

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

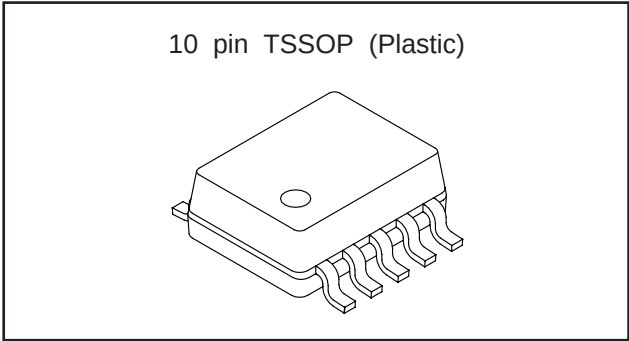
- CMOS input control
- Insertion loss 0.5 dB (Typ.) at 2.0 GHz
- High isolation 25 dB (Typ.) at 2.0 GHz
- Small Package TSSOP-10pin

Applications

DPDT switch for digital cellular telephones such as PCS handsets.

Structure

GaAs J-FET MMIC



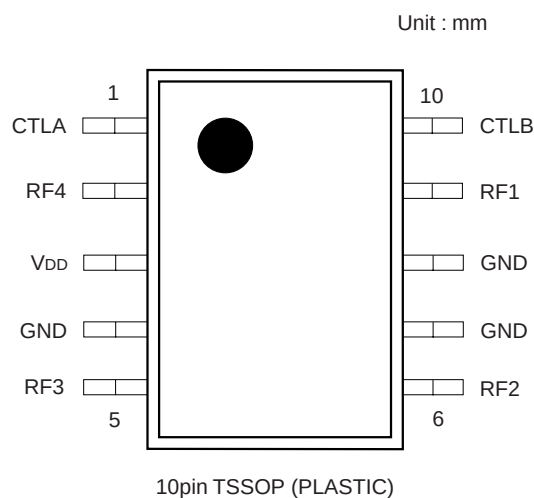
Absolute Maximum Ratings (Ta=25 °C)

- | | | | |
|-------------------------|------------------|-------------|-----|
| • Supply voltage | V _{DD} | 7 | V |
| • Control voltage | V _{ctl} | 5 | V |
| • Input power | P _{in} | 25 | dBm |
| • Operating temperature | T _{opr} | −35 to +85 | °C |
| • Storage temperature | T _{stg} | −65 to +150 | °C |

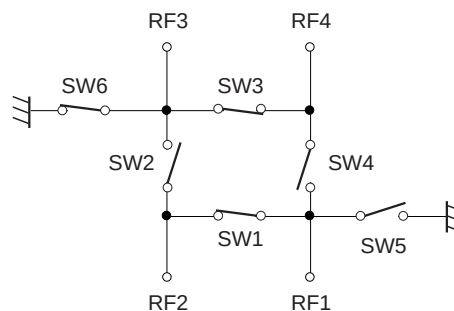
GaAs MMICs are ESD sensitive devices. Special handling precautions are required.

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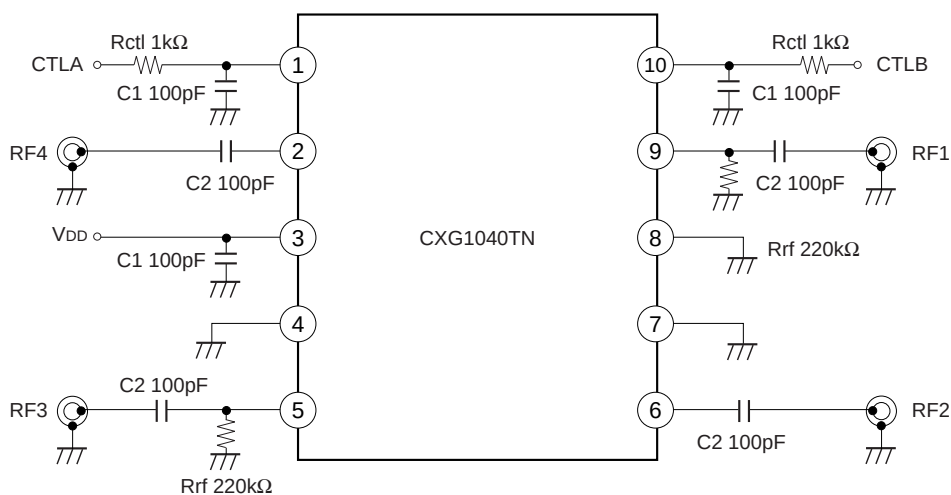
Pin Configuration



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 _{DD}	2.7		4	V

Electrical Characteristics (1)V_{DD}=3 V, V_{ctl} (L)=0 V, V_{ctl} (H)=2.8 V±3 %,

@2 GHz, Pin=10 dBm, Impedance at all ports : 50 Ω

(Ta=25 °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	μs
Bias current	I _{DD}		0.7	1.1	mA
Control current	I _{ctl}		80	150	μA

*1 two-tone input power up to 10 dBm

Electrical Characteristics (2)V_{DD}=3 V, V_{ctl} (L)=0 V, V_{ctl} (H)=2.8 V±3 %,

@2 GHz, Pin=10 dBm, Impedance at all ports : 50 Ω

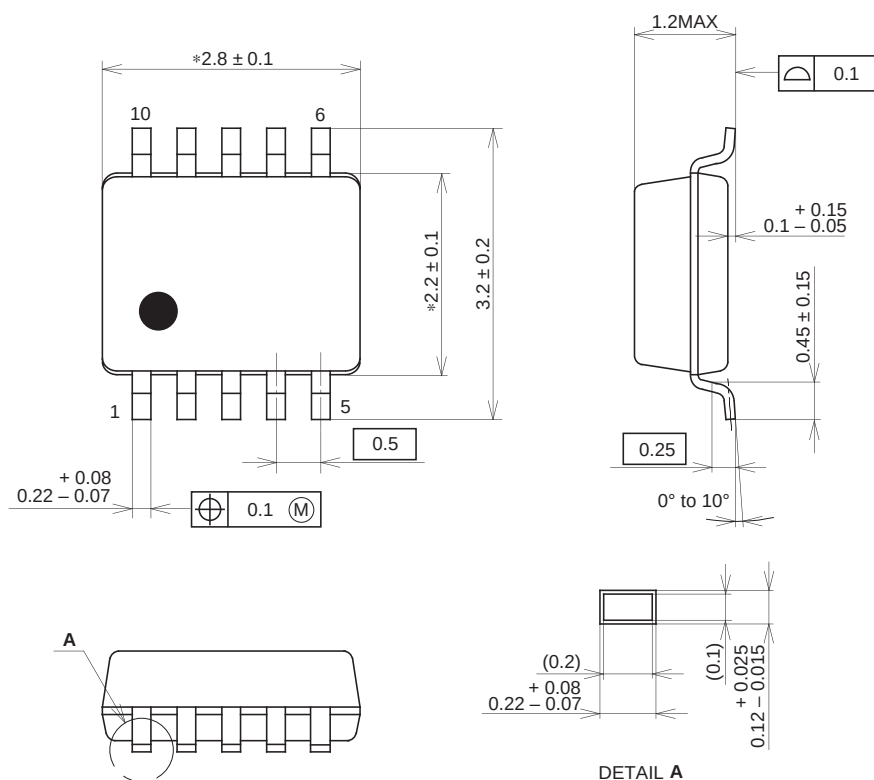
(Ta=−35 °C to +85 °C)

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	μs
Bias current	I _{DD}		0.7	1.3	mA
Control current	I _{ctl}		80	180	μA

*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