

Preliminary

ES/FMM5116YE

K,Ka-Band Up-Converter MMIC

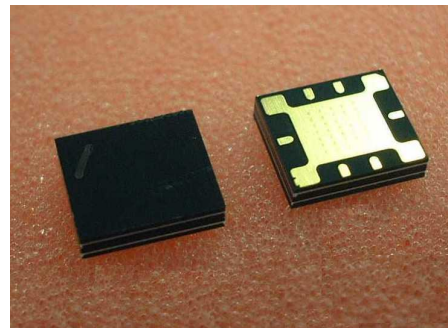
FEATURES

- High Conversion Gain, $G_c = -11$ dB (Typ.)
- High Linearity
- Broad RF Frequency Band ; 20 - 30 GHz
- SMT Laminate Package (YE Package)
- Impedance Matched $Z_{in}/Z_{out} = 50\Omega$

DESCRIPTION

The FMM5116YE is a double, single balanced diode mixer up-converter MMIC. The device consists of a low noise mixer, LO amplifier, and LO frequency doubler. This upconverter is uniquely suited for point-to-point radios, point-to-multi point radios, and satellite communications.

Eudyna's stringent Quality Assurance Program assures the highest reliability and consistent performance.



ABSOLUTE MAXIMUM RATING

Item	Symbol	Rating	Unit
DC Supply Voltage	V _{DD}	8	V
IF Input Power	P _{inIF}	20	dBm
Lo Input Power	P _{inLO}	10	dBm
Storage Temperature	T _{stg}	-55 to +125	°C

RECOMMENDED OPERATING CONDITIONS

Item	Symbol	Recommend	Unit
DC Supply Voltage	V _{DD}	<=5	V
Input Local power level	P _{inLO}	0 to +5	dBm
Operating Case Temperature	T _c	-40 to +85	°C

ELECTRICAL CHARACTERISTICS (Ambient Temperature T_a=25°C)

Item	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
RF Frequency Range	f _{RF}	V _{DD} =+5V P _{LO} =+3dBm P _{IF} =0dBm	20	-	30	GHz
LO Frequency Range	f _{LO}		9.5	-	16.5	GHz
IF Frequency Range	f _{IF}		0.1	-	3	GHz
Conversion Gain	G _c		-19	-11	-	dB
Conversion Gain Flatness (fixed f _{IF} , swept f _{LO}) (f _{IF} =1.0GHz)	dG		-	3	-	dB
Conversion Gain Flatness (fixed f _{LO} , swept f _{IF}) (f _{LO} =13.5GHz)	dG		-	2	-	dB
Return Loss (RF/LO)	RL _{RF} , RL _{LO}		-	-12	-	dB
Return Loss (IF)	RL _{IF}		-	-4	-	dB
Input P _{1dB} at IF port	P _{1dBIFin}		-	14	-	dBm
3rd Order Input Intercept Point	IIP ₃		-	22	-	dBm
Current Consumption @DC	I _{DD} (DC)	-	120	170	mA	
Current Consumption @RF	I _{DD} (RF)	-	160	220	mA	

ESD	Class 0	~ 250V
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Note : Based on JEDEC JESD22-A114-C

Case Style	YE
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Edition 1.1
July 2008

