

Description

The HTH7G06P500H(B) is an unmatched discrete LDMOS Power Amplifier with 500W saturated output power covering frequency range from 1.8 - 600 MHz.

Features

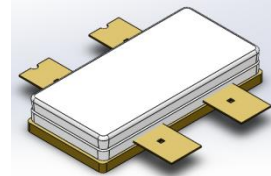
- Operating Frequency Range: 1.8 - 600 MHz
- Operating Drain Voltage: 28-50V
- Saturation Output Power: 500W
- Internally Unmatched device
- Excellent thermal stability due to low thermal resistance package
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design

Applications

- Analog and Digital Broadcasting
- Meteorological and Aviation Radar
- Private network communication base station
- Industrial Laser Sources and Plasma Equipment
- Various nuclear magnetic resonance instruments
- Particle accelerator

Ordering Information

Part Number	Description
HTH7G06P500H(B)	Tray Package
HTH7G06P500H(B) EVB	400-470 MHz EVB

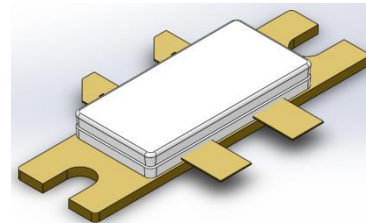


ACC2110S-4L

Earless Flanged balanced

Air Cavity Ceramic Package; 4 Leads

HTH7G06P500H



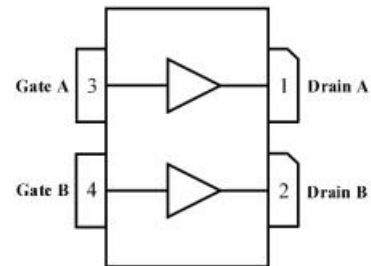
ACC2110B-4L

Flanged balanced

Air Cavity Ceramic Package; 4 Leads,

2 Mounting holes

HTH7G06P500HB



(Top View)

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

Pin Connections

Typical Performance

RF Characteristics (Pulsed-CW)

Freq (MHz)	P3dB (dBm)	P3dB (W)	Gain (dB)	Eff(%)@P3dB
400	57.71	590	23.64	60.83
435	57.70	588	24.61	59.84
470	57.71	590	25.03	58.06

Test conditions unless otherwise noted: 25 °C, VDD = +50Vdc, IDQ =200mA, 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})	-6 to +10	V
Storage Temperature (T _{STG})	-55 to +150	°C
Junction Temperature (T _J)	+225	°C

Electrical Specification

DC Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Breakdown Voltage V _{(BR)DSS}	V _{gs} =0V, I _{ds} =332uA	105	-	-	V
Gate-Source Threshold Voltage V _{GS(th)}	V _{ds} =V _{gs} , I _{ds} =332uA	1.2	2.0	2.8	V
Drain Leakage Current I _{DSS}	V _{gs} =0V, V _{ds} =50V	-	-	10	uA
Gate Leakage Current I _{GSS}	V _{gs} =5V, V _{ds} =0V	-	-	1	uA

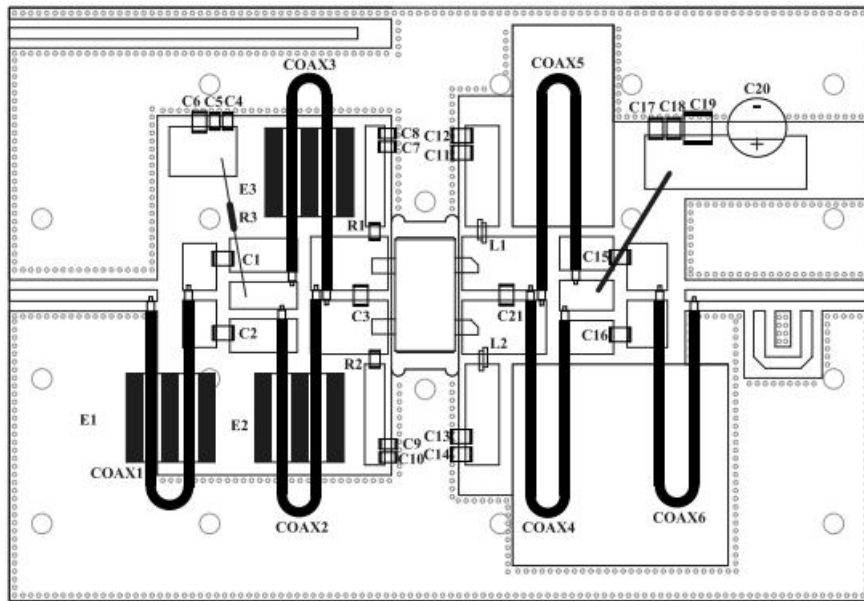
Load Mismatch Test

Condition	Test Result
VSWR=65:1 at all Phase Angles, V _{DD} = +50Vdc, I _{DQ} =200mA, P _{PEAK} = 588W, P _{AVG} = 118W, PW = 200us, DC= 20%, freq@435 MHz	No Device Degradation

