

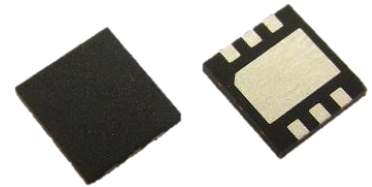
FEATURES

- High Voltage Operation : $V_{DS}=50V$
- High Power : 44dBm (typ.) @ P_{sat}
- High Efficiency : 60% (typ.) @ P_{sat}
- Power Gain : 19dB (typ.) @ $f=2.65GHz$
- Proven Reliability

DESCRIPTION

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

This new product is ideally suited for use up to 3.8GHz W-CDMA & LTE design requirements as it offers high gain, long term reliability and ease of use. This device target applications are driver stage and final stage of micro cell base transceiver stations.



ABSOLUTE MAXIMUM RATINGS

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^*		19.4	W
Storage Temperature	Tstg		-40 to +125	deg.C
Channel Temperature	Tch		250	deg.C

* : Case Temperature $T_c=25deg.C$

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V_{DS}		≤ 55	V
Forward Gate Current	IGF	$RG=15ohm$	≤ 46	mA
Reverse Gate Current	IGR	$RG=15ohm$	≥ -0.7	mA
Channel Temperature	Tch		≤ 200	deg.C
Average Output Power	Pave.		≤ 41.0	dBm

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

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-Off Voltage	V_p	$V_{DS}=50V, I_{DS}=5.4mA$	-1.0	-1.5	-2.0	V
Saturated Power	P_{sat}^*1	$V_{DS}=50V,$ $I_{DS}(DC)\approx 0mA$ $f=2.65GHz$	43.0	44.0	-	dBm
Drain Efficiency	DE^*2	$V_{DS}=50V$	11.5	13.5	-	%
Power Gain	G_p^*2	$I_{DS}(DC)\approx 100mA$ $f=2.65GHz$	18.0	19.0	-	dB
Thermal Resistance	R_{th}^*3	Channel to Case at 16.5W PDC	-	7.0	8.0	deg.C/W

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

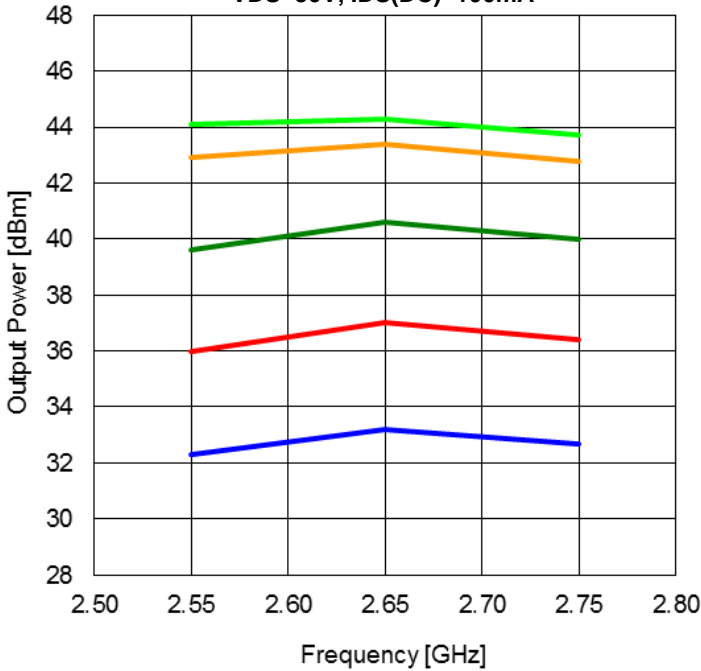
*2 : $P_{out}=30.5dBm$, CW modulation Signal (W-CDMA)

*3 : Sampling Test : samples size 10pcs. Criteria(accept / reject)=(0 / 1)

