RQA0005MXAQS

Silicon N-Channel MOS FET

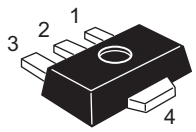
REJ03G1568-0100
Rev.1.00
Jul 04, 2007

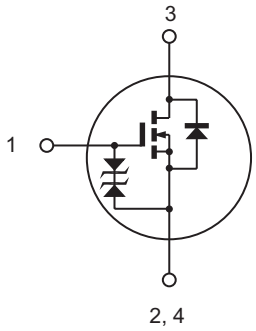
Features

- High Output Power, High Gain, High Efficiency
  Pout = +33 dBm, Linear Gain = 21 dB, PAE = 68% (f = 520 MHz)
- Compact package capable of surface mounting

Outline

RENESAS Package code: PLZZ0004CA-A
(Package Name : UPAK®)





1. Gate
2. Source
3. Drain
4. Source

Note: Marking is “MX”.

*UPAK is a trademark of Renesas Technology Corp.

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]	9	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.

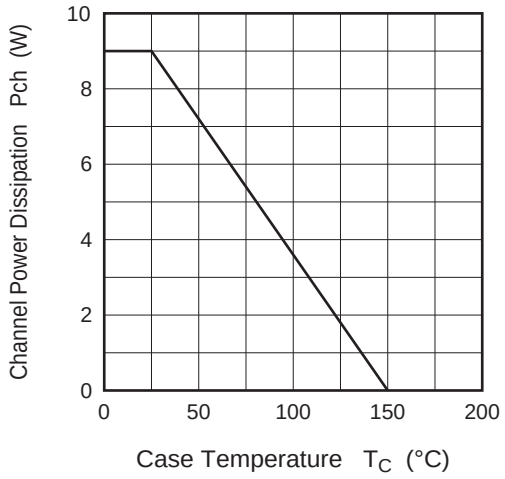
Electrical Characteristics

(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 = 1mA
Forward Transfer Admittance	|yfs|	—	1.1	—	S	V_{DS} = 6 V, I_D = 600mA
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	—	33	—	dBm	V_{DS} = 6V, I_{DQ} = 200 mA
		—	2	—	W	f = 520 MHz, Pin = +20 dBm
Power Added Efficiency	PAE	—	68	—	%	

