

Description

The HTL7G06S009P is an unmatched discrete LDMOS Power Amplifier with 8W saturated output power covering frequency range for VHF/UHF applications.

Features

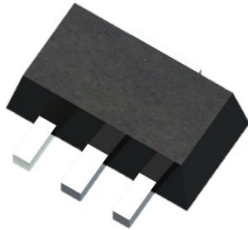
- Operating Frequency Range: VHF/UHF
- Operating Drain Voltage: +3.6V/+7.2V
- Saturation Output Power: 8W
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design

Freq (MHz)	Vdd (V)	Pin (W)	Pout (W)	Eff (%)
400-470	3.6	0.10	2.3	60
400-470	7.2	0.32	8.0	60
136-174	7.2	0.32	8.5	60


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

Applications

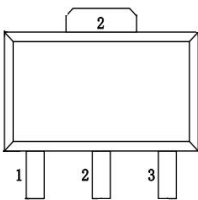

- VHF Band handheld Walkie-talkie
- UHF Band handheld Walkie-talkie
- 1.8-1000MHz other application Drivers or Final stage Amplifiers



SOT-89-3L
HTL7G06S009P



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
HTL7G06S009P	Reel Package
HTL7G06S009P EVB	136 - 174 MHz EVB
HTL7G06S009P EVB1	400 - 470 MHz EVB

Absolute Maximum Ratings

Parameter	Range/Value	Unit
Drain voltage (V_{DSS})	-0.5 to +25	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 $V_{(BR)DSS}$	$V_{GS}=0V, I_{DS}=39.6\mu A$	25	-	-	V
Gate-Source Threshold Voltage $V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=39.6\mu A$	1.2	1.5	1.8	V
Drain Leakage Current I_{DSS}	$V_{GS}=0V, V_{DS}=12V$	-	-	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, $V_{DD} = +8.4V_{dc}$, $I_{DQ} = 200mA$, CW signal 38.5 dBm @435MHz test on WATECH Application Board	No Device Degradation

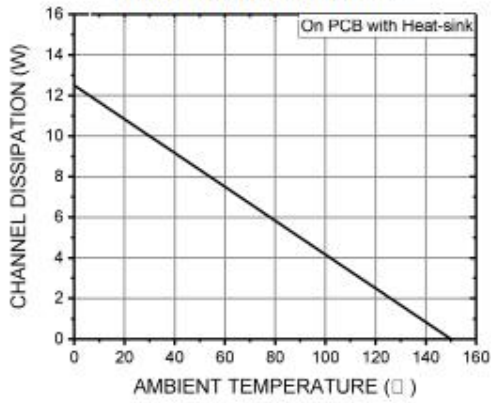
RF Characteristics (CW)

Freq (MHz)	Vdd (V)@Idq (mA)	Pin (W)	Pout (W)	Eff (%)
174	7.2@200	0.32	8.8	65
435	7.2@200	0.32	8.6	65

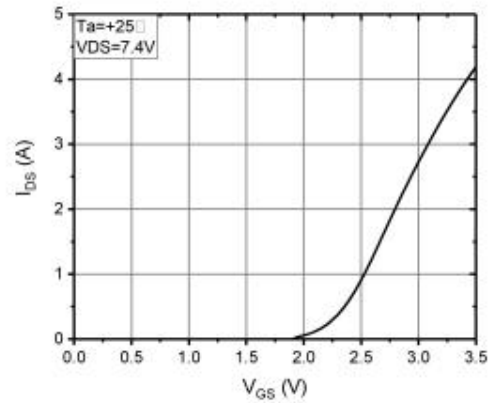
Test conditions unless otherwise noted: 25 °C test on WATECH Application Board

DC Performance

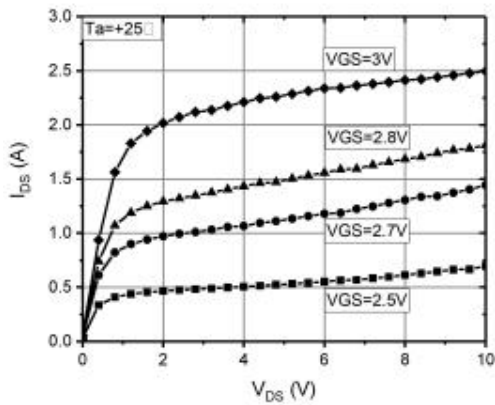
CHANNEL DISSIPATION VS. AMBIENT TEMPERATURE



