

# RQA0008NXAQS

## Silicon N-Channel MOS FET

REJ03G1569-0100

Rev.1.00

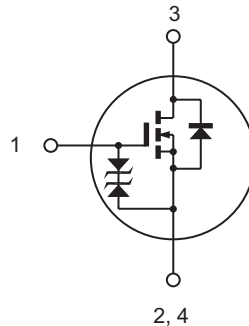
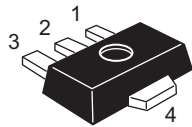
Jul 04, 2007

### 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<sup>®</sup>)



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 <sub>DSS</sub>	16	V
Gate to source voltage	V <sub>GSS</sub>	±5	V
Drain current	I <sub>D</sub>	2.4	A
Channel dissipation	P <sub>ch</sub> <sup>note</sup>	10	W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

Note: Value at Tc = 25°C

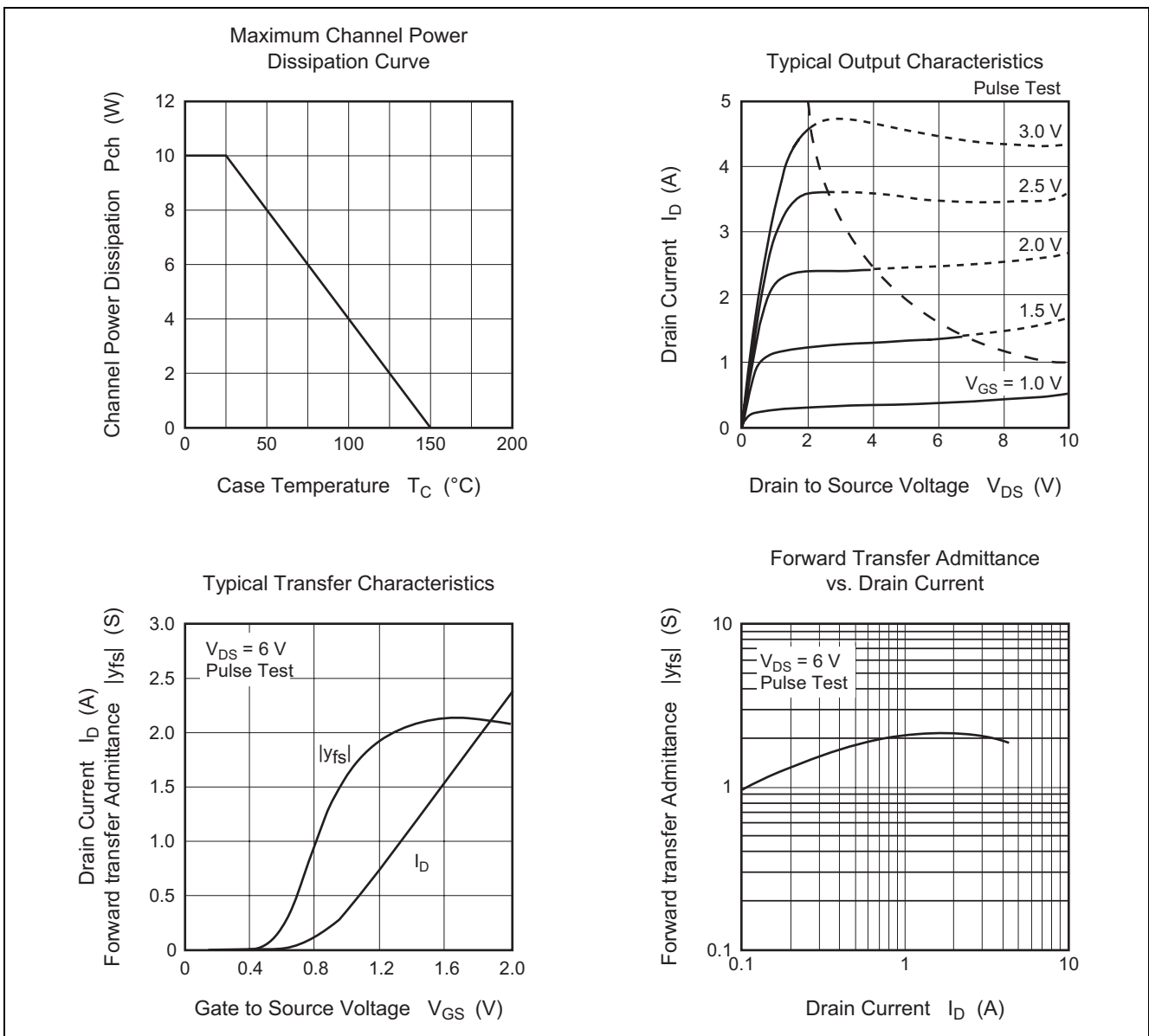
This device is sensitive to electro static discharge. An adequate careful handling procedure is requested.