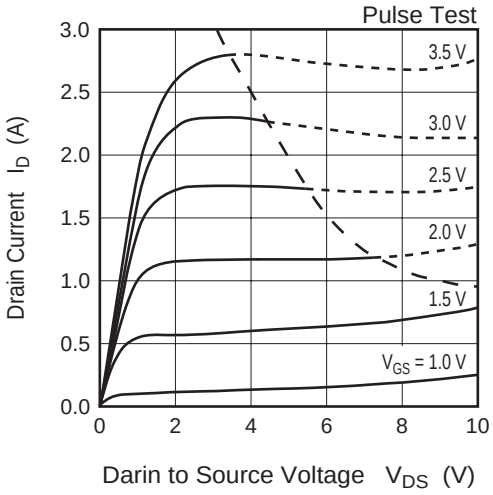
Main Characteristics

Maximum Channel Power Dissipation Curve

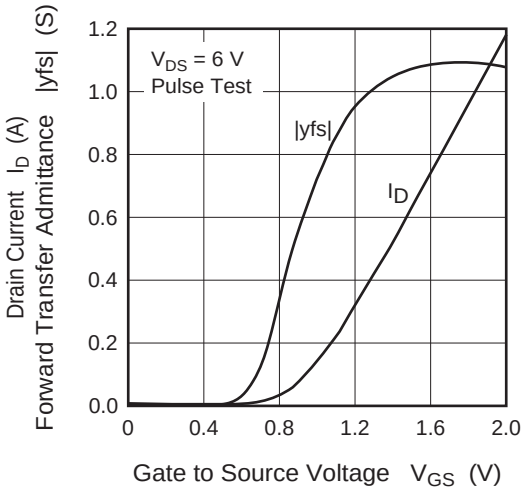


Typical Output Characteristics

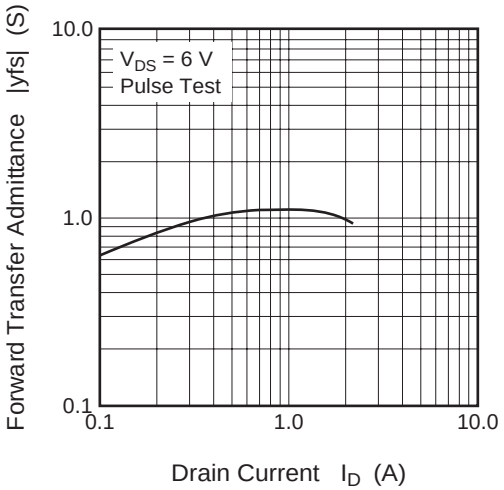
Pulse Test



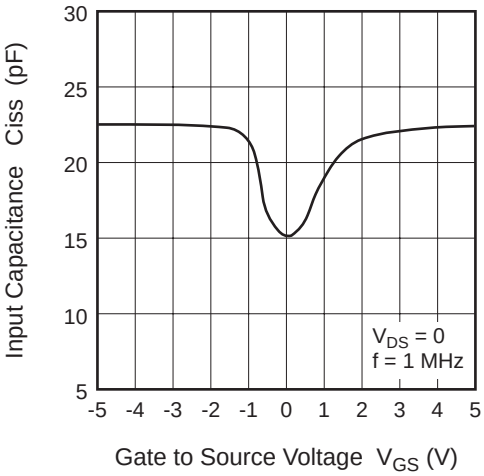
Typical Transfer Characterisitics



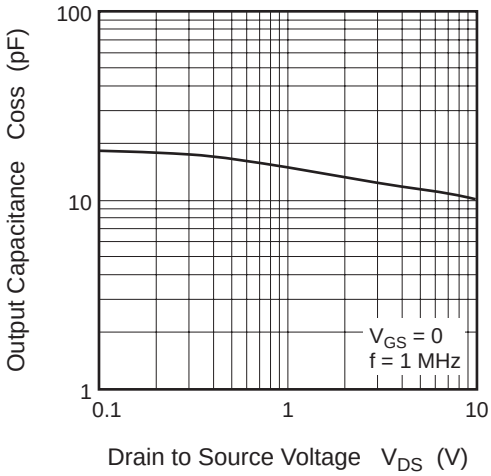
Forward Transfer Admittance vs. Drain Current



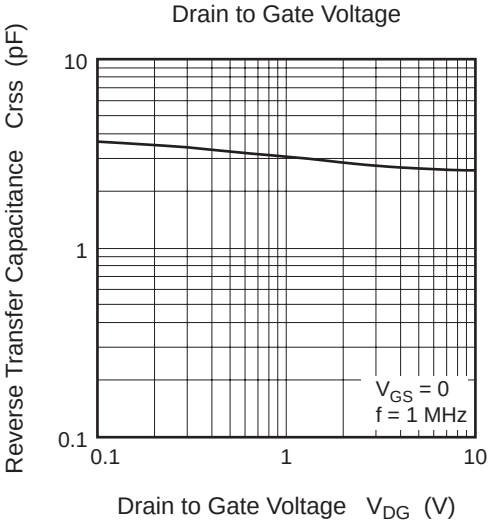
Input Capacitance vs.
Gate to Source Voltage