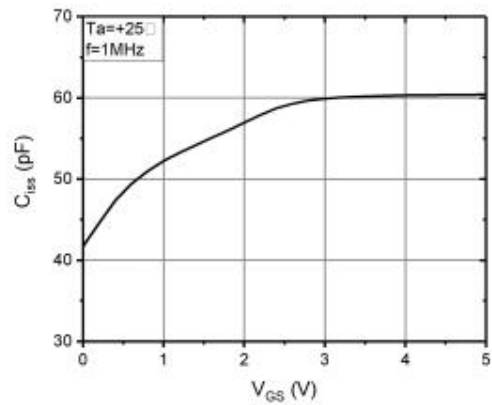
I_{DS} VS. V_{GS}



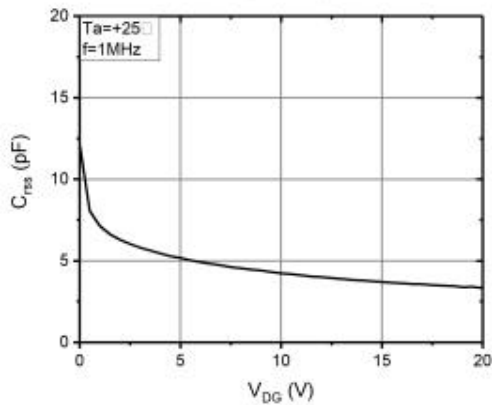
I_{DS} VS. V_{DS}



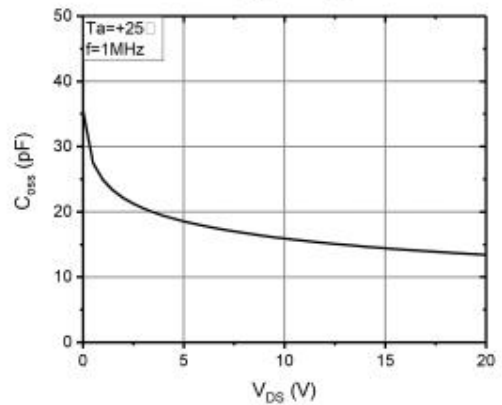
C_{iss} VS. V_{GS}



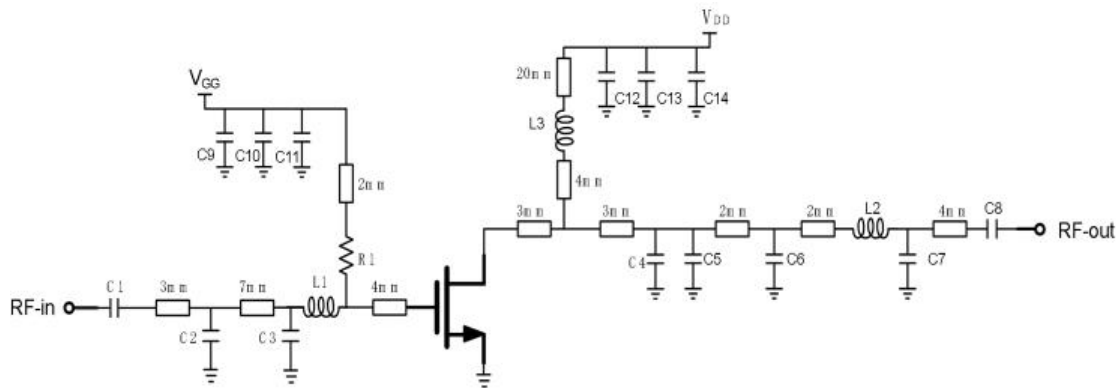
C_{rss} VS. V_{DS}



