SONY

CXG1039TN

High Isolation Absorptive SPDT Switch MMIC with Integrated Control Logic

Description

The CXG1039TN is a high isolation absorptive SPDT (Single Pole Dual Throw) switch MMIC used in PCS handsets.

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

Features

- Absorptive type
- CMOS input control
- Low insertion loss 0.8 dB (Typ.) at 2.0 GHz
- High isolation 50 dB (Typ.) at 2.0 GHz
- Small Package TSSOP-10pin

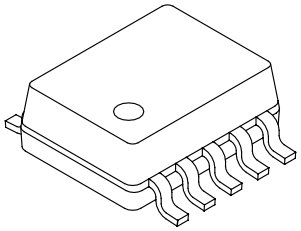
Applications

High isolation switch for digital cellular telephones such as PCS handsets.

Structure

GaAs J-FET MMIC

10 pin TSSOP (Plastic)



Absolute Maximum Ratings (Ta=25 °C)

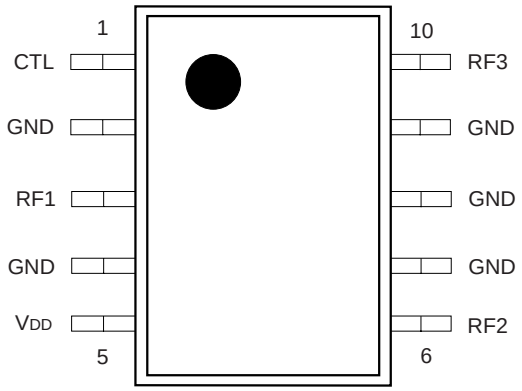
• Supply voltage	V_{DD}	7	V
• Control voltage	Vctl	5	V
• Input power	Pin	25	dBm
• Operating temperature	Topr	–35 to +85	°C
• Storage temperature	Tstg	–65 to +150	°C

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

E99143-TE

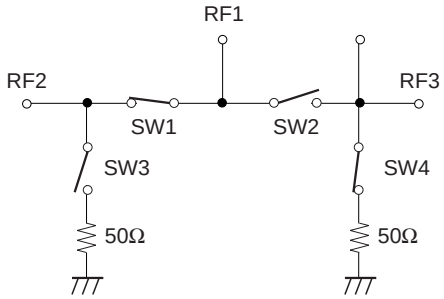
Pin Configuration

Unit : mm

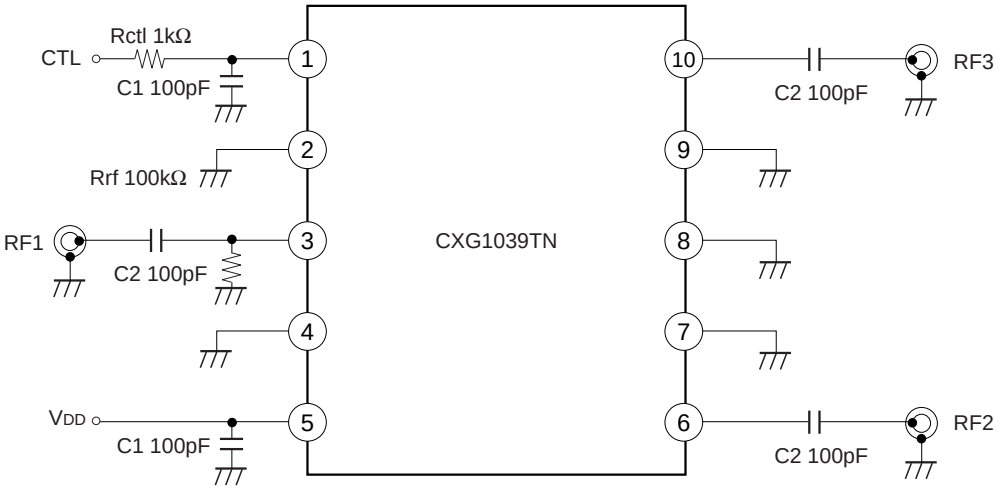


10pin TSSOP (PLASTIC)

Block Diagram



Recommended Circuit



When using the CXG1039TN, 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 100 kΩ is recommended.