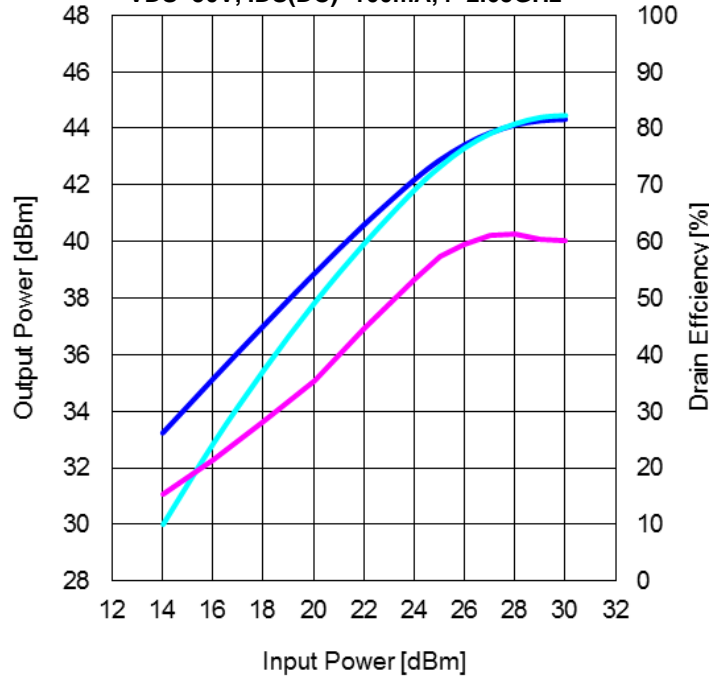
RoHS COMPLIANCE Yes

RF characteristics @f=2.65GHz fine tuned

Output Power vs. Frequency
VDS=50V, IDS(DC)=100mA



Output Power and Drain Efficiency vs. Input Power
VDS=50V, IDS(DC)=100mA, f=2.65GHz

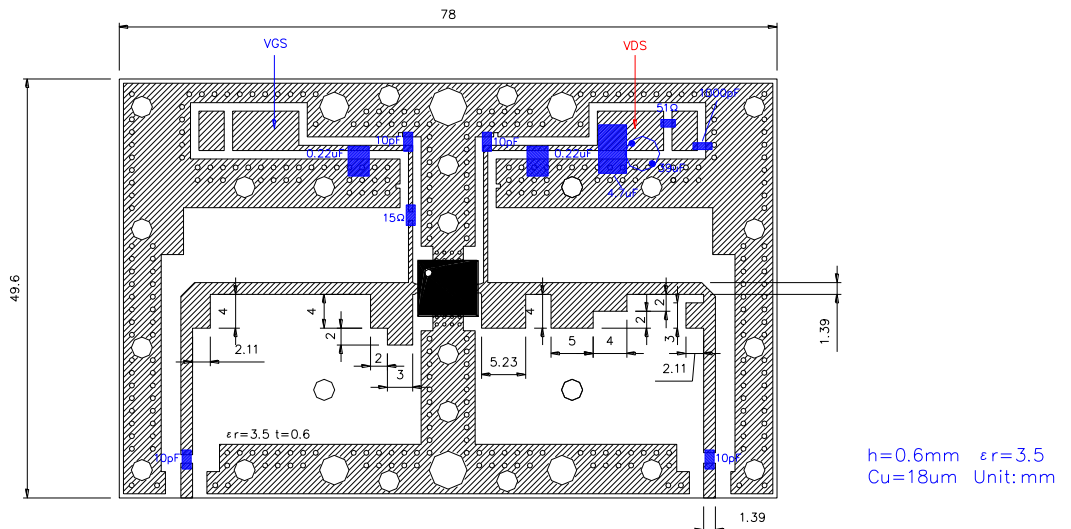


Pin=14dBm Pin=18dBm Pin=22dBm
Pin=26dBm Pin=30dBm

Pout (class AB) Pout (class B) DE (class B)

