

### Description

The HTL7G06S006P is an unmatched discrete LDMOS Power Amplifier with 6W saturated output power covering frequency range for VHF/UHF applications.

### Features

- Operating Frequency Range: VHF/UHF
- Operating Drain Voltage: +7.2V
- Saturation Output Power: 6W
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design, using an internal monolithic Zener diode from Gate to Source

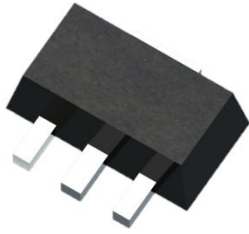
Freq (MHz)	Vdd (V)	Pin (W)	Pout (W)	Eff (%)
175	7.4	0.32	6.5	66
520	7.4	0.32	5.5	61

Test conditions unless otherwise noted: 25 °C,


$V_{DD} = +7.4Vdc$ ,  $I_{DQ} = 500mA$ , CW Signal

### Applications

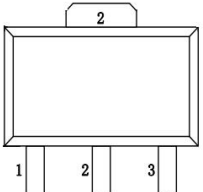

- VHF Band handheld Walkie-talkie
- UHF Band handheld Walkie-talkie
- 1.8-600MHz other application Drivers or Final stage Amplifiers



**SOT-89-3L**  
**HTL7G06S006P**



OUTLINE DRAWING

Terminal No.  
1 : Gate  
2 : Source  
3 : Drain  
UNIT: mm

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

**Pin Connections**

### Ordering Information

Part Number	Description
HTL7G06S006P	Reel Package
HTL7G06S006P EVB	175 MHz EVB
HTL7G06S006P EVB1	520 MHz EVB

## Absolute Maximum Ratings

Parameter	Range/Value	Unit
Drain voltage ( $V_{DSS}$ )	-0.5 to +20	V
Gate voltage ( $V_{GS}$ )	-5 to +10	V
Operation voltage ( $V_{DD}$ )	+9.0	V
Storage Temperature ( $T_{STG}$ )	-55 to +150	°C
Junction Temperature ( $T_J$ )	-40 to +150	°C
Thermal Resistance Junction to Case ( $R_{TH}$ )	6.5	°C/W

## Electrical Specification

### DC Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Breakdown Voltage $V_{(BR)DSS}$	$V_{GS}=0V, I_{DS}=39.6\mu A$	20	-	-	V
Gate-Source Threshold Voltage $V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=39.6\mu A$	0.8	1.55	2.6	V
Drain Leakage Current $I_{DSS}$	$V_{GS}=0V, V_{DS}=17V$	-	-	1	$\mu A$
Gate Leakage Current $I_{GSS}$	$V_{GS}=10V, V_{DS}=0V$	-	-	1	$\mu A$

### Load Mismatch Test

Condition	Test Result
VSWR=10:1, at all Phase Angles, $V_{DD} = +8.4V_{dc}$ , $I_{DQ} = 500mA$ , CW signal 37 dBm @175MHz test on WATECH Application Board	No Device Degradation
VSWR=10:1, at all Phase Angles, $V_{DD} = +8.4V_{dc}$ , $I_{DQ} = 500mA$ , CW signal 37 dBm @520MHz test on WATECH Application Board	No Device Degradation

### RF Characteristics (CW)

Freq (MHz)	Vdd (V)@Idq (mA)	Pin (W)	Pout (W)	Eff (%)
430	7.4@500	0.31	6.5	66

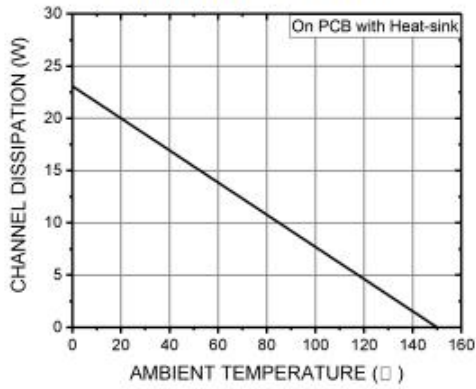
*Test conditions unless otherwise noted: 25 °C test on WATECH Application Board*

