RQL1001JLAQH

SiGe MMIC
High Frequency Low Noise Amplifier

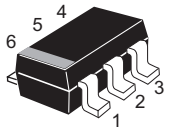
REJ03G1539-0100
Rev.1.00
May 16, 2007

Features

- Small SMD package CMPAK-6.
- Ideal for wireless LAN(2.4 GHz / 5 GHz band), Cordless Phone, GPS antenna, IMS band applications
- Low noise, High gain,
  NF = 1.2 dB, PG = 19.5 dB, f = 2.45 GHz
  NF = 2.1 dB, PG = 16.5 dB, f = 5.85 GHz
- Having of power control terminal (Vctrl)

Outline

RENESAS Package code: PTSP0006JA-A
(Package name: CMPAK-6)



1. RFout
2. GND
3. Vctrl
4. GND
5. RFin
6. GND

Note: Marking is “JL”.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Supply Voltage	V_{CC}	4	V
Maximum Current	I_{CC}	20	mA
Maximum Input Power	$P_{in\ max}$	+5	dBm
Total Power Dissipation	P_t	80 Note	mW
Operating Case Temperature	Tc(op)	–10 to +85	°C
Storage Temperature	Tstg	–55 to +150	°C

Note: Value on PCB (FR-4 : 40 x 40 x 1.6 mm double side)

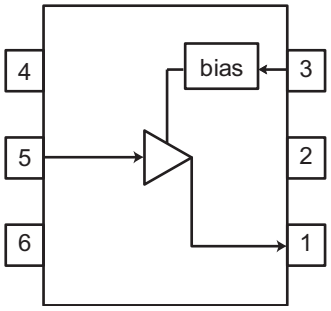
Electrical Characteristics

(Ta = 25°C)

Item	Symbol	Min.	Typ	Max.	Unit	Test Conditions
Noise Figure	NF	—	1.2	—	dB	f = 2.45 GHz, V_{CC} = 3 V, V_{ctrl} = 2.7 V
		—	2.1	—		f = 5.85 GHz, V_{CC} = 3 V, V_{ctrl} = 3.0 V
Power Gain	PG	—	19.5	—	dB	f = 2.45 GHz, V_{CC} = 3 V, V_{ctrl} = 2.7 V
		—	16.5	—		f = 5.85 GHz, V_{CC} = 3 V, V_{ctrl} = 3.0 V
Input Return Loss[note1]	S11	—	12	—	dB	f = 2.45 GHz, V_{CC} = 3 V, V_{ctrl} = 2.7 V
		—	10	—		f = 5.85 GHz, V_{CC} = 3 V, V_{ctrl} = 3.0 V
Output Return Loss [note2]	S22	—	20	—	dB	f = 2.45 GHz, V_{CC} = 3 V, V_{ctrl} = 2.7 V
		—	25	—		f = 5.85 GHz, V_{CC} = 3 V, V_{ctrl} = 3.0 V
1 dB Compression Point at output	P1dB	—	+3.5	—	dBm	f = 2.45 GHz, V_{CC} = 3 V, V_{ctrl} = 2.7 V
		—	+2	—		f = 5.85 GHz, V_{CC} = 3 V, V_{ctrl} = 3.0 V
Third Order Intercept Point at output	OIP3	—	+13.5	—	dBm	f = 2.45 GHz, Δf = 1 MHz, V_{CC} = 3 V, V_{ctrl} = 2.7 V
		—	+11	—		f = 5.85 GHz, Δf = 1 MHz, V_{CC} = 3 V, V_{ctrl} = 3.0 V

