

Description

The HTN8G27S015P is an unmatched discrete LDMOS Power Amplifier with 40W saturated output power covering frequency range from 700 - 2700 MHz.

Features

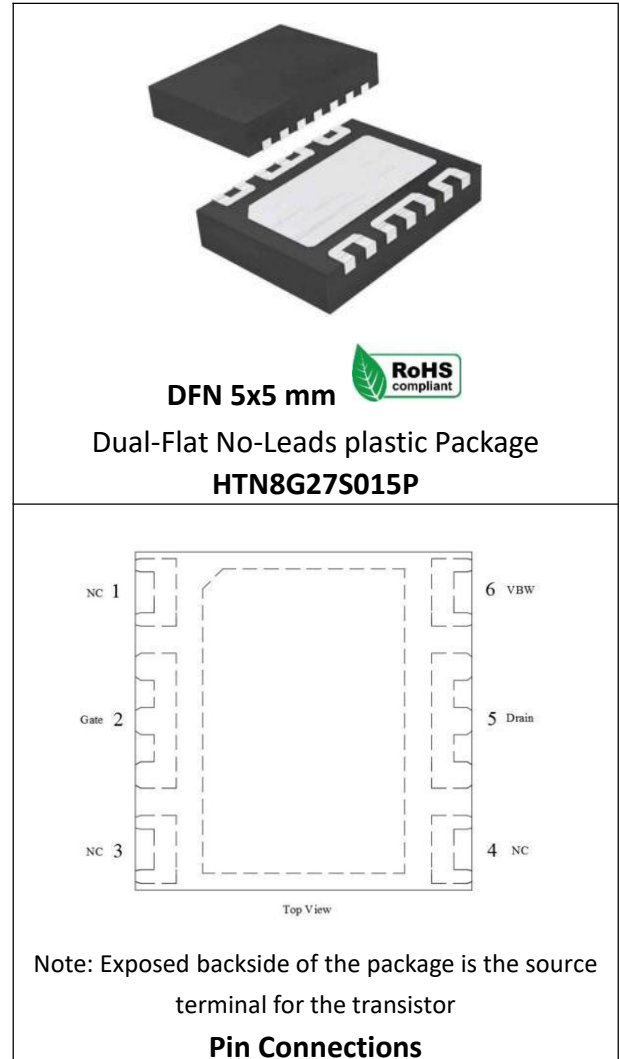
- Operating Frequency Range: 700 - 2700 MHz
- Operating Drain Voltage: +28V
- Saturation Output Power: 15W
- Power Average: 1.0W
- Excellent thermal stability due to low thermal resistance package
- Enhanced robustness design without device degradation
- Efficiency: 13.7%@2140MHz, LTE
- Gain: 19.1dB@2140MHz, LTE

Applications

- mMIMO Driver stage
- Small Base station Final stage

Ordering Information

Part Number	Description
HTN8G27S015P	Reel Package
HTN8G27S015PEVB	758- 798 MHz EVB
HTN8G27S015PEVB	920- 960 MHz EVB
HTN8G27S015PEVB	1805 - 1880 MHz EVB
HTN8G27S015PEVB	2110 - 2170 MHz EVB
HTN8G27S015PEVB	2300 - 2400 MHz EVB
HTN8G27S015PEVB	2110 - 2170 MHz EVB
HTN8G27S015PEVB	2500 - 2700 MHz EVB



Typical Performance

RF Characteristics (LTE)

Freq (MHz)	Gain (dB)	Eff (%)	ACPR (dBc)*
758	24.4	13.5	-50.1
940	24.5	11.5	-47.8
1840	20.8	13.2	-50.8
2140	19.1	13.7	-53.1
2350	20.2	12.3	-51.3
2600	20.9	10.6	-50.5

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, PAVG = 30 dBm (1W), FDD LTE 20MHz DL Signal, 9.6 dB PAR @ 0.01% CCDF test on WATECH Application Board

