RQA0001DNS

Silicon N-Channel MOS FET

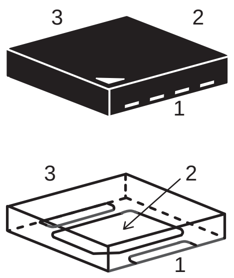
REJ03G0582-0300
Rev.3.00
Oct 11, 2006

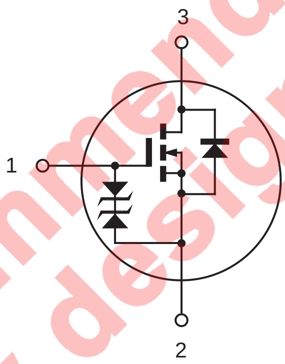
Features

- High Output Power, High Gain, High Efficiency
  Pout = +33 dBm, Linear Gain = 21 dB, PAE = 68% (f = 520 MHz)
- Small Outline Package (WSON0303-2: 3.0 × 3.0 × 0.8mm)

Outline

RENESAS Package code: PWSN0002ZA-A
(Package name: HWSON-2 <WSON0303-2>)





1. Gate
2. Source
3. Drain

Note: Marking is “A0001”.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	16	V
Gate to source voltage	V_{GSS}	±5	V
Drain current	I_D	0.8	A
Channel dissipation	Pch^{note}	5	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–50 to +150	°C

Note: Value at Tc = 25°C

This Device is sensitive to Electro Static Discharge. An Adequate careful handling procedure is requested.

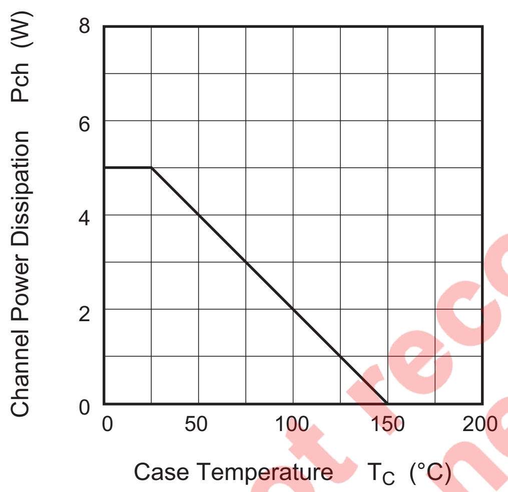
Electrical Characteristics

(Ta = 25°C)

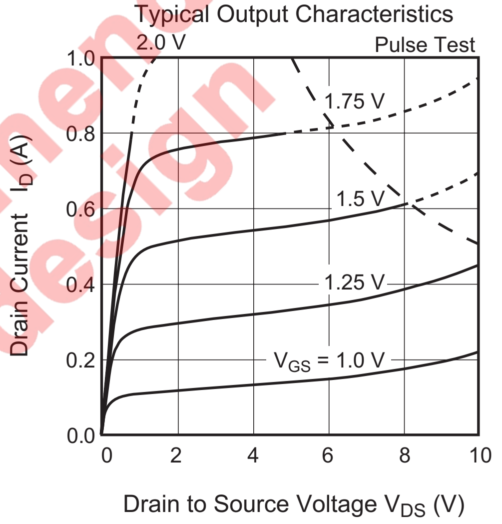
Item	Symbol	Min.	Typ	Max.	Unit	Test Conditions
Zero gate voltage drain current	I_{DSS}	—	—	10	µA	V_{DS} = 16 V, V_{GS} = 0
Gate to source leakage current	I_{GSS}	—	—	±2	µA	V_{GS} = ±5 V, V_{DS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	0.15	0.45	0.75	V	V_{DS} = 6 V, I_D = 1 mA
Forward Transfer Admittance	$\lvert y_{fs} \rvert$	0.6	1.1	1.6	S	V_{DS} = 6 V, I_D = 600 mA
Input capacitance	Ciss	—	22	—	pF	V_{GS} = 5 V, V_{DS} = 0, f = 1 MHz
Output capacitance	Coss	—	12	—	pF	V_{DS} = 6 V, V_{GS} = 0, f = 1 MHz
Reverse transfer capacitance	Crss	—	2.6	—	pF	V_{DG} = 6 V, V_{GS} = 0, f = 1 MHz
Output Power	Pout	32	33	—	dBm	V_{DS} = 6 V, I_{DQ} = 200 mA
		1.58	2	—	W	f = 520 MHz,
Power Added Efficiency	PAE	55	68	—	%	Pin = +20 dBm (100 mW)

