RQA0008NXAQS

Silicon N-Channel MOS FET

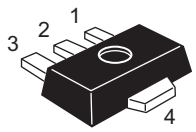
REJ03G1569-0100
Rev.1.00
Jul 04, 2007

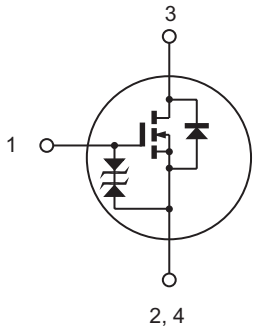
Features

- High Output Power, High Gain, High Efficiency
  Pout = +36 dBm, Linear Gain = 18 dB, PAE = 65% (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 “NX”.

*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	2.4	A
Channel dissipation	Pch[note]	10	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Note: Value at Tc = 25°C

This device is sensitive to electro static discharge. An adequate careful handling procedure is requested.

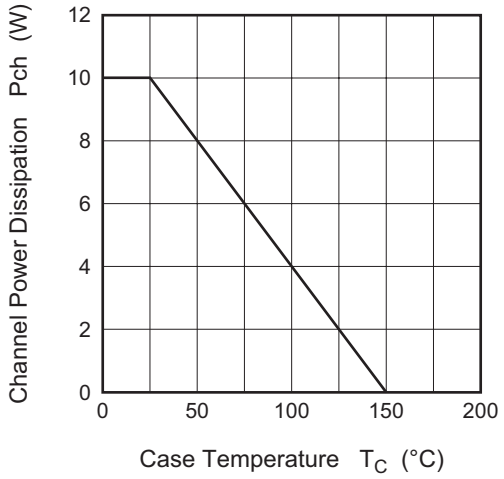
Electrical Characteristics

(Ta = 25°C)

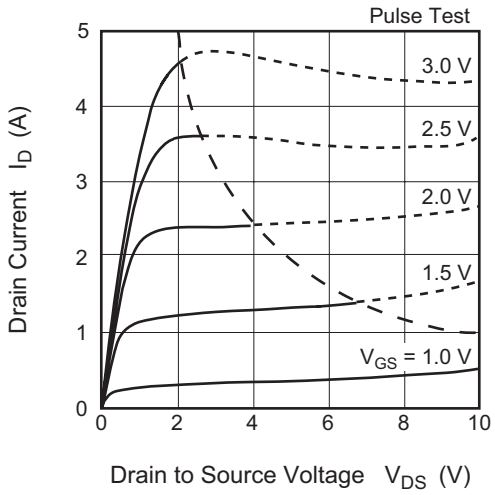
Item	Symbol	Min.	Typ	Max.	Unit	Test Conditions
Zero gate voltage drain current	I_{DSS}	—	—	10	µA	V_{DS} = 16 V, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±2	µA	V_{GS} = ±5 V, V_{DS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	0.15	0.4	0.8	V	V_{DS} = 6 V, I_D = 1 mA
Forward Transfer Admittance	|yfs|	—	2.4	—	S	V_{DS} = 6 V, I_D = 1.2 A
Input capacitance	Ciss	—	44	—	pF	V_{GS} = 5 V, V_{DS} = 0, f = 1 MHz
Output capacitance	Coss	—	25	—	pF	V_{DS} = 6 V, V_{GS} = 0, f = 1 MHz
Reverse transfer capacitance	Crss	—	6.0	—	pF	V_{DG} = 6 V, V_{GS} = 0, f = 1 MHz
Output Power	Pout	—	36	—	dBm	V_{DS} = 6 V, I_{DQ} = 400 mA
		—	3.98	—	W	f = 520 MHz, Pin = +20 dBm
Power Added Efficiency	PAE	—	65	—	%	

