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MOTOROLA

MC13025

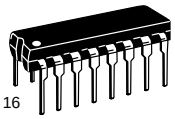
Electronically Tuned Radio Front End

ETR® FRONT END for C–QUAM® AM STEREO

SEMICONDUCTOR TECHNICAL DATA

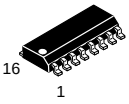
The MC13025 is the complementary ETR® Electronically Tuned Radio front–end for the second generation MC13022 C–QUAM® AM stereo IF and decoder. The MC13025 provides a high dynamic range mixer, voltage controlled oscillator, and first IF that with the MC13022 and synthesizer form a complete digitally controlled AM stereo tuner system. This system in turn may drive a dual channel audio processor and high power amplifiers for car radio or home stereo applications. Other applications include portable radio "boom boxes", table radios and component stereo systems.

- Operates Over a Wide Range of Supply Voltages: 6.0 V_{CC} to 10 V_{CC}
- Wideband AGC Voltage to RF Amp for Extended Dynamic Range
- Buffered VCO Output to Frequency Synthesizer
- No External RF Amp Needed for Most Home Stereo and Portable Radios
- IF Drive Output Matches the MC13022 for Optimum Performance
- VCO Operates at Four Times Local Oscillator Injection Frequency

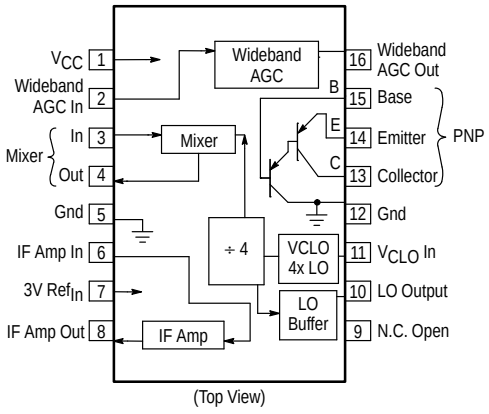


P SUFFIX
PLASTIC PACKAGE
CASE 648

D SUFFIX
PLASTIC PACKAGE
CASE 751B
(SO–16)



PIN CONNECTIONS

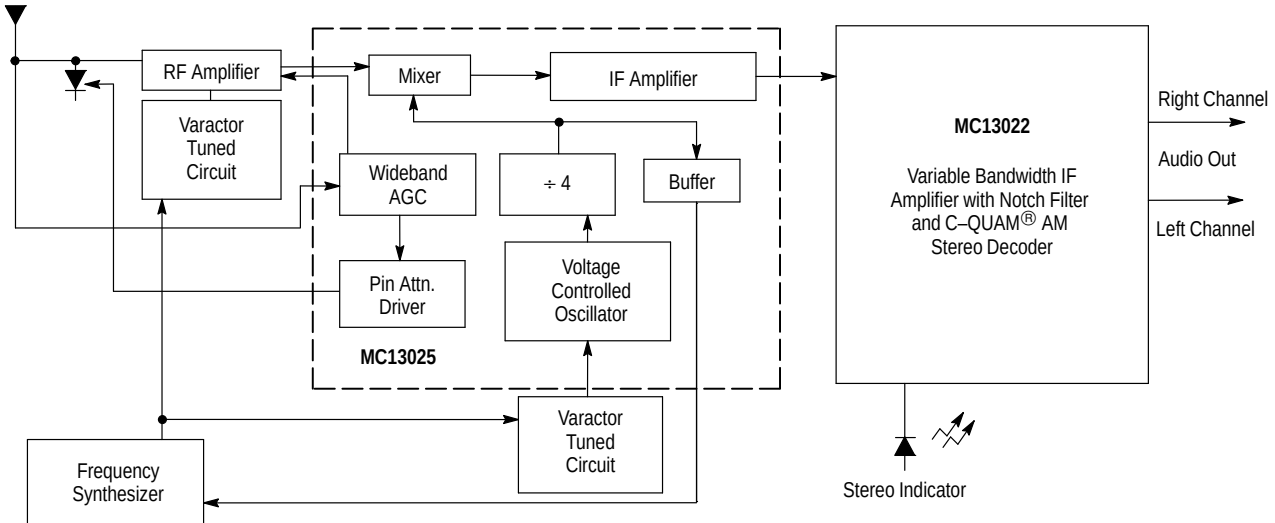


(Top View)

ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC13025D	T_A = –40° to +85°C	SO–16
MC13025P		Plastic DIP

Simplified Block Diagram



This device contains 93 active transistors.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Supply Voltage	V_{CC}	12	Vdc
Ambient Operating Temperature	T_A	–40 to +85	°C
Storage Temperature	T_{stg}	–65 to +150	°C
Junction Temperature	T_J	150	°C
Power Dissipation Derate above 25°C	P_D	1.25 10	W mW/°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C, 8.0 V_{CC} test circuit as shown in Figure 2.)

