

SILICON MMIC L-BAND DOWNCONVERTER

UPC2734GR

FEATURES

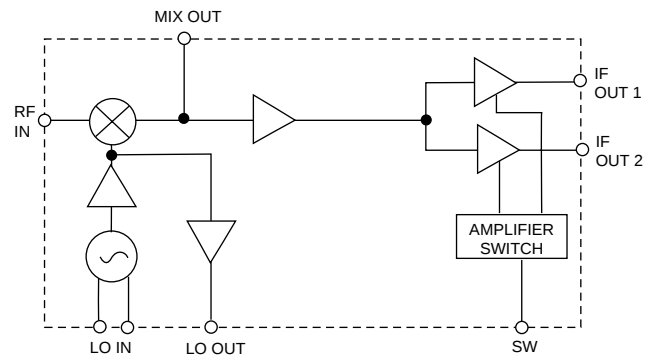
- BROADBAND FREQUENCY OPERATION**
RF = 0.9 - 2.1 GHz, LO = 1.1 - 2.5 GHz
- HIGH DYNAMIC RANGE:**
PSAT = +5 dBm Typical
- LOW DISTORTION:**
IP3 = +11 dBm Typical
- SWITCHABLE IF OUTPUTS**
- SMALL SSOP20 PACKAGE**
- TAPE AND REEL PACKAGING AVAILABLE**

DESCRIPTION

The UPC2734GR Silicon MMIC Frequency Downconverter is manufactured using the NESAT III MMIC process. The NESAT III process produces transistors with f_T approaching 20 GHz. The device was designed specifically for use as a Receiver/Downconverter in wide-dynamic range DBS, compressed video or spread-spectrum receivers.

NEC's stringent quality assurance and test procedures ensure the highest reliability and performance.

INTERNAL BLOCK DIAGRAM



SW	OUTPUT
$V_{SW} \leq 2 \text{ V}^*$	IF OUT 1
$V_{SW} \oplus 3 \text{ V}$	IF OUT 2

* If SW is left open, IF OUT1 is selected.

ELECTRICAL CHARACTERISTICS¹ ($T_A = 25^\circ \text{C}$, $V_{CC} = 5 \text{ V}$, $P_{LO} = -10 \text{ dBm}$)

PART NUMBER PACKAGE OUTLINE			UPC2734GR S20 (SSOP20)		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I_{CC}	Circuit Current (no signal)	mA	28	40	52
f_{RF}	RF Frequency Range	GHz	0.9		2.1
CG	Conversion Gain $f_{RF} = 900 \text{ MHz}$, $f_{IF} = 402.8 \text{ MHz}$ $f_{RF} = 900 \text{ MHz}$, $f_{IF} = 479.5 \text{ MHz}$ $f_{RF} = 2.1 \text{ GHz}$, $f_{IF} = 402.8 \text{ MHz}$ $f_{RF} = 2.1 \text{ GHz}$, $f_{IF} = 479.5 \text{ MHz}$	dB	10	13	16
		dB	9	12	15
		dB	7.5	10.5	13.5
		dB	7	10	13
NF	Noise Figure $f_{RF} = 900 \text{ MHz}$, $f_{IF} = 402.8 \text{ MHz}$ $f_{RF} = 900 \text{ MHz}$, $f_{IF} = 479.5 \text{ MHz}$ $f_{RF} = 2.1 \text{ GHz}$, $f_{IF} = 402.8 \text{ MHz}$ $f_{RF} = 2.1 \text{ GHz}$, $f_{IF} = 479.5 \text{ MHz}$	dB		9	11
		dB		10	13
		dB		14	17
		dB		15	18
PSAT	Saturated Output Power ($P_{IN} = 0 \text{ dBm}$) $f_{RF} = 900 \text{ MHz}$, $f_{IF} = 402.8 \text{ MHz}$ $f_{RF} = 900 \text{ MHz}$, $f_{IF} = 479.5 \text{ MHz}$ $f_{RF} = 2.1 \text{ GHz}$, $f_{IF} = 402.8 \text{ MHz}$ $f_{RF} = 2.1 \text{ GHz}$, $f_{IF} = 479.5 \text{ MHz}$	dBm	+1	+4	
		dBm	+0.5	+3.5	
		dBm	+1	+4	
		dBm	0	+3	
IP3	SSB 3rd Order Intercept Point $f_1 = 900 \text{ MHz}$, $f_2 = 930 \text{ MHz}$ $f_1 = 2.1 \text{ GHz}$, $f_2 = 2.13 \text{ GHz}$	dBm		+11	
		dBm		+10	

