

## High Isolation DPDT Switch

### Description

The CXG1040TN is a DPDT (Dual Pole Dual Throw) antenna switch MMIC used in Personal Communication handsets such as PCS.

This IC is designed using the Sony's GaAs J-FET process and operates with CMOS input.

### Features

- CMOS input control
- Insertion loss      0.5 dB (Typ.) at 2.0 GHz
- High isolation      25 dB (Typ.) at 2.0 GHz
- Small Package      TSSOP-10pin

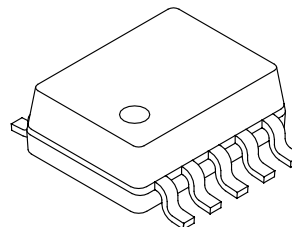
### Applications

DPDT switch for digital cellular telephones such as PCS handsets.

### Structure

GaAs J-FET MMIC

10 pin TSSOP (Plastic)



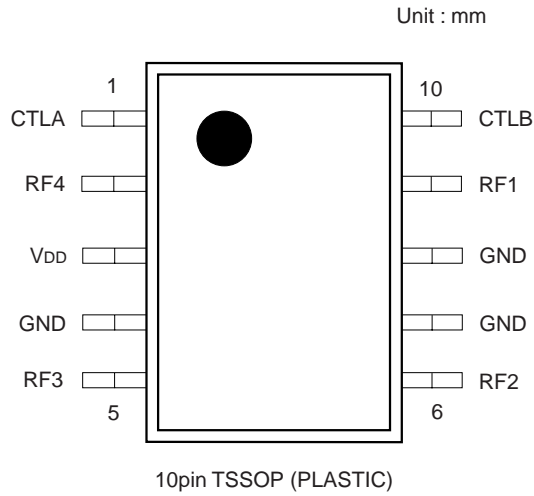
### Absolute Maximum Ratings (Ta=25 °C)

• Supply voltage	V <sub>DD</sub>	7	V
• Control voltage	V <sub>ctl</sub>	5	V
• Input power	P <sub>in</sub>	25	dBm
• Operating temperature	T <sub>opr</sub>	-35 to +85	°C
• Storage temperature	T <sub>stg</sub>	-65 to +150	°C

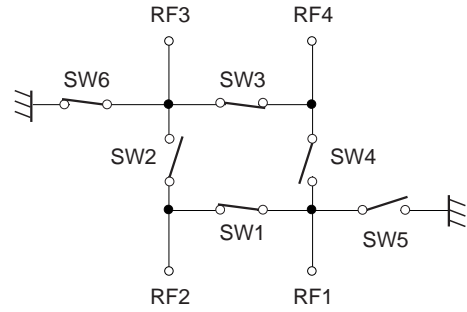
GaAs MMICs are ESD sensitive devices. Special handling precautions are required.

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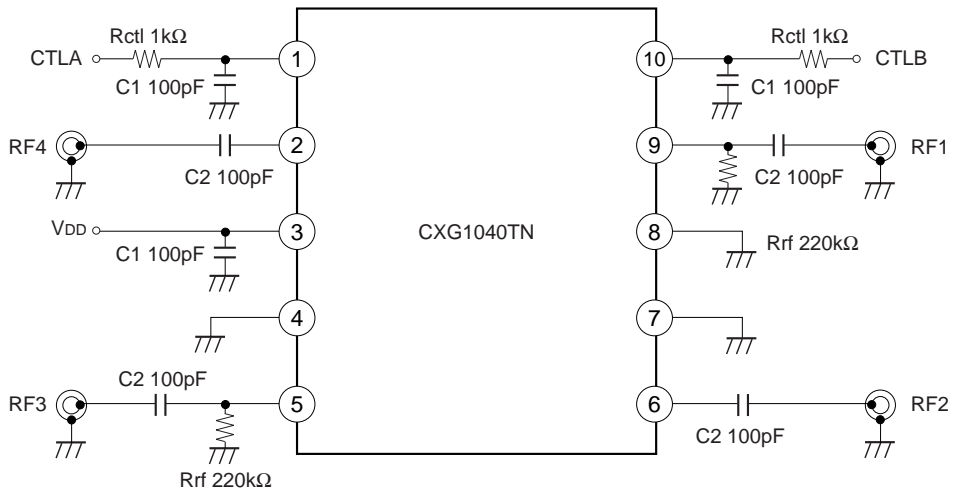
Pin Configuration



Block Diagram



Recommended Circuit



When using the CXG1040TN, the following external components should be used:

- C1: This is used for signal line filtering 100 pF is recommended.
- C2: This is used for RF De-coupling and must be used in all applications. 100 pF is recommended.
- Rctl: This is used to give improved ESD performance.
- Rrf: This resistor is used to stabilize the dc operating point at high power levels. A value of 220 kΩ is recommended.

