HTU7G06S002P

2W, 1.8 - 1000 MHz LDMOS Amplifier

Product datasheet

Description

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

Features

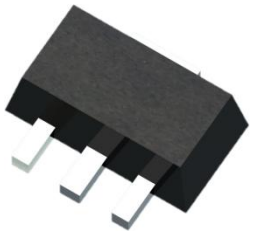
- Operating Frequency Range: VHF/UHF
- Operating Drain Voltage: +4V
- Saturation Output Power: 2W
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design

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_{DD} = +4Vdc, I_{DQ}= 300mA, CW Signal

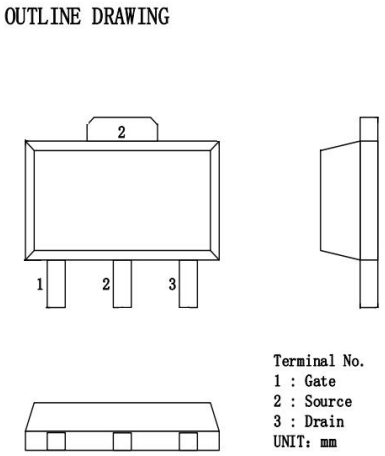
Applications

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



SOT-89-3L
HTU7G06S002P

RoHS compliant



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

Pin Connections

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 $V_{(BR)DSS}$	Vgs=0V, Ids=39.6uA	12	-	-	V
Gate-Source Threshold Voltage $V_{GS(th)}$	Vds=Vgs, Ids=8uA	0.6	0.9	1.2	V
Drain Leakage Current I_{DSS}	Vgs=0V, Vds=12V	-	-	1	uA
Gate Leakage Current I_{GSS}	Vgs=10V, Vds=0V	-	-	1	uA

Load Mismatch Test

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

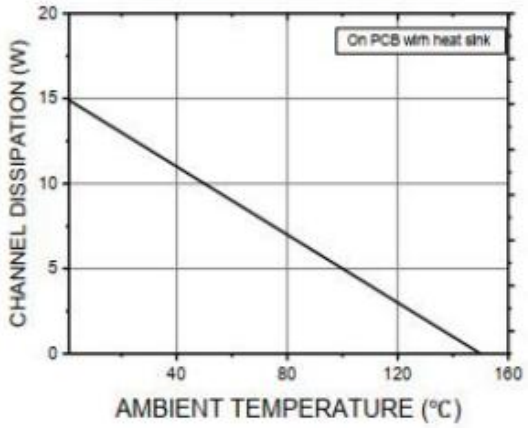
RF Characteristics (CW)

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

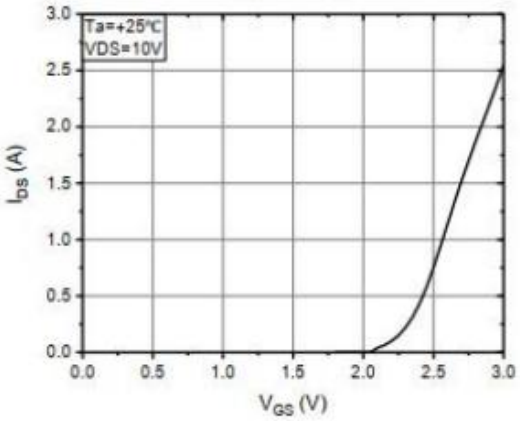
Test conditions unless otherwise noted: 25 °C test on HOTLO Application Board

DC Performance

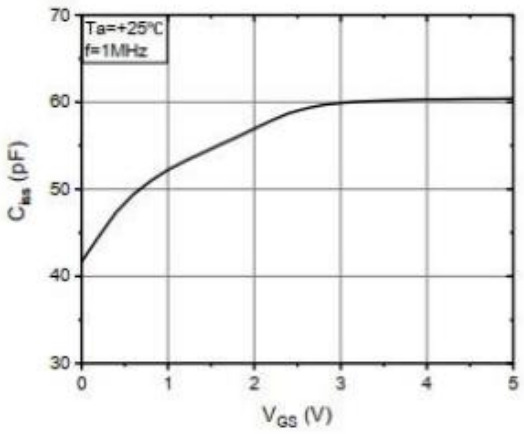
CHANNEL DISSIPATION VS. AMBIENT TEMPERATURE