Note:

1. Test Circuit.

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{CC}	Supply Voltage	V	6
P _D	Power Dissipation ²	mW	433
T _{OP}	Operating Temperature	°C	-40 to +85
T _{STG}	Storage Temperature	°C	-65 to +150

Notes:

- Operation in excess of any one of these parameters may result in permanent damage.
- Mounted on a 50 x 50 x 1.6 mm epoxy glass PWB (T_A = +75°C).

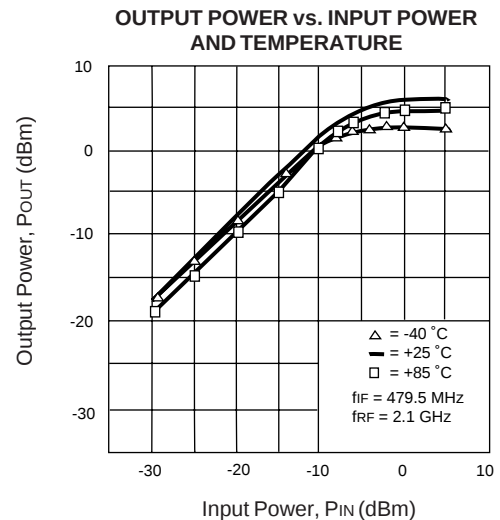
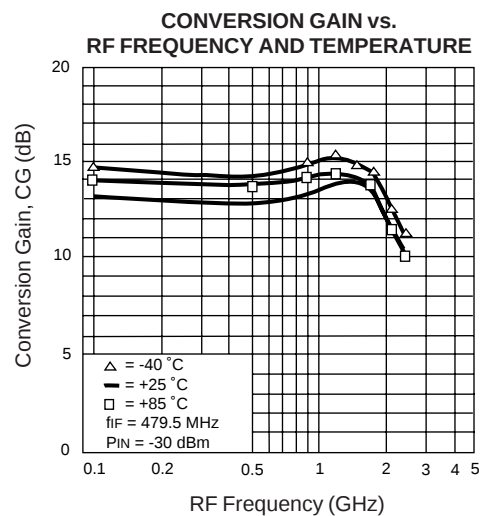
RECOMMENDED OPERATING CONDITIONS

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V _{CC}	Supply Voltage	V	4.5	5.0	5.5
T _{OP}	Operating Temperature	°C	-40	25	85