C_{oss} VS. V_{DS}

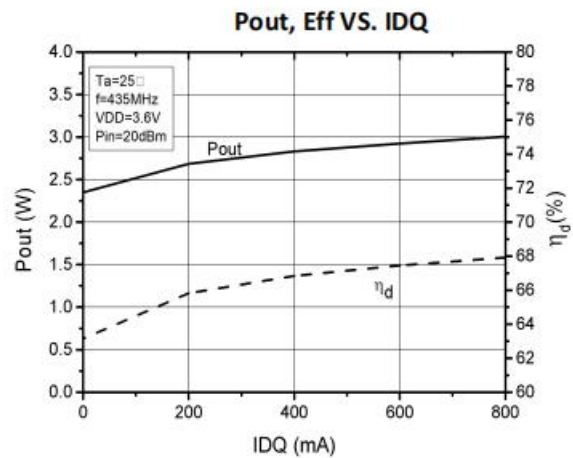
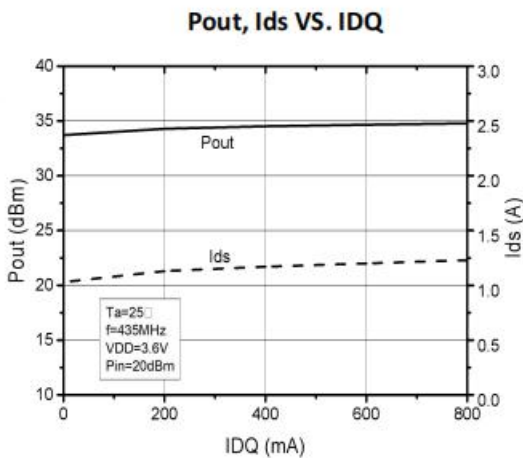
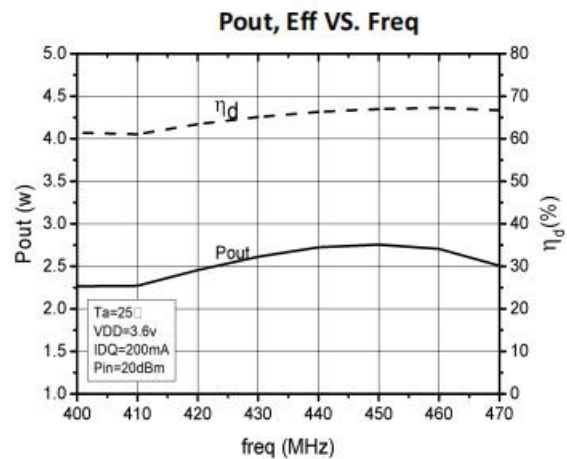
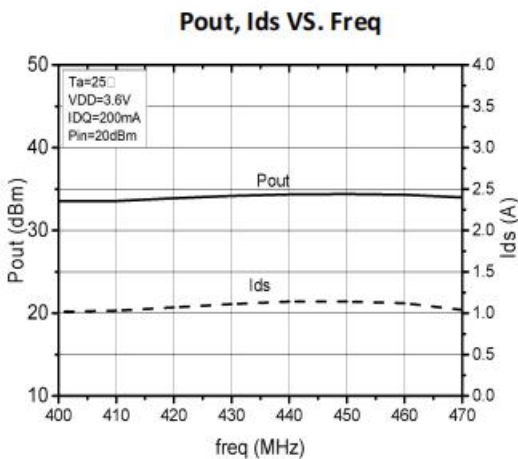
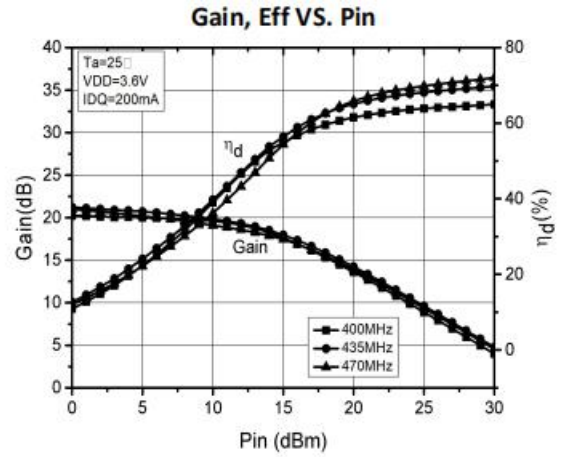
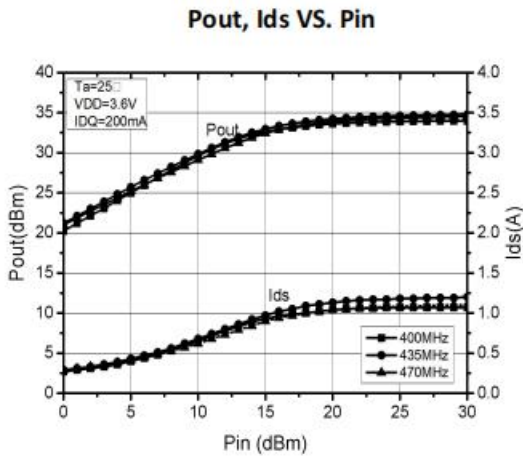


