HTH8G02P550H(B)

550W, 1.8 - 200 MHz LDMOS Amplifier

Product datasheet

Description

The HTH8G02P550H(B) is an unmatched discrete LDMOS Power Amplifier with 550W saturated output power covering frequency range from 1.8 - 200 MHz.

Features

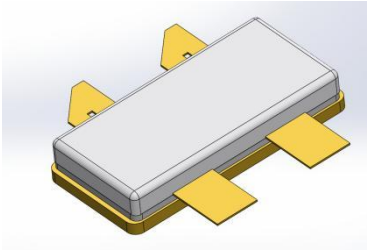
- Operating Frequency Range: 1.8 - 200 MHz
- Operating Drain Voltage: 28-50V
- Saturation Output Power: 550W
- Internally Unmatched device
- Excellent thermal stability due to low thermal resistance package
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design

Applications

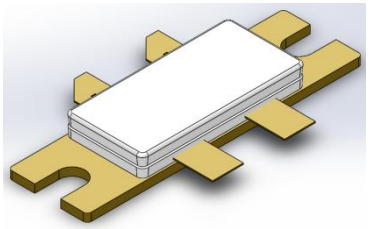
- HF VHF band High Power Amplifier
- Broadcasting transmitter
- Industrial Scientific Medical (ISM)
  - Laser generation
  - Plasma generation
  - Particle accelerators
  - MRI, RF ablation and skin treatment
  - Industrial heating, welding and drying systems

Ordering Information

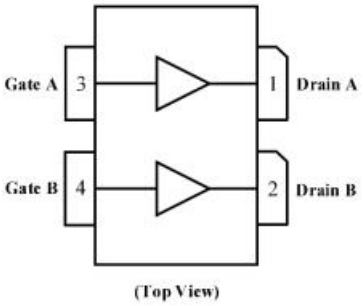
Part Number	Description
HTH8G02P550H(B)	Tray Package
HTH8G02P550H(B)EVB	100 MHz EVB



ACC2110S-4L
Earless Flanged
Air Cavity Ceramic Package; 4 Leads
HTH8G02P550H



ACC2110B-4L
Flanged balanced
Air Cavity Ceramic Package; 4 Leads,
2 Mounting holes
HTH8G02P550HB



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

Pin Connections

Typical Performance

RF Characteristics (CW)

Freq (MHz)	P3dB (dBm)	P3dB (W)	Gain (dB)	Eff(%)@P3dB
100	57.54	558	25.28	70

Test conditions unless otherwise noted: 25 °C, VDD = +50Vdc, IDQ =300mA test on WATECH Application Board

RF Characteristics (Pulsed-CW)

Freq (MHz)	P3dB (dBm)	P3dB (W)	Gain (dB)	Eff(%)@P3dB
100	57.82	580	25.32	75

Test conditions unless otherwise noted: 25 °C, VDD = +50Vdc, IDQ =300mA, PW = 100us, DC= 10% test on WATECH Application Board

Absolute Maximum Ratings

Parameter	Range/Value	Unit
Drain voltage (V_{DSS})	-0.5 to +135	V
Gate voltage (V_{GS})	-5 to +10	V
Operating Voltage (V_{DS})	0 to +50	
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 $V_{(BR)DSS}$	Vgs=0V, Ids=380uA	-	135	-	V
Gate-Source Threshold Voltage $V_{GS(th)}$	Vds=10V, Ids=380uA	1.5	2.25	2.9	V
Drain Leakage Current I_{DSS}	Vgs=0V, Vds=50V	-	1	10	uA
Gate Leakage Current I_{GSS}	Vgs=5V, Vds=0V	-	0.1	1	uA

