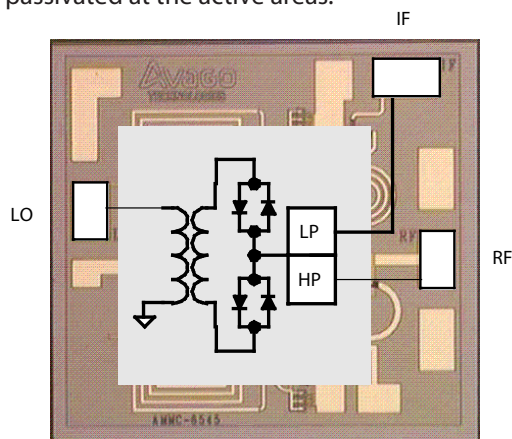


Data Sheet

Description

Avago's AMMC-6545 is an easy-to-use broadband sub-harmonic mixer, with the LO injected at half the frequency of that required by a conventional mixer. MMIC includes an 180° balanced diode based mixer. The MMIC is fabricated using PHEMT technology. The sub-harmonic mixer is designed to be an easy-to-use component for any chip and wire application. Intended applications include microwave radios, 802.16, VSAT and satellite receivers. Since this one mixer can cover several bands, the AMMC-6545 can reduce part inventory. For improved reliability and moisture protection, the die is passivated at the active areas.



Chip Size: 885 μ m x 825 μ m

Chip Size Tolerance: ± 10 μ m (± 0.4 mils)

Chip Thickness: 100 \pm 10 μ m (4 \pm 0.4 mils)

Pad Dimensions: 120 x 80 μ m (4.7 x 3.2 mils)

Features

- RF Frequency: 18-45GHz
- LO Frequency: 9-24GHz
- IF Frequency: DC-3GHz
- Suitable for Up and Down Conversion
- Diode Mixer

Typical Performance

- Conversion Loss: 11.0 \pm 1.5 dB
- 2*LO Leakage @ R port: -39 dBm
- 2*LO Leakage @ I port: -50 dBm
- L-R Isolation: 40 dB
- L-I Isolation: 36 dB
- IP₃ (@LO=+17dBm): +15 dBm
- LO Drive Power: +15 dBm
- LO Drive range (dBm): +12 to +20

Applications

- Microwave Radio systems
- Satellite VSAT, DBS Up/Down Link
- LMDS & Pt-Pt mmW Long Haul
- Broadband Wireless Access (including 802.16 and 802.20 WiMax)
- WLL and MMDS loops

Absolute Maximum Ratings^[1]

| Symbol | Parameter/Condition | Units | Minimum | Maximum |
|------------------|------------------------------------|-------|---------|---------|
| Pin RF | CW Input Power to RF Port | dBm | | 25 |
| T _b | Operating Backside Temp. | °C | -55 | |
| T _{stg} | Storage Temp. | °C | -65 | |
| T _{max} | Maximum Assembly Temp (60 sec max) | °C | | 260 |

Note:

1. Operation in excess of any one of these conditions may result in permanent damage to this device.

DC Specifications/Physical Properties^[2]

1. Operation in excess of any of these conditions may result in permanent damage to this device. The absolute maximum ratings for Pin were determined at an ambient temperature of 25°C unless noted otherwise.
2. Ambient operational temperature T_A=25°C unless noted.
3. Channel-to-backside Thermal Resistance (T_{channel} = 34°C) as measured using infrared microscopy. Thermal Resistance at backside temp. (T_B) = 25°C calculated from measured data.

AMMC-6545 Operating Conditions

| Symbol | Parameters and Test Conditions | Units | Minimum | Typical | Maximum |
|--------|--------------------------------|-------|---------|---------|---------|
| RFfreq | RF Frequency | GHz | 18 | | 48 |
| LOfreq | LO Frequency | GHz | 9 | | 24 |
| IFfreq | IF Frequency | GHz | DC | | 3 |
| LO | LO Drive Power | dBm | +12 | +15 | +22 |

AMMC-6545 RF Specifications

T_A= 25°C, Z_o=50Ω, LO=+15 dBm, IF=2GHz.

