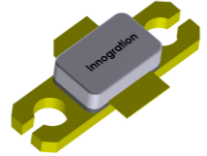


**GaN HEMT 28V, HF-1.5GHz 140W, RF Power Transistor****Description**

The XTAH15140GX is a 140W GaN HEMT, designed for multiple application up to 1.5GHz. It can be used in CW, Pulse and any other modulation modes. There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.



- Typical class AB 400-500MHz RF Performance with device soldered

$V_{ds}=28V$, $I_{dq}=100mA$, CW

Voltage(V)	Pin(dBm)	Psat(dBm)	Psat(W)	Gain(dB)	Eff(%)
28	35	>51	120~150	16-17	65-70

- Typical class AB 840-1020MHz RF Performance with device soldered

$V_{ds}=28V$, $I_{dq}=100mA$, CW

Voltage(V)	Pin(dBm)	Psat(dBm)	Psat(W)	Gain(dB)	Eff(%)
28	36	>50.5	115-150	15-16	60-66

Applications

- L band power amplifier
- P band power amplifier
- ISM/RF Energy power amplifier

Important Note: Proper Biasing Sequence for GaN HEMT Transistors**Turning the device ON**

1. Set V_{GS} to the pinch-off (V_P) voltage, typically $-5V$
2. Turn on V_{DS} to nominal supply voltage
3. Increase V_{GS} until I_{DS} current is attained
4. Apply RF input power to desired level

Turning the device OFF

1. Turn RF power off
2. Reduce V_{GS} down to V_P , typically $-5V$
3. Reduce V_{DS} down to $0V$
4. Turn off V_{GS}

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+200	Vdc
Gate--Source Voltage	V_{GS}	-8 to +0.5	Vdc
Operating Voltage	V_{DD}	50	Vdc
Maximum gate current	I_{gs}	36	mA
Storage Temperature Range	T_{stg}	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature	T_J	+225	°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case by FEA $T_C=85^{\circ}C$, at $P_{diss}=60W$	$R_{\theta JC}$	1.25	°C /W

Table 3. Electrical Characteristics ($T_A = 25^{\circ}C$ unless otherwise noted)**DC Characteristics (measured on wafer prior to packaging)**

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=-8V$; $I_{DS}=36mA$	V_{DSS}		200		V
Gate Threshold Voltage	$V_{DS}=10V$, $I_D=36mA$	$V_{GS(th)}$	-4		-2	V

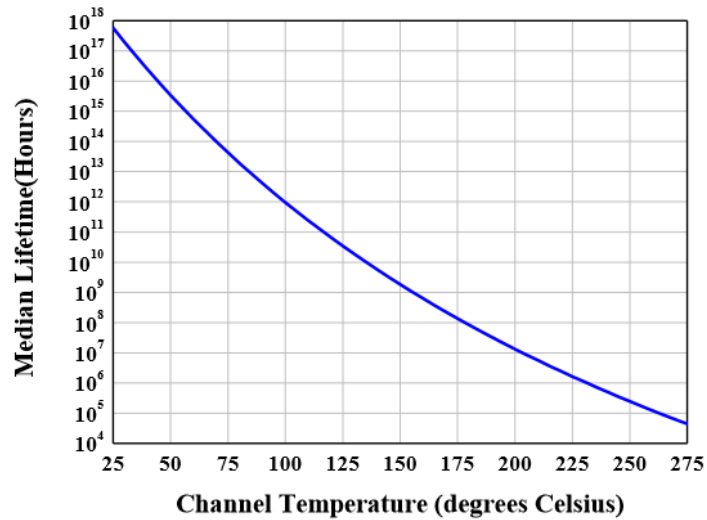


Gate Quiescent Voltage	VDS =28V, IDS=100mA, Measured in Functional Test	V _{GS(Q)}		-3.24		V
------------------------	---	--------------------	--	-------	--	---

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1.5GHz, Pout=140W Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature



