

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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L-BAND SP3T SWITCH

DESCRIPTION

The μ PG2045TQ is an L-band SP3T GaAs FET switch which was developed for CDMA/PCS/GPS triple mode digital cellular telephone application. The device can operate from 500 MHz to 2.0 GHz, having the low insertion loss and high linearity by 2.4 V low control voltage.

FEATURES

- Low insertion loss : L_{INS} = 0.28 dB TYP. @ ANT-RF2, V_{cont} = +2.4 V/0 V, f = 1.0 GHz
: L_{INS} = 0.38 dB TYP. @ ANT-RF2, V_{cont} = +2.4 V/0 V, f = 2.0 GHz
- High power : P_{in} (0.1 dB) = 32.0 dBm TYP. @ V_{cont} = +2.4 V/0 V, f = 1.0 GHz
- High-density surface mounting : 10-pin plastic TSON package (2.30 × 2.55 × 0.60 mm)

APPLICATION

- CDMA/PCS/GPS triple mode digital cellular telephone etc.

ORDERING INFORMATION

Part Number	Package	Marking	Supplying Form
μ PG2045TQ-E1	10-pin plastic TSON	2045	- Embossed tape 8 mm wide - Pin 5, 6 face the perforation side of the tape - Qty 3 kpcs/reel

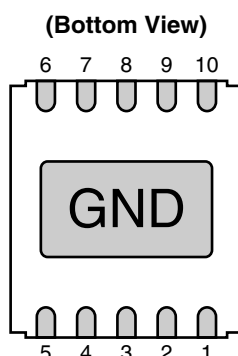
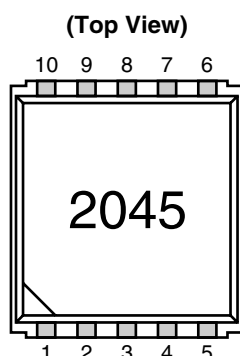
Remark To order evaluation samples, contact your nearby sales office.

Part number for sample order: μ PG2045TQ

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

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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

PIN CONNECTIONS AND INTERNAL BLOCK DIAGRAM



Pin No.	Pin Name
1	RF1
2	GND
3	RF2
4	V _{cont2}
5	RF3
6	V _{cont3}
7	GND
8	ANT
9	GND
10	V _{cont1}

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

Parameter	Symbol	Ratings	Unit
Switch Control Voltage	V _{cont}	−6.0 to +6.0	V
Input Power	P _{in}	+36	dBm
Operating Ambient Temperature	T _A	−45 to +85	°C
Storage Temperature	T _{stg}	−55 to +150	°C

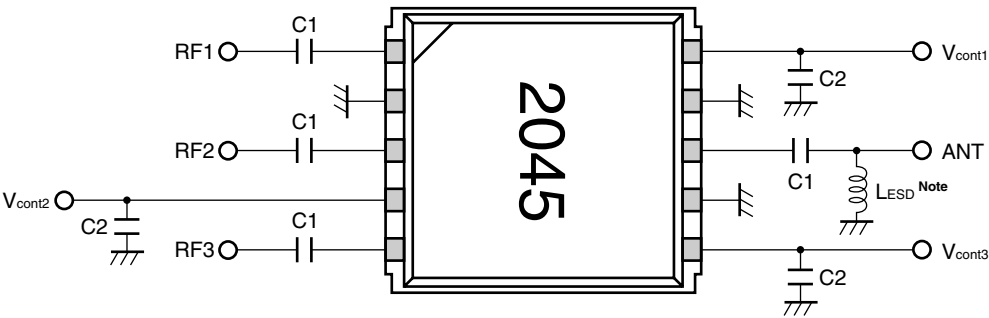
RECOMMENDED OPERATING RANGE (T_A = +25°C)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Switch Control Voltage (High)	V _{cont} (H)	+2.4	+2.6	+5.0	V
Switch Control Voltage (Low)	V _{cont} (L)	−0.2	0	+0.2	V

ELECTRICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, $V_{\text{cont}} = 2.4 \text{ V/0 V}$, $Z_0 = 50 \Omega$, off chip DC blocking capacitors value: 56 pF, unless otherwise specified)