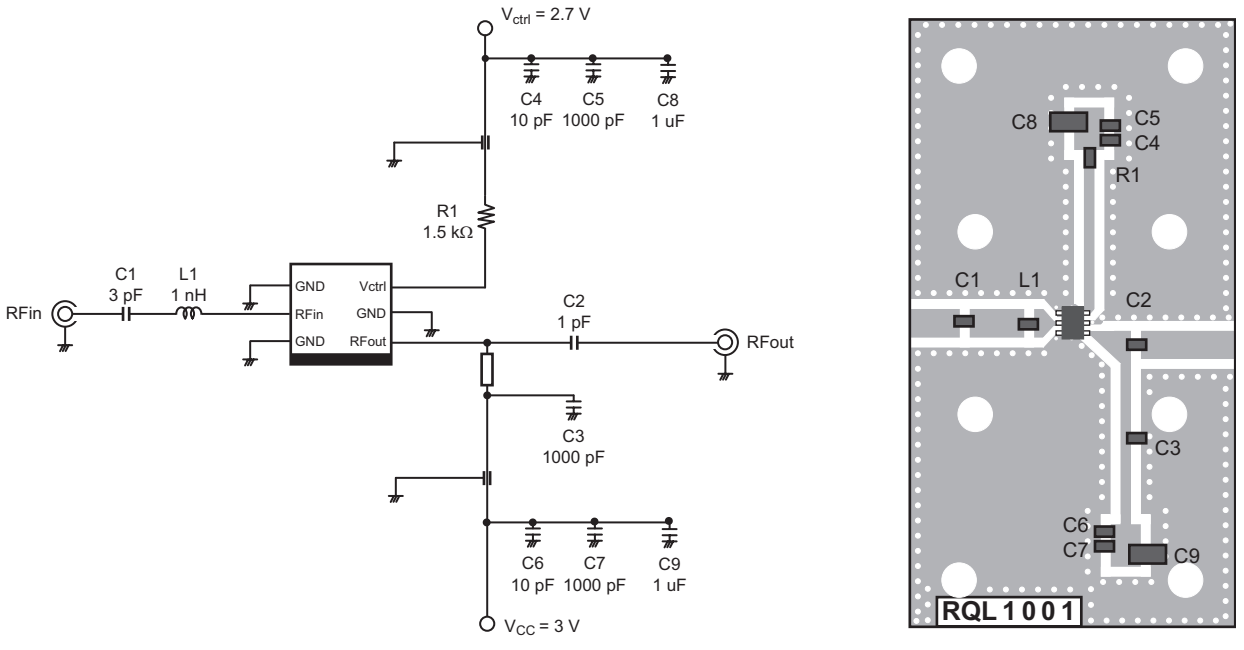
Notes: 1, 2. Value on our specification circuit. (Refer to P.3, P.5)

Circuit Block Diagram



Pin	Terminal
1	RFout
2	GND
3	Vctrl
4	GND
5	RFin
6	GND

2.45 GHz Characteristics

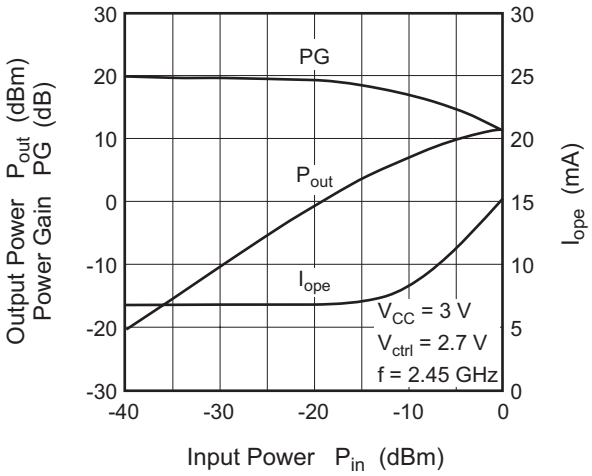


Component ID	Value	Part Code	Tolerance	Rated Voltage	Manufacture
C1	3 pF	CM05CH3R0C50AH	-0.25 to +0.25 pF	50 V	KYOCERA
C2	1 pF	CM05CH1R0C50AH	-0.25 to +0.25 pF		
C3, C5, C7	1000 pF	CM05B102K50AH	-10 to +10%		
C4, C6	10 pF	CM05CH100J50AH	-5 to 5%		
C8, C9	1 µF	F921A105MPA	-10 to +10%	10 V	NICHICON