*Uncorrected DPD

Absolute Maximum Ratings

Parameter	Range/Value	Unit
Drain voltage (V _{DSS})	-0.5 to +65	V
Gate voltage (V _{GS})	-6 to +10	V
Drain voltage (V _{DD})	0 to +32	V
Storage Temperature (T _{STG})	-65 to +150	°C
Junction Temperature (T _J)	-40 to +225	°C

Electrical Specification

DC Characteristics (Main)

Parameter	Conditions	Min	Typ	Max	Unit
Breakdown Voltage V _{(BR)DSS}	V _{gs} =0V, I _{ds} =17uA	65	-	-	V
Gate-Source Threshold Voltage V _{GS(th)}	V _{gs} =V _{ds} , I _{ds} =17uA	1.3	1.5	1.7	V
Drain Leakage Current I _{bss}	V _{gs} =0V, V _{ds} =28V	-	-	500	nA
Gate Leakage Current I _{gss}	V _{gs} =5V, V _{ds} =0V	-	-	100	nA

DC Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Breakdown Voltage $V_{(BR)DSS}$	$V_{gs}=0V, I_{ds}=17\mu A$	65	-	-	V
Gate-Source Threshold Voltage $V_{GS(th)}$	$V_{ds}=10V, I_{ds}=17\mu A$	1.3	1.5	1.7	V
Drain Leakage Current I_{DSS}	$V_{gs}=0V, V_{ds}=28V$	-	-	500	nA
Gate Leakage Current I_{GSS}	$V_{gs}=5V, V_{ds}=0V$	-	-	100	nA

RF Characteristics (Pulsed CW)

Parameter	Min	Typ	Max	Units
Frequency Range	-	2.6	-	GHz
P3dB	41.5	42	-	dBm
Gain@30.0dBm	19.5	20.5	21.5	dB
Eff @ P3dB	40	-	-	%

Test conditions: 25 °C, VDD=28V, IDQ=200mA, $V_{gsp}=V_{gpc}-1.9V$, Pulsed CW, 1ms, Duty Cycle = 10%, Test on Watech Test Fixture with compensation.

RF Characteristics (WCDMA)

Parameter	Min	Typ	Max	Units
Frequency Range	-	2.6	-	GHz
Gain @30.0dBm	19.5	20.5	21.5	dB
Eff @30.0dBm	12	12.5	14	%
ACLR@5MHz	-	-53	-46	dBc

Test conditions: 25 °C, VDD=28V, IDQ=180mA, $V_{gsp}=V_{gpc}-1.9V$, Pout=30dBm, Single-carrier, 5MHz WCDMA signal with 9.6dB PAR @ 0.01% CCDF, Test on Watech Test Fixture with compensation.

Load Mismatch Test

Condition	Test Result
VSWR=10:1, at all Phase Angles, VDD = +28Vdc, Pout = 30 dBm NR-100MHz @2600 MHz test on WATECH Application Board	No Device Degradation



