

Description

The HTH1D12P1K0H(B) is an unmatched discrete LDMOS Power Amplifier with 1000W saturated output power covering frequency range from 960 - 1215 MHz.

Features

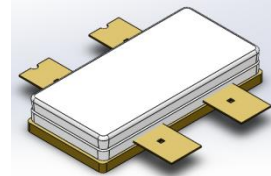
- Operating Frequency Range: 960 -1215MHz
- Operating Drain Voltage: 50V
- Saturation Output Power: 1000W
- Excellent thermal stability due to low thermal resistance package
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design

Applications

- Avionics applications in the frequency range of 960 MHz to 1215 MHz
- High efficiency and high power for pulse signal application

Ordering Information

Part Number	Description
HTH1D12P1K0H(B)	Tray Package
HTH1D12P1K0H(B) EVB	960-1215 MHz EVB

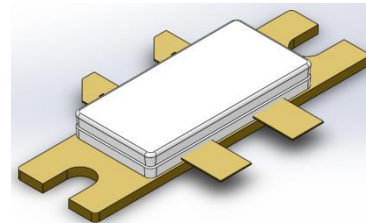


ACC2110S-4L

Earless Flanged Balanced

Air Cavity Ceramic Package; 4 Leads

HTH1D12P1K0H



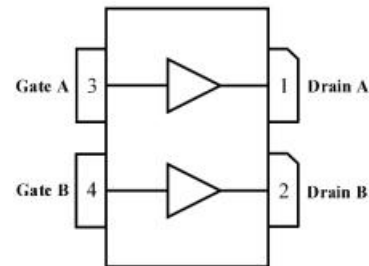
ACC2110B-4L

Flanged Balanced

Air Cavity Ceramic Package; 4 Leads,

2 Mounting holes

HTH1D12P1K0HB



(Top View)

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

Pin Connections

Typical Performance

RF Characteristics (Pulse)

Freq (MHz)	P1dB (dBm)	Eff (%)@P1dB	Gain (dB)	P3dB (dBm)	Eff(%)@P3dB
960	58.87	56.97	21.72	60.38	65.11
1130	58.75	57.05	21.05	60.00	62.75
1215	58.95	55.49	21.06	59.87	62.03

Test conditions unless otherwise noted: 25 °C, VDD = +50Vdc, IDQ = 100mA, Pulse Width = 100us, Duty Cycle= 10% test on WATECH Application Board

Absolute Maximum Ratings

Parameter	Range/Value	Unit
Drain voltage (V _{DSS})	0 to 150	V
Gate voltage (V _{GS})	-10 to 2	V
Storage Temperature (T _{STG})	-55 to 150	°C
Junction Temperature (T _J)	225	°C

Electrical Specification

DC Characteristics (Carrier)

Parameter	Conditions	Min	Typ	Max	Unit
Breakdown Voltage V _{(BR)DSS}	V _{gs} =-8V, I _{ds} =120mA	150	-	-	V
Gate-Source Threshold Voltage V _{GS(th)}	V _{ds} =10V, I _{ds} =120mA	-3.6	-2.8	-2.0	V
Drain Leakage Current I _{DSS}	V _{gs} =-10V, V _{ds} =50V	-	0.48	-	mA
Gate Leakage Current I _{GSS}	V _{gs} =-10V, V _{ds} =0V	-	36	-	uA

DC Characteristics (Peak)

Parameter	Conditions	Min	Typ	Max	Unit
Breakdown Voltage V _{(BR)DSS}	V _{gs} =-8V, I _{ds} =120mA	150	-	-	V
Gate-Source Threshold Voltage V _{GS(th)}	V _{ds} =10V, I _{ds} =120mA	-3.6	-2.8	-2.0	V
Drain Leakage Current I _{DSS}	V _{gs} =-10V, V _{ds} =50V	-	0.48	-	mA
Gate Leakage Current I _{GSS}	V _{gs} =-10V, V _{ds} =0V	-	36	-	uA