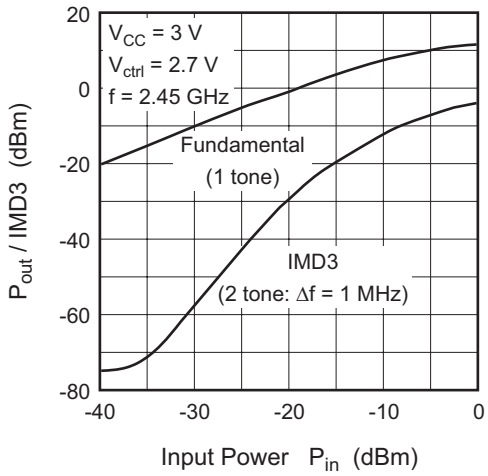
Component ID	Value	Part Code	Tolerance	Imax	Manufacture
L1	1 nH	LL1005-FHL1N0S	-0.3 to 0.3 nH	500 mA	TOKO

Component ID	Value	Part Code	Tolerance	Power Rating	Manufacture
R1	1.5 kΩ	RK73B1ETTD152J	-5 to +5%	0.063 W	KOA

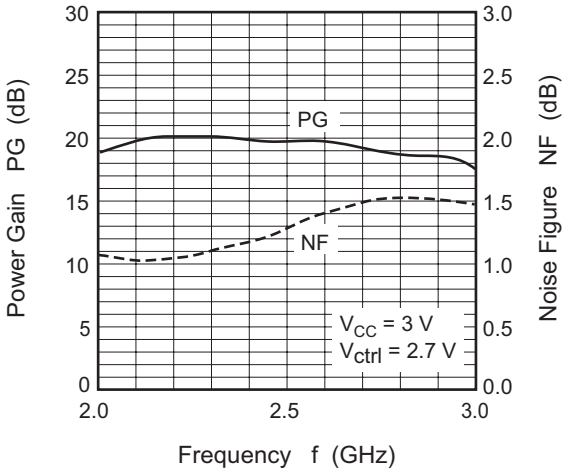
Pin - Pout Characteristics



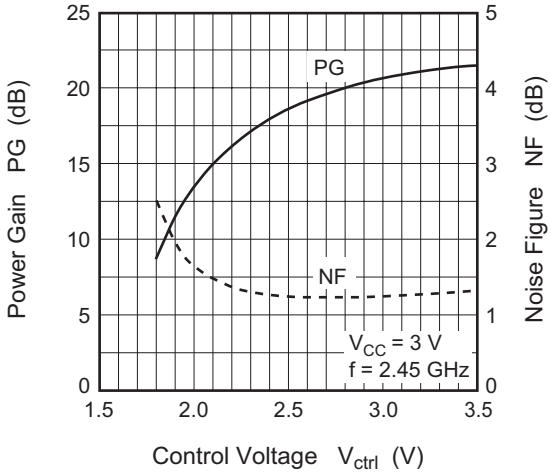