## Truth Table

CTLA	CTLB		SW1	SW2	SW3	SW4	SW5	SW6
H	H	RF1 - RF2 ON	H	L	H	L	L	H
H	L	RF2 - RF3 ON	L	H	L	H	H	L
L	H	RF3 - RF4 ON	H	L	H	L	H	L
L	L	RF4 - RF1 ON	L	H	L	H	L	H

## Operating Condition

(Ta=-35 °C to +85 °C)

	Symbol	Min.	Typ.	Max.	Unit.
Control voltage (High)	Vctl (H)	2.5		3.6	V
Control voltage (Low)	Vctl (L)	0		0.5	V
Bias voltage	V <sub>DD</sub>	2.7		4	V

**Electrical Characteristics (1)**

$V_{DD}=3\text{ V}$ ,  $V_{ctl}(L)=0\text{ V}$ ,  $V_{ctl}(H)=2.8\text{ V}\pm 3\%$ ,

@2 GHz,  $P_{in}=10\text{ dBm}$ , Impedance at all ports :  $50\ \Omega$

( $T_a=25\text{ }^\circ\text{C}$ )

Item	Symbol	Min.	Typ.	Max.	Unit
Insertion loss	IL		0.5	0.8	dB
Isolation	Iso	20	25		dB
VSWR	VSWR		1.3	1.5	
Input power for 1 dB compression	P1dB	20	24		dBm
3rd order input intercept point *1	IP3	45			dBm
Switching speed	Tsw		1	5	$\mu\text{s}$
Bias current	$I_{DD}$		0.7	1.1	mA
Control current	$I_{ctl}$		80	150	$\mu\text{A}$

\*1 two-tone input power up to 10 dBm

**Electrical Characteristics (2)**

$V_{DD}=3\text{ V}$ ,  $V_{ctl}(L)=0\text{ V}$ ,  $V_{ctl}(H)=2.8\text{ V}\pm 3\%$ ,

@2 GHz,  $P_{in}=10\text{ dBm}$ , Impedance at all ports :  $50\ \Omega$

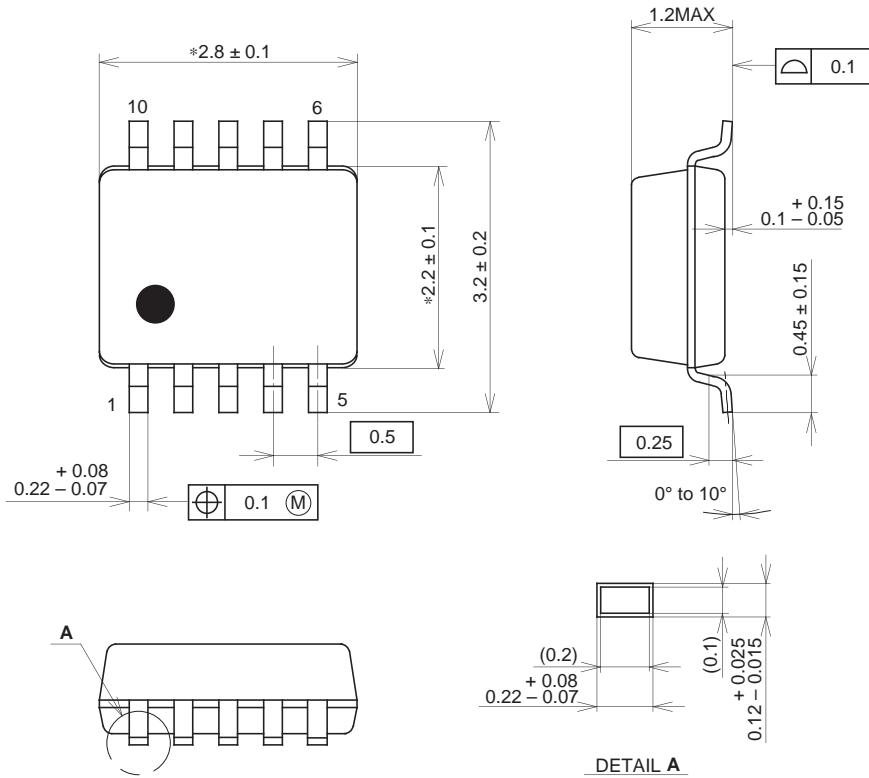
( $T_a=-35\text{ }^\circ\text{C}$  to  $+85\text{ }^\circ\text{C}$ )

Item	Symbol	Min.	Typ.	Max.	Unit
Insertion loss	IL		0.5	1.0	dB
Isolation	Iso	20	25		dB
VSWR	VSWR		1.3	1.5	
Input power for 1 dB compression	P1dB	20	24		dBm
3rd order input intercept point *1	IP3	45			dBm
Switching speed	Tsw		1	5	$\mu\text{s}$
Bias current	$I_{DD}$		0.7	1.3	mA
Control current	$I_{ctl}$		80	180	$\mu\text{A}$

\*1 two-tone input power up to 10 dBm

Package Outline Unit : mm

10PIN TSSOP(PLASTIC)



NOTE: Dimension "\*" does not include mold protrusion.

PACKAGE STRUCTURE

SONY CODE	TSSOP-10P-L01
EIAJ CODE	_____
JEDEC CODE	_____

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE MASS	0.02g