

Analog Devices Welcomes Hittite Microwave Corporation

NO CONTENT ON THE ATTACHED DOCUMENT HAS CHANGED



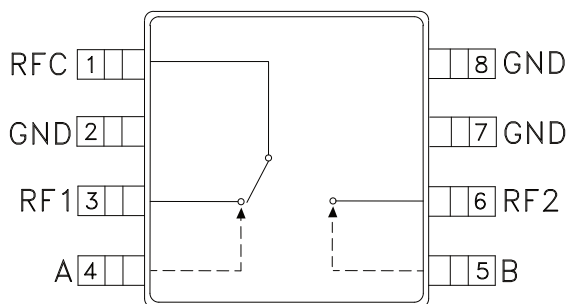
THIS PAGE INTENTIONALLY LEFT BLANK

Typical Applications

The HMC190BMS8(E) is ideal for:

- MMDS & WirelessLAN
- Portable Wireless

Functional Diagram



Features

- Low Insertion Loss: 0.4 dB
- Ultra Small Package: MSOP8
- High Input IP3: +56 dBm
- Positive Control: 0/+3V @ 0.1 μ A

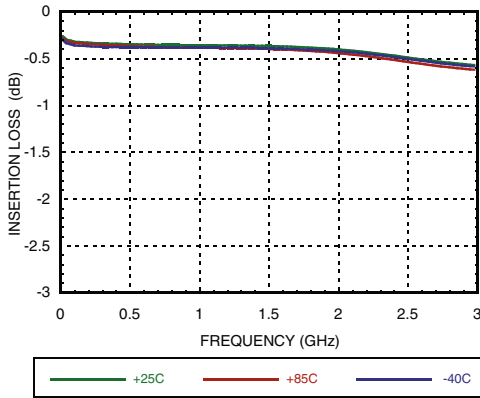
General Description

The HMC190BMS8(E) is a low cost SPDT switch in a 8-lead MSOP package. The switch can control signals from DC to 3 GHz. It is especially suited for low and medium power applications using positive control voltages. The two control voltages require a minimal amount of DC current, which is optimal for battery powered radio systems at 0.9, 1.9, and 2.4 GHz. The HMC190BMS8(E) provides exceptional third order intermodulation performance of +56 dBm. The design has been optimized for the small MSOP package, and maintains a VSWR of better than 1.2:1 up to 2 GHz. This device is the positive control MSOP8 packaged version of our HMC239AS8(E) negative control device.

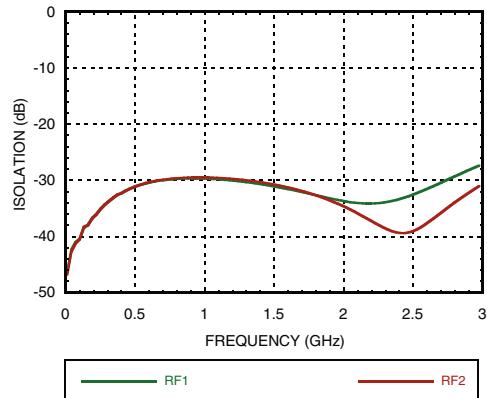
Electrical Specifications, $T_A = +25^\circ \text{C}$, $V_{ctl} = 0/+3$ to $+8 \text{Vdc}$

| Parameter | Frequency | Min. | Typ. | Max. | Units |
|---|---------------|--|------|------|-------|
| Insertion Loss | DC - 1.0 GHz | | 0.4 | 0.6 | dB |
| | DC - 2.0GHz | | 0.4 | 0.6 | dB |
| | DC - 2.5GHz | | 0.5 | 0.8 | dB |
| | DC - 3.0 GHz | | 0.7 | 1.0 | dB |
| Isolation | DC - 1.0 GHz | 23 | 30 | | dB |
| | DC - 2.0 GHz | 23 | 30 | | dB |
| | DC - 2.5 GHz | 22 | 30 | | dB |
| | DC - 3.0 GHz | 19 | 25 | | dB |
| Return Loss | DC - 1.0 GHz | 24 | 30 | | dB |
| | DC - 2.0 GHz | 20 | 24 | | dB |
| | DC - 2.5 GHz | 15 | 20 | | dB |
| | DC - 3.0 GHz | 10 | 16 | | dB |
| Input Power for 1 dB Compression ($V_{ctl} = 0/+5\text{V}$) | 0.5 - 1.0 GHz | 25 | 30 | | dBm |
| | 0.5 - 3.0 GHz | 23 | 29 | | dBm |
| Input Third Order Intercept ($V_{ctl} = 0/+5\text{V}$) Two-tone Input Power = +10 dBm Each Tone) | 0.5 - 1.0 GHz | 45 | 56 | | dBm |
| | 0.5 - 3.0 GHz | 44 | 55 | | dBm |
| Switching Characteristics | DC - 3.0 GHz | | 5 | | ns |
| | | tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF) | | 10 | |