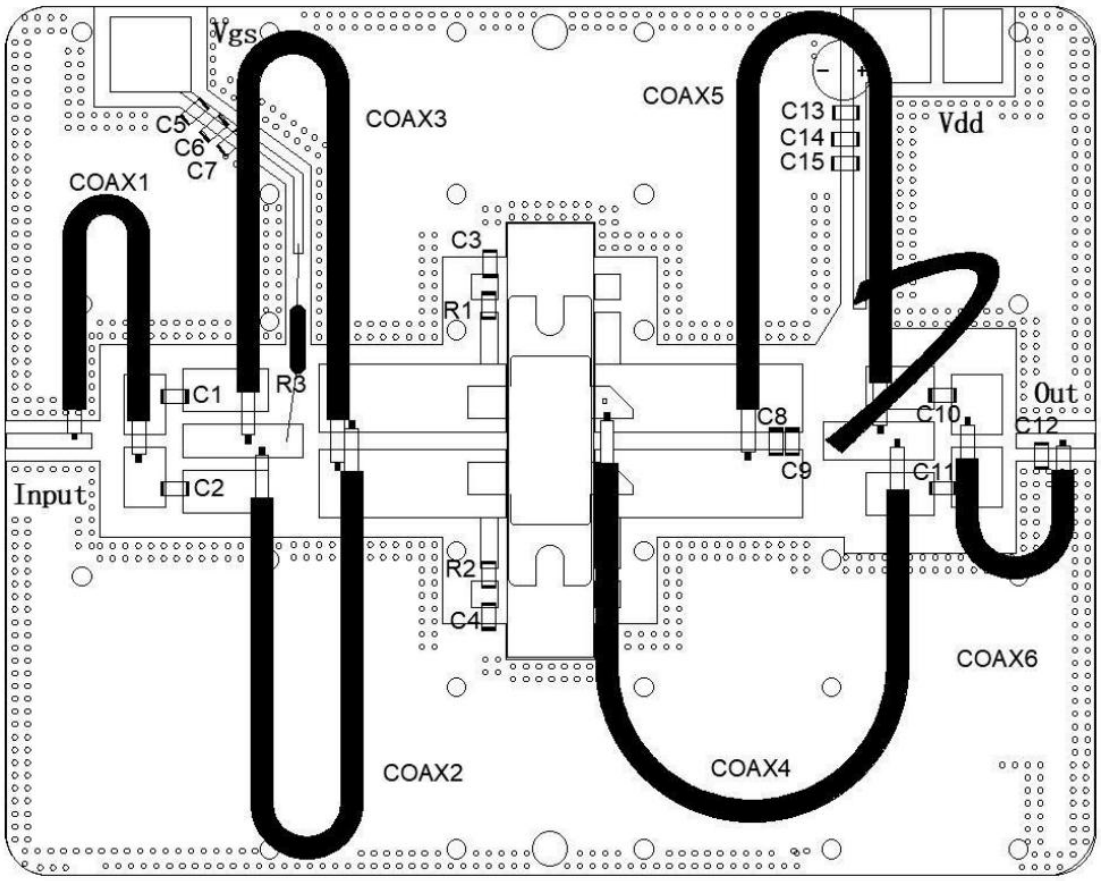
Load Mismatch Test

Condition	Test Result
VSWR=65:1 at all Phase Angles, V_{DD} = +50Vdc, I_{DQ}=300mA, Pout = 550W, PW = 200us, DC= 20%, freq@100 MHz	No Device Degradation

Thermal Information

Parameter	Condition	Value (Typ)	Unit
Thermal Resistance Junction to Case (R_{TH})	T_{FLANGE}= 45°C, V_{DD} = +50Vdc, I_{DQ}=300mA, CW, P_{AVG}= 57.4 dBm (550W), freq@100 MHz	0.12	°C /W