| Symbol | Parameters | Frequency (GHz) | Units | Minimum | Typical | Maximum |
|--------|--------------------------------------------|--------------------------------------------------------------------|-------------------|------------------|----------------------|---------|
| CL | Conversion Loss ^[2] | RF=21GHz, LO=11.5GHz RF=23GHz, LO=12.5GHz RF=26GHz, LO=14GHz | dB | | 10 | 12 |
| IIP3 | Input Third Order Intercept ^[2] | RF=21GHz, LO=11.5GHz RF=23GHz, LO=12.5GHz RF=26GHz, LO=14GHz | dBm dBm dBm | 11 9.5 8.5 | 13.5 10.3 10.9 | |
| 2LO-R | 2LO-R Leakage | RF=21GHz, LO=10.5GHz RF=23GHz, LO=11.5GHz RF=26GHz, LO=13GHz | dBm dBm dBm | | -45 | -35 |
| 2LO-I | 2LO-I Leakage | RF=21GHz, LO=10.5GHz RF=23GHz, LO=11.5GHz RF=26GHz, LO=13GHz | dBm dBm dBm | | -50 | |
| L-R | Isolation | | dB | | 40 | |
| L-I | Isolation | | dB | | 36 | |

Notes:

1. Production RF tested at 21, 23 and 26GHz in up-converter configuration.
2. All tested parameters are guaranteed with ±0.5dB for CL and ±1.5dBm for IIP3 and 2LO-R leakage.

AMMC-6545 Typical Performance

$T_A = 25^\circ\text{C}$, $Z_0 = 50\Omega$, LO = +15 dBm, IF = 1GHz, LO Power = +15 dBm unless otherwise noted

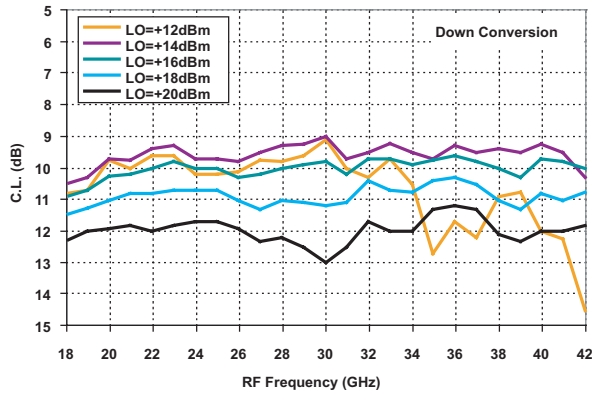


Figure 1. Down-Conversion Loss at LO = +12 to +20 dBm
[LO Freq. = (RF+IF)/2, IF=1GHz].

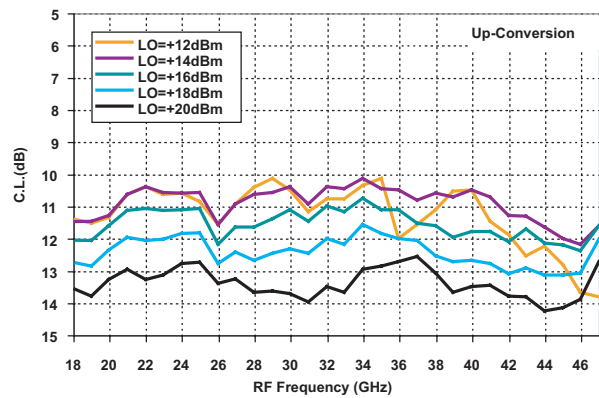


Figure 2. Up-Conversion Loss at LO = +13 to +20 dBm
[LO Freq. = (RF+IF)/2, IF=1GHz].

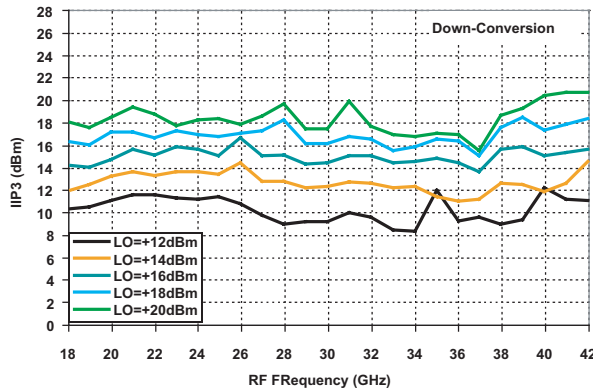


Figure 3. Down-Conversion IIP3 at LO = +12 to +20 dBm
[LO Freq. = (RF+IF)/2, IF=1GHz].

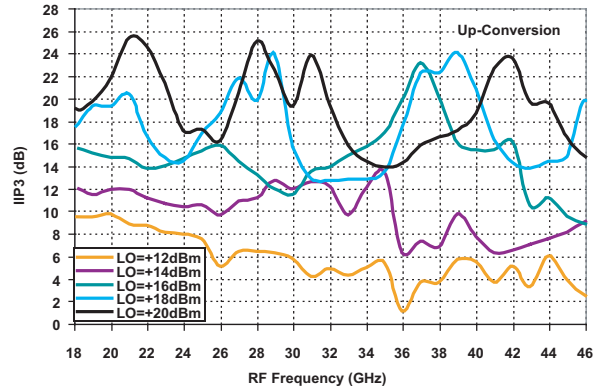


Figure 4. Up-Conversion IIP3 at LO = +12 to +20 dBm
[LO Freq. = (RF+IF)/2, IF=1GHz].