Main Characteristics

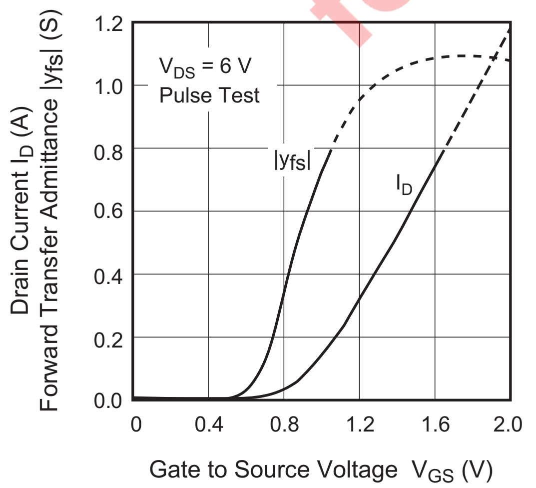
Maximum Channel Power Dissipation Curve



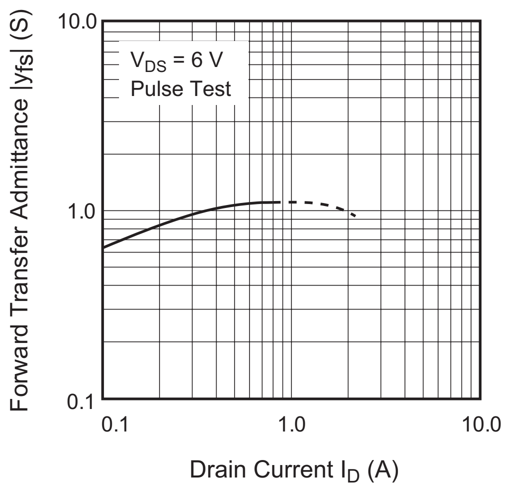
Typical Output Characteristics



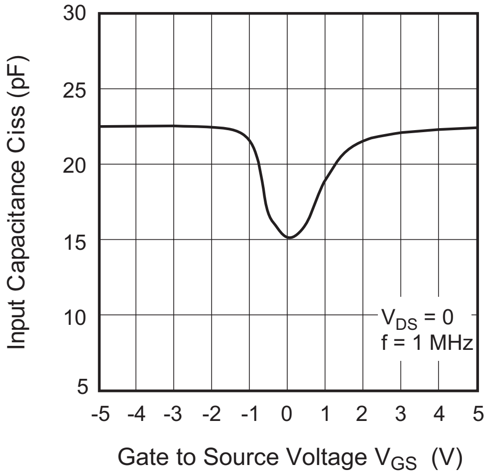
Typical Transfer Characteristics



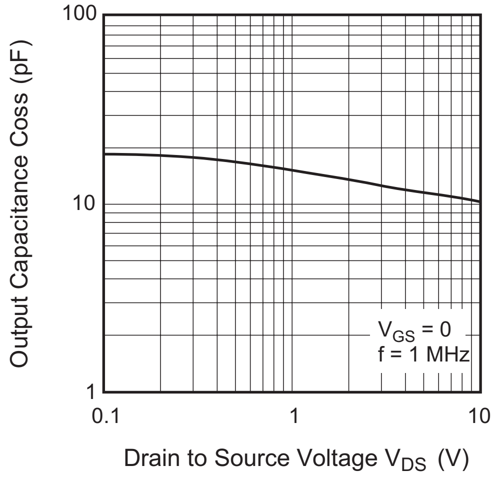
Forward Transfer Admittance vs. Drain Current



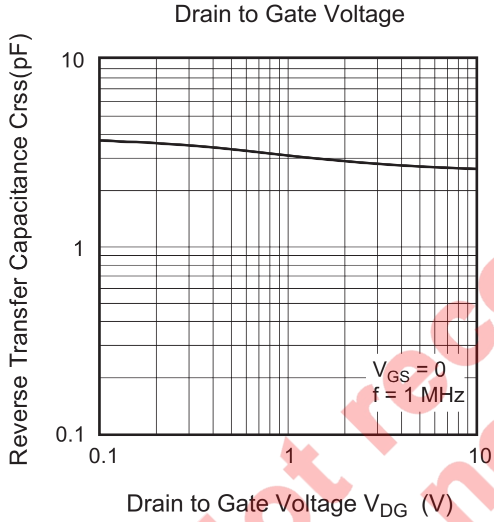
Input Capacitance vs.
Gate to Source Voltage



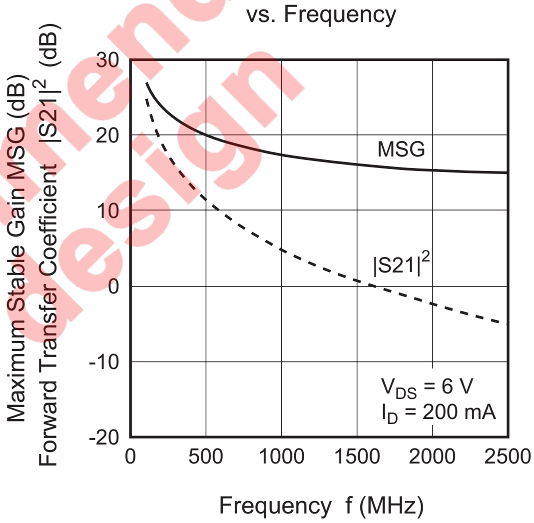
Output Capacitance vs.
Drain to Source Voltage



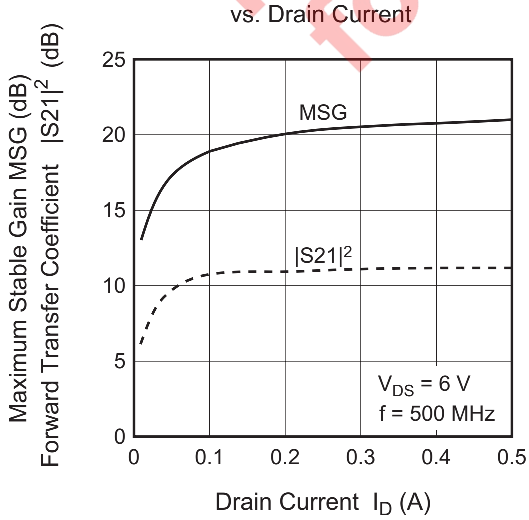
Reverse Transfer Capacitance vs.
Drain to Gate Voltage



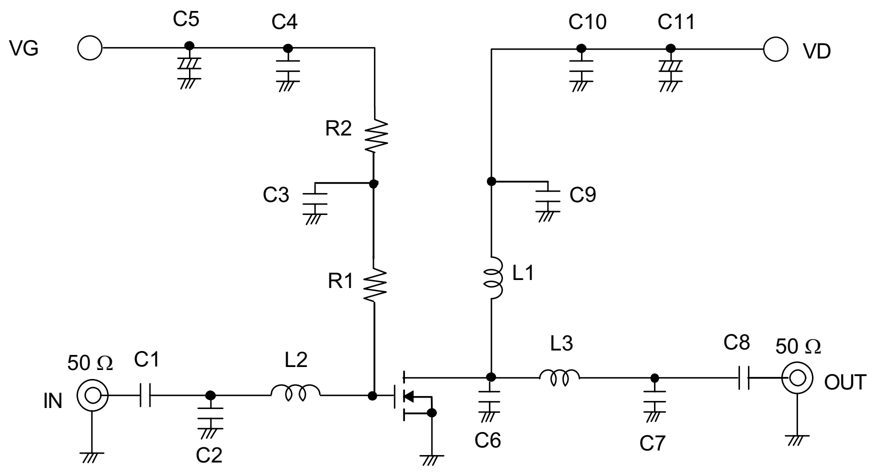
Maximum Stable Gain, $|S21|^2$
vs. Frequency



