

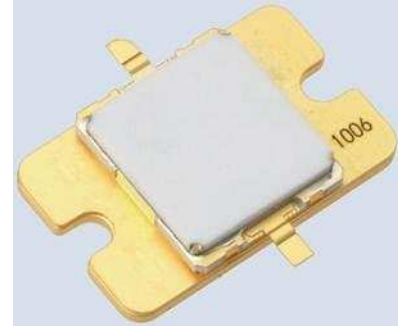
### FEATURES

- High Voltage Operation :  $V_{DS}=50V$
- High Power : 52.5dBm (typ.) @  $P_{sat}$
- High Efficiency: 65%(typ.) @  $P_{sat}$
- Power Gain : 16dB(typ.) @  $f=2.6GHz$
- Proven Reliability

### DESCRIPTION

SEI'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 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	$P_t$		132	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	$V_{DS}$		$\leq 55$	V
Forward Gate Current	$I_{GF}$	$R_G=5\text{ ohm}$	$\leq 153$	mA
Reverse Gate Current	$I_{GR}$	$R_G=5\text{ ohm}$	$\geq -5.8$	mA
Channel Temperature	$T_{ch}$		$\leq 180$	deg.C
Average Output Power	$P_{ave.}$		$\leq 49.5$	dBm

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

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-Off Voltage	$V_p$	$V_{DS}=50V$ $I_{DS}=40.8mA$	-1.0	-1.5	-2.0	V
Saturated Power	$P_{sat} *1$	$V_{DS}=50V$	51.5	52.5	-	dBm
Drain Efficiency	$\eta_d *2$	$I_{DS}(DC)=600mA$	25	30	-	%
Power Gain	$G_p *2$	$f=2.60GHz$	15	16	-	dB
Thermal Resistance	$R_{th}$	Channel to Case at 78W $P_{DC}$	-	1.4	1.6	deg.C/W

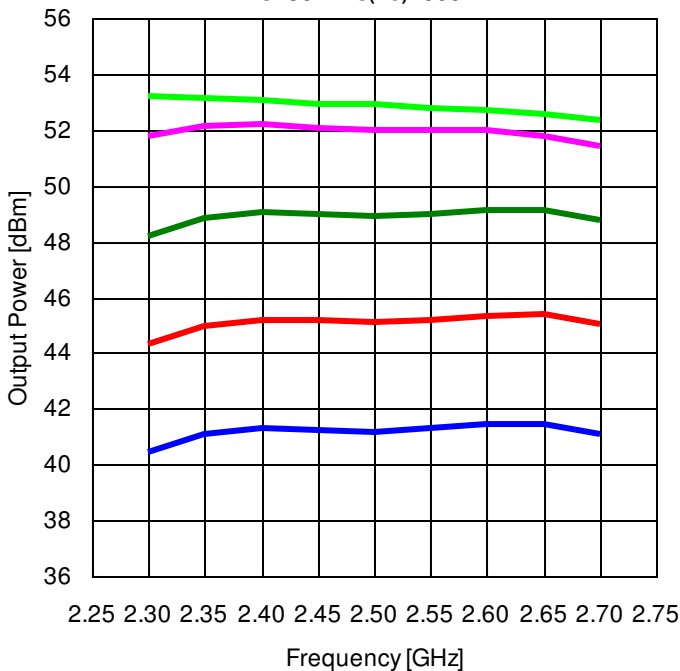
\*1 : 10%-duty RF pulse (DC supply constant)

\*2 :  $P_{out} = 44.5dBm$ , CW modulation Signal (W-CDMA)

