NEC

GaAs INTEGRATED CIRCUIT

μPG2035T5F

GaAs MMIC DPDT SWITCH FOR 2.4 GHz AND 5 GHz DUALBAND WIRELESS LAN

DESCRIPTION

The μPG2035T5F is a GaAs MMIC DPDT switch for 2.4 GHz and 5 GHz dualband wireless LAN. High isolation and dualband operations suit to dualband wireless LAN system.

FEATURES

- Operating frequency : f = 2.4 to 2.5 GHz and 4.9 to 6.0 GHz
- Low insertion loss : $L_{INS}1$ = 0.8 dB TYP. @ f = 2.4 to 2.5 GHz
  : $L_{INS}2$ = 1.2 dB TYP. @ f = 4.9 to 6.0 GHz
- Handling power : $P_{in\ (1\ dB)}$ = +31 dBm TYP. @ f = 2.4 to 2.5 GHz
  : +30 dBm TYP. @ f = 4.9 to 6.0 GHz
- Control voltage : V_{cont} = +3.0 V/0 V (Two control type)
- High isolation : ISL1 (between INPUT and OUTPUT) = 34 dB TYP. @ f = 2.4 to 2.5 GHz
  : ISL2 (between INPUT and OUTPUT) = 33 dB TYP. @ f = 4.9 to 6.0 GHz
  : ISL3 (between TX and RX, between ANT1 and ANT2) = 24 dB TYP. @ f = 2.4 to 2.5 GHz
  : ISL4 (between TX and RX, between ANT1 and ANT2) = 22 dB TYP. @ f = 4.9 to 6.0 GHz
- Input/output return loss : RL_{in}/RL_{out} = 15 dB TYP.
- Switching speed : 50 ns @ t_{RISE}/t_{FALL} (10/90% RF)
- 12-pin plastic QFN package (3.0 × 3.0 × 0.75 mm)

APPLICATION

- 2.4 GHz and 5 GHz dualband wireless LAN : IEEE802.11a+b/g

ORDERING INFORMATION

Part Number	Package	Marking	Supplying Form
μPG2035T5F-E2	12-pin plastic QFN	2035	• Embossed tape 8 mm wide • Pin 1 indicates roll-in direction of tape • Qty 3 kpcs/reel

Remark To order evaluation samples, contact your nearby sales office.
Part number for sample order: μPG2035T5F

Caution Observe precautions when handling because these devices are sensitive to electrostatic discharge.

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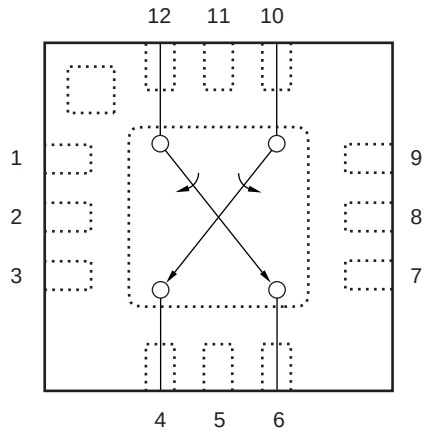
PIN CONNECTIONS AND INTERNAL BLOCK DIAGRAM

(Top View)



Pin No.	Pin Name	Description
1	NC	Ground
2	NC	Ground
3	V_{cont1}	Control 1
4	ANT1	Antenna Port 1
5	NC	Ground
6	ANT2	Antenna Port 2
7	V_{cont2}	Control 2
8	NC	Ground
9	NC	Ground
10	RX	Receive Port
11	NC	Ground
12	TX	Transmit Port
EXPOSED PAD	GND	Ground

Remark NC is functionally non-connection pin but actually grounding is recommended.

TRUTH TABLE

V_{cont1}	V_{cont2}	ANT1-RX	ANT1-TX	ANT2-TX	ANT2-RX
2.7 to 5.0 V	0 ± 0.2 V	ON	OFF	ON	OFF
0 ± 0.2 V	2.7 to 5.0 V	OFF	ON	OFF	ON

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

Parameter	Symbol	Ratings	Unit
Switch Control Voltage	V_{cont}	–6.0 to +6.0 Note 1	V
Input Power	P_{in}	+36	dBm
Total Power Dissipation	P_{tot}	0.15 Note 2	W
Operating Ambient Temperature	T_A	–45 to +85	°C
Storage Temperature	T_{stg}	–55 to +150	°C

