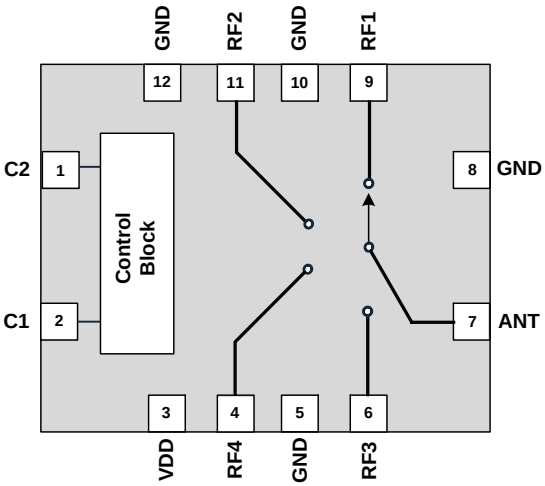
RFMD + TriQuint = Qorvo

RFSW6042

Low Insertion High Isolation SP4T Switch 5MHz to 6000MHz

Package: QFN, 12-pin, 1.8mm x 1.8mm

The RFSW6042 is a low loss, high isolation SP4T switch with performance optimized for use in Cellular BTS applications. Plus it is also ideally suited for use in CATV and SATV applications. This part is packaged in a compact 1.8mm x 1.8mm, 12-pin, QFN package which allows for a small solution size with no need for external DC blocking capacitors (when no external DC is applied to the device ports).



Functional Block Diagram

Features

- 5MHz to 6000MHz Operation
- Low Insertion Loss: 0.45dB at 2GHz
- High Isolation: 34dB at 2GHz
- High IP3: >70dBm at 2GHz
- Compatible with Low Voltage Logic (V_{HIGH} Minimum = 1.3V)
- No External DC Blocking
  - Capacitors Required on RF Paths if DC is Applied Externally
- 2000V HBM ESD Rating on All Ports
- 3V to 5V Operation

Applications

- Cellular BTS
- CATV, SATV Applications
- Test Equipment
- General Purpose Switch

Ordering Information

RFSW6042SQ	Sample bag with 25 pieces
RFSW6042SR	7" Reel with 100 pieces
RFSW6042TR7	7" Reel with 2500 pieces
RFSW6042PCK-410	5MHz to 3GHz PCBA with 5-piece sample bag
RFSW6042PCK-411	3GHz to 6GHz PCB with 5-piece sample bag

Absolute Maximum Ratings

Parameter	Rating	Unit
Control Voltage (V_{CTL})	3.0	V
Supply Voltage (V_{DD})	6.0	V
Maximum CW Input Power for V_{DD} = 3V	35	dBm
Storage Temperature Range	-40 to +150	°C
ESD Rating - Human Body Model (HBM)	2000	V
Moisture Sensitivity Level	MSL2	

Caution! ESD sensitive device.

RFMD Green: RoHS status based on EU Directive 2011/65/EU (at time of this document revision), halogen free per IEC 61249-2-21, < 1000ppm each of antimony trioxide in polymeric materials and red phosphorus as a flame retardant, and <2% antimony in solder.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

Recommended Operating Condition

Parameter	Specification			Unit
	Min	Typ	Max	
Operating Temperature Range	-40		+85	°C
V_{DD} – Switch Supply Voltage	3	5	5.5	V

Nominal Operating Parameters

Parameter	Specification			Unit	Condition
	Min	Typ	Max		
General Performance					**Electrical Specifications, TA=25°C, VDD=5V**
Operating Frequency Range	5		6000	MHz	
Insertion Loss (RFC to RF1/RF2/ RF3/RF4)		0.32	0.5	dB	925MHz
		0.45	0.6	dB	1990MHz
		0.45		dB	2650MHz
		1.25		dB	5850MHz
Isolation (RFC to RF1/RF2/RF3 / RF4)		36		dB	925MHz
		28		dB	1990MHz
		25		dB	2650MHz
		17		dB	5850MHz
Isolation (RF1 to RF2/RF3/RF4)	35	43		dB	925MHz
	27	34		dB	1990MHz
		30		dB	2650MHz
		15		dB	5850MHz
Return Loss (On State)		-15		dB	5MHz ~ 3GHz
Return Loss (On State)		-12		dB	3GHz ~ 6GHz
900MHz Second Harmonic		-108	-95	dBc	Pin = 28dBm

Parameter	Specification			Unit	Condition
	Min	Typ	Max		
900MHz Third Harmonic		-103	-90	dBc	
2000MHz Second Harmonic		-100	-80	dBc	Pin = 33dBm
2000MHz Third Harmonic		-89	-77	dBc	
Input IP3		71		dBm	2Ghz, 21dBm per tone, 1MHz spacing
Max Operational Input Power		35		dBm	
Power Supply					
V_{DD} Supply Current		65	130	µA	
CTL1, CTL2 – Control Voltage High	1.3		2.7	V	
CTL1, CTL2 – Control Voltage Low	0		0.45	V	
Control Current			5	µA	
Switching Speed, One RF Port to Another		2	5	us	10% to 90% RF
Turn On Time			20	us	Time for V_{DD} = 0V to part ON and RF = 90%

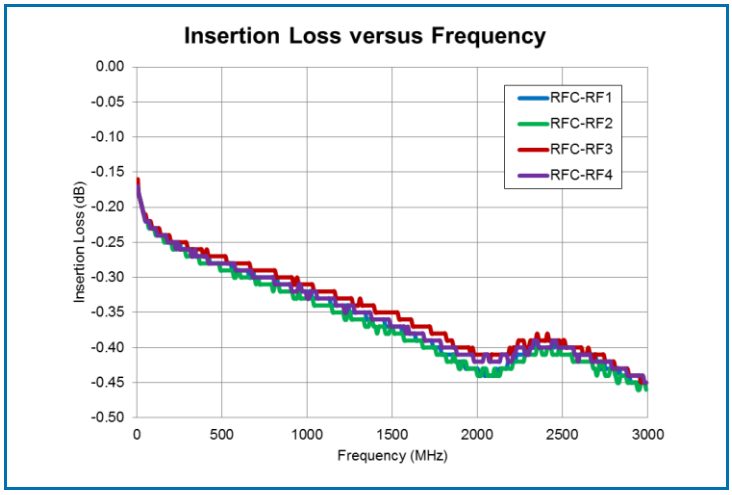
Power-up / Power-down Sequence and Operation Controls