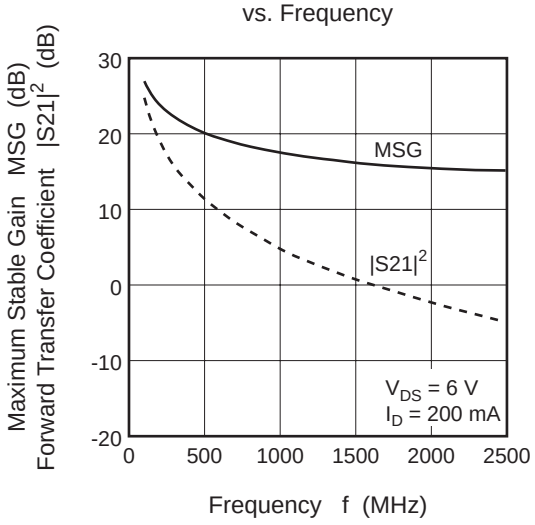
Output Capacitance vs.
Drain to Source Voltage



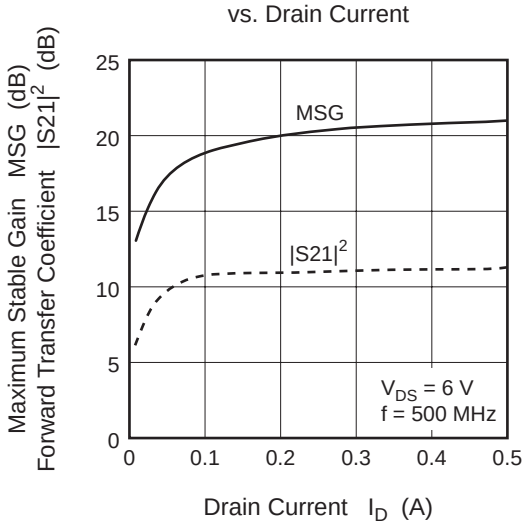
Reverse Transfer Capacitance vs.
Drain to Gate Voltage



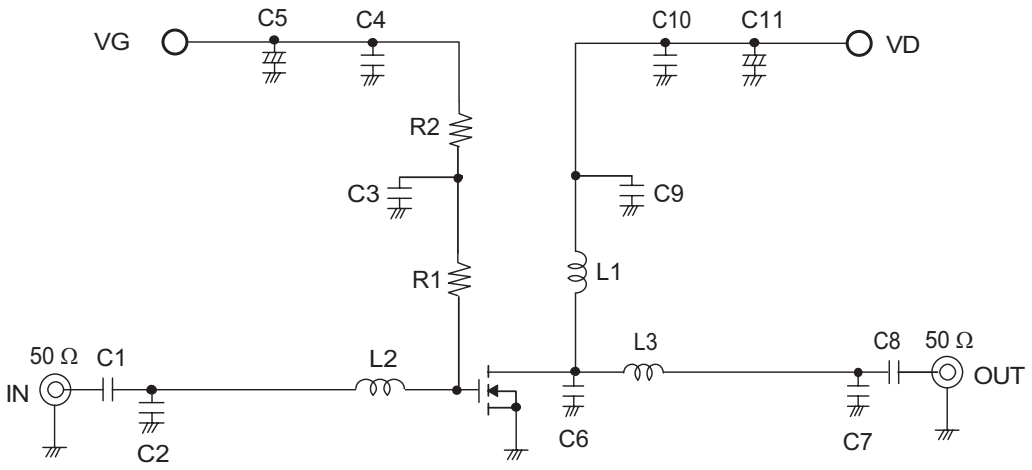
Maximum Stable Gain, $|S21|^2$
vs. Frequency



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



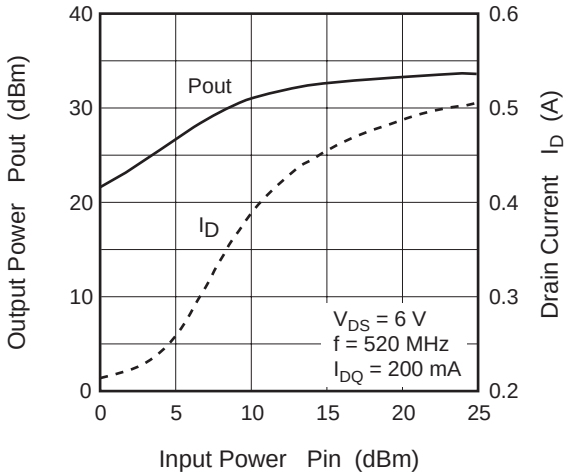
Evaluation Circuit (f = 520 MHz)