HTN8G27S015P

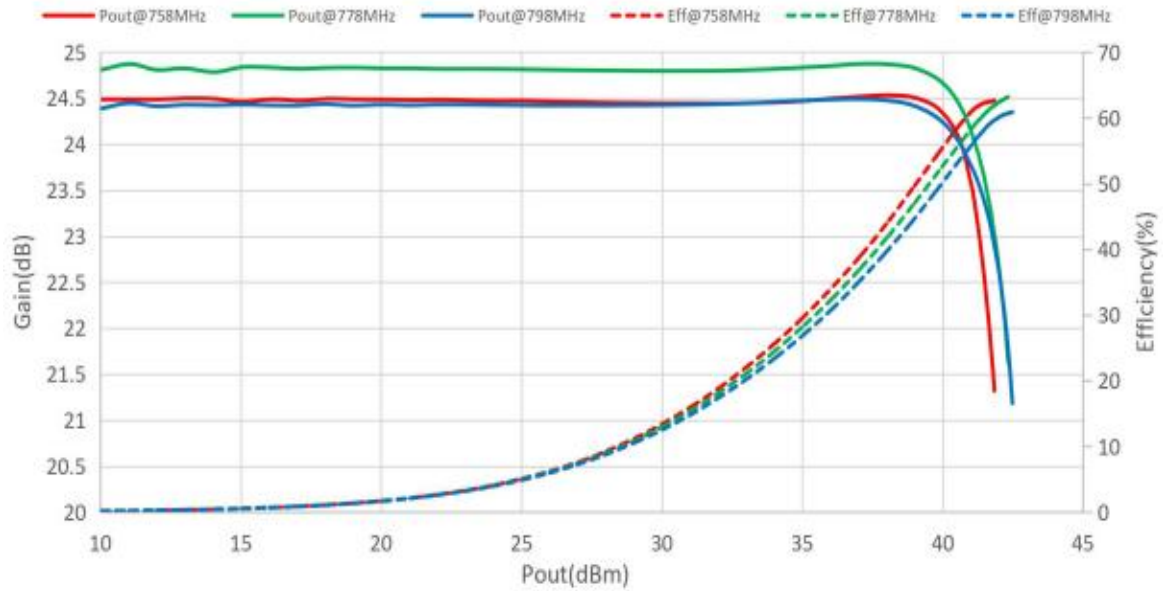
15W, 700 - 2700 MHz LDMOS Amplifier

Product datasheet

Thermal Information

Parameter	Condition	Value (Typ)	Unit
Thermal Resistance Junction to Case (R_{TH})	$T_{CASE} = 50^{\circ}C$, CW 15W	2.3	$^{\circ}C / W$

Performance Plots 758- 798 MHz Reference Design

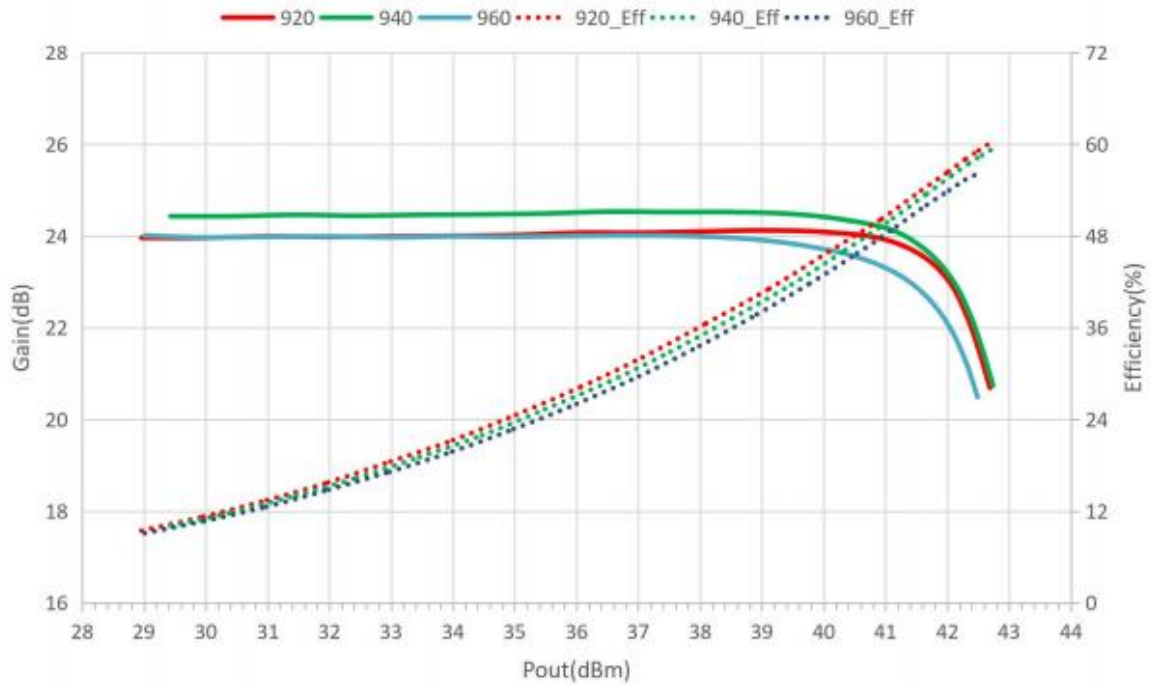


Pulsed CW, Gain and Efficiency vs Pout

Freq (MHz)	Gain (dB)	P1dB (dBm)	Eff(%)@P1dB	P3dB (dBm)	Eff(%)@P3dB
758	24.53	41.03	61.06	41.79	62.61
778	24.87	41.28	59.65	42.26	63.07
798	24.49	41.26	57.65	42.40	60.78

