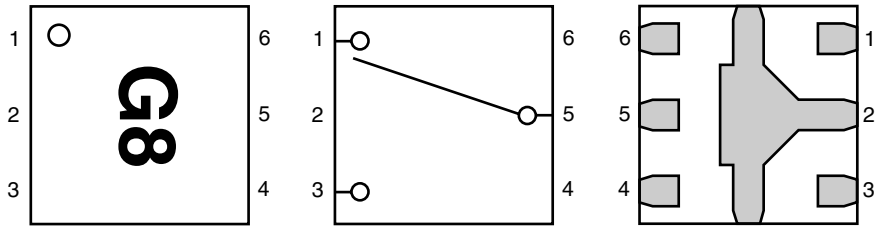
PIN CONNECTIONS AND INTERNAL BLOCK DIAGRAM

(Top View) (Top View) (Bottom View)



Pin No.	Pin Name
1	OUTPUT1
2	GND
3	OUTPUT2
4	$V_{cont}2$
5	INPUT
6	$V_{cont}1$

Remark Exposed pad : GND

TRUTH TABLE

$V_{cont}1$	$V_{cont}2$	INPUT–OUTPUT1	INPUT–OUTPUT2
High	Low	OFF	ON
Low	High	ON	OFF

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Switch Control Voltage	V_{cont}	+6.0 Note	V
Input Power	P_{in}	+31	dBm
Power Dissipation	P_D	150	mW
Operating Ambient Temperature	T_A	–40 to +90	°C
Storage Temperature	T_{stg}	–55 to +150	°C

Note: $|V_{cont}1 - V_{cont}2| \leq 6.0$ V

RECOMMENDED OPERATING RANGE (T_A = +25°C, unless otherwise specified)

<R>

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Switch Control Voltage (H)	$V_{cont\ (H)}$	1.8	3.0	3.6	V
Switch Control Voltage (L)	$V_{cont\ (L)}$	–0.2	0	+0.2	V
Operating Frequency	f	2.0	–	6.0	GHz

ELECTRICAL CHARACTERISTICS 1
(T_A = +25°C, $V_{cont\ (H)}$ = 3.0 V, $V_{cont\ (L)}$ = 0 V, Z_O = 50 Ω, DC blocking capacitors = 6 pF, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss 1	$L_{ins}1$	f = 2.0 to 2.5 GHz	–	0.40	0.60	dB
Insertion Loss 2	$L_{ins}2$	f = 2.5 to 6.0 GHz	–	0.50	0.80	dB
Isolation 1 (INPUT–OFF Port)	ISL1	f = 2.0 to 2.5 GHz	23	26	–	dB
Isolation 2 (INPUT–OFF Port)	ISL2	f = 2.5 to 6.0 GHz	22	25	–	dB
Isolation 3 (OUTPUT1–OUTPUT2)	ISL3	f = 2.0 to 2.5 GHz	24	27	–	dB
Isolation 4 (OUTPUT1–OUTPUT2)	ISL4	f = 2.5 to 6.0 GHz	24	27	–	dB
Input Return Loss 1	$RL_{in}1$	f = 2.0 to 2.5 GHz	15	20	–	dB
Input Return Loss 2	$RL_{in}2$	f = 4.9 to 6.0 GHz	15	20	–	dB
Input Return Loss 3	$RL_{in}3$	f = 2.5 to 4.9 GHz	12	17	–	dB
Output Return Loss 1	$RL_{out}1$	f = 2.0 to 2.5 GHz	15	20	–	dB
Output Return Loss 2	$RL_{out}2$	f = 4.9 to 6.0 GHz	15	20	–	dB
Output Return Loss 3	$RL_{out}3$	f = 2.5 to 4.9 GHz	12	17	–	dB
0.1 dB Loss Compression Input Power Note	$P_{in\ (0.1\ dB)}$	f = 2.5 GHz	+26	+29	–	dBm
		f = 6.0 GHz	+26	+29	–	dBm
1 dB Loss Compression Input Power Note	$P_{in\ (1\ dB)}$	f = 2.5 GHz	–	+30.5	–	dBm
		f = 6.0 GHz	–	+30.5	–	dBm
Input 3rd order Intercept Point	IIP_3	f = 2.5 GHz	–	+50	–	dBm
Switch Control Current	I_{cont}	No RF input	–	0.1	1.0	μA
Switch Control Speed	t_{SW}	50% CTL to 90/10% RF	–	20	100	ns

Note: $P_{in\ (0.1\ dB)}$ is the measured input power level when the insertion loss increases 0.1 dB more than that of the linear range.
$P_{in\ (1\ dB)}$ is the measured input power level when the insertion loss increases 1 dB more than that of the linear range.