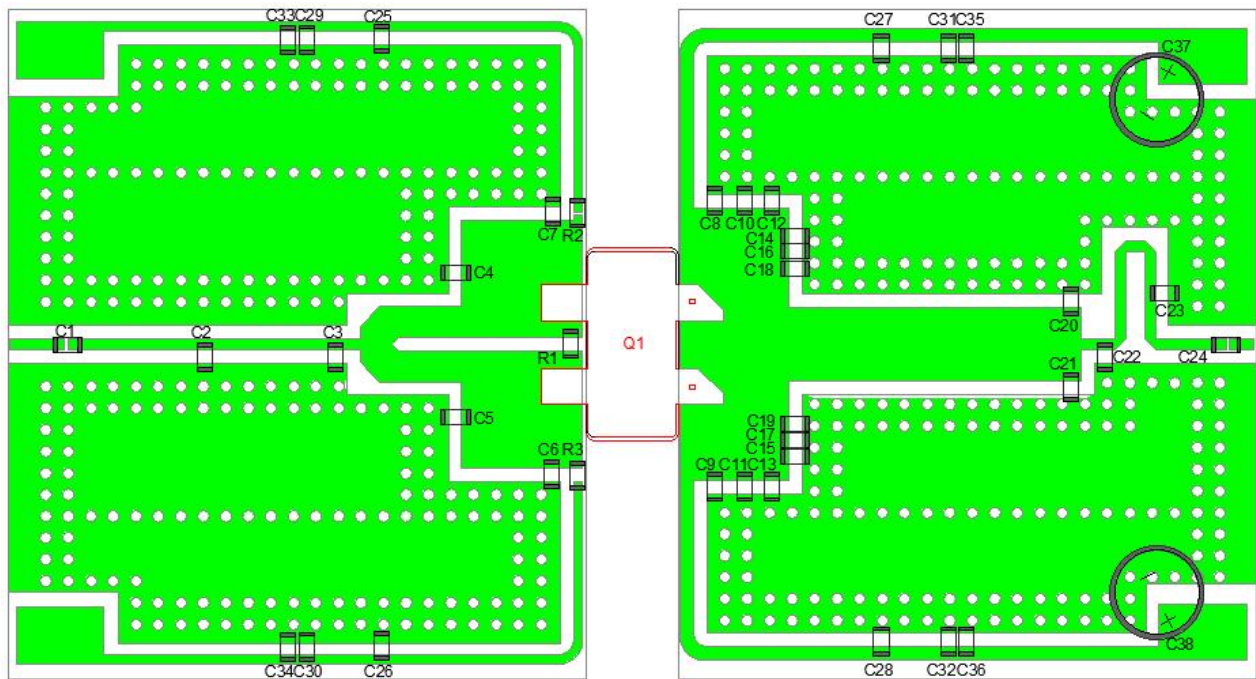
Load Mismatch Test

Condition	Test Result
VSWR=10:1, at all Phase Angles, $V_{DD} = +50Vdc$, $I_{DQ} = 100mA$, 10% Pulse PAVG = 1000W, Frequency 1215MHz test on WATECH Application Board	No Device Degradation

Thermal Information

Parameter	Condition	Value (Typ)	Unit
Thermal Resistance Junction to Case (R_{TH})	$T_{CASE} = 26.8^{\circ}C$, $V_{DD} = +50Vdc$, $I_{DQ} = 100mA$, PAVG = 59.7 dBm (933W), 10% pulse signal	0.31	$^{\circ}C / W$

HTH1D12P1K0H(B) 960 - 1215 MHz Reference Design



EVN Layout



HTH1D12P1K0H(B)