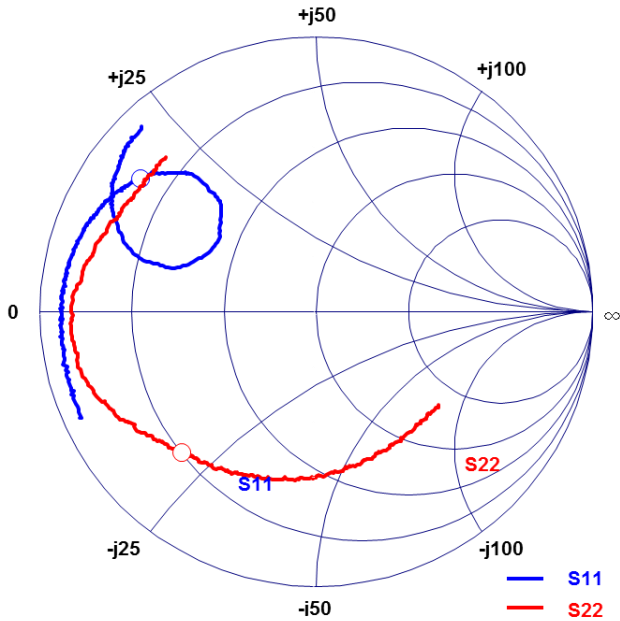
Test Fixture

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

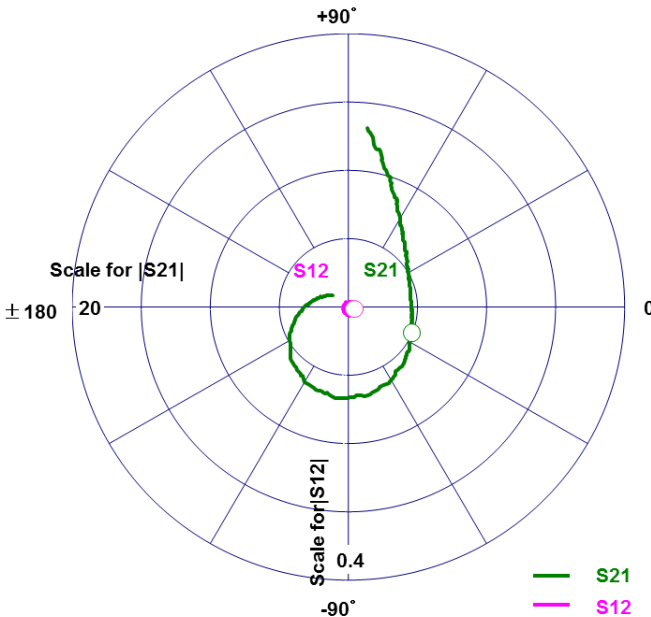


S-Parameters @VDS=50V, IDS(DC)=100mA, f=0.5 to 4.5GHz
 ZI = Zs = 50ohm Marker : 2.65GHz

