

Description

The HTU7G06S0P6P is an unmatched discrete LDMOS Power Amplifier with 0.6W saturated output power covering frequency range for VHF/UHF applications.

Features

- Operating Frequency Range: VHF/UHF
- Operating Drain Voltage: +4V
- Saturation Output Power: 0.8W
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design

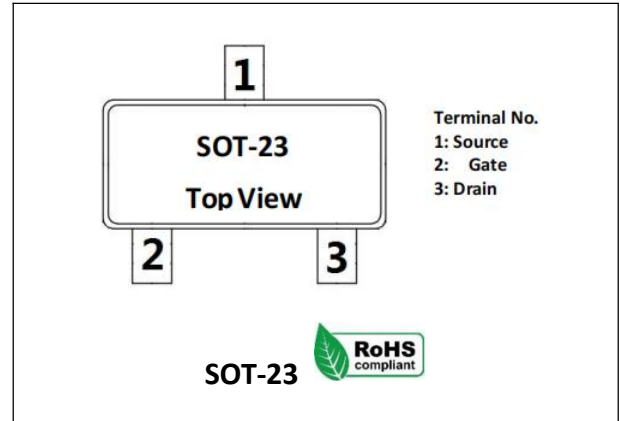
| Freq (MHz) | Vdd (V) | Pin (W) | Pout (W) | Eff (%) |
|------------|---------|---------|----------|---------|
| 400-470 | 4.0 | 0.10 | 0.82 | 67.8 |

Test conditions unless otherwise noted: 25 °C,

$V_{DD} = +4V_{dc}$, $I_{DQ} = 50mA$, 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 |
|------------------|-------------------|
| HTU7G06S0P6P | Reel Package |
| HTU7G06S0P6P EVB | 400 - 470 MHz EVB |

Absolute Maximum Ratings

| Parameter | Range/Value | Unit |
|--|-------------|------|
| Drain voltage (V_{DSS}) | -0.5 to +17 | V |
| Gate voltage (V_{GS}) | -5 to +10 | V |
| Operation voltage (V_{DD}) | +8.5 | V |
| Storage Temperature (T_{STG}) | -55 to +150 | °C |
| Junction Temperature (T_J) | -40 to +150 | °C |
| Thermal Resistance Junction to Case (R_{TH}) | 75 | °C/W |

Electrical Specification

DC Characteristics

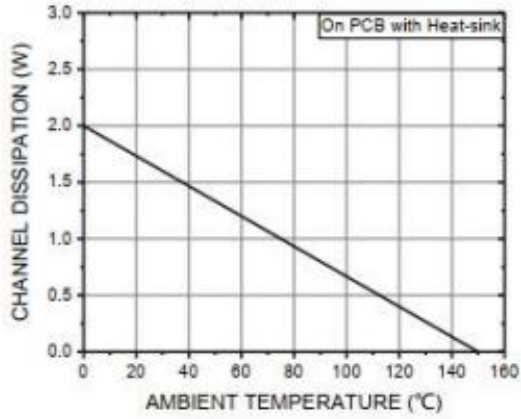
| Parameter | Conditions | Min | Typ | Max | Unit |
|--|--------------------------------|-----|-----|-----|---------|
| Breakdown Voltage $V_{(BR)DSS}$ | $V_{GS}=0V, I_{DS}=8\mu A$ | 17 | - | - | V |
| Gate-Source Threshold Voltage $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_{DS}=8\mu A$ | 0.5 | 1.0 | 1.5 | V |
| Drain Leakage Current I_{DSS} | $V_{GS}=0V, V_{DS}=17V$ | - | - | 1 | μA |
| Gate Leakage Current I_{GSS} | $V_{GS}=10V, V_{DS}=0V$ | - | - | 1 | μA |

