

TENTATIVE TOSHIBA FIELD EFFECT TRANSISTOR GaAs N-CHANNEL DUAL GATE MES TYPE

# 3SK320

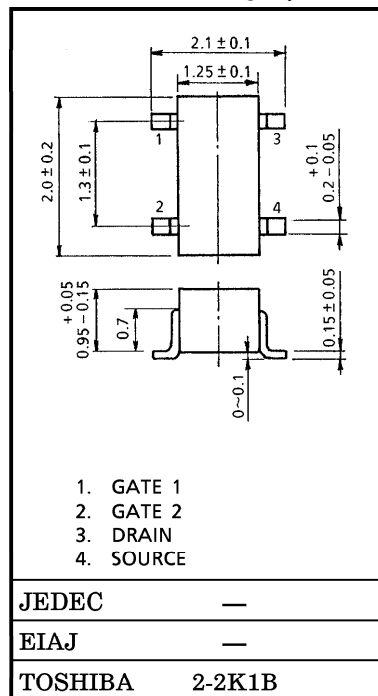
UHF BAND LOW NOISE AMP

UHF BAND MIX

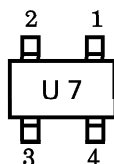
Unit in mm

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Gate 1-Drain Voltage	V <sub>G1DO</sub>	-6	V
Gate 2-Drain Voltage	V <sub>G2DO</sub>	-6	V
Gate 1-Source Voltage	V <sub>G1S</sub>	-4	V
Gate 2-Source Voltage	V <sub>G2S</sub>	-4	V
Gate 1 Current	I <sub>G1</sub>	1	mA
