

DATA SHEET

NEC

GaAs INTEGRATED CIRCUIT μ PG2024TQ

GaAs MMIC DPDT SWITCHES FOR 5 GHz BAND WIRELESS LAN

DESCRIPTION

The μ PG2024TQ is a GaAs MMIC DPDT switch for 5 GHz band wireless LAN. Low insertion loss and high handling power contribute to user's system design.

FEATURES

- Operating frequency : $f = 4.8$ to 5.85 GHz
- Low insertion loss : $L_{INS} = 1.2$ dB TYP. @ $f = 4.8$ to 5.85 GHz
- Handling power : $P_{in(0.1\text{ dB})} = +32$ dBm TYP. @ $f = 4.8$ to 5.85 GHz
- Control voltage : $V_{cont} = +2.8$ V/0 V TYP.
- High isolation : ISL (between TX and RX) = 30 dB TYP. @ $f = 5.2$ GHz
ISL (between ANT1/2 and RX/TX) = 25 dB TYP. @ $f = 5.2$ GHz
- Input/output return loss : $RL_{in}/RL_{out} = 20$ dB TYP. @ $f = 4.8$ to 5.85 GHz
- Switching speed : $t_{SW} = 20$ ns TYP. @ t_{RISE}/t_{FALL} (10/90% RF)
- High-density surface mounting : 10-pin plastic TSON package ($2.30 \times 2.55 \times 0.60$ mm)

APPLICATION

- 5 GHz band wireless LAN (IEEE802.11a)

ORDERING INFORMATION

Part Number	Package	Marking	Supplying Form
μ PG2024TQ-E1	10-pin plastic TSON	2024	<ul style="list-style-type: none">Embossed tape 8 mm widePin 5, 6 face the perforation side of the tapeQty 3 kpcs/reel

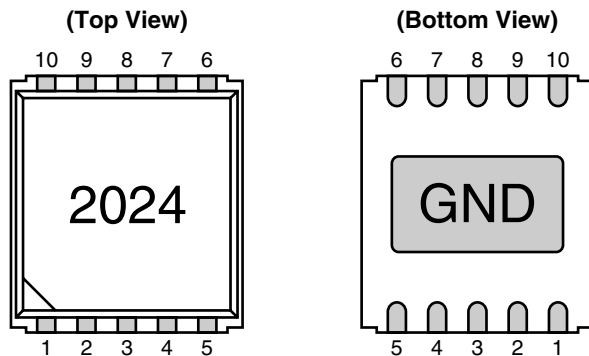
Remark To order evaluation samples, contact your nearby sales office.

Part number for sample order: μ PG2024TQ

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

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.
Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

PIN CONNECTIONS



Pin No.	Pin Name
1	TX
2	V _{cont1}
3	V _{cont2}
4	GND
5	RX
6	ANT1
7	V _{cont3}
8	V _{cont4}
9	GND
10	ANT2

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

Parameter	Symbol	Ratings	Unit
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}	-65 to +150	°C

Notes 1. Within the condition of $|V_{cont1} - V_{cont2}| \leq 6.0$ 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
Control Voltage (High)	V _{cont (H)}	2.7	2.8	3.3	V
Control Voltage (Low)	V _{cont (L)}	-0.2	0	+0.2	V
Operating Frequency	f	4.8	5.5	5.85	GHz
Operating Ambient Temperature	T _A	-40	+25	+85	°C

ELECTRICAL CHARACTERISTICS

($T_A = +25^{\circ}\text{C}$, $V_{\text{cont}} = 2.8 \text{ V/0 V}$, $Z_0 = 50 \Omega$, DC block capacitor = 2 pF : Each port, on the below TRUTH TABLE, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss	L _{INS}	f = 4.9 GHz	–	1.2	1.5	dB
		f = 5.2 GHz	–	1.2	1.5	
		f = 5.8 GHz	–	1.5	1.7	
Isolation (Between TX and RX)	ISL	f = 4.9 GHz	20	25	–	dB
		f = 5.2 GHz	25	30	–	
		f = 5.8 GHz	20	25	–	
Input Return Loss	RL _{in}	f = 4.9 GHz	10	20	–	dB
		f = 5.2 GHz	10	20	–	
		f = 5.8 GHz	7	20	–	
Output Return Loss	RL _{out}	f = 4.9 GHz	10	20	–	dB
		f = 5.2 GHz	10	20	–	
		f = 5.8 GHz	7	20	–	
0.1 dB Gain Compression Input Power	P _{in (0.1 dB)}	f = 4.9 GHz	30	33	–	dBm
		f = 5.2 GHz	30	32	–	
		f = 5.8 GHz	30	32	–	
Switching Speed	t _{sw}	t _{RISE} /t _{FALL} (10/90% RF)	–	20	–	ns
Control Current	I _{cont}		–	5	–	μA
Input 3rd Order Intercept Point	IIP ₃		–	50	–	dBm

