



GaAs INTEGRATED CIRCUIT

μ PG2185T6R

SPDT SWITCH FOR 2 GHz TO 6 GHz

<R> DESCRIPTION

The μ PG2185T6R is a GaAs MMIC SPDT (Single Pole Double Throw) switch which was designed for 2 GHz to 6 GHz applications, including dual-band wireless LAN. This device can operate from frequency 2 GHz to 6 GHz, with the low insertion loss and high isolation.

This device is housed in a 6-pin plastic TSSON (Thin Shrink Small Out-line Non-leaded) package, and is suitable for high-density surface mounting.

<R> FEATURES

- Operating frequency : $f = 2.0$ to 6.0 GHz
- Switch control voltage : $V_{\text{cont (H)}} = 2.8$ to 3.3 V (3.0 V TYP.)
: $V_{\text{cont (L)}} = -0.2$ to 0.2 V (0 V TYP.)
- Low insertion loss : $L_{\text{ins1}} = 0.40$ dB TYP. @ $f = 2.0$ to 2.5 GHz, $V_{\text{cont (H)}} = 3.0$ V, $V_{\text{cont (L)}} = 0$ V
: $L_{\text{ins2}} = 0.50$ dB TYP. @ $f = 2.5$ to 6.0 GHz, $V_{\text{cont (H)}} = 3.0$ V, $V_{\text{cont (L)}} = 0$ V
- High isolation : $ISL1 = 26$ dB TYP. @ $f = 2.0$ to 2.5 GHz, $V_{\text{cont (H)}} = 3.0$ V, $V_{\text{cont (L)}} = 0$ V
: $ISL2 = 25$ dB TYP. @ $f = 2.5$ to 6.0 GHz, $V_{\text{cont (H)}} = 3.0$ V, $V_{\text{cont (L)}} = 0$ V
- Power Handling : $P_{\text{in (1 dB)}} = +30.5$ dBm TYP. @ $f = 2.5$ GHz, $V_{\text{cont (H)}} = 3.0$ V, $V_{\text{cont (L)}} = 0$ V
: $P_{\text{in (1 dB)}} = +30.5$ dBm TYP. @ $f = 6.0$ GHz, $V_{\text{cont (H)}} = 3.0$ V, $V_{\text{cont (L)}} = 0$ V
- High-density surface mounting : 6-pin plastic TSSON package ($1.0 \times 1.0 \times 0.37$ mm)

APPLICATIONS

- Wireless LAN (IEEE802.11a/b/g/n)
- <R> • UWB

ORDERING INFORMATION

Part Number	Order Number	Package	Marking	Supplying Form
μ PG2185T6R-E2	μ PG2185T6R-E2-A	6-pin plastic TSSON (Pb-Free)	G8	<ul style="list-style-type: none">• Embossed tape 8 mm wide• Pin 1, 6 face the perforation side of the tape• Qty 5 kpcs/reel

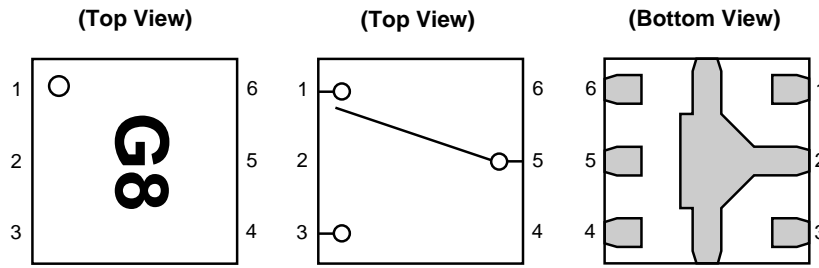
Remark To order evaluation samples, contact your nearby sales office.

Part number for sample order: μ PG2185T6R-A

Caution Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions must be employed at all times.

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.

PIN CONNECTIONS AND INTERNAL BLOCK DIAGRAM



Pin No.	Pin Name
1	OUTPUT1
2	GND
3	OUTPUT2
4	V _{cont2}
5	INPUT
6	V _{cont1}

Remark Exposed pad : GND

TRUTH TABLE

V _{cont1}	V _{cont2}	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 $|V_{cont1} - V_{cont2}| \leq 6.0 \text{ V}$

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

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Switch Control Voltage (H)	V _{cont (H)}	2.8	3.0	3.3	V
Switch Control Voltage (L)	V _{cont (L)}	-0.2	0	+0.2	V
Operating Frequency	f	2.0	-	6.0	GHz