Truth Table

CTL		SW1	SW2	SW3	SW4
H	RF1 - RF2 ON	ON	OFF	OFF	ON
L	RF1 - RF3 ON	OFF	ON	ON	OFF

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, Vctl (L)=0 V, Vctl (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		0.8	1.2	dB
Isolation	ISO	40	50		dB
ON port VSWR	VSWR (ON)		1.2	1.5	
OFF port VSWR	VSWR (OFF)		1.7	2.0	
3rd order input intercept point *1	IP3	35			dBm
Input power for 1 dBm compression	P1dB	12	17		dBm
Switching speed	TSW		1	5	µs
Bias current	I_{DD}		220	350	µA
Control current	ICRL		80	150	µA

*1 two-tone input power up to 5 dBm

Electrical Characteristics (2)

V_{DD}=3 V, Vctl (L)=0 V, Vctl (H)=2.8 V±3 %,

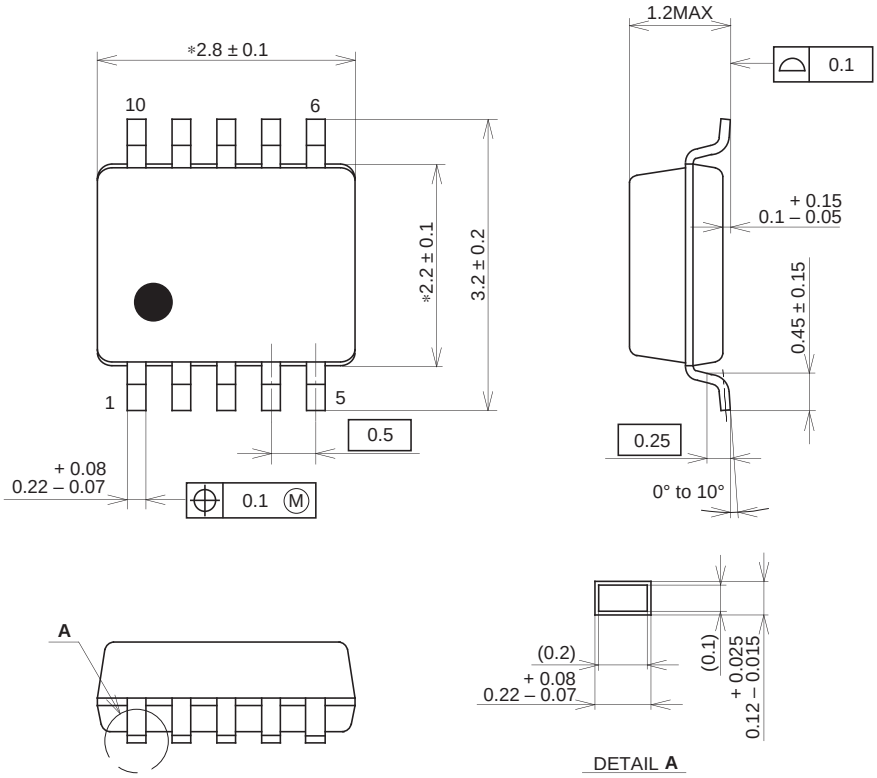
@2 GHz, Pin=10 dBm, Impedance at all ports : 50 Ω (Ta=–35 °C to +85 °C)

Item	Symbol	Min.	Typ.	Max.	Unit
Insertion loss	IL		0.8	1.4	dB
Isolation	ISO	40	50		dB
ON port VSWR	VSWR (ON)		1.2	1.5	
OFF port VSWR	VSWR (OFF)		1.7	2.0	
3rd order input intercept point *1	IP3	35			dBm
Input power for 1 dBm compression	P1dB	12	17		dBm
Switching speed	TSW		1	5	µs
Bias current	I_{DD}		220	450	µA
Control current	ICRL		80	180	µA

*1 two-tone input power up to 5 dBm

Package Outline Unit : mm

10PIN TSSOP(PLASTIC)



NOTE: Dimension "∗" does not include mold protrusion.

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

PACKAGE STRUCTURE

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