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ= 200mA, PW = 1ms, DC= 10% test on WATECH Application Board

Performance Plots 920- 960 MHz Reference Design

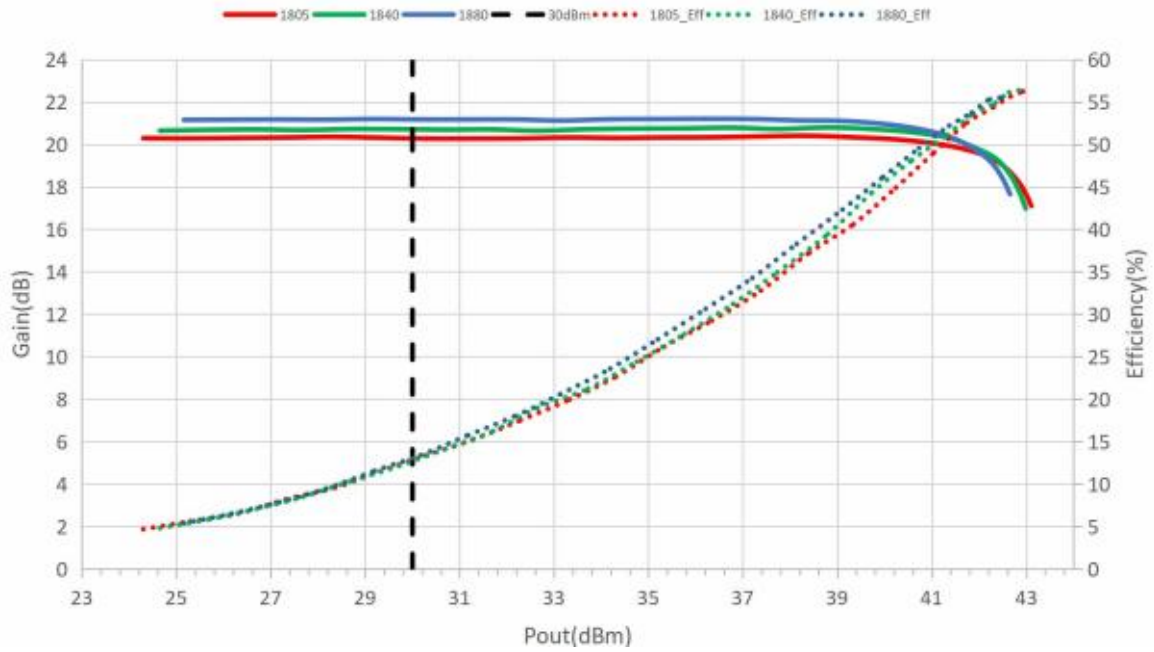


Pulsed CW, Gain and Efficiency vs Pout

Freq (MHz)	Gain (dB)	P1dB (dBm)	Eff(%)@P1dB	P3dB (dBm)	Eff(%)@P3dB
920	24.12	41.94	55.99	42.60	59.65
940	24.53	41.77	54.09	42.57	58.58
960	24.01	41.34	50.18	42.36	55.63

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ= 230mA, PW = 1ms, DC= 10% test on WATECH Application Board