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ELECTRICAL CHARACTERISTICS

($T_A = +25^\circ\text{C}$, $V_{\text{cont}}(\text{H}) = 3.0\text{ V}$, $V_{\text{cont}}(\text{L}) = 0\text{ V}$, $Z_0 = 50\ \Omega$, DC blocking capacitors = 6 pF, unless otherwise specified)

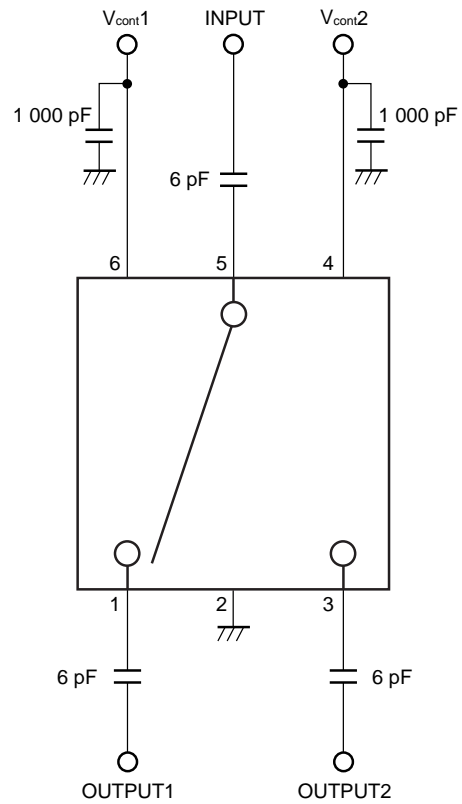
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss 1	L_{ins1}	f = 2.0 to 2.5 GHz	–	0.40	0.60	dB
Insertion Loss 2	L_{ins2}	f = 2.5 to 6.0 GHz	–	0.50	0.80	dB
Isolation 1 (INPUT–OFF Port)	ISL1	f = 2.0 to 2.5 GHz	23	26	–	dB
Isolation 2 (INPUT–OFF Port)	ISL2	f = 2.5 to 6.0 GHz	22	25	–	dB
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_{in1}	f = 2.0 to 2.5 GHz	15	20	–	dB
Input Return Loss 2	RL_{in2}	f = 4.9 to 6.0 GHz	15	20	–	dB
Input Return Loss 3	RL_{in3}	f = 2.5 to 4.9 GHz	12	17	–	dB
Output Return Loss 1	RL_{out1}	f = 2.0 to 2.5 GHz	15	20	–	dB
Output Return Loss 2	RL_{out2}	f = 4.9 to 6.0 GHz	15	20	–	dB
Output Return Loss 3	RL_{out3}	f = 2.5 to 4.9 GHz	12	17	–	dB
0.1 dB Loss Compression Input Power <small>Note</small>	$P_{\text{in}}(0.1\text{ dB})$	f = 2.5 GHz	+26	+29	–	dBm
		f = 6.0 GHz	+26	+29	–	dBm
1 dB Loss Compression Input Power <small>Note</small>	$P_{\text{in}}(1\text{ dB})$	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}	RF None	–	0.1	1.0	μA
Switch Control Speed	t_{sw}	50% CTL to 90/10%	–	20	100	ns

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

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

Caution It is necessary to use DC blocking capacitors with this device.

EVALUATION CIRCUIT

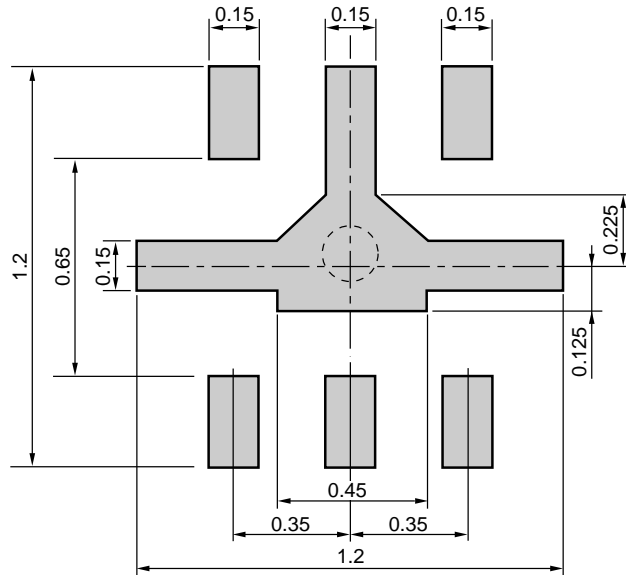


The application circuits and their parameters are for reference only and are not intended for use in actual design-ins.

