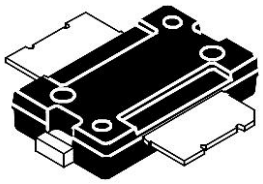
HTM9G06S075P

75W, 1.8 - 520 MHz LDMOS Amplifier

Preliminary datasheet

Description

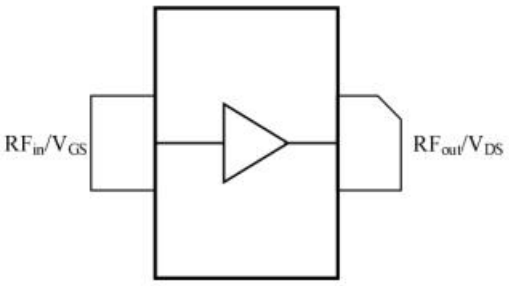
The HTM9G06S075P is an unmatched discrete LDMOS Power Amplifier with 75W saturated output power covering frequency range from 1.8 - 520 MHz, designed for mobile two-way radio applications with high gain, good ruggedness and broadband performance to make it ideal for large-signal, common source amplifier applications in mobile radio equipment.



TO270-2L

Over-Molded 2 leads (Straight)

HTM9G06S075P



(Top View)

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

Pin Connections

Features

- Operating Frequency Range: 1.8 - 520 MHz
- Operating Drain Voltage: 12.5V
- Saturation Output Power: 75W
- Excellent thermal stability due to low thermal resistance package
- Enhanced robustness design without device degradation
- Internally integrated enhanced ESD design

Applications

- Output Stage VHF&UHF Band Mobile Radio

Ordering Information

Part Number	Description
HTM9G06S075P	Reel Package
HTM9G06S075P EVB	450-520MHz EVB

Typical Performance

RF Characteristics (CW)

Freq (MHz)	P3dB (dBm)	Eff (%)@P3dB	Gain (dB)	P5dB (dBm)	Eff(%)@P5dB
520	48.40	69.22	21.37	48.79	71.79

Test conditions unless otherwise noted: 25 °C, VDD = +12.5Vdc, IDQ = 400mA CW test on WATECH Application Board

RF Characteristics (CW)

Freq (MHz)	P3dB (dBm)	Eff (%)@P3dB	Gain (dB)	P5dB (dBm)	Eff(%)@P5dB
450	49.34	65.31	17.55	49.76	68.02
485	48.62	67.58	18.66	49.00	69.93
520	48.49	65.48	18.15	48.89	67.77

Test conditions unless otherwise noted: 25 °C, VDD = +12.5dc, IDQ= 400mA CW test on WATECH Application Board

Absolute Maximum Ratings

Parameter	Range/Value	Unit
Drain voltage (V_{DSS})	-0.5 to +65	V
Gate voltage (V_{GS})	-6 to +10	V
Storage Temperature (T_{STG})	-55 to +150	°C
Junction Temperature (T_J)	+225	°C

Electrical Specification

DC Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Breakdown Voltage $V_{(BR)DSS}$	Vgs=0V, Ids=203uA	60	63	-	V
Gate-Source Threshold Voltage $V_{GS(th)}$	Vgs=Vds, Ids=203uA	0.9	1.2	1.9	V
Drain Leakage Current I_{DSS}	Vgs=0V, Vds=50V	-	0.5	-	uA
Gate Leakage Current I_{GSS}	Vgs=5V, Vds=0V	-	0.05	-	uA