HTH8G02P550H(B) 100 MHz Reference Design



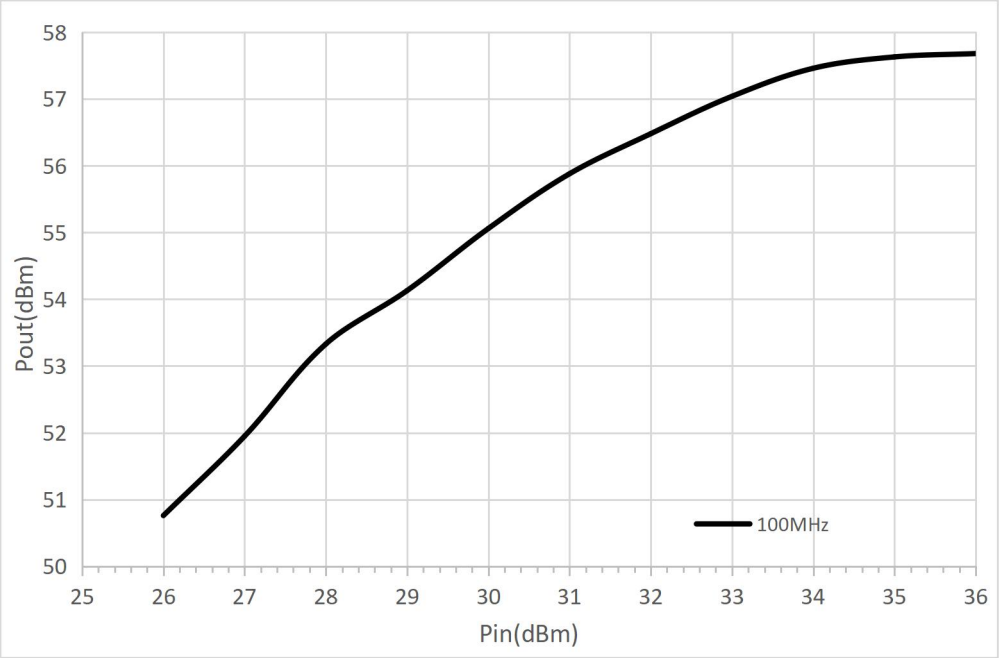
EVB Layout

Bill of Materials (BoM) - HTH8G02P550H(B) 100 MHz Reference Design

Reference	Value	Description	Manufacturer	P/N
Q1	-	550W, 1.8 - 200 MHz LDMOS PA	Watech	HTH8G02P550H(B)
C5,C13	4u7F	MLCC	Murata	GRM31CR71H475KA12L
C1,C2,C10,C11	300pF	MLCC	ATC	ATC100B301JT
C8	10pF	MLCC	ATC	ATC100B100JT

C9,C12	4p7F	MLCC	ATC	ATC100B4R7JT
C3,C4,C6,C14	1nF	MLCC	Murata	GR321AD72E102KW01D
C7,C15	100pF	MLCC	Murata	GRM1885C1H101JA01
R3	820Ω	Wire Resistor	-	-
Coax 2,3	16.7Ω 4:1,110 mm		-	-
Coax 4,5	16.7Ω 4:1, 100 mm		-	-
Coax 1	50Ω 2:1,100 mm		-	-
Coax 6	50Ω 2:1, 40mm		-	-
PCB	RF35 (er = 3.5), 30 mil (0.762 mm), 35 µm (1oz)			

Performance Plots

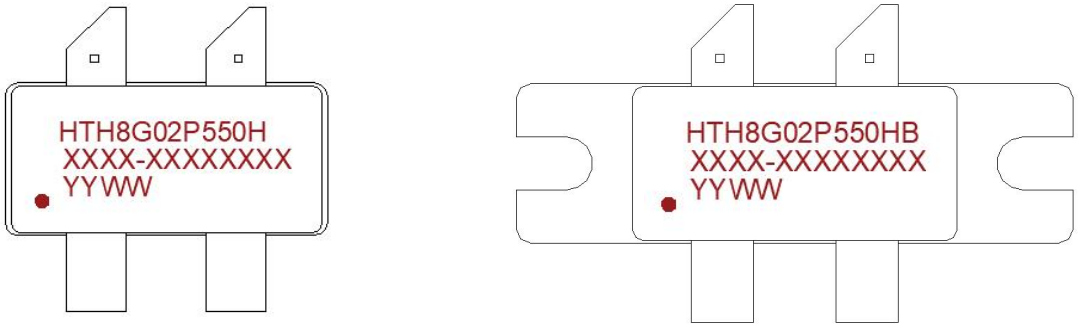


Pulsed CW, Pout vs Pin

Pulsed CW, Gain and Efficiency vs Pout

Test conditions unless otherwise noted: 25 °C, VDD = +50dc, IDQ= 300mA, PW = 100us, DC= 10% test on WATECH Application Board

