier

Product datasheet

Contact Information

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

- Web: www.watechelectronics.com
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