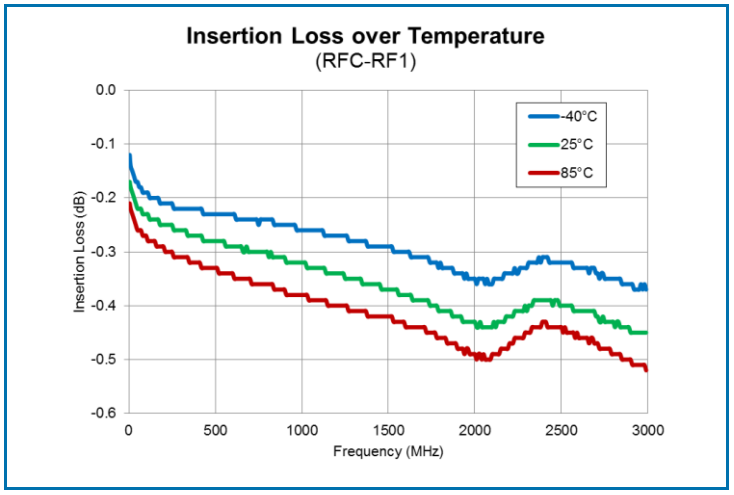
Power-up / Power-down	Sequence for Power-up and Power-down from Supply that is Connected to V_{DD} Pin
Power-up	Turn on VDD, then C1 and C2, then (20µs or greater), apply RF signal
Power-down	Turn off RF signal, then C1 and C2, turn off V_{DD}
Switching Ports	Turn off RF signal, then change C1 and C2 state, then (5µs or greater). Turn on RF signal

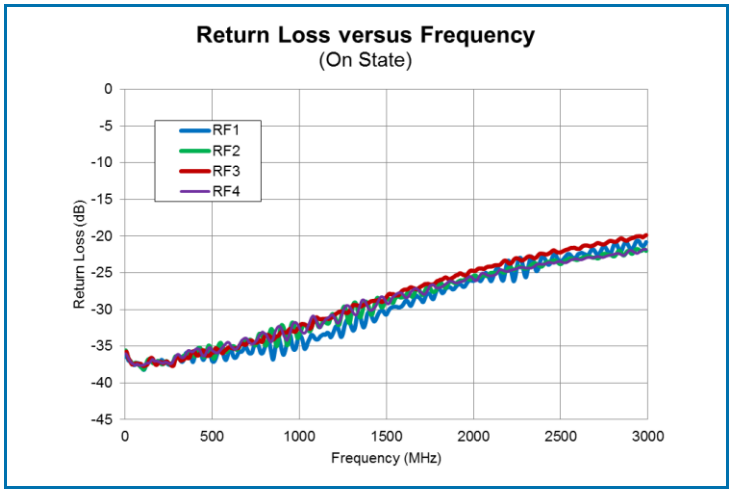
Switch is controlled by C1 and C2

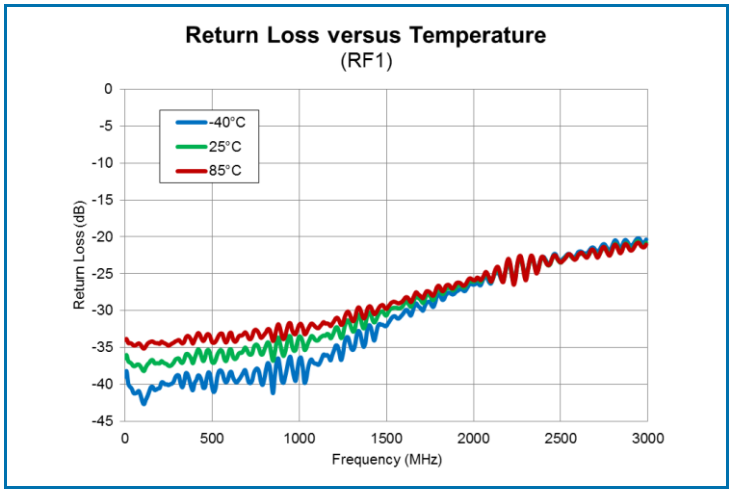
Mode	C1	C2
RF1-ANT	High	Low
RF2-ANT	Low	High
RF3-ANT	High	High
RF4-ANT	Low	Low

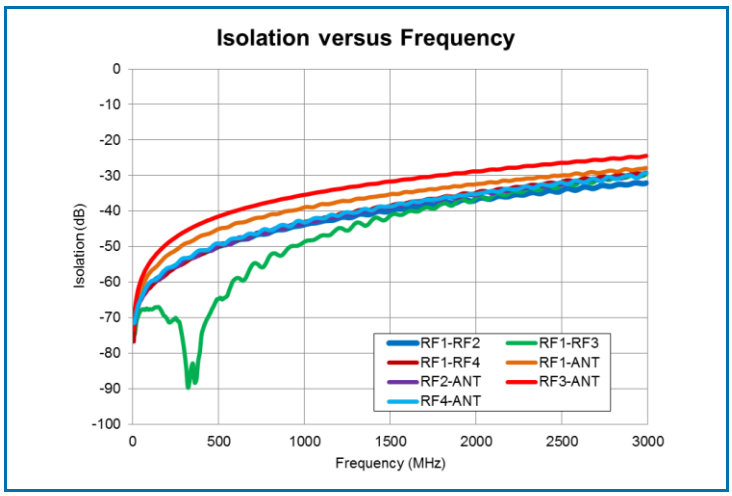
Typical Performance: 5MHz ~ 3000MHz, V_{DD} = 5V unless otherwise noted