Characteristics	Pin	Min	Typ	Max	Unit
Supply Current	1	7.0	8.2	10	mAdc
3.0 V Ref, Current In	7	–50	7.0	90	μAdc
IF Out DC Current	8	0.9	1.05	1.2	mAdc
Mixer DC Current Output	4	0.70	0.77	0.82	mAdc
IF Output Amplitude, RF Input @ 1.7 MHz, 31.6 mV	8	270	330	390	mVrms
Local Oscillator Output	10	160	181	220	mVrms
Wideband AGC Pull–Down Current	16	0.5	1.0	1.5	mAdc
PNP Darlington (DC Beta @ 5.0 mA I_E)		1000	2500	–	
PNP Darlington Collector Leakage (V_E = V_B = 8.0 V)	13	–0.13	–0.06	–	μAdc

Figure 1. Test Circuit

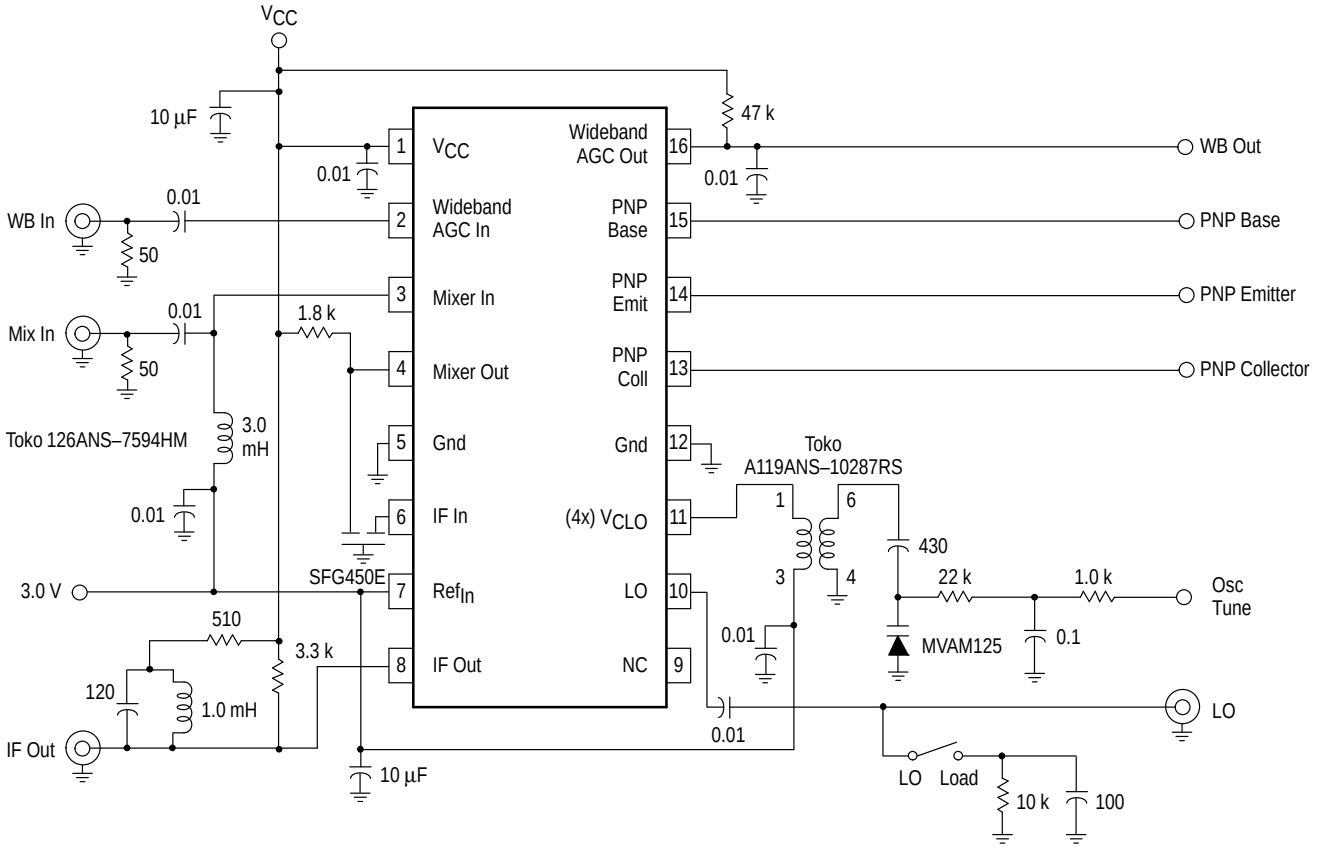
