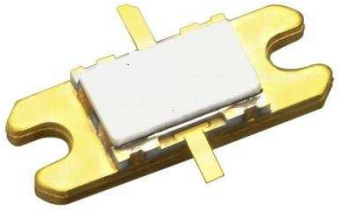
SGN26C050MK

High Voltage - High Power GaN-HEMT

FEATURES

- High Voltage Operation : V_{DS}=50V
- High Power : 47.0dBm (typ.) @ Psat
- High Efficiency: 63%(typ.) @ Psat
- Power Gain : 17.5dB(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 in 2.6GHz WiMAX & LTE design requirements as it offers high gain, long term reliability and ease of use.

ABSOLUTE MAXIMUM RATINGS (Case Temperature Tc=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		62.5	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}		$\leq$ 50	V
Forward Gate Current	I_{GF}	R_G=10 ohm	$\leq$ 51	mA
Reverse Gate Current	I_{GR}	R_G=10 ohm	$\geq$ -1.7	mA
Channel Temperature	T_{ch}		$\leq$ 180	deg.C
Average Output Power	Pave.		$\leq$ 44	dBm

ELECTRICAL CHARACTERISTICS (Case Temperature Tc=25deg.C)

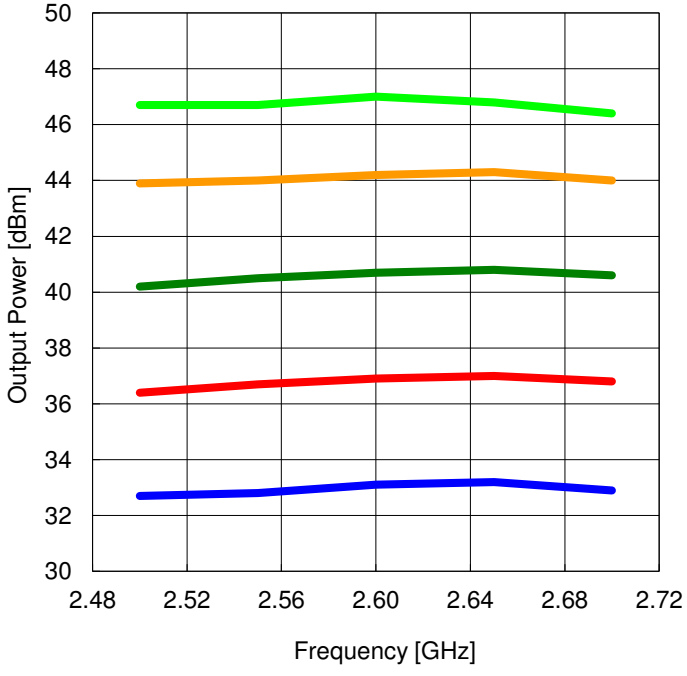
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-Off Voltage	V_p	VDS=50V IDS=12mA	-1.0	-1.5	-2.0	V
Saturated Power	Psat *1	VDS=50V	46.0	47.0	-	dBm
Drain Efficiency	η_d *2	IDS(DC)=200mA	28	33	-	%
Power Gain	Gp *2	f=2.6GHz	16.5	17.5	-	dB
Thermal Resistance	R_{th}	Channel to Case at 39W P_{DC}	-	3.0	3.6	deg.C/W

*1 : 10%-duty RF pulse (DC supply constant)
*2 : Pout = 39.0dBm, CW modulation Signal (W-CDMA)