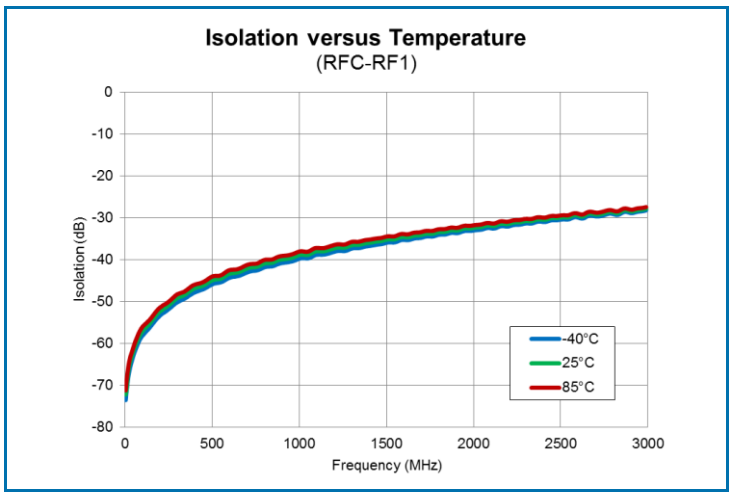




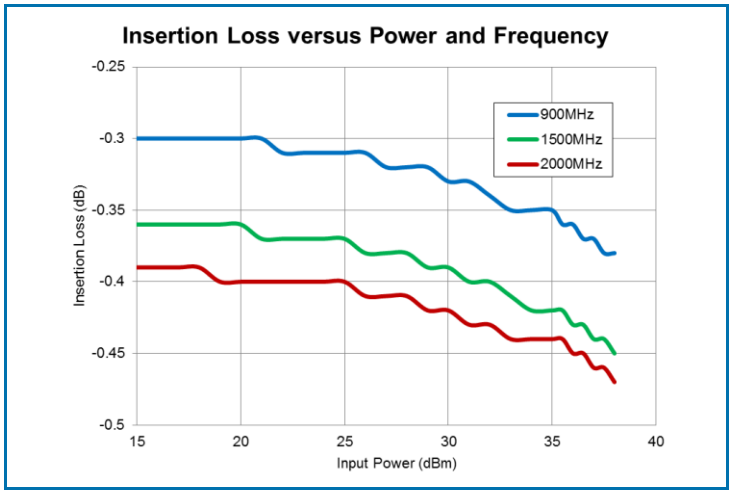


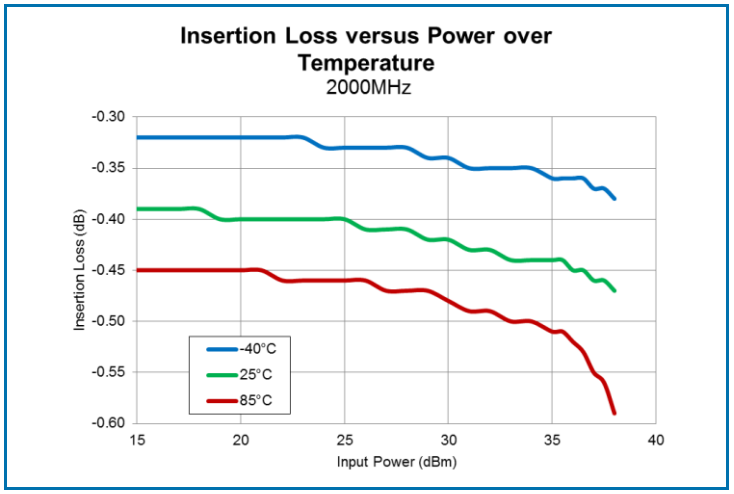




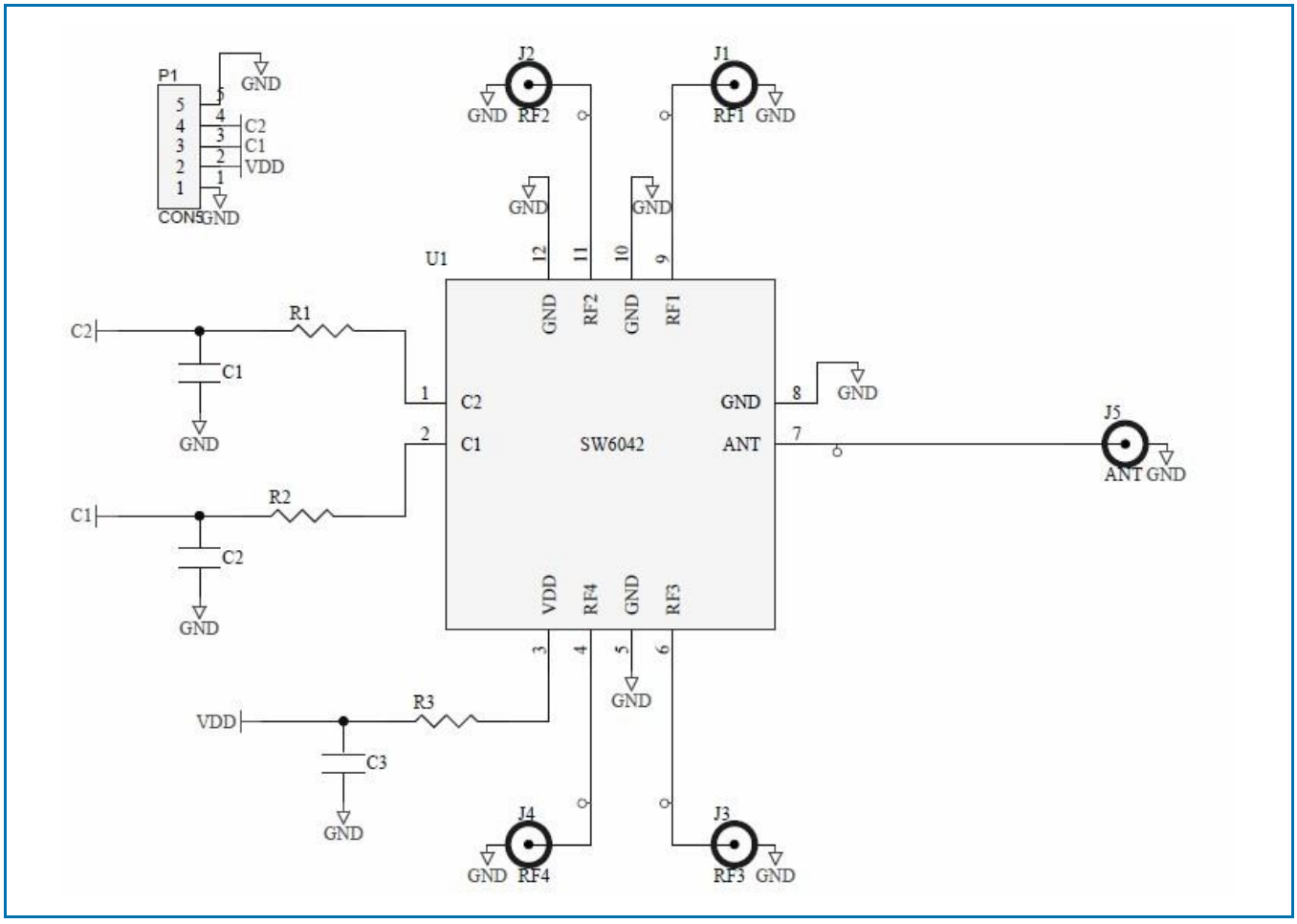


Typical Performance: 5MHz ~ 3000MHz, V_{DD} = 5V unless otherwise noted