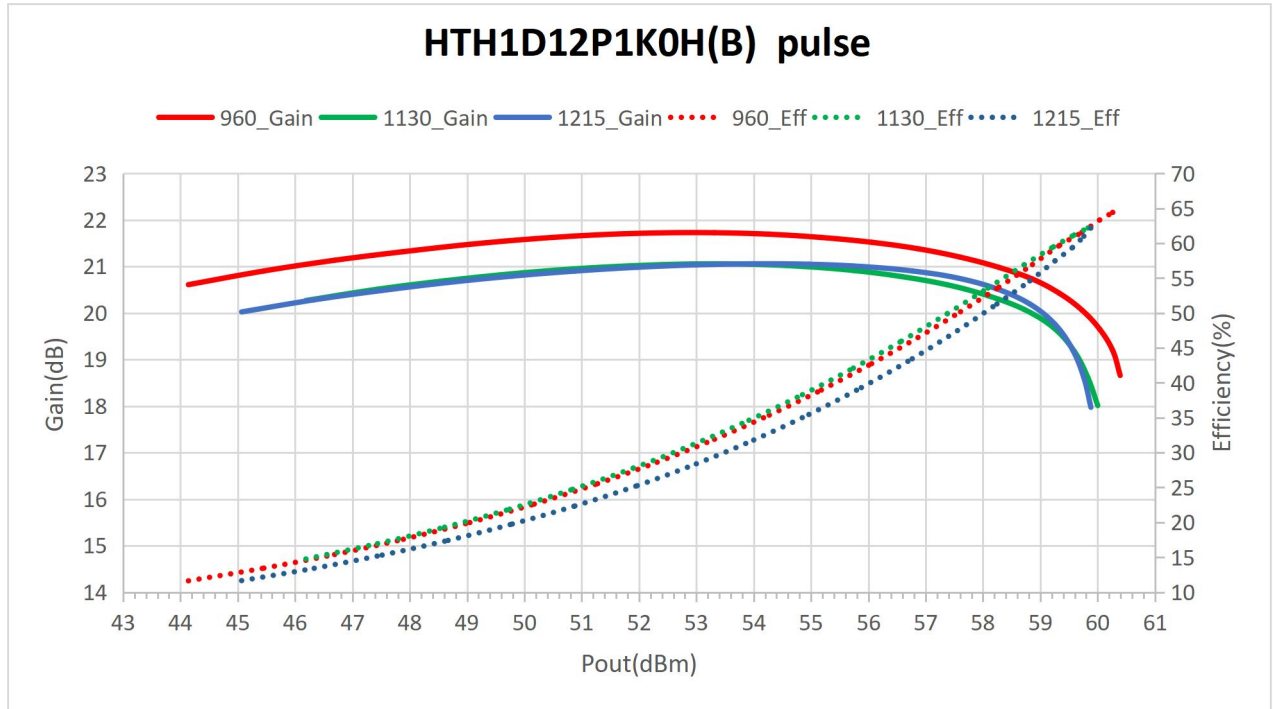
1000W, 960 - 1215 MHz LDMOS Amplifier

Product datasheet

Bill of Materials (BoM) - HTH1D12P1K0H(B) 960 - 1215 MHz Reference Design

Reference	Value	Description	Manufacturer	P/N
Q1	-	1000W, 960 - 1215MHz GaN PA	Watech	HTH1D12P1K0H(B)
C1,C25,C26	56pF	MLCC	Murata	GRM21A5C2E560FW01
C2,C14~C17,C20 ~C23	1.0pF	MLCC	Murata	GRM21A5C2E1R0FW01
C3	5.6pF	MLCC	Murata	GRM21A5C2E5R6FW01
C4,C5,C8~C11	4.3pF	MLCC	Murata	GRM21A5C2E4R3FW01
C6,C7	6.2pF	MLCC	Murata	GRM21A5C2E6R2FW01
C12,C13	3.3pF	MLCC	Murata	GRM21A5C2E3R3FW01
C18,C19	2.2pF	MLCC	Murata	GRM21A5C2E2R2FW01
C27,C28	22pF	MLCC	Dalicap	DLC70B220JW501XT
C24	100pF	MLCC	Dalicap	DLC70B101JW501XT
C29~C32	1000pF	MLCC	Dalicap	DLC70B102JW501XT
R1,R2,R3	10Ω	Chip Resistor	KOA	SMD 1206
C33~C36	4.7uF	MLCC	YAGEO	CC1210KKX5R9BB475
C37,C38	1000uF	AEC	Chongx VEHT	100V 18*35mm
PCB	Rogers 4350B (er = 3.5), thickness = 20 mil (0.508 mm); thickness copper plating = 35 μm , gold plated.			