Maximum Stable Gain, $|S21|^2$
vs. Drain Current

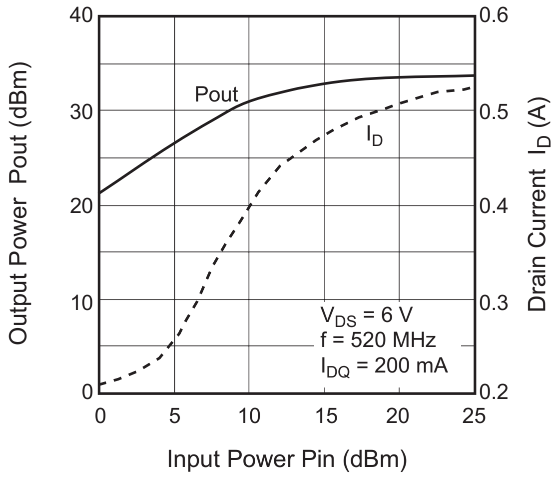


Evaluation Circuit (f = 520 MHz)

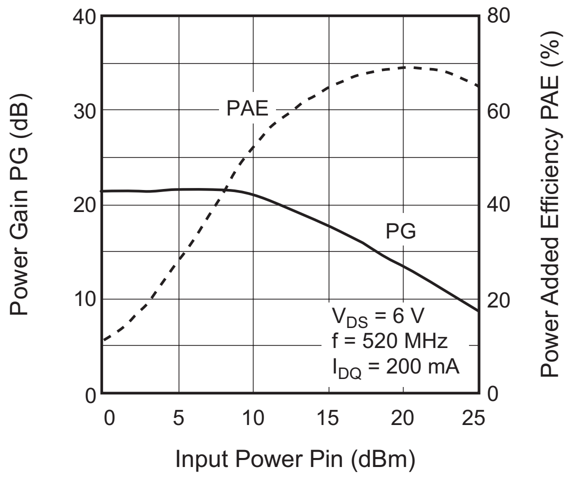


C1, C8:	68 pF Chip Capacitor
C2:	15 pF Chip Capacitor
C3, C9:	100 pF Chip Capacitor
C4, C10:	1000 pF Chip Capacitor
C5, C11 :	2.2 μF Electrolysis Capacitor
C6:	4 pF Chip Capacitor
C7:	12 pF Chip Capacitor
L1:	8 Turns D: 0.5 mm, ϕ 2.4 mm Enamel Wire
L2:	4.7 nH Chip Inductor
L3:	3.6 nH Chip Inductor
R1:	33 Ω Chip Resistor
R2:	2.7 kΩ Chip Resistor

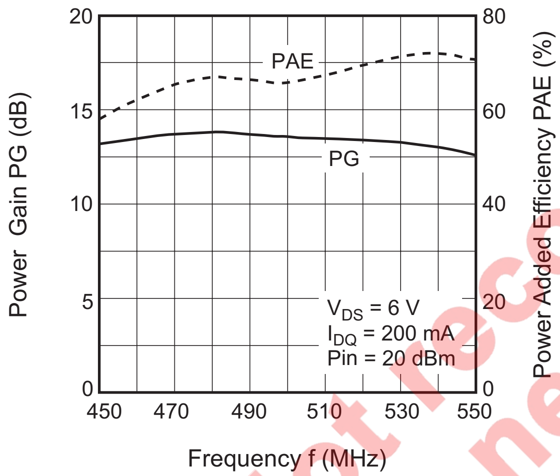
Output Power, Drain Current
vs. Input Power



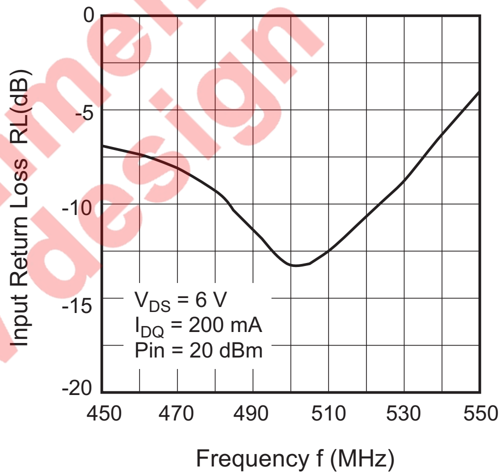
Power Gain, Power Added Efficiency
vs. Input Power



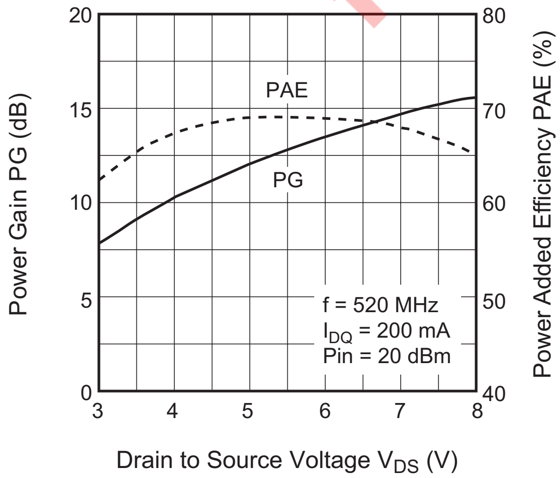
Power Gain, Power Added Efficiency
vs. Frequency



