

Description

The HTH8G07P400H(B) is an unmatched discrete LDMOS Power Amplifier with 400W saturated output power covering frequency range from 1.8 - 700 MHz.

Features

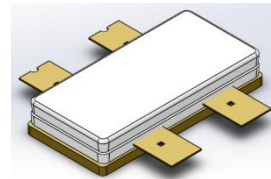
- Operating Frequency Range: 1.8 - 700 MHz
- Operating Drain Voltage: +50V
- Saturation Output Power: 400W
- Internally Unmatched device
- Excellent thermal stability due to low thermal resistance package
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design

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
HTH8G07P400H(B)	Tray Package
HTH8G07P400H(B)EVB	470 -700 MHz EVB

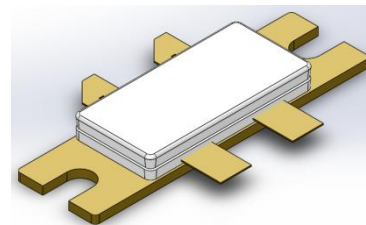


ACC2110S-4L

Earless Flanged balanced

Air Cavity Ceramic Package; 4 Leads

HTH8G07P400H

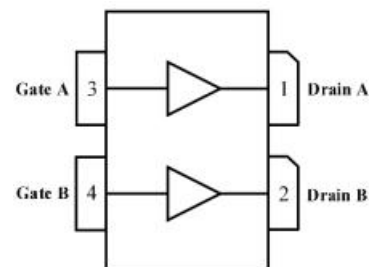


ACC2110B-4L

Flanged balanced

Air Cavity Ceramic Package; 4 Leads,
2 Mounting holes

HTH8G07P400HB



(Top View)

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

Pin Connections



HTH8G07P400H(B)

400W, 1.8 - 700 MHz LDMOS Amplifier

Product datasheet

Typical Performance

RF Characteristics (Pulsed-CW)

Freq (MHz)	Gain(dB)	P1dB (dBm)	Eff(%) @P1dB	P3dB (dBm)	Eff(%) @P3dB
470	21.99	55.74	58.16	56.51	60.43
500	22.12	55.44	59.21	56.29	62.22
550	22.77	55.66	56.96	56.48	59.31
600	21.78	56.11	56.88	56.77	58.71
650	21.01	55.76	57.69	56.44	58.96
700	21.69	55.88	56.87	56.49	57.64

Test conditions unless otherwise noted: 25 °C, VDD = +48Vdc, IDQ =600mA, PW = 100us, DC= 10% test on WATECH Application Board

RF Characteristics (Pulsed-CW)

Freq (MHz)	Gain(dB)	P5dB (dBm)	Eff(%) @P5dB	PBO Gain (48.5 dBm)	PBO Eff(%) @48.5dBm
350	26.72	56.00	62.87	26.63	56.57
360	27.71	55.63	63.32	27.71	61.96
370	27.52	55.35	62.94	27.24	64.77

Test conditions unless otherwise noted: 25 °C, VDD = +48Vdc, IDQ-carry =500mA, Vgs-peak=1.8V, PW = 100us, DC= 10% test on WATECH Application Board

Absolute Maximum Ratings

Parameter	Range/Value	Unit
Drain voltage (V _{DSS})	-0.5 to +110	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 $V_{(BR)DSS}$	$V_{gs}=0V, I_{ds}=180\mu A$	110	-	-	V
Gate-Source Threshold Voltage $V_{GS(th)}$	$V_{ds}=10V, I_{ds}=180\mu A$	-	2.2	-	V
Drain Leakage Current I_{DSS}	$V_{gs}=0V, V_{ds}=110V$	-	-	10	μA
Gate Leakage Current I_{GSS}	$V_{gs}=10V, V_{ds}=0V$	-	-	1	μA