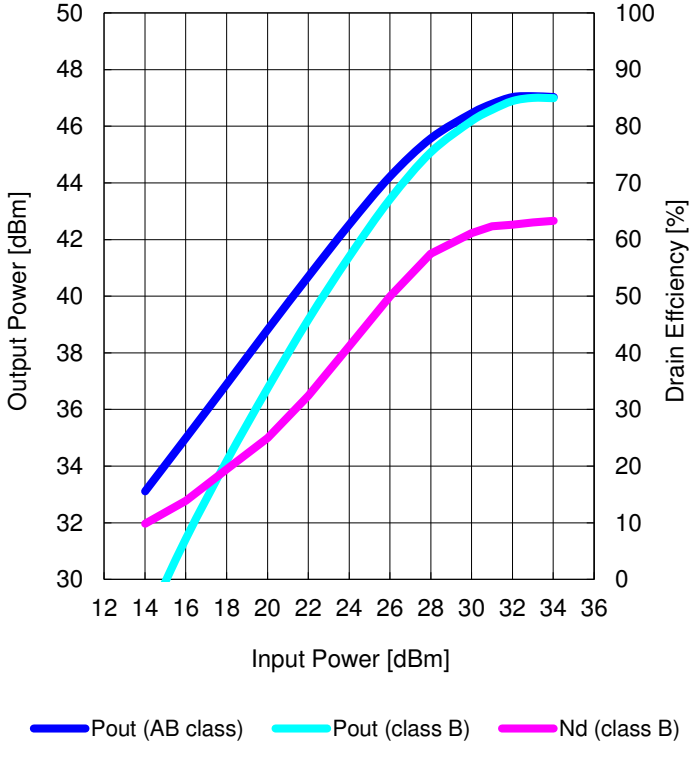
RoHS COMPLIANCE	Yes

RF characteristics @f=2.6GHz fine tuned

Output Power vs. Frequency
VDS=50V, IDS(DC)=200mA

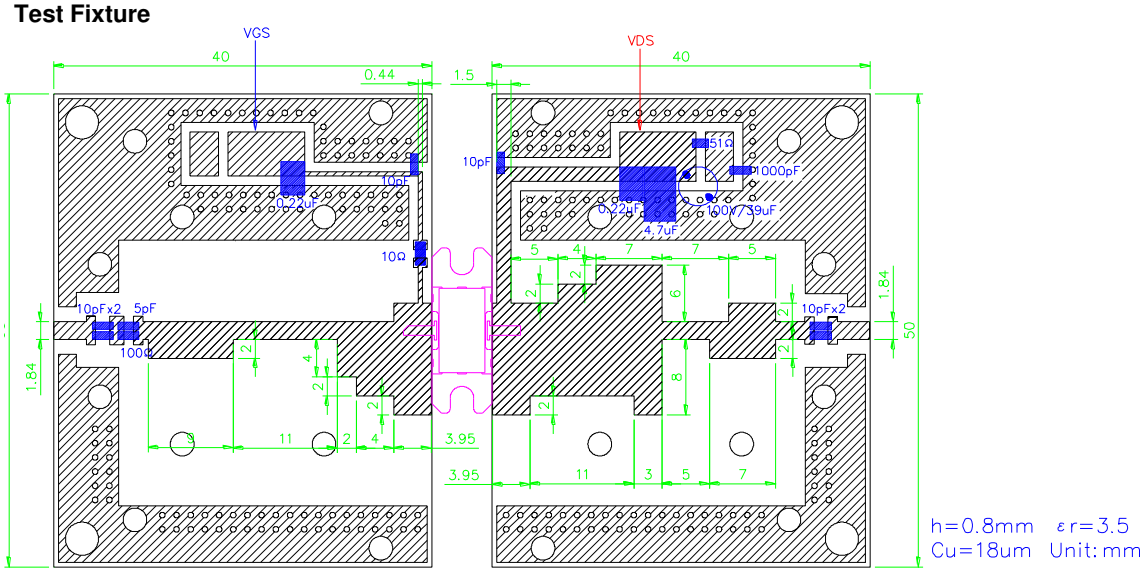


Output Power and Drain Efficiency vs. Input Power
VDS=50V, IDS(DC)=200mA, f=2.6GHz