- Reference DATA -



Freq. GHz	S11			S21		S12		S22	
	MAG	ANG		MAG	ANG	MAG	ANG	MAG	ANG
0.5	0.94	-155.65	13.19	84.08	0.013	16.05	0.56	-37.71	
0.6	0.92	-161.75	11.14	77.41	0.010	-4.13	0.55	-42.44	
0.7	0.92	-166.26	9.77	71.95	0.010	6.94	0.56	-47.46	
0.8	0.93	-171.00	8.65	66.45	0.010	-5.31	0.55	-52.29	
0.9	0.93	-174.34	7.80	62.45	0.010	-3.85	0.56	-57.00	
1.0	0.92	-177.21	7.06	58.10	0.010	-11.36	0.56	-61.60	
1.1	0.92	179.87	6.58	53.44	0.011	-13.18	0.56	-67.03	
1.2	0.92	177.54	6.15	48.44	0.009	-8.62	0.57	-72.04	
1.3	0.92	175.21	5.84	43.87	0.009	-15.52	0.58	-76.75	
1.4	0.92	172.63	5.48	39.81	0.009	-14.96	0.59	-81.37	
1.5	0.91	170.64	5.23	35.86	0.009	-15.25	0.59	-85.92	
1.6	0.91	168.93	5.06	31.56	0.007	-9.07	0.60	-90.78	
1.7	0.90	166.43	4.89	26.37	0.009	-9.61	0.61	-95.09	
1.8	0.90	163.95	4.78	21.88	0.008	-17.19	0.62	-100.11	
1.9	0.89	161.74	4.68	17.06	0.008	-19.50	0.63	-104.05	
2.0	0.89	159.22	4.61	12.85	0.007	-17.39	0.64	-108.50	
2.1	0.88	157.06	4.54	8.33	0.008	-16.51	0.64	-112.09	
2.2	0.87	154.39	4.59	3.05	0.008	-14.18	0.65	-116.41	
2.3	0.86	152.08	4.59	-2.23	0.008	-16.43	0.66	-120.48	
2.4	0.85	149.72	4.63	-7.30	0.009	-22.65	0.68	-124.37	
2.5	0.83	146.98	4.73	-13.17	0.009	-22.95	0.69	-128.36	
2.6	0.81	144.35	4.88	-18.32	0.009	-25.16	0.70	-131.22	
2.7	0.78	140.65	5.06	-25.53	0.009	-33.27	0.72	-135.52	
2.8	0.76	138.53	5.25	-32.64	0.009	-25.18	0.73	-138.96	
2.9	0.71	135.02	5.53	-41.24	0.009	-27.18	0.75	-142.78	
3.0	0.66	131.86	5.84	-51.46	0.011	-36.72	0.78	-146.98	
3.1	0.60	130.91	6.24	-61.17	0.012	-45.54	0.81	-151.06	
3.2	0.53	131.49	6.48	-73.19	0.012	-58.63	0.83	-156.85	
3.3	0.46	138.97	6.66	-87.66	0.011	-66.22	0.87	-162.43	
3.4	0.44	149.68	6.54	-104.82	0.011	-88.13	0.88	-169.96	
3.5	0.49	159.57	6.24	-121.22	0.009	-106.49	0.89	-176.66	
3.6	0.59	163.50	5.69	-135.92	0.010	-130.49	0.88	176.41	
3.7	0.68	162.61	4.94	-149.00	0.007	-149.91	0.86	170.88	
3.8	0.75	158.94	4.25	-161.34	0.006	-171.57	0.84	165.44	
3.9	0.81	154.62	3.58	-172.62	0.006	162.44	0.82	160.03	
4.0	0.85	150.73	3.06	177.63	0.006	136.22	0.80	155.40	
4.1	0.87	147.31	2.61	170.29	0.006	121.82	0.79	150.80	
4.2	0.90	142.44	2.25	162.91	0.006	99.45	0.78	147.26	
4.3	0.91	140.02	1.92	156.72	0.006	85.02	0.78	143.13	
4.4	0.91	136.90	1.67	149.46	0.006	81.67	0.78	138.91	
4.5	0.92	133.30	1.45	143.74	0.008	62.08	0.78	134.21	



ESD characteristic

Test Methodology	Class
Human Body Model (per JESD22-A114)	1C
Machine Model (per JESD22-A115)	A
Charged-Device Model (per JESD22-C101)	C3

Ordering Information

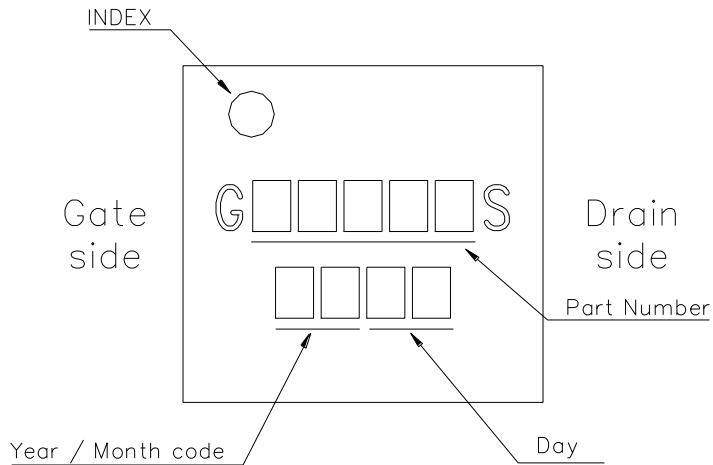
Part Number	MOQ	MOU	Packing Style
SGFCF20S-DT	2500pcs.	2500pcs.	Tape and Reel (16mm width Tape)
SGFCF20S-DT1	500pcs.	500pcs.	Tape and Reel (16mm width Tape)
SGFCF20S-D	20pcs.	20pcs.	Tray (4-inch)

Note : *MOQ stands for Minimum Order Quantity.
*MOU stands for Minimum Order Unit size.

