

MC13751

Dual-Band Upmixer and Driver Amplifier

The MC13751 is an integrated transmit upmixer and driver amplifier designed for use in cellular phones. It includes two mixers and two RF step attenuators. The device is fabricated using Motorola's Advanced RF BiCMOS process with the SiGe:C option and is housed in a leadless QFN-24 package.

- Total Gain:
 22 dB for Low Band
 19.5 dB for High Band
- Total Current Consumption = 53 mA (Typ)
- Available in Tape and Reel, 2500 Units per 12 mm, 7 inch Reel

DUAL-BAND UPMIXER AND DRIVER AMPLIFIER

SEMICONDUCTOR TECHNICAL DATA

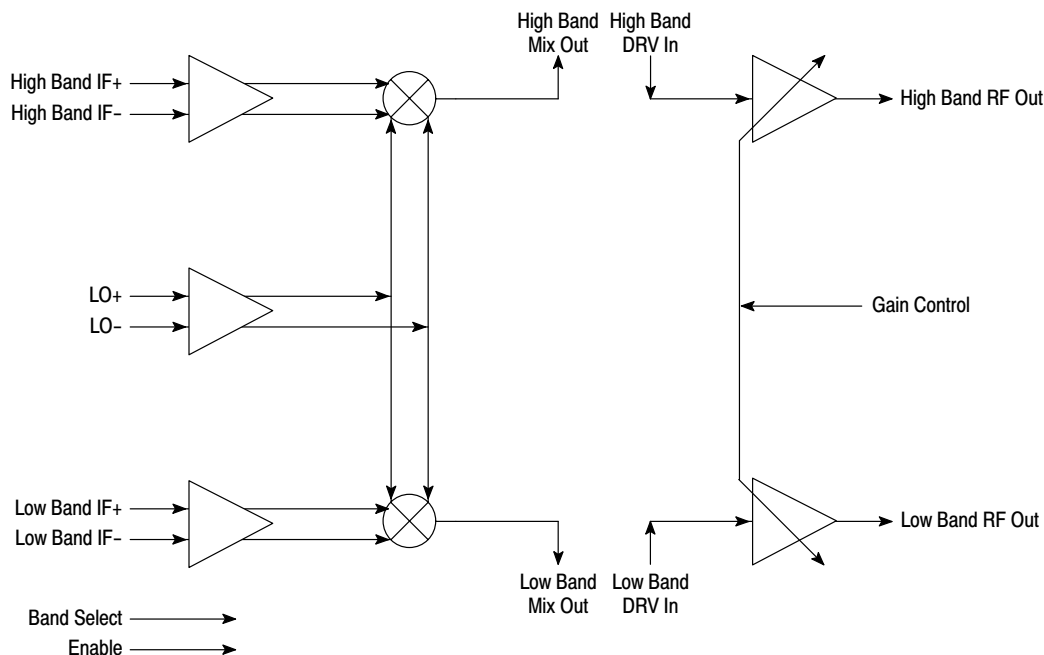


(Scale 2:1)

PLASTIC PACKAGE
 CASE 1307
 (QFN-24, Tape and Reel Only)

ORDERING INFORMATION

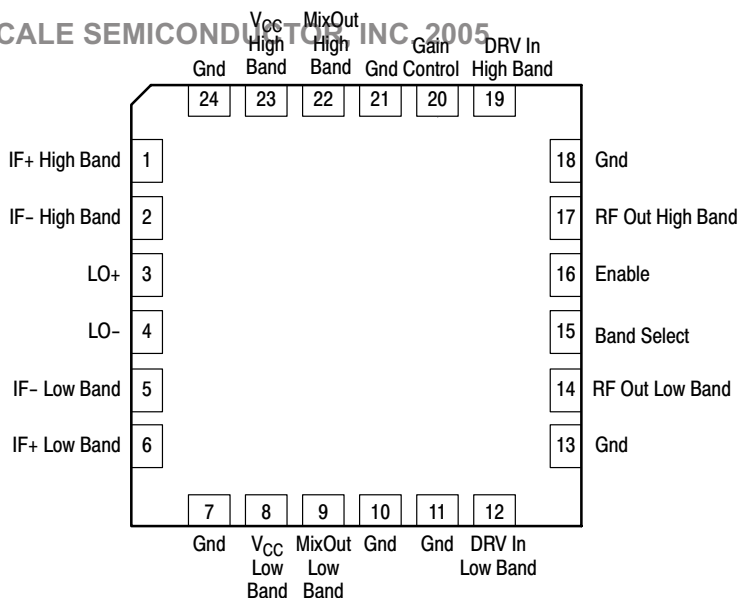
Device	Device Marking	Package
MC13751FCR2	MC751	QFN-24

Simplified Block Diagram


This device contains 223 active transistors.