Load Mismatch Test

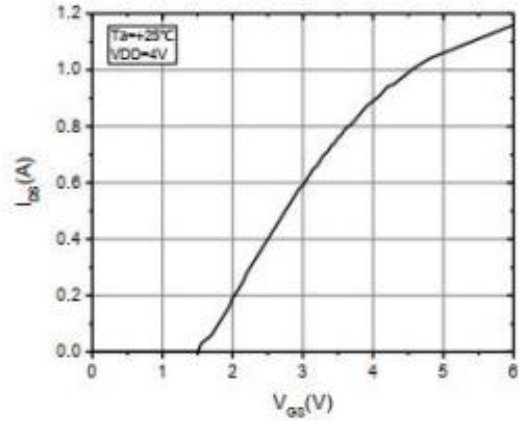
| Condition | Test Result |
|--|-----------------------|
| VSWR=20:1, at all Phase Angles, $V_{DD} = +4.2V_{dc}$, $I_{DQ} = 50mA$, CW signal 29.5 dBm @435MHz test on WATECH Application Board | No Device Degradation |
| VSWR=20:1, at all Phase Angles, $V_{DD} = +8.4V_{dc}$, $I_{DQ} = 50mA$, CW signal 28.4 dBm @435MHz test on WATECH Application Board | No Device Degradation |

DC Performance

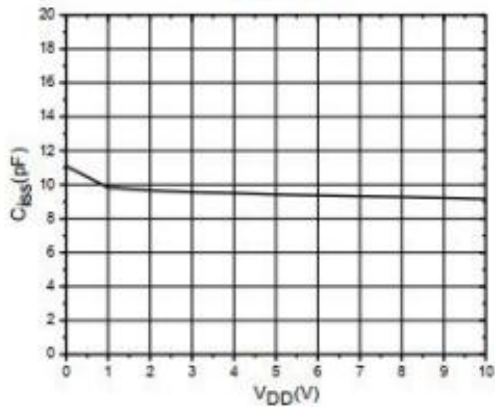
**CHANNEL DISSIPATION VS.
AMBIENT TEMPERATURE**