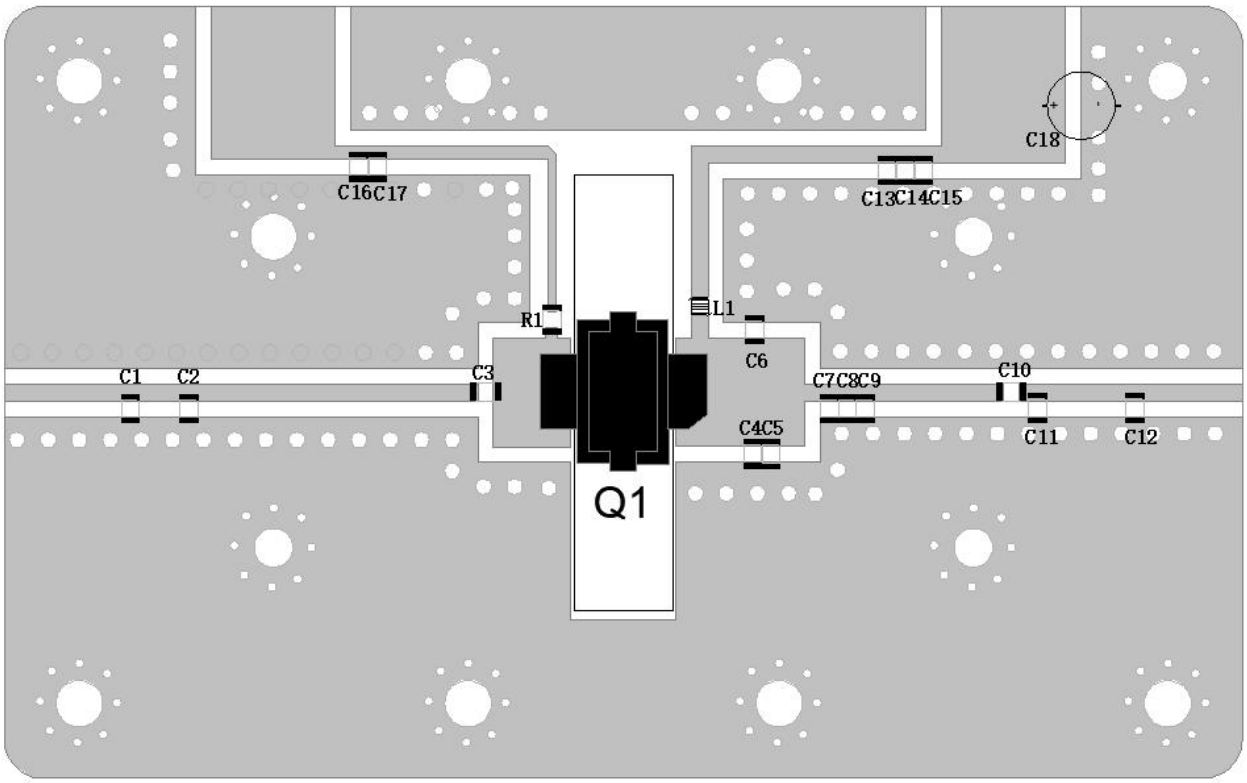
Load Mismatch Test

Condition	Test Result
VSWR=65:1, at all Phase Angles, V_{DD} = +17Vdc, I_{DQ}= 400mA, CW P_{AVG} = 75W, Frequency 520MHz test on WATECH Application Board	No Device Degradation

Thermal Information

Parameter	Condition	Value (Typ)	Unit
Thermal Resistance Junction to Case (R_{TH})	T_{CASE}= 25°C, V_{DD} = +12.5Vdc, I_{DQ}= 400mA, P_{AVG} = 48.88 dBm (75W), CW signal	1.17	°C /W