0.4-0.5GHz Typical performance

Figure 3: Network analyzer output S11/S21

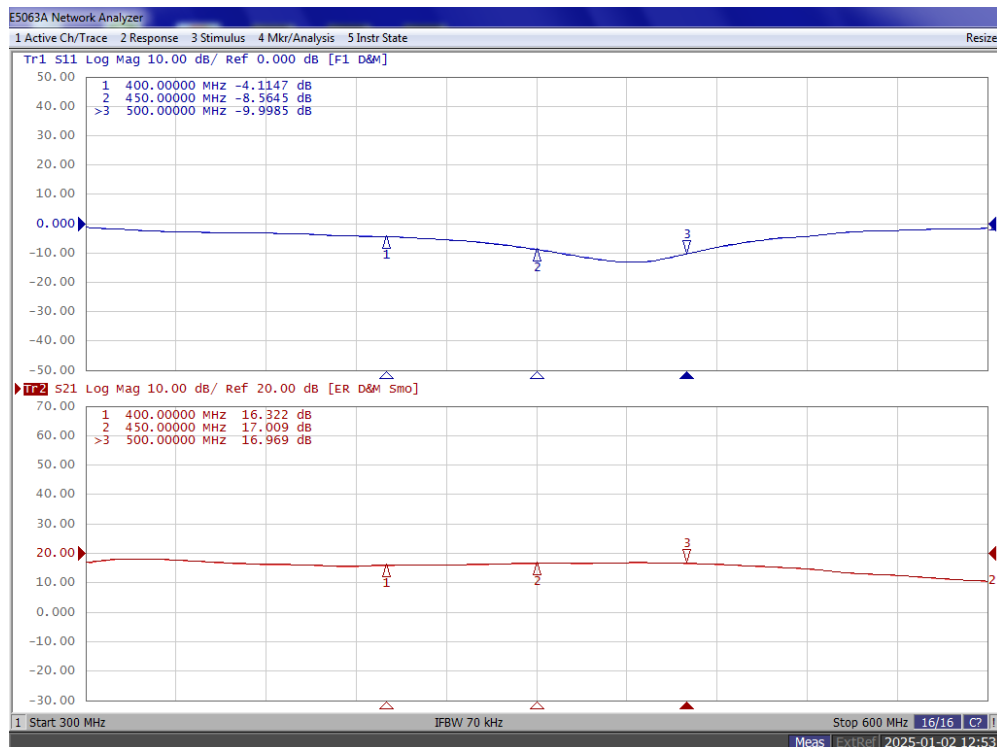
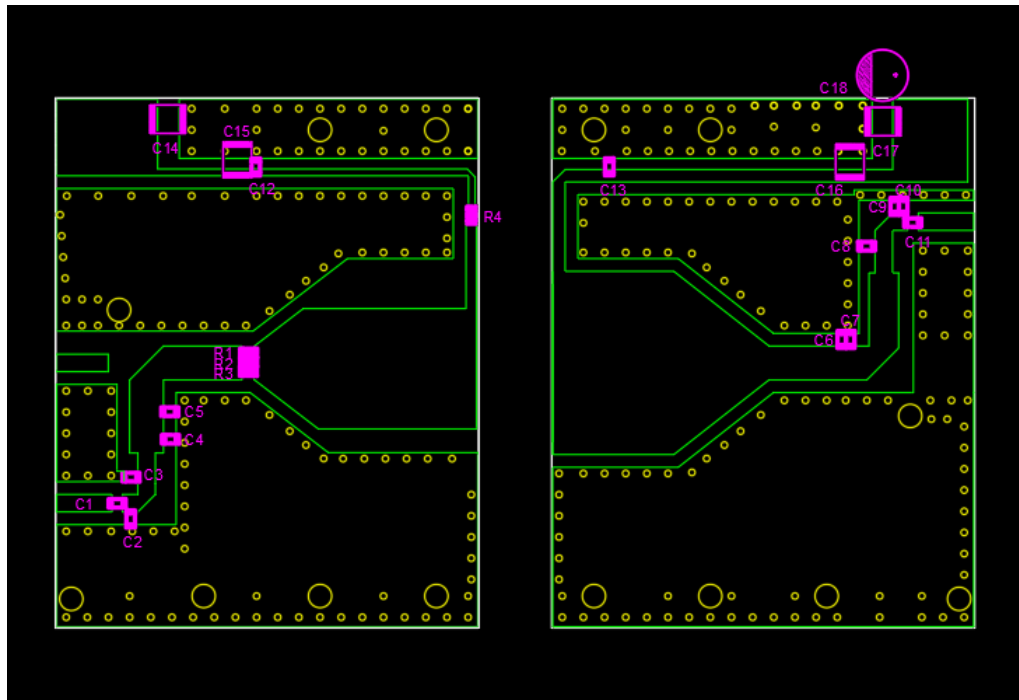


Figure 4: Picture of application board



Reference	Footprint	Value	Quantity
C1	0603	20pF	1
C2, C3, C5, C10	0603	5.6pF	4
C4, C7	0603	10pF	2
C6	0603	12pF	1
C8	0603	0.5pF	1
C9	0603	4.7pF	1
C11, C12	0603	82pF	2
C13	0603	100pF	1
C14, C15, C16, C17	1210	10uF/63V	4
C18		470uF/63V	1
R1, R2, R3, R4	0603	10ohm	4
U1	GX	XTAH15140GX	1