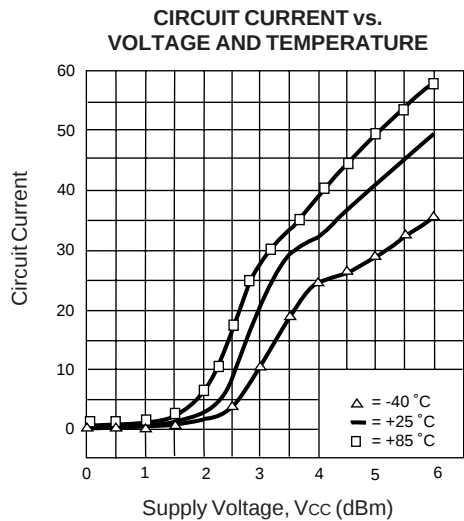
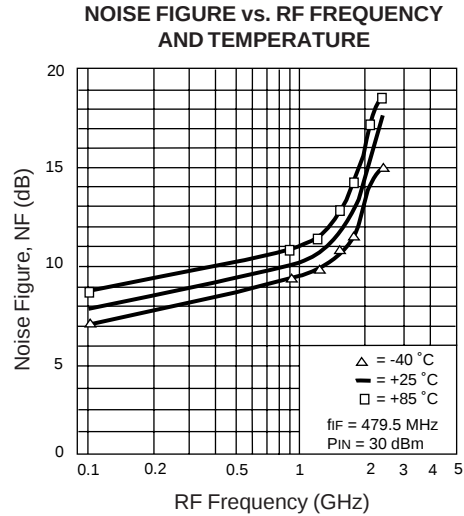
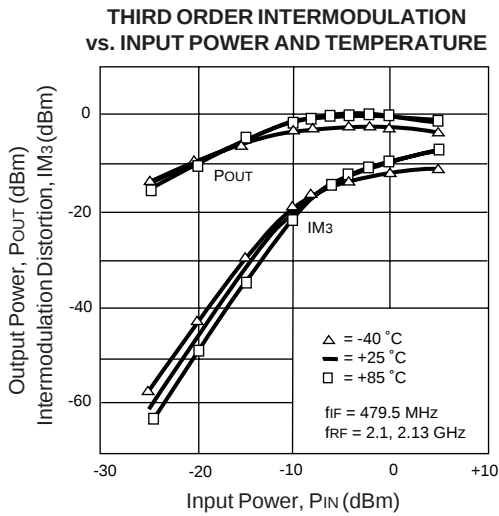
ELECTRICAL CHARACTERISTICS (T_A = 25° C, V_{CC} = 5 V, Measured using Application Circuit)

PART NUMBER PACKAGE OUTLINE			UPC2734GR S20 (SSOP20)		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
f _{RF}	RF Frequency Range	GHz	0.9		2.1
CG	Conversion Gain f _{RF} = 900 MHz, f _{IF} = 402.8 MHz f _{RF} = 900 MHz, f _{IF} = 479.5 MHz f _{RF} = 2.1 GHz, f _{IF} = 402.8 MHz f _{RF} = 2.1 GHz, f _{IF} = 479.5 MHz	dB		14	
		dB		13.5	
		dB		14.5	
		dB		14	
NF	Noise Figure f _{RF} = 900 MHz, f _{IF} = 402.8 MHz f _{RF} = 900 MHz, f _{IF} = 479.5 MHz f _{RF} = 2.1 GHz, f _{IF} = 402.8 MHz f _{RF} = 2.1 GHz, f _{IF} = 479.5 MHz	dB		9.7	
		dB		9.7	
		dB		11	
		dB		11	
P _{SAT}	Saturated Output Power (P _{IN} = 0 dBm) f _{RF} = 900 MHz, f _{IF} = 402.8 MHz f _{RF} = 900 MHz, f _{IF} = 479.5 MHz f _{RF} = 2.1 GHz, f _{IF} = 402.8 MHz f _{RF} = 2.1 GHz, f _{IF} = 479.5 MHz	dBm		+5	
		dBm		+4	
		dBm		+5	
		dBm		+5.5	
IP ₃	SSB 3rd Order Intercept Point f _{RF1} = 900 MHz, f _{RF2} = 930 MHz f _{RF1} = 2.1 GHz, f _{RF2} = 2.13 GHz	dBm		+11	
		dBm		+11	