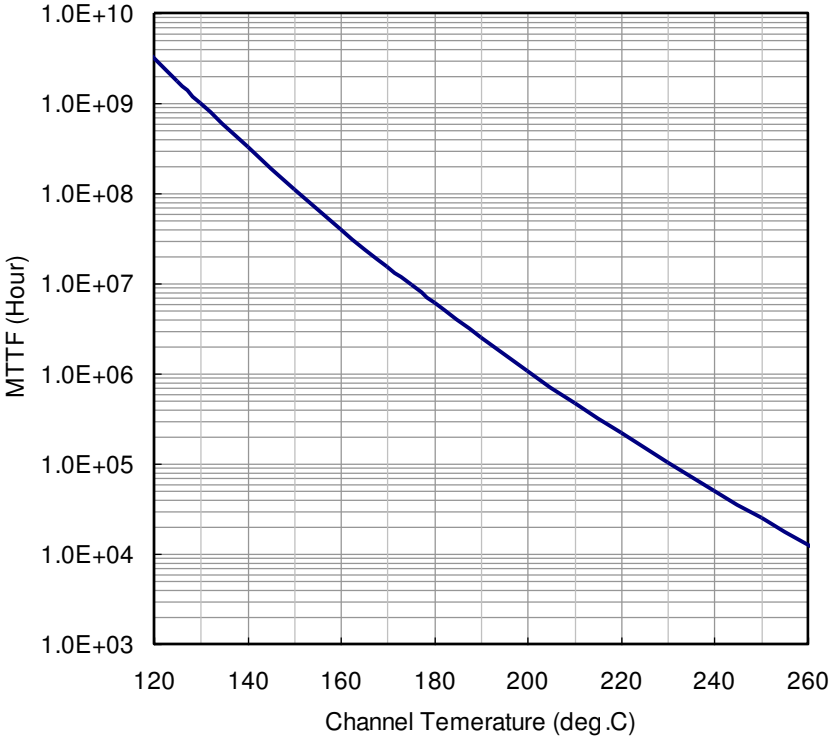


Pulse Signal (10%-duty, DC : constant)

Test Fixture



MTTF Calculation
– Estimated MTTF –



Ea=1.6eV
Confidence Level=90%

Channel Temp (deg.C)	MTTF (Hours)
160	4.05×10^7
180	6.07×10^6
200	1.07×10^6

$AF=\exp[(-Ea/k)(1/T_{stress}-1/T_{use})$

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

Where;

AF: acceleration factor

Ea: activation energy (1.6 eV)

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

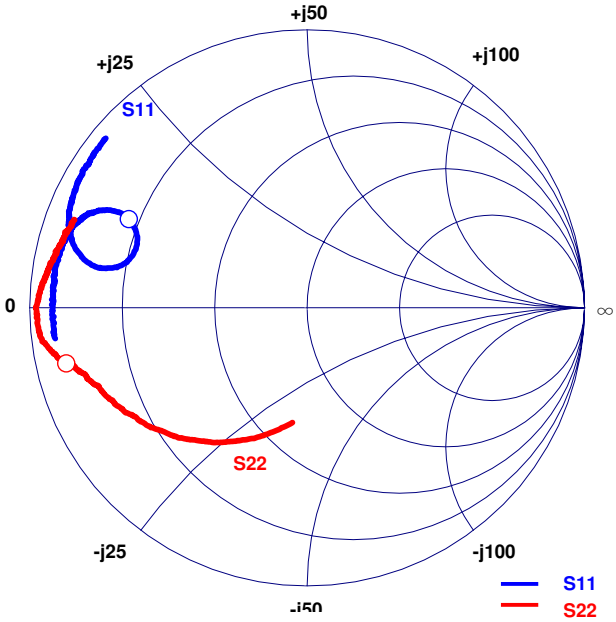
T_{stress}: stress temperature (K)

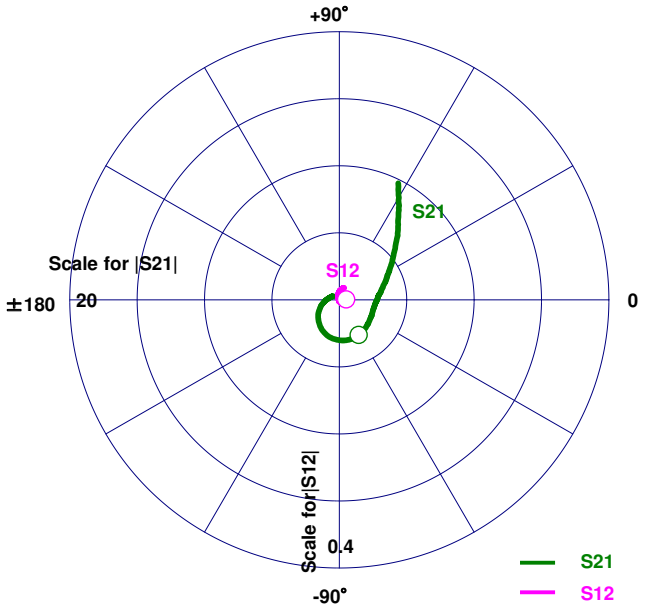
T_{use}: use temperature (K)