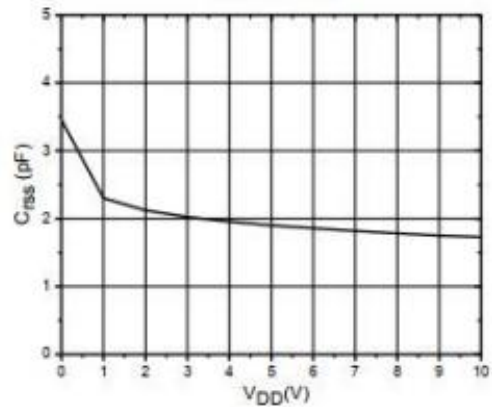
I_{DS} VS. V_{GS}



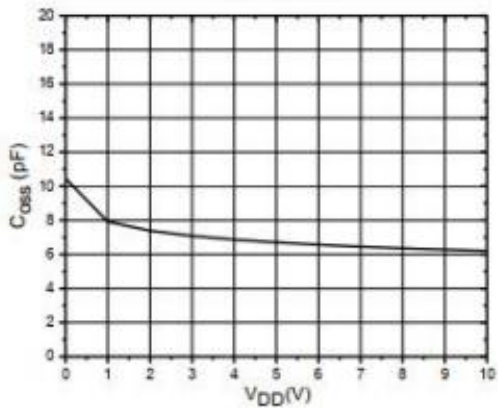
C_{iss} VS. V_{DD}



C_{rss} VS. V_{DD}

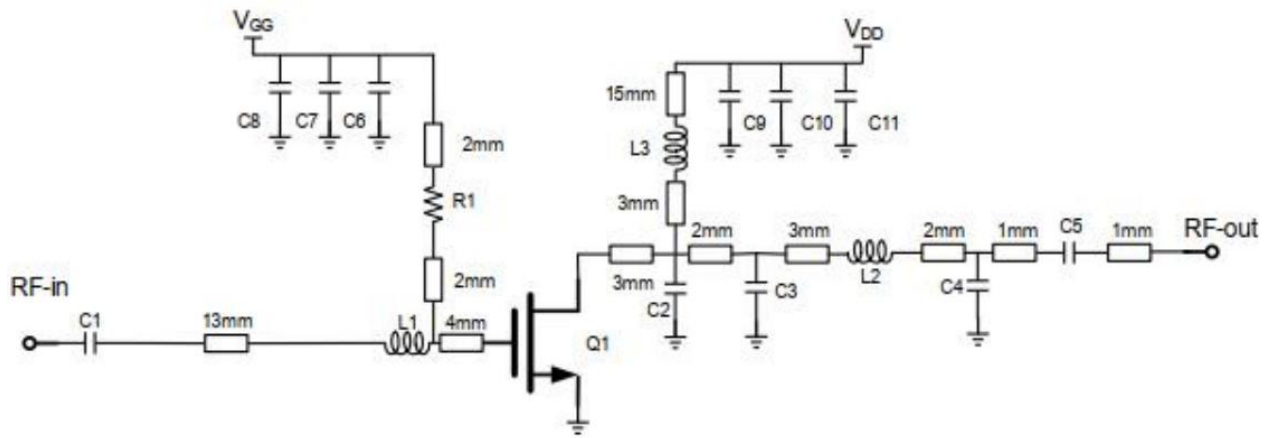


C_{oss} VS. V_{DD}



Test conditions unless otherwise noted: 25 °C

HTU7G06S0P6P 400 - 470 MHz Reference Design, 4.0V@50mA

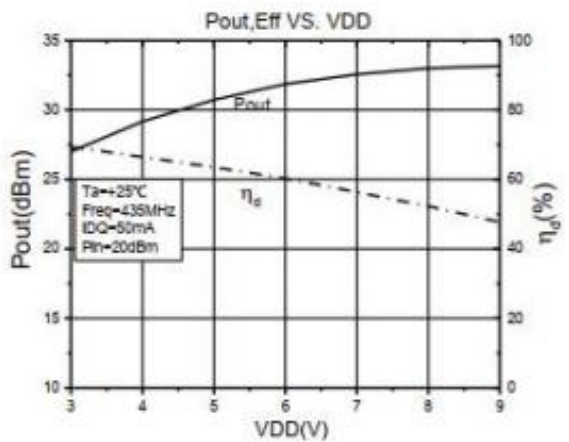
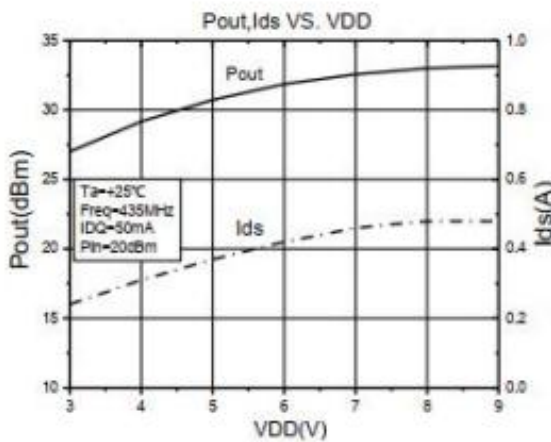
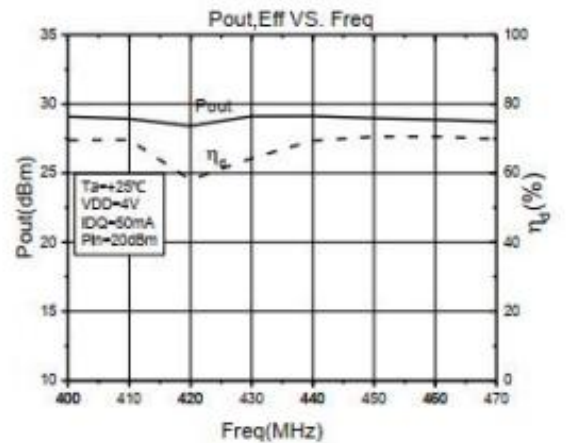
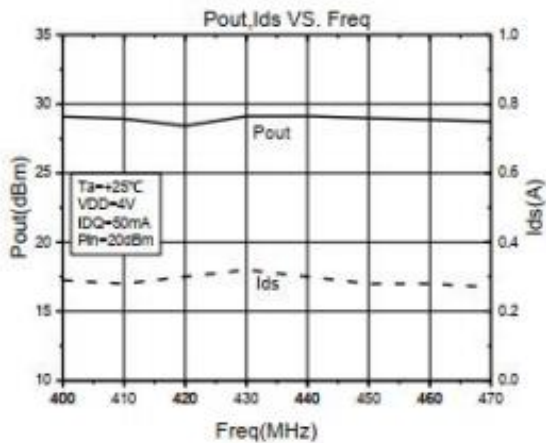
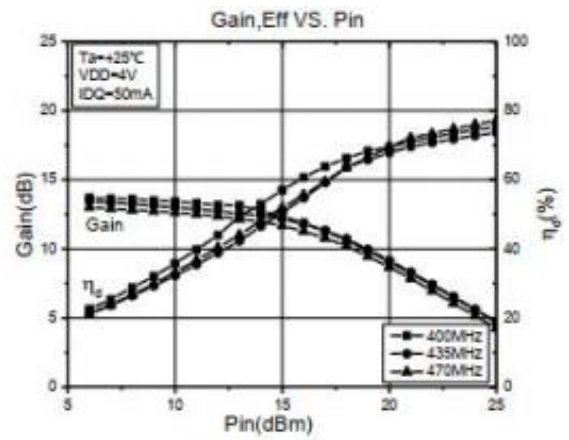
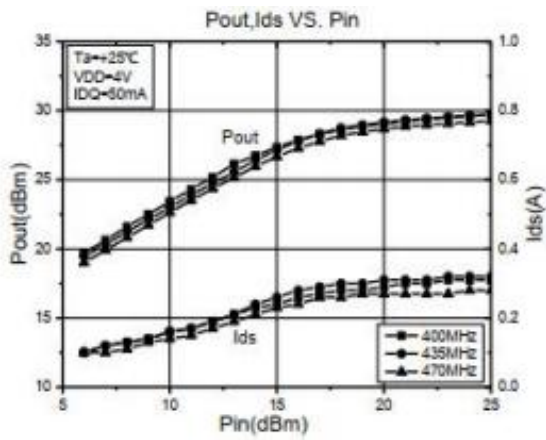