CAUTION

It is necessary to use DC blocking capacitors with this device.
The value of DC blocking capacitors should be chosen to accommodate the frequency of operation, bandwidth, switching speed and the condition with actual board of your system.

<R> **ELECTRICAL CHARACTERISTICS 2**
(T_A = +25°C, $V_{cont\ (H)}$ = 1.8 V, $V_{cont\ (L)}$ = 0 V, Z_O = 50 Ω, DC blocking capacitors = 6 pF, unless otherwise specified)

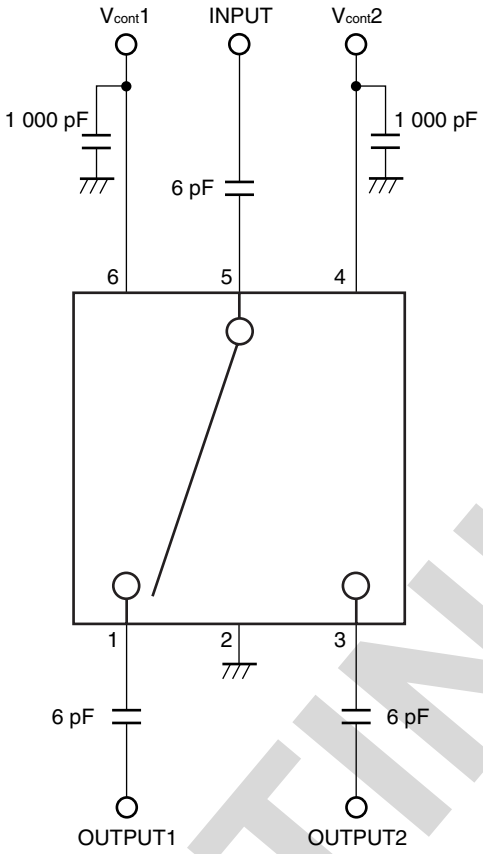
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss 1	$L_{ins}1$	f = 2.0 to 2.5 GHz	–	0.40	0.60	dB
Insertion Loss 2	$L_{ins}2$	f = 2.5 to 6.0 GHz	–	0.50	0.80	dB
Isolation 1 (INPUT–OFF Port)	ISL1	f = 2.0 to 2.5 GHz	22	26	–	dB
Isolation 2 (INPUT–OFF Port)	ISL2	f = 2.5 to 6.0 GHz	22	25	–	dB
Isolation 3 (OUTPUT1–OUTPUT2)	ISL3	f = 2.0 to 2.5 GHz	22	27	–	dB
Isolation 4 (OUTPUT1–OUTPUT2)	ISL4	f = 2.5 to 6.0 GHz	22	27	–	dB
Input Return Loss 1	$RL_{in}1$	f = 2.0 to 2.5 GHz	15	20	–	dB
Input Return Loss 2	$RL_{in}2$	f = 4.9 to 6.0 GHz	15	20	–	dB
Input Return Loss 3	$RL_{in}3$	f = 2.5 to 4.9 GHz	12	17	–	dB
Output Return Loss 1	$RL_{out}1$	f = 2.0 to 2.5 GHz	15	20	–	dB
Output Return Loss 2	$RL_{out}2$	f = 4.9 to 6.0 GHz	15	20	–	dB
Output Return Loss 3	$RL_{out}3$	f = 2.5 to 4.9 GHz	12	17	–	dB
0.1 dB Loss Compression Input Power **Note**	$P_{in\ (0.1\ dB)}$	f = 2.5 GHz	+20	+23	–	dBm
		f = 6.0 GHz	+19	+23	–	dBm
1 dB Loss Compression Input Power **Note**	$P_{in\ (1\ dB)}$	f = 2.5 GHz	–	+28	–	dBm
		f = 6.0 GHz	–	+27	–	dBm
Input 3rd order Intercept Point	IIP_3	f = 2.5 GHz	–	+50	–	dBm
Switch Control Current	I_{cont}	No RF input	–	0.1	1.0	μA
Switch Control Speed	t_{SW}	50% CTL to 90/10% RF	–	20	100	ns

Note: $P_{in\ (0.1\ dB)}$ is the measured input power level when the insertion loss increases 0.1 dB more than that of the linear range.
$P_{in\ (1\ dB)}$ is the measured input power level when the insertion loss increases 1 dB more than that of the linear range.