Test conditions unless otherwise noted: 25 °C

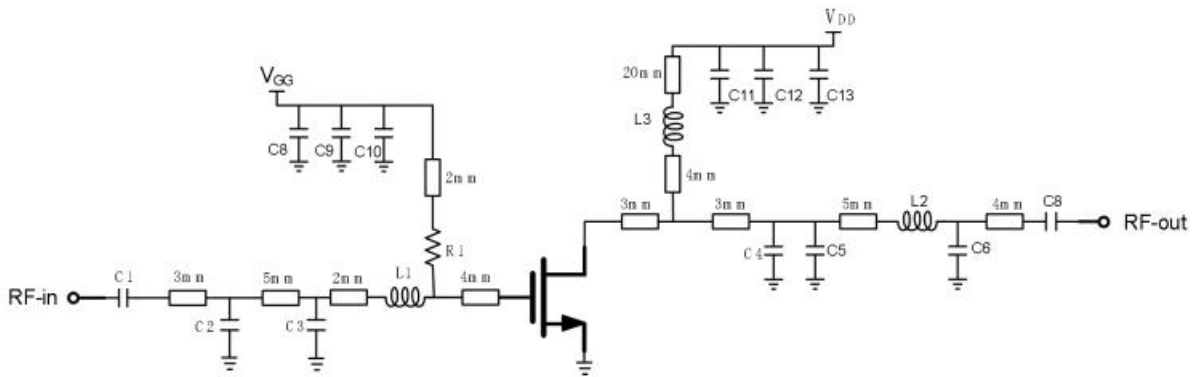
HTL7G06S009P 400 - 470 MHz Reference Design, 3.6V@200mA

EVB Layout
BoM - HTL7G06S009P 400 - 470 MHz Reference Design, 3.6V@200mA

Reference	Value	Description	Manufacturer	P/N
Q1	-	8W, 1.8 - 1000 MHz LDMOS PA	Watech	HTL7G06S009P
C1, C8, C11, C14	100pF	MLCC	Murata	GRM1885C1H101JA01
C2	15pF	MLCC	Murata	GRM1885C1H150JA01
C3	12pF	MLCC	Murata	GRM1885C1H120JA01
C4, C6	20pF	MLCC	Murata	GRM1885C1H200JA01
C5	6pF	MLCC	Murata	GRM1885C1H6R0JA01
C7	7pF	MLCC	Murata	GRM1885C1H7R0JA01
C9	4.7uF	MLCC	Murata	GRM32ER61H474KA12L
C10, C13	1nF	MLCC	Murata	GRM1885C1H102JA01
C12	10uF	MLCC	Murata	GRM32ER61H105KA12L
L1	2.7nH/0603		Murata	GRM1885C1H272JA01
L2	D: 0.31 mm, Inside: 1.2 mm, 4 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, 3.6V@200mA