Main Characteristics

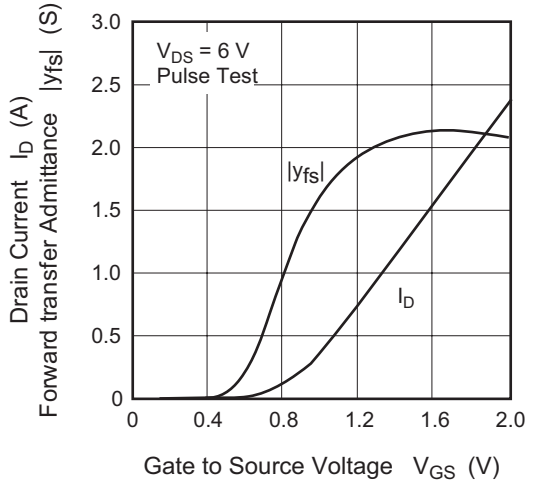
Maximum Channel Power Dissipation Curve



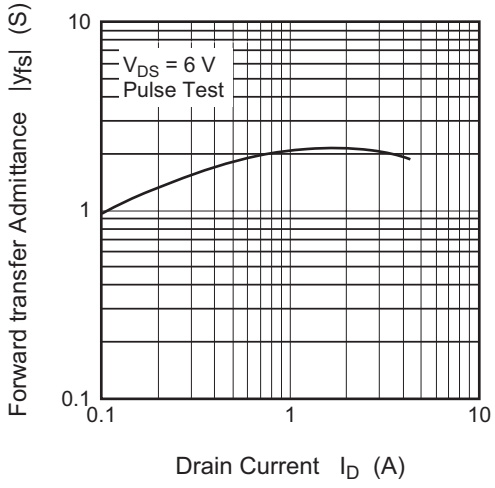
Typical Output Characteristics



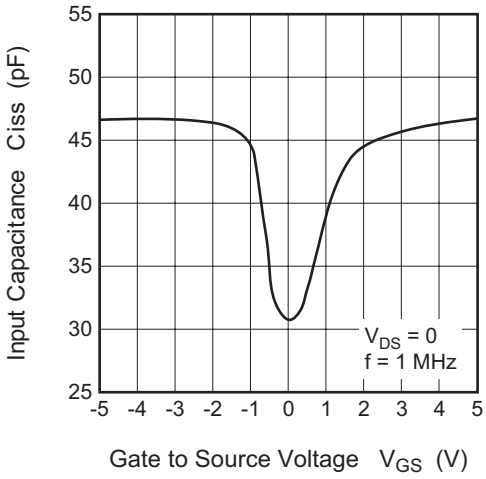
Typical Transfer Characteristics



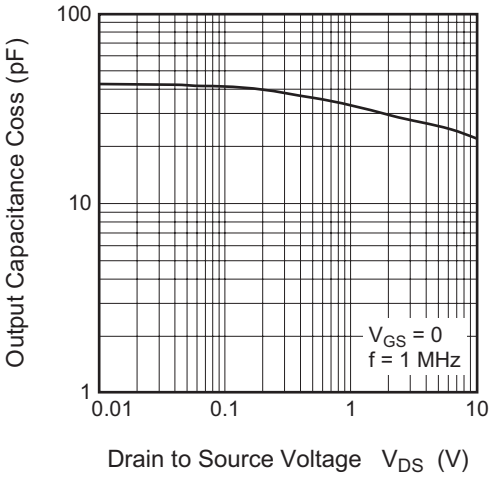
Forward Transfer Admittance vs. Drain Current



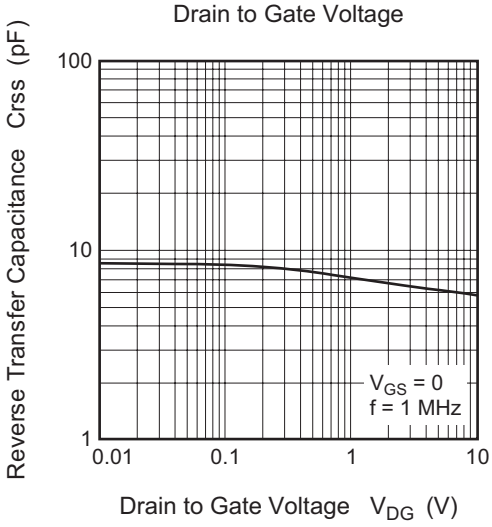
Input Capacitance vs.
Gate to Source Voltage