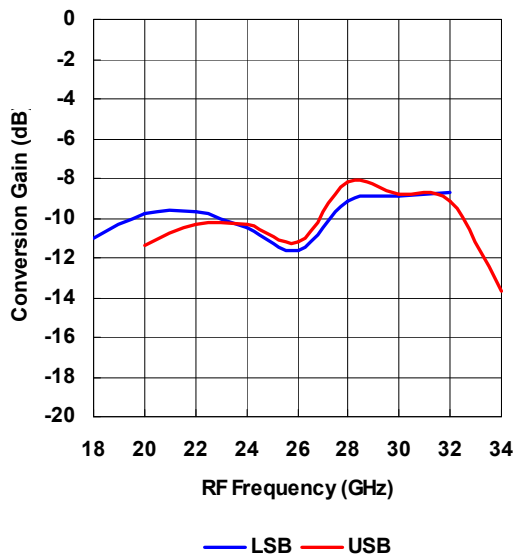
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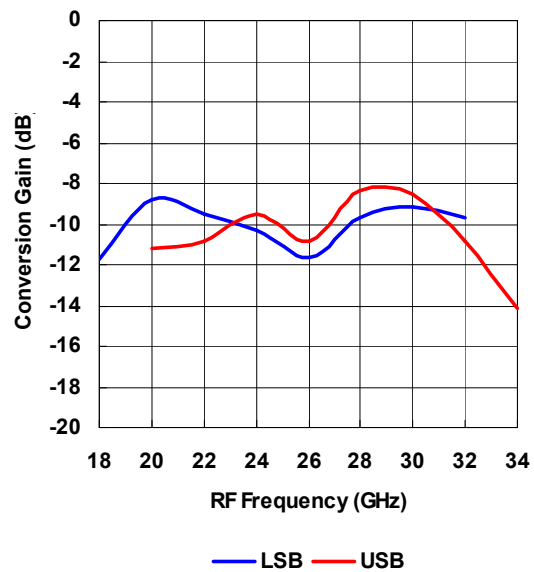
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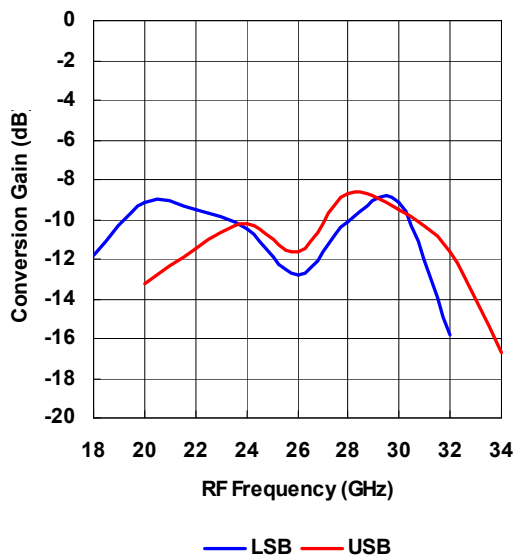
Conversion Gain vs. Frequency
@ $f_{IF}=1\text{GHz}$, $V_{DD}=5\text{V}$, $P_{in(IF)}=0\text{dBm}$, $P_{in(Lo)}=+3\text{dBm}$



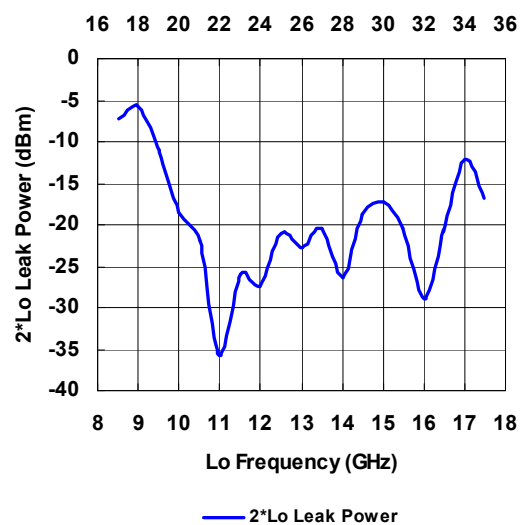
Conversion Gain vs. Frequency
@ $f_{IF}=2\text{GHz}$, $V_{DD}=5\text{V}$, $P_{in(IF)}=0\text{dBm}$, $P_{in(Lo)}=+3\text{dBm}$



Conversion Gain vs. Frequency
@ $f_{IF}=3\text{GHz}$, $V_{DD}=5\text{V}$, $P_{in(IF)}=0\text{dBm}$, $P_{in(Lo)}=+3\text{dBm}$



2xLo Leak Power vs. Frequency
@ $V_{DD}=5\text{V}$, $P_{in(Lo)}=+3\text{dBm}$
2*Lo Frequency (GHz)