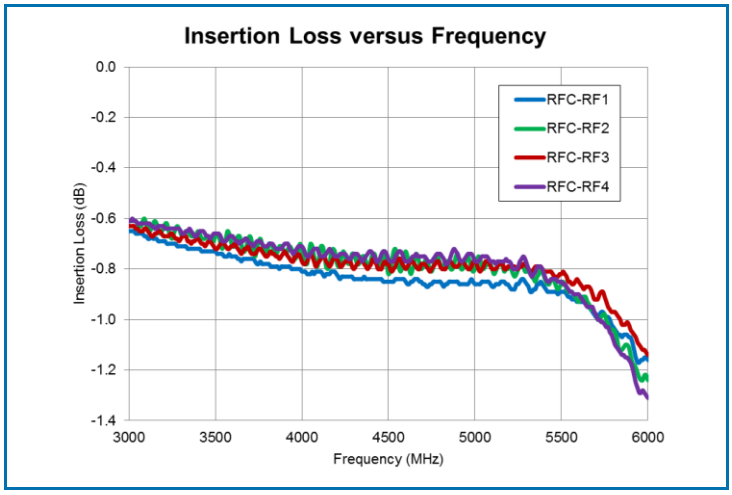
Evaluation Board Schematic 5MHz to 3000MHz Application Circuit

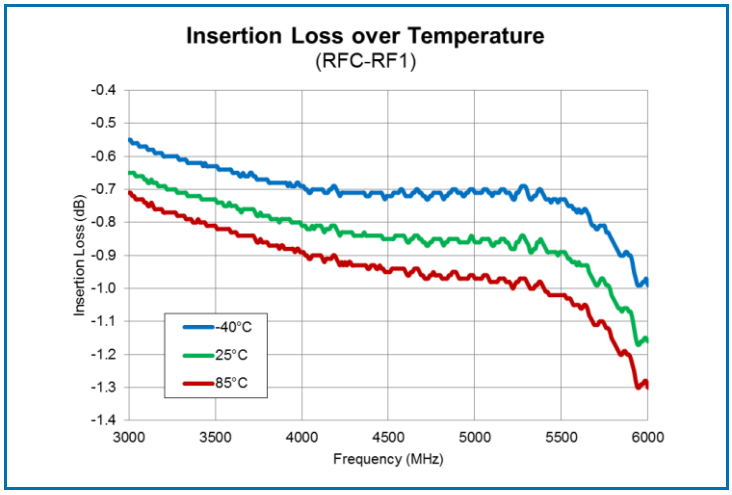


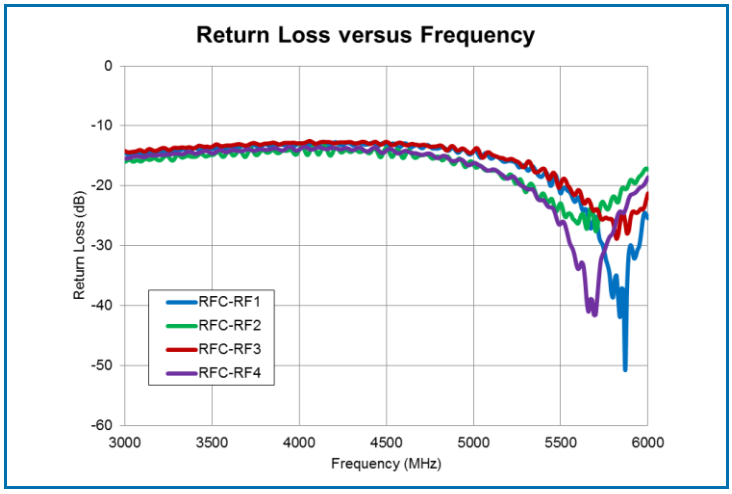
Evaluation Board Bill of Materials (BOM) 5MHz to 3000MHz Application Circuit