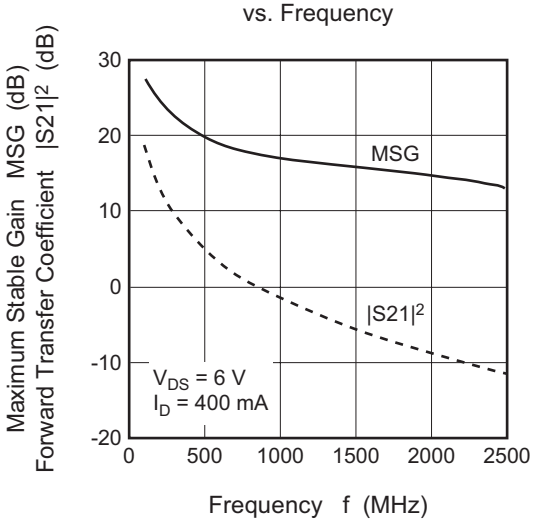
Output Capacitance vs.
Drain to Source Voltage



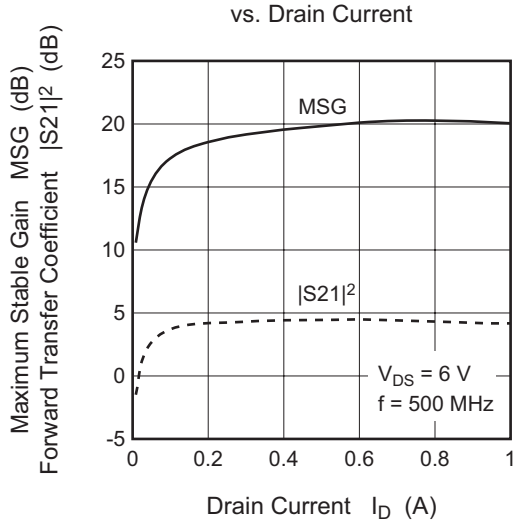
Reverse Transfer Capacitance vs.
Drain to Gate Voltage



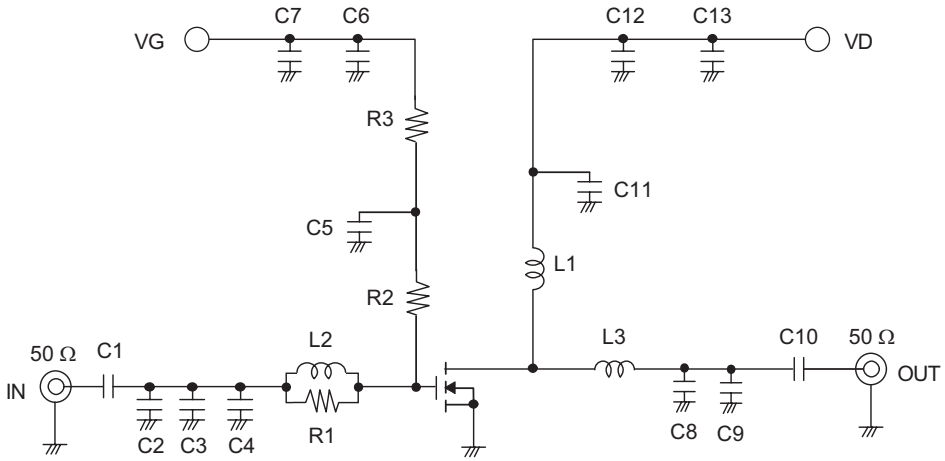
Maximum Stable Gain, $|S21|^2$
vs. Frequency