Parameter	Symbol	Pass	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss	L_{INS}	ANT-RF2	$f = 0.5 \text{ to } 1.0 \text{ GHz}$	–	0.28	0.45	dB
			$f = 1.0 \text{ to } 2.0 \text{ GHz}$	–	0.38	0.55	dB
		ANT-RF1 ANT-RF3	$f = 0.5 \text{ to } 1.0 \text{ GHz}$	–	0.50	0.65	dB
			$f = 1.0 \text{ to } 2.0 \text{ GHz}$	–	0.65	0.80	dB
Isolation	ISL	ANT-RF1 ANT-RF3	$f = 0.5 \text{ to } 1.0 \text{ GHz}$	24	27	–	dB
			$f = 1.0 \text{ to } 2.0 \text{ GHz}$	18	21	–	dB
		ANT-RF2	$f = 0.5 \text{ to } 1.0 \text{ GHz}$	18	21	–	dB
			$f = 1.0 \text{ to } 2.0 \text{ GHz}$	13	15	–	dB
Input Return Loss	RL_{in}	ANT-RF1/2/3	$f = 0.5 \text{ to } 2.0 \text{ GHz}$	15	20	–	dB
Output Return Loss	RL_{out}	ANT-RF1/2/3	$f = 0.5 \text{ to } 2.0 \text{ GHz}$	15	20	–	dB
0.1 dB Gain Compression Input Power	$P_{\text{in}} (0.1 \text{ dB})$	ANT-RF1/2/3	$f = 1.0 \text{ GHz}$	30.0	32.0	–	dBm
2nd Harmonics	$2f_0$	ANT-RF1/2/3	$f = 1.0 \text{ GHz}$, $P_{\text{in}} = +27 \text{ dBm}$	–	75	–	dBc
3rd Harmonics	$3f_0$	ANT-RF1/2/3	$f = 1.0 \text{ GHz}$, $P_{\text{in}} = +27 \text{ dBm}$	–	75	–	dBc
Input 3rd Order Intercept Point	IIP_3	ANT-RF2	$f = 882 \text{ MHz/883 MHz}$	–	66	–	dBm
		ANT-RF1 ANT-RF3	@ 1 MHz spacing, $P_{\text{in}} = +24 \text{ dBm}$ each @ 2 Tone	–	64	–	dBm
		ANT-RF2	$f = 1960 \text{ MHz/1961 MHz}$	–	60	–	dBm
		ANT-RF1 ANT-RF3	@ 1 MHz spacing, $P_{\text{in}} = +16 \text{ dBm}$ each @ 2 Tone	–	58	–	dBm
Switch Control Speed	t_{sw}			–	150	–	ns
Switch Control Current	I_{cont}		RF Non	–	1	20	μA

EVALUATION CIRCUIT



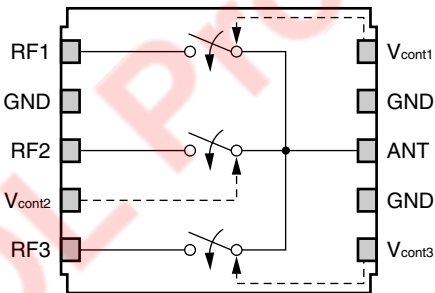
Note Recommend attached L_{ESD} to antenna port for ESD protection.

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

USING THE NEC EVALUATION BOARD

Symbol	Values
C1	56 pF
C2	1 000 pF

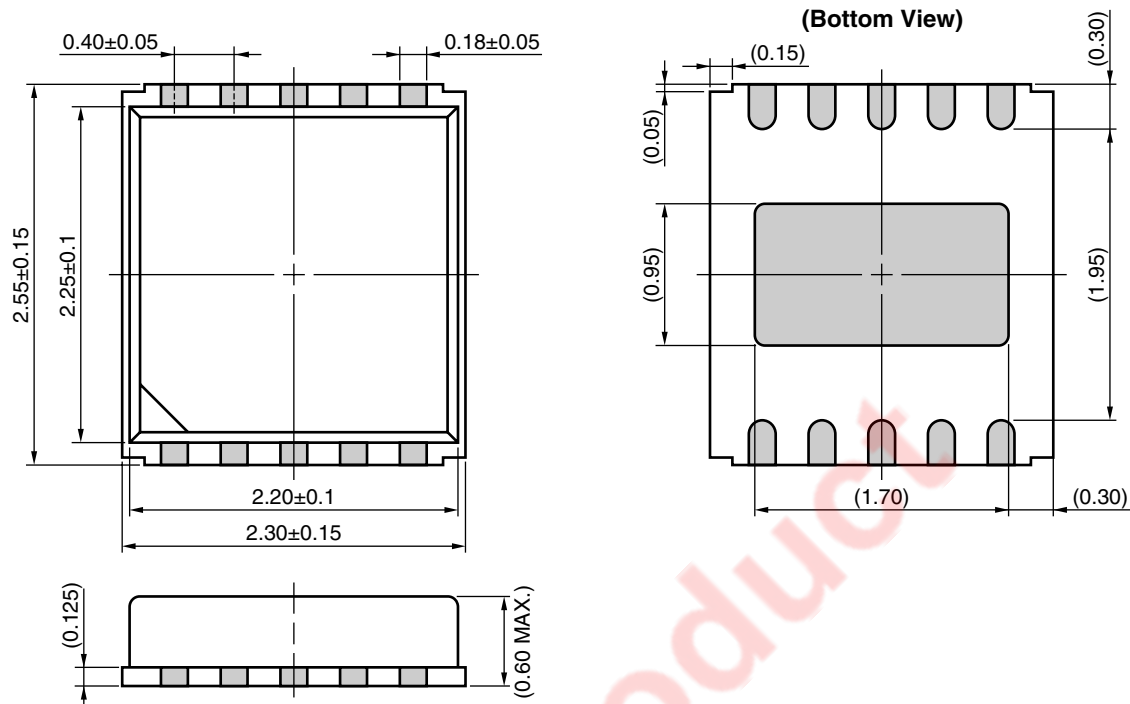
TRUTH TABLE



V _{cont1}	V _{cont2}	V _{cont3}	ANT-RF1	ANT-RF2	ANT-RF3
High	Low	Low	ON	OFF	OFF
Low	High	Low	OFF	ON	OFF
Low	Low	High	OFF	OFF	ON

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

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EOL Product

► For further information, please contact

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