# Electrical Characteristics

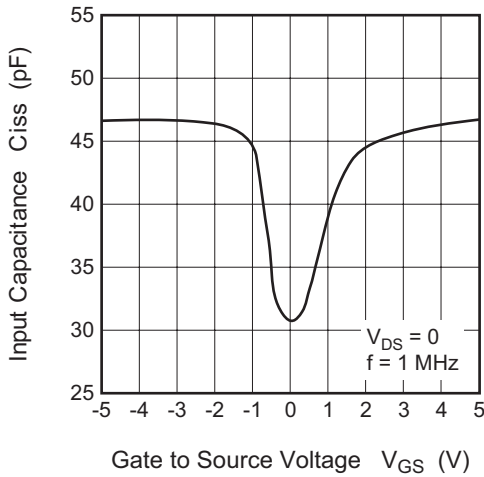
(Ta = 25°C)

Item	Symbol	Min.	Typ	Max.	Unit	Test Conditions
Zero gate voltage drain current	$I_{DSS}$	—	—	10	$\mu A$	$V_{DS} = 16 V, V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 2$	$\mu A$	$V_{GS} = \pm 5 V, V_{DS} = 0$
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	$ y_{fs} $	—	2.4	—	S	$V_{DS} = 6 V, I_D = 1.2 A$
Input capacitance	$C_{iss}$	—	44	—	pF	$V_{GS} = 5 V, V_{DS} = 0, f = 1 MHz$
Output capacitance	$C_{oss}$	—	25	—	pF	$V_{DS} = 6 V, V_{GS} = 0, f = 1 MHz$
Reverse transfer capacitance	$C_{rss}$	—	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	$f = 520 MHz, P_{in} = +20 dBm$
Power Added Efficiency	PAE	—	65	—	%	

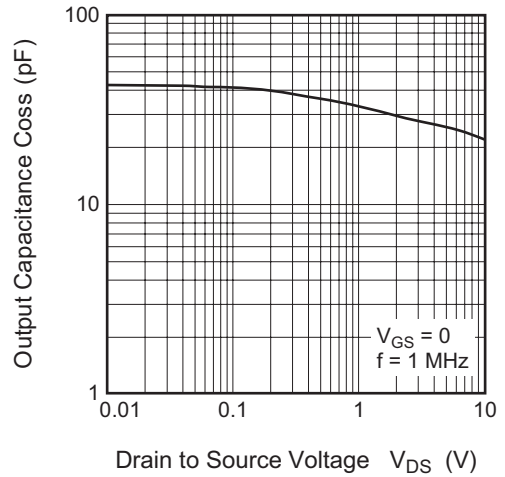
## Main Characteristics



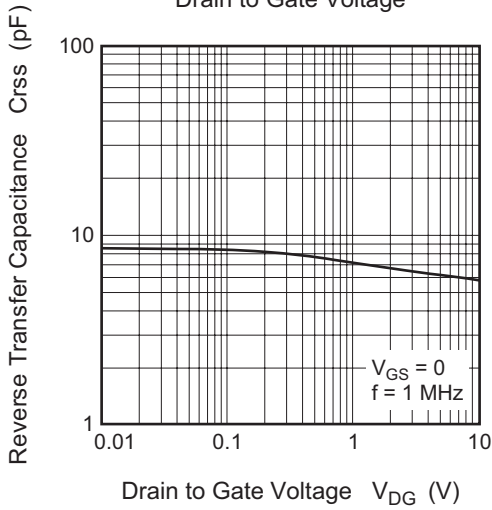
Input Capacitance vs. Gate to Source Voltage



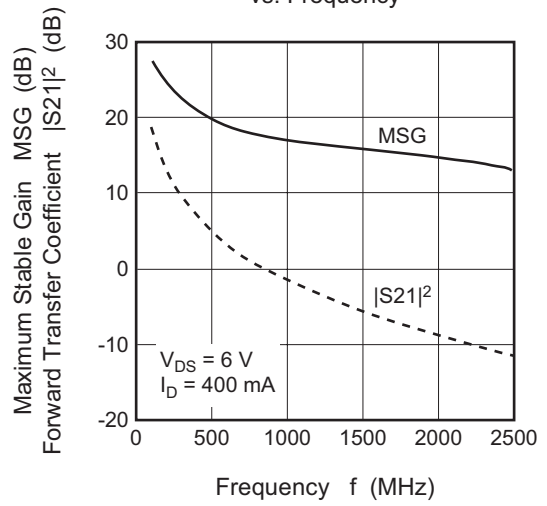
Output Capacitance vs. Drain to Source Voltage



