

## Description

The HTU7G06S002P is an unmatched discrete LDMOS Power Amplifier with 2W saturated output power covering frequency range for VHF/UHF applications.

## Features

- Operating Frequency Range: VHF/UHF
- Operating Drain Voltage: +4V
- Saturation Output Power: 2W
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design

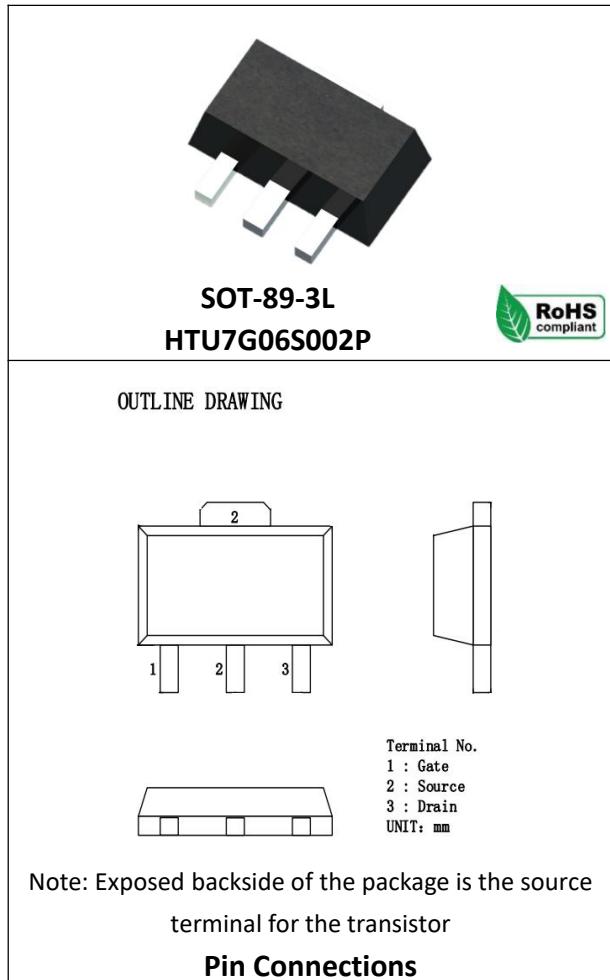
Freq (MHz)	Vdd (V)	Pin (W)	Pout (W)	Eff (%)
400-470	4.0	0.10	2.5	60

*Test conditions unless otherwise noted: 25 °C,*

*V<sub>DD</sub> = +4Vdc, I<sub>DQ</sub> = 300mA, CW Signal*

## Applications

- VHF Band handheld Walkie-talkie
- UHF Band handheld Walkie-talkie
- 1.8-1000MHz other application Drivers or Final stage Amplifiers



## Ordering Information

Part Number	Description
HTU7G06S002P	Reel Package
HTU7G06S002P EVB	400 - 470 MHz EVB

**Absolute Maximum Ratings**

Parameter	Range/Value	Unit
Drain voltage ( $V_{DSS}$ )	-0.5 to +12	V
Gate voltage ( $V_{GS}$ )	-5 to +10	V
Operation voltage ( $V_{DD}$ )	+4	V
Storage Temperature ( $T_{STG}$ )	-55 to +150	°C
Junction Temperature ( $T_J$ )	-40 to +150	°C
Thermal Resistance Junction to Case ( $R_{TH}$ )	10	°C/W

**Electrical Specification****DC Characteristics**

Parameter	Conditions	Min	Typ	Max	Unit
Breakdown Voltage $V_{(BR)DSS}$	$V_{GS}=0V$ , $I_{DS}=39.6\mu A$	12	-	-	V
Gate-Source Threshold Voltage $V_{GS(th)}$	$V_{DS}=V_{GS}$ , $I_{DS}=8\mu A$	1.0	1.5	2.0	V
Drain Leakage Current $I_{DSS}$	$V_{GS}=0V$ , $V_{DS}=12V$	-	-	1	$\mu A$
Gate Leakage Current $I_{GSS}$	$V_{GS}=10V$ , $V_{DS}=0V$	-	-	1	$\mu A$

**Load Mismatch Test**

Condition	Test Result
VSWR=20:1, at all Phase Angles, $V_{DD} = +4.2V_{dc}$ , $I_{DQ} = 300mA$ , CW signal 34 dBm @435MHz test on WATECH Application Board	No Device Degradation