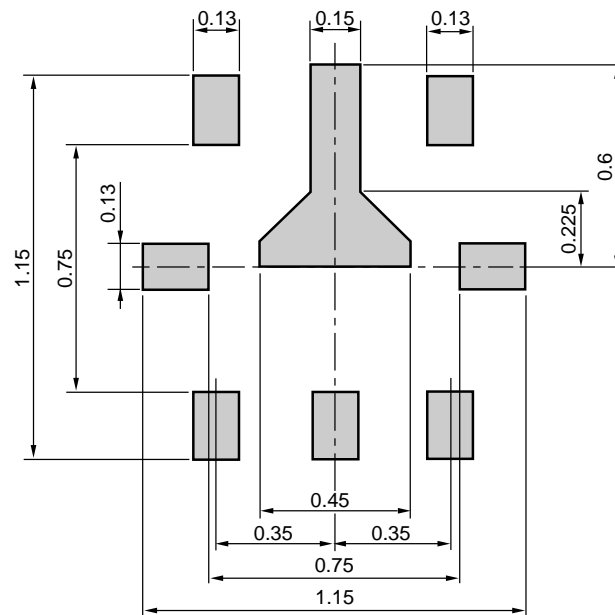
MOUNTING PAD AND SOLDER MASK LAYOUT DIMENSIONS

6-PIN PLASTIC TSSOP (UNIT: mm)

MOUNTING PAD



SOLDER MASK



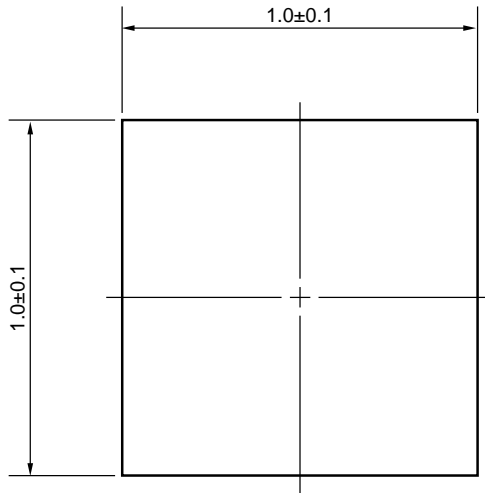
Solder thickness : 0.08 mm

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

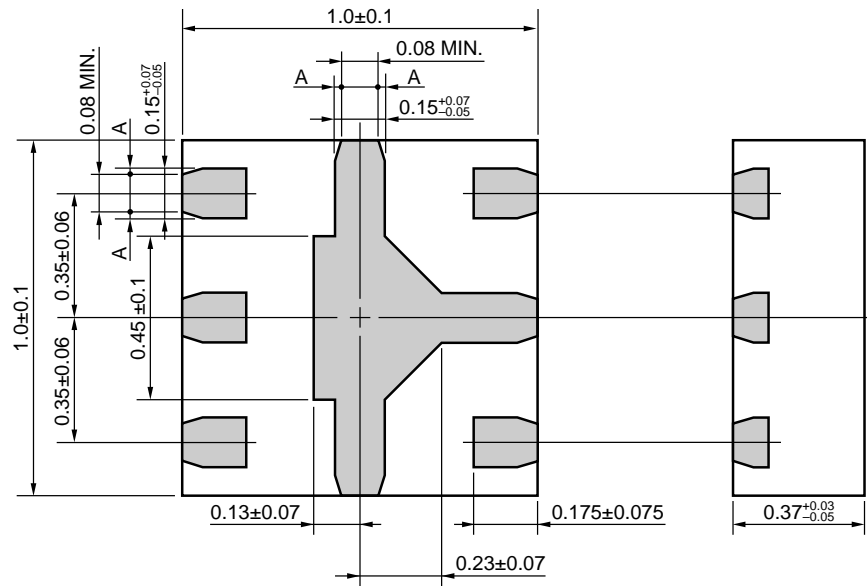
PACKAGE DIMENSIONS

6-PIN PLASTIC TSSOP (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) : 260°C or below Time at peak temperature : 10 seconds or less Time at temperature of 220°C or higher : 60 seconds or less Preheating time at 120 to 180°C : 120±30 seconds Maximum number of reflow processes : 3 times Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	IR260
Wave Soldering	Peak temperature (molten solder temperature) : 260°C or below Time at peak temperature : 10 seconds or less Preheating temperature (package surface temperature) : 120°C or below Maximum number of flow processes : 1 time Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	WS260
Partial Heating	Peak temperature (terminal temperature) : 350°C or below Soldering time (per side of device) : 3 seconds or less Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	HS350

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

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M8E 02.11-1

Caution	GaAs Products	<p>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.</p> <ul style="list-style-type: none">• 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.<ol style="list-style-type: none">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.
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