ESD characteristic

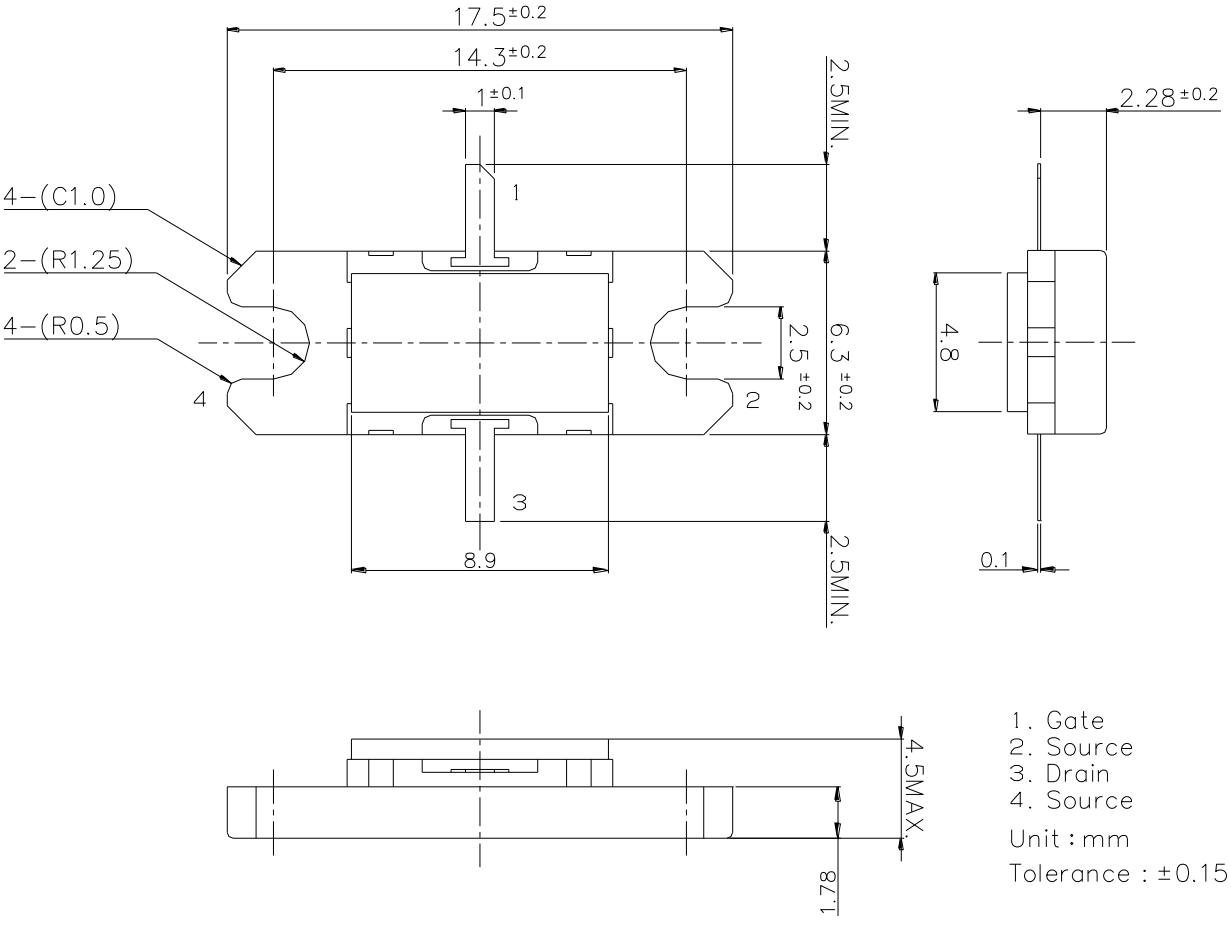
Test Methodology	Class
Human Body Model (per JESD22-A114)	0
Machine Model (per JEIA/ESD22-A115)	A

S-Parameters @VDS=50V, IDS(DC)=200mA, f=0.5 to 4.5GHz
Zl = Zs = 50 ohm Marker : 2.6GHz