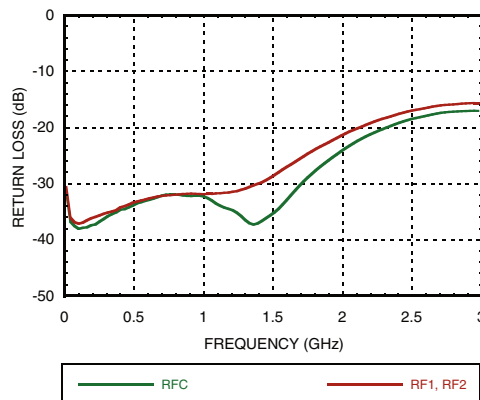
Insertion Loss



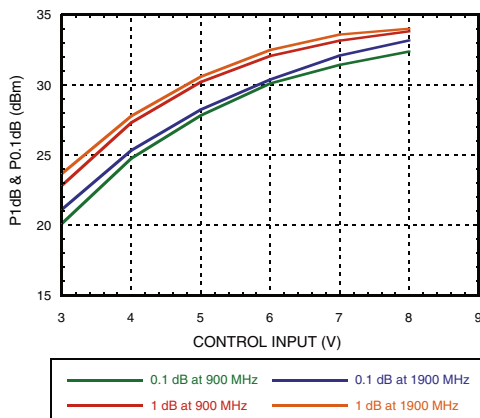
Isolation



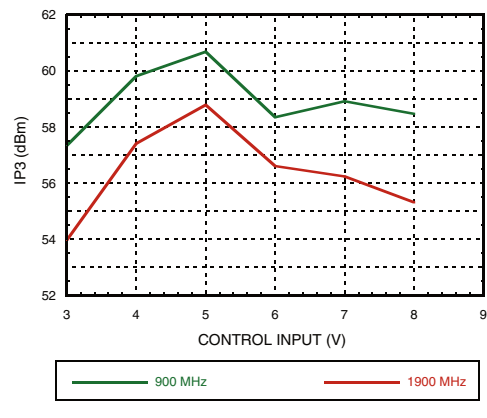
Return Loss



Input 0.1 and 1.0 dB Compression vs. Control Voltage



Input Third Order Intercept Point vs. Control Voltage




Distortion vs. Control Voltage

| Control Input (Vdc) | Third Order Intercept (dBm) +10 dBm Each Tone | |
|------------------------|--|----------|
| | 900 MHz | 1900 MHz |
| +5 | 58 | 56 |
| +8 | 56 | 55 |

Compression vs. Control Voltage

| Control Input (Volts) | Carrier at 900 MHz | | Carrier at 1900 MHz | |
|--------------------------|--|--|--|--|
| | Input Power for 0.1 dB Compression (dBm) | Input Power for 1.0 dB Compression (dBm) | Input Power for 0.1 dB Compression (dBm) | Input Power for 1.0 dB Compression (dBm) |
| | +3 | 20 | 23 | 21 |
| +5 | 27 | 30 | 27 | 30 |
| +8 | 32 | 34 | 32 | 34 |

Truth Table

*Control Input Voltage Tolerances are ± 0.2 Vdc.

| Control Input* | | Control Current | | Signal Path State | |
|----------------|---------|-----------------|---------------|-------------------|-----------|
| A (Vdc) | B (Vdc) | Ia (μ A) | Ib (μ A) | RF to RF1 | RF to RF2 |
| 0 | +3 | -0.1 | 0.1 | ON | OFF |
| +3 | 0 | 0.1 | -0.1 | OFF | ON |
| 0 | +5 | -1 | 1 | ON | OFF |
| +5 | 0 | 1 | -1 | OFF | ON |
| 0 | +8 | -5 | 5 | ON | OFF |
| +8 | 0 | 5 | -5 | OFF | ON |

Caution: Do not operate in 1 dB compression at power levels above +31 dBm ($V_{ctl} = +5$ Vdc) and do not "hot switch" power levels greater than +20dBm ($V_{ctl} = +5$ Vdc).