Gate 2 Current	I <sub>G2</sub>	1	mA
Power Dissipation	P <sub>D</sub>	100	mW
Channel Temperature	T <sub>ch</sub>	125	°C
Storage Temperature Range	T <sub>stg</sub>	-55~125	°C



Marking



961001EAC1

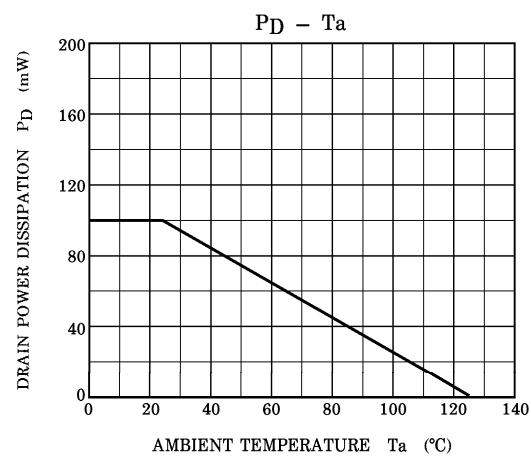
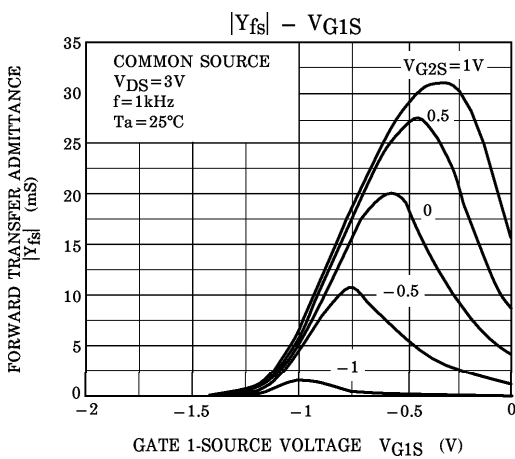
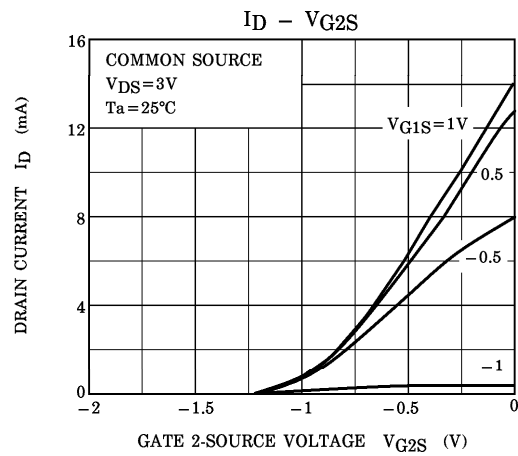
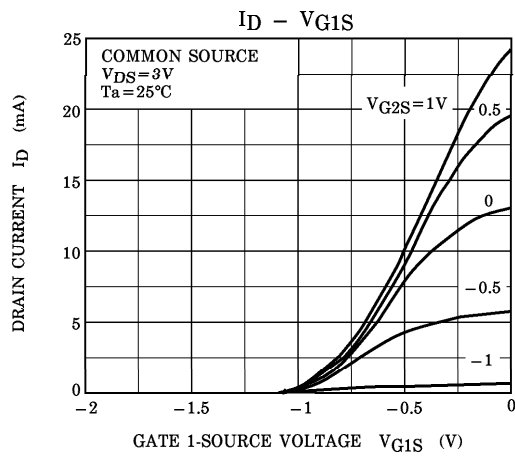
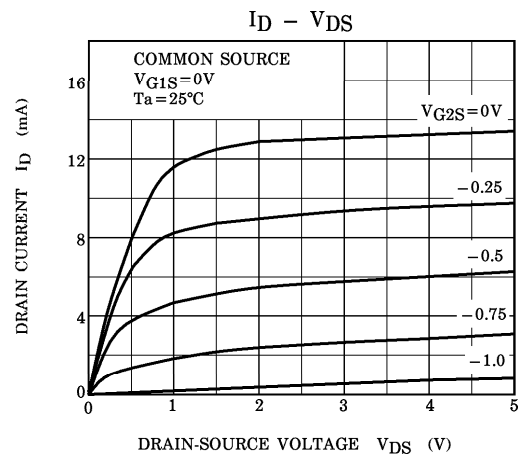
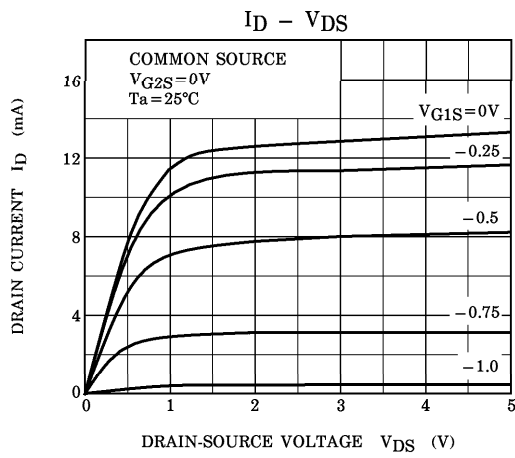
- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