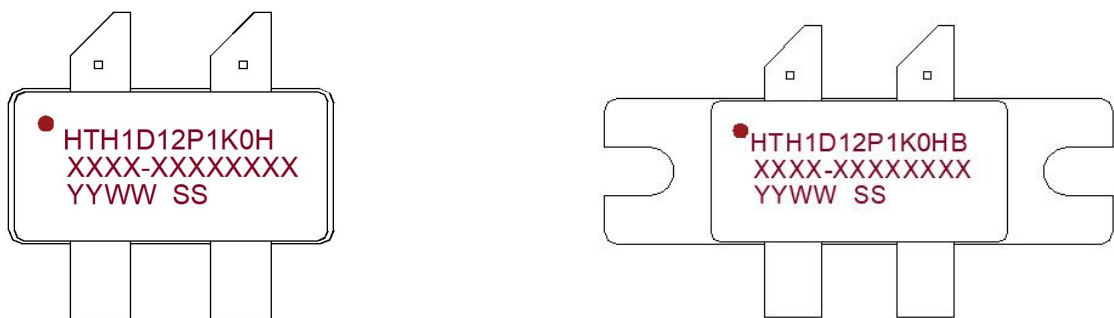
Performance Plots



Pulsed CW, Gain and Efficiency vs Pout

Test conditions unless otherwise noted: 25 °C, VDD = +50Vdc, IDQ= 100mA , Pulse Width = 100us, Duty Cycle= 10% test on WATECH Application Board

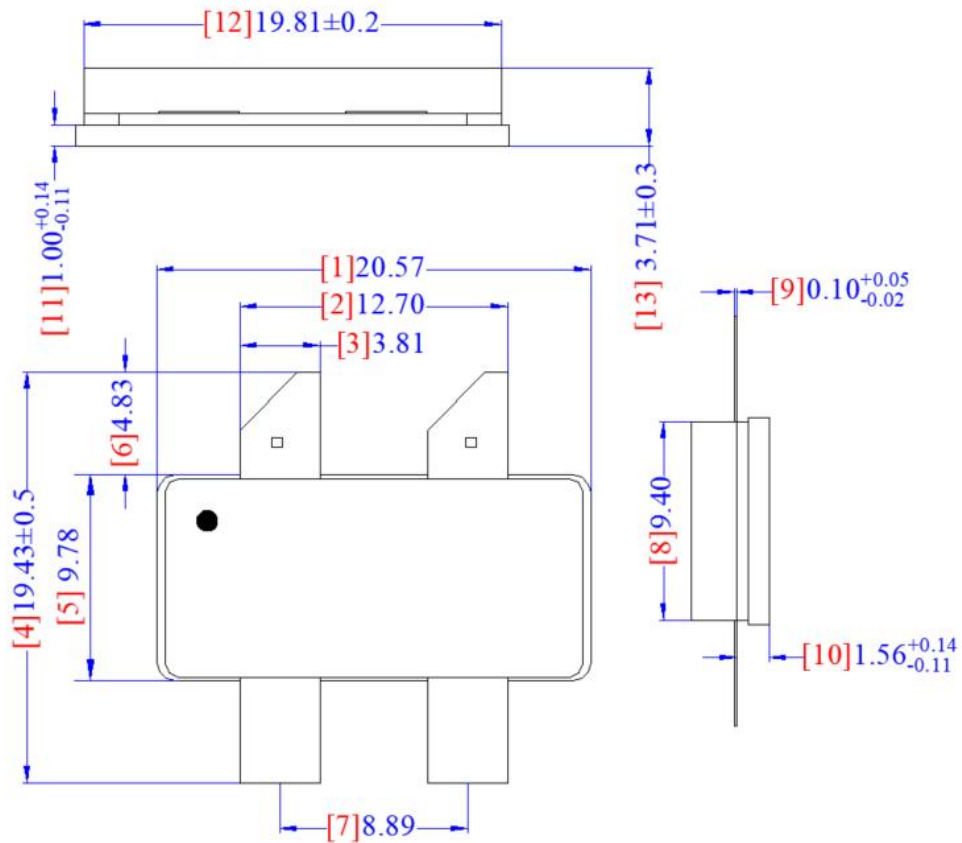
Package Marking and Dimensions



- Line1 (fixed): Device name in work order
- Line2 (unfixed): Mark Lot number in work order (Sample: E596-EERA0001)
- Line3 (unfixed): Date Code + "SS"(The last two digits of sub lot Number)