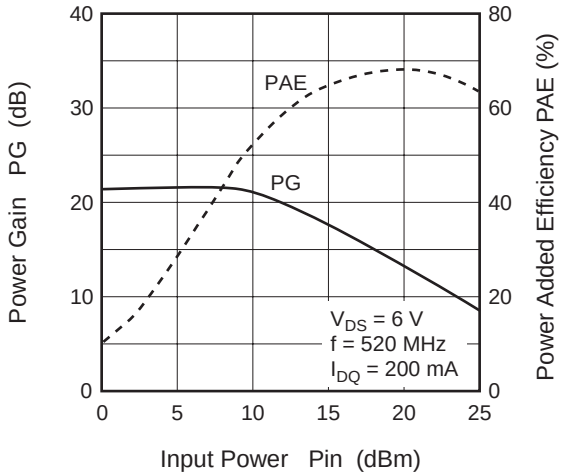
C1, C8	68 pF Chip Capacitor
C2	16 pF Chip Capacitor
C3, C9	100 pF Chip Capacitor
C4, C10	1000 pF Chip Capacitor
C5, C11	2.2 μF Electrolysis Capacitor
C6	4 pF Chip Capacitor
C7	11 pF Chip Capacitor
L1	8 Turns D: 0.5 mm, ϕ 2.4 mm Enamel Wire
L2	2.2 nH Chip Inductor
L3	3.3 nH Chip Inductor
R1	33 Ω Chip Resistor
R2	2.7 kΩ Chip Resistor

Micro strip line width = 2.2 mm / 50 Ω, εr 3.6

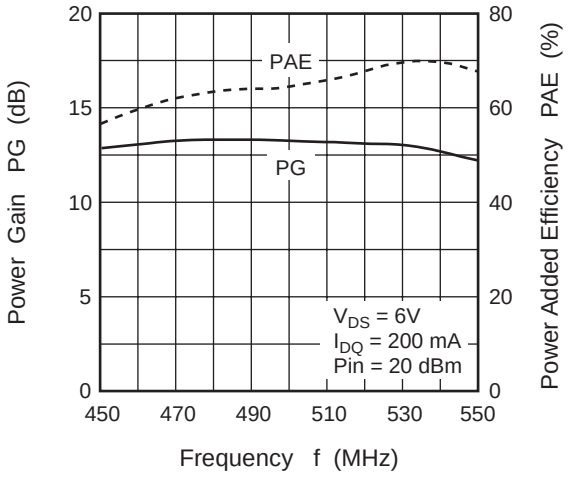
Output Power, Drain Current vs. Input Power



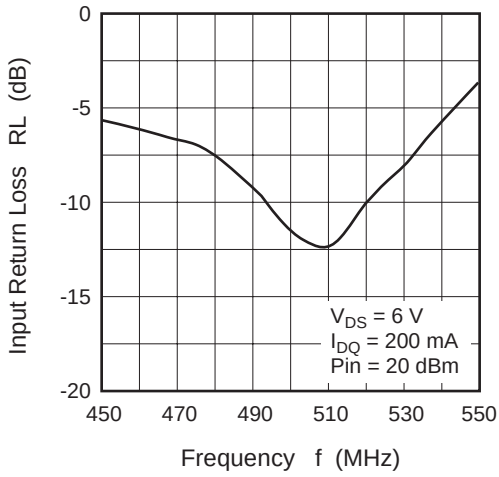
Power Gain, Power Added Efficiency vs. Input Power