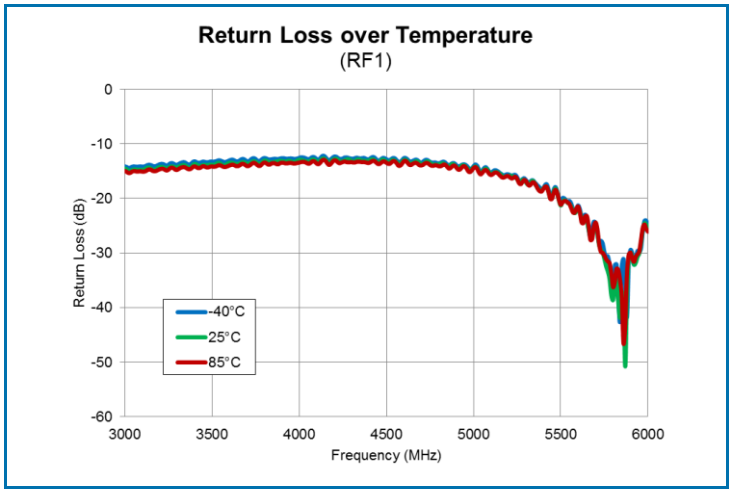
Description	Reference Designator	Manufacturer	Manufacturer's P/N
RFSW6032 Evaluation Board			RFSW6032-410
CAP, 100pF, 5%, 50V, C0G, 0402	C1-C2	Murata Electronics	GRM1555C1H101JA01D
CAP, 10000pF, 10%, 25V, X7R, 0402	C3	Murata Electronics	GRM155R71E103KA01D
RES, 0Ω, 0402	R1-R3	Kamaya, Inc.	RMC1-16SJPTH
CONN, SMA, END LNCH, MINI, FLT, 0.068”	J1-J5	Emerson Network Power	142-0741-851
CONN, HDR, ST, PLRZD, 5-PIN, 0.100”	P1	ITW Pancon	MPSS100-5-C
High Power SP4T	U1	RFMD	RFSW6042

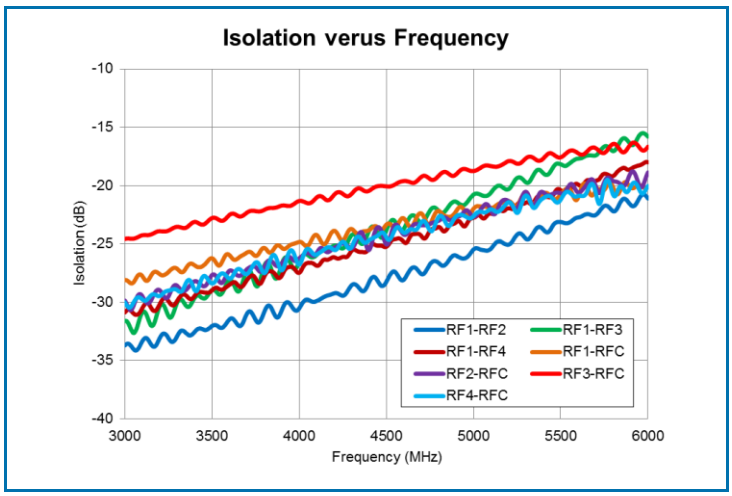
Typical Performance: 3000MHz ~ 6000MHz, V_{DD} = 5V unless otherwise noted