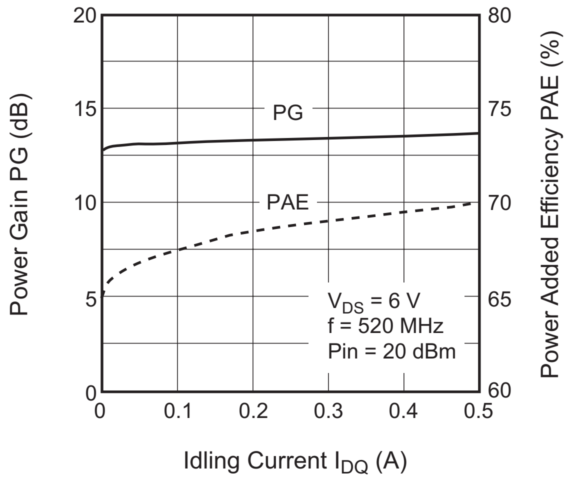
Input Return Loss vs. Frequency



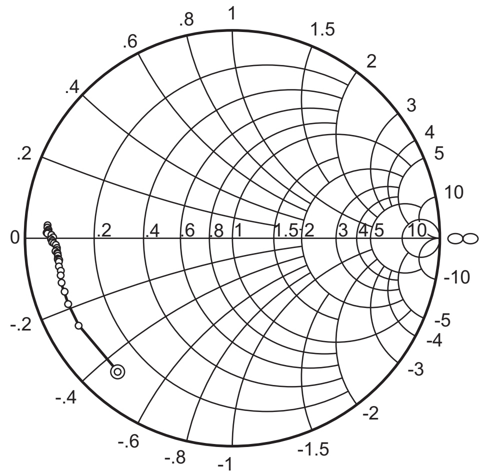
Power Gain, Power Added Efficiency
vs. Drain to Source Voltage



Power Gain, Power Added Efficiency
vs. Idling Current

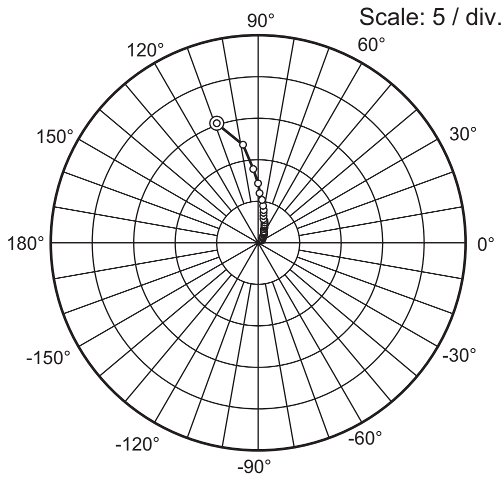


S_{11} Parameter vs. Frequency



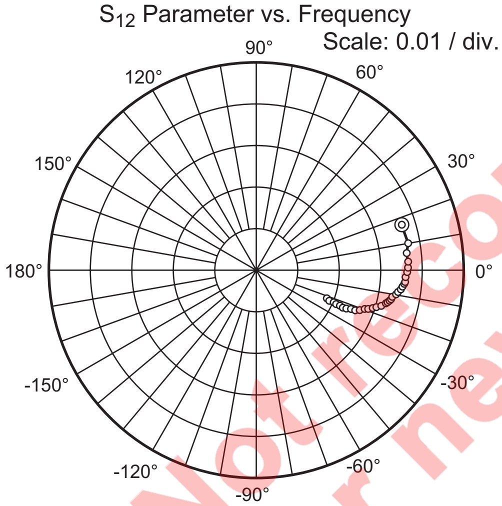
Condition: V_{DS} = 6V, I_{DQ} = 200 mA, Zo = 50 Ω
100 to 1000 MHz (50 MHz Step)
1000 to 2500 MHz (200 MHz Step)

S_{21} Parameter vs. Frequency



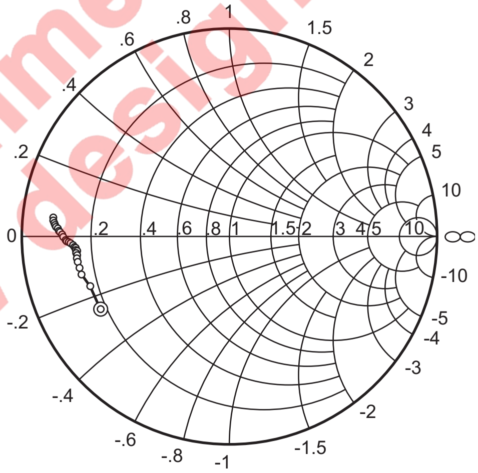
Condition: V_{DS} = 6V, I_{DQ} = 200 mA, Zo = 50 Ω
100 to 1000 MHz (50 MHz Step)
1000 to 2500 MHz (200 MHz Step)

S_{12} Parameter vs. Frequency



Condition: V_{DS} = 6V, I_{DQ} = 200 mA, Zo = 50 Ω
100 to 1000 MHz (50 MHz Step)
1000 to 2500 MHz (200 MHz Step)

S_{22} Parameter vs. Frequency



Condition: V_{DS} = 6V, I_{DQ} = 200 mA, Zo = 50 Ω
100 to 1000 MHz (50 MHz Step)
1000 to 2500 MHz (200 MHz Step)