HTM9G06S075P 450-520MHz Reference Design



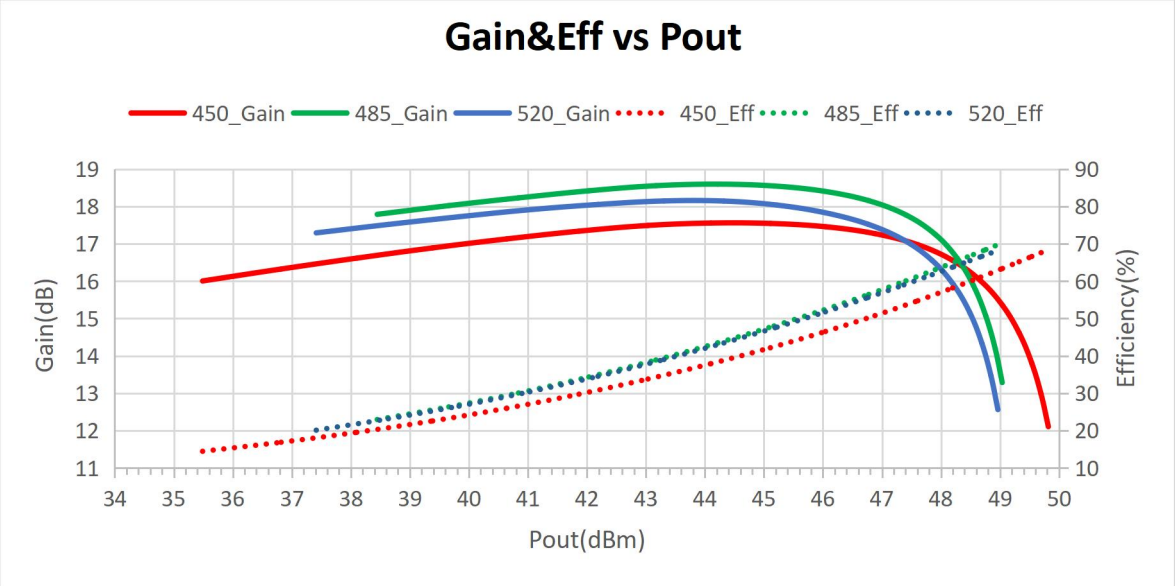
EVB Layout

Bill of Materials (BoM) - HTM9G06S075P 450-520 MHz Reference Design

Reference	Value	Description	Manufacturer	P/N
Q1	-	75W, 450 - 520 MHz LDMOS PA	Watech	HTM9G06S075P
C1,C2	10pF	MLCC	Murata	GRM21A5C2E100FW01
C3	100pF	MLCC	Murata	GRM21A5C2E101FW01
C4	43pF	MLCC	Murata	GRM21A5C2E430FW01
C5	33pF	MLCC	Murata	GRM21A5C2E330FW01
C6	47pF	MLCC	Murata	GRM21A5C2E470FW01
C7	15pF	MLCC	Murata	GRM21A5C2E150FW01
C8	13pF	MLCC	Murata	GRM21A5C2E130FW01
C9	9.1pF	MLCC	Murata	GRM21A5C2E9R1FW01

C10	820pF	MLCC	Dalicap	DLC70B821JW501XT
C11	5PF	MLCC	Murata	GRM21A5C2E5R0FW01
C12	13PF	MLCC	Murata	GRM21A5C2E130FW01
C13	30pF	MLCC	Dalicap	DLC70B300JW501XT
C14,C17	1nF	MLCC	Dalicap	DLC70B102JW501XT
C15,C16	4.7uF	MLCC	YAGEO	CC1210KKX5R9BB475
R1	27Ω	Chip Resistor	KOA	SMD 0805
L1	3 turns d=6mm	Air Inductor	1mm copper wire	
C18	1000uF	AEC	Chongx VEHT	100V 18*35mm
PCB	Rogers 4350B (er = 3.5), thickness = 20 mil (0.508 mm); thickness copper plating = 35 µm , gold plated。			

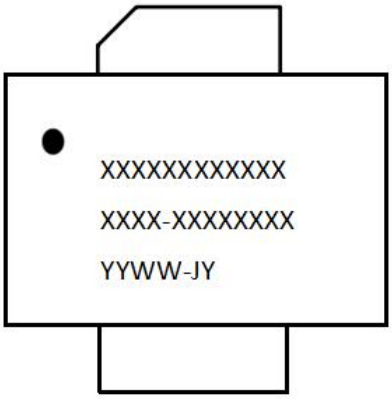
Performance Plots



CW, Gain and Efficiency vs Pout

Test conditions unless otherwise noted: 25 °C, VDD = +12.5Vdc, IDQ= 400mA CW test on WATECH Application Board