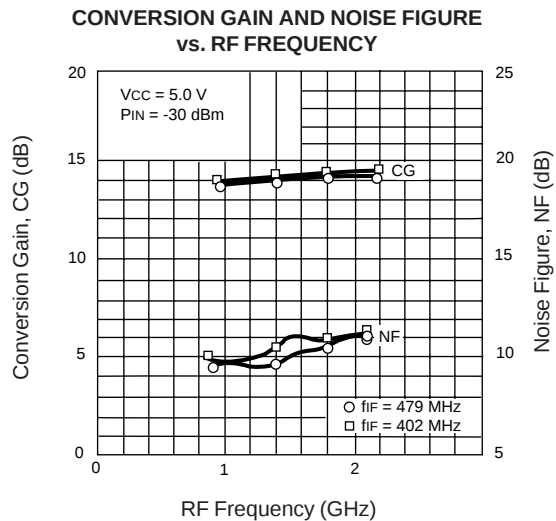
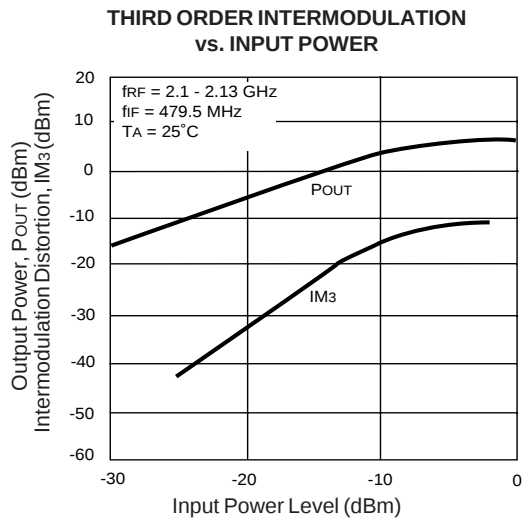
TYPICAL PERFORMANCE CURVES (V_{CC} = 5 V, from Test Circuit)



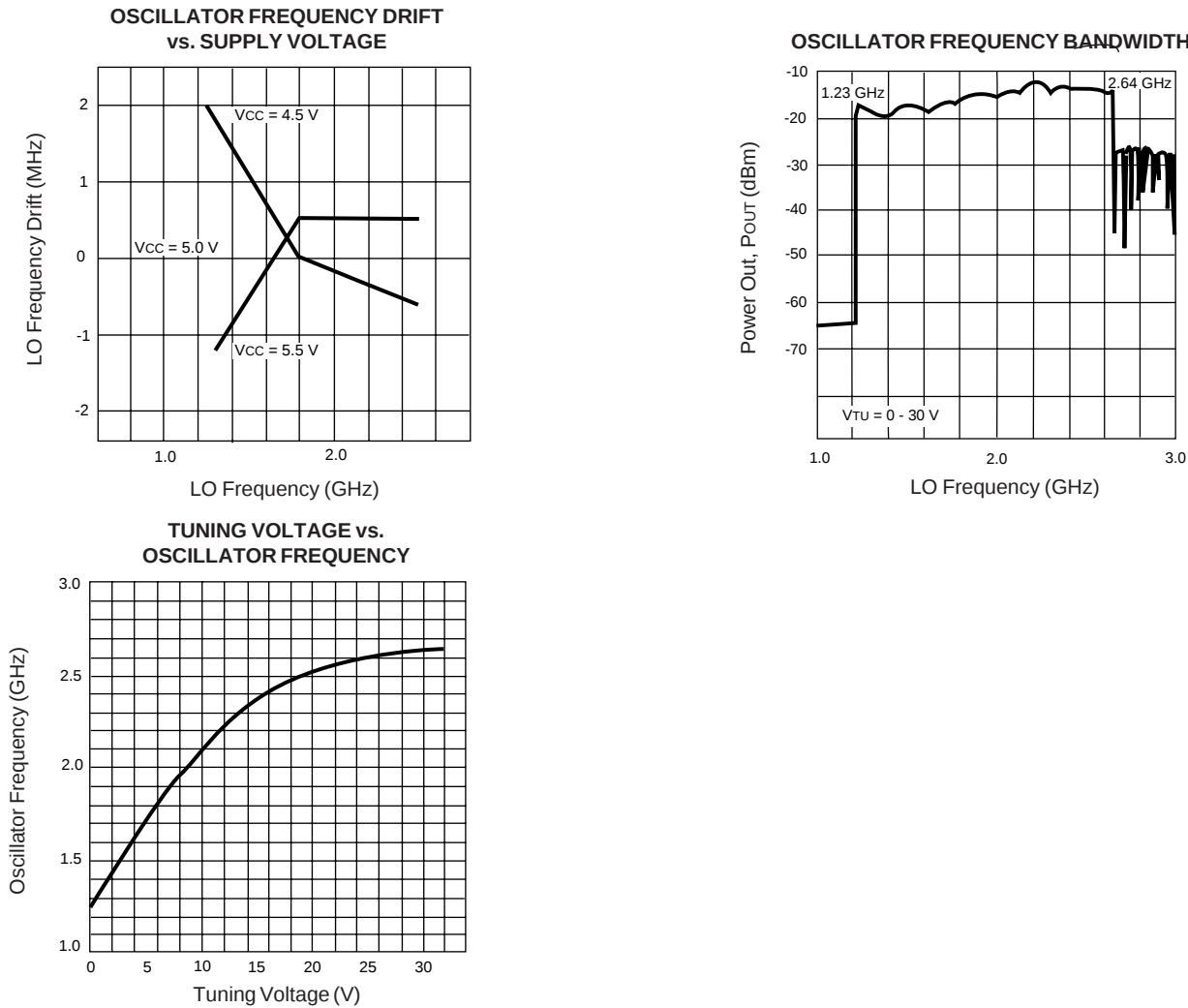
TYPICAL PERFORMANCE CURVES (V_{CC} = 5 V, from Test Circuit)



