

FEATURES

- High Voltage Operation : $V_{DS}=50V$
- High Power : 50.3dBm (typ.) @ P_{sat}
- High Efficiency: 65%(typ.) @ P_{sat}
- Power Gain : 17dB(typ.) @ $f=2.6GHz$
- Proven Reliability

DESCRIPTION

SEDI's GaN-HEMT offers high efficiency, ease of matching, greater consistency and broad bandwidth for high power L-band amplifiers with 50V operation, and gives you higher gain.

This new product is ideally suited for use from 2.3GHz to 2.7GHz WiMAX & LTE design requirements as it offers high gain, long term reliability and ease of use.



ABSOLUTE MAXIMUM RATINGS (Case Temperature $T_c=25deg.C$)

Item	Symbol	Condition	Rating	Unit
Operating-Voltage	V_{DS}		55	V
Drain-Source Voltage	V_{DS}	$V_{GS}=-8V$	160	V
Gate-Source Voltage	V_{GS}		-15	V
Total Power Dissipation	P_t		97.8	W
Storage Temperature	T_{stg}		-65 to +175	deg.C
Channel Temperature	T_{ch}		250	deg.C

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V_{DS}		≤ 55	V
Forward Gate Current	I_{GF}	$R_G=5\text{ ohm}$	≤ 102	mA
Reverse Gate Current	I_{GR}	$R_G=5\text{ ohm}$	≥ -3.9	mA
Channel Temperature	T_{ch}		≤ 180	deg.C
Average Output Power	$P_{ave.}$		≤ 47.3	dBm

ELECTRICAL CHARACTERISTICS (Case Temperature $T_c=25deg.C$)

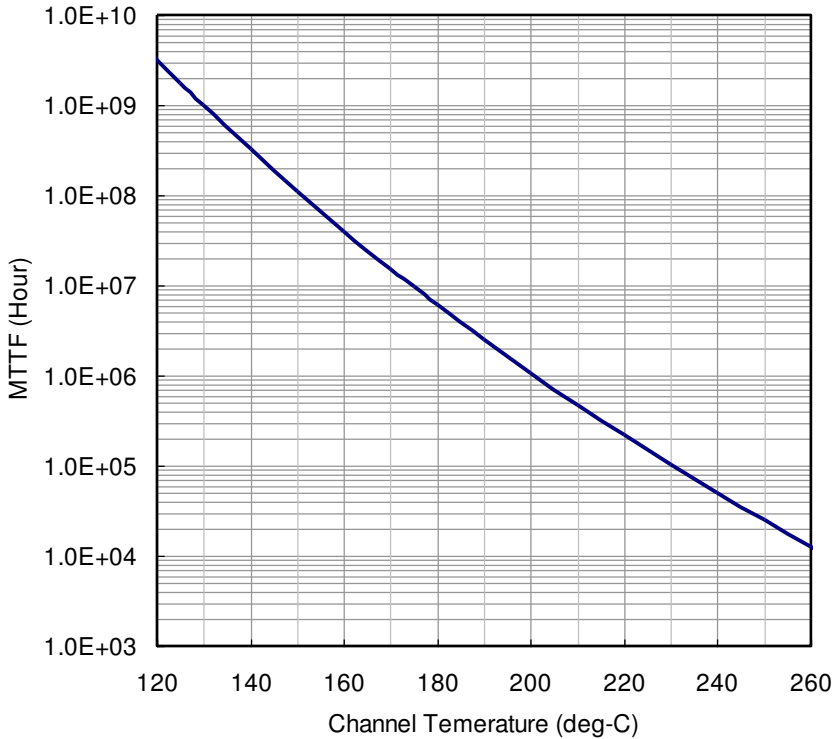
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-Off Voltage	V_p	$V_{DS}=50V\ I_{DS}=27mA$	-1.0	-1.5	-2.0	V
Saturated Power	$P_{sat} *1$	$V_{DS}=50V$	49.5	50.3	-	dBm
Drain Efficiency	$\eta_d *2$	$I_{DS}(DC)=400mA$	27	32	-	%
Power Gain	$G_p *2$	$f=2.60GHz$	16.0	17.0	-	dB
Thermal Resistance	R_{th}	Channel to Case at 52.5W P_{DC}	-	2.0	2.3	deg.C/W