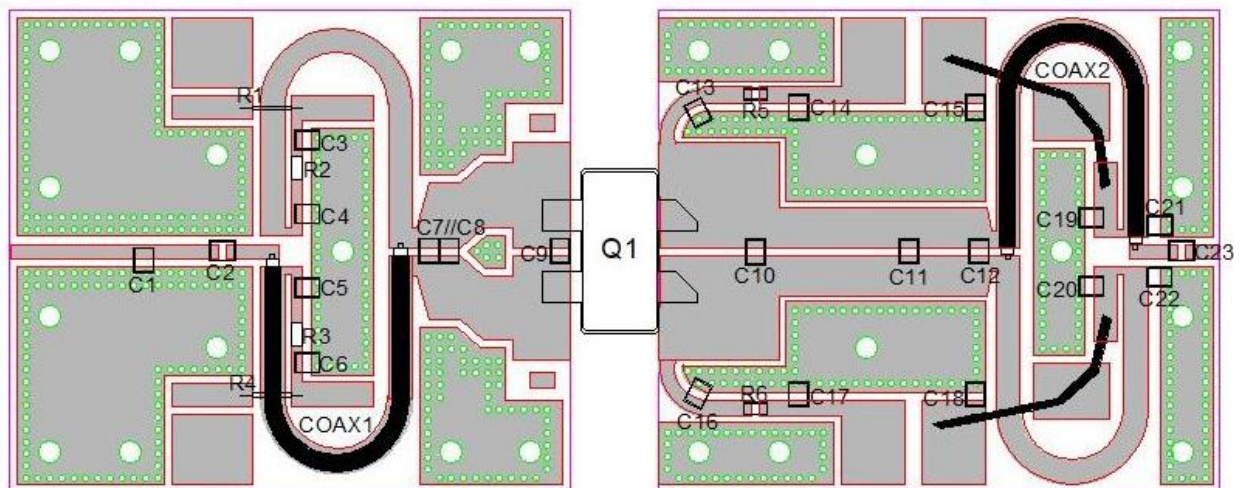
Load Mismatch Test

Condition	Test Result
$V_{DD}=48V, I_{DQ}=500mA, V_{gs-peak}=1.8V, Freq=360MHz, P_{avg}=70W, W-CDMA$ VSWR 10:1	No Device Degradation

Thermal Information

Parameter	Condition	Value (Typ)	Unit
Thermal Resistance Junction to Case (R_{TH})	$V_{DD}=48V, I_{DQ-carry}=500mA,$ $V_{gs-peak}=1.8V, T_{case}=25^{\circ}C, P_{avg}=70W,$ LTE 20MHz	0.6	$^{\circ}C/W$

HTH8G07P400H(B) 470 - 700 MHz Reference Design



EVB Layout



HTH8G07P400H(B)