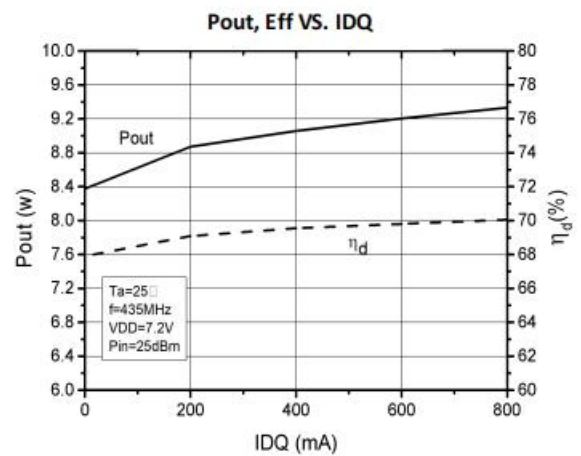
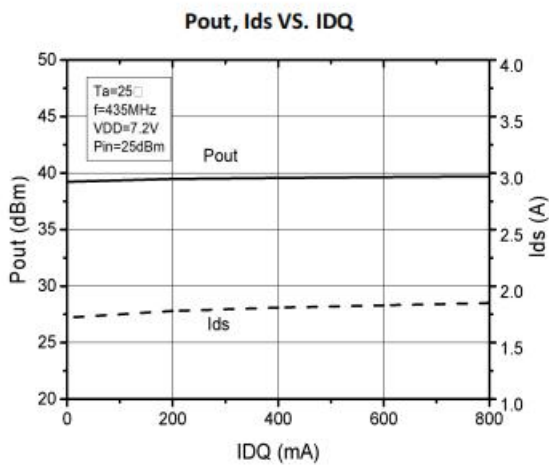
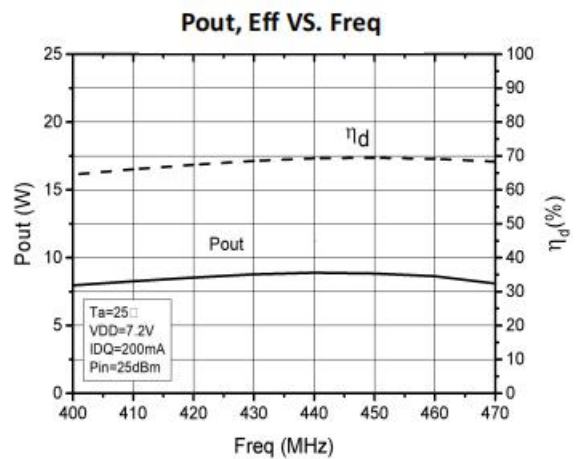
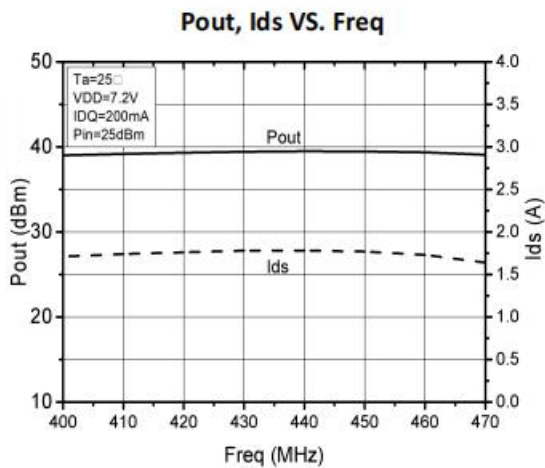
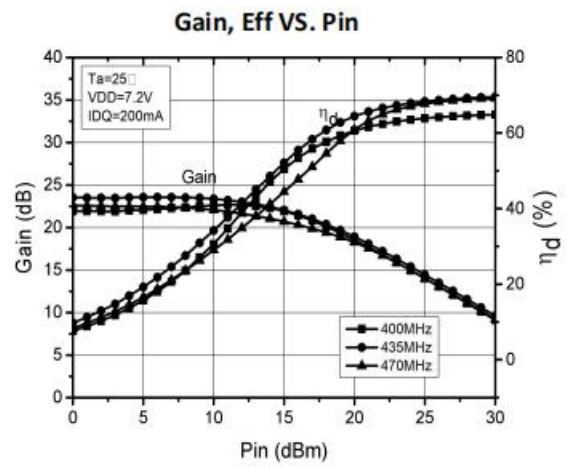
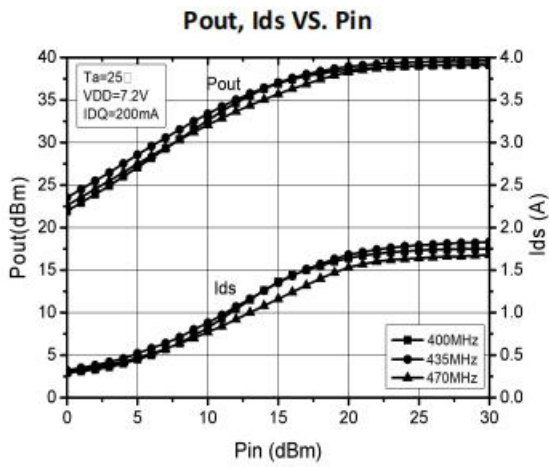


Test conditions unless otherwise noted: 25 °C, VDD = +3.6Vdc, IDQ=200mA, CW test on WATECH Application Board