Freq (MHz)	Vdd (V)@Idq (mA)	Pin (W)	Pout (W)	Eff (%)
520	7.4@500	0.31	5.5	61

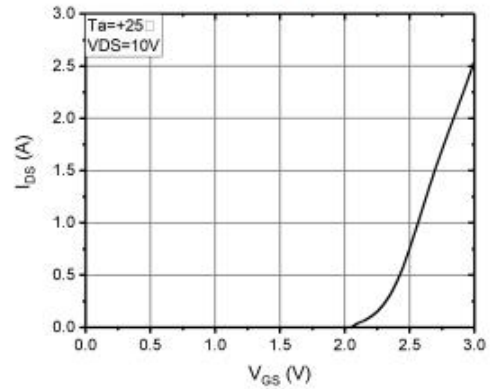
*Test conditions unless otherwise noted: 25 °C test on WATECH Application Board*

### DC Performance

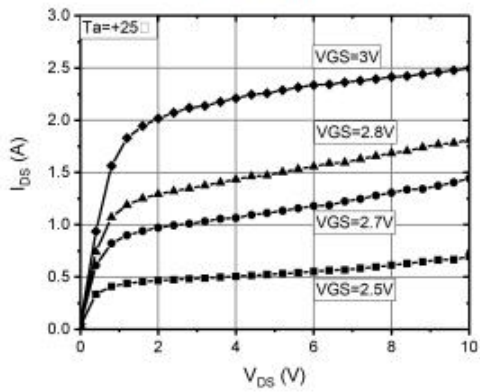
**CHANNEL DISSIPATION VS.  
AMBIENT TEMPERATURE**