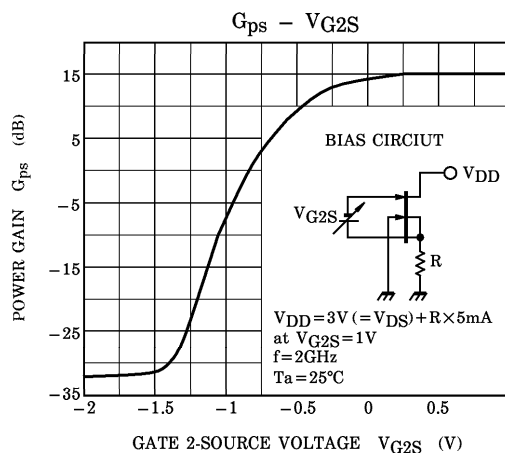
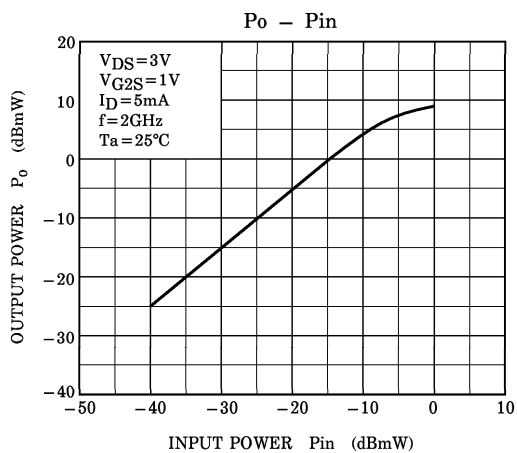
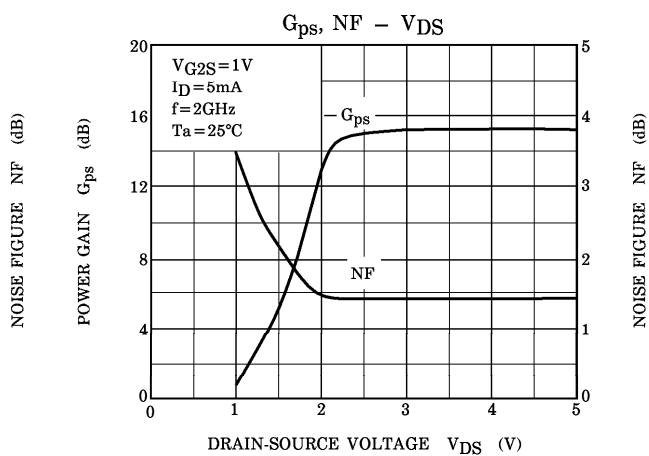
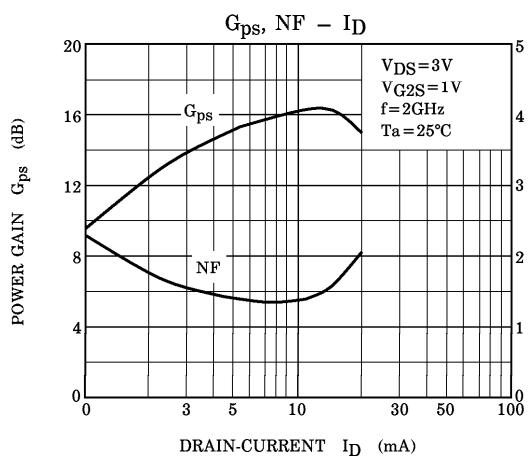
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate 1 Leakage Current	I <sub>G1SS</sub>	V <sub>DS</sub> =0, V <sub>G1S</sub> =-3V, V <sub>G2S</sub> =0	—	—	-4	μA
Gate 2 Leakage Current	I <sub>G2SS</sub>	V <sub>DS</sub> =0, V <sub>G1S</sub> =0, V <sub>G2S</sub> =-3V	—	—	-4	μA
Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =3V, V <sub>G1S</sub> =0, V <sub>G2S</sub> =0	9	—	18	mA
Gate 1-Source Cut-off Voltage	V <sub>G1S</sub> (OFF)	V <sub>DS</sub> =3V, V <sub>G2S</sub> =0, I <sub>D</sub> =100μA	-0.8	—	-1.4	V
Gate 2-Source Cut-off Voltage	V <sub>G2S</sub> (OFF)	V <sub>DS</sub> =3V, V <sub>G1S</sub> =0, I <sub>D</sub> =100μA	-0.8	—	-1.4	V
Forward Transfer Admittance	Y <sub>fs</sub>	V <sub>DS</sub> =3V, V <sub>G2S</sub> =1V, I <sub>D</sub> =5mA, f=1kHz	—	22	—	mS
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =3V, V <sub>G2S</sub> =1V, I <sub>D</sub> =5mA, f=1MHz	—	0.6	1.4	pF
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> =3V, V <sub>G2S</sub> =1V, I <sub>D</sub> =5mA, f=1MHz	—	0.012	0.03	pF
Power Gain (1)	G <sub>ps</sub> (1)	V <sub>DS</sub> =3V, V <sub>G2S</sub> =1V, I <sub>D</sub> =5mA, f=800MHz	—	20.5	—	dB
Noise Figure (1)	NF (1)	V <sub>DS</sub> =3V, V <sub>G2S</sub> =1V, I <sub>D</sub> =5mA, f=800MHz	—	0.9	—	dB
Power Gain (2)	G <sub>ps</sub> (2)	V <sub>DS</sub> =3V, V <sub>G2S</sub> =1V, I <sub>D</sub> =5mA, f=2GHz	12	15	—	dB
Noise Figure (2)	NF (2)	V <sub>DS</sub> =3V, V <sub>G2S</sub> =1V, I <sub>D</sub> =5mA, f=2GHz	—	1.4	2.2	dB

