



PRELIMINARY DATA SHEET

GaAs INTEGRATED CIRCUIT

uPG2157T5F

GaAs MMIC DPST SW FOR WiMAX

DESCRIPTION

The uPG2157T5F is a GaAs MMIC DPST SW which was developed for WiMAX. This device can operate frequency from 2.3GHz to 5.85GHz, having the low insertion loss and high isolation.

This device is housed in a 12-pin QFN(Quad Flat Non-leaded) package. And this package is able to high-density surface mounting.

FEATURES

- Control Voltage : $V_{cont(H)} = 2.5$ to $3.3V$ (3.0V TYP.)
: $V_{cont(L)} = 0$ to $0.4V$ (0V TYP.)
- Low Insertion Loss : $L_{ins1} = 0.60dB$ TYP. @ $f = 2.3$ to $2.7GHz$, $V_{cont(H)} = 3.0V$, $V_{cont(L)} = 0V$
: $L_{ins2} = 0.60dB$ TYP. @ $f = 3.3$ to $3.8GHz$, $V_{cont(H)} = 3.0V$, $V_{cont(L)} = 0V$
: $L_{ins3} = 0.80dB$ TYP. @ $f = 5.15$ to $5.85GHz$, $V_{cont(H)} = 3.0V$, $V_{cont(L)} = 0V$
- High Isolation : $ISL1 = 28dB$ TYP. @ $f = 2.3$ to $2.7GHz$, $V_{cont(H)} = 3.0V$, $V_{cont(L)} = 0V$
: $ISL2 = 25dB$ TYP. @ $f = 3.3$ to $3.8GHz$, $V_{cont(H)} = 3.0V$, $V_{cont(L)} = 0V$
: $ISL3 = 22dB$ TYP. @ $f = 5.15$ to $5.85GHz$, $V_{cont(H)} = 3.0V$, $V_{cont(L)} = 0V$
- Handling Power : $P_{in(1dB)} = >+37.0dBm$ TYP. @ $f = 2.5GHz$, $V_{cont(H)} = 3.0V$, $V_{cont(L)} = 0V$
: $P_{in(1dB)} = >+37.0dBm$ TYP. @ $f = 5.85GHz$, $V_{cont(H)} = 3.0V$, $V_{cont(L)} = 0V$
- High-density surface mounting : 12-pin QFN package (3.0 × 3.0 × 0.75 mm)

APPLICATION

- Antenna switch for WiMAX, 802.11a/b/g access point

ORDERING INFORMATION

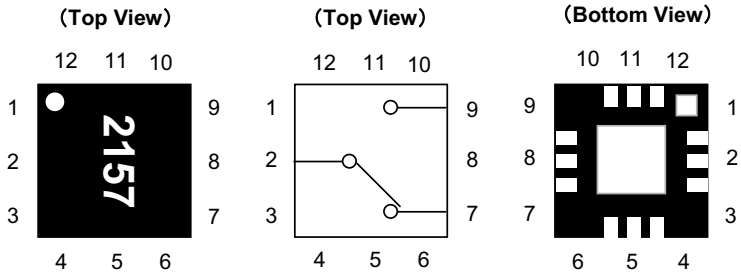
Part Number	Order Number	Package	Marking	Supplying Form
uPG2157T5F – E2	uPG2157T5F – E2 – A	12-pin plastic QFN (Pb-Free)	2157	<ul style="list-style-type: none">• Embossed tape 8 mm wide• Pin1 indicates roll-in direction of tape• Qty 3 kpcs/reel

Remark To order evaluation samples, contact your nearby sales office.
Part number for sample order : uPG2157T5F

Caution Electro-static sensitive devices

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	Pin No.	Pin Name
1	GND	7	OUTPUT2
2	INPUT	8	GND
3	GND	9	OUTPUT1
4	GND	10	GND
5	V _{cont2}	11	V _{cont1}
6	GND	12	GND