Notes 1. $|V_{cont1} - V_{cont2}| \leq 6.0$ V

2. Mounted on double-sided copper-clad 50 × 50 × 1.6 mm epoxy glass PWB, T_A = +85°C

RECOMMENDED OPERATING RANGE (T_A = +25°C)

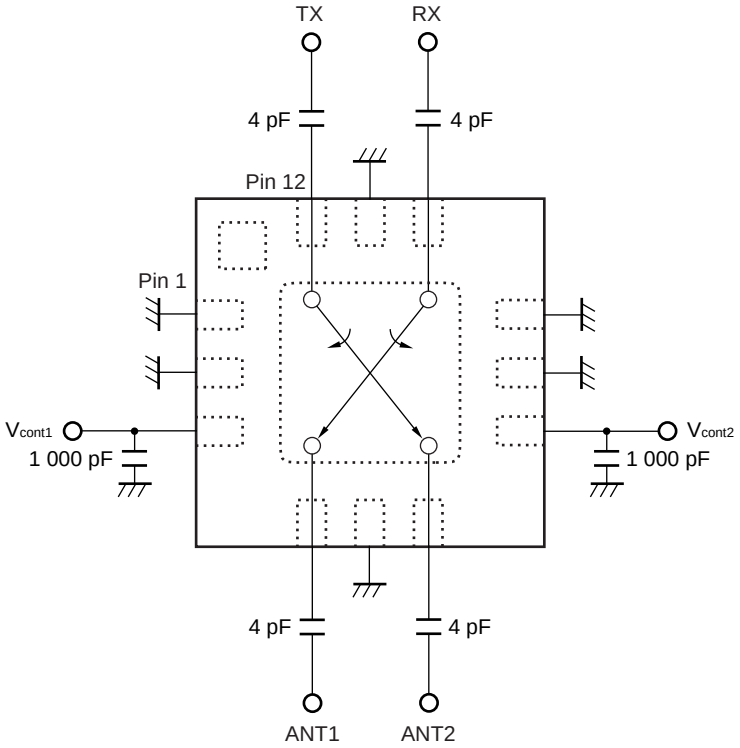
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating Frequency 1	f1	2.4	–	2.5	GHz
Operating Frequency 2	f2	4.9	–	6.0	GHz
Switch Control Voltage (H)	$V_{cont\ (H)}$	2.7	3.0	5.0	V
Switch Control Voltage (L)	$V_{cont\ (L)}$	–0.2	0	0.2	V

ELECTRICAL CHARACTERISTICS (T_A = +25°C, V_{cont} = 3.0 V/0 V, Z_O = 50 Ω, DC blocking capacitors value: 4 pF, Each port, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss 1	$L_{INS}1$	f = 2.4 to 2.5 GHz	–	0.8	1.0	dB
Insertion Loss 2	$L_{INS}2$	f = 4.9 to 6.0 GHz	–	1.2	1.4	dB
Isolation 1 (between INPUT and OUTPUT)	ISL1	f = 2.4 to 2.5 GHz	25	34	–	dB
Isolation 2 (between INPUT and OUTPUT)	ISL2	f = 4.9 to 6.0 GHz	25	33	–	dB
Isolation 3 (between TX and RX, between ANT1 and ANT2)	ISL3	f = 2.4 to 2.5 GHz	17	24	–	dB
Isolation 4 (between TX and RX, between ANT1 and ANT2)	ISL4	f = 4.9 to 6.0 GHz	17	22	–	dB
Input and Output Return Loss 1	RL1	f = 2.4 to 2.5 GHz	–	15	–	dB
Input and Output Return Loss 2	RL2	f = 4.9 to 6.0 GHz	–	15	–	dB
Switch Control Current 1	$I_{cont}1$	f = 2.4 to 2.5 GHz	–	0.7	1.5	μA
Switch Control Current 2	$I_{cont}2$	f = 4.9 to 6.0 GHz	–	0.7	1.5	μA
1 dB Gain Compression Input Power	$P_{in\ (1\ dB)}$	f = 2.4 to 2.5 GHz	–	31	–	dBm
		f = 4.9 to 6.0 GHz	–	30	–	
3rd Order Distortion Input Intercept Point 1	IIP_3 1	f = 2.4 to 2.5 GHz	–	45	–	dBm
3rd Order Distortion Input Intercept Point 2	IIP_3 2	f = 4.9 to 6.0 GHz	–	45	–	dBm
Switch Control Speed 1	t_{SW} 1	f = 2.4 to 2.5 GHz, t_{RISE}/t_{FALL} (10/90% RF)	–	50	–	ns
Switch Control Speed 2	t_{SW} 2	f = 4.9 to 6.0 GHz, t_{RISE}/t_{FALL} (10/90% RF)	–	50	–	ns