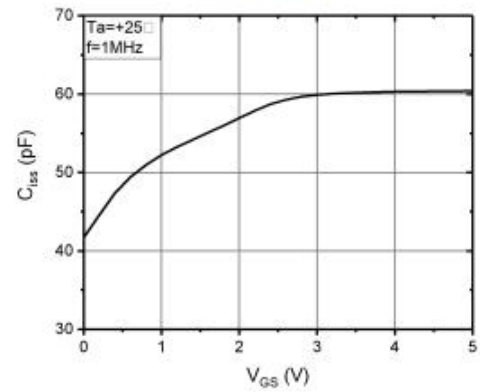
**I<sub>DS</sub> VS. V<sub>GS</sub>**



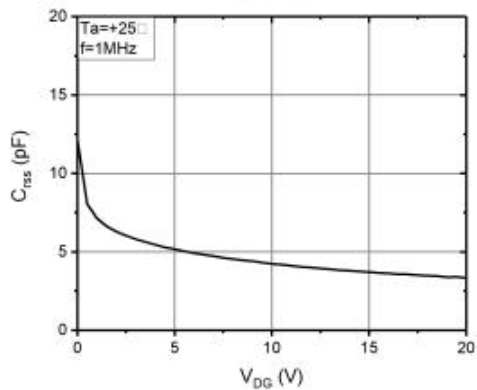
**I<sub>DS</sub> VS. V<sub>DS</sub>**



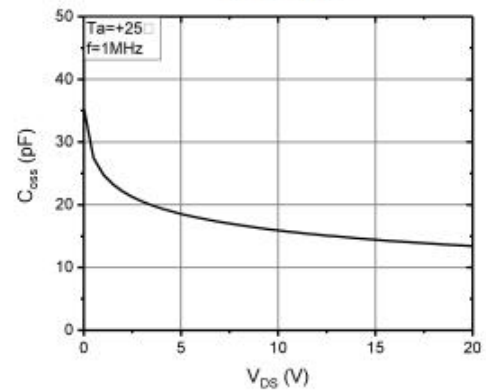
**C<sub>iss</sub> VS. V<sub>GS</sub>**



**C<sub>rss</sub> VS. V<sub>DS</sub>**



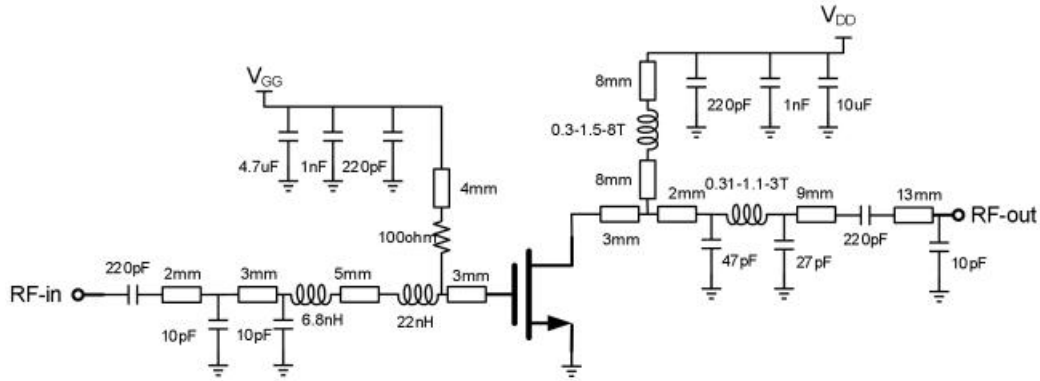
**C<sub>oss</sub> VS. V<sub>DS</sub>**



Test conditions unless otherwise noted: 25 °C

**HTL7G06S006P 175 MHz Reference Design, 7.4V@500mA**

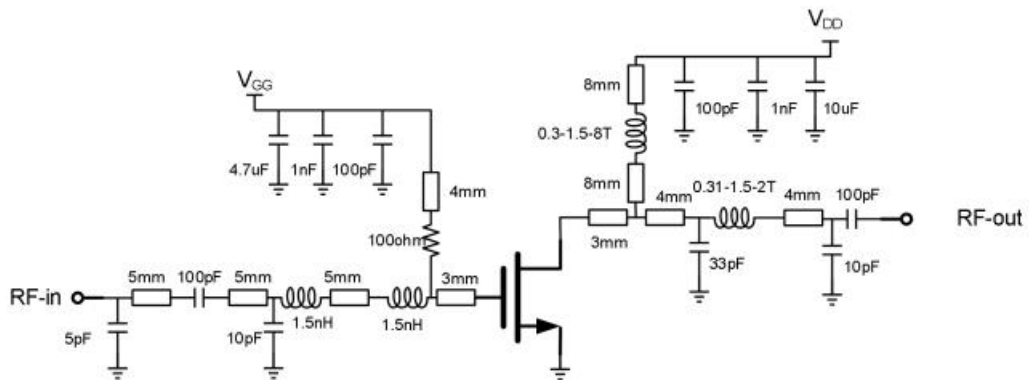
175MHz @V<sub>DD</sub> = 7.4V, I<sub>DQ</sub> = 500mA