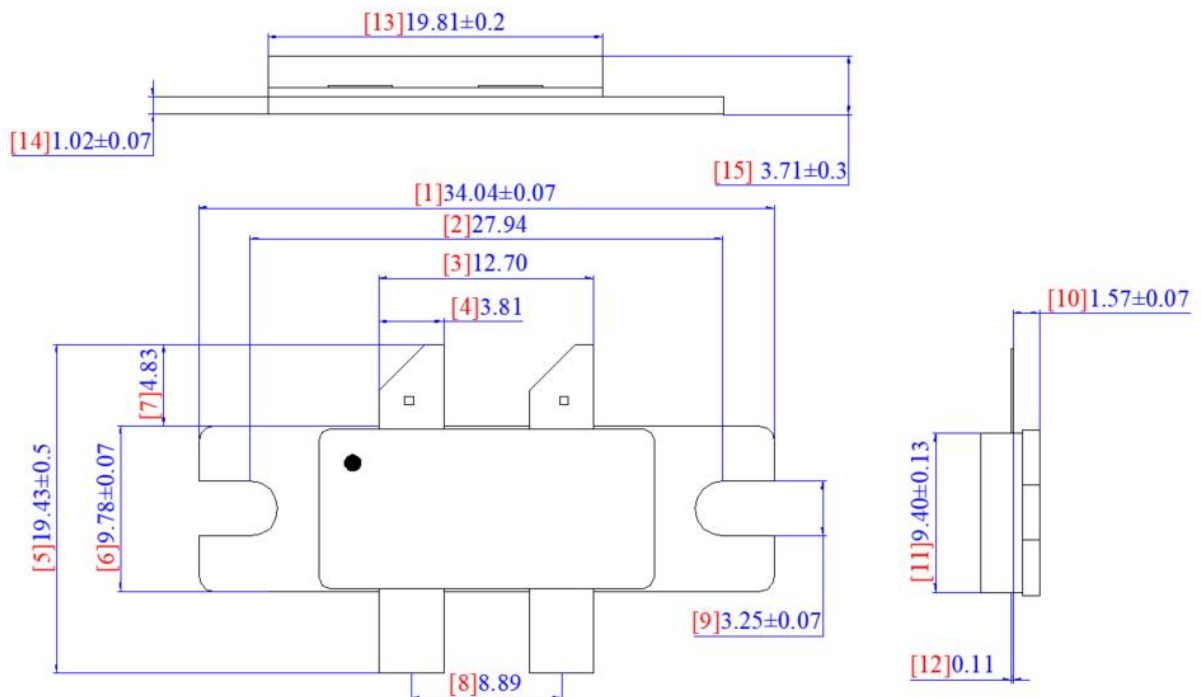
This Marking SPEC only stipulates the content of Marking. For marking requirements such as font and size, please refer to the latest version of "Watech Product Printing Specification"

Marking



Remark: 1.Unit: mm; 2.Unlabeled tolerance is ±0.13mm.