0.85-1GHz Typical performance

Figure 5: Network analyzer output S11/S21

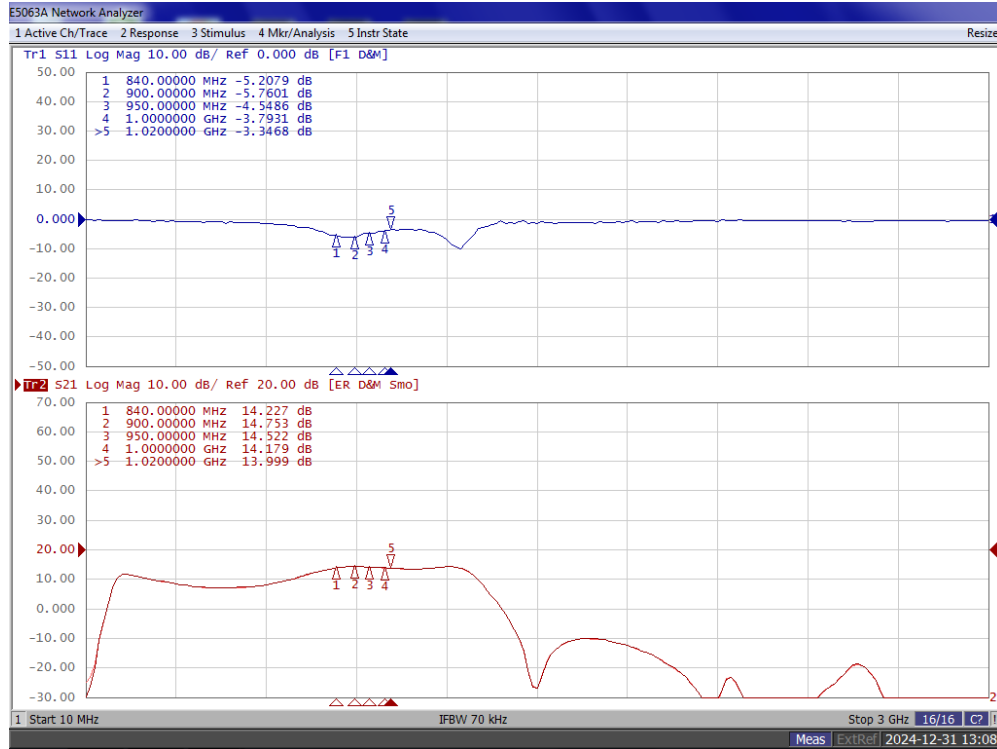
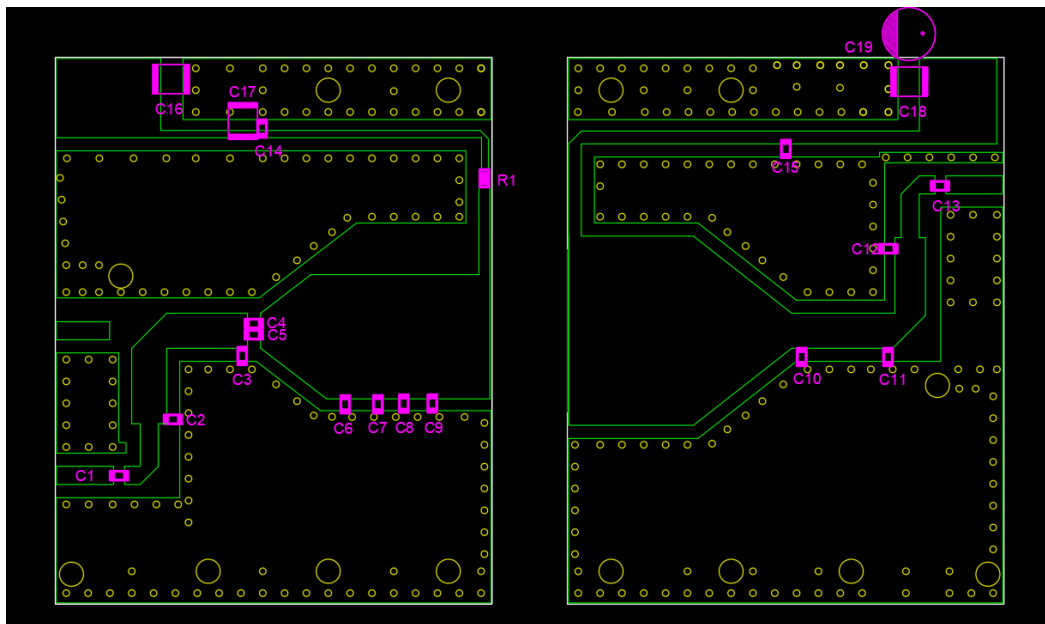


Figure 6: Picture of application board





Reference	Footprint	Value	Quantity
C1, C3	0603	6.8pF	2
C2	0603	2.2pF	1
C4, C5	0603	34pF	2
C6, C8	0603	2.7pF	2
C7	0603	8.2pF	1
C9, C10	0603	3.6pF	2
C11	0603	1pF	1
C12	0603	1.5pF	1
C13, C14, C15	0603	68pF	3
C16, C17, C18	1210	10uF/63V	3
C19		470uF/63V	1
R1	0603	10ohm	1
U1	GX	XTAH15140GX	1