## CAUTION

This device electrostatic sensitivity. Please handle with caution.





## S-PARAMETER

(V<sub>DS</sub>=2V, I<sub>D</sub>=2mA, V<sub>G2S</sub>=0.5V, T<sub>a</sub>=25°C, Z<sub>L</sub>=Z<sub>S</sub>=50Ω)

FREQ. (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.998	-3.5	1.196	174.7	0.0019	59.4	0.968	-2.1
200	0.996	-4.9	1.195	172.8	0.0026	63.7	0.967	-2.9
300	0.992	-6.9	1.194	170.4	0.0034	66.0	0.966	-3.9
400	0.990	-9.3	1.195	167.2	0.0044	69.9	0.964	-5.2
500	0.984	-11.6	1.193	164.1	0.0051	79.0	0.963	-6.6
600	0.979	-14.0	1.195	161.0	0.0064	79.3	0.962	-7.8
700	0.971	-16.3	1.197	158.1	0.0070	77.2	0.960	-9.2
800	0.963	-18.6	1.202	155.0	0.0075	80.3	0.959	-10.5
900	0.953	-20.8	1.202	152.1	0.0083	79.3	0.958	-11.8
1000	0.945	-23.1	1.209	148.9	0.0087	77.5	0.956	-13.1
1100	0.935	-25.2	1.208	145.9	0.0087	74.9	0.954	-14.5
1200	0.926	-27.5	1.214	142.5	0.0093	78.1	0.951	-15.8
1300	0.918	-29.7	1.217	139.4	0.0098	79.5	0.948	-17.1
1400	0.906	-32.1	1.223	136.0	0.0102	78.9	0.946	-18.4
1500	0.895	-34.4	1.226	132.9	0.0107	75.9	0.944	-19.8
1600	0.882	-36.7	1.231	129.5	0.0107	74.8	0.943	-21.1
1700	0.867	-39.0	1.229	126.2	0.0106	75.7	0.941	-22.4
1800	0.854	-41.2	1.229	122.6	0.0108	71.6	0.939	-23.8
1900	0.839	-43.4	1.229	119.5	0.0109	68.6	0.936	-25.2
2000	0.824	-45.5	1.232	115.8	0.0106	71.8	0.933	-26.5
2100	0.810	-47.7	1.227	112.6	0.0116	70.2	0.929	-27.9
2200	0.796	-50.0	1.227	108.8	0.0119	67.2	0.927	-29.2
2300	0.778	-52.2	1.226	105.6	0.0116	65.5	0.924	-30.6
2400	0.761	-54.2	1.225	101.7	0.0118	66.2	0.923	-31.9
2500	0.746	-55.9	1.221	98.6	0.0125	63.0	0.921	-33.0
2600	0.735	-57.1	1.228	96.1	0.0123	63.5	0.921	-33.8

## S-PARAMETER

(V<sub>DS</sub>=2V, I<sub>D</sub>=5mA, V<sub>G2S</sub>=0.5V, T<sub>a</sub>=25°C, Z<sub>L</sub>=Z<sub>S</sub>=50Ω)

FREQ. (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.997	-4.3	1.913	174.3	0.0017	113.5	0.953	-2.1
200	0.995	-5.8	1.909	172.3	0.0021	103.9	0.953	-2.9
300	0.990	-7.8	1.904	169.8	0.0029	95.8	0.952	-4.0
400	0.984	-10.4	1.900	166.4	0.0035	87.2	0.951	-5.3
500	0.977	-12.9	1.897	163.1	0.0036	82.1	0.950	-6.6
600	0.969	-15.3	1.896	159.9	0.0045	81.8	0.948	-7.9
700	0.959	-17.8	1.894	156.6	0.0051	84.0	0.946	-9.3
800	0.950	-20.4	1.896	153.3	0.0057	81.4	0.944	-10.6
900	0.938	-22.9	1.892	150.2	0.0069	81.1	0.941	-11.9
1000	0.925	-25.4	1.895	146.9	0.0077	83.9	0.940	-13.2
1100	0.912	-28.0	1.892	143.8	0.0088	84.4	0.938	-14.5
1200	0.899	-30.6	1.897	140.3	0.0093	81.3	0.936	-15.8
1300	0.884	-32.9	1.893	137.0	0.0092	82.1	0.935	-17.1
1400	0.870	-35.3	1.896	133.5	0.0090	84.4	0.933	-18.4
1500	0.855	-37.7	1.893	130.1	0.0099	79.8	0.931	-19.8
1600	0.837	-39.9	1.892	126.6	0.0097	79.2	0.929	-21.2
1700	0.818	-42.1	1.881	123.1	0.0100	76.7	0.925	-22.6
1800	0.799	-44.2	1.874	119.4	0.0108	75.4	0.923	-24.0
1900	0.780	-46.4	1.865	116.1	0.0115	73.4	0.919	-25.4
2000	0.761	-48.5	1.857	112.4	0.0115	72.8	0.916	-26.8
2100	0.744	-50.7	1.843	109.0	0.0120	69.6	0.915	-28.1
2200	0.725	-52.6	1.831	105.3	0.0120	73.8	0.913	-29.6
2300	0.708	-54.5	1.820	102.0	0.0113	71.6	0.913	-30.9
2400	0.688	-56.3	1.810	98.1	0.0119	72.2	0.913	-32.2
2500	0.672	-57.8	1.801	95.1	0.0127	75.0	0.913	-33.4
2600	0.659	-58.8	1.805	92.5	0.0136	77.8	0.913	-34.2

## S-PARAMETER

(V<sub>DS</sub>=2V, I<sub>D</sub>=10mA, V<sub>G2S</sub>=0.5V, T<sub>a</sub>=25°C, Z<sub>L</sub>=Z<sub>s</sub>=50Ω)

