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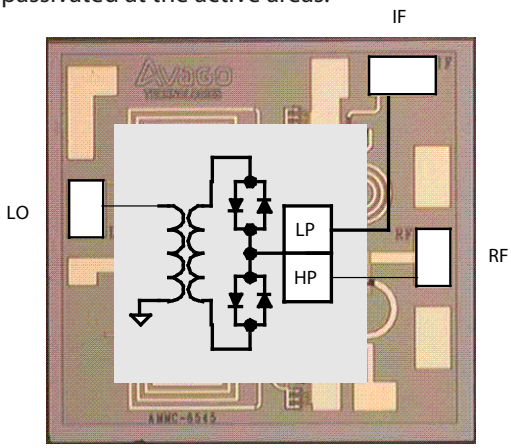
AMMC-6545
18 to 45 GHz Sub-Harmonic Mixer

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: 885µm x 825µm
Chip Size Tolerance: ±10 µm (±0.4 mils)
Chip Thickness: 100 ± 10 µm (4 ±0.4 mils)
Pad Dimensions: 120 x 80 µm (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±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
- IP_3 (@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
Tb	Operating Backside Temp.	°C	-55	
Tstg	Storage Temp.	°C	-65	
Tmax	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, Zo=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°C, Z_o=50Ω, LO=+15 dBm, IF=1GHz, LO Power = +15 dBm unless otherwise noted

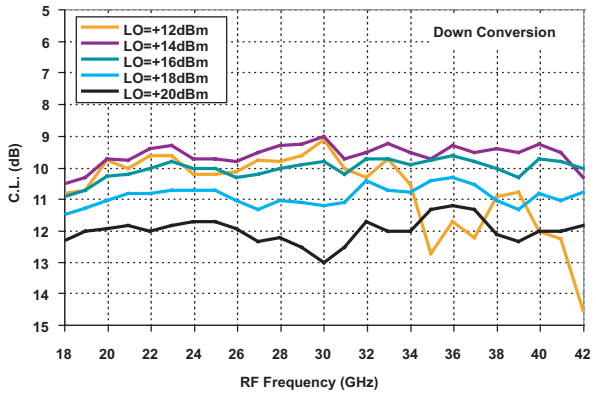


Figure 1. Down-Conversion Loss at LO=+12 to +20dBm [LO Freq. = (RF+IF)/2, IF=1GHz].

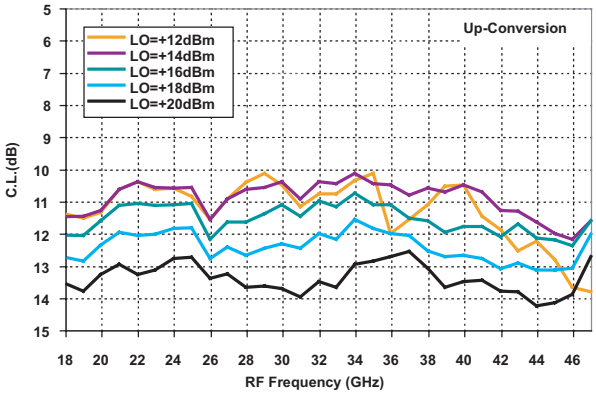


Figure 2. Up-Conversion Loss at LO=+13 to +20dBm [LO Freq. = (RF+IF)/2, IF=1GHz].

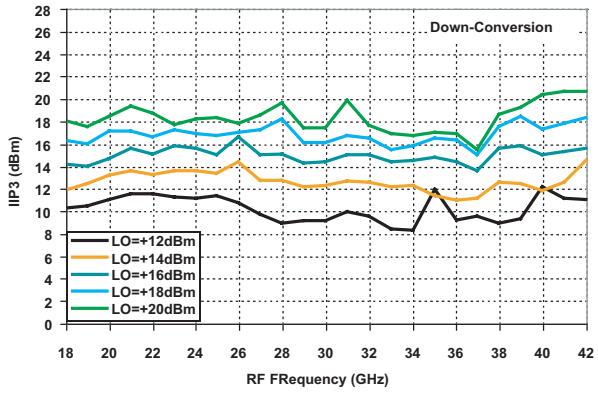


Figure 3. Down-Conversion IIP3 at LO=+12 to +20dBm [LO Freq. = (RF+IF)/2, IF=1GHz].