3rd. Order Intermodulation Distortion



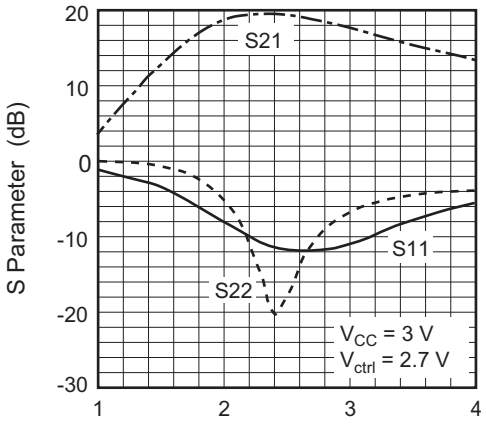
Power Gain, Noise Figure vs. Frequency



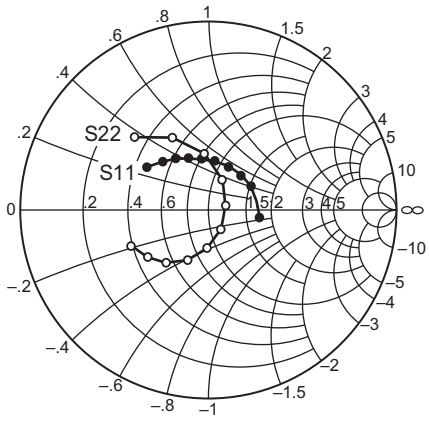
Power Gain, Noise Figure vs. Control Voltage



S Parameter vs. Frequency

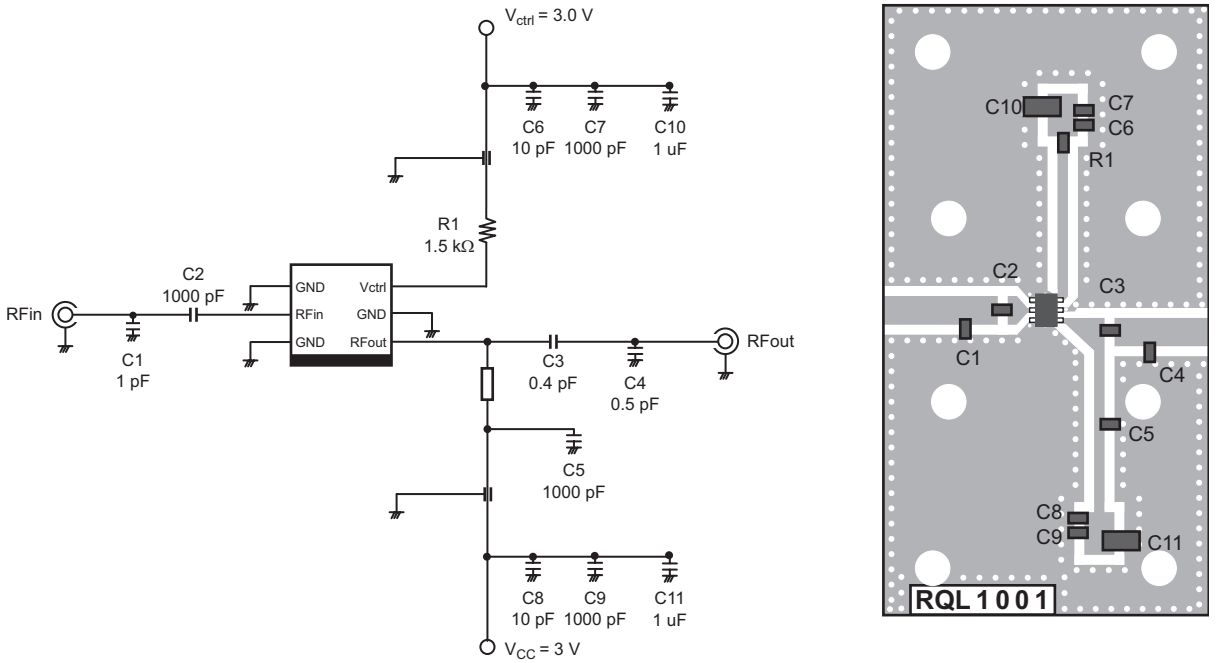


S Parameter vs. Frequency



Test condition : V_{CC} = 3 V, V_{ctrl} = 2.7 V
2.0 to 3.0 GHz (0.1 GHz step)