Moisture Sensitivity Level

Level	Floor Life	
	Time	Condition
2a	4weeks after open the package	≤30deg.C/60%RH

Package Markings



Year code

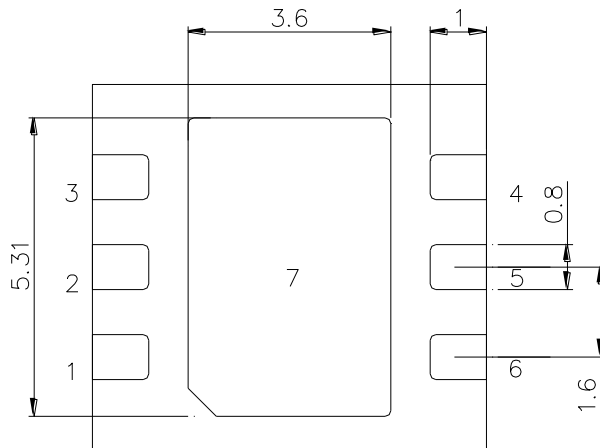
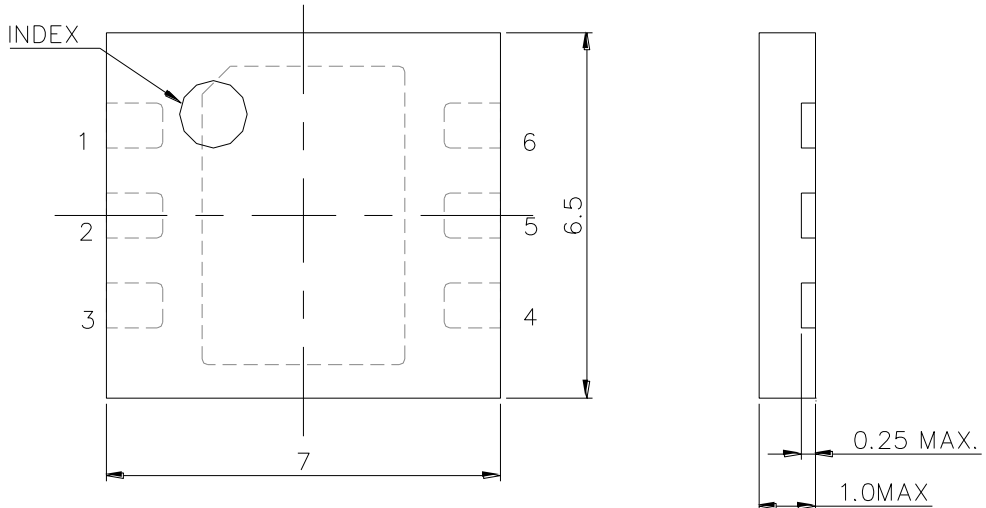
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023
Code	X	Y	Z	A	B	C	D	E	F

Note: Code letter is cycling 25 alphabet without Q.