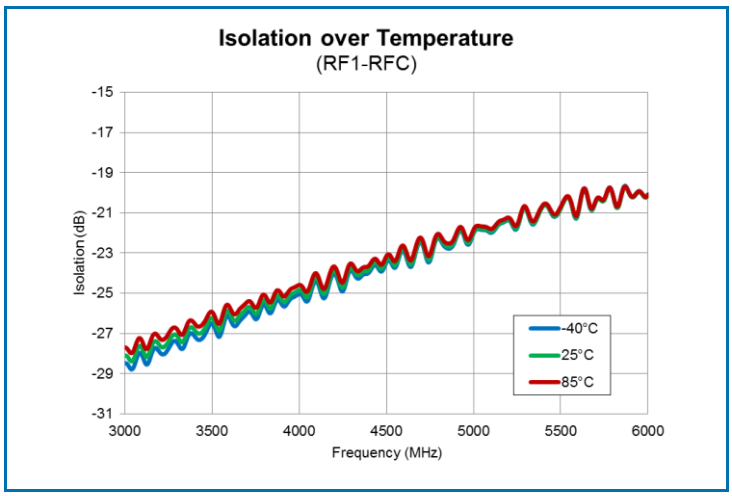




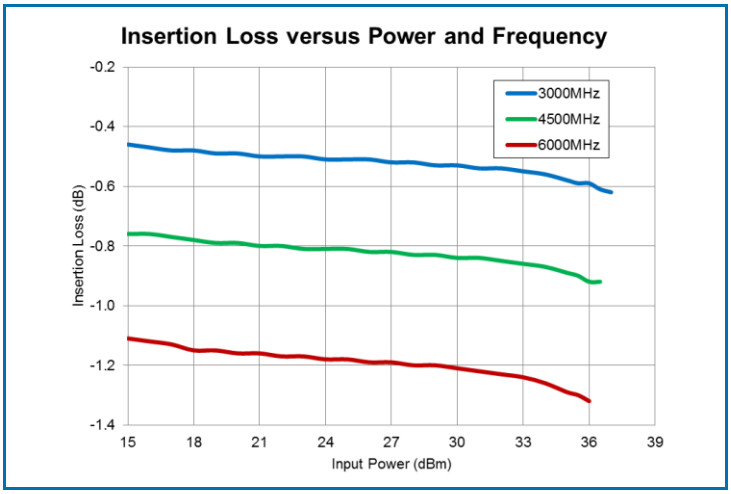


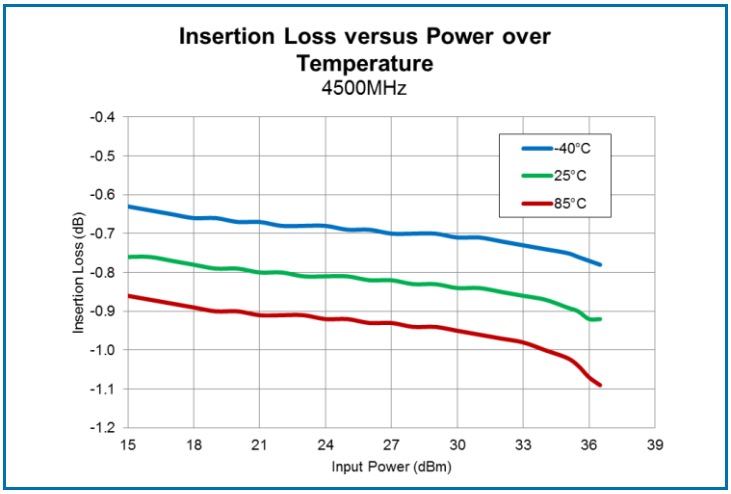




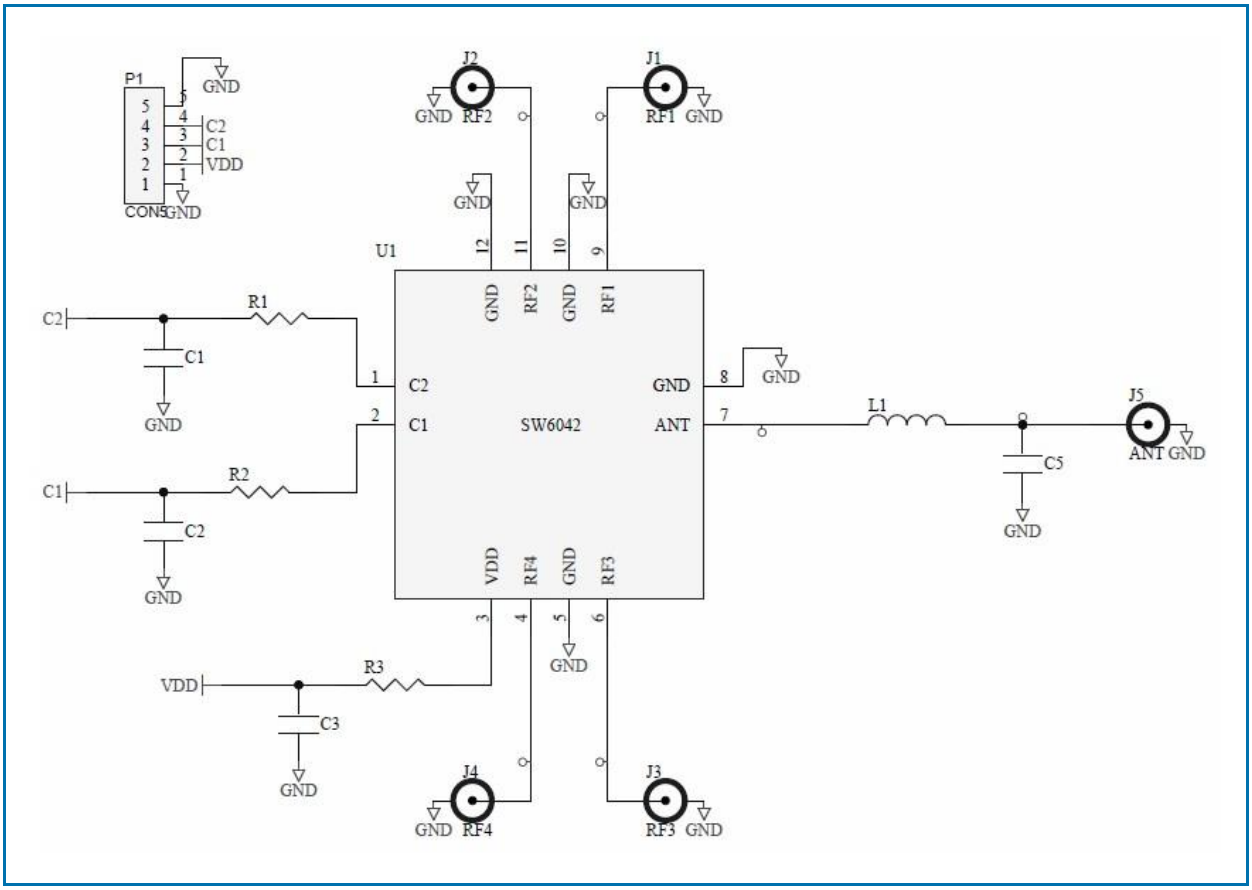


Typical Performance: 3000MHz ~ 6000MHz, V_{DD} = 5V unless otherwise noted





Evaluation Board Schematic 3000MHz to 6000MHz Application Circuit



Evaluation Board Bill of Materials (BOM) 3000MHz to 6000MHz Application Circuit

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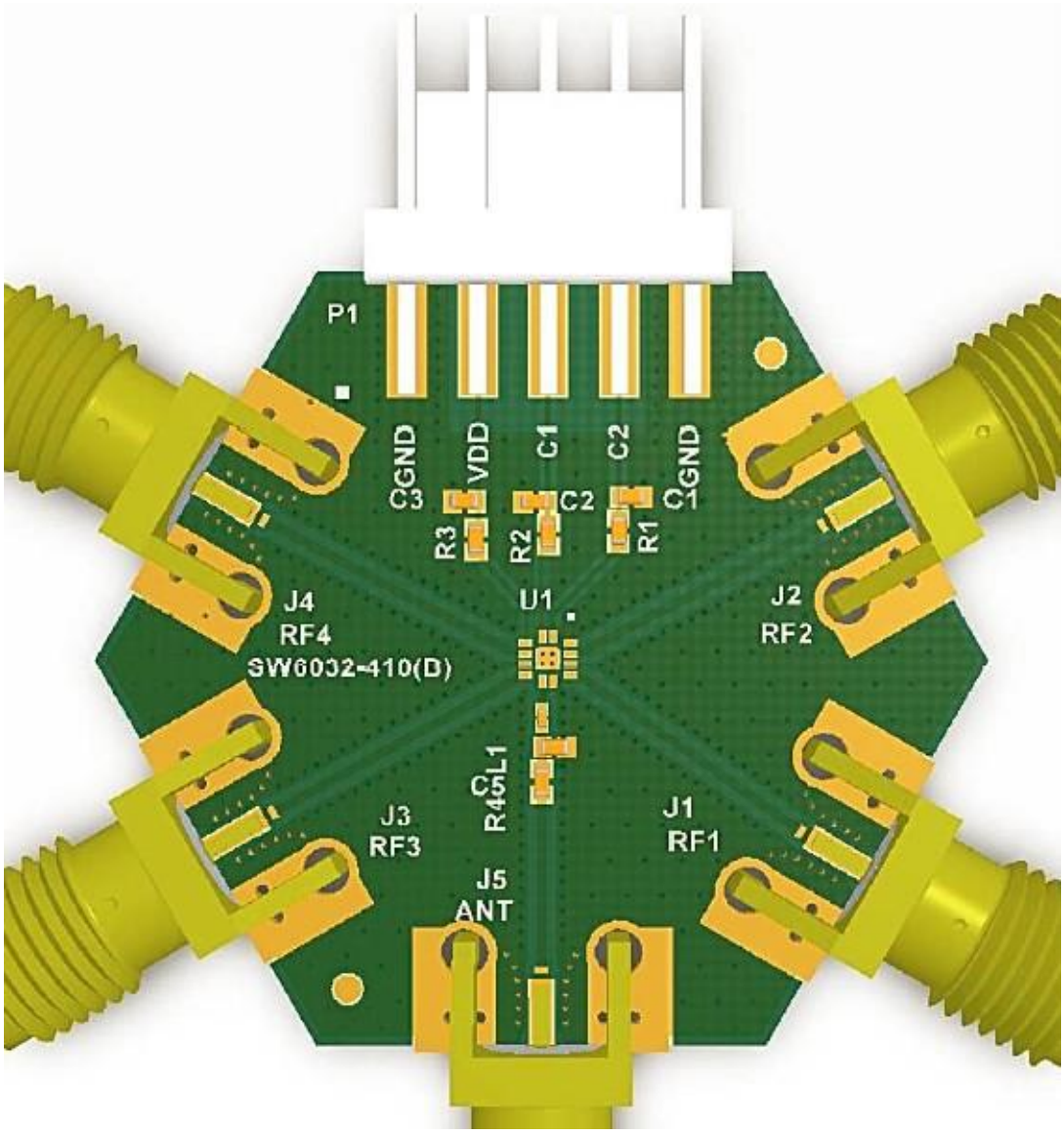
CAP, 10000pF, 10%, 25V, X7R, 0402	C3	Murata Electronics	GRM155R71E103KA01D
CAP, 0.5pF, +/-0.25pF, 50V, C0G, 0402	C5	Murata Electronics	GRM1555C1HR50CA01D
RES, 0Ω, 0402	R1-R3	Kamaya, Inc.	RMC1-16SJPTH
IND, 1nH, +/-0.1nH, T/F, 0201	L1	Murata Electronics	LQP03TG1N0B02D
CONN, SMA, END LNCH, MINI, FLT, 0.068”	J1-J5	Emerson Network Power	142-0741-851
CONN, HDR, ST, PLRZD, 5-PIN, 0.100”	P1	ITW Pancon	MPSS100-5-C
High Power SP4T	U1	RFMD	RFSW6042