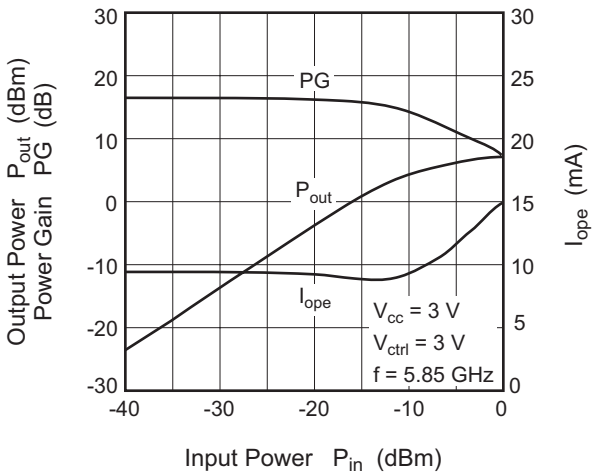
5.85 GHz Characteristics



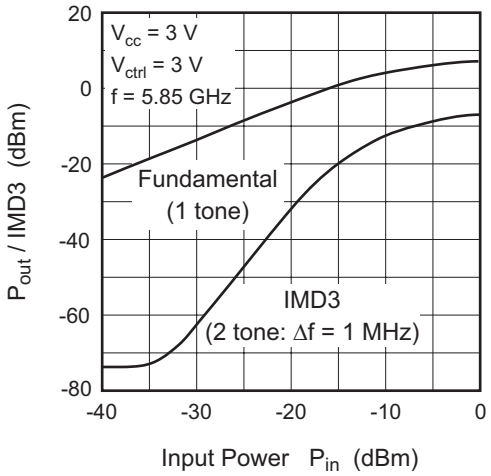
Component ID	Value	Part Code	Tolerance	Rated Voltage	Manufacture
C1	1 pF	CM05CH1R0C50AH	-0.25 to +0.25 pF	50 V	KYOCERA
C2, C5, C7, C9	1000 pF	CM05B102K50AH	-10 to +10%		
C3	0.4 pF	CM05CH0R4C50AH	-0.25 to +0.25 pF		
C4	0.5 pF	CM05CH0R5C50AH	-0.25 to +0.25 pF		
C6, C8	10 pF	CM05CH100J50AH	-5 to 5%		
C10, C11	1 µF	F921A105MPA	-10 to +10%	10 V	NICHICON

Component ID	Value	Part Code	Tolerance	Power Rating	Manufacture
R1	1.5 kΩ	RK73B1ETTD152J	-5 to +5%	0.063 W	KOA