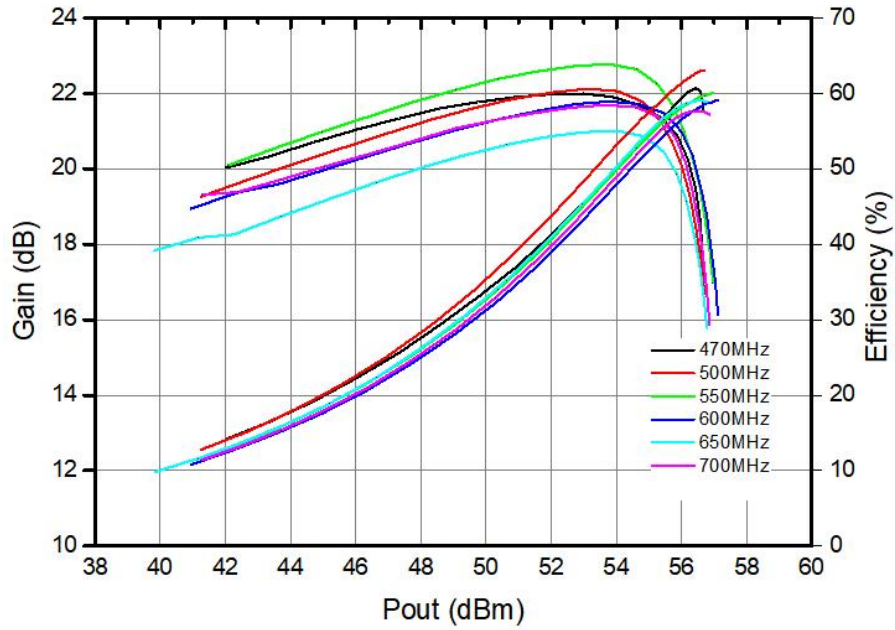
400W, 1.8 - 700 MHz LDMOS Amplifier

Product datasheet

Bill of Materials (BoM) - HTH8G07P400H(B) 470 - 700 MHz Reference Design

Reference	Value	Description	Manufacturer	P/N
Q1	-	400W, 1.8 - 700 MHz LDMOS PA	Watech	HTH8G07P400H(B)
R1, R4	100 Ohm	100 Ohm	Wire resistor	
R2,R3	5.6 Ohm	5.6 Ohm	YAGEL	RC1210JR-075R6L
R5,R6	10 Ohm	10 Ohm	YAGEL	SR0805FR-4710RL
C1	4.7pF	4.7pF Chip Capacitors	ATC	ATC100B4R7CT
C2	39pF	39pF Chip Capacitors	ATC	ATC100B390JT
C3,C6,C21,C22	4.7uF	4.7uF Chip Capacitors	Murata	GCM32DC72A475KE02L
C7	10pF	10pF Chip Capacitors	ATC	ATC100B100JT
C8	12pF	12pF Chip Capacitor	ATC	ATC100B120JT
C9	20pF	20pF Chip Capacitor	ATC	ATC100B200JT
C10	24pF	24pF Chip Capacitors	ATC	ATC100B240JT
C11	16pF	16pF Chip Capacitors	ATC	ATC100B160JT
C12	6.8pF	6.8pF Chip Capacitors	ATC	ATC100B6R8CT
C4,C5,C13,C15, C16,C18,C19,C 20,C23	100pF	100pF Chip Capacitors	ATC	ATC800B100JT
C14,C17	10uF	10uF Chip Capacitors	Murata	GCM32EL8EH106KA07L
COAX1		250Ohm Coax, 60 mm 2:1	Arbitrary	Arbitrary
COAX2		250Ohm Coax, 75 mm 2:1	Arbitrary	Arbitrary
PCB	Rogers4350B(er=3.5),30mil,35 μm (1oz)			

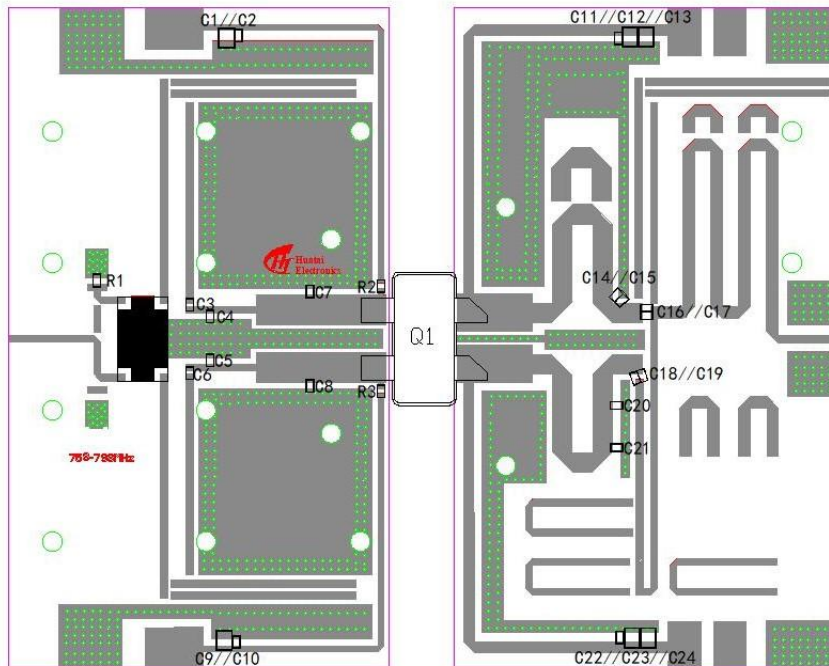
Performance Plots



Pulsed CW, Gain and Efficiency vs Pout

Test conditions unless otherwise noted: 25 °C, VDD = +48Vdc, IDQ= 600mA, PW = 100us, DC= 10% test on WATECH Application Board