EVB Layout

BoM - HTU7G06S0P6P 400 - 470 MHz Reference Design, 4.0V@50mA

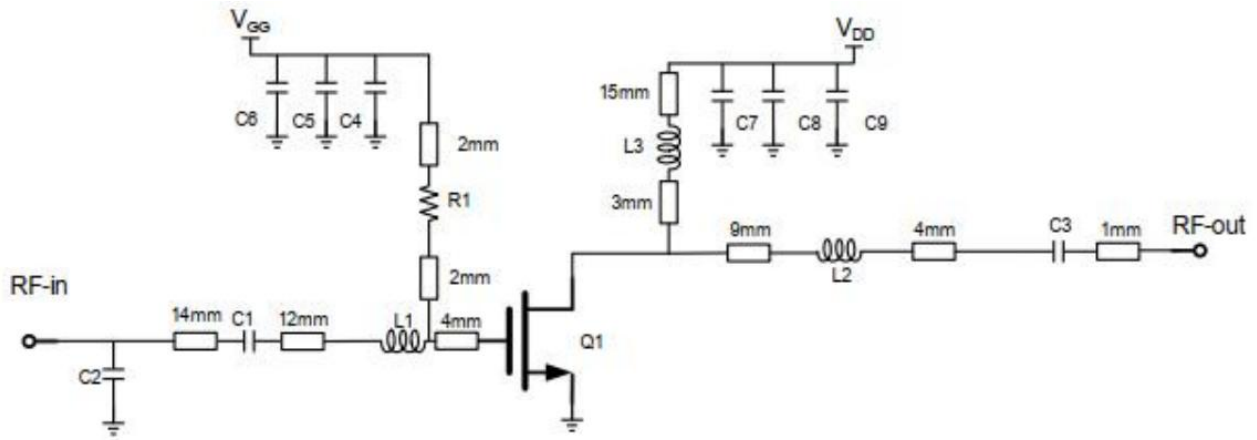
| Reference | Value | Description | Manufacturer | P/N |
|----------------|---|----------------------------------|--------------|--------------------|
| Q1 | - | 0.6W, 1.8 - 1000 MHz LDMOS PA | Watech | HTU7G06S0P6P |
| C1, C5, C6, C9 | 100pF | MLCC | Murata | GRM1885C1H101A01 |
| C2 | 18pF | MLCC | Murata | GRM1885C1H180JA01 |
| C4 | 4pF | MLCC | Murata | GRM1885C1H4R0JA01 |
| C3 | 9pF | MLCC | Murata | GRM1885C1H9R0JA01 |
| C7,C10 | 1nF | MLCC | Murata | GRM1885C1H102JA01 |
| C8,C11 | 10uF | MLCC | Murata | GRM32ER61H105KA12L |
| L1 | 5.6nH/0603 | | - | - |
| L2 | D: 0.4 mm, Inside: 1.2 mm, 3 Turns | | - | Enameled wire |
| L3 | D: 0.4 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@50mA