CAUTION

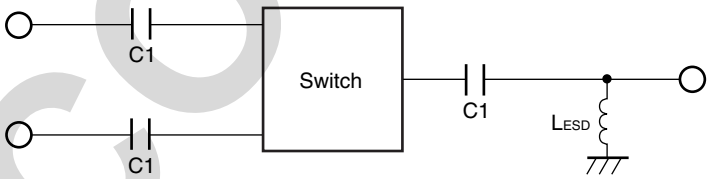
It is necessary to use DC blocking capacitors with this device.
The value of DC blocking capacitors should be chosen to accommodate the frequency of operation, bandwidth, switching speed and the condition with actual board of your system.

EVALUATION CIRCUIT



The application circuits and their parameters are for reference only and are not intended for use in actual design-ins.

<R> APPLICATION INFORMATION

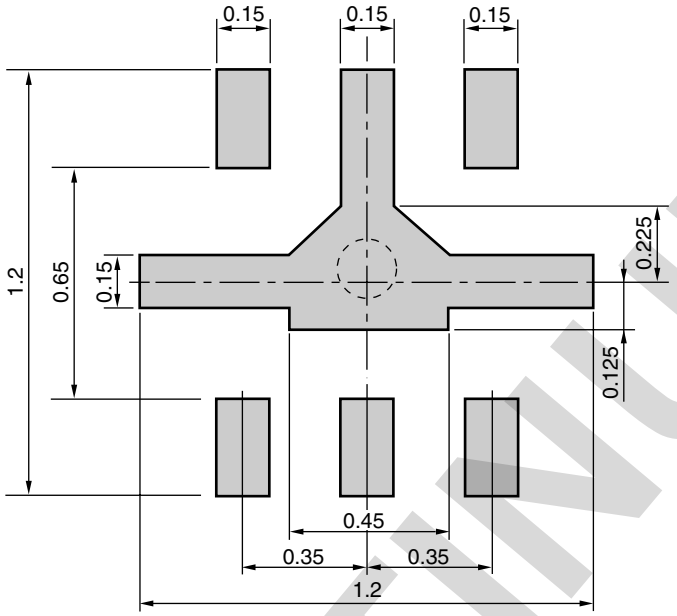


- C1 are DC blocking capacitors external to the device.
  The value may be tailored to provide specific electrical responses.
- The RF ground connections should be kept as short as possible and connected to directly to a good RF ground for best performance.
- L_{ESD} provides a means to increase the ESD protection on a specific RF port, typically the port attached to the antenna.

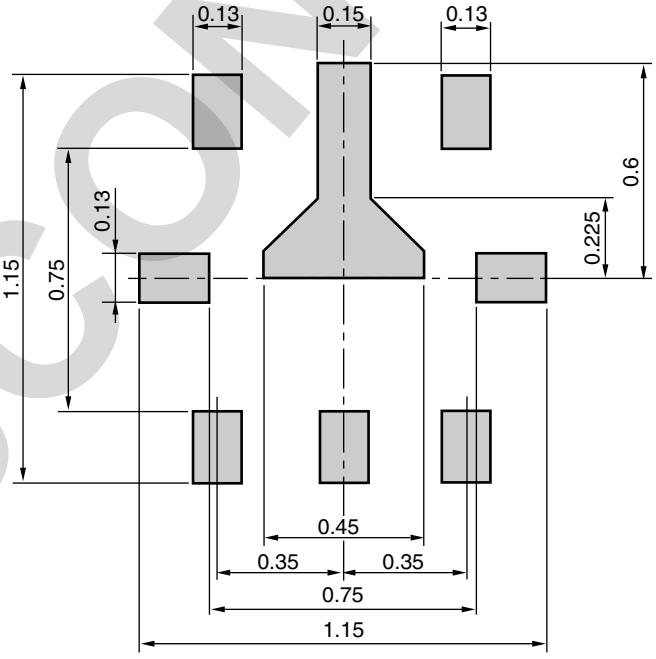
MOUNTING PAD AND SOLDER MASK LAYOUT DIMENSIONS

6-PIN PLASTIC TSSON (T6R) (UNIT: mm)

MOUNTING PAD



SOLDER MASK



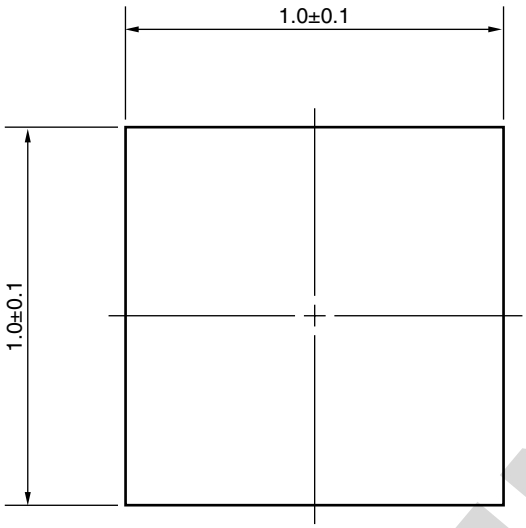
Solder thickness : 0.08 mm

Remark The mounting pad and solder mask layouts in this document are for reference only.