HTL7G06S009P 400 - 470 MHz Reference Design, 7.2V@200mA

EVB Layout
BoM - HTL7G06S009P 400 - 470 MHz Reference Design, 7.2V@200mA

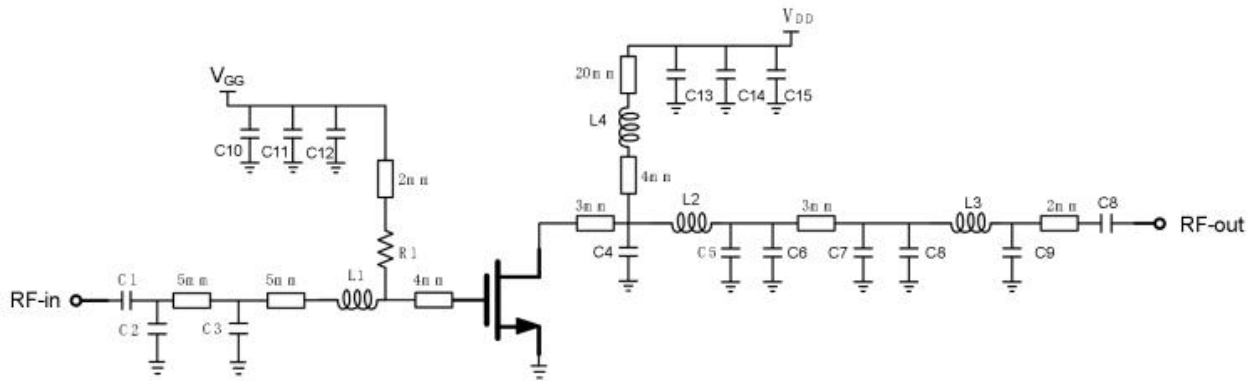
Reference	Value	Description	Manufacturer	P/N
Q1	-	0.6W, 1.8 - 1000 MHz LDMOS PA	Watech	HTL7G06S009P
C1,C7, C10, C13	100pF	MLCC	Murata	GRM1885C1H101JA01
C2, C3	15pF	MLCC	Murata	GRM1885C1H150JA01
C4, C5	22pF	MLCC	Murata	GRM1885C1H220JA01
C6	8pF	MLCC	Murata	GRM1885C1H8R0JA01
C8	4.7uF	MLCC	Murata	GRM32ER61H474KA12L
C9, C12	1nF	MLCC	Murata	GRM1885C1H102JA01
C11	10uF	MLCC	Murata	GRM32ER61H105KA12L
L1	5.6nH/0603		Murata	GRM1885C1H272JA01
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@200mA



Test conditions unless otherwise noted: 25 °C, VDD = +7.2Vdc, IDQ=200mA, CW test on WATECH Application Board