Test conditions unless otherwise noted: 25 °C, VDD = +4Vdc, IDQ=50mA, CW test on WATECH Application Board

HTU7G06S0P6P 400 - 470 MHz Reference Design, 7.2V@50mA

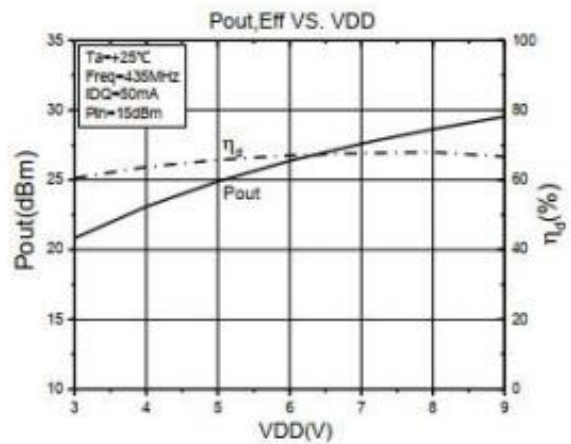
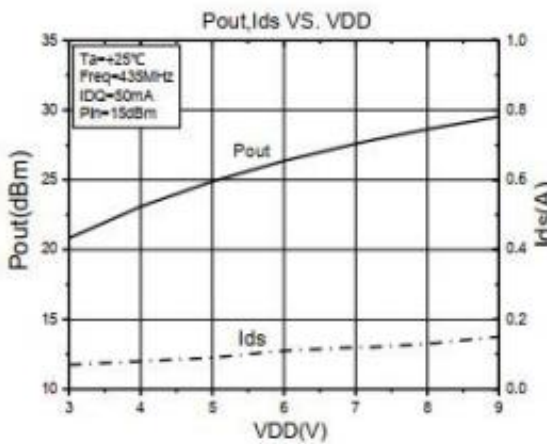
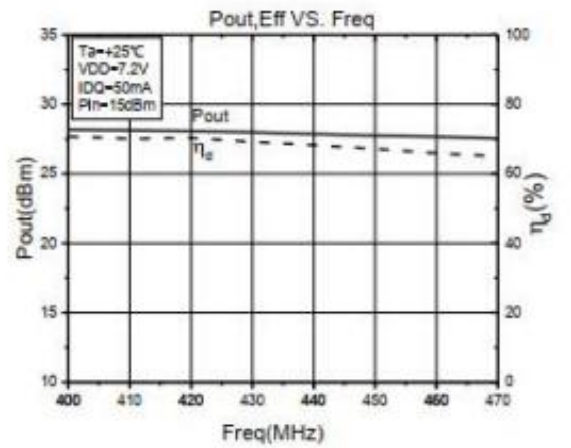
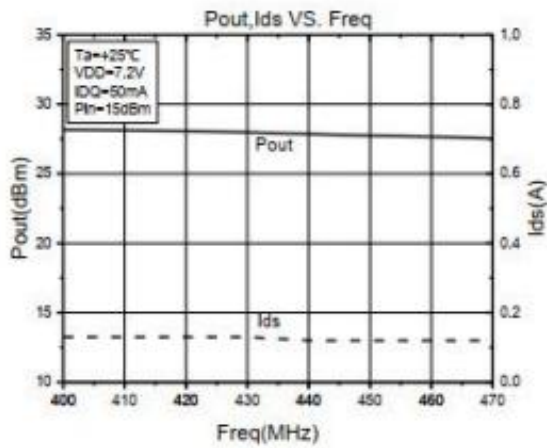
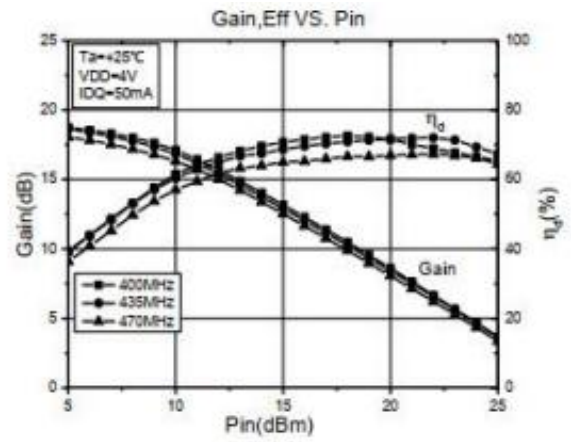
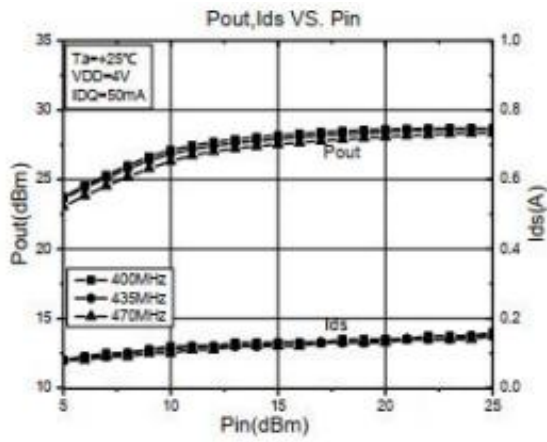


