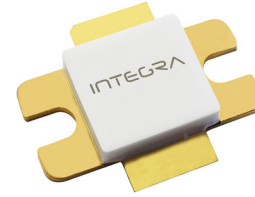


S-Band, GaN/SiC, RF Power Transistor

2.4 - 2.5 GHz | 1.9 kW | 65% Efficiency typ | 16 dB Gain typ | 100 V | 50µs Pulse Length, 1% Duty Cycle

IGN2425S1500 is a high power GaN-on-SiC RF power transistor. It operates over 2.4 - 2.5 GHz. Under 50µs, 1% duty cycle pulse conditions it supplies a minimum of 1.5 kW of peak output power, with typically 15.5 dB of associated gain and 58% efficiency. It operates from a 100 V supply voltage. For optimal thermal efficiency, the transistor is housed in a metal-based package with an epoxy-sealed ceramic lid.



FEATURES

- GaN on SiC HEMT Technology
- Output Power >1500 W
- Pre-matched Input and Output Impedance
- High Efficiency - 65% typical
- RoHS and REACH Compliant

APPLICATIONS

- Medical

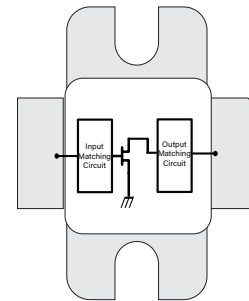


Table 1. RF Electrical Characteristics (Case temperature = 30 °C unless otherwise stated)

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Gain	G	14	15.5	17	dB	$P_{OUT} = 1500W$ $f = 2.4, 2.45, 2.5 \text{ GHz}$ $V_{DS} = 100V, I_{DS} = 50mA$ 50µs, 1%
Drain Efficiency During the Pulse	η	50	58	70	%	
Input Return Loss	IRL	10	15	25	dB	
Pulse Droop	D	0.2	-0.35	-0.6	dB	
Load Mismatch Stability	VSWR-S	2:1				
VSWR Withstand	VSWR-LMT	5:1				

Note: Consult Integra Technologies Application Note 001 for information on how RF output power and pulse droop are measured.

Table 2. Absolute Maximum Ratings (Not Simultaneous)

Parameter	Symbol	Value	Units	Test Conditions
DC Drain-Source Voltage	V_{DS}	300	V	25 °C
DC Gate-Source Voltage	V_{GS}	-8 to +1	V	25 °C
DC Drain Current	I_D	48	A	25 °C
DC Gate Current	I_G	48	mA	25 °C
RF Input Power	$P_{RF,IN}$	95	W	25 °C
Operating Channel Temperature	T_{CH}	-55 to +225	°C	
Storage Temperature	T_{STG}	-55 to +110	°C	
Soldering Temperature	T_{SOLDER}	260 for 60s	°C	

Note: Operation outside the limits given in this table may cause permanent damage to the transistor

Table 3. DC Electrical Characteristics (Case temperature = 25 °C unless otherwise stated)

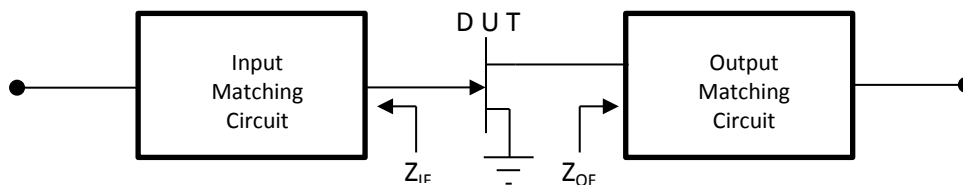
Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Gate Pinch-Off Voltage	V_P	-5			V	$V_{DS} = 100V, I_{DS} = 1mA$
Quiescent Gate Voltage	V_Q		-3.9		V	$V_{DS} = 100V, I_{DS} = 50mA$

Table 4. Thermal Resistance (Case temperature = 85 °C unless otherwise stated)

Parameter	Symbol	Typ	Units	Test Conditions
Peak Thermal Resistance, Channel to Case	R_{TH}	0.1	°C/W	$P_{DISS} = 1086W$ 50µs Pulse length, 1% Duty Cycle $V_{DS} = 100V$

Table 5. Test Fixture Source & Load Impedances (Case temperature = 25 °C unless otherwise stated)