HTL7G06S009P 136 - 174 MHz Reference Design, 7.2V@200mA



EVB Layout

BoM - HTL7G06S009P 136 - 174 MHz Reference Design, 7.2V@200mA

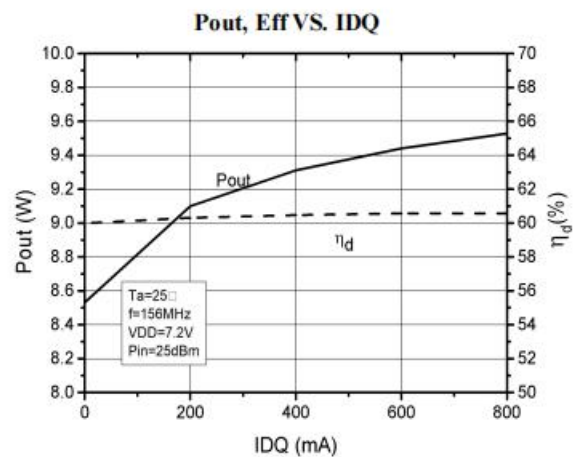
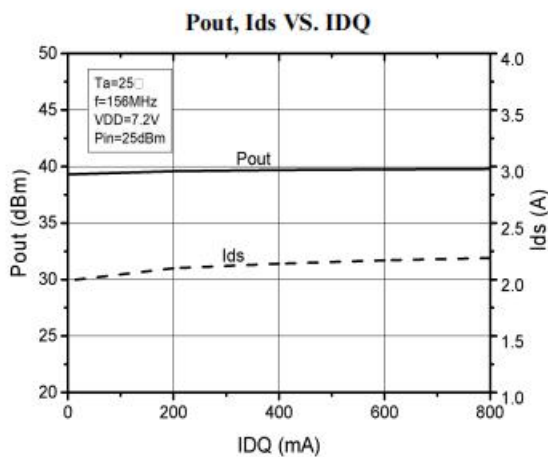
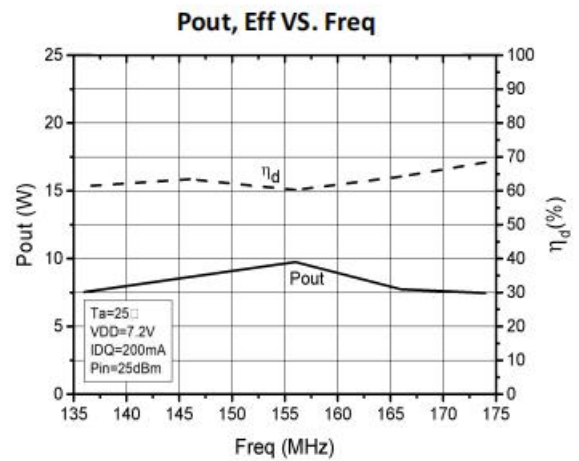
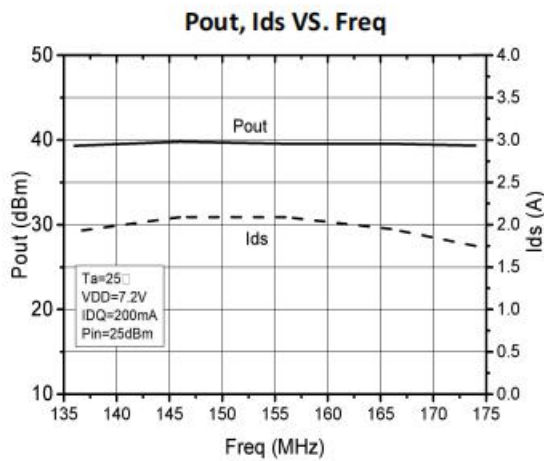
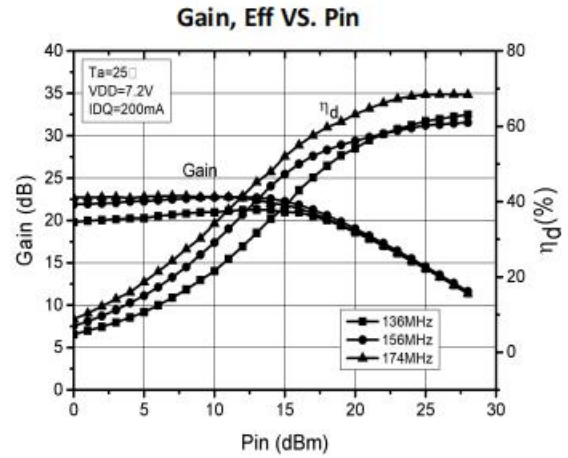
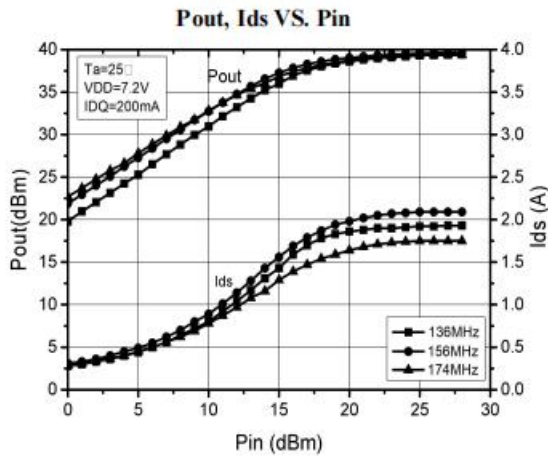
Reference	Value	Description	Manufacturer	P/N
Q1	-	8W, 1.8 - 1000 MHz LDMOS PA	Watech	HTL7G06S009P
C1, C10, C13, C16	100pF	MLCC	Murata	GRM1885C1H101JA01
C2	6pF	MLCC	Murata	GRM1885C1H6R0JA01
C3	27pF	MLCC	Murata	GRM1885C1H270JA01
C4	150pF	MLCC	Murata	GRM1885C1H151JA01
C5,C7	22pF	MLCC	Murata	GRM1885C1H220JA01
C6	18pF	MLCC	Murata	GRM1885C1H180JA01
C8	2pF	MLCC	Murata	GRM1885C1H2R0JA01
C9	10pF	MLCC	Murata	GRM1885C1H100JA01
C12, C15	1nF	MLCC	Murata	GRM1885C1H102JA01
C11	4.7uF	MLCC	Murata	GRM32ER61H474KA12L
C14	10uF	MLCC	Murata	GRM32ER61H105KA12L