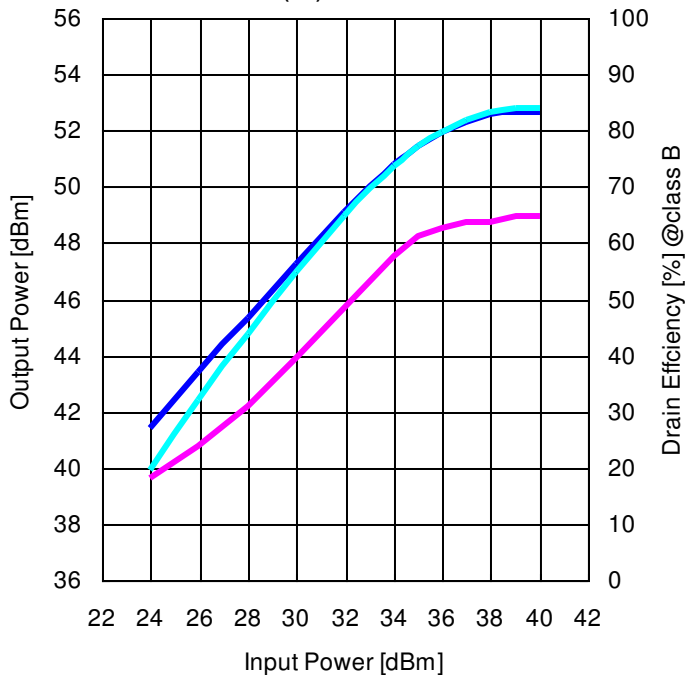
<b>RoHS COMPLIANCE</b>	<b>Yes</b>
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### RF characteristics @ f=2.6GHz fine tuned

**Output Power vs. Frequency**  
V<sub>DS</sub>=50V I<sub>DS(DC)</sub>=600mA



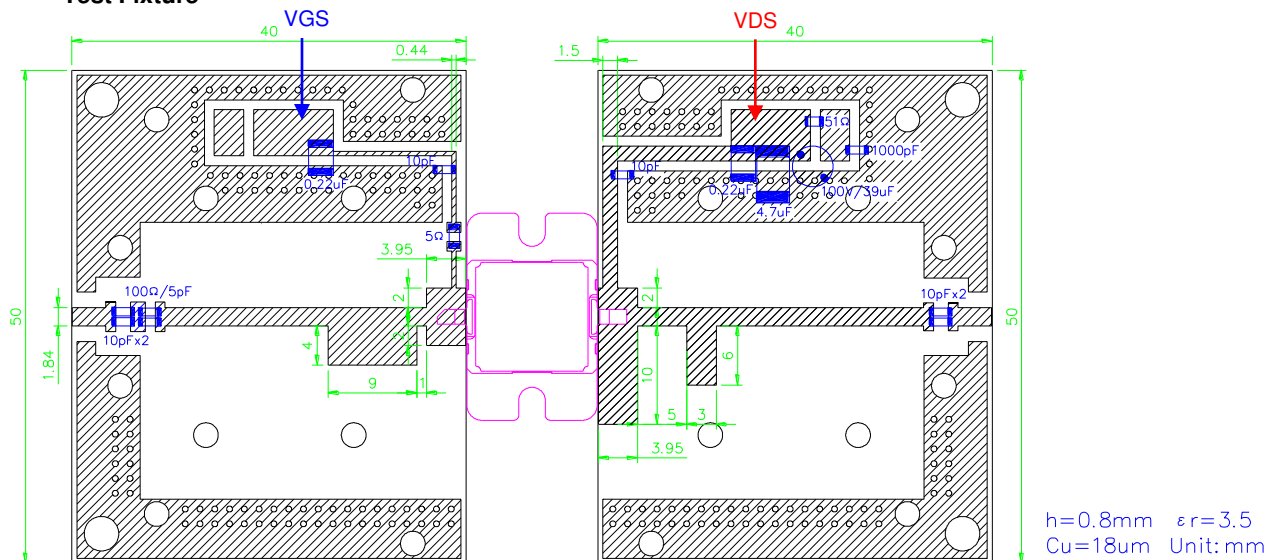
**Output Power and Drain Efficiency vs. Input Power**  
V<sub>DS</sub>=50V I<sub>DS(DC)</sub>=600mA f=2.6GHz