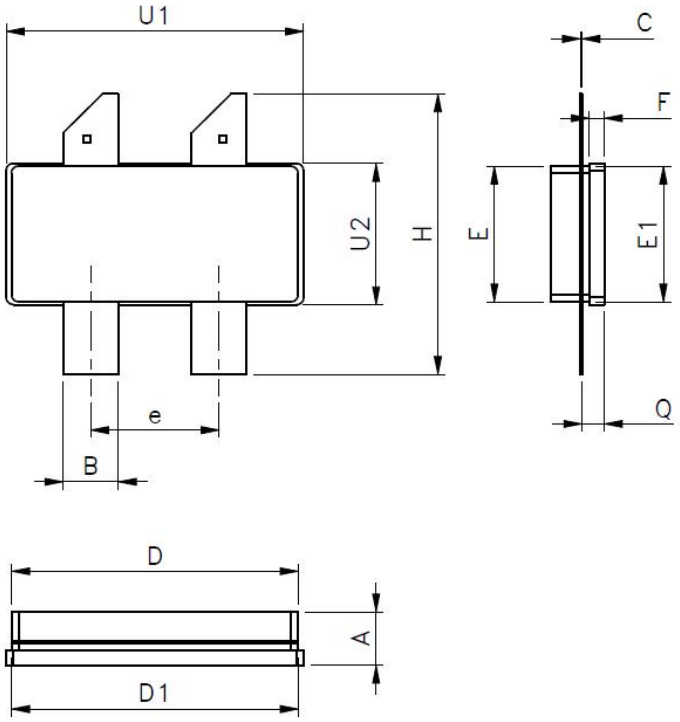
Package Marking and Dimensions



- 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”

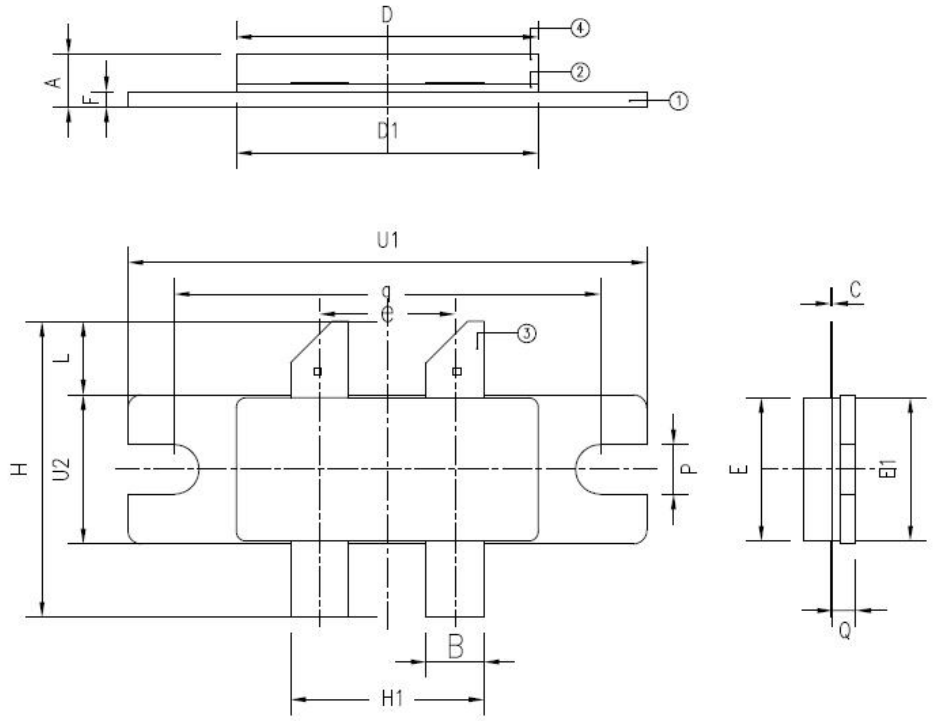
Marking



Symbol	Dimesions in Milimeters			Dimesions 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	Dimesions in Milimeters			Dimesions 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	-