Thermal Information

Parameter	Condition	Value (Typ)	Unit
Thermal Resistance Junction to Case (R_{TH})	$T_{FLANGE} = 60^{\circ}C$, $V_{DD} = +50Vdc$, $I_{DQ} = 200mA$, $P_{PEAK} = 57 dBm$ (500W), $PW = 200\mu s$, DC= 20%, freq@400 MHz	0.2	$^{\circ}C / W$

HTH7G06P500H(B) 400 - 470 MHz Reference Design



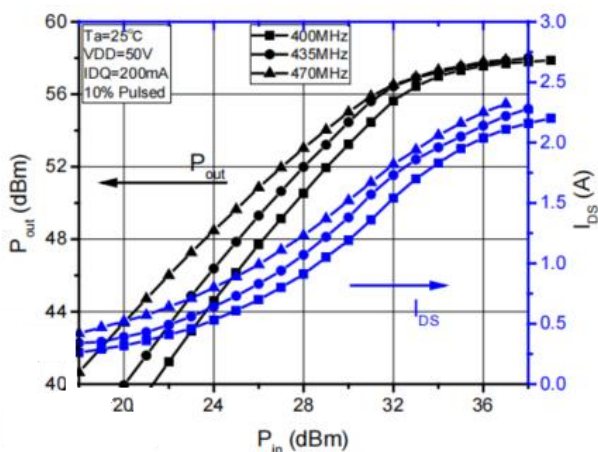
EVB Layout

Bill of Materials (BoM) - HTH7G06P500H(B) 400 - 470 MHz Reference Design

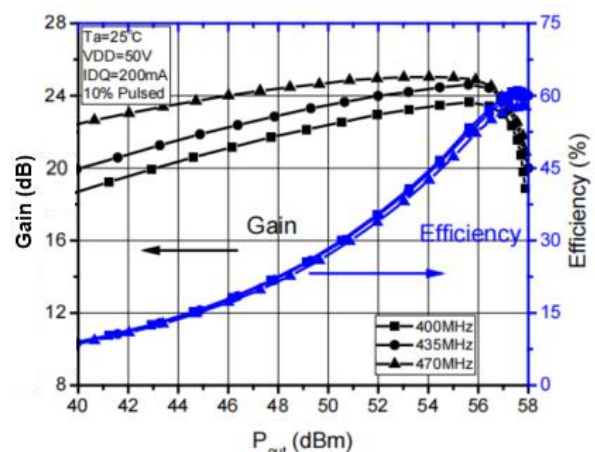
Reference	Value	Description	Manufacturer	P/N
Q1	-	300W, 1.8 - 600 MHz LDMOS PA	Watech	HTH7G06P500H(B)
C1, C2, C11, C13, C15, C16, C17	560pF	MLCC	ATC	ATC100B561JT500XT
C3	20pF	MLCC	ATC	ATC100B200JT500XT
C4, C7, C9	470pF	MLCC	TDK	GRM1885C1H471JA01D
C5, C8, C10	10nF	MLCC	Murata	GR321AD72E103KW01D

Reference	Value	Description	Manufacturer	P/N
C6	10uF	MLCC	-	-
C12, C14, C18	100nF	MLCC	Murata	GR332QD72E104KW01L
C19	10uF	MLCC	AVX	22201C106MAT2A
C20	2200uF/63V	MLCC	Panasonic	ECA-1JHG222
C21	10pF	MLCC	ATC	ATC100B100JT500XT
C22	12pF	MLCC	ATC	ATC100B120JT500XT
E1, E2, E3	#43 Multi-Aperture Core		Fair-Rite	2843000302
L1, L2	Air core inductors, 1mm ECW, ID 3mm, 1 turn		-	-
R1, R2	50Ω/0805	Thick Film Resistor	-	-
R3	1KΩ	Wire Resistor	-	-
Coax 1,6	50Ω SR Coax, 60, 80 mm 2:1		-	-
Coax 2,3,4,5	25Ω SR Coax, 60, 160 mm 4:1		-	-
PCB	RF35 (er = 3.5), 30 mil (0.762 mm), 35 μm (1oz)			