*1 : 10%-duty RF pulse (DC supply constant)

*2 : $P_{out} = 42.0dBm$, CW modulation Signal (W-CDMA or WiMAX)

RoHS COMPLIANCE	Yes
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**MTTF Calculation
- Estimated MTTF -**



Ea=1.6eV
Confidence Level=90%

Channel Temp (deg-C)	MTTF (Hours)
160	4.05 x 10 ⁷
180	6.07 x 10 ⁶
200	1.07 x 10 ⁶

$$AF = \exp\left[-\frac{Ea}{k}\left(\frac{1}{T_{stress}} - \frac{1}{T_{use}}\right)\right]$$

$$MTTF_{use} = MTTF_{stress} * AF$$

Where;

AF: acceleration factor

Ea: activation energy (1.6 eV)

k: Boltzman's constant (8.62 x 10⁻⁵ eV/K)

T_{stress}: stress temperature (K)

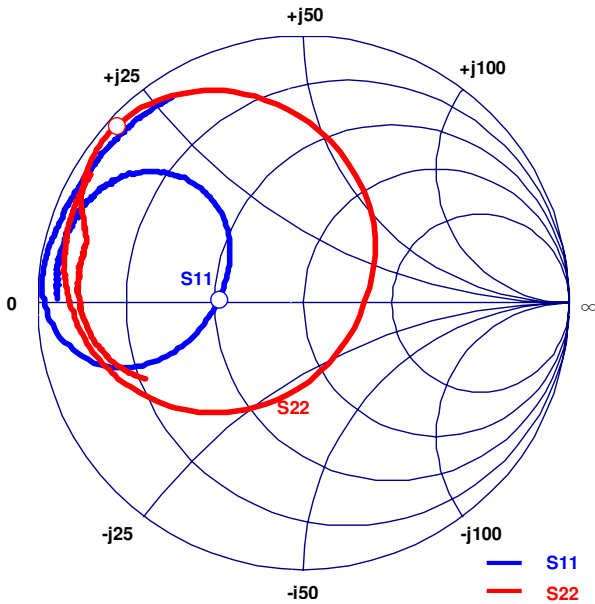
T_{use}: use temperature (K)

ESD characteristic

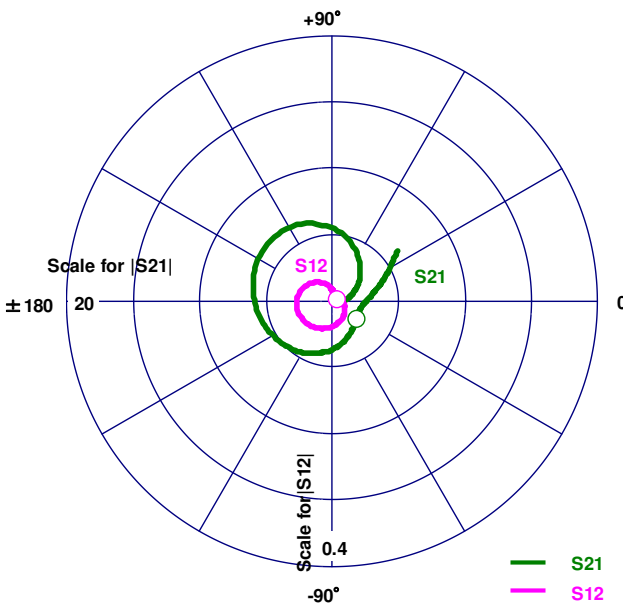
Test Methodology	Class
Human Body Model (per JESD22-A114)	1B
Machine Model (per JEIA/ESD22-A115)	A