Freq.	S11		S21		S12		S22	
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.50	0.91	-173.05	9.74	63.33	0.007	-6.69	0.42	-97.28
0.60	0.92	-176.77	8.01	56.54	0.007	-8.56	0.46	-104.72
0.70	0.92	-179.22	6.79	50.04	0.007	-9.38	0.50	-111.63
0.80	0.92	178.44	5.81	44.20	0.006	-9.66	0.54	-117.69
0.90	0.92	176.23	5.10	38.72	0.006	-8.62	0.58	-122.83
1.00	0.92	174.54	4.56	33.20	0.005	-6.87	0.61	-127.90
1.10	0.92	172.75	4.10	28.02	0.005	-5.19	0.64	-132.16
1.20	0.92	171.20	3.77	22.96	0.005	-0.45	0.67	-136.08
1.30	0.92	169.53	3.45	18.33	0.005	6.09	0.69	-140.00
1.40	0.91	168.11	3.22	13.60	0.005	10.71	0.71	-143.15
1.50	0.92	166.25	3.03	8.49	0.005	15.10	0.73	-146.39
1.60	0.91	165.46	2.89	4.47	0.005	20.45	0.74	-149.02
1.70	0.91	163.79	2.80	-0.73	0.006	25.88	0.76	-151.71
1.80	0.90	162.38	2.70	-5.55	0.006	23.60	0.78	-154.21
1.90	0.89	160.76	2.65	-10.14	0.006	25.66	0.79	-156.57
2.00	0.88	159.22	2.62	-15.77	0.007	24.21	0.80	-158.55
2.10	0.87	157.74	2.63	-20.65	0.008	26.52	0.81	-160.05
2.20	0.85	156.41	2.66	-27.17	0.008	23.46	0.83	-161.71
2.30	0.83	155.00	2.72	-34.32	0.008	19.54	0.84	-163.47
2.40	0.80	153.83	2.81	-41.82	0.009	17.30	0.85	-164.64
2.50	0.76	153.10	2.90	-51.12	0.010	13.25	0.87	-166.07
2.60	0.72	153.64	2.99	-61.24	0.010	4.62	0.89	-167.04
2.70	0.68	155.93	3.06	-73.82	0.014	-6.48	0.92	-168.68
2.80	0.65	159.95	3.02	-87.73	0.010	-18.19	0.94	-170.83
2.90	0.66	164.86	2.89	-101.83	0.009	-30.28	0.96	-173.03
3.00	0.71	168.04	2.64	-116.37	0.008	-40.65	0.97	-175.87
3.10	0.76	169.01	2.33	-129.27	0.005	-56.79	0.97	-178.43
3.20	0.81	168.24	2.04	-140.46	0.003	-71.76	0.97	179.30
3.30	0.85	166.46	1.76	-150.12	0.002	-92.84	0.97	177.32
3.40	0.88	164.26	1.52	-158.16	0.001	177.11	0.96	175.51
3.50	0.90	161.93	1.33	-165.28	0.002	133.52	0.95	173.72
3.60	0.91	159.87	1.17	-171.24	0.004	125.39	0.95	172.39
3.70	0.92	157.56	1.03	-176.96	0.004	104.67	0.94	171.02
3.80	0.93	155.43	0.92	177.85	0.006	104.07	0.93	169.43
3.90	0.94	153.25	0.83	173.37	0.007	97.96	0.93	168.16
4.00	0.94	151.45	0.76	169.07	0.009	94.40	0.92	166.65
4.10	0.94	149.35	0.70	164.79	0.011	90.36	0.92	165.51
4.20	0.95	147.01	0.65	160.73	0.013	89.05	0.91	164.07
4.30	0.95	144.68	0.61	156.61	0.015	79.02	0.91	162.33
4.40	0.95	142.35	0.58	152.37	0.017	75.20	0.90	161.06
4.50	0.95	139.97	0.56	148.27	0.019	68.58	0.90	159.30


17.5±0.2
14.3±0.2
1±0.1
2.5MIN.
4−(C1.0)
2−(R1.25)
4−(R0.5)
1
2
3
4
2.5±0.2
6.3±0.2
2.5MIN.
8.9
2.28±0.2
4.8
0.1
4.5MAX.
1.78
1. Gate
2. Source
3. Drain
4. Source
Unit : mm
Tolerance : ±0.15

For further information please contact:

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