Performance Plots

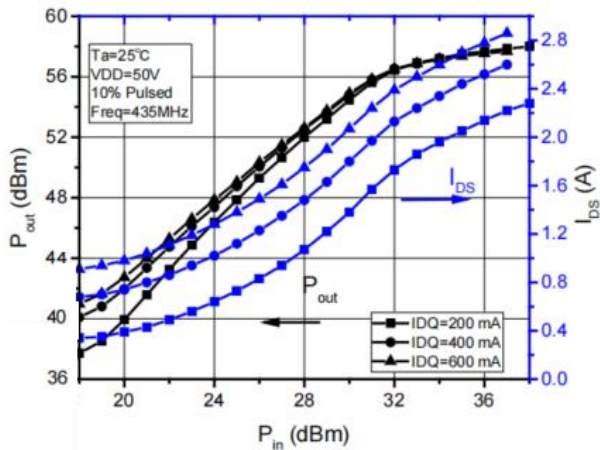


Pulsed CW, Pout vs Pin

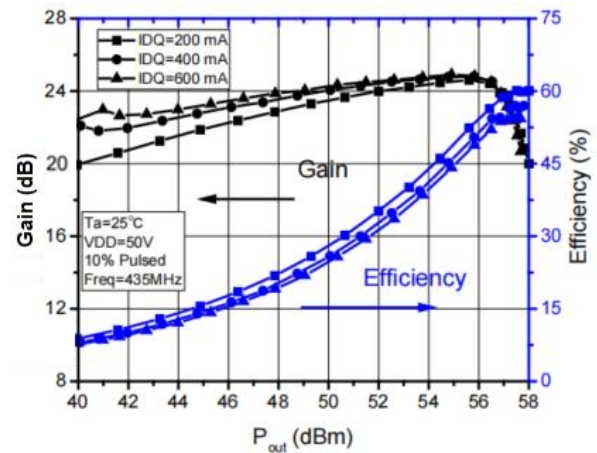


Pulsed CW, Gain and Efficiency vs Pout

Test conditions unless otherwise noted: 25 °C, VDD = +50dc, IDQ= 200mA, PW = 100us, DC= 10% test on WATECH Application Board



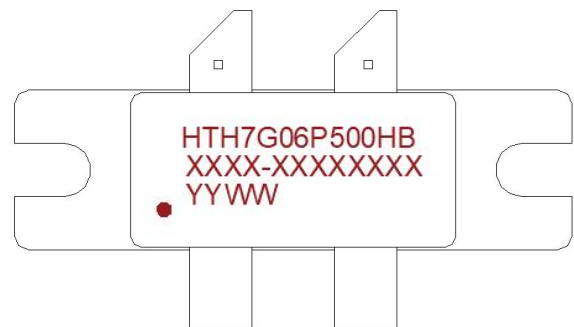
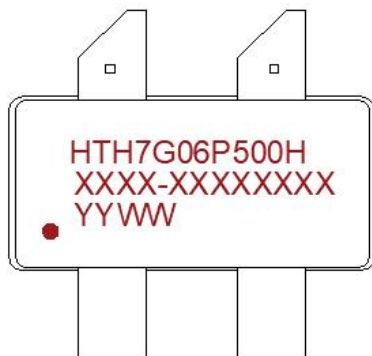
Pulsed CW, Pout vs Pin @Idq's