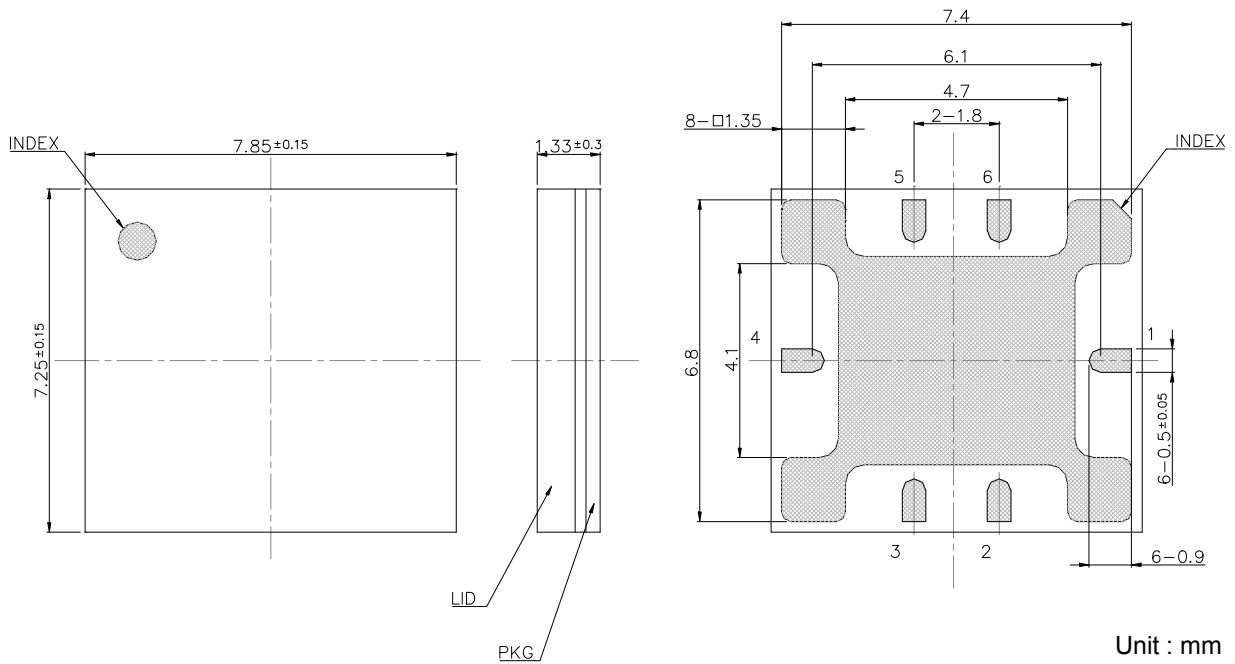


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■ Package Outline



Pin Assignment

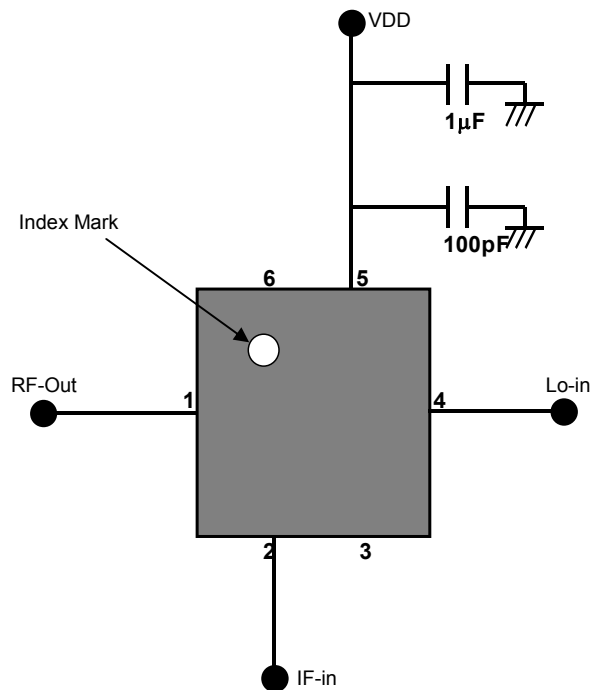
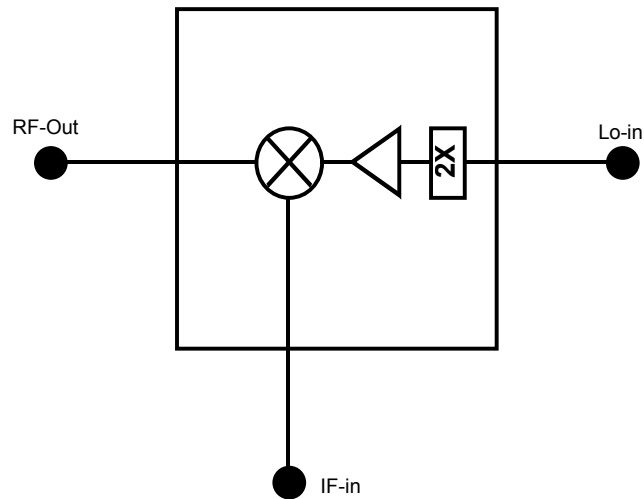
- 1 : RF-Output
- 2 : IF-Input
- 3 : N.C.
- 4 : Lo-Input
- 5 : VDD
- 6 : N.C.