HTH8G07P400H(B) 350 - 370 MHz Reference Design

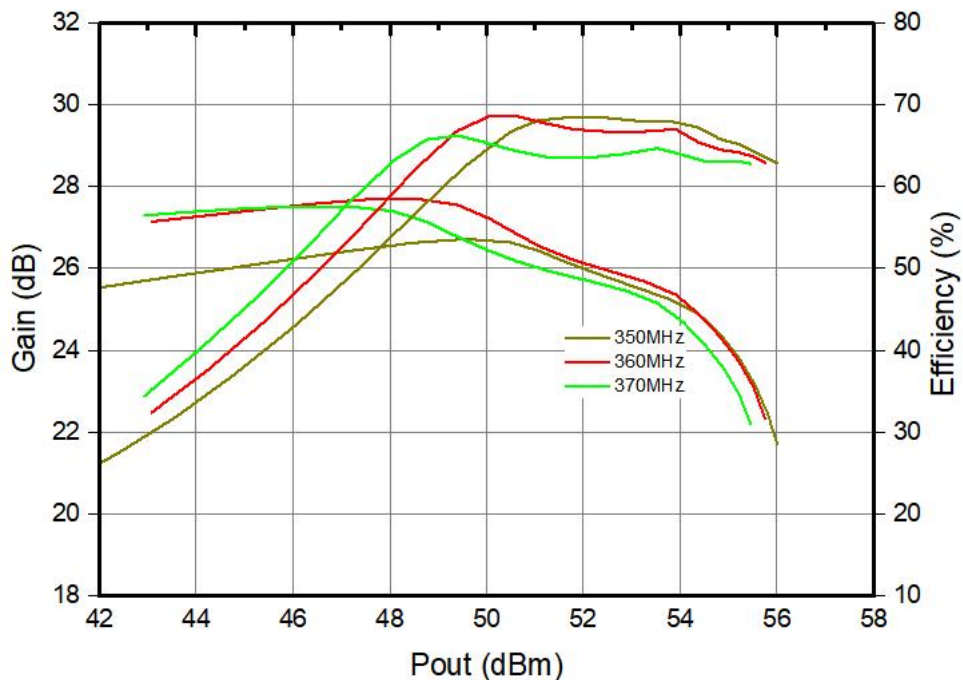


EVB Layout

Bill of Materials (BoM) - HTH8G07P400H(B) 350 - 370 MHz Reference Design

Reference	Value	Description	Manufacturer	P/N
Q1	-	400W, 1.8 - 700 MHz LDMOS PA	Watech	HTH8G07P400H(B)
R1,R2,R3	100 Ohm	50 Ohm	KOA Speer	RN732BTDD50R0B25
C1,C9,C12,C13,C23,C24	5.6 Ohm	4.7uF Chip Capacitors	Murata	GCM32DC72A475KE02L
C2,C3,C6,C10,C11,C16,C17,C18,C19,C22	10 Ohm	100pF Chip Capacitors	Murata	GQM2195C2E101JB12D
C4,C5	4.7pF	36pF Chip Capacitors	Murata	GQM2195C2E360JB12
C7,C8	39pF	43pF Chip Capacitors	Murata	GQM2195C2E430JB12
C14,C20	4.7uF	24pF Chip Capacitors	Murata	GQM2195C2E240JB12
C15	10pF	20pF Chip Capacitors	Murata	GQM2195C2E200JB12
C21	12pF	11pF Chip Capacitors	Murata	GQM2195C2E110JB12
PCB	Rogers4350B(er=3.5),20mil,35 μm (1oz)			

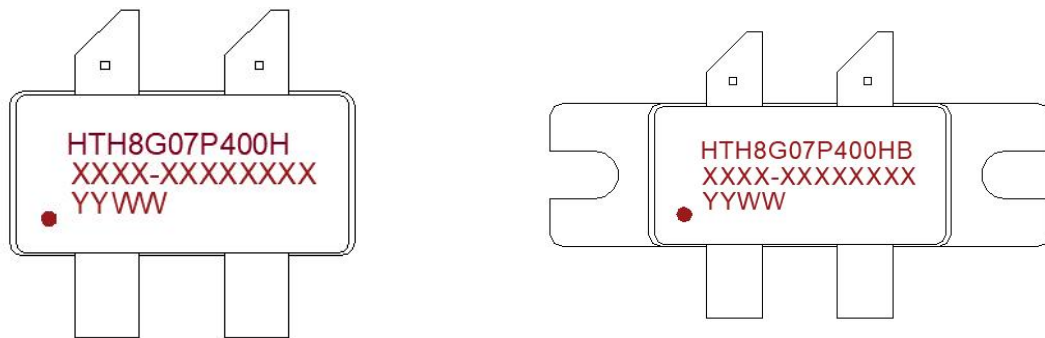
Performance Plots



Pulsed CW, Gain and Efficiency vs Pout

Test conditions unless otherwise noted: 25 °C, VDD = +48Vdc, IDQ-carry =500mA, Vgs-peak=1.8V, PW = 100us, DC= 10% test on WATECH Application Board