S parameter

(V_{DS} = 6 V, I_{DQ} = 50 mA, Zo = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.823	-115.4	12.90	113.1	0.056	20.6	0.664	-128.9
150	0.809	-136.7	10.15	102.5	0.058	11.1	0.648	-144.3
200	0.805	-148.3	7.75	94.5	0.058	5.8	0.662	-152.3
250	0.798	-154.5	6.30	89.3	0.058	1.2	0.665	-156.8
300	0.797	-158.5	5.28	85.2	0.058	-2.0	0.666	-159.8
350	0.796	-161.4	4.51	81.6	0.058	-4.9	0.668	-162.1
400	0.795	-163.5	3.93	78.6	0.057	-7.6	0.671	-163.7
450	0.797	-165.0	3.47	75.7	0.057	-10.0	0.676	-164.8
500	0.800	-166.5	3.11	73.0	0.056	-12.3	0.678	-165.7
550	0.803	-167.5	2.79	70.6	0.055	-14.3	0.682	-166.5
600	0.808	-168.3	2.53	68.2	0.054	-16.1	0.688	-166.9
650	0.809	-169.0	2.31	66.0	0.053	-17.8	0.691	-167.5
700	0.813	-169.6	2.11	63.8	0.053	-19.4	0.694	-167.9
750	0.815	-170.1	1.94	61.7	0.052	-21.0	0.702	-168.1
800	0.817	-170.5	1.80	59.8	0.051	-22.5	0.707	-168.4
850	0.822	-170.9	1.67	57.8	0.050	-23.7	0.713	-168.6
900	0.826	-171.5	1.56	55.8	0.049	-24.9	0.720	-169.0
950	0.828	-171.8	1.46	54.1	0.048	-26.3	0.727	-169.2
1000	0.828	-172.1	1.37	52.4	0.047	-27.5	0.734	-169.5
1050	0.831	-172.8	1.29	50.4	0.046	-28.7	0.741	-169.9
1100	0.834	-173.4	1.22	48.9	0.045	-29.9	0.750	-170.2
1150	0.839	-173.9	1.16	47.2	0.044	-31.1	0.758	-170.6
1200	0.847	-174.1	1.10	45.9	0.043	-32.1	0.765	-171.0
1250	0.856	-174.2	1.05	44.5	0.042	-33.1	0.773	-171.4
1300	0.857	-174.4	0.99	42.9	0.041	-33.9	0.780	-171.8
1350	0.859	-174.6	0.94	41.3	0.041	-35.0	0.787	-172.2
1400	0.859	-175.0	0.90	39.9	0.039	-35.9	0.793	-172.6
1450	0.863	-175.3	0.85	38.1	0.039	-36.7	0.799	-173.0
1500	0.867	-175.7	0.82	36.7	0.038	-37.5	0.804	-173.5
1550	0.868	-175.8	0.78	35.3	0.037	-38.3	0.809	-174.0
1600	0.871	-176.1	0.74	34.0	0.036	-39.1	0.814	-174.4
1650	0.870	-176.5	0.71	32.5	0.035	-39.8	0.819	-175.0
1700	0.868	-176.9	0.68	31.1	0.034	-40.6	0.823	-175.5
1750	0.869	-177.4	0.65	29.6	0.033	-41.3	0.827	-176.1
1800	0.876	-178.0	0.63	28.3	0.032	-41.6	0.832	-176.6
1850	0.884	-178.5	0.60	27.1	0.032	-42.2	0.836	-177.0
1900	0.892	-178.8	0.58	26.1	0.031	-42.8	0.839	-177.5
1950	0.898	-178.7	0.56	25.2	0.030	-43.4	0.844	-178.1
2000	0.903	-178.7	0.54	24.1	0.029	-43.7	0.850	-178.5
2050	0.903	-178.5	0.52	23.3	0.028	-44.0	0.852	-178.8
2100	0.900	-178.7	0.50	22.2	0.027	-44.4	0.856	-179.3
2150	0.899	-178.9	0.48	21.3	0.027	-44.7	0.862	-179.7
2200	0.897	-179.4	0.46	20.2	0.026	-44.8	0.865	180.0
2250	0.897	-179.8	0.45	19.3	0.025	-45.3	0.867	179.5
2300	0.897	179.7	0.43	18.4	0.024	-45.3	0.871	178.9
2350	0.901	179.5	0.42	17.2	0.024	-45.5	0.877	178.6
2400	0.904	179.1	0.41	16.3	0.023	-45.4	0.877	178.2
2450	0.903	178.9	0.39	15.5	0.022	-45.6	0.878	177.7
2500	0.906	178.4	0.38	14.4	0.022	-45.8	0.881	177.2

S parameter

(V_{DS} = 6 V, I_{DQ} = 100 mA, Zo = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.850	-121.5	14.14	112.6	0.044	17.8	0.690	-142.4
150	0.835	-146.3	11.33	99.7	0.045	10.0	0.687	-154.5
200	0.830	-154.9	8.50	93.6	0.045	5.7	0.705	-160.7
250	0.831	-160.2	6.88	89.5	0.045	2.0	0.709	-164.2
300	0.827	-163.4	5.76	86.0	0.045	-0.6	0.710	-166.5
350	0.823	-165.8	4.91	83.1	0.045	-2.7	0.712	-168.3
400	0.822	-167.5	4.28	80.7	0.044	-4.9	0.713	-169.5
450	0.823	-169.0	3.79	78.2	0.044	-6.9	0.715	-170.5
500	0.825	-170.2	3.40	75.9	0.044	-8.5	0.714	-171.2
550	0.827	-171.0	3.07	74.1	0.043	-10.1	0.716	-171.9
600	0.826	-171.6	2.78	72.1	0.043	-11.3	0.719	-172.2
650	0.834	-172.3	2.56	70.1	0.042	-12.6	0.720	-172.6
700	0.829	-173.0	2.35	68.2	0.041	-13.9	0.721	-173.0
750	0.830	-173.4	2.17	66.5	0.041	-15.1	0.726	-173.2
800	0.832	-173.7	2.02	64.7	0.040	-16.1	0.729	-173.3
850	0.836	-174.0	1.88	62.9	0.040	-17.0	0.731	-173.5
900	0.837	-174.5	1.76	61.2	0.039	-18.0	0.737	-173.8
950	0.836	-174.8	1.66	59.6	0.039	-19.2	0.742	-173.9
1000	0.838	-175.0	1.57	58.1	0.038	-20.1	0.745	-174.1
1050	0.839	-175.5	1.48	56.3	0.038	-21.0	0.750	-174.4
1100	0.841	-176.2	1.41	54.8	0.037	-22.0	0.756	-174.6
1150	0.846	-176.5	1.34	53.5	0.037	-22.9	0.762	-174.8
1200	0.851	-176.6	1.27	52.1	0.036	-23.6	0.766	-175.1
1250	0.856	-176.7	1.21	51.0	0.035	-24.4	0.773	-175.5
1300	0.858	-176.9	1.15	49.4	0.035	-25.1	0.777	-175.6
1350	0.859	-176.8	1.10	48.1	0.034	-25.9	0.782	-176.0
1400	0.860	-177.3	1.05	46.6	0.033	-26.7	0.787	-176.2
1450	0.864	-177.5	1.00	45.0	0.033	-27.3	0.790	-176.4
1500	0.866	-177.8	0.96	43.7	0.032	-27.9	0.795	-176.8
1550	0.868	-178.0	0.92	42.4	0.031	-28.5	0.799	-177.2
1600	0.867	-178.1	0.88	41.0	0.031	-29.0	0.803	-177.5
1650	0.867	-178.5	0.84	39.7	0.030	-29.7	0.808	-177.9
1700	0.863	-178.9	0.81	38.3	0.030	-30.2	0.810	-178.3
1750	0.865	-179.2	0.78	37.0	0.029	-30.8	0.815	-178.8
1800	0.871	-179.9	0.75	35.6	0.028	-30.8	0.818	-179.2
1850	0.880	179.7	0.73	34.4	0.028	-31.4	0.822	-179.5
1900	0.885	179.6	0.70	33.3	0.027	-31.8	0.824	-180.0
1950	0.893	179.6	0.68	32.4	0.026	-32.2	0.829	179.6
2000	0.900	179.7	0.66	31.4	0.026	-32.2	0.833	179.3
2050	0.897	179.8	0.63	30.5	0.025	-32.5	0.836	179.1
2100	0.893	179.7	0.61	29.5	0.024	-32.8	0.839	178.7
2150	0.893	179.6	0.59	28.5	0.024	-32.8	0.845	178.3
2200	0.891	179.2	0.57	27.7	0.023	-32.7	0.847	178.1
2250	0.890	178.9	0.55	26.6	0.023	-33.1	0.851	177.7
2300	0.890	178.5	0.53	25.5	0.022	-33.0	0.854	177.2
2350	0.894	178.2	0.52	24.5	0.022	-33.1	0.859	176.9
2400	0.895	177.8	0.50	23.4	0.021	-32.7	0.860	176.5
2450	0.895	177.7	0.49	22.6	0.021	-33.0	0.861	176.1
2500	0.896	177.2	0.47	21.7	0.020	-32.9	0.862	175.6