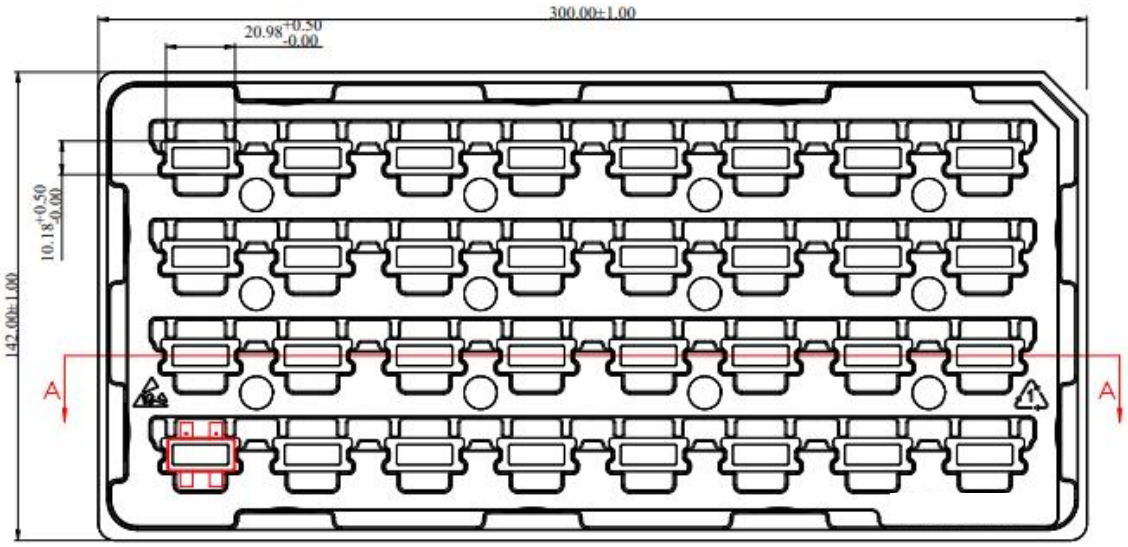
Package Dimensions

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

Packing Information

HTH8G02P550H：

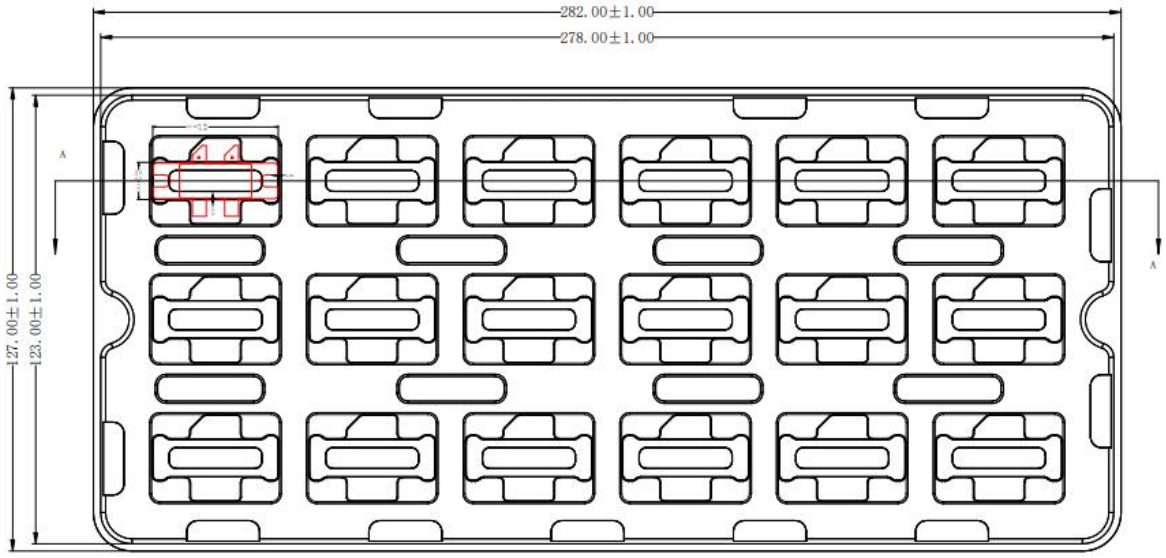
Package Type	Qty/Tray(pcs)	Qty/Box(pcs)
ACC2110S-4L	32	160



HTH8G02P550H Packaging Descriptions

HTH8G02P550HB：

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



HTH8G02P550HB 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	Dec. 2021	Preliminary
Rev 1.1	Objective	March 2023	New format based on English version datasheet
Rev 2.0	Product	Sept.2023	Update TBD information
Rev 2.1	Product	Aug.2024	Update package information

Contact Information

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