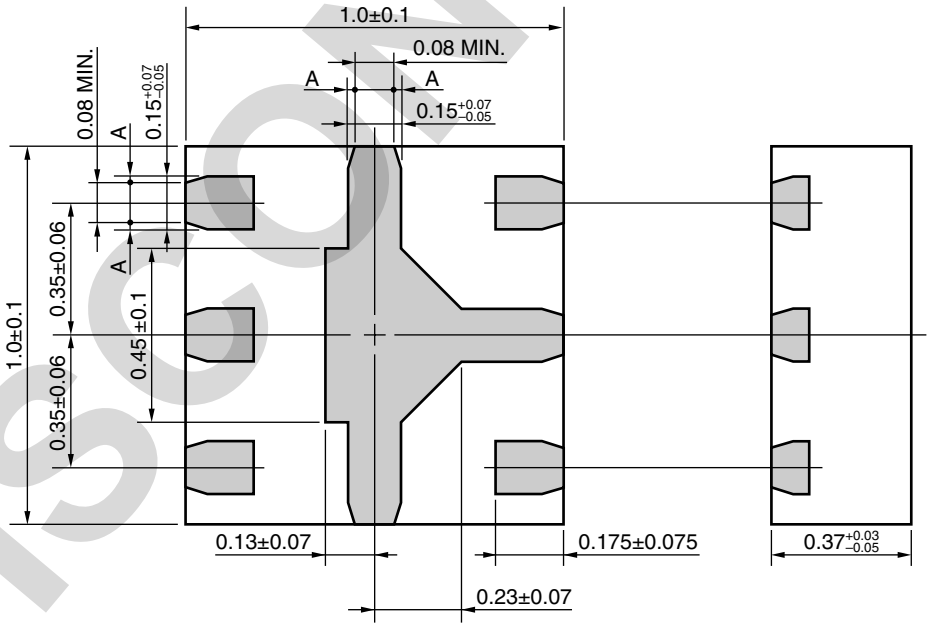
PACKAGE DIMENSIONS

6-PIN PLASTIC TSSON (T6R) (UNIT: mm)

(Top View)



(Bottom View)



Remark A > 0

RECOMMENDED SOLDERING CONDITIONS

This product should be soldered and mounted under the following recommended conditions. For soldering methods and conditions other than those recommended below, contact your nearby sales office.

Soldering Method	Soldering Conditions		Condition Symbol
Infrared Reflow	Peak temperature (package surface temperature) Time at peak temperature Time at temperature of 220°C or higher Preheating time at 120 to 180°C Maximum number of reflow processes Maximum chlorine content of rosin flux (% mass)	: 260°C or below : 10 seconds or less : 60 seconds or less : 120±30 seconds : 3 times : 0.2% (Wt.) or below	IR260
<R> Partial Heating	Peak temperature (terminal temperature) Soldering time (per side of device) Maximum chlorine content of rosin flux (% mass)	: 350°C or below : 3 seconds or less : 0.2% (Wt.) or below	HS350

CAUTION

Do not use different soldering methods together (except for partial heating).

Caution GaAs Products	This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points. • Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below. 1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials. 2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal. • Do not burn, destroy, cut, crush, or chemically dissolve the product. • Do not lick the product or in any way allow it to enter the mouth.

Revision History	μPG2185T6R Data Sheet

Rev.	Date	Description	
		Page	Summary
1.00	May 30, 2008	–	First Edition Issued
2.00	Aug 22, 2008	–	Second Edition Issued
3.00	Nov 22, 2012	All	The format of Renesas Electronics Corporation is applied to this data sheet.
		p.1	The value of Switch control voltage ($V_{cont (H)}$) is changed to “1.8 to 3.6 V”.
		p.2	The minimum and maximum values of Switch control voltage ($V_{cont (H)}$) are changed to 1.8 V and 3.6V, respectively.
		p.4	ELECTRICAL CHARACTERISTICS 2 is added.
		p.5	APPLICATION INFORMATION is added.
		p.8	The “Wave Soldering” is deleted from RECOMMENDED SOLDERING CONDITIONS.