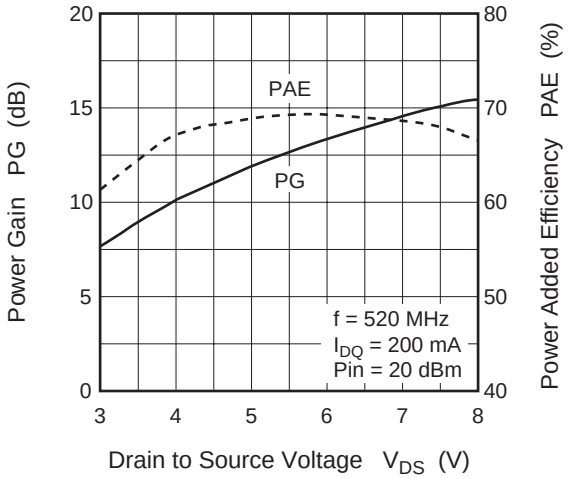
Power Gain, Powe Added Efficiency vs. Frequency



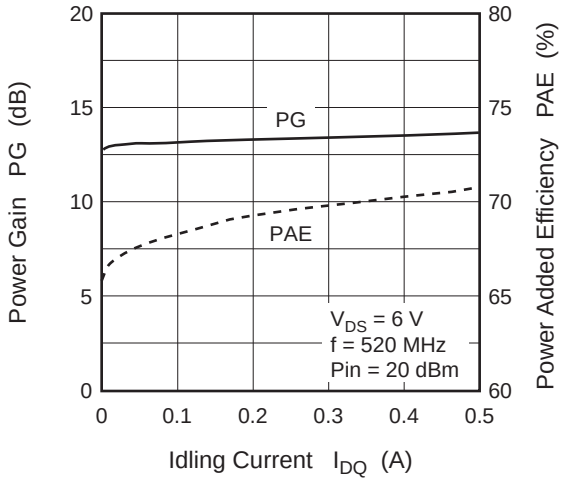
Input Return Loss vs. Frequency



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



Power Gain, Power Added Efficiency vs. Idling Current



S Parameter

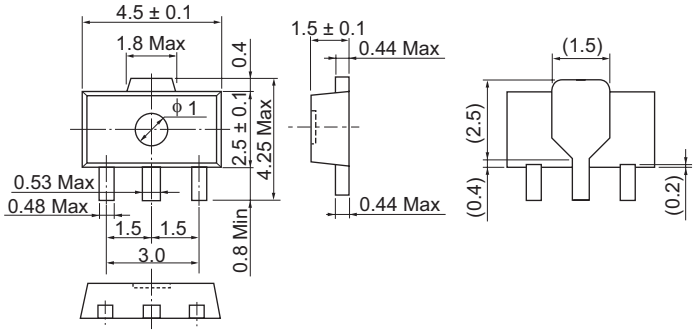
(V_{DS} = 6 V, I_{DQ} = 200 mA, Zo = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.843	-136.4	12.72	104.1	0.037	-5.7	0.765	-150.7
150	0.863	-154.9	11.92	89.1	0.037	-6.3	0.727	-162.2
200	0.853	-161.8	9.13	79.6	0.037	-7.4	0.728	-166.8
250	0.847	-167.1	7.38	72.5	0.037	-13.4	0.730	-170.8
300	0.844	-170.8	6.16	66.1	0.037	-19.0	0.733	-173.5
350	0.843	-173.7	5.27	60.0	0.037	-24.0	0.734	-175.5
400	0.841	-176.2	4.59	54.2	0.037	-29.2	0.735	-177.3
450	0.840	-178.2	4.08	48.7	0.037	-33.6	0.736	-178.8
500	0.841	180.0	3.65	43.3	0.036	-38.4	0.738	180.0
550	0.842	178.4	3.31	37.9	0.036	-42.7	0.741	178.8
600	0.843	176.9	3.02	32.6	0.035	-47.0	0.743	177.8
650	0.844	175.6	2.78	27.5	0.035	-51.4	0.746	176.9
700	0.845	174.3	2.56	22.2	0.035	-55.3	0.746	176.0
750	0.844	173.1	2.38	17.1	0.034	-59.6	0.748	174.9
800	0.845	171.8	2.21	12.0	0.034	-63.9	0.750	174.0
850	0.845	170.6	2.07	6.9	0.033	-67.9	0.753	173.2
900	0.848	169.5	1.94	1.9	0.033	-71.9	0.755	172.4
950	0.851	168.4	1.83	-3.1	0.032	-76.0	0.758	171.4
1000	0.853	167.4	1.73	-8.0	0.032	-79.8	0.760	170.5
1050	0.856	166.4	1.64	-12.9	0.031	-83.8	0.764	169.7
1100	0.858	165.5	1.55	-17.7	0.031	-87.6	0.765	168.7
1150	0.860	164.5	1.47	-22.5	0.030	-91.4	0.769	167.8
1200	0.861	163.5	1.40	-27.4	0.030	-95.3	0.774	166.9
1250	0.862	162.5	1.33	-32.1	0.029	-98.9	0.778	166.1
1300	0.864	161.5	1.27	-37.0	0.029	-102.6	0.780	165.3
1350	0.865	160.5	1.21	-41.8	0.028	-106.3	0.784	164.4