**EVB Layout**

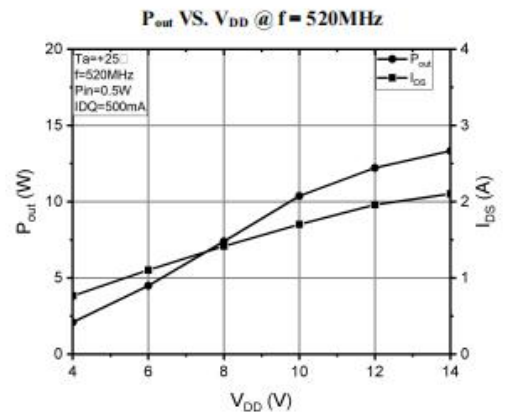
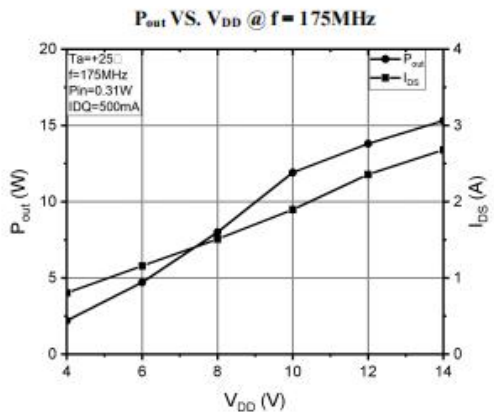
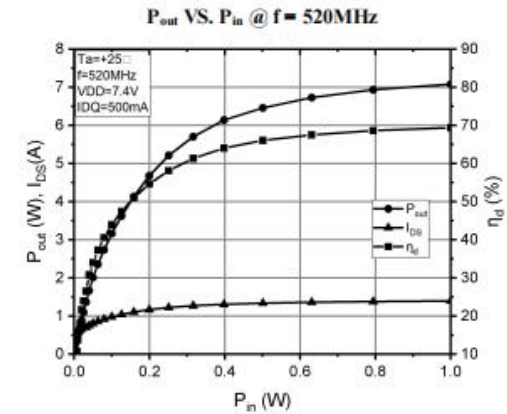
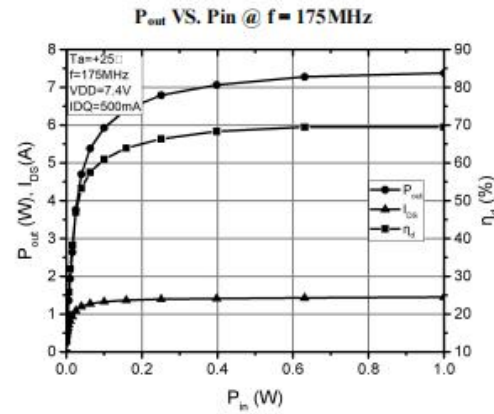
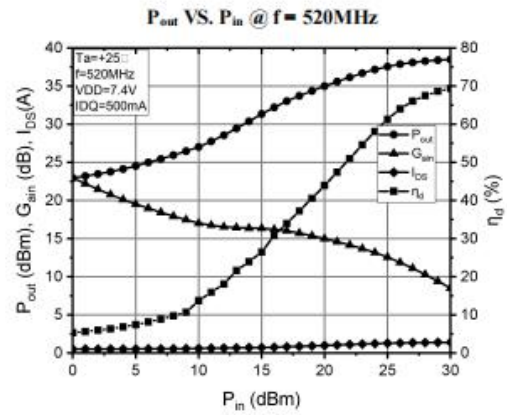
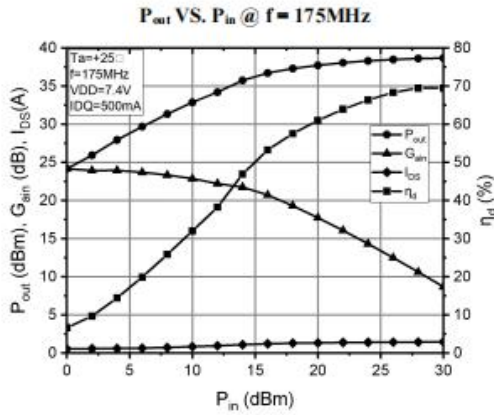
**HTL7G06S006P 520 MHz Reference Design, 7.4V@500mA**

520MHz @V<sub>DD</sub> = 7.4V, I<sub>DQ</sub> = 500mA



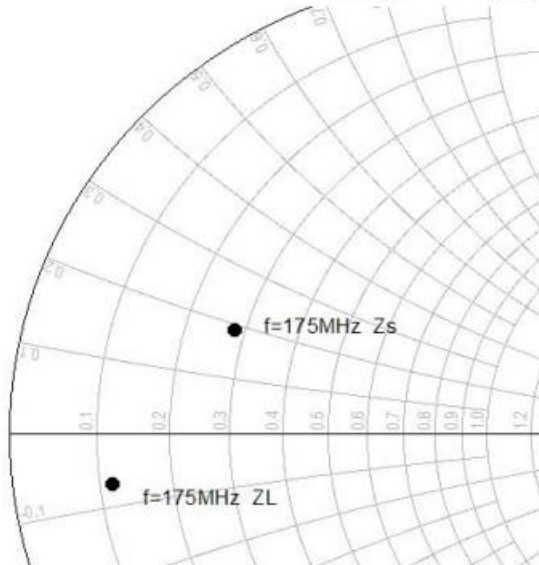
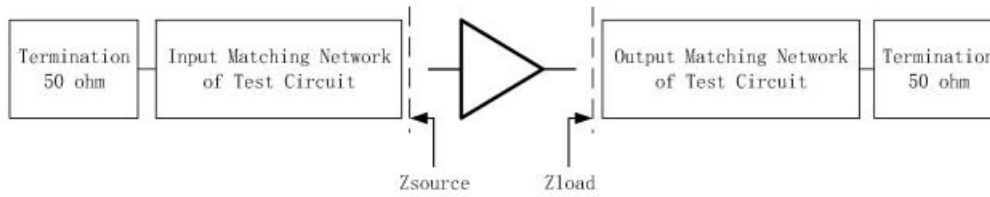
**EVB Layout**