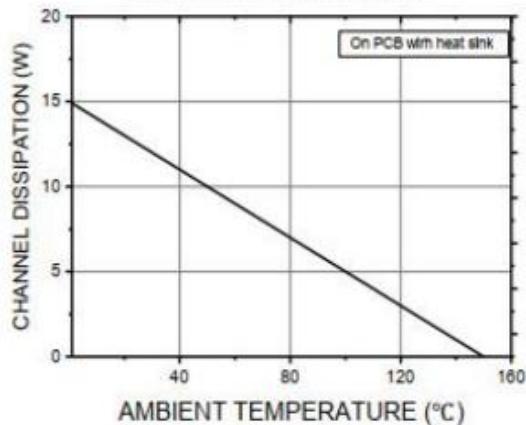
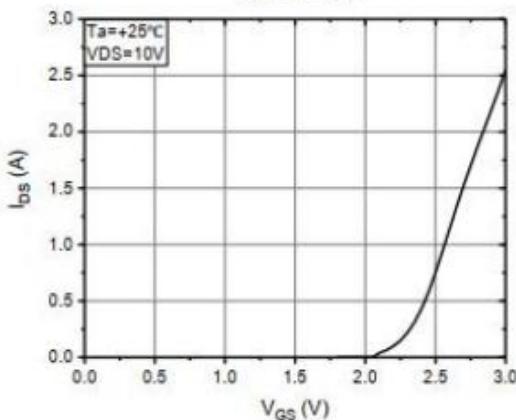
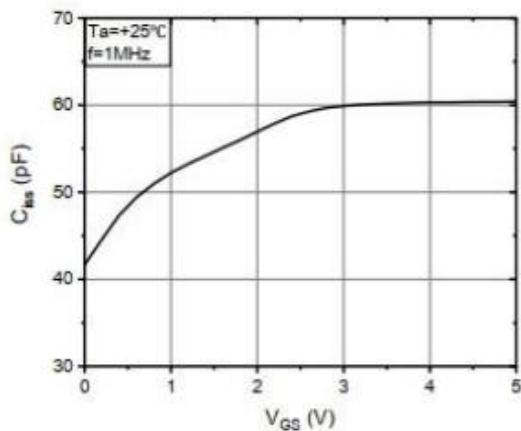
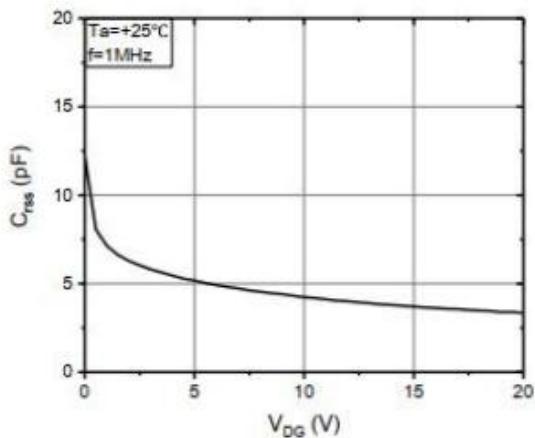
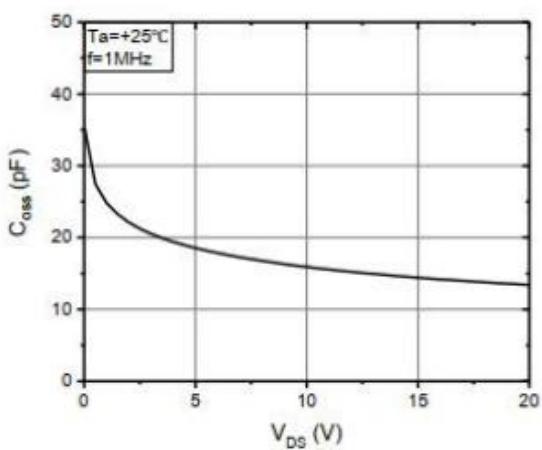
**RF Characteristics (CW)**