Performance Plots 1805 - 1880 MHz Reference Design

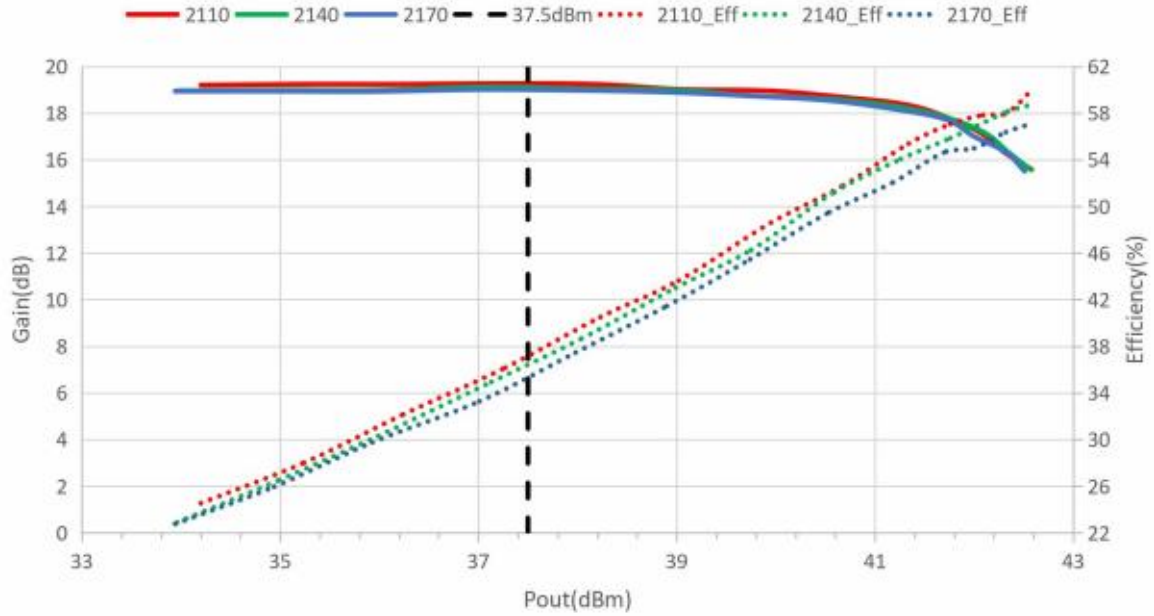


Pulsed CW, Gain and Efficiency vs Pout

Freq (MHz)	Gain (dB)	P1dB (dBm)	Eff(%)@P1dB	P3dB (dBm)	Eff(%)@P3dB
1805	20.41	42.18	54.00	43.05	56.60
1840	20.80	41.96	53.83	42.85	56.39
1880	21.21	41.52	52.69	42.54	55.47

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ= 190mA, PW = 1ms, DC= 10% test on WATECH Application Board