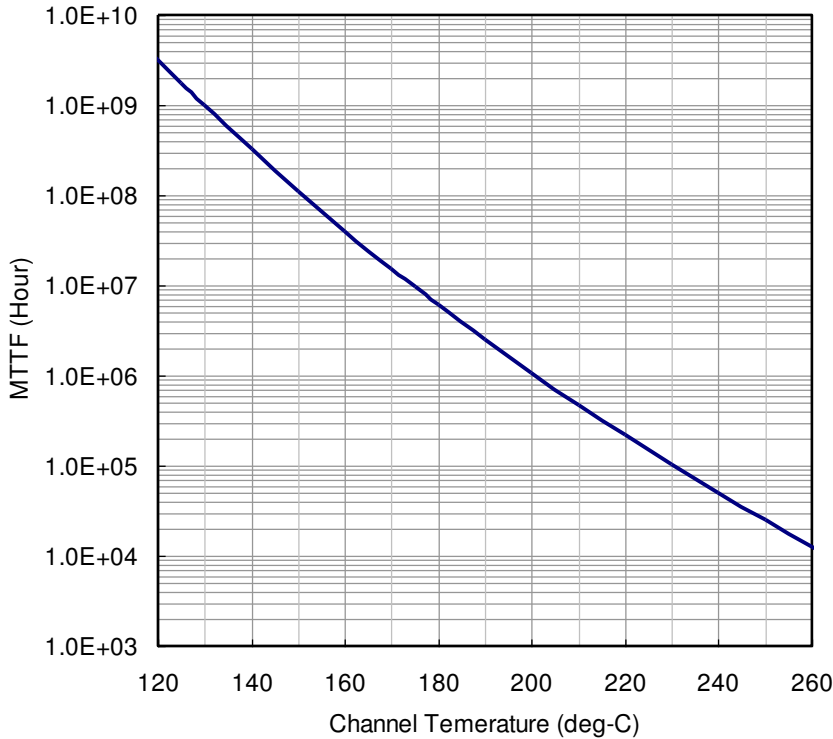
— Pin=24dBm    — Pin=28dBm    — Pin=32dBm  
— Pin=36dBm    — Pin=40dBm

— Pout (class AB)    — Pout (class B)    — Nd (class B)  
**Pulse Signal (10%-duty, DC : constant)**

### Test Fixture



### MTTF Calculation - Estimated MTTF -



Ea=1.6eV  
Confidence Level=90%

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

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

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

Where;

AF: acceleration factor

Ea: activation energy (1.6 eV)

k: Boltzman's constant ( $8.62 \times 10^{-5}$  eV/K)

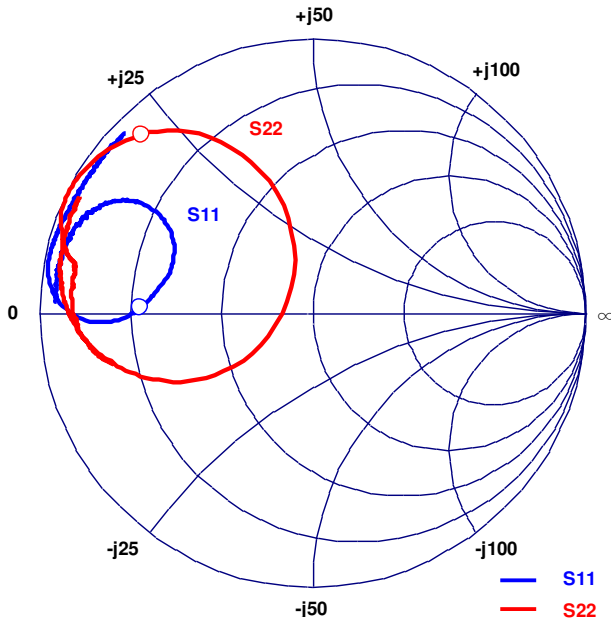
T<sub>stress</sub>: stress temperature (K)

T<sub>use</sub>: use temperature (K)