Freq (MHz)	Vdd (V)@Idq (mA)	Pin (W)	Pout (W)	Eff (%)
430	4.0@300	0.1	3.0	63

*Test conditions unless otherwise noted: 25 °C test on WATECH Application Board*

## DC Performance

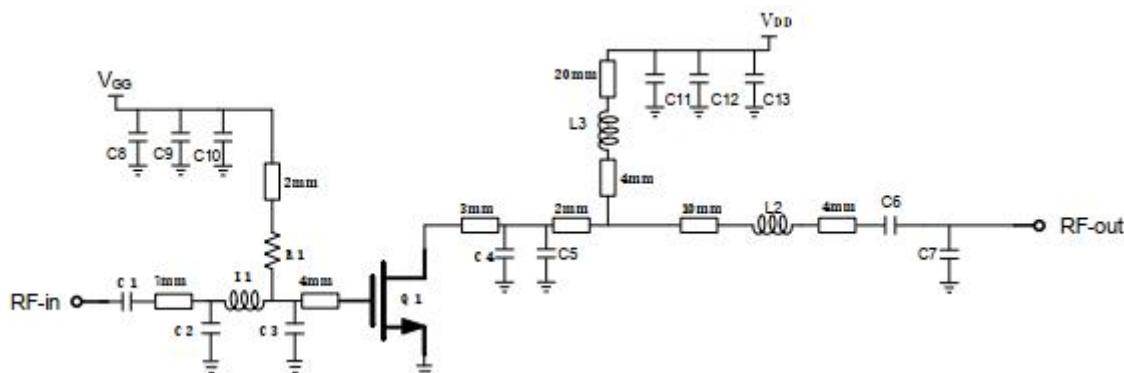
**CHANNEL DISSIPATION VS.  
AMBIENT TEMPERATURE**

**I<sub>DS</sub> VS. V<sub>GS</sub>****C<sub>iss</sub> VS. V<sub>GS</sub>****C<sub>rs</sub> VS. V<sub>DS</sub>****C<sub>oss</sub> VS. V<sub>DS</sub>**

*Test conditions unless otherwise noted: 25 °C*



## HTU7G06S002P 400 - 470 MHz Reference Design, 4.0V@300mA



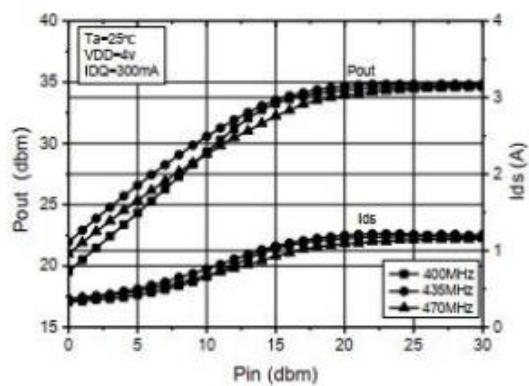
EVB Layout

## BoM - HTU7G06S002P 400 - 470 MHz Reference Design, 4.0V@300mA

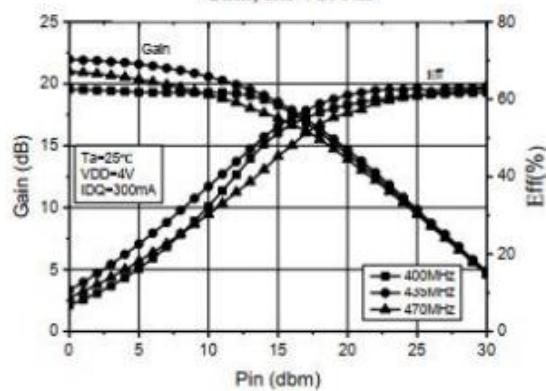
Reference	Value	Description	Manufacturer	P/N
Q1	-	2W, 1.8 - 1000 MHz LDMOS PA	Watech	HTU7G06S002P
C1, C6, C10, C13	100pF	MLCC	Murata	GRM1885C1H101JA01
C2	15pF	MLCC	Murata	GRM1885C1H150JA01
C3	47pF	MLCC	Murata	GRM1885C1H470JA01
C4	27pF	MLCC	Murata	GRM1885C1H270JA01
C5	18pF	MLCC	Murata	GRM1885C1H180JA01
C7	8pF	MLCC	Murata	GRM1885C1H8R0JA01
C8	4.7uF	MLCC	Murata	GRM32ER61H474KA12L
C9, C12	1nF	MLCC	Murata	GRM1885C1H102JA01
C11	10uF	MLCC	Murata	GRM32ER61H105KA12L
L1	1.8nH/0603		-	GRM1885C1H182JA01
L2	D: 0.4 mm, Inside: 1.5 mm, 2 Turns		-	Enameled wire
L3	D: 0.35 mm, Inside: 1.5 mm, 8 Turns		-	Enameled wire
R1	51 Ω	Thick Film Resistor	-	-
PCB	FR-4 (er = 4.3), 30 mil (0.762 mm), 35 µm (1oz)			