CONTACT CONNECTIONS

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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Supply Voltage	V _{CC}	3.6	V
LO Input Power		0	dBm
IF Input Level		0	dBm
Operating Temperature Range	T _A	-30 to 85	°C

NOTES: 1. Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the limits in the Electrical Characteristics tables.
 2. ESD (electrostatic discharge) immunity meets Human Body Model (HBM) ≤250 V and Machine Model (MM) ≤25 V. Additional ESD data available upon request.

DC ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
Supply Voltage		2.7	2.78	2.86	V
Power Supply Current		-	53	64	mA
Enable					V
Inactive State		-	-	0.6	
Active State		1.6	-	-	
Band					V
800 MHz Enabled		-	-	0.6	
1900 MHz Enabled		1.6	-	-	
Power Down State Leakage Current (0.2 V Logic Levels)		-	-	25	μA
Gain Select Voltage					V
Gain High = 1		1.6	-	-	
Gain Low = 0		-	-	0.6	
Gain Select (enable and band signals current)		-	-	10	μA

ELECTRICAL CHARACTERISTICS

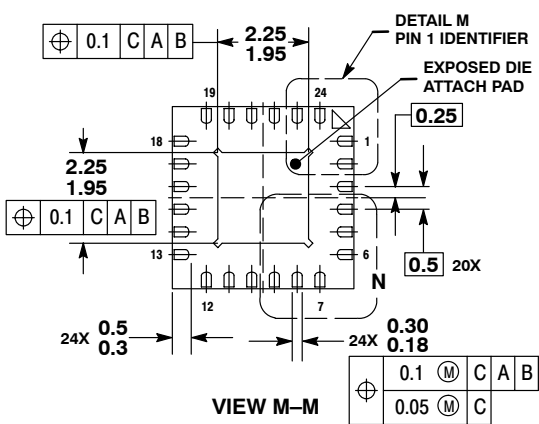
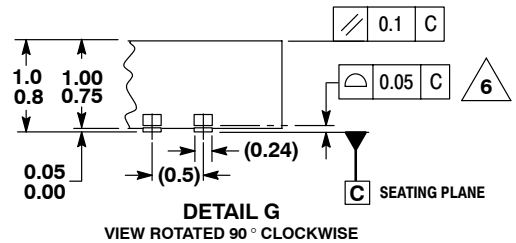
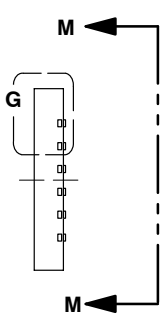
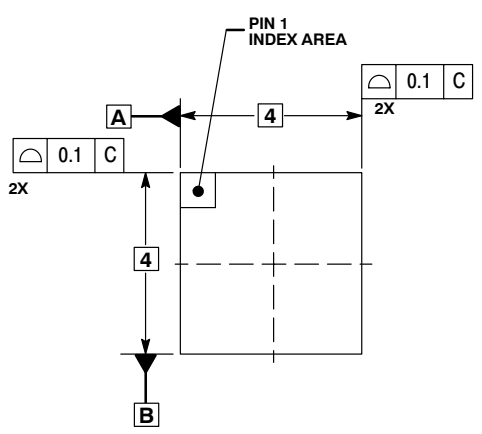
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
IF Frequency						MHz
Low Band			150	178	250	
High Band			150	213	250	
LO Frequency Range						MHz
Low Band			1002	–	1029	
High Band			2028	–	2125	
RF Frequency Range						MHz
Low Band			824	–	849	
High Band			1850	–	1910	
IF Input Level, Both Bands (differential, typ –7.0 dBm)			–60	–	0	dBm
LO Input Level, Both Bands (differential)			–12	–10	–8.0	dBm
RF GMSK Output Level						dBm
Both Bands			10	–	–	
Both Bands, Low Gain			6.0	–	–	
RF Linear Output Level, TDMA						dBm
Both Bands			6.0	–	–	
Both Bands, Low Gain			2.0	–	–	
ACP						dBc
@ f ±30 kHz, TDMA			–32	–	–	
@ f ±60 kHz, TDMA			–51	–	–	
@ f ±200 kHz, GSM			–36	–	–	
@ f ±400 kHz, GSM			–66	–	–	
Conversion Gain Mixer						dBc
Low Band			6.3	8.3	10.3	
High Band			6.5	8.5	10.5	
Gain, Driver, High Gain						dBc
Low Band			11.7	13.7	15.7	
High Band			9.0	11	13	
Gain, Drivers, Low Gain						dBc
Low Band			7.7	9.7	11.7	
High Band			5.0	7.0	9.0	
Noise Figure						dB
Mixer (SSB)			–	11	14	
Drivers			–	5.0	8.0	
IF Impedance (differential)			–	200	–	Ω
LO Impedance (differential)			–	100	–	Ω
RF Impedance (Both Bands @ Mixer (rf out, driver rf in and driver rf out))			–	50	–	Ω