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

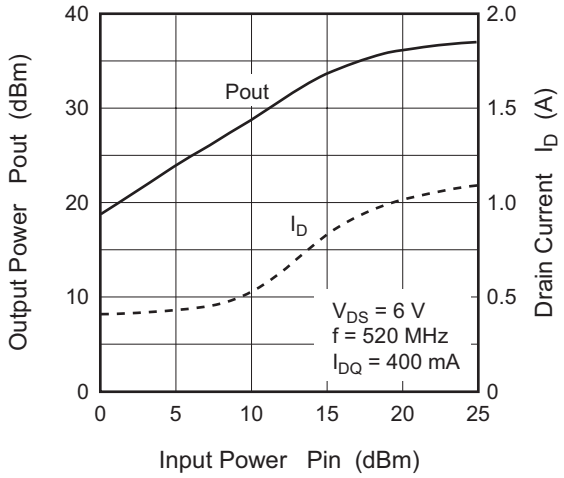


Evaluation Circuit (f = 520 MHz)

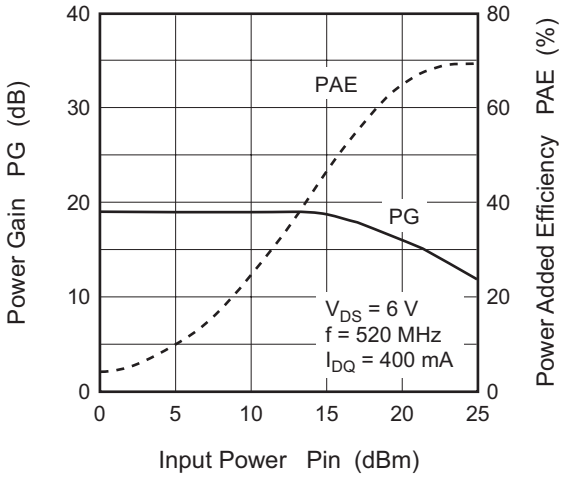


C1, C5, C10, C11:	100 pF Chip Capacitor
C2, C3, C8:	10 pF Chip Capacitor
C4:	5 pF Chip Capacitor
C6, C12:	1000 pF Chip Capacitor
C7, C13:	0.01 μF Chip Capacitor
C9:	11 pF Chip Capacitor
L1:	8 Turns D : 0.5 mm, ϕ 2.4 mm Enamel Wire
L2:	1.2 nH Chip Inductor
L3:	1.0 nH Chip Inductor
R1:	51 Ω Chip Resistor
R2:	510 Ω Chip Resistor
R3:	3.3 kΩ Chip Resistor

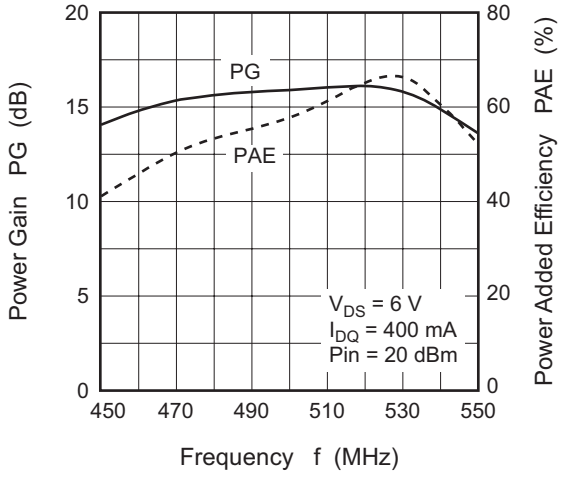
Output Power, Drain Current vs. Input Power



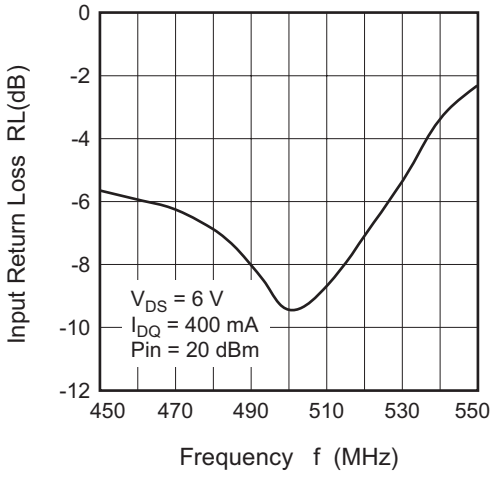
Power Gain, Power Added Efficiency vs. Input Power