Frequency (GHz)	Z_{IF}	Z_{OF}	Units	Test Conditions
2.4	3.5 - j 2.0	4.6 - j 1.5	Ω	$P_{OUT} = 1500W$ 50µs Pulse length, 1% Duty Cycle $V_{DS} = 100V, I_{DS} = 50mA$
2.45	3.5 - j 1.7	4.6 - j 1.1	Ω	
2.5	3.4 - j 1.5	4.5 - j 0.8	Ω	



TYPICAL PERFORMANCE

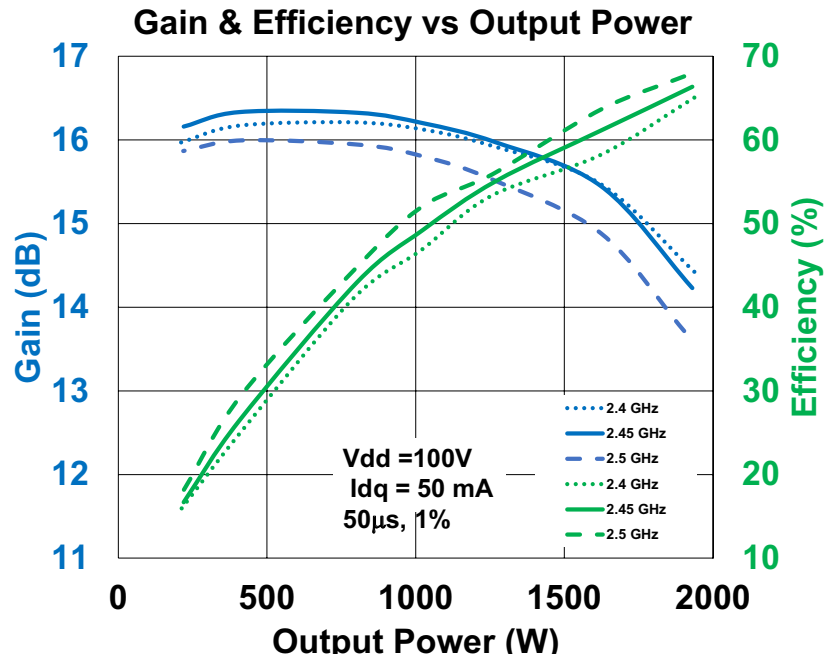
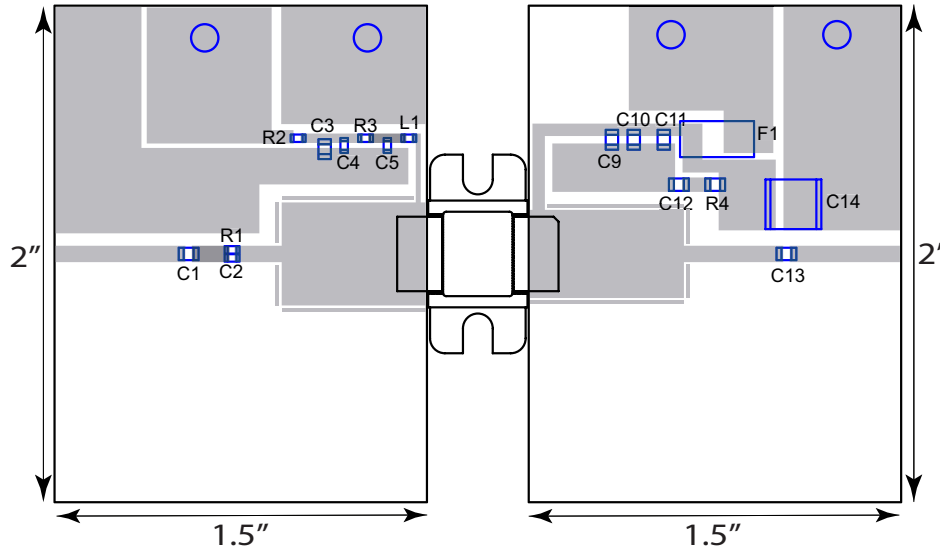