Performance Plots 2110 - 2170 MHz Reference Design

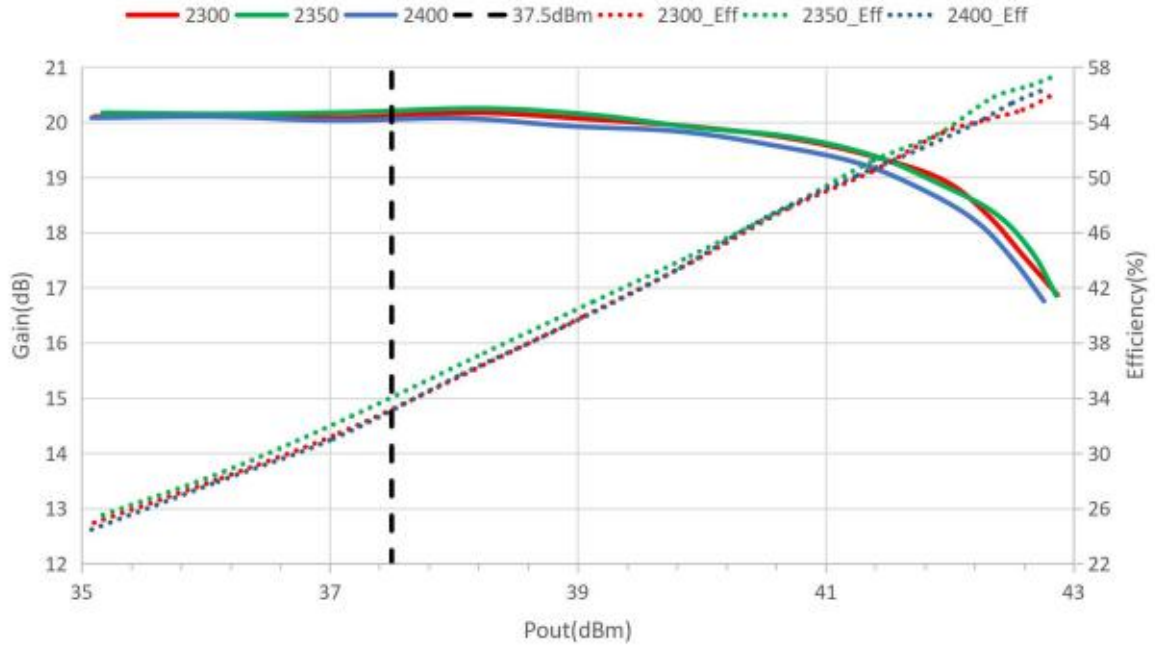


Pulsed CW, Gain and Efficiency vs Pout

Freq (MHz)	Gain (dB)	P1dB (dBm)	Eff(%)@P1dB	P3dB (dBm)	Eff(%)@P3dB
2110	19.27	41.39	55.58	42.32	58.03
2140	19.13	41.38	54.51	42.41	58.31
2170	19.01	41.38	53.03	42.39	56.58

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ= 190mA, PW = 1ms, DC= 10% test on WATECH Application Board

Performance Plots 2300 - 2400 MHz Reference Design

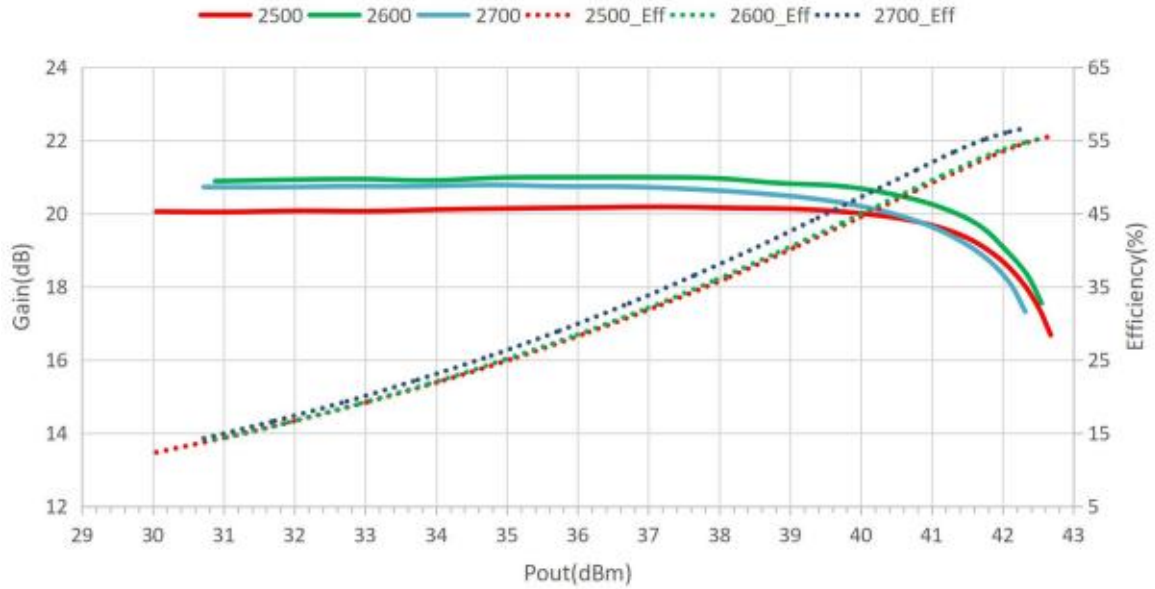


Pulsed CW, Gain and Efficiency vs Pout

Freq (MHz)	Gain (dB)	P1dB (dBm)	Eff(%)@P1dB	P3dB (dBm)	Eff(%)@P3dB
2300	20.17	41.66	51.83	42.75	55.63
2350	20.25	41.54	51.78	42.76	57.05
2400	20.10	41.43	50.82	42.65	55.93

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ= 190mA, PW = 1ms, DC= 10% test on WATECH Application Board