### Performance Plots 175 MHz & 520MHz Reference Design, 7.4V@500mA

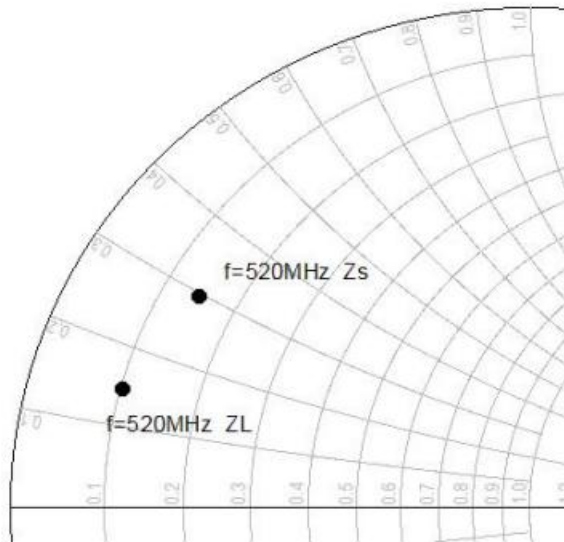


Test conditions unless otherwise noted: 25 °C, V<sub>DD</sub> = +7.4Vdc, I<sub>DQ</sub>=500mA, CW test on WATECH Application Board

### Input/Output Impedance Characteristics @7.4V, 175-520 MHz



@ $P_{in}=0.31W$ , $V_{DS}=7.4V$ , $I_{dq}=500mA$	
$Z_s$	$13.90 + j 9.38$
$Z_L$	$5.21 - j 3.41$



@ $P_{in}=0.5W$ , $V_{DS}=7.4V$ , $I_{dq}=500mA$	
$Z_s$	$7.02 + j 15.30$
$Z_L$	$4.92 + j 7.42$

Test conditions unless otherwise noted: 25 °C, VDD = +7.4Vdc, IDQ=500mA, CW test on WATECH Application Board



**HTL7G06S006P S-Parameters , 7.4.0V@500mA**

Freq (MHz)	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
150	0.99	176.0	7.56	3.5	0.02	-83.3	0.84	15.1
175	0.97	172.4	6.66	-11.2	0.02	-97.2	0.84	-10.1
200	0.96	167.8	5.62	-32.9	0.02	-117.5	0.84	-46.2
250	0.94	161.2	4.44	-68.0	0.02	-151.7	0.84	-106.0
300	0.93	155.3	3.66	-102.2	0.02	175.7	0.84	-165.2
350	0.92	149.6	3.11	-135.8	0.02	144.3	0.83	136.3
400	0.92	144.2	2.70	-169.0	0.02	112.3	0.83	78.0
450	0.92	138.9	2.39	157.8	0.01	80.5	0.83	19.7
500	0.91	133.7	2.16	124.6	0.02	50.4	0.83	-38.6
520	0.91	131.6	2.07	111.2	0.02	37.5	0.84	-62.2
550	0.91	128.6	1.95	91.2	0.02	18.2	0.83	-97.2
600	0.91	123.4	1.77	58.0	0.01	-12.6	0.83	-155.8
650	0.91	118.4	1.62	25.2	0.01	-43.5	0.82	146.2
700	0.90	113.4	1.49	-7.2	0.01	-73.9	0.82	88.8
750	0.90	108.5	1.39	-39.7	0.01	-102.5	0.82	31.7
800	0.90	103.6	1.30	-72.3	0.01	-134.1	0.82	-25.7
850	0.89	98.7	1.23	-105.1	0.01	-164.7	0.82	-83.8
900	0.89	93.9	1.16	-138.2	0.01	162.4	0.81	-142.6
950	0.89	89.1	1.09	-171.1	0.01	131.3	0.81	158.6
1000	0.88	84.5	1.02	156.6	0.01	107.3	0.80	100.7
1050	0.87	80.0	0.97	124.3	0.01	72.7	0.80	43.9
1100	0.87	75.7	0.92	92.5	0.01	42.5	0.79	-12.8
1150	0.87	71.5	0.89	60.4	0.01	12.7	0.80	-70.4
1200	0.87	67.0	0.86	27.8	0.01	-18.1	0.79	-128.5
1250	0.87	62.5	0.83	-4.9	0.01	-49.3	0.79	172.8
1300	0.87	57.9	0.80	-37.5	0.01	-79.2	0.78	114.6
1350	0.87	53.3	0.78	-70.0	0.01	-108.3	0.78	56.6
1400	0.87	48.8	0.75	-102.4	0.01	-140.5	0.79	-0.8
1450	0.86	44.3	0.74	-135.0	0.01	-172.2	0.79	-58.6
1500	0.86	39.8	0.72	-167.7	0.01	158.4	0.78	-117.6