S parameter

(V_{DS} = 6 V, I_{DQ} = 200 mA, Zo = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.847	-130.3	15.20	108.9	0.037	17.2	0.713	-150.4
150	0.856	-150.5	11.84	98.7	0.037	10.0	0.714	-160.3
200	0.855	-158.2	8.83	93.3	0.037	6.2	0.734	-165.2
250	0.850	-162.5	7.13	89.9	0.037	3.0	0.738	-168.1
300	0.850	-165.4	5.97	86.8	0.037	0.6	0.740	-170.1
350	0.848	-167.8	5.12	84.1	0.037	-1.2	0.741	-171.8
400	0.845	-169.5	4.45	82.0	0.036	-3.0	0.741	-172.6
450	0.849	-170.9	3.95	79.8	0.036	-4.6	0.742	-173.5
500	0.846	-172.2	3.55	77.6	0.036	-5.7	0.740	-174.2
550	0.846	-172.9	3.20	76.0	0.035	-6.9	0.742	-174.8
600	0.847	-173.3	2.92	74.4	0.035	-7.9	0.743	-175.0
650	0.849	-174.1	2.68	72.6	0.035	-9.1	0.743	-175.5
700	0.849	-174.7	2.47	70.9	0.034	-10.0	0.744	-175.8
750	0.848	-175.1	2.28	69.4	0.034	-11.0	0.746	-175.8
800	0.850	-175.2	2.13	68.1	0.034	-11.7	0.749	-176.0
850	0.854	-175.7	2.00	66.3	0.033	-12.5	0.750	-176.2
900	0.851	-176.2	1.87	64.6	0.033	-13.1	0.754	-176.5
950	0.849	-176.6	1.76	63.2	0.033	-13.9	0.758	-176.6
1000	0.851	-176.7	1.67	61.7	0.032	-14.7	0.761	-176.8
1050	0.852	-177.2	1.58	60.1	0.032	-15.3	0.763	-177.0
1100	0.852	-177.8	1.50	58.7	0.031	-16.2	0.768	-177.3
1150	0.860	-177.9	1.44	57.6	0.031	-16.9	0.772	-177.5
1200	0.861	-178.2	1.37	56.4	0.030	-17.3	0.775	-177.6
1250	0.868	-178.3	1.31	55.1	0.030	-18.0	0.780	-178.0
1300	0.867	-178.5	1.25	53.8	0.030	-18.4	0.783	-178.1
1350	0.867	-178.5	1.19	52.4	0.029	-19.0	0.787	-178.4
1400	0.870	-178.8	1.14	50.9	0.029	-19.6	0.790	-178.5
1450	0.868	-179.1	1.09	49.4	0.028	-20.1	0.793	-178.7
1500	0.872	-179.3	1.05	48.3	0.028	-20.2	0.797	-179.1
1550	0.872	-179.4	1.01	46.9	0.027	-20.8	0.799	-179.4
1600	0.873	-179.5	0.97	45.8	0.027	-21.2	0.803	-179.7
1650	0.869	-179.8	0.93	44.4	0.026	-21.7	0.807	180.0
1700	0.867	179.9	0.89	43.2	0.026	-22.0	0.809	179.6
1750	0.869	179.4	0.86	41.8	0.025	-22.4	0.812	179.2
1800	0.874	178.9	0.83	40.6	0.025	-22.4	0.815	178.8
1850	0.881	178.5	0.81	39.4	0.024	-22.6	0.817	178.6
1900	0.887	178.3	0.78	38.5	0.024	-22.8	0.819	178.3
1950	0.895	178.4	0.75	37.5	0.023	-22.9	0.823	177.9
2000	0.898	178.5	0.73	36.5	0.023	-23.1	0.828	177.6
2050	0.897	178.5	0.70	35.4	0.022	-22.8	0.830	177.4
2100	0.894	178.6	0.68	34.6	0.022	-23.2	0.833	177.0
2150	0.892	178.5	0.66	33.8	0.022	-23.0	0.838	176.7
2200	0.894	178.2	0.64	32.9	0.021	-23.1	0.840	176.6
2250	0.892	177.7	0.62	31.8	0.021	-23.1	0.844	176.2
2300	0.891	177.4	0.60	30.8	0.020	-22.7	0.846	175.8
2350	0.892	177.1	0.58	29.7	0.020	-22.7	0.851	175.5
2400	0.895	176.7	0.57	28.4	0.019	-22.2	0.851	175.1
2450	0.895	176.5	0.55	27.7	0.019	-22.1	0.852	174.8
2500	0.895	176.2	0.54	26.8	0.019	-21.9	0.854	174.3