EXPOSED PAD : GND

Truth Table

V _{cont1}	V _{cont2}	INPUT – OUTPUT1	INPUT – OUTPUT2
High	Low	ON	OFF
Low	High	OFF	ON

ASOLUTE MAXIMUM RATINGS (Unless otherwise specified, T_A = +25°C)

Parameter	Symbol	Ratings	Unit
Switch Control Voltage	V _{cont}	+6.0	V
Input Power	P _{in}	+38	dBm
Operating Ambient Temperature	T _A	-45 to +85	°C
Storage Temperature	T _{stg}	-55 to +150	°C

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

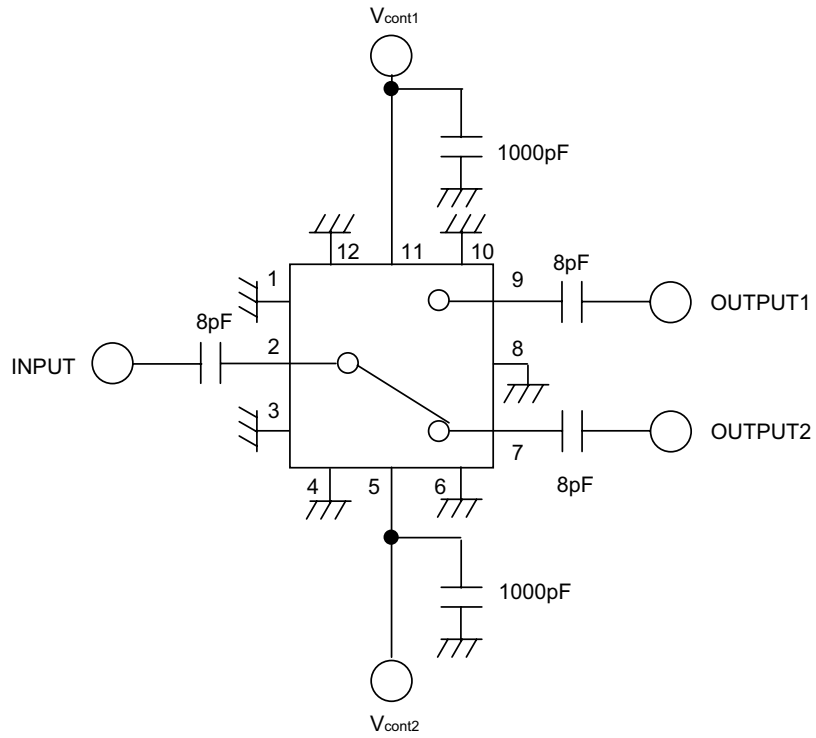
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating Frequency	f _{opt1}	2.3	-	2.7	GHz
	f _{opt2}	3.3	-	3.8	GHz
	f _{opt3}	5.15	-	5.85	GHz
Switch Control Voltage (H)	V _{cont (H)}	2.5	3.0	3.3	V
Switch Control Voltage (L)	V _{cont (L)}	0	-	0.4	V