*S-Parameters*

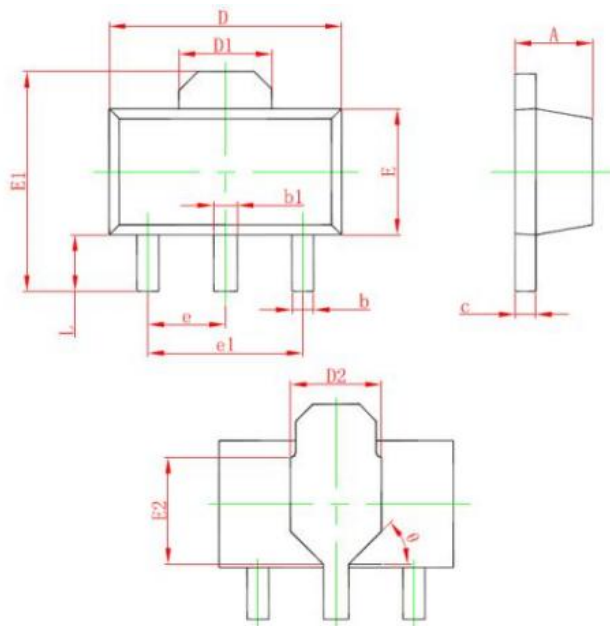
### Package Marking and Dimensions



- Line1 (fixed): fixed code H0606E
- 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



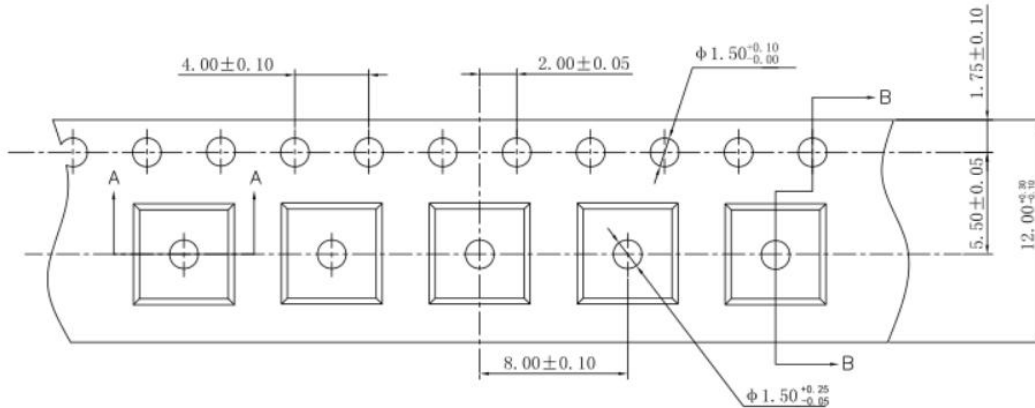
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
D2	1.750 REF.		0.069 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
E2	1.900 REF.		0.075 REF.	
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047
θ	45°		45°	

#### Package Dimensions



### Tape and Reel Information

Package Type	Reel Size(inch)	Qty/Reel(pcs)	Qty/Box(pcs)	Qty/Carton(pcs)
SOT89	7inches	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	

### 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 3.2	Product	March 2023	New format based on English version datasheet
Rev 3.3	Product	March 2024	Version released after re review



# HTL7G06S006P

## 6W, 1.8 - 600 MHz LDMOS Amplifier

Product datasheet

### 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)

For technical questions and application information:

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

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