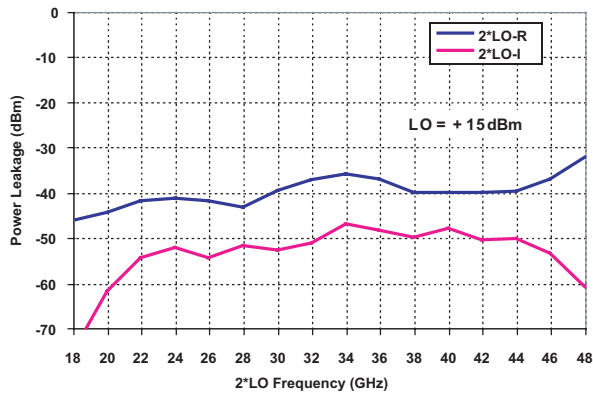


Figure 5. 2*LO-R and 2*LO-I Power Leakage @ LO = +15 dBm.

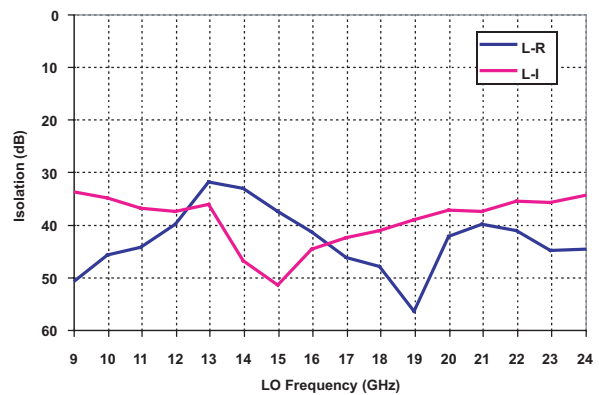


Figure 6. L-R and L-I Isolation @ LO = +15 dBm.

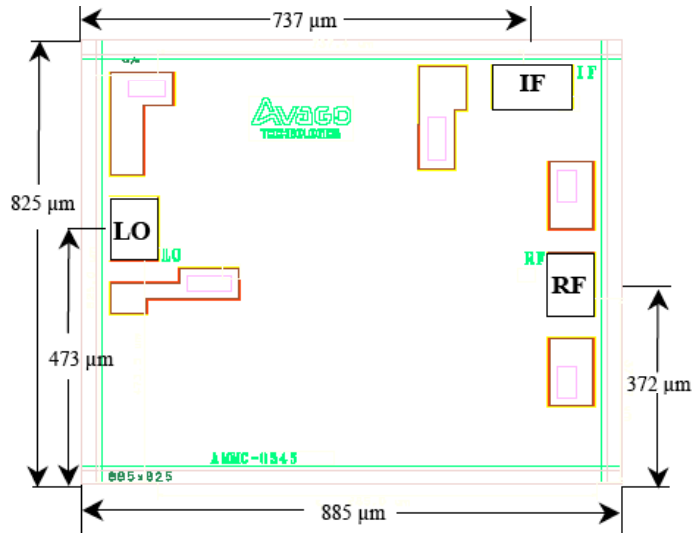


Figure 7. Die dimension details.

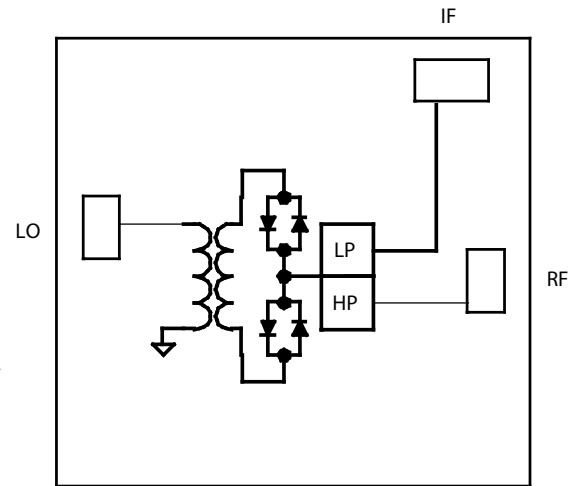


Figure 8. Simplified Schematic of the mixer.

AMMC-6545 Ordering Information

AMMC-6545-W10 = 10 devices per tray

AMMC-6545-W50 = 50 devices per tray

For product information and a complete list of distributors, please go to our web site: www.avagotech.com

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