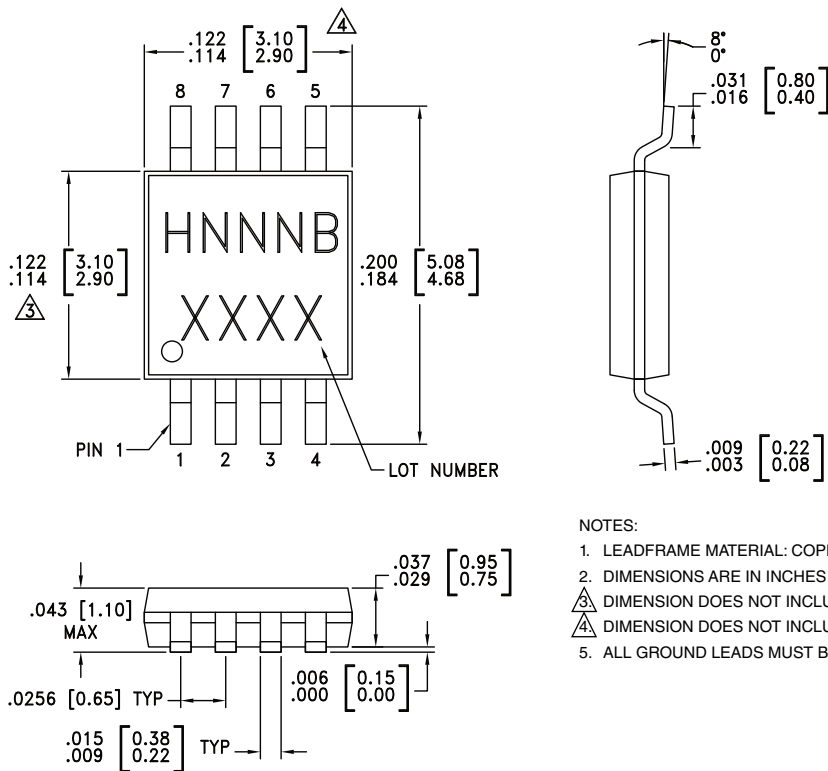
DC blocks are required at ports RFC, RF1 and RF2.



Absolute Maximum Ratings

| | | |
|-------------------------------|-------------|-----------------|
| Max. Input Power | 0.5 GHz | +27 dBm |
| $V_{CTL} = 0/+8V$ | 0.5 - 2 GHz | +34 dBm |
| Control Voltage Range (A & B) | | -0.2 to +12 Vdc |
| Storage Temperature | | -65 to +150 °C |
| Operating Temperature | | -40 to +85 °C |
| ESD Sensitivity (HBM) | | Class 1A |



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

Outline Drawing

NOTES:

- LEADFRAME MATERIAL: COPPER ALLOY
- DIMENSIONS ARE IN INCHES [MILLIMETERS].
-  DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.
-  DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.
- ALL GROUND LEADS MUST BE SOLDERED TO PCB RF GROUND.

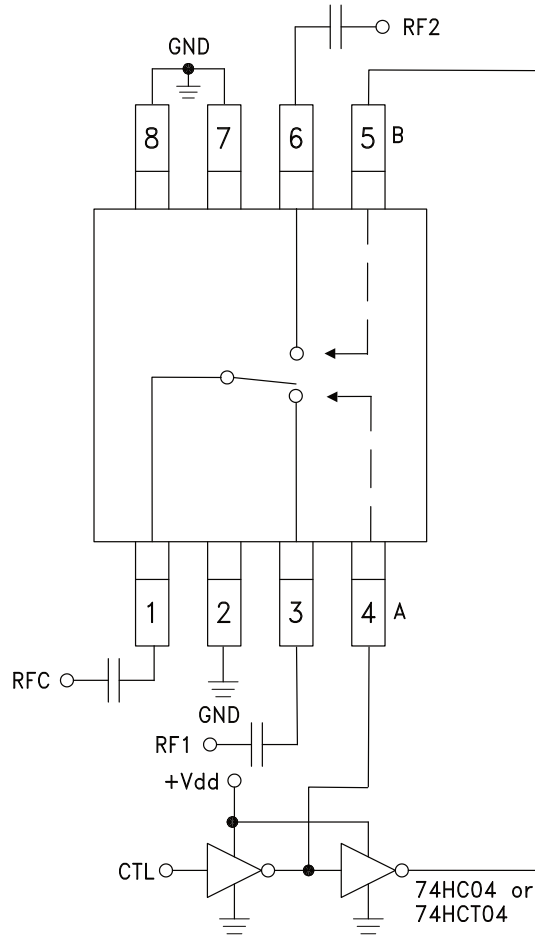
Package Information

| Part Number | Package Body Material | Lead Finish | MSL Rating | Package Marking ^[3] |
|-------------|--|---------------|---------------------|--------------------------------|
| HMC190BMS8 | Low Stress Injection Molded Plastic | Sn/Pb Solder | MSL1 ^[1] | H190B XXXX |
| HMC190BMS8E | RoHS-compliant Low Stress Injection Molded Plastic | 100% matte Sn | MSL1 ^[2] | <u>H190B</u> XXXX |