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

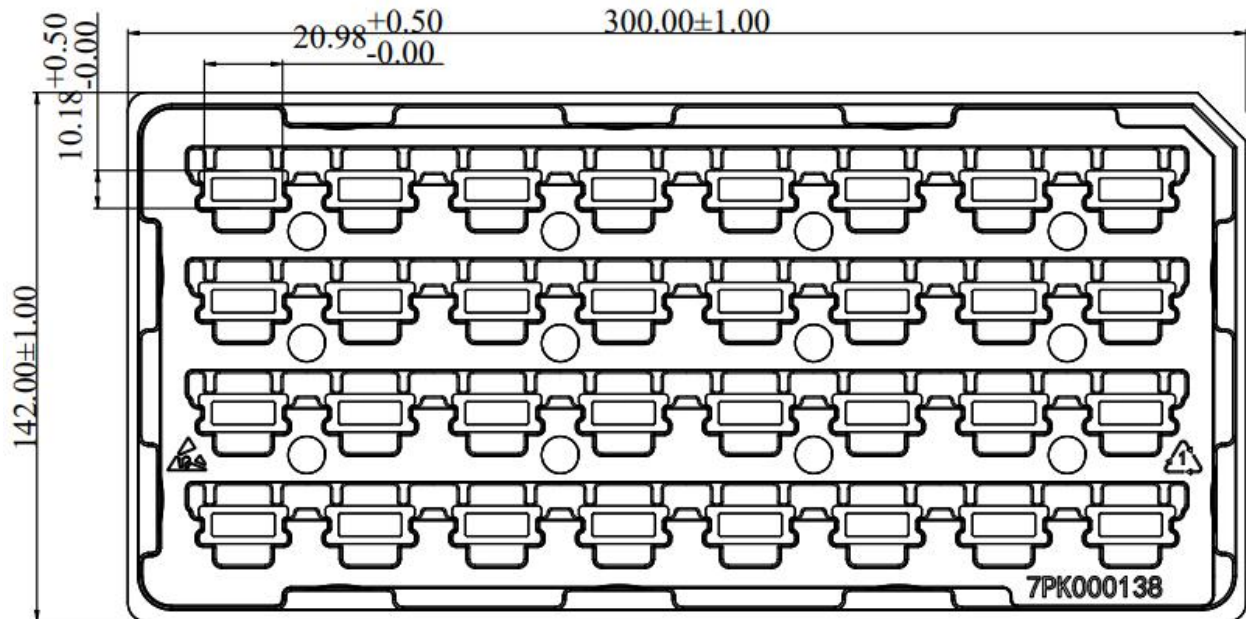


Remark: 1.Unit: mm; 2.Unlabeled tolerance is ±0.13mm.

Tape and Reel Information

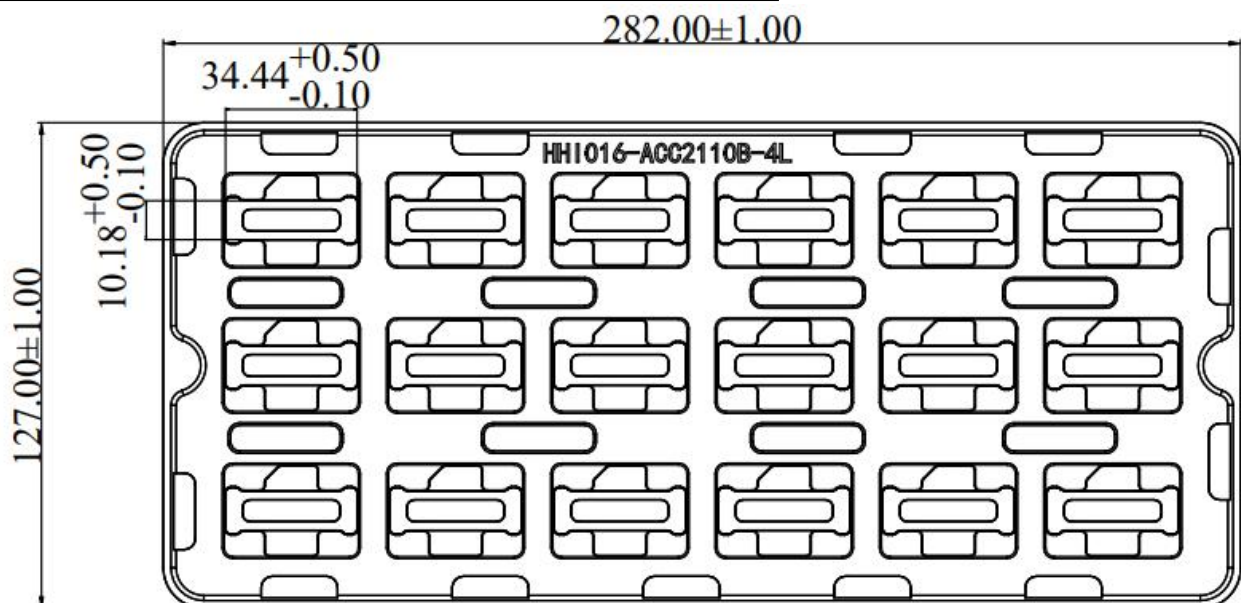
HTH1D12P1K0H:

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



HTH1D12P1K0HB:


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 – Me 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	March 2023	Product version datasheet



HTH1D12P1K0H(B) 1000W, 960 - 1215 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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- Email: MKT@huatai-elec.com

For technical questions and application information:

- Email: MKT@huatai-elec.com

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