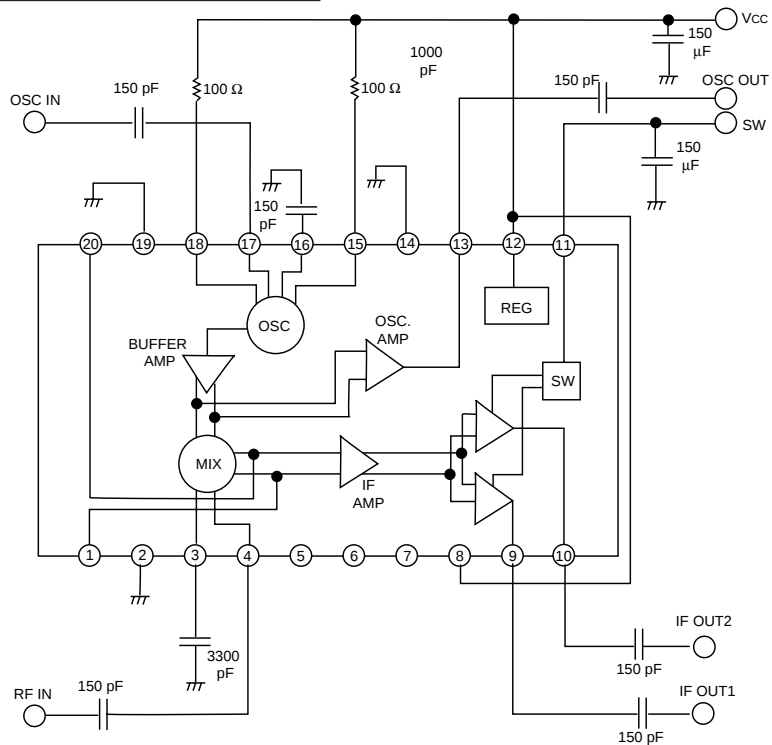
TYPICAL PERFORMANCE CURVES (V_{CC} = 5 V, from Application Circuit)