EVN Layout

BoM - HTU7G06S0P6P 400 - 470 MHz Reference Design, 7.2V@50mA

| Reference | Value | Description | Manufacturer | P/N |
|-------------|---|----------------------------------|--------------|--------------------|
| Q1 | - | 0.6W, 1.8 - 1000 MHz LDMOS PA | Watech | HTU7G06S0P6P |
| C1,C3,C4,C7 | 100pF | MLCC | Murata | GRM1885C1H101A01 |
| C2 | 8pF | MLCC | Murata | GRM1885C1H8R0JA01 |
| C7,C10 | 1nF | MLCC | Murata | GRM1885C1H102JA01 |
| C8,C11 | 1uF | MLCC | Murata | GRM32ER61H105KA12L |
| L1 | 5.6nH/0603 | | - | - |
| L2 | D: 0.4 mm, Inside: 1.2 mm, 4 Turns | | - | Enameled wire |
| L3 | D: 0.4 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, 7.2V@50mA



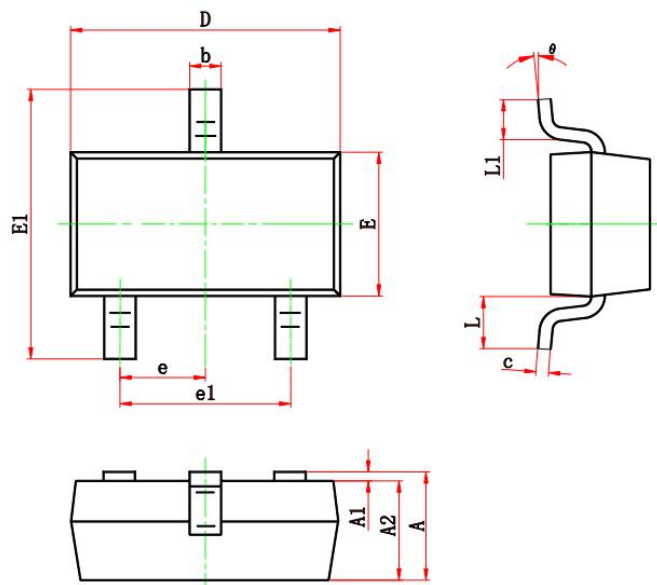
Test conditions unless otherwise noted: 25 °C, VDD = +7.2Vdc, IDQ=50mA, CW test on WATECH Application Board