SPURIOUS (measured with interstage filter)

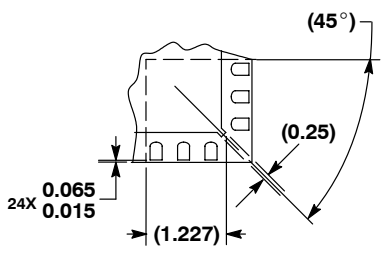
Characteristic	Symbol	Min	Typ	Max	Unit
LO Leakage to RF Port (Both bands, P _{out} = 6.0 dBm)		–	–	–20	dBc
IF Leakage to RF Port (Both bands)		–	–	–50	dBc
Image Supression (Both bands)		–	–	–20	dBc
2x Image Supression (Both bands)		–	–	–40	dBc
LO – 2x IF (Both bands)		–	–	–30	dBc
2x LO – 7x IF (Low band)		–	–	–40	dBc
5 * IF (Low band)		–	–	–80	dBc
11 * IF (Low band)		–	–	–80	dBc

OUTLINE DIMENSIONS

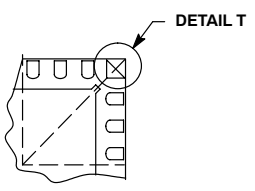
ARCHIVED BY FREESCALE SEMICONDUCTOR, INC. 2005 PLASTIC PACKAGE CASE 1307-01 (QFN-24) ISSUE B



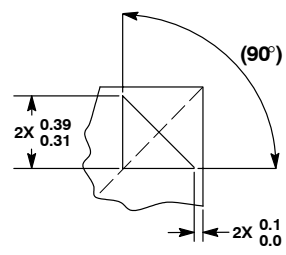
- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS.
 2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994.
 3. THE COMPLETE JEDEC DESIGNATOR FOR THIS PACKAGE IS: HF-PQFP-N.
 4. CORNER CHAMFER MAY NOT BE PRESENT. DIMENSIONS OF OPTIONAL FEATURES ARE FOR REFERENCE ONLY.
 5. CORNER LEADS CAN BE USED FOR THERMAL OR GROUND AND ARE TIED TO THE DIE ATTACH PAD. THESE LEADS ARE NOT INCLUDED IN THE LEAD COUNT.
 6. COPLANARITY APPLIES TO LEADS, CORNER LEADS, AND DIE ATTACH PAD.
 7. FOR ANVIL SINGULATED QFN PACKAGES, MAXIMUM DRAFT ANGLE IS 12°.



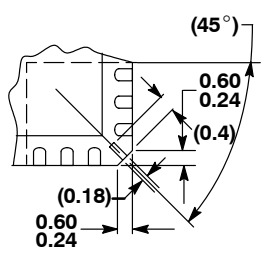
DETAIL N
PREFERRED CORNER CONFIGURATION
4



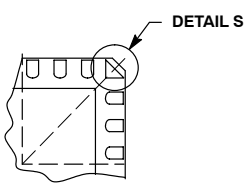
DETAIL M
PREFERRED PIN 1 BACKSIDE IDENTIFIER



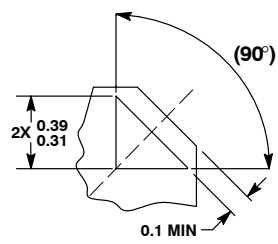
DETAIL T
PREFERRED PIN 1 BACKSIDE IDENTIFIER



DETAIL N
CORNER CONFIGURATION OPTION
4 5



DETAIL M
PIN 1 BACKSIDE IDENTIFIER OPTION



DETAIL S
PIN 1 BACKSIDE IDENTIFIER OPTION


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