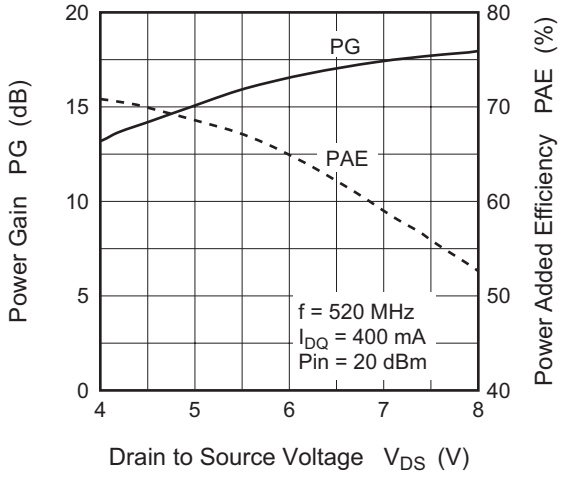
Power Gain, Power Added Efficiency vs. Frequency



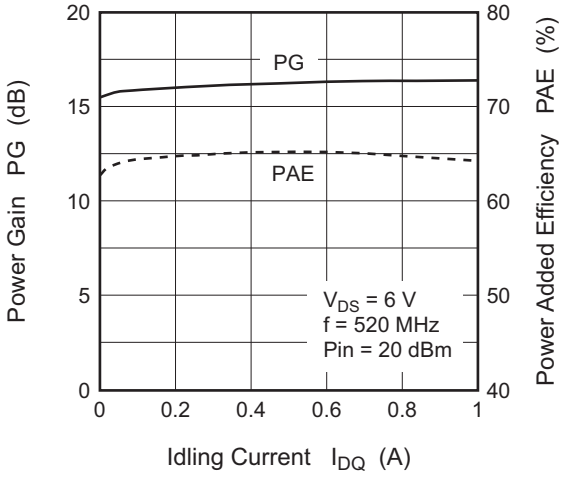
Input Return Loss vs. Frequency



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



Power Gain, Power Added Efficiency vs. Idling Current



S Parameter

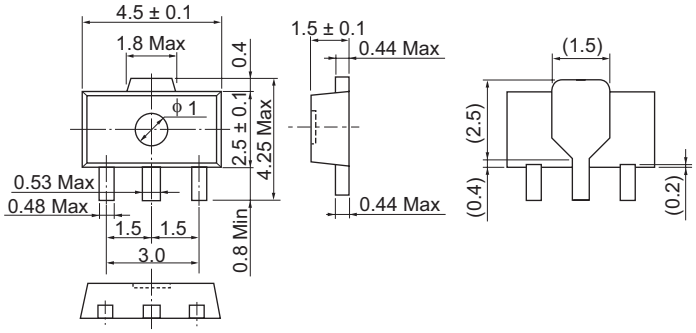
(V_{DS} = 6 V, I_{DQ} = 400 mA, Zo = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.883	-170.0	8.48	84.9	0.021	-3.0	0.867	-175.4
150	0.904	-175.7	5.46	80.1	0.021	-5.3	0.879	-177.3
200	0.902	-178.2	4.13	72.6	0.021	-12.0	0.872	-178.5
250	0.900	179.6	3.30	67.1	0.021	-16.5	0.872	-179.7
300	0.898	177.8	2.75	61.6	0.021	-19.8	0.873	179.5
350	0.898	176.2	2.34	56.2	0.020	-24.2	0.873	178.8
400	0.897	174.8	2.04	50.9	0.020	-27.7	0.874	178.4
450	0.898	173.4	1.80	45.7	0.020	-31.3	0.873	177.8
500	0.899	172.3	1.61	40.7	0.020	-34.4	0.873	177.4
550	0.900	171.2	1.46	35.5	0.019	-38.2	0.875	176.8
600	0.900	170.1	1.33	30.5	0.019	-41.5	0.876	176.5
650	0.899	169.0	1.22	25.5	0.019	-45.0	0.876	176.0
700	0.899	167.9	1.13	20.5	0.019	-47.8	0.878	175.6
750	0.899	166.9	1.04	15.6	0.018	-51.2	0.878	175.2
800	0.898	165.8	0.97	10.6	0.018	-54.8	0.880	174.9
850	0.899	164.7	0.91	5.7	0.018	-57.4	0.878	174.4
900	0.901	163.7	0.85	0.9	0.018	-60.9	0.880	173.9
950	0.903	162.7	0.80	-3.9	0.017	-63.5	0.882	173.5
1000	0.903	161.8	0.75	-8.7	0.017	-66.5	0.883	173.1
1050	0.903	160.8	0.71	-13.4	0.017	-69.3	0.884	172.6
1100	0.905	159.8	0.68	-18.1	0.016	-71.9	0.883	172.1
1150	0.906	158.8	0.64	-22.8	0.016	-74.8	0.886	171.6
1200	0.907	157.8	0.61	-27.3	0.016	-76.8	0.888	171.2