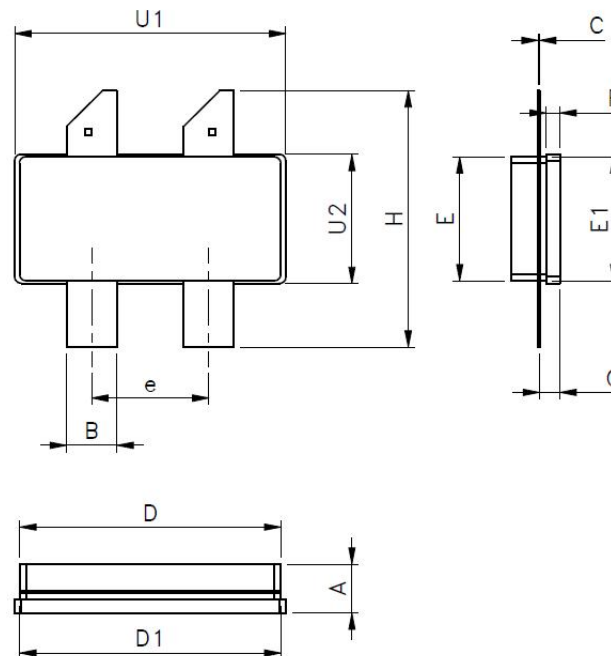
Package Marking and Dimensions



- 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

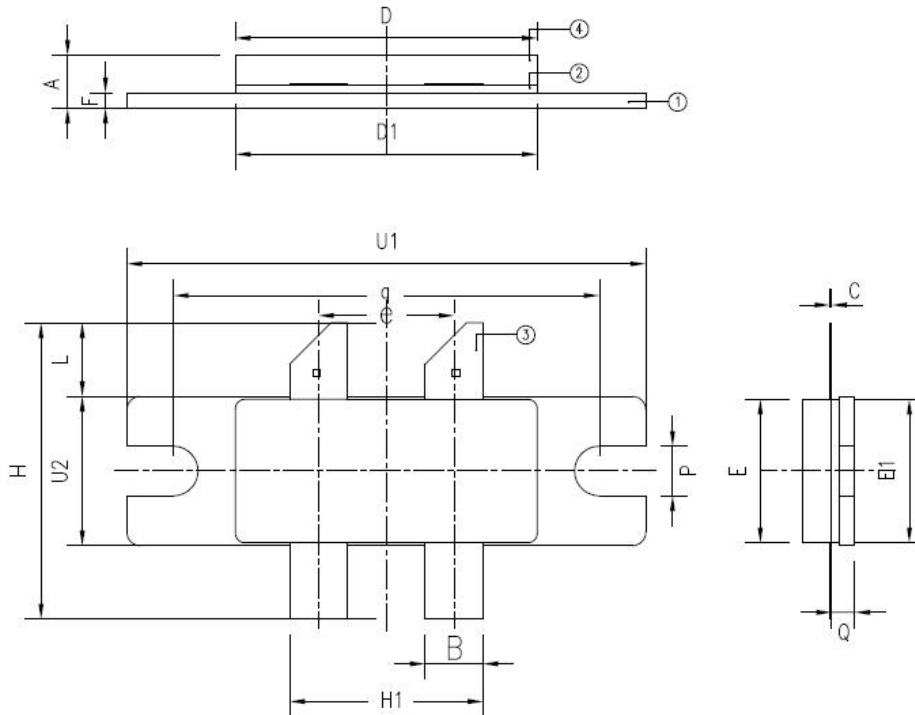


Symbol	Dimesions in Millimeters			Dimesions in Inches		
	Min.	Mon.	Max.	Min.	Mon.	Max.
A	3.12	3.69	4.26	0.123	0.145	0.168

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	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	-