[1] Max peak reflow temperature of 235 °C

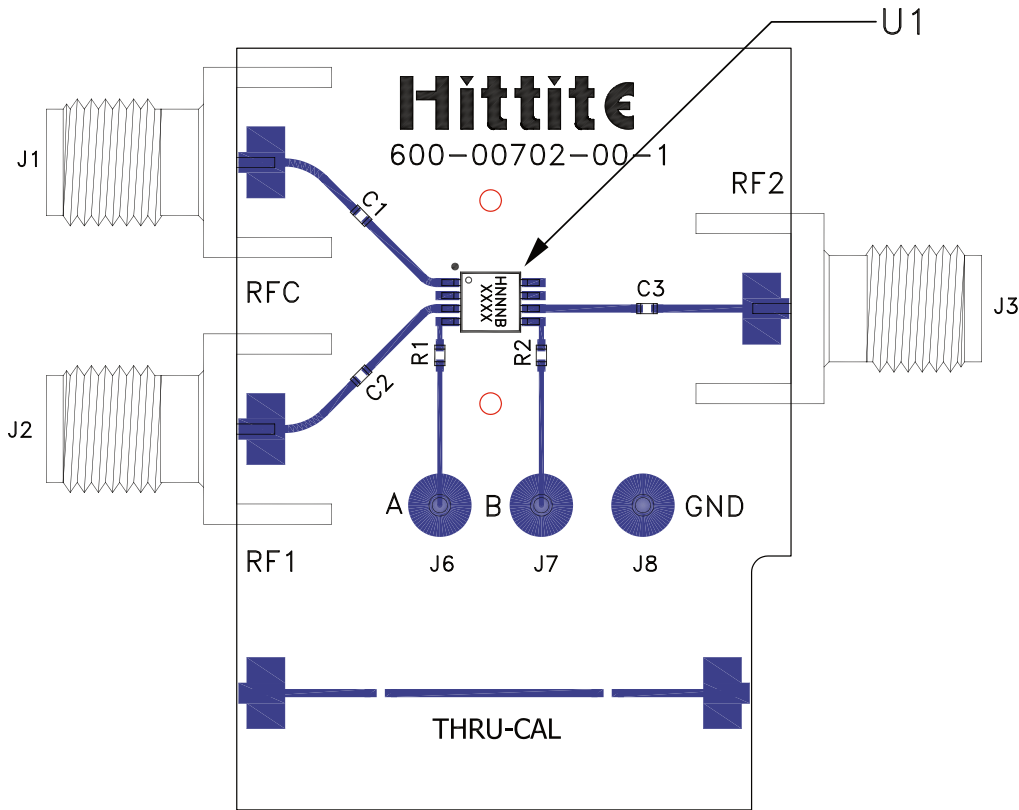
[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX

Typical Application Circuit

Notes:

1. Set logic gate and switch Vdd = +3V to +5V and use HCT series logic to provide a TTL driver interface.
2. Control inputs A/B can be driven directly with CMOS logic (HC) with Vdd of 5 to 8 Volts applied to the CMOS logic gates.
3. DC blocking capacitors are required for each RF port as shown. Capacitor value determines lowest frequency of operation.
4. Highest RF signal power capability is achieved with Vdd = +8V and A/B set to 0/+8V.

Evaluation Circuit Board



List of Materials for Evaluation PCB EVAL01-HMC190BMS8 [1]

| Item | Description |
|---------|--------------------------------|
| J1 - J3 | PCB Mount SMA RF Connector |
| J6 - J8 | DC Pin |
| C1 - C3 | 330 pF Capacitor, 0402 Pkg. |
| R1 - R2 | 1 KOhm Resistor, 0402 Pkg. |
| U1 | HMC190BMS8(E) SPDT Switch |
| PCB [2] | 600-00702-00-01 Evaluation PCB |

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the final application should be generated with proper RF circuit design techniques. Signal lines at the RF port should have 50 Ohm impedance and the package ground leads and package bottom should be connected directly to the ground plane similar to that shown above. The evaluation circuit board shown above is available from Hittite Microwave Corporation upon request.



Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331