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■ Block Diagram and External Component



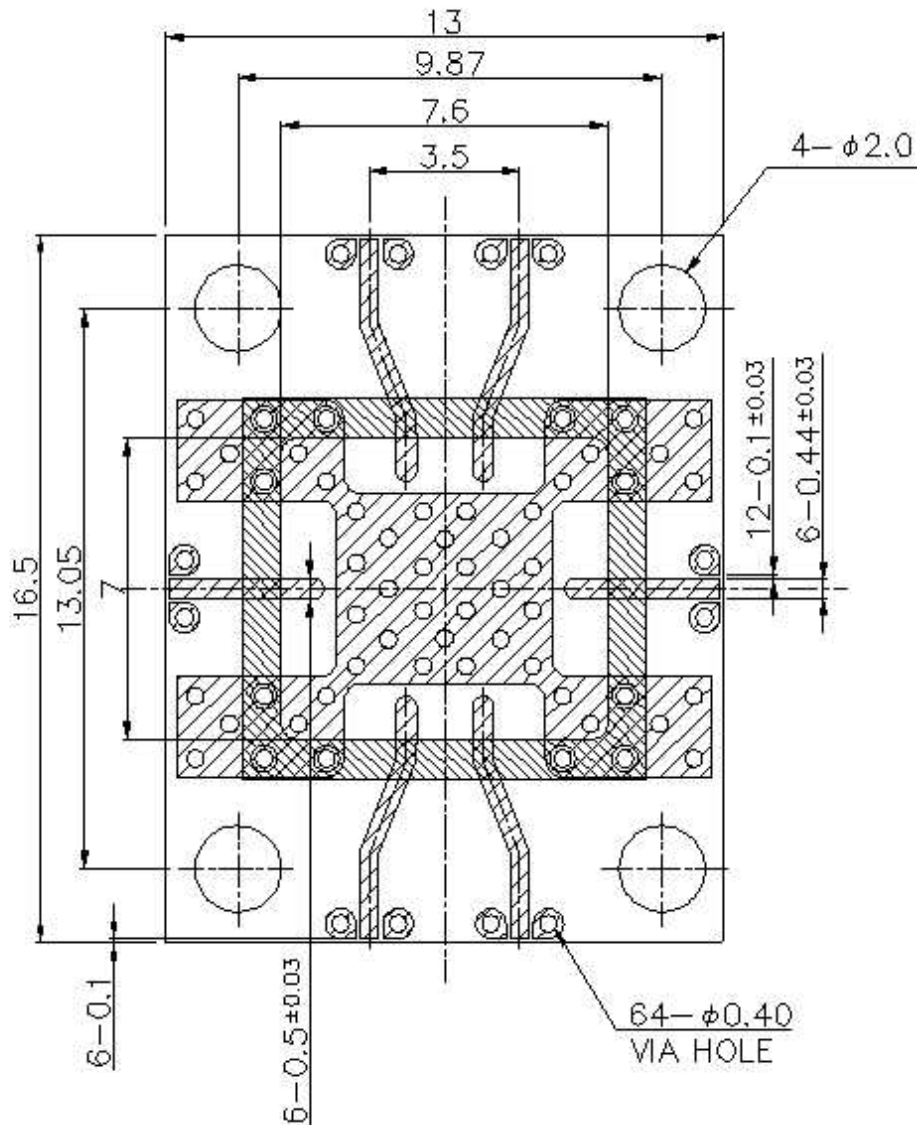
Note) : The capacitors are recommended on the bias supply line, close to the package, in order to prevent video oscillations which could damage the module.

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■ Recommended Foot Pattern Layout



Notes :

- 1.LAMINATE : Rogers Corporation RO4003, Thickness $t=0.2\text{mm}$, Cu Foil $18\ \mu\text{m}$
2.  : Finish to copper foil ; Ni $0.1\ \mu\text{m}$ min./Au $0.1\pm 0.08\ \mu\text{m}$ (Both side)
3.  : Resist

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