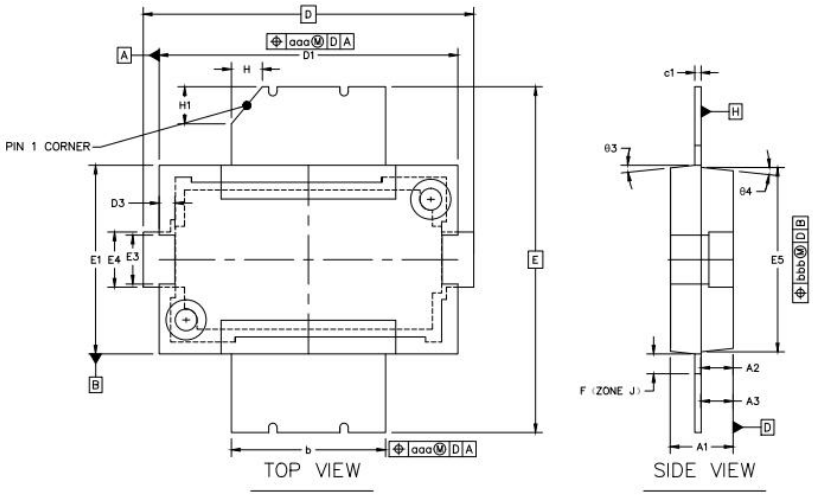
Package Marking and Dimensions

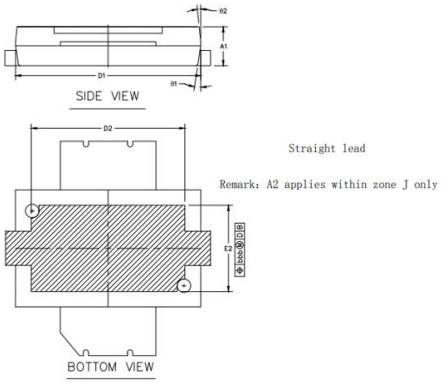


- Line1 (fixed): Device name in work order
- Line2 (unfixed): Mark Lot Number in work order (Sample: E596-20140001)
- Line3 (unfixed): Date Code + JY(Fixed)

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



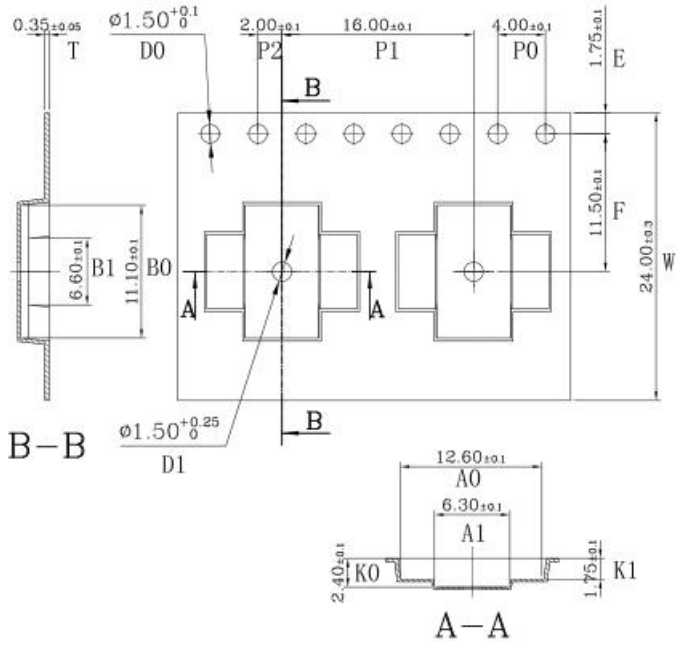


		SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS		A1	1.98	2.03	2.08
MOLD THICKNESS		A2	1.02	1.045	1.07
		A3	0.99	1.04	1.09
L/F THICKNESS		C1		0.203 REF	
BODY SIZE	X	D	10.57	10.67	10.77
	Y	E	11.08	11.18	11.28
CION SIZE	X	D2		7.37 MIN	
	Y	E2		3.81 MIN	
MOLD LENGTH		D1	9.6	9.65	9.7
LENGTH		D3	0.41	0.51	0.61
MOLD WIDTH		E1	6.05	6.1	6.15
WIDTH		E3	1.48	1.58	1.68
		E4	1.68	1.78	1.88
		E5	5.91	5.96	6.01
ZONE WIDTH		F		0.64 BSC	
LEAD WIDTH		b	4.9	4.98	5.06
PACKAGE EDGE TOLERANCE		aaa		0.1	
LEAD OFFSET		bbb		0.2	
TAPER ANGLE		θ1	7°	9°	11°
		θ2	4°	6°	8°
		θ3	4°	6°	8°
		θ4	4°	6°	8°
PIN1 SIZE		H		1 REF	
		H1		1.2 REF	

Package Dimensions

Tape and Reel Information

Package Type	Reel Size(inch)	Qty/Reel(pcs)	Qty/Box(pcs)	Qty/Carton(pcs)
TO270 (Straight)	13inch	1500	1500	7500



Tape & Reel Packaging Descriptions

Handling Precautions

Parameter	Grade
Moisture Sensitivity Level MSL	3

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B	JESD22-A114
ESD – Me 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 1.0	Preliminary	March 2024	Preliminary
Rev 1.1	Preliminary	April 2024	Update R_{TH} test result

Contact Information

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