EVALUATION CIRCUIT

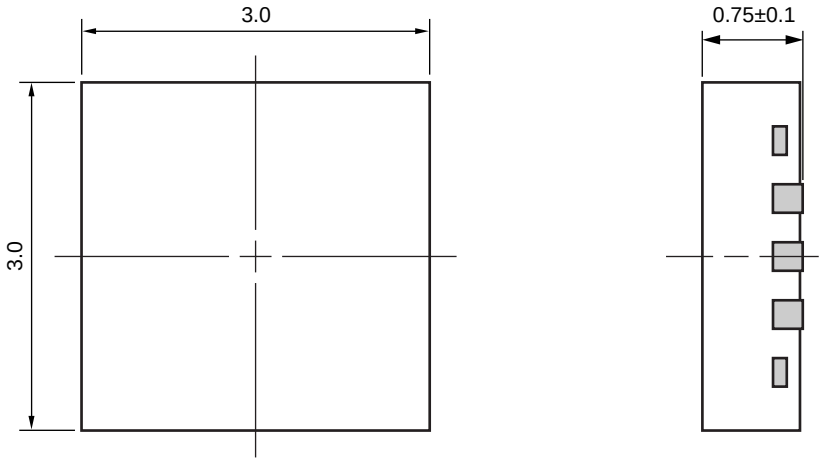
(Top View)



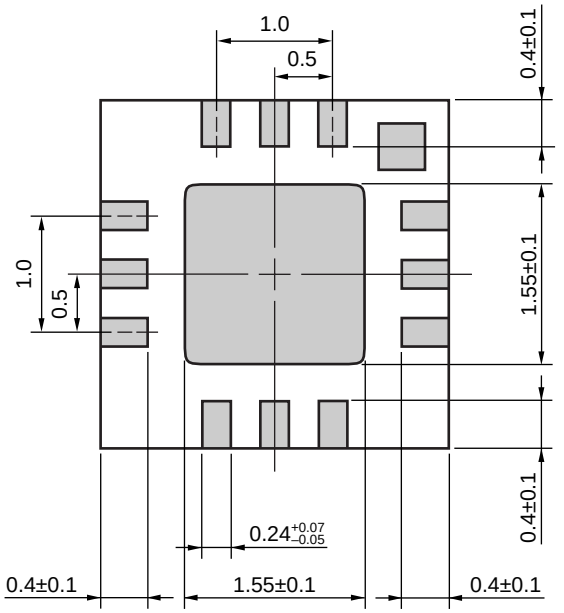
The application circuits and their parameters are for reference only and are not intended for use in actual design-ins.

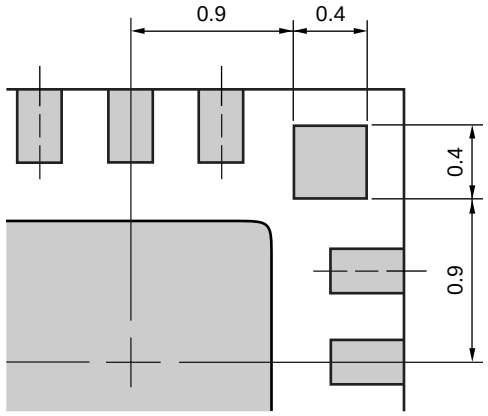
PACKAGE DIMENSIONS

12-PIN PLASTIC QFN (UNIT: mm)



(Bottom View)





Dimensions of pin No.1 indication

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
VPS	Peak temperature (package surface temperature) Time at temperature of 200°C or higher Preheating time at 120 to 150°C Maximum number of reflow processes Maximum chlorine content of rosin flux (% mass)	: 215°C or below : 25 to 40 seconds : 30 to 60 seconds : 3 times : 0.2%(Wt.) or below	VP215
Wave Soldering	Peak temperature (molten solder temperature) Time at peak temperature Preheating temperature (package surface temperature) Maximum number of flow processes Maximum chlorine content of rosin flux (% mass)	: 260°C or below : 10 seconds or less : 120°C or below : 1 time : 0.2%(Wt.) or below	WS260
Partial Heating	Peak temperature (pin 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).

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M8E 00.4-0110

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▶**For further information, please contact**

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