HTL7G06S009P
8W, 1.8 - 1000 MHz LDMOS Amplifier
Product datasheet

Reference	Value	Description	Manufacturer	P/N
L1		39nH/0603	-	GRM1885C1H393A01
L2, L3		D: 0.4 mm, Inside: 1.2 mm, 3 Turns	-	Enameled wire
L4		D: 0.31mm, Inside: 1.5 mm, 9 Turns	-	Enameled wire
R1	50 Ω	Thick Film Resistor	-	-
PCB		FR-4 (er = 4.3), 30 mil (0.762 mm), 35 μ m (1oz)		

Performance Plots 136 - 174 MHz Reference Design, 7.2V@200mA

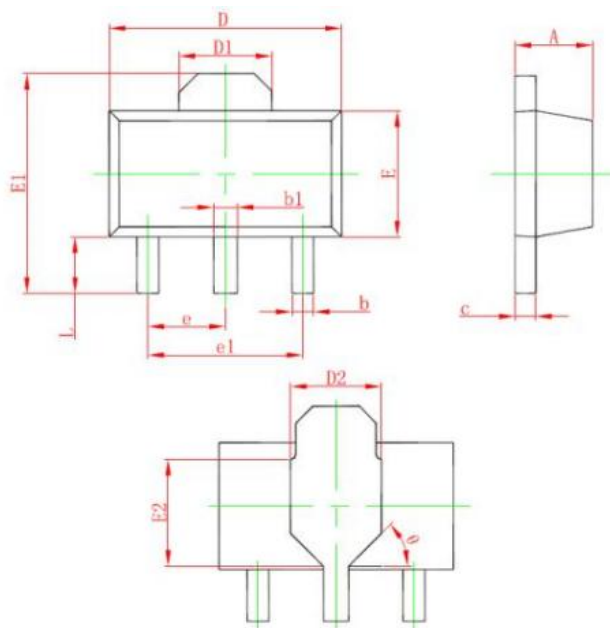


Test conditions unless otherwise noted: 25 °C, VDD = +7.2Vdc, IDQ=200mA, CW test on WATECH Application Board

Package Marking and Dimensions


- Line1 (fixed): fixed code H0609A
- 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”

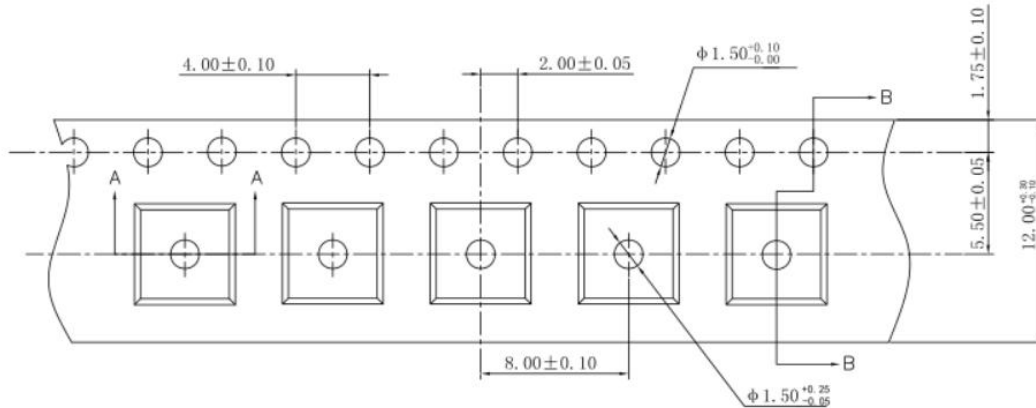
Marking


Symbol	Dimesions in Milimeters		Dimesions 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

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

Revision history

Document ID	Datasheet Status	Release Date	Revision Version
Rev 3.0	Product	July 2021	The silkscreen was updated to "H0609A". The company name was updated to "Suzhou Watech Electronics Technology Co. Ltd."
Rev 3.1	Product	March 2023	New format based on English version datasheet
Rev 3.2	Product	March 2024	Version released after re review



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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