Package Marking and Dimensions



- Line1 (fixed): fixed code SP6A.
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

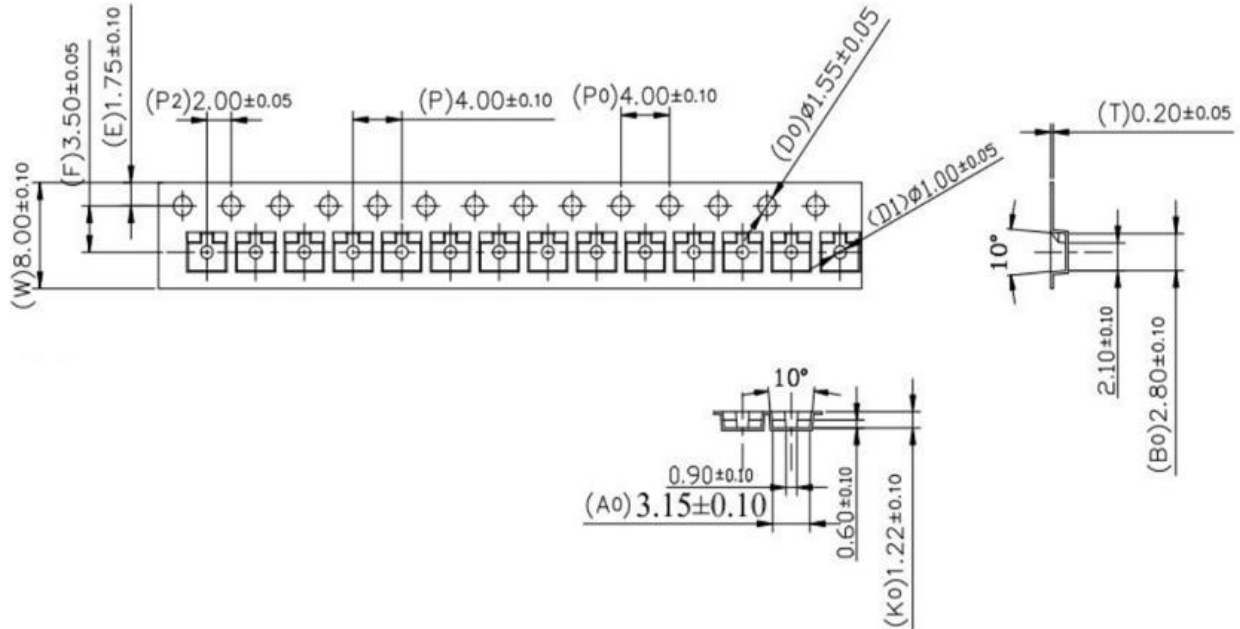


| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.150 | 0.000 | 0.006 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 6° |

Package Dimensions

Tape and Reel Information

| Package Type | Reel Size(inch) | Qty/Reel(pcs) | Qty/Box(pcs) | Qty/Carton(pcs) |
|--------------|-----------------|---------------|--------------|-----------------|
| SOT23 | 7inch | 3000 | 30000 | 120000 |



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

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

Revision history

| Document ID | Datasheet Status | Release Date | Revision Version |
|-------------|------------------|--------------|---|
| Rev 2.8 | Product | March 2023 | New format based on English version datasheet |
| Rev 2.9 | Product | March 2024 | Version released after re review |



HTU7G06S0P6P

0.6W, 1.8 - 1000 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

Important Notice

Information in this document is believed to be accurate and reliable. However, WATECH does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

“Typical” parameters are the average values expected by WATECH in large quantities and are provided for information purposes only. All information and specifications contained herein are subject to change without notice and customers should obtain and verify the latest relevant information before placing orders for WATECH products.

The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information.

Applications that are described herein for any of these products are for illustrative purposes only. WATECH makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification. Customers are responsible for the design and operation of their applications and products using WATECH products, and WATECH accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the WATECH product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third-party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

WATECH products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of a WATECH product can reasonably be expected to result in personal injury, death or severe property or environmental damage. This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.