Package Outline

Flanged ceramic package; 2 leads

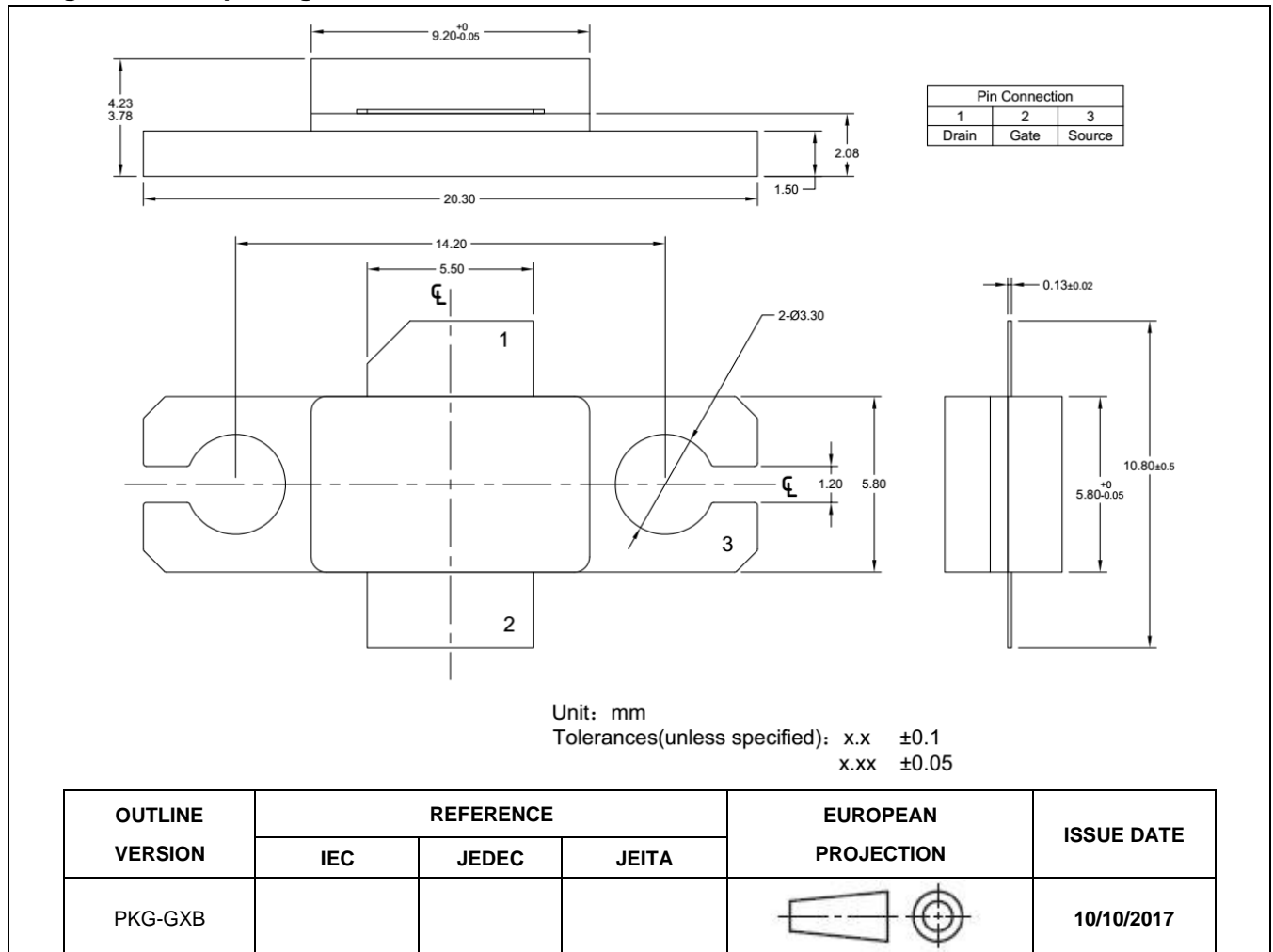


Figure 1. Package Outline PKG-G2E



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2025/1/2	V1.0	Advanced Datasheet Creation

Application data based on: ZYX-25-01/02

Notice

Specifications are subject to change without notice. Innegration believes the information within the data sheet to be reliable. Innegration makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose.

“Typical” parameter is the average values expected by Innegration in quantities and are provided for information purposes only. It can and do vary in different applications and related performance can vary over time. All parameters should be validated by customer’s technical experts for each application.

Innegration products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Innegration product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility.

For any concerns or questions related to terms or conditions, please check with Innegration and authorized distributors

Copyright © by Innegration (Suzhou) Co.,Ltd.