- Reference DATA -

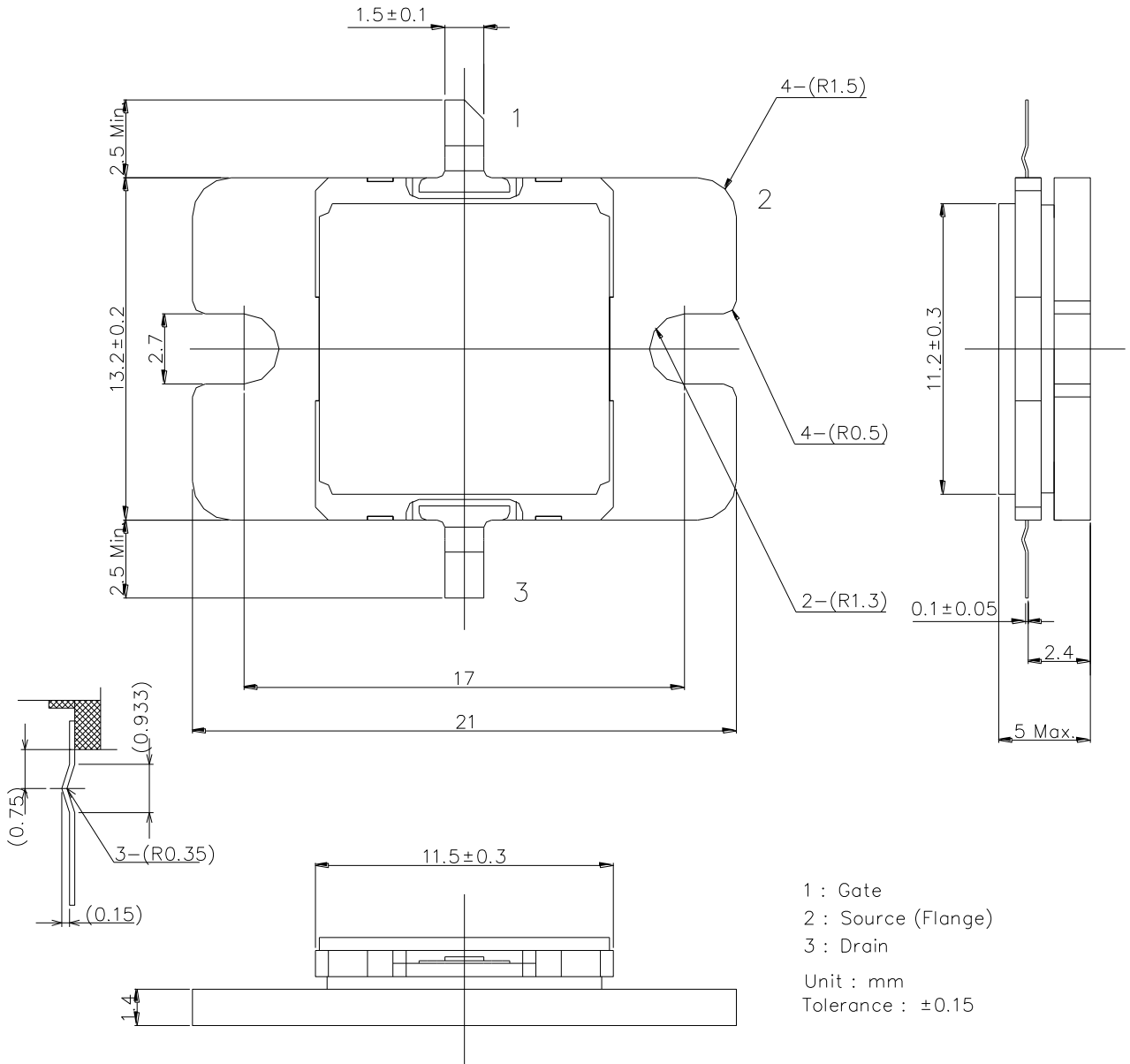
S-Parameters @V_{DS}=50V, I_{DS(DC)}=400mA, f=0.5 to 4.5 GHz
 Z_l = Z_s = 50 ohm Marker : 2.6GHz