## Performance Plots 400 - 470 MHz Reference Design, 4.0V@300mA

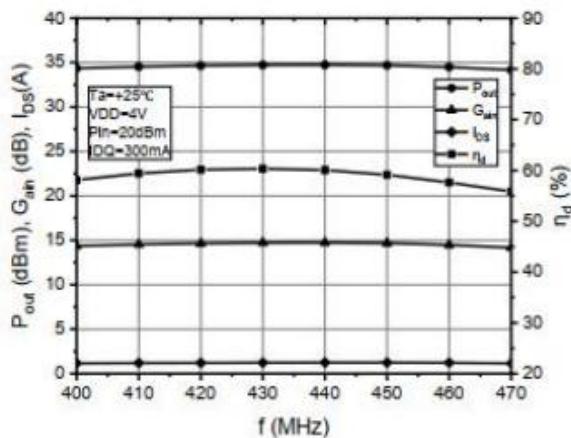
Pout, Ids VS. Pin



Gain, Eff VS. Pin



Pout,Ids,Gain, Eff VS. Freq



Test conditions unless otherwise noted: 25 °C, VDD = +4Vdc, IDQ=300mA, CW test on WATECH Application Board

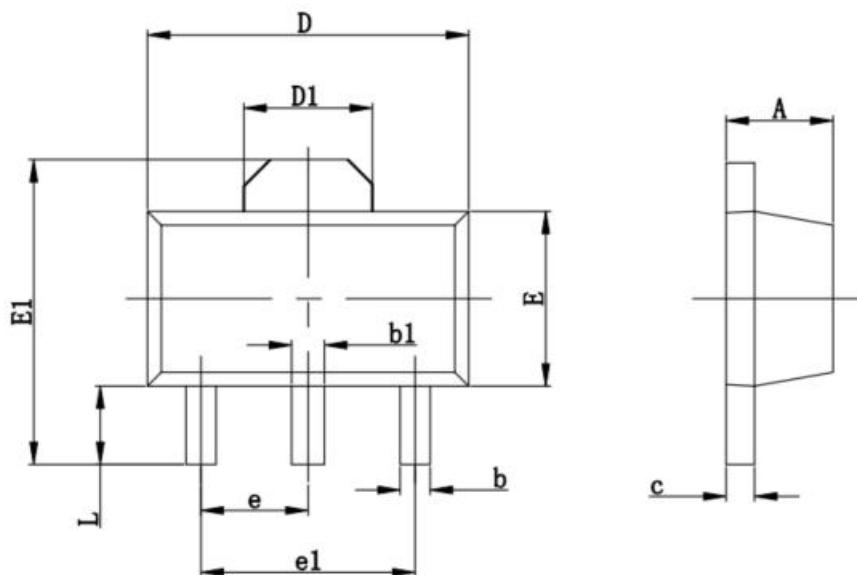
## Package Marking and Dimensions



- Line1 (fixed): fixed code H0602C
- Line2 (unfixed): Date Code + SS(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

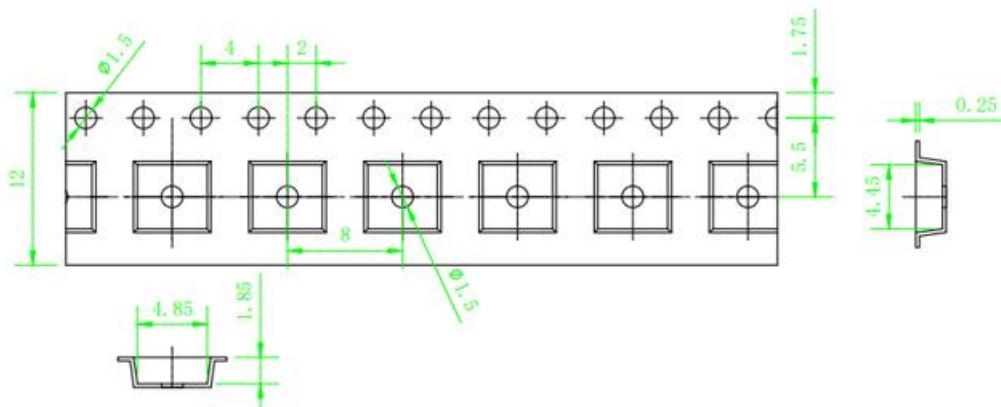


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.100	0.035	0.047

### Package Dimensions

## Tape and Reel Information

Package Type	Reel Size(inch)	Qty/Reel(pcs)	Qty/Box(pcs)	Qty/Carton(pcs)
SOT89	7inch	1000	10000	40000



## **Tape & Reel Packaging Descriptions**

## Handling Precautions

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	 <b>ATTENTION</b> OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES



## 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

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Acronym	Definition
LDMOS	Laterally-Diffused Metal-Oxide Semiconductor
CW	Continuous Waveform

## Revision history

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Document ID	Datasheet Status	Release Date	Revision Version
Rev 3.3	Product	March 2023	New format based on English version datasheet
Rev 3.4	Product	March 2024	Version released after re review



## Contact Information

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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](mailto:MKT@huatai-elec.com)

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- Email: [MKT@huatai-elec.com](mailto:MKT@huatai-elec.com)

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