STANDARD CHARACTERISTICS FOR REFERENCE

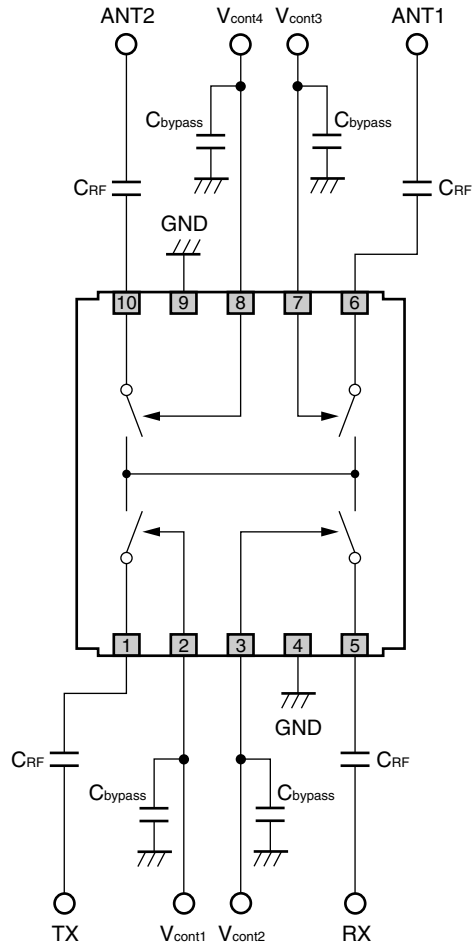
($T_A = +25^{\circ}\text{C}$, $V_{\text{cont}} = 2.8 \text{ V/0 V}$, $Z_0 = 50 \Omega$, DC block capacitor = 2 pF : Each port, on the below TRUTH TABLE, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Isolation (Between ANT1/2 and RX/TX)	ISL	f = 4.9 GHz	–	22	–	dB
		f = 5.2 GHz	–	25	–	
		f = 5.8 GHz	–	21	–	

TRUTH TABLE

V _{cont1}	V _{cont2}	V _{cont3}	V _{cont4}	PASS
Low	High	High	Low	ANT1-RX
High	Low	Low	High	ANT2-TX
High	Low	High	Low	ANT1-TX
Low	High	Low	High	ANT2-RX

TEST CIRCUIT

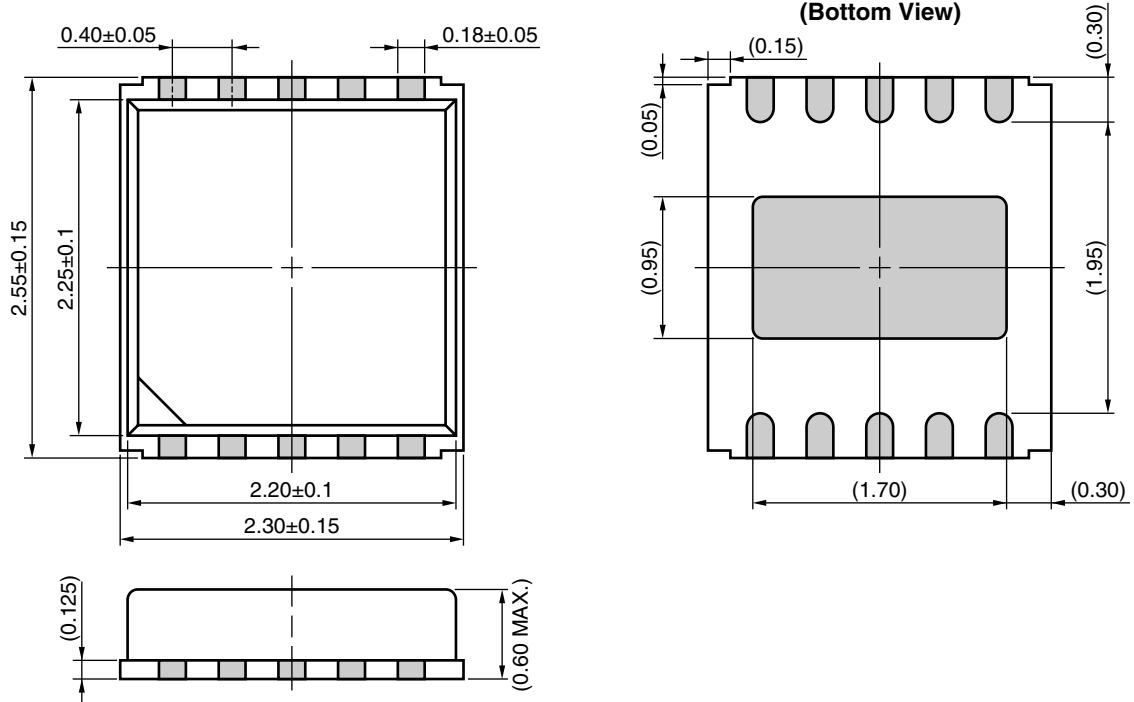


Remark C_{RF} : 2 pF
 C_{bypass} : 1 000 pF

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

PACKAGE DIMENSIONS

10-PIN PLASTIC TSON (UNIT: mm)



Remark () : Reference value

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
VPS	Peak temperature (package surface temperature) : 215°C or below Time at temperature of 200°C or higher : 25 to 40 seconds Preheating time at 120 to 150°C : 30 to 60 seconds Maximum number of reflow processes : 3 times Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	VP215
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 (pin 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 00.4-0110

<p>Caution</p>	<p>GaAs Products</p>	<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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