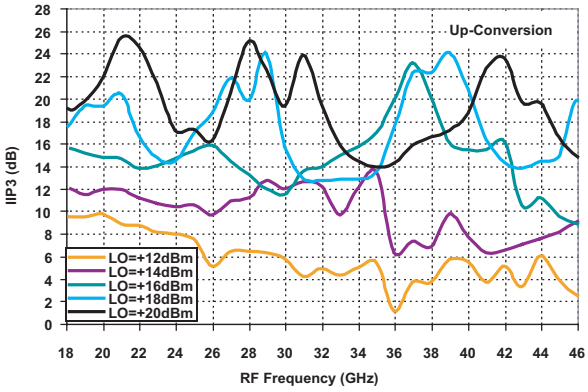


Figure 4. Up-Conversion IIP3 at LO=+12 to +20dBm [LO Freq. = (RF+IF)/2, IF=1GHz].

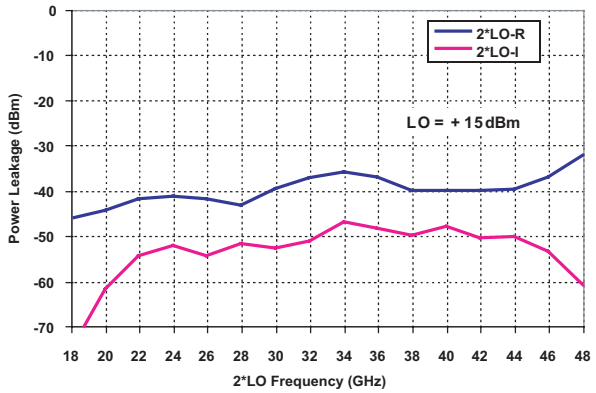


Figure 5. 2*LO-R and 2*LO-I Power Leakage @LO=+15dBm.

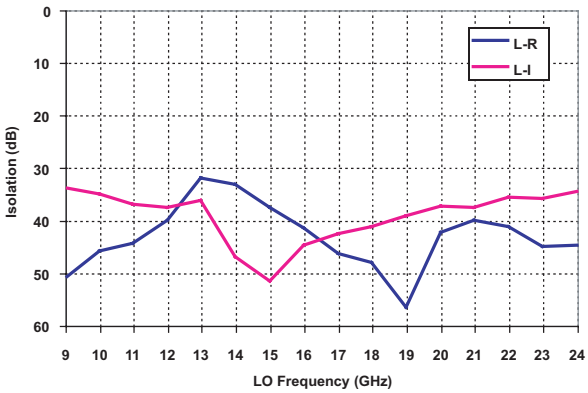


Figure 6. L-R and L-I Isolation @LO=+15dBm.

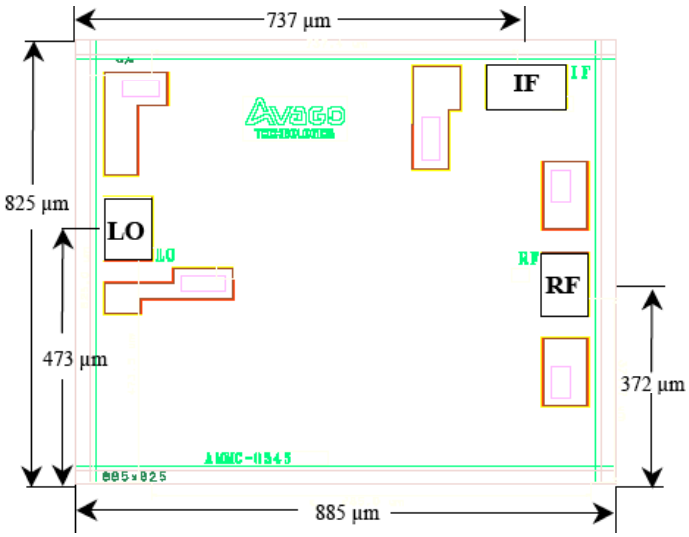


Figure 7. Die dimension details.

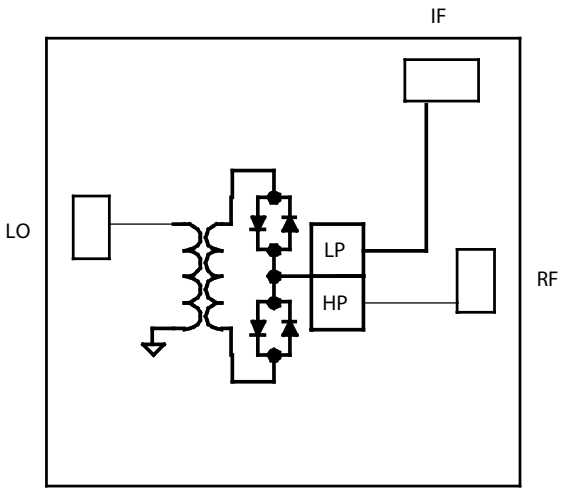


Figure 8. Simplified Schematic of the mixer.

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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