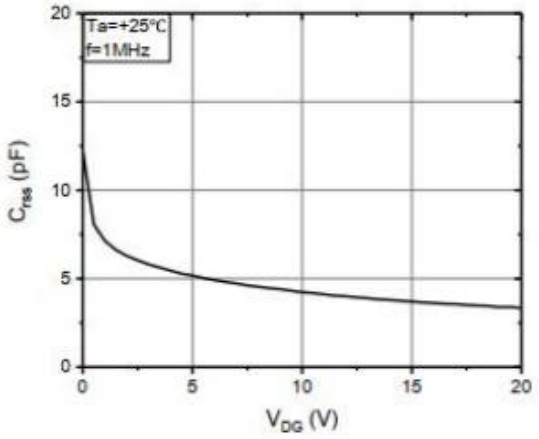
I_{DS} VS. V_{GS}



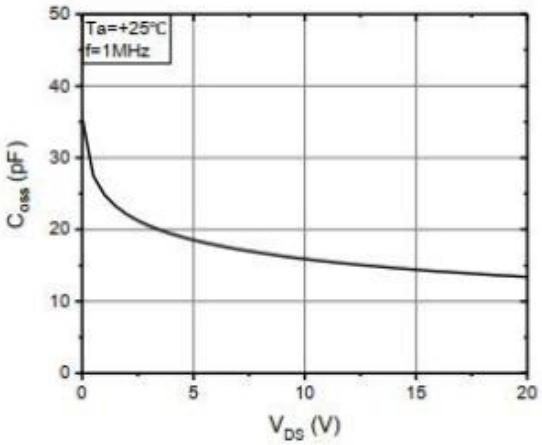
C_{iss} VS.V_{GS}



C_{rss} VS. V_{DS}

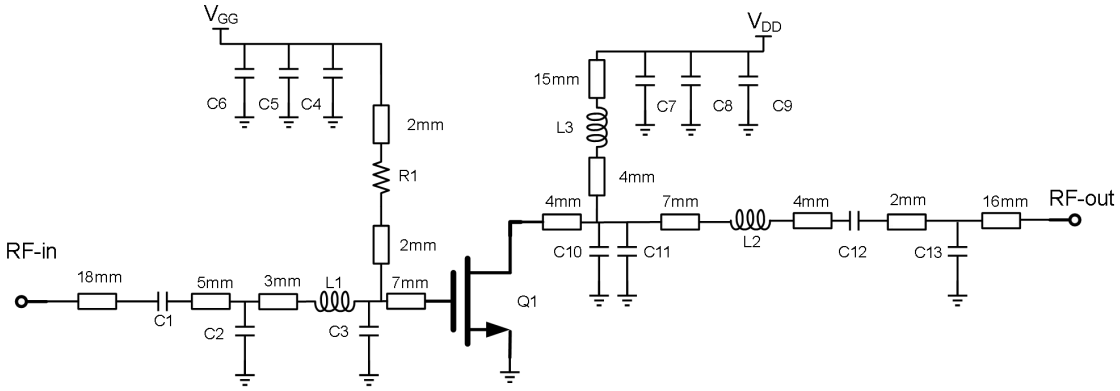


C_{oss} VS.V_{DS}



Test conditions unless otherwise noted: 25 °C

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



EVB Layout

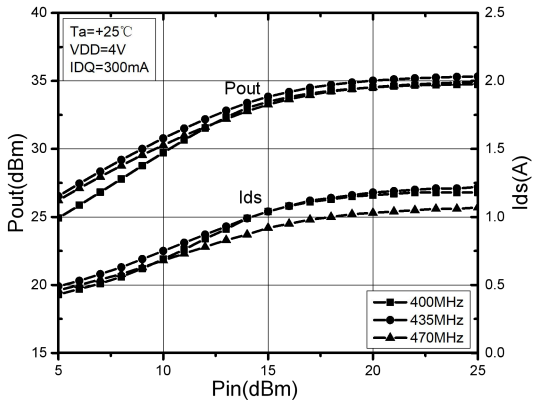
BoM - HTU7G06S002P 400 - 470 MHz Reference Design, 4.0V@300mA