Figure 1

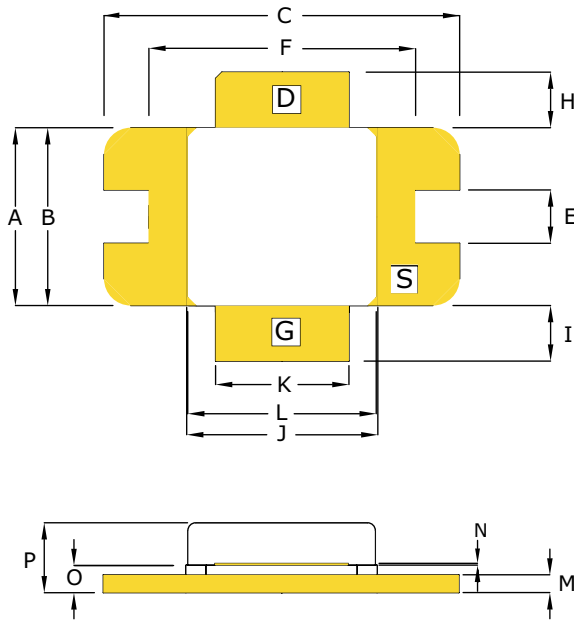
TEST FIXTURE



Bill of Materials for IGN2425S1500 Test Fixture

Designator	Description	Part Number
C1,C9, C13	CAP 10pF, 250V, 0805	600F100JT250XT
C2	CAP 15pF, 250V, 0603	600S150JT250XT
C3	CAP 1000pF, 100V, 0805	08051A102J4T2A
C4	CAP 100pF, 250V, 0603	600S101JT250XT
C5	CAP 10pF, 250V, 0603	600S100JT250XT
C10	CAP 100pF, 250V, 0805	600F101JT250XT
C11, C12	CAP 0.1μF, 100V, 0805, X7R	08051C104K4T2A
C14	CAP 2.2μF, 250V, 2220, X7R	C5750X7T2E225K250KA
R1, R3	RES, 5.11 OHM, 0603	CRCW06035R11FKEA
R2	RES 100 OHM, 0603	CRCW0603100RJNEAC
R4	RES 10 OHM, 0805	ERJ-2RKF10R0X
L1	IND 6.8nH, 0603	0603HP-6N8XJRW
F1	FUSE 10A	CB61F10A-TR1
PC Board Type	ROGERS RO4350B, 30mil, 1/1oz. Copper	

PACKAGE PL44E1



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.395	0.405	10.03	10.29
B	0.395	0.405	10.03	10.29
C	0.795	0.805	20.19	20.45
E	0.115	0.125	2.92	3.18
F	0.595	0.605	15.11	15.37
H	0.110	0.140	2.79	3.56
I	0.110	0.140	2.79	3.56
J	0.425	0.435	10.80	11.05
K	0.295	0.305	7.49	7.75
L	0.420	0.428	10.67	10.87
M	0.035	0.045	0.89	1.14
N	0.004	0.007	0.10	0.18
O	0.055	0.069	1.40	1.75
P	0.143	0.179	3.63	4.55

PIN SCHEDULE	
D	DRAIN
S	SOURCE
G	GATE

ESD & MSL Rating

Parameter	Rating	Standard
ESD Human Body Model (HBM)	TBD	ESDA/JEDEC JS-001-2012
ESD Charged Device Model (CDM)	TBD	JEDEC JESD22-C101F
Moisture Sensitivity Level (MSL)	Unlimited Shelf Life	IPC/JEDEC J-STD-020

RoHS Compliance

Integra Technologies, Inc declares that its GaN and LDMOS Transistor Products comply with EU Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS2), as adopted by EU member states on January 2, 2013 and amended on March 31, 2015 by EU Directive 2015/863/EU.

REACH Compliance

Integra Technologies supports EU Regulation number 1907/2006 concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) as these apply to Integra semiconductor products, development tools, and shipping packaging.

In support of the REACH regulation, Integra will:

- Inform customers and recipients of Integra product if they contain any substances that are of very high concern (SVHC) per the European Chemical Agency (ECHA) website.
- Notify ECHA if any Integra product that contains any SVHCs which exceed guidelines for REACH chemicals by weight per part number and for total content weight per year for all products produced in or imported to the European market.
- Cease shipments of product containing REACH Annex XIV substances until authorization has been obtained.
- Cease shipment of product containing REACH Annex XVII chemicals when restrictions apply.

Integra has evaluated its materials, BOMs, and product specifications and product and has determined that this transistor conforms to all REACH and SVHC regulations and guidelines. Integra has implemented actions and control programs that will assure continued compliance.

Disclaimer

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DEFINITIONS:

DATA SHEET STATUS

Advanced Specification - This data sheet contains Advanced specifications.

Preliminary Specification - This data sheet contains specifications based on preliminary measurements and data.

Final Specification - This data sheet contains final product specifications.

MAXIMUM RATINGS Stress above one or more of the maximum ratings may cause permanent damage to the device. These are maximum ratings only operation of the device at these or at any other conditions above those given in the characteristics sections of the specification is not implied. Exposure to maximum values for extended periods of time may affect device reliability.

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