Month code

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Code	H	M	N	P	R	S	T	U	W	X	Y	Z

Z2D Package Outline
Full Mold Plastic Package

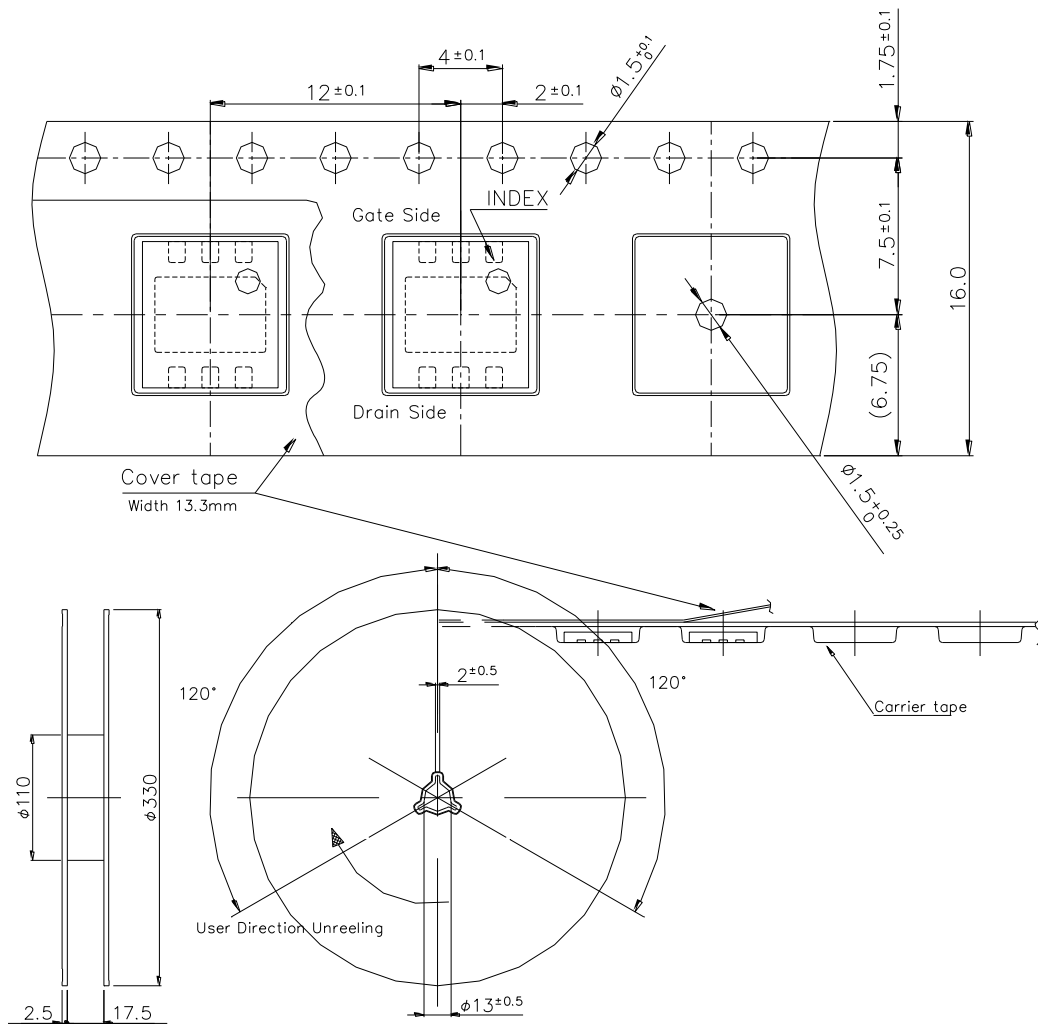


<Single Type>

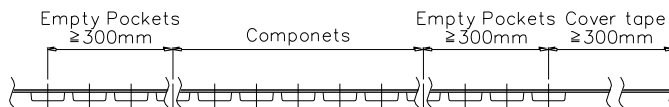
- 1 : NC
- 2 : Gate
- 3 : NC
- 4 : NC
- 5 : Drain
- 6 : NC
- 7 : Source

Unit: mm
Tolerance : $\pm 0.15\text{mm}$

Index and Tape / Reel Configuration
 (Part Number : SGFCF20S-DT, SGFCF20S-DT1)



(Unit in mm)



- Note : Baking of Tape & Reel is possible by following condition.
1. Recommended Baking Condition : 125deg.C, 8hours
 2. Upper limit number of times : 5 times

* Reference standard : JIS standard(JIS C 0806-3)