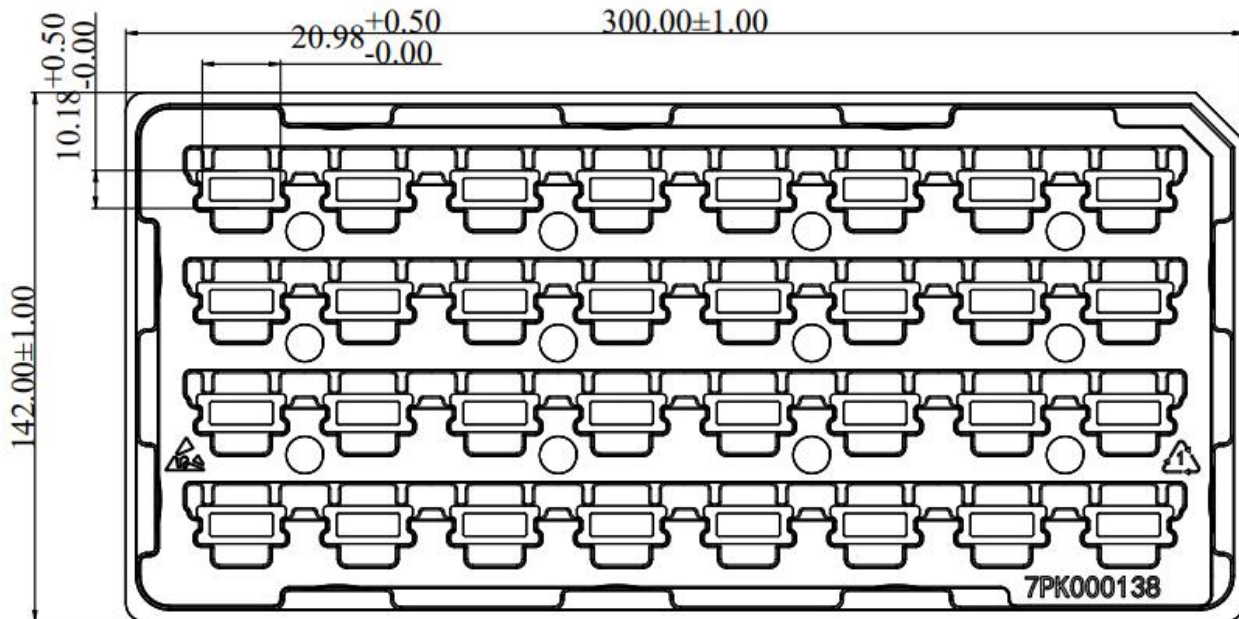
Package Dimensions

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

Packing Information

HTH8G07P400H:

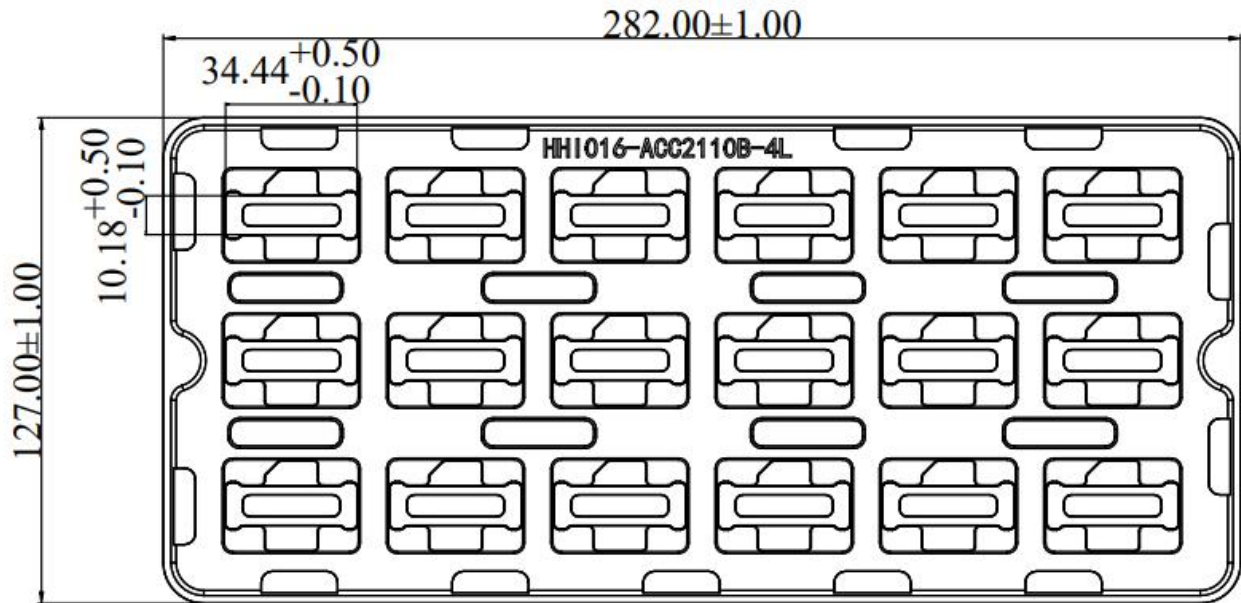
Package Type	Qty/Tray(pcs)	Qty/Box(pcs)	Qty/Carton(pcs)
ACC2110S-4L	32	160	960



Tray Packaging Descriptions

HTH8G07P400HB:

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	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	Dece.2023	Update frequency information
Rev 2.2	Product	March 2024	Version released after re review



HTH8G07P400H(B) 400W, 1.8 - 700 MHz LDMOS Amplifier

Product datasheet

Contact Information

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

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