FREQ. (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.993	-4.6	2.468	173.8	0.0006	61.7	0.936	-2.1
200	0.991	-6.2	2.464	171.6	0.0018	81.6	0.936	-2.9
300	0.987	-8.5	2.455	168.7	0.0028	91.9	0.935	-3.9
400	0.981	-11.4	2.450	165.0	0.0044	91.0	0.934	-5.3
500	0.973	-14.1	2.443	161.4	0.0050	88.7	0.933	-6.6
600	0.962	-16.9	2.436	157.8	0.0058	89.1	0.932	-7.9
700	0.951	-19.7	2.425	154.3	0.0063	86.0	0.930	-9.2
800	0.937	-22.4	2.424	150.6	0.0072	79.9	0.928	-10.5
900	0.921	-25.0	2.411	147.2	0.0079	75.4	0.927	-11.8
1000	0.905	-27.7	2.406	143.7	0.0084	73.9	0.925	-13.1
1100	0.887	-30.3	2.393	140.2	0.0087	77.3	0.922	-14.4
1200	0.869	-32.8	2.393	136.5	0.0092	80.0	0.920	-15.7
1300	0.853	-35.3	2.380	133.0	0.0095	79.5	0.919	-17.0
1400	0.835	-37.7	2.378	129.3	0.0091	80.8	0.917	-18.4
1500	0.818	-40.0	2.366	125.8	0.0095	79.8	0.915	-19.7
1600	0.799	-42.3	2.359	122.1	0.0101	78.2	0.914	-21.1
1700	0.778	-44.5	2.339	118.5	0.0105	78.1	0.912	-22.6
1800	0.757	-46.7	2.319	114.6	0.0105	78.1	0.910	-23.9
1900	0.735	-48.8	2.299	111.1	0.0114	78.4	0.908	-25.3
2000	0.712	-51.0	2.281	107.1	0.0119	79.5	0.907	-26.8
2100	0.692	-53.1	2.256	103.5	0.0122	78.9	0.904	-28.2
2200	0.672	-55.1	2.230	99.5	0.0124	77.5	0.904	-29.6
2300	0.652	-56.9	2.212	96.2	0.0126	74.9	0.904	-31.0
2400	0.633	-58.5	2.191	92.1	0.0122	72.9	0.904	-32.4
2500	0.617	-59.6	2.171	89.0	0.0119	71.5	0.904	-33.6
2600	0.603	-60.4	2.171	86.3	0.0114	68.9	0.905	-34.5

(V<sub>DS</sub>=3V, I<sub>D</sub>=2mA, V<sub>G2S</sub>=1V, T<sub>a</sub>=25°C, Z<sub>L</sub>=Z<sub>s</sub>=50Ω)

FREQ. (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.997	-3.7	1.220	175.0	0.0027	58.3	0.973	-2.0
200	0.996	-5.0	1.218	173.1	0.0031	68.8	0.973	-2.7
300	0.994	-6.8	1.218	170.7	0.0034	76.3	0.972	-3.7
400	0.990	-9.1	1.217	167.6	0.0040	81.2	0.970	-4.9
500	0.985	-11.4	1.216	164.6	0.0043	83.2	0.970	-6.1
600	0.980	-13.7	1.217	161.6	0.0048	87.8	0.968	-7.3
700	0.973	-16.0	1.217	158.8	0.0050	83.1	0.966	-8.6
800	0.963	-18.2	1.219	155.7	0.0054	76.7	0.964	-9.9
900	0.956	-20.4	1.219	152.9	0.0063	75.7	0.961	-11.1
1000	0.947	-22.6	1.225	149.9	0.0074	75.1	0.958	-12.3
1100	0.937	-24.9	1.227	146.9	0.0077	75.6	0.956	-13.6
1200	0.926	-27.2	1.237	143.6	0.0086	75.9	0.955	-14.8
1300	0.917	-29.3	1.240	140.6	0.0093	78.2	0.953	-16.0
1400	0.905	-31.6	1.246	137.3	0.0093	76.0	0.951	-17.3
1500	0.893	-33.8	1.249	134.2	0.0095	71.5	0.950	-18.5
1600	0.883	-36.1	1.253	131.0	0.0099	68.8	0.948	-19.8
1700	0.870	-38.3	1.252	127.7	0.0101	71.0	0.945	-21.1
1800	0.856	-40.5	1.251	124.1	0.0097	70.5	0.942	-22.4
1900	0.842	-42.6	1.252	121.0	0.0095	72.2	0.940	-23.6
2000	0.828	-44.8	1.254	117.5	0.0096	75.1	0.939	-24.9
2100	0.811	-47.1	1.252	114.3	0.0100	73.8	0.936	-26.1
2200	0.795	-49.1	1.249	110.6	0.0091	70.5	0.935	-27.4
2300	0.781	-51.2	1.248	107.8	0.0095	68.1	0.934	-28.6
2400	0.765	-53.4	1.247	104.0	0.0092	69.3	0.933	-29.9
2500	0.753	-54.9	1.243	101.1	0.0084	71.2	0.932	-30.9
2600	0.744	-56.0	1.248	98.5	0.0077	77.0	0.933	-31.7