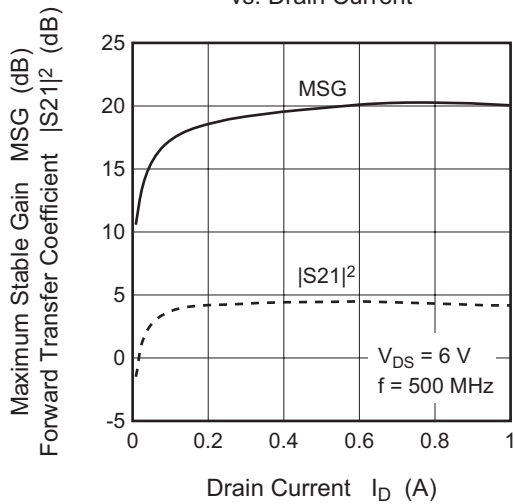
Reverse Transfer Capacitance vs. Drain to Gate Voltage



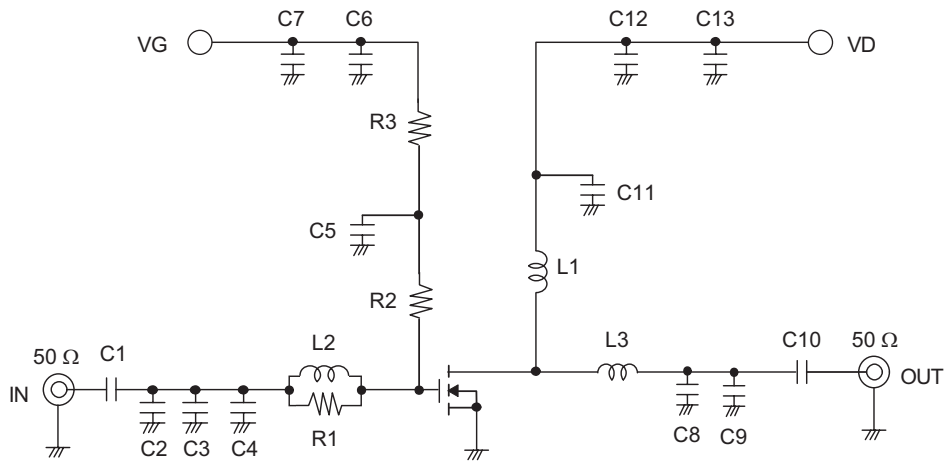
Maximum Stable Gain,  $|S_{21}|^2$  vs. Frequency