Pulsed Gain and Efficiency vs Pout @Idq's

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

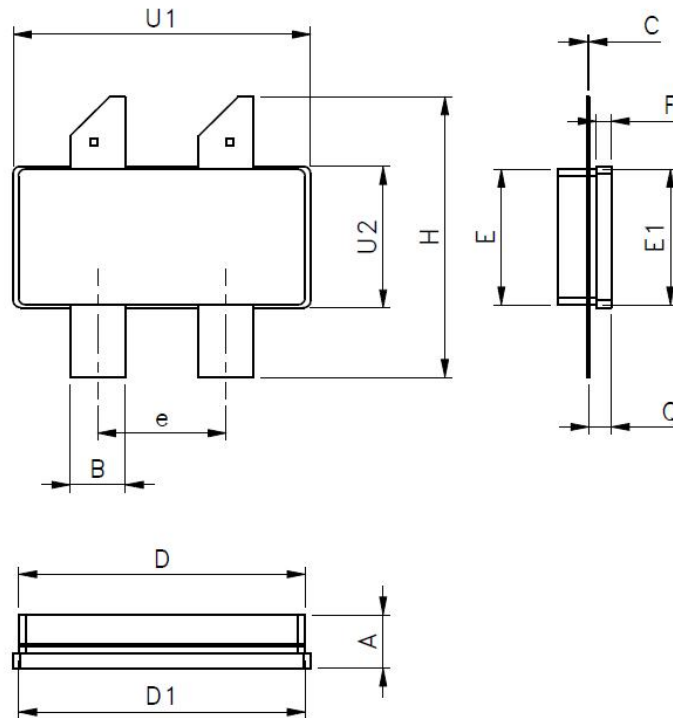
Package Marking and Dimensions



- 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"