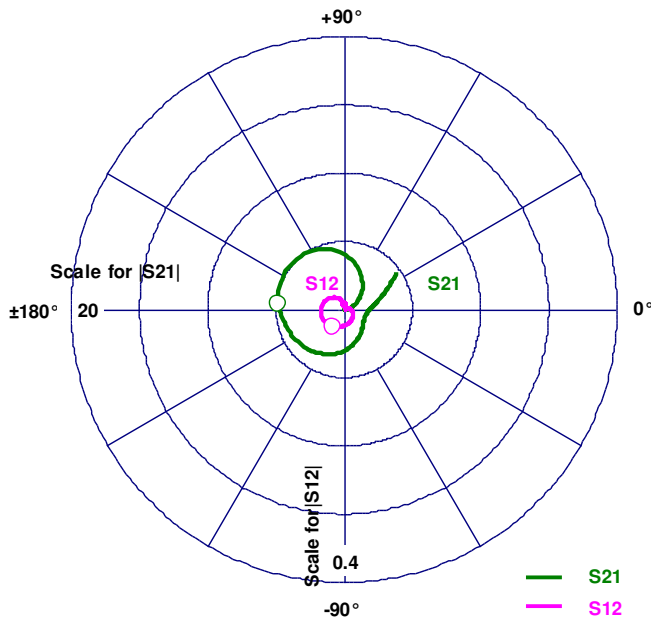
### ESD Characteristics

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

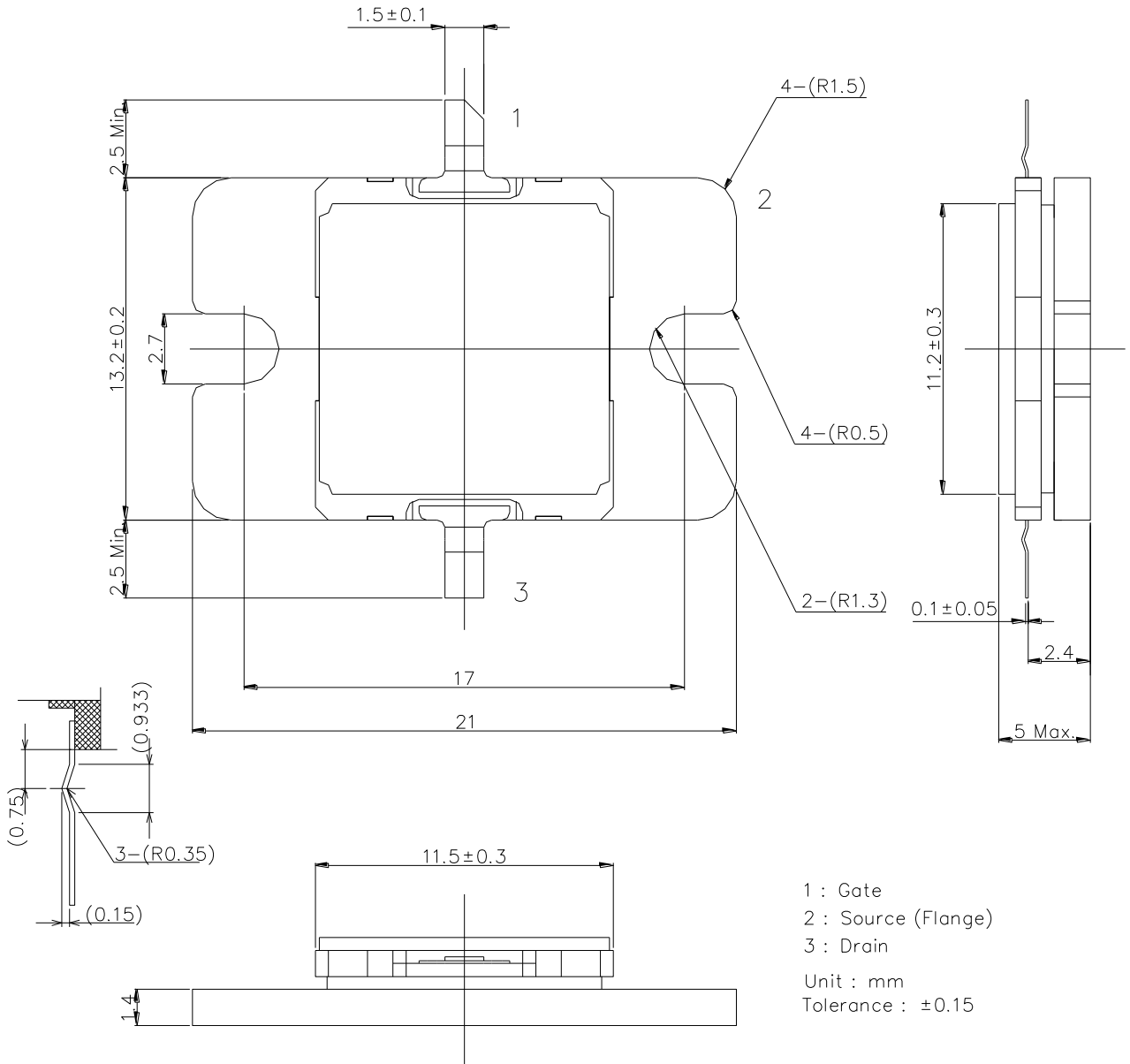
S-Parameters @V<sub>DS</sub>=50V, I<sub>DS(DC)</sub>=600mA, f=0.5 to 4.5 GHz  
 Z<sub>l</sub> = Z<sub>s</sub> = 50 ohm      Marker : 2.6GHz