ELECTRICAL CHARACTERISTICS (T_A = +25°C, V_{cont} (H) = 3.0V, V_{cont} (L) = 0V, DC cut capacitor = 8pF)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	UNIT
Insertion Loss1	L _{ins1}	f = 2.3 to 2.7GHz	-	0.60	0.85	dB
Insertion Loss2	L _{ins2}	f = 3.3 to 3.8GHz	-	0.60	0.85	dB
Insertion Loss3	L _{ins3}	f = 5.15 to 5.85GHz	-	0.60	1.05	dB
Isolation1 (INPUT-OFF Port)	ISL1	f = 2.3 to 2.7GHz	25	28	-	dB
Isolation2 (INPUT-OFF Port)	ISL2	f = 3.3 to 3.8GHz	22	25	-	dB
Isolation3 (INPUT-OFF Port)	ISL3	f = 5.15 to 5.85GHz	19	22	-	dB
Isolation4 (OUTPUT1-OUTPUT2)	ISL4	f = 2.3 to 2.7GHz	23	26	-	dB
Isolation5 (OUTPUT1-OUTPUT2)	ISL5	f = 3.3 to 3.8GHz	20	23	-	dB
Isolation6 (OUTPUT1-OUTPUT2)	ISL6	f = 5.15 to 5.85GHz	18	21	-	dB
Input Return Loss1	RL _{in1}	f = 2.3 to 2.7GHz	-	20	-	dB
Input Return Loss2	RL _{in2}	f = 3.3 to 3.8GHz	-	20	-	dB
Input Return Loss3	RL _{in3}	f = 5.15 to 5.85GHz	-	20	-	dB
Output Return Loss1	RL _{out1}	f = 2.3 to 2.7GHz	-	20	-	dB
Output Return Loss2	RL _{out2}	f = 3.3 to 3.8GHz	-	20	-	dB
Output Return Loss3	RL _{out3}	f = 5.15 to 5.85GHz	-	20	-	dB
Return Loss (OFF Port)	RL	f = 2.3 to 2.7GHz	-	15	-	dB
		f = 3.3 to 3.8GHz	-	15	-	dB
		f = 5.15 to 5.85GHz	-	15	-	dB
1dB Loss Compression Input Power ^{Note}	P _{in(1dB)}	f = 2.5GHz	-	>+37.0	-	dB
		f = 5.85GHz	-	>+37.0	-	dB
Switch Control Current	I _{cont}		-	20	30	uA
Switch Control Speed	t _{sw}	50% CTL to 90/10% RF	-	100	-	ns

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

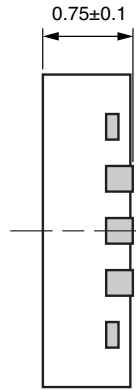
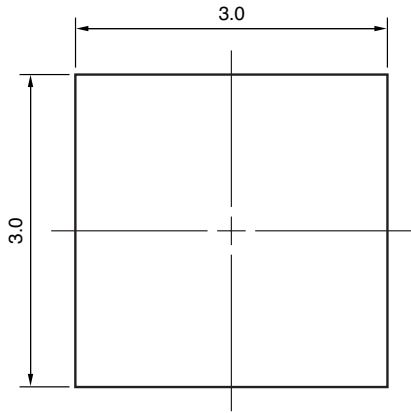
EVALUATION CIRCUIT



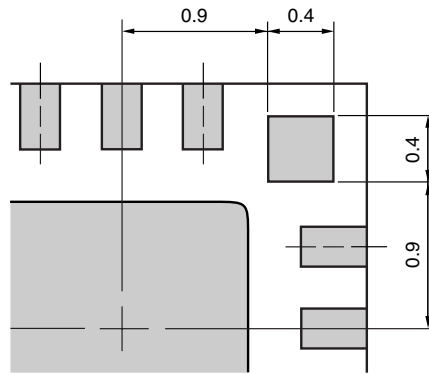
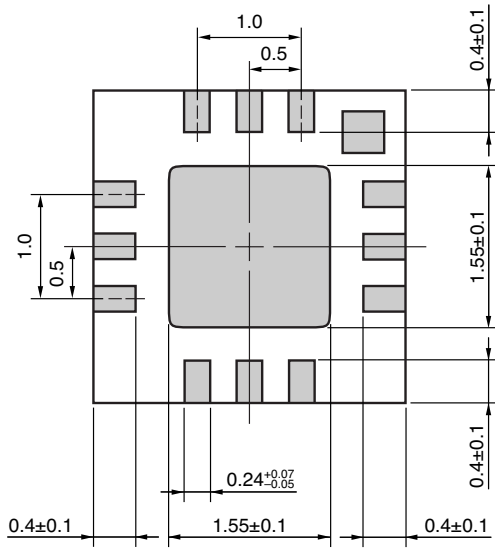
The application circuits and their parameters are for reference only and are not intended for use in actual design-ins.

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) : 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).

Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL’s understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
		-A	-AZ
Lead (Pb)	< 1000 PPM	Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.

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