## S-PARAMETER

(V<sub>DS</sub>=3V, I<sub>D</sub>=5mA, V<sub>G2S</sub>=1V, T<sub>a</sub>=25°C, Z<sub>L</sub>=Z<sub>S</sub>=50Ω)

FREQ. (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.995	-4.2	1.923	174.6	0.0012	133.1	0.963	-2.0
200	0.992	-5.6	1.919	172.6	0.0020	112.8	0.963	-2.7
300	0.989	-7.6	1.914	170.0	0.0027	104.4	0.961	-3.7
400	0.984	-10.1	1.912	166.7	0.0035	93.7	0.959	-4.9
500	0.978	-12.5	1.910	163.5	0.0039	90.3	0.958	-6.2
600	0.971	-15.0	1.909	160.3	0.0050	81.0	0.956	-7.4
700	0.964	-17.5	1.907	157.3	0.0054	78.4	0.954	-8.6
800	0.952	-20.0	1.909	154.0	0.0065	74.9	0.952	-9.8
900	0.941	-22.4	1.903	150.9	0.0075	76.3	0.950	-11.1
1000	0.927	-25.0	1.906	147.6	0.0078	78.6	0.949	-12.3
1100	0.913	-27.5	1.901	144.5	0.0084	80.3	0.947	-13.5
1200	0.897	-29.9	1.905	141.1	0.0088	77.5	0.945	-14.7
1300	0.884	-32.3	1.901	138.0	0.0082	77.8	0.944	-16.0
1400	0.870	-34.7	1.902	134.5	0.0082	70.5	0.942	-17.2
1500	0.854	-36.8	1.899	131.4	0.0092	68.5	0.940	-18.3
1600	0.837	-39.0	1.901	128.0	0.0096	71.0	0.939	-19.6
1700	0.820	-41.3	1.891	124.7	0.0101	72.4	0.936	-20.8
1800	0.803	-43.5	1.882	121.0	0.0102	72.3	0.933	-22.0
1900	0.784	-45.5	1.873	117.8	0.0107	79.0	0.930	-23.3
2000	0.765	-47.5	1.864	114.0	0.0104	79.9	0.928	-24.5
2100	0.747	-49.5	1.849	110.8	0.0099	76.7	0.925	-25.8
2200	0.726	-51.5	1.833	107.0	0.0090	75.2	0.923	-27.1
2300	0.705	-53.4	1.824	104.0	0.0094	76.1	0.923	-28.3
2400	0.686	-55.5	1.812	100.2	0.0087	73.4	0.922	-29.5
2500	0.672	-57.1	1.801	97.4	0.0087	75.1	0.921	-30.5
2600	0.660	-58.3	1.807	94.8	0.0086	77.6	0.921	-31.2

(V<sub>DS</sub>=3V, I<sub>D</sub>=10mA, V<sub>G2S</sub>=1V, T<sub>a</sub>=25°C, Z<sub>L</sub>=Z<sub>S</sub>=50Ω)

FREQ. (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.989	-4.4	2.577	174.0	0.0019	85.2	0.954	-1.9
200	0.987	-6.1	2.569	171.8	0.0023	80.5	0.953	-2.6
300	0.984	-8.4	2.559	169.0	0.0026	89.3	0.952	-3.6
400	0.980	-11.2	2.550	165.3	0.0033	78.1	0.951	-4.8
500	0.972	-13.9	2.543	161.8	0.0037	76.2	0.949	-6.1
600	0.964	-16.6	2.534	158.2	0.0042	74.8	0.948	-7.2
700	0.954	-19.1	2.524	154.8	0.0049	75.7	0.946	-8.5
800	0.939	-21.7	2.520	151.3	0.0057	75.3	0.944	-9.7
900	0.924	-24.3	2.505	148.0	0.0062	76.7	0.942	-10.9
1000	0.906	-26.8	2.501	144.5	0.0068	79.4	0.939	-12.1
1100	0.888	-29.3	2.484	141.2	0.0077	84.4	0.938	-13.3
1200	0.870	-31.8	2.479	137.6	0.0079	84.6	0.935	-14.5
1300	0.853	-34.2	2.462	134.2	0.0086	83.4	0.933	-15.6
1400	0.834	-36.7	2.457	130.5	0.0089	84.4	0.932	-16.9
1500	0.818	-39.0	2.439	127.1	0.0092	78.2	0.930	-18.1
1600	0.799	-41.3	2.427	123.5	0.0090	72.0	0.928	-19.3
1700	0.780	-43.4	2.404	120.0	0.0090	74.7	0.926	-20.6
1800	0.757	-45.4	2.381	116.1	0.0089	69.7	0.925	-21.8
1900	0.735	-47.3	2.354	112.9	0.0089	69.8	0.922	-23.0
2000	0.713	-49.5	2.334	109.1	0.0086	75.4	0.919	-24.2
2100	0.692	-51.3	2.304	105.7	0.0091	78.6	0.917	-25.5
2200	0.668	-53.0	2.275	101.9	0.0088	81.3	0.915	-26.7
2300	0.650	-54.8	2.251	98.8	0.0087	85.5	0.915	-27.9
2400	0.627	-56.3	2.227	95.0	0.0087	91.2	0.915	-29.1
2500	0.609	-57.2	2.204	92.1	0.0092	94.2	0.916	-30.0
2600	0.593	-58.1	2.200	89.7	0.0091	99.3	0.917	-30.7