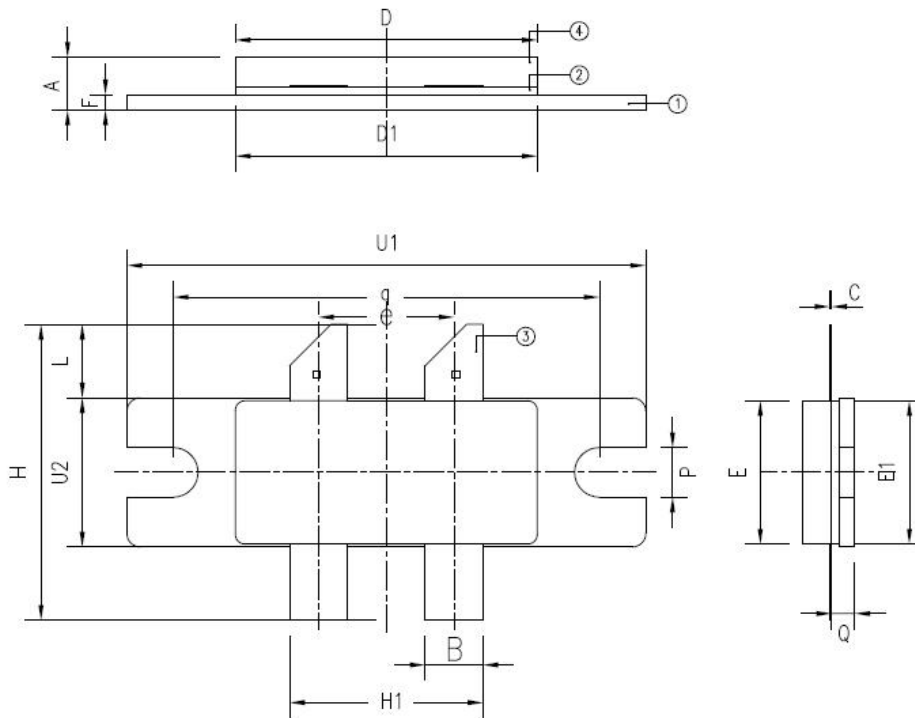
Marking



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	-

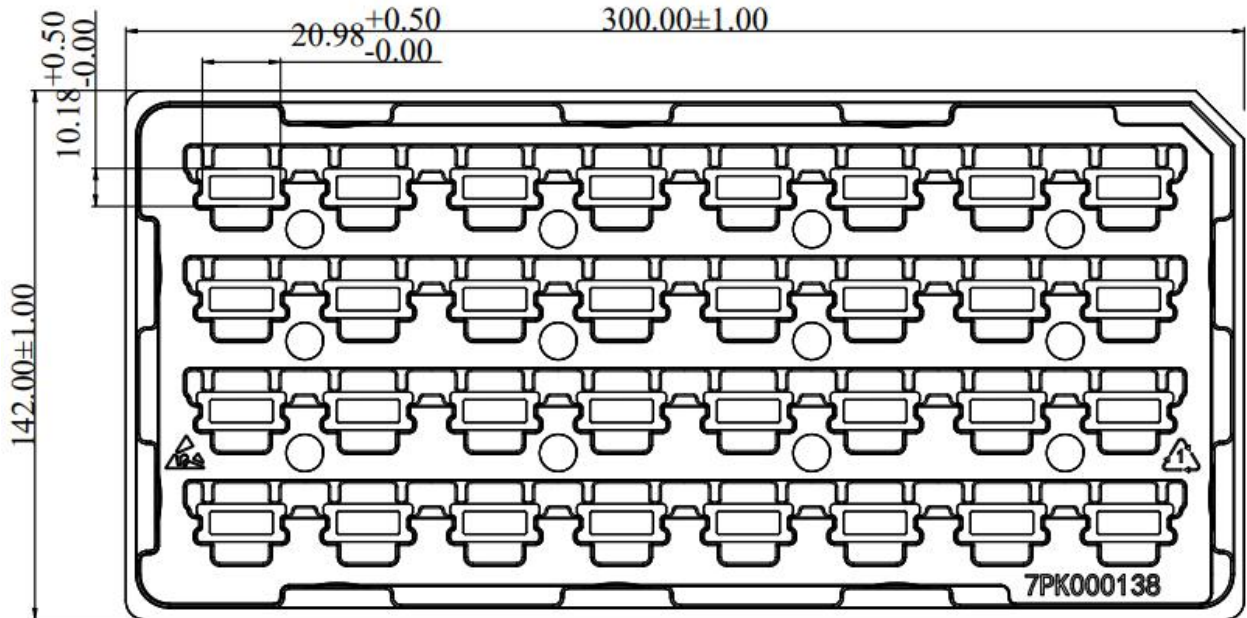
Package Dimensions

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

Packing Information

HTH7G06P500H:

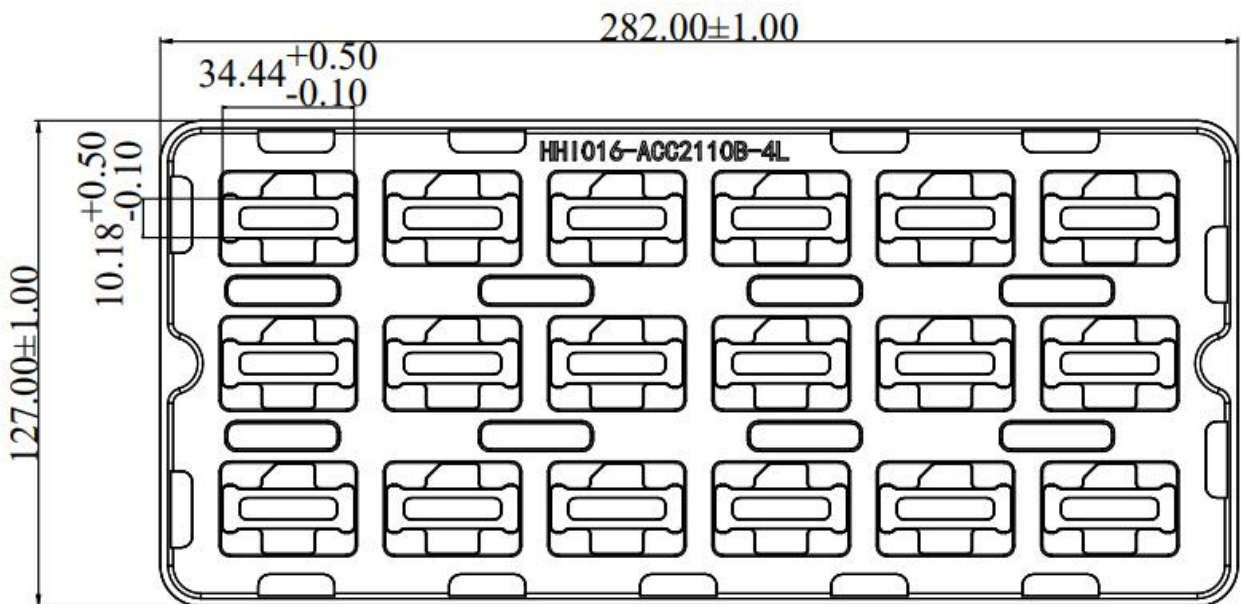
Package Type	Qty/Tray(pcs)	Qty/Box(pcs)	Qty/Carton(pcs)
ACC2110S-4L	32	160	960



Tray Packaging Descriptions

HTH7G06P500HB:


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 1.6	Product	Mar. 2023	New format based on English version datasheet
Rev 1.7	Product	Sept. 2023	Update TBD information
Rev 1.8	Product	Mar. 2024	Version released after re review



HTH7G06P500H(B) 500W, 1.8 - 600 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
- Email: MKT@huatai-elec.com

For technical questions and application information:

- Email: MKT@huatai-elec.com

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