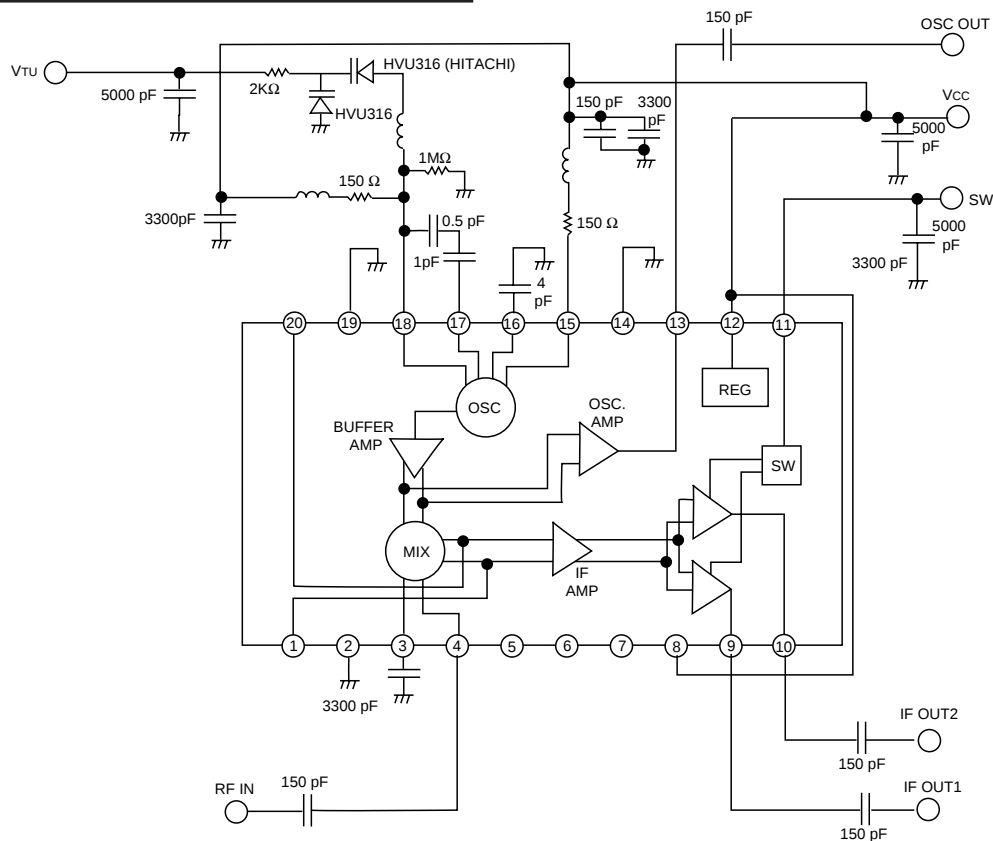
TYPICAL PERFORMANCE CURVES (TA = 25°C, Vcc = 5 V unless otherwise specified, from Application Circuit)



TEST CIRCUIT

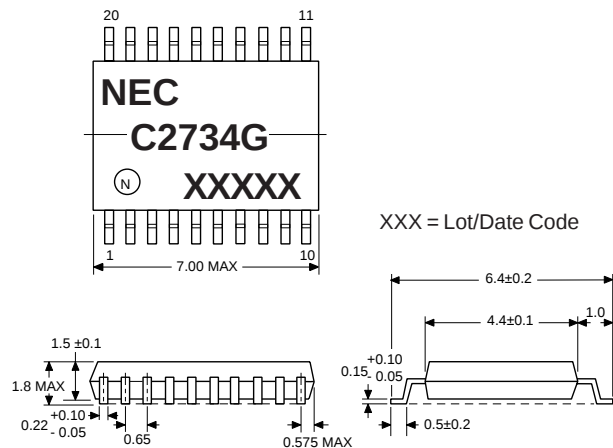


APPLICATION CIRCUIT



OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE SSOP 20



All dimensions are typical unless otherwise specified.
Lead Material: Alloy 42
Lead Plating: Lead Tin Alloy

LEAD CONNECTIONS

- | | |
|--------------------|---------------------------|
| 1. Mixer IF Output | 11. SW - IF Amp Switch |
| 2. GND | 12. VCC |
| 3. Bypass (RF IN) | 13. OSC OUT |
| 4. RF IN | 14. GND |
| 5. NC | 15. OSC Collector 1 |
| 6. NC | 16. OSC Base 2 |
| 7. NC | 17. OSC Base 1 |
| 8. VCC | 18. OSC Collector 2 |
| 9. IF OUT 1 | 19. GND |
| 10. IF OUT 2 | 20. Bypass (Mixer IF OUT) |

NC = No Connection

ORDERING INFORMATION

PART NUMBER	QUANTITY
UPC2734GR-E1	2500/Reel

Note:
Embossed Tape, 12 mm wide.
Pins 1 through 10 are in tape pull-out direction.