1400	0.867	159.4	1.16	-46.6	0.028	-109.9	0.789	163.5
1450	0.868	158.5	1.11	-51.3	0.027	-113.4	0.792	162.8
1500	0.871	157.5	1.06	-56.0	0.027	-116.7	0.794	161.9
1550	0.874	156.6	1.02	-60.6	0.026	-120.2	0.796	161.1
1600	0.876	155.7	0.98	-65.4	0.025	-123.4	0.799	160.2
1650	0.878	154.8	0.94	-70.1	0.025	-126.8	0.801	159.3
1700	0.879	154.0	0.91	-74.8	0.024	-130.3	0.803	158.5
1750	0.879	153.2	0.88	-79.3	0.024	-133.2	0.805	157.4
1800	0.880	152.4	0.85	-83.8	0.023	-136.4	0.808	156.4
1850	0.882	151.5	0.82	-88.2	0.023	-139.6	0.812	155.5
1900	0.886	150.2	0.79	-92.7	0.022	-142.7	0.814	154.5
1950	0.888	148.9	0.76	-97.3	0.022	-146.0	0.818	153.4
2000	0.890	147.8	0.74	-101.7	0.021	-149.0	0.820	152.5
2050	0.893	146.8	0.71	-106.2	0.021	-151.9	0.825	151.7
2100	0.897	145.9	0.69	-110.6	0.020	-155.0	0.826	150.7
2150	0.900	145.0	0.67	-115.2	0.020	-157.7	0.829	149.6
2200	0.902	144.1	0.65	-119.7	0.019	-160.4	0.832	148.6
2250	0.904	143.3	0.63	-124.1	0.019	-163.0	0.837	147.8
2300	0.904	142.5	0.61	-128.6	0.019	-165.3	0.839	146.9
2350	0.904	141.7	0.59	-133.0	0.018	-168.3	0.839	145.9
2400	0.903	140.9	0.57	-137.5	0.018	-170.7	0.841	144.8
2450	0.901	139.9	0.55	-142.0	0.018	-173.1	0.843	144.0
2500	0.898	138.9	0.54	-146.5	0.017	-175.5	0.842	143.0

Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
SC-62	PLZZ0004CA-A	UPAK / UPAKV	0.050g

Unit: mm



Ordering Information

Part Name	Quantity	Shipping Container
RQA0005MXTL-E	1000 pcs.	φ178 mm reel, 12 mm emboss taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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

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http://www.renesas.com

Refer to "**http://www.renesas.com/en/network**" for the latest and detailed information.

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Colophon .7.0