Reference	Value	Description	Manufacturer	P/N
Q1	-	2W, 1.8 - 1000 MHz LDMOS PA	Holto	HTU7G06S002P
C6, C10, C13	100 pF	MLCC	muRata	GRM1885C1H101JA01
C1	33pF	MLCC	muRata	GRM1885C1H330JA01
C2	22 pF	MLCC	muRata	GRM1885C1H220JA01
C3	12 pF	MLCC	muRata	GRM1885C1H120JA01
C10	27 pF	MLCC	muRata	GRM1885C1H270JA01
C11	18 pF	MLCC	muRata	GRM1885C1H180JA01
C13	8 pF	MLCC	muRata	GRM1885C1H8R0JA01
C6	4.7 uF	MLCC	muRata	GRM32ER61H474KA12L
C5, C8	1 nF	MLCC	muRata	GRM1885C1H102JA01
C9	10 uF	MLCC	muRata	GRM32ER61H105KA12L
L1	1.2 nH	1.2 nH Chip Inductor	muRata	0603
L2	W.D.: 0.40mm, I.D.: 1.5mm, 2 turns		Arbitrary	-
L3	W.D.: 0.35mm, I.D.: 1.5mm, 8 turns		Arbitrary	-

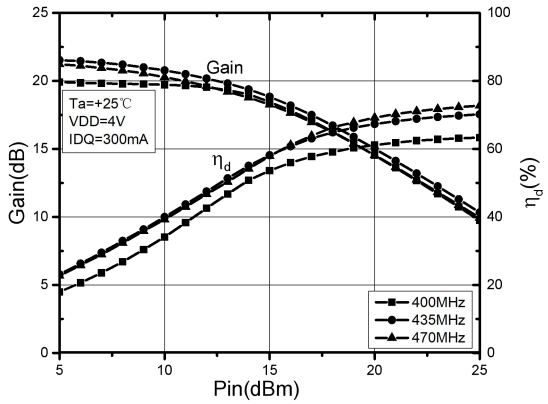
R1	51 Ω	Chip Resistor	Arbitrary	-
PCB	FR-4 (er = 4.3), 30 mil (0.762 mm), 35 µm (1oz)			