## S-PARAMETER

(V<sub>DS</sub>=5V, I<sub>D</sub>=2mA, V<sub>G2S</sub>=1.5V, T<sub>a</sub>=25°C, Z<sub>L</sub>=Z<sub>S</sub>=50Ω)

FREQ. (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.993	-3.7	1.184	174.9	0.0009	116.0	0.977	-1.7
200	0.992	-5.0	1.182	173.0	0.0015	106.6	0.977	-2.4
300	0.991	-6.8	1.179	170.6	0.0020	92.3	0.975	-3.4
400	0.987	-8.9	1.178	167.5	0.0025	88.4	0.975	-4.6
500	0.983	-11.2	1.180	164.5	0.0033	83.3	0.973	-5.7
600	0.979	-13.4	1.181	161.5	0.0043	78.3	0.972	-6.9
700	0.974	-15.6	1.181	158.6	0.0048	74.1	0.970	-8.1
800	0.966	-17.8	1.188	155.6	0.0055	78.5	0.969	-9.2
900	0.962	-20.1	1.189	152.8	0.0068	72.9	0.967	-10.3
1000	0.954	-22.3	1.195	149.9	0.0071	77.0	0.965	-11.4
1100	0.942	-24.5	1.194	147.1	0.0074	79.2	0.963	-12.5
1200	0.931	-26.8	1.202	144.0	0.0085	78.1	0.961	-13.6
1300	0.923	-28.9	1.202	140.9	0.0090	73.5	0.960	-14.7
1400	0.911	-31.1	1.208	137.7	0.0093	75.9	0.958	-15.8
1500	0.899	-33.3	1.210	134.7	0.0098	71.6	0.956	-17.0
1600	0.889	-35.6	1.217	131.4	0.0094	69.5	0.954	-18.2
1700	0.876	-37.7	1.218	128.2	0.0087	68.8	0.952	-19.3
1800	0.862	-39.9	1.218	124.8	0.0083	73.6	0.950	-20.5
1900	0.848	-42.1	1.217	121.9	0.0084	77.1	0.947	-21.7
2000	0.833	-44.3	1.220	118.2	0.0084	75.2	0.945	-22.8
2100	0.818	-46.5	1.218	115.1	0.0098	73.1	0.943	-23.9
2200	0.803	-48.7	1.216	111.4	0.0096	69.2	0.941	-25.0
2300	0.786	-50.9	1.219	108.4	0.0096	66.4	0.940	-26.2
2400	0.769	-52.9	1.218	104.5	0.0089	63.0	0.940	-27.2
2500	0.754	-54.4	1.214	101.6	0.0085	65.7	0.940	-28.1
2600	0.742	-55.6	1.220	99.0	0.0075	69.7	0.940	-28.8

(V<sub>DS</sub>=5V, I<sub>D</sub>=5mA, V<sub>G2S</sub>=1.5V, T<sub>a</sub>=25°C, Z<sub>L</sub>=Z<sub>S</sub>=50Ω)