Freq. GHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.50	0.92	179.00	6.21	37.34	0.004	-25.36	0.66	-154.50
0.60	0.93	176.30	4.93	29.29	0.004	-20.18	0.71	-158.61
0.70	0.93	174.22	4.08	21.62	0.004	-18.73	0.75	-162.62
0.80	0.94	171.70	3.45	14.93	0.003	-18.71	0.78	-166.31
0.90	0.93	169.84	3.02	8.52	0.003	-13.24	0.80	-169.76
1.00	0.93	167.80	2.69	2.94	0.003	-2.15	0.82	-172.88
1.10	0.92	165.50	2.47	-2.98	0.003	0.59	0.83	-175.74
1.20	0.93	163.14	2.31	-8.49	0.004	7.85	0.84	-178.47
1.30	0.92	160.92	2.20	-14.17	0.004	14.99	0.84	-178.94
1.40	0.91	158.48	2.16	-19.60	0.005	15.63	0.85	-176.68
1.50	0.90	156.07	2.15	-25.80	0.005	15.39	0.85	-174.31
1.60	0.89	153.80	2.19	-31.70	0.007	15.03	0.85	-172.07
1.70	0.87	150.08	2.27	-38.83	0.008	13.87	0.85	-170.01
1.80	0.85	147.17	2.40	-45.93	0.009	7.52	0.85	-168.07
1.90	0.81	143.54	2.60	-54.63	0.011	2.72	0.85	-166.19
2.00	0.76	139.75	2.86	-64.19	0.013	-3.02	0.85	-164.65
2.10	0.70	136.18	3.22	-75.29	0.016	-13.58	0.86	-163.10
2.20	0.61	132.75	3.64	-88.64	0.020	-24.87	0.87	-161.17
2.30	0.49	131.94	4.08	-103.74	0.024	-39.15	0.89	-158.61
2.40	0.38	137.93	4.56	-121.21	0.029	-55.74	0.93	-154.13
2.50	0.31	155.18	5.00	-140.05	0.034	-73.50	0.96	-147.29
2.60	0.32	177.87	5.46	-160.25	0.040	-92.83	0.97	-136.68
2.70	0.41	-165.90	5.95	177.36	0.046	-115.09	0.91	-121.15
2.80	0.55	-158.98	6.40	151.09	0.052	-141.02	0.75	-97.76
2.90	0.76	-161.35	6.40	119.04	0.055	-172.44	0.44	-55.62
3.00	0.92	-171.77	5.28	85.89	0.048	154.98	0.23	-55.55
3.10	0.98	178.42	3.80	59.15	0.037	130.95	0.48	-122.06
3.20	0.99	170.93	2.71	40.10	0.028	112.47	0.66	-146.36
3.30	0.98	165.90	1.93	26.49	0.021	100.44	0.77	-160.08
3.40	0.97	162.24	1.46	16.62	0.017	93.83	0.83	-169.39
3.50	0.96	159.11	1.14	8.29	0.015	89.66	0.86	-176.41
3.60	0.95	156.02	0.92	1.39	0.013	83.84	0.89	-178.46
3.70	0.95	153.23	0.77	-4.83	0.012	80.06	0.90	-174.16
3.80	0.95	150.43	0.65	-10.27	0.012	80.73	0.91	-170.15
3.90	0.94	147.39	0.57	-15.67	0.011	78.46	0.92	-166.58
4.00	0.94	144.40	0.51	-20.46	0.011	72.37	0.93	-163.54
4.10	0.94	140.94	0.46	-25.12	0.011	68.42	0.93	-160.39
4.20	0.93	137.11	0.43	-29.97	0.011	63.96	0.93	-157.65
4.30	0.93	133.06	0.41	-35.20	0.012	60.06	0.93	-154.70
4.40	0.92	128.43	0.39	-39.74	0.012	54.35	0.94	-151.57
4.50	0.92	122.77	0.38	-45.97	0.013	49.22	0.93	-149.15



I2D Package Outline Metal-Ceramic Hermetic Package





GaN-HEMT 105W

EGN26C105I2D

High Voltage - High Power GaN-HEMT

For further information please contact:

<http://global-sei.com/Electro-optic/about/office.html>