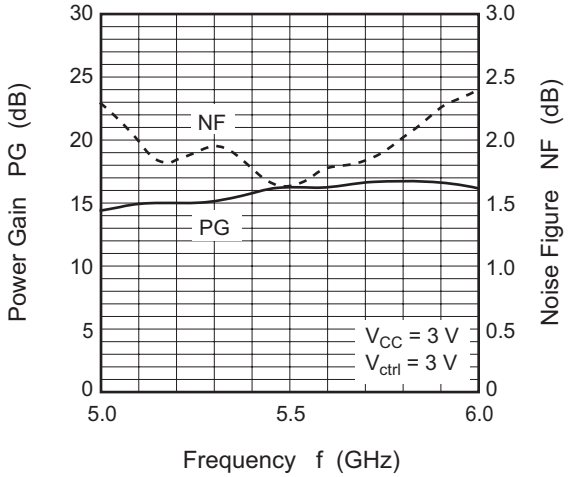
Pin - Pout Characteristics



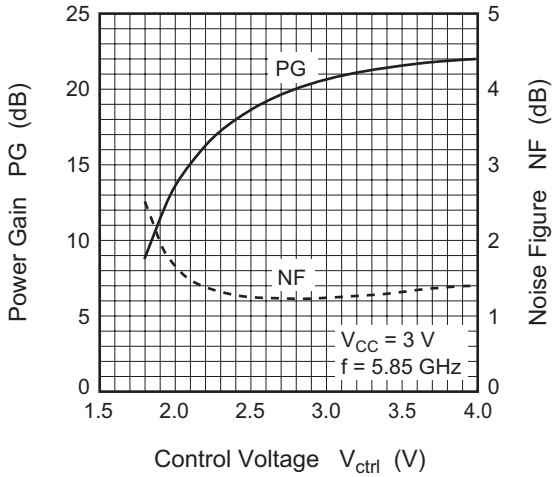
3rd. Order Intermodulation Distortion



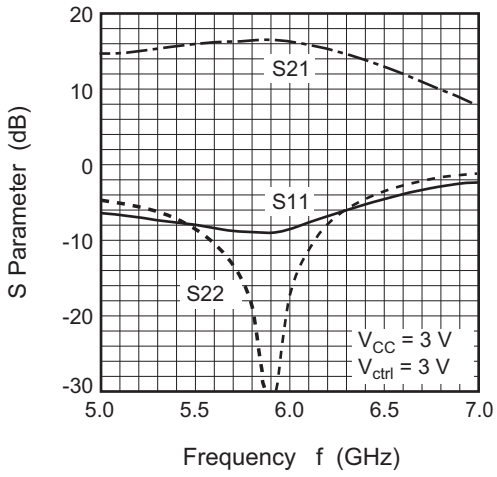
Power Gain, Noise Figure vs. Frequency



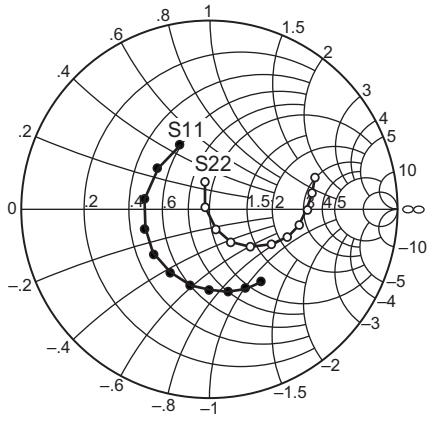
Power Gain, Noise Figure vs. Control Voltage



S Parameter vs. Frequency



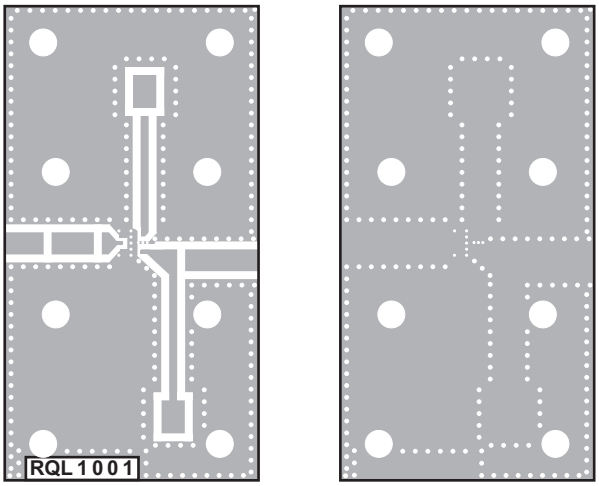
S Parameter vs. Frequency



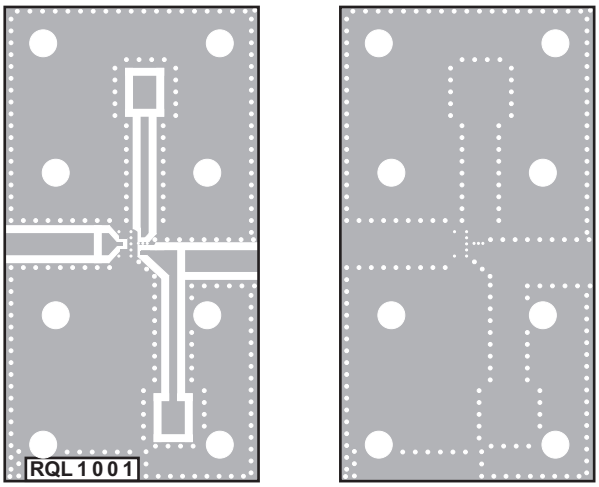
Test condition : V_{CC} = 3 V, V_{ctrl} = 3 V
5.0 to 6.0 GHz (0.1 GHz step)