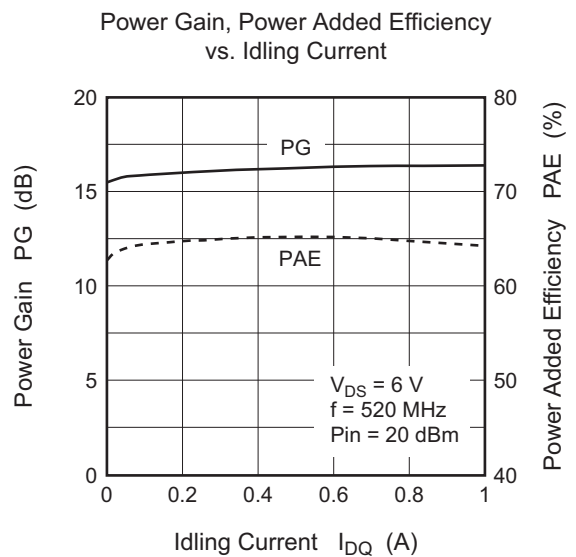
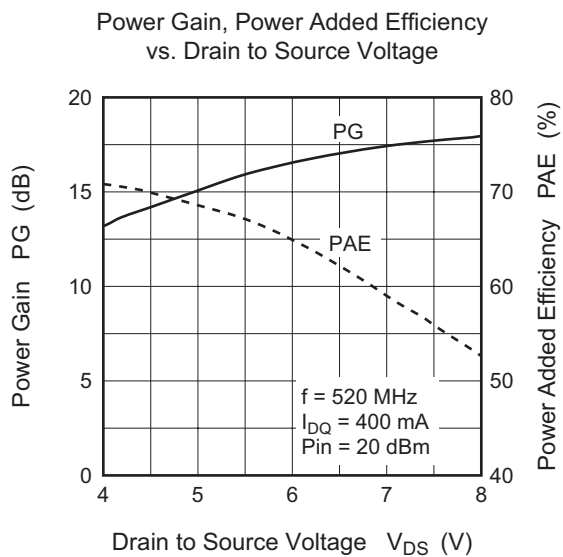
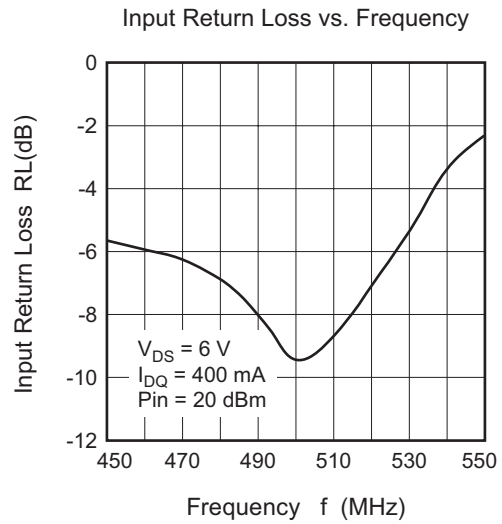
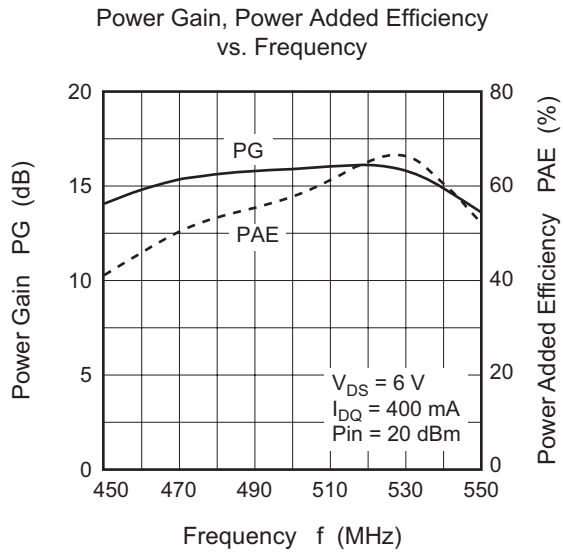
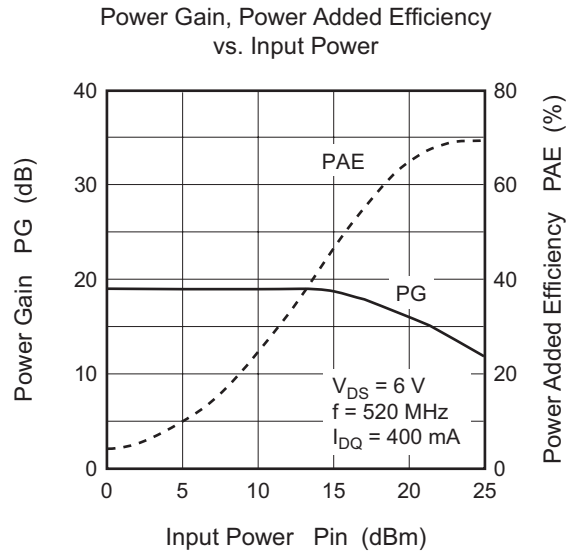
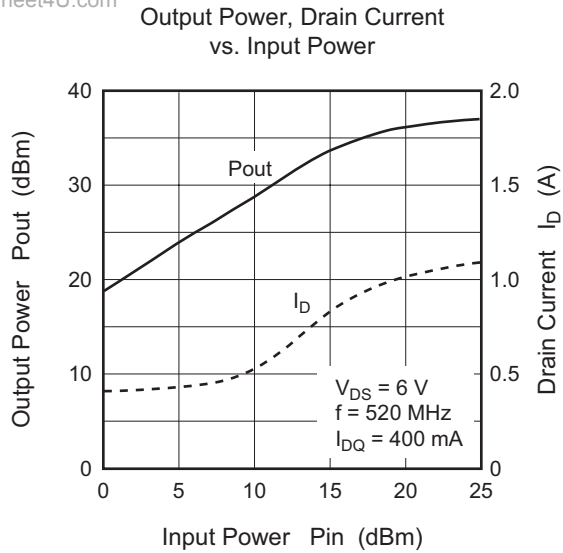
Maximum Stable Gain,  $|S_{21}|^2$  vs. Drain Current