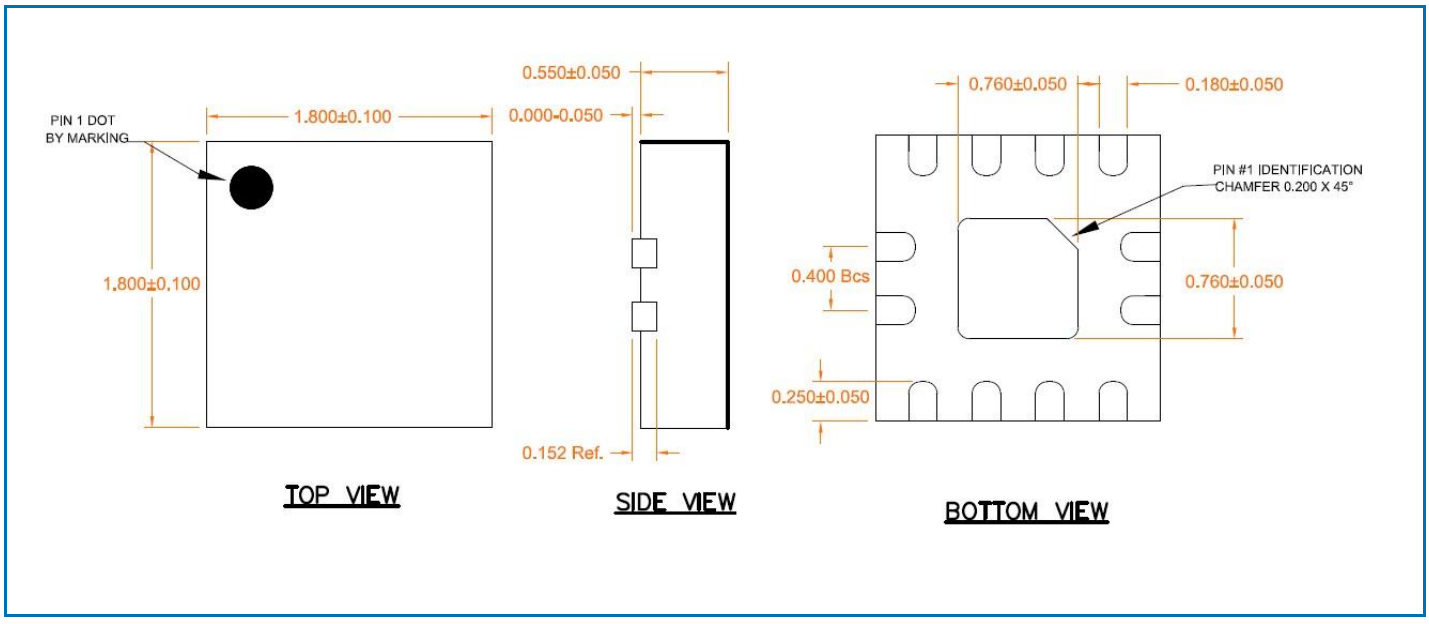
Evaluation Board Assembly Drawing



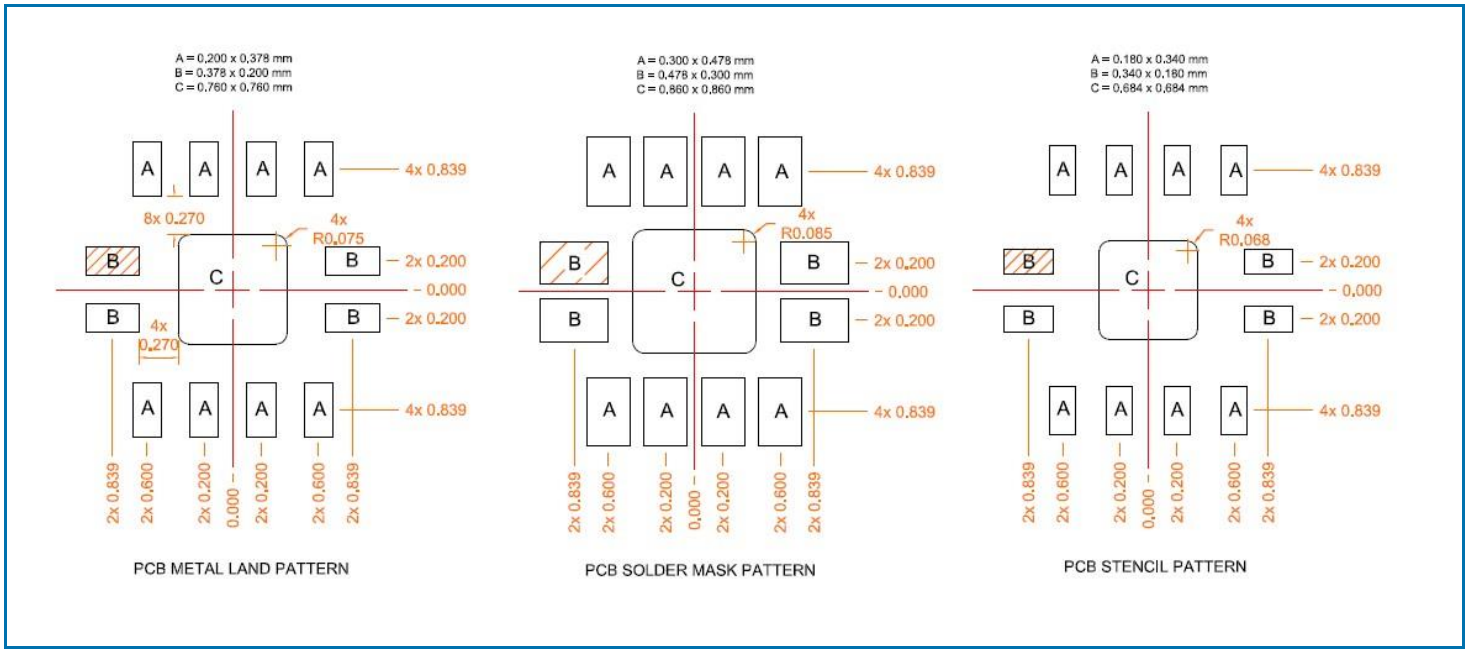
Pin Names and Descriptions

Pin	Name	Description
1	C2	Switch Logic Control 2
2	C1	Switch Logic Control 1
3	VDD	Supply Voltage
4	RF4	Single-ended RF Port
5	GND	Low Inductance Path to Ground
6	RF3	Single-ended RF Port
7	ANT	Single-ended RF Port
8	GND	Low Inductance Path to Ground
9	RF1	Single-ended RF Port
10	GND	Low Inductance Path to Ground
11	RF2	Single-ended RF Port
12	GND	Low Inductance Path to Ground

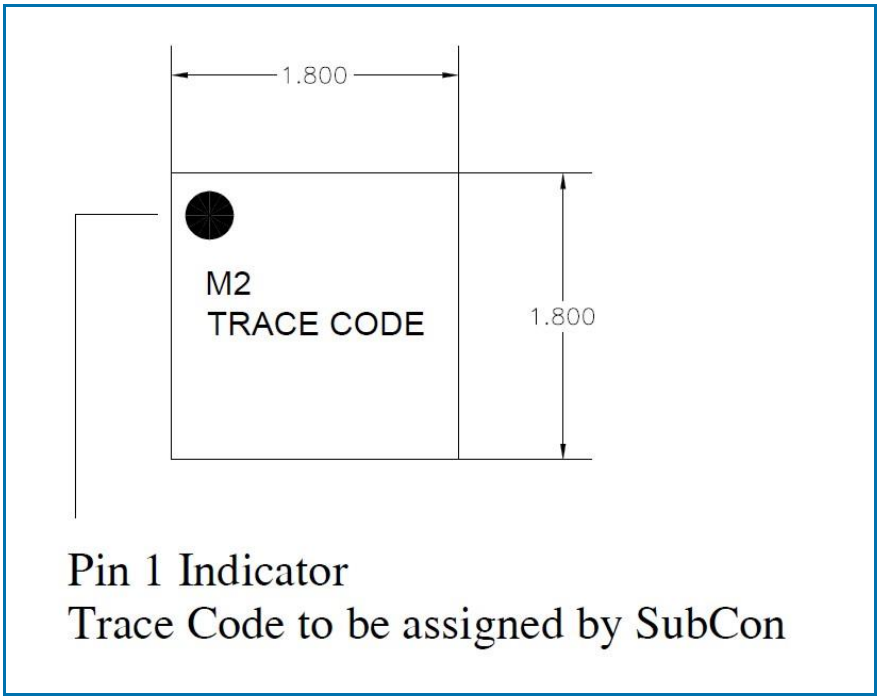
Package Outline Drawing (Dimensions in millimeters)



Stencil, PCB Pattern (Dimensions in millimeters)



Branding Diagram



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- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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AVIC JONHON

«JONHON» (основан в 1970 г.)

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«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

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FORSTAR®

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