Performance Plots 2500 - 2700 MHz Reference Design

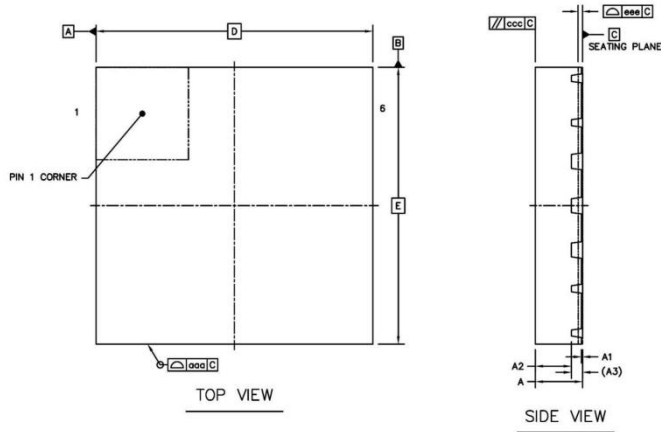


Pulsed CW, Gain and Efficiency vs Pout

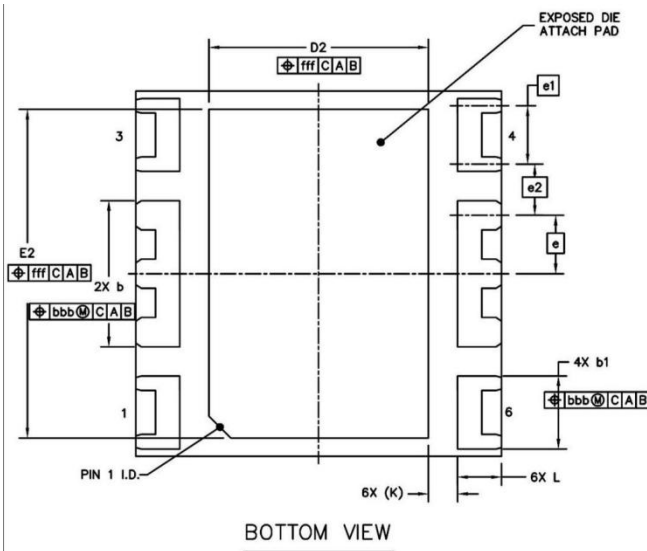
Freq (MHz)	Gain (dB)	P1dB (dBm)	Eff(%)@P1dB	P3dB (dBm)	Eff(%)@P3dB
2500	20.18	41.61	51.83	42.56	55.27
2600	20.99	41.31	50.93	42.43	54.97
2700	20.78	40.80	51.01	42.19	56.36

Test conditions unless otherwise noted: 25 °C, VDD = +28Vdc, IDQ= 190mA, PW = 1ms, DC= 10% test on WATECH Application Board

Package Marking and Dimensions




	SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS	A	0.8	0.85	0.9
STAND OFF	A1	0	0.02	0.05
MOLD THICKNESS	A2	---	0.65	---
L/F THICKNESS	A3	0.203 REF		
LEAD WIDTH	b	1.95	2	2.05
	b1	0.95	1	1.05
BODY SIZE	X	D		
	Y	E		
LEAD PITCH	e	0.8 BSC		
	e1	0.8 BSC		
	e2	0.7 BSC		
EP SIZE	X	D2	2.9	3
	Y	E2	4.4	4.5
LEAD LENGTH	L	0.5	0.6	0.7
LEAD TIP TO EXPOSED PAD EDGE	K	0.4 REF		
PACKAGE EDGE TOLERANCE	aaa	0.1		
MOLD FLATNESS	ccc	0.1		
COPLANARITY	eee	0.08		
LEAD OFFSET	bbb	0.1		
EXPOSED PAD OFFSET	fff	0.1		



Package Dimensions

Handling Precautions

Parameter	Grade
Moisture Sensitivity Level MSL	3

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 2.1	Product	April 2021	The operating frequency is adjusted to 700 to 2700MHz. Related test data is added at this frequency
Rev 2.2	Product	March 2023	New format based on English version 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.