S parameter

(V_{DS} = 6 V, I_{DQ} = 300 mA, Zo = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.864	-131.1	15.08	109.1	0.034	17.0	0.720	-153.1
150	0.869	-150.3	11.79	99.0	0.034	9.4	0.723	-162.2
200	0.868	-158.2	8.84	93.9	0.034	6.6	0.745	-166.8
250	0.865	-163.1	7.16	90.1	0.034	3.1	0.751	-169.3
300	0.862	-166.0	6.00	87.2	0.034	1.6	0.750	-171.1
350	0.857	-168.3	5.13	84.8	0.034	-0.9	0.749	-172.7
400	0.853	-169.7	4.47	82.6	0.034	-2.1	0.751	-173.6
450	0.854	-171.3	3.98	80.6	0.033	-3.7	0.751	-174.4
500	0.855	-172.4	3.58	78.5	0.033	-4.9	0.749	-175.1
550	0.853	-173.5	3.24	76.8	0.033	-6.1	0.748	-175.6
600	0.854	-173.9	2.95	75.3	0.033	-7.0	0.751	-175.8
650	0.857	-174.3	2.73	73.8	0.032	-7.8	0.750	-176.1
700	0.855	-175.1	2.51	71.9	0.032	-8.3	0.752	-176.5
750	0.853	-175.3	2.32	70.4	0.032	-9.6	0.754	-176.6
800	0.856	-175.7	2.17	68.8	0.031	-10.1	0.756	-176.8
850	0.857	-176.2	2.03	67.3	0.031	-10.7	0.758	-176.9
900	0.858	-176.6	1.91	65.7	0.031	-11.1	0.760	-177.2
950	0.856	-176.7	1.80	64.5	0.030	-12.2	0.764	-177.4
1000	0.857	-177.2	1.70	62.7	0.030	-12.6	0.766	-177.4
1050	0.857	-177.6	1.61	61.2	0.030	-13.1	0.769	-177.8
1100	0.858	-178.4	1.53	59.8	0.029	-14.1	0.773	-178.0
1150	0.864	-178.5	1.47	58.7	0.029	-14.8	0.778	-178.3
1200	0.868	-178.6	1.40	57.5	0.028	-14.9	0.780	-178.4
1250	0.871	-179.0	1.34	56.2	0.028	-15.6	0.784	-178.8
1300	0.872	-178.9	1.27	55.0	0.028	-15.8	0.787	-178.9
1350	0.872	-179.0	1.21	53.7	0.027	-16.4	0.790	-179.1
1400	0.872	-179.2	1.16	52.2	0.027	-16.8	0.793	-179.3
1450	0.875	-179.7	1.12	50.8	0.027	-17.3	0.796	-179.5
1500	0.876	-179.8	1.07	49.6	0.026	-17.4	0.799	-179.8
1550	0.876	-179.8	1.03	48.4	0.026	-17.9	0.802	179.9
1600	0.874	-179.9	0.99	47.4	0.025	-18.1	0.805	179.6
1650	0.875	179.8	0.95	45.9	0.025	-18.7	0.808	179.2
1700	0.872	179.4	0.91	44.5	0.025	-18.9	0.810	178.9
1750	0.873	179.0	0.88	43.3	0.024	-19.1	0.813	178.5
1800	0.878	178.3	0.85	42.0	0.024	-19.0	0.816	178.1
1850	0.884	178.1	0.83	40.9	0.023	-19.2	0.818	177.9
1900	0.890	177.9	0.80	39.9	0.023	-19.3	0.820	177.6
1950	0.898	178.0	0.78	38.9	0.022	-19.6	0.824	177.2
2000	0.903	178.0	0.75	38.0	0.022	-19.6	0.827	177.0
2050	0.897	178.3	0.73	37.3	0.021	-19.4	0.830	176.7
2100	0.896	178.2	0.70	36.1	0.021	-19.5	0.833	176.5
2150	0.894	178.0	0.68	35.3	0.021	-19.2	0.838	176.1
2200	0.896	177.7	0.66	34.3	0.020	-19.1	0.840	176.1
2250	0.891	177.3	0.64	33.2	0.020	-19.3	0.842	175.6
2300	0.892	177.0	0.62	32.3	0.020	-18.8	0.845	175.1
2350	0.894	176.7	0.60	31.2	0.019	-18.7	0.849	175.0
2400	0.896	176.3	0.59	30.3	0.019	-17.9	0.849	174.7
2450	0.897	176.4	0.57	29.2	0.018	-17.9	0.850	174.3
2500	0.897	175.9	0.55	28.4	0.018	-17.5	0.853	173.8