1250	0.909	156.8	0.58	-32.0	0.015	-79.6	0.891	170.8
1300	0.911	155.8	0.55	-36.6	0.015	-81.9	0.893	170.4
1350	0.912	154.9	0.52	-41.2	0.015	-84.1	0.896	170.0
1400	0.912	154.0	0.50	-45.8	0.015	-86.2	0.897	169.5
1450	0.912	153.1	0.48	-50.3	0.014	-88.6	0.898	169.1
1500	0.913	152.1	0.46	-54.8	0.014	-90.2	0.900	168.7
1550	0.914	151.2	0.44	-59.2	0.014	-92.6	0.900	168.4
1600	0.915	150.3	0.42	-63.8	0.014	-94.1	0.902	167.8
1650	0.916	149.4	0.40	-68.3	0.013	-95.9	0.903	167.4
1700	0.915	148.5	0.39	-72.6	0.013	-97.6	0.904	167.0
1750	0.914	147.6	0.38	-76.9	0.013	-99.0	0.904	166.4
1800	0.913	146.7	0.36	-81.1	0.013	-100.8	0.906	165.8
1850	0.915	145.7	0.35	-85.3	0.013	-102.2	0.909	165.5
1900	0.920	144.5	0.34	-89.5	0.013	-103.9	0.909	165.0
1950	0.923	143.3	0.33	-93.6	0.013	-105.8	0.910	164.5
2000	0.925	142.3	0.31	-97.9	0.013	-107.2	0.911	163.9
2050	0.926	141.4	0.30	-102.1	0.013	-108.7	0.913	163.5
2100	0.928	140.5	0.29	-106.3	0.013	-109.9	0.914	163.0
2150	0.929	139.6	0.28	-110.6	0.013	-112.2	0.916	162.4
2200	0.930	138.7	0.27	-114.7	0.013	-112.8	0.917	161.8
2250	0.932	137.8	0.27	-118.9	0.013	-114.9	0.921	161.5
2300	0.931	137.1	0.26	-123.0	0.013	-116.5	0.921	161.0
2350	0.930	136.3	0.25	-127.1	0.013	-118.5	0.921	160.5
2400	0.926	135.5	0.24	-131.2	0.013	-120.2	0.924	159.9
2450	0.922	134.4	0.24	-135.4	0.014	-121.9	0.923	159.5
2500	0.920	133.3	0.23	-139.5	0.014	-123.7	0.921	159.0

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
RQA0008NXTL-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

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Colophon .7.0