Freq. GHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.50	0.94	177.74	4.71	34.10	0.003	-16.77	0.75	-165.38
0.60	0.95	175.84	3.73	26.54	0.003	-18.34	0.79	-167.78
0.70	0.95	173.65	3.05	19.01	0.003	-17.87	0.82	-170.48
0.80	0.94	172.27	2.57	13.42	0.003	-6.32	0.83	-172.82
0.90	0.95	170.62	2.27	7.66	0.003	-5.76	0.85	-175.05
1.00	0.95	168.80	2.02	1.84	0.003	7.28	0.86	-177.14
1.10	0.94	167.12	1.87	-3.03	0.003	9.86	0.87	-178.98
1.20	0.94	165.32	1.76	-8.82	0.003	14.44	0.88	179.01
1.30	0.93	163.56	1.69	-13.95	0.003	19.06	0.88	177.47
1.40	0.93	161.89	1.67	-19.26	0.004	21.94	0.89	175.69
1.50	0.92	159.58	1.68	-25.47	0.005	19.78	0.88	174.32
1.60	0.91	157.95	1.75	-31.15	0.006	17.99	0.88	173.05
1.70	0.90	155.98	1.85	-38.54	0.006	13.73	0.88	171.53
1.80	0.87	153.33	1.99	-46.45	0.008	6.70	0.88	170.31
1.90	0.83	150.71	2.22	-56.01	0.009	1.38	0.88	169.46
2.00	0.78	148.53	2.50	-67.41	0.011	-6.80	0.89	168.30
2.10	0.71	147.30	2.86	-81.10	0.014	-20.40	0.90	167.74
2.20	0.63	148.55	3.30	-97.85	0.017	-35.61	0.93	165.91
2.30	0.56	153.87	3.67	-116.92	0.020	-54.11	0.96	162.38
2.40	0.54	163.31	4.04	-137.68	0.023	-74.11	0.99	156.56
2.50	0.57	171.59	4.34	-160.07	0.026	-96.24	0.98	147.47
2.60	0.63	178.21	4.77	175.52	0.030	-120.77	0.90	133.90
2.70	0.74	-177.51	5.06	143.50	0.034	-153.77	0.63	114.19
2.80	0.89	179.84	4.55	105.86	0.032	169.78	0.16	115.91
2.90	0.97	172.72	3.22	71.86	0.024	136.35	0.39	-146.58
3.00	0.98	167.14	2.09	48.66	0.017	115.99	0.65	-158.58
3.10	0.98	163.75	1.39	34.20	0.012	104.40	0.78	-167.78
3.20	0.98	161.05	0.98	23.35	0.009	95.78	0.85	-174.41
3.30	0.97	158.74	0.72	14.61	0.008	93.63	0.89	-179.31
3.40	0.97	157.05	0.55	9.12	0.007	91.30	0.91	177.14
3.50	0.96	155.21	0.43	2.96	0.006	93.99	0.92	173.86
3.60	0.96	153.45	0.35	-1.77	0.006	95.27	0.93	171.18
3.70	0.96	151.82	0.29	-5.52	0.006	91.05	0.94	169.13
3.80	0.96	150.45	0.24	-10.02	0.007	90.37	0.94	166.69
3.90	0.96	148.67	0.21	-12.94	0.007	92.98	0.95	165.06
4.00	0.96	146.91	0.18	-16.37	0.007	83.86	0.95	162.93
4.10	0.96	145.05	0.16	-19.06	0.007	87.17	0.95	161.14
4.20	0.95	143.03	0.14	-21.34	0.008	78.03	0.95	159.10
4.30	0.96	141.08	0.13	-23.61	0.008	75.38	0.95	157.43
4.40	0.95	138.83	0.12	-25.88	0.008	70.12	0.95	155.58
4.50	0.95	136.20	0.11	-27.76	0.009	68.14	0.95	153.62



### I2D Package Outline Metal-Ceramic Hermetic Package





# **EGN26C160I2D**

*High Voltage - High Power GaN-HEMT*

**For further information please contact:**

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