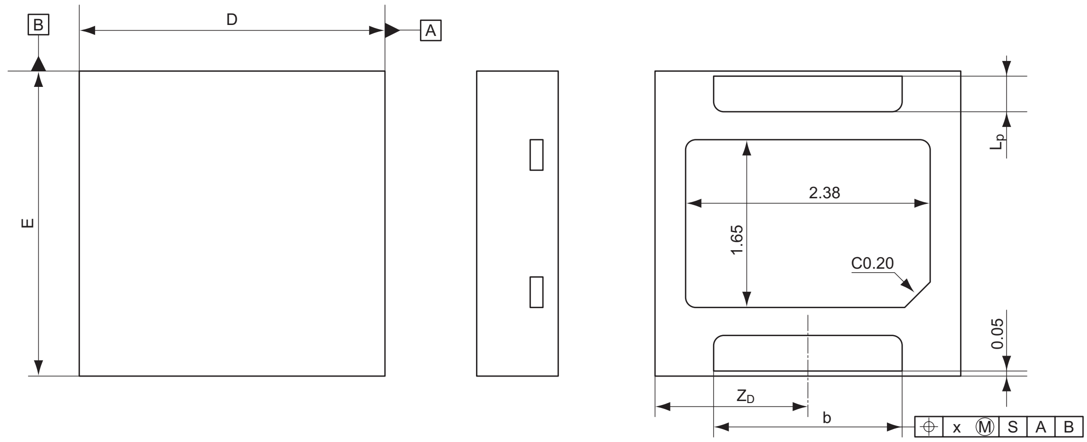
S parameter

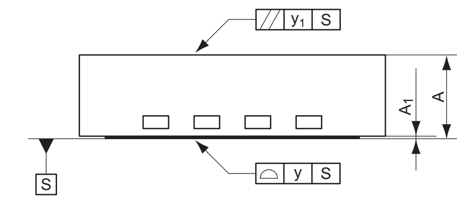
(V_{DS} = 6 V, I_{DQ} = 400 mA, Zo = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.899	-128.3	14.60	110.0	0.033	16.5	0.721	-154.3
150	0.877	-149.7	11.59	99.4	0.033	9.7	0.726	-163.0
200	0.874	-157.9	8.76	94.3	0.033	6.7	0.749	-167.2
250	0.867	-162.7	7.11	90.4	0.033	3.7	0.753	-169.7
300	0.866	-166.0	5.97	87.4	0.033	1.4	0.754	-171.5
350	0.860	-168.2	5.11	85.0	0.032	-0.2	0.754	-172.9
400	0.859	-170.0	4.47	82.8	0.032	-1.9	0.755	-173.7
450	0.857	-171.3	3.97	80.8	0.032	-3.1	0.756	-174.4
500	0.861	-172.6	3.58	78.9	0.032	-4.3	0.754	-175.0
550	0.860	-173.4	3.24	77.2	0.032	-5.3	0.757	-175.4
600	0.860	-173.8	2.96	75.6	0.031	-6.2	0.757	-175.8
650	0.861	-174.5	2.72	74.1	0.031	-6.9	0.758	-176.1
700	0.862	-175.1	2.51	72.3	0.031	-7.7	0.761	-176.4
750	0.860	-175.5	2.33	70.7	0.031	-8.6	0.761	-176.6
800	0.860	-175.7	2.17	69.2	0.030	-9.3	0.764	-176.8
850	0.861	-176.2	2.03	67.6	0.030	-9.9	0.767	-177.1
900	0.862	-176.7	1.92	66.0	0.030	-10.4	0.769	-177.3
950	0.861	-177.2	1.80	64.5	0.029	-11.3	0.772	-177.5
1000	0.861	-177.3	1.71	62.9	0.029	-12.0	0.775	-177.6
1050	0.858	-177.8	1.62	61.4	0.029	-12.5	0.777	-178.0
1100	0.862	-178.4	1.54	60.0	0.028	-13.2	0.780	-178.4
1150	0.866	-178.8	1.47	58.7	0.028	-13.7	0.783	-178.5
1200	0.871	-178.8	1.40	57.6	0.028	-14.3	0.784	-178.8
1250	0.876	-178.9	1.34	56.5	0.027	-14.7	0.789	-179.1
1300	0.875	-179.1	1.28	55.2	0.027	-15.1	0.790	-179.2
1350	0.874	-179.1	1.22	53.8	0.027	-15.5	0.794	-179.4
1400	0.876	-179.5	1.17	52.5	0.026	-15.9	0.796	-179.6
1450	0.878	-179.7	1.12	51.1	0.026	-16.2	0.798	-179.8
1500	0.878	180.0	1.08	49.7	0.025	-16.6	0.801	179.9
1550	0.880	-179.9	1.03	48.6	0.025	-16.7	0.803	179.6
1600	0.879	179.9	0.99	47.4	0.024	-17.0	0.805	179.3
1650	0.878	179.7	0.95	46.1	0.024	-17.6	0.808	179.0
1700	0.873	179.2	0.91	44.9	0.024	-17.6	0.810	178.7
1750	0.875	178.8	0.88	43.4	0.023	-17.9	0.813	178.3
1800	0.885	178.3	0.86	42.4	0.023	-17.7	0.817	177.9
1850	0.888	177.8	0.83	41.1	0.022	-17.9	0.818	177.7
1900	0.895	177.8	0.80	40.2	0.022	-18.0	0.819	177.4
1950	0.900	177.9	0.78	39.2	0.022	-18.0	0.824	177.0
2000	0.901	177.8	0.75	38.2	0.021	-17.9	0.828	176.8
2050	0.903	178.1	0.73	37.3	0.021	-17.8	0.829	176.6
2100	0.899	178.0	0.70	36.4	0.020	-17.7	0.833	176.2
2150	0.896	177.7	0.68	35.5	0.020	-17.4	0.838	175.9
2200	0.895	177.5	0.66	34.6	0.020	-17.6	0.840	175.7
2250	0.893	177.3	0.64	33.6	0.019	-17.4	0.842	175.4
2300	0.893	176.7	0.62	32.4	0.019	-16.9	0.845	175.0
2350	0.896	176.7	0.61	31.6	0.019	-16.6	0.849	174.8
2400	0.899	176.2	0.59	30.7	0.018	-15.9	0.849	174.4
2450	0.899	176.2	0.57	29.7	0.018	-16.0	0.850	174.1
2500	0.899	175.7	0.56	28.6	0.018	-15.5	0.852	173.7

Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
HWSON-2	—	PWSN0002ZA-A	—	0.022g





Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	2.9	3.0	3.1
E	2.9	3.0	3.1
A	0.70	0.75	0.80
A_1	0	—	0.05
A_2	—	—	—
b	1.68	1.73	1.78
$\boxed{e}$	—	—	—
L_p	—	0.33	—
x	—	—	—
y	—	—	0.08
y_1	—	—	0.10
Z_D	—	1.50	—

Ordering Information

Part Name	Quantity	Shipping Container
RQA0001DNSTR-E	2000 pcs.	φ178 mm Reel, 12 mm Emboss Taping

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

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