Evaluation Board

f = 2.45 GHz

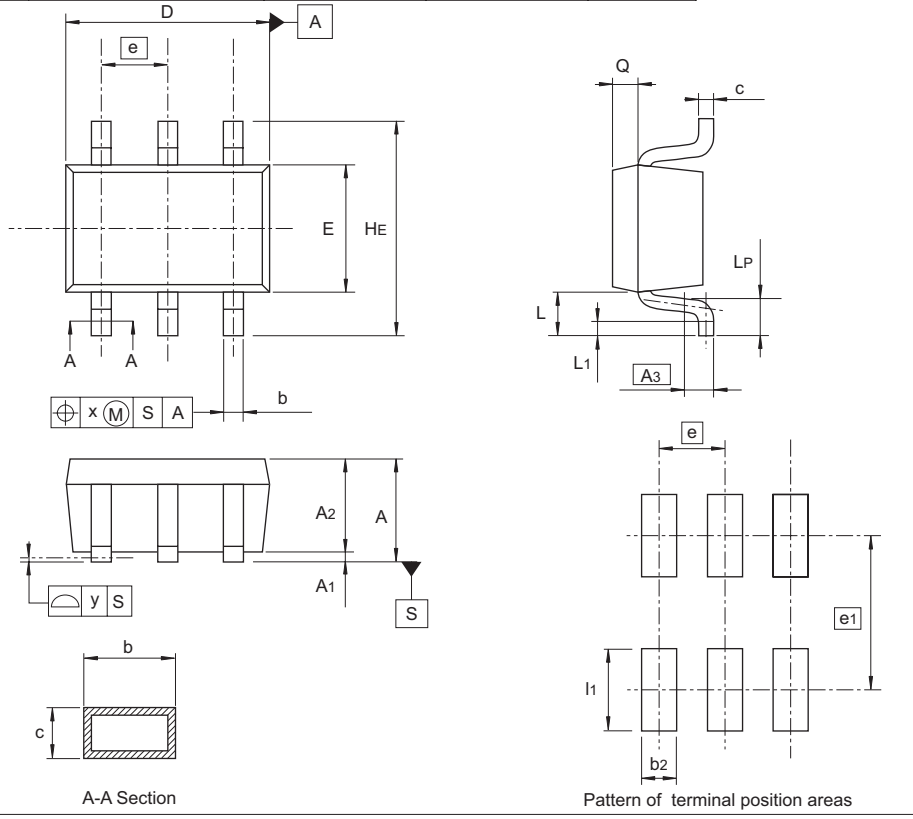


f = 5.85 GHz



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
CMPAK-6	SC-88	PTSP0006JA-A	CMPAK-6 / CMPAK-6V	0.006g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	0.8	–	1.1
A_1	0	–	0.1
A_2	0.8	0.9	1.0
$\boxed{A_3}$	–	0.25	–
b	0.15	0.2	0.25
c	0.1	0.15	0.25
D	1.8	2.0	2.2
E	1.15	1.25	1.35
$\boxed{e}$	–	0.65	–
H_E	2.0	2.1	2.2
L	0.3	–	0.7
L_1	0.1	–	0.5
L_P	0.2	–	0.6
x	–	–	0.05
y	–	–	0.05
b_2	–	–	0.35
$\boxed{e_1}$	–	1.5	–
l_1	–	–	0.9
Q	–	0.25	–

Ordering Information

Part Name	Quantity	Shipping Container
RQL1001JLTL-E	3000 pcs	ϕ178 mm reel, 8 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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RENESAS SALES OFFICES

http://www.renesas.com

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

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