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

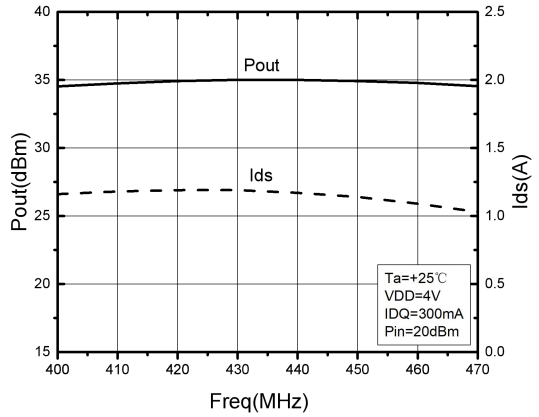
Pout,Ids VS. Pin



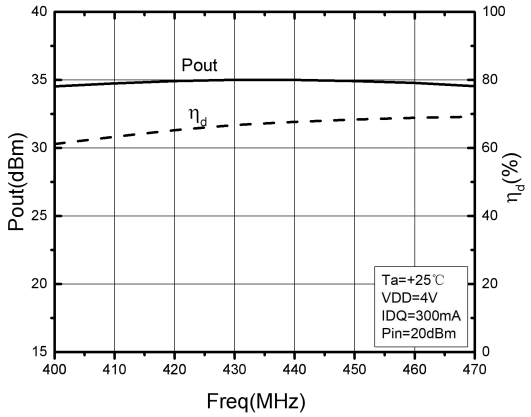
Gain,Eff VS. Pin



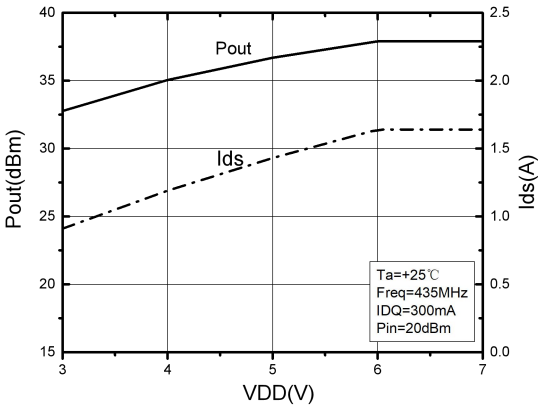
Pout,Ids VS. Freq



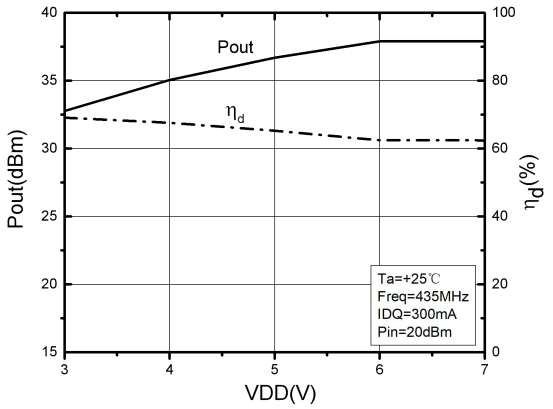
Pout,Eff VS. Freq



Pout,Ids VS. VDD



Pout,Eff VS. VDD



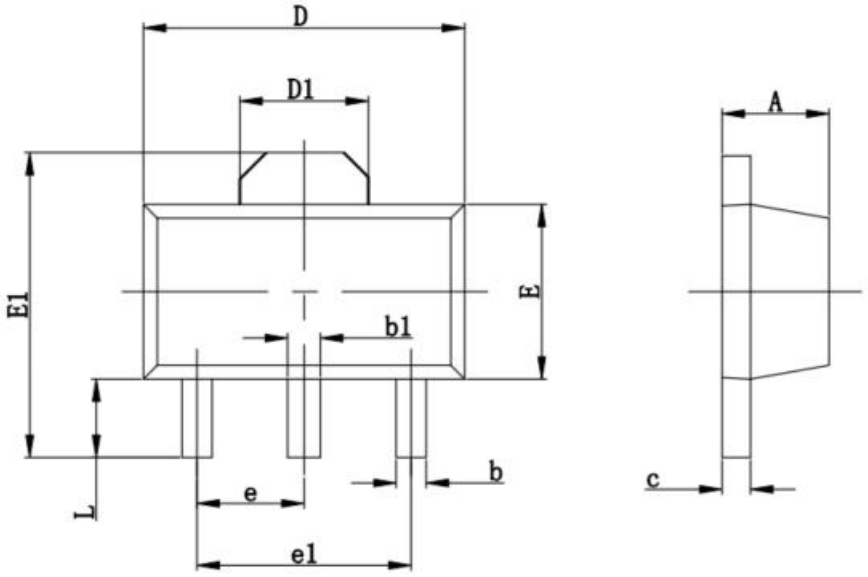
Test conditions unless otherwise noted: 25 °C, VDD = +4Vdc, IDQ=300mA, CW test on HOTLO Application Board

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 “Holto Product Printing Specification”

Marking

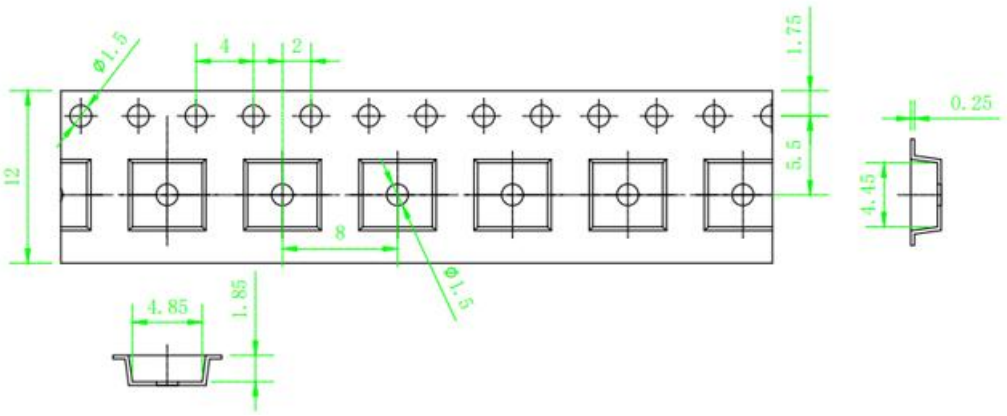


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP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

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 3.3	Product	March 2023	New format based on English version datasheet
Rev 3.4	Product	March 2024	Version released after re review
Rev 3.5	product	April 2024	Upade DC Vth limit

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations and information about HOTLO:

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