## Evaluation Circuit (f = 520 MHz)



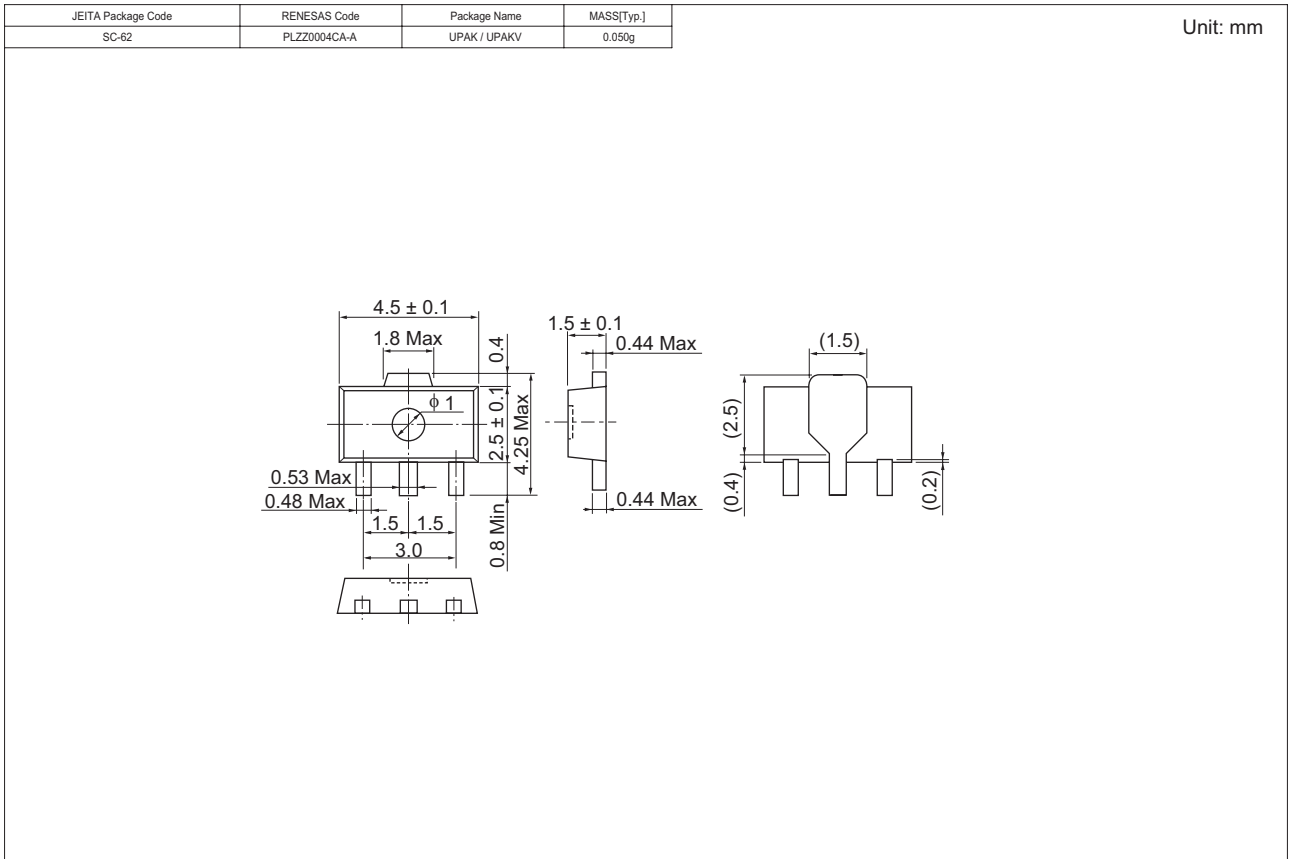
C1, C5, C10, C11:	100 pF Chip Capacitor
C2, C3, C8:	10 pF Chip Capacitor
C4:	5 pF Chip Capacitor
C6, C12:	1000 pF Chip Capacitor
C7, C13:	0.01 $\mu$ F Chip Capacitor
C9:	11 pF Chip Capacitor
L1:	8 Turns D : 0.5 mm, $\phi$ 2.4 mm Enamel Wire
L2:	1.2 nH Chip Inductor
L3:	1.0 nH Chip Inductor
R1:	51 $\Omega$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



(V<sub>DS</sub> = 6 V, I<sub>DQ</sub> = 400 mA, Z<sub>o</sub> = 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



## Ordering Information

Part Name	Quantity	Shipping Container
RQA0008NXTL-E	1000 pcs.	$\phi 178$ 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.

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