FREQ. (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.994	-4.1	1.887	174.4	0.0014	89.2	0.968	-1.9
200	0.992	-5.6	1.887	172.4	0.0019	74.4	0.967	-2.5
300	0.989	-7.5	1.883	169.9	0.0026	74.8	0.966	-3.4
400	0.985	-10.0	1.881	166.6	0.0029	74.8	0.965	-4.5
500	0.980	-12.4	1.879	163.3	0.0034	79.7	0.964	-5.7
600	0.972	-14.9	1.880	160.1	0.0043	85.2	0.963	-6.8
700	0.965	-17.3	1.873	157.0	0.0049	94.7	0.961	-7.9
800	0.955	-19.8	1.877	153.8	0.0055	92.0	0.959	-9.0
900	0.944	-22.2	1.871	150.7	0.0067	89.0	0.958	-10.2
1000	0.931	-24.5	1.874	147.5	0.0069	83.6	0.956	-11.3
1100	0.919	-27.0	1.867	144.4	0.0070	83.8	0.954	-12.4
1200	0.903	-29.4	1.872	141.0	0.0077	77.5	0.951	-13.5
1300	0.888	-31.7	1.867	137.8	0.0076	77.0	0.950	-14.6
1400	0.872	-34.1	1.869	134.4	0.0076	77.9	0.948	-15.7
1500	0.856	-36.4	1.865	131.2	0.0081	77.6	0.946	-16.8
1600	0.837	-38.6	1.863	127.7	0.0085	74.5	0.944	-18.0
1700	0.820	-40.9	1.854	124.3	0.0083	77.3	0.942	-19.1
1800	0.802	-43.3	1.846	120.6	0.0093	76.3	0.941	-20.2
1900	0.784	-45.5	1.837	117.4	0.0095	75.0	0.938	-21.3
2000	0.766	-47.6	1.830	113.6	0.0100	77.4	0.936	-22.4
2100	0.748	-49.7	1.818	110.6	0.0104	80.9	0.934	-23.5
2200	0.728	-51.8	1.808	106.9	0.0103	80.8	0.933	-24.6
2300	0.708	-53.5	1.793	104.0	0.0095	84.6	0.931	-25.6
2400	0.686	-55.4	1.783	100.3	0.0090	89.5	0.931	-26.6
2500	0.668	-57.1	1.771	97.5	0.0082	94.5	0.931	-27.5
2600	0.655	-58.4	1.776	95.0	0.0076	98.5	0.931	-28.1



## S-PARAMETER

(V<sub>DS</sub>=5V、I<sub>D</sub>=10mA、V<sub>G2S</sub>=1.5V、T<sub>a</sub>=25°C、Z<sub>L</sub>=Z<sub>S</sub>=50Ω)

FREQ. (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.994	-4.1	2.507	173.8	0.0007	63.5	0.963	-1.7
200	0.990	-5.8	2.502	171.6	0.0011	70.8	0.963	-2.4
300	0.986	-8.1	2.495	168.8	0.0016	79.4	0.962	-3.3
400	0.980	-10.9	2.493	165.2	0.0024	84.0	0.960	-4.4
500	0.972	-13.8	2.483	161.6	0.0029	81.4	0.960	-5.6
600	0.964	-16.5	2.476	158.0	0.0038	88.5	0.958	-6.7
700	0.954	-19.1	2.463	154.6	0.0044	88.4	0.956	-7.9
800	0.939	-21.8	2.461	151.1	0.0048	79.9	0.954	-8.9
900	0.925	-24.3	2.445	147.7	0.0059	79.7	0.952	-10.0
1000	0.908	-26.8	2.437	144.2	0.0059	77.8	0.949	-11.1
1100	0.889	-29.4	2.420	140.8	0.0061	78.9	0.947	-12.2
1200	0.869	-31.9	2.421	137.2	0.0063	78.9	0.944	-13.2
1300	0.851	-34.3	2.404	133.7	0.0070	85.4	0.942	-14.3
1400	0.833	-36.8	2.395	130.1	0.0072	87.7	0.941	-15.4
1500	0.814	-39.3	2.383	126.7	0.0075	86.6	0.939	-16.5
1600	0.795	-41.5	2.368	123.1	0.0077	85.2	0.937	-17.6
1700	0.775	-43.7	2.342	119.6	0.0083	89.1	0.935	-18.7
1800	0.754	-45.8	2.317	115.8	0.0077	88.7	0.933	-19.8
1900	0.730	-47.8	2.292	112.5	0.0070	91.7	0.931	-20.9
2000	0.706	-49.7	2.271	108.6	0.0084	98.5	0.928	-21.9
2100	0.684	-51.6	2.243	105.3	0.0089	95.4	0.928	-22.9
2200	0.662	-53.3	2.215	101.5	0.0084	93.7	0.927	-24.0
2300	0.641	-55.0	2.191	98.4	0.0085	94.6	0.927	-25.0
2400	0.619	-56.5	2.168	94.5	0.0088	91.9	0.927	-26.1
2500	0.601	-57.5	2.144	91.5	0.0084	89.0	0.928	-27.0
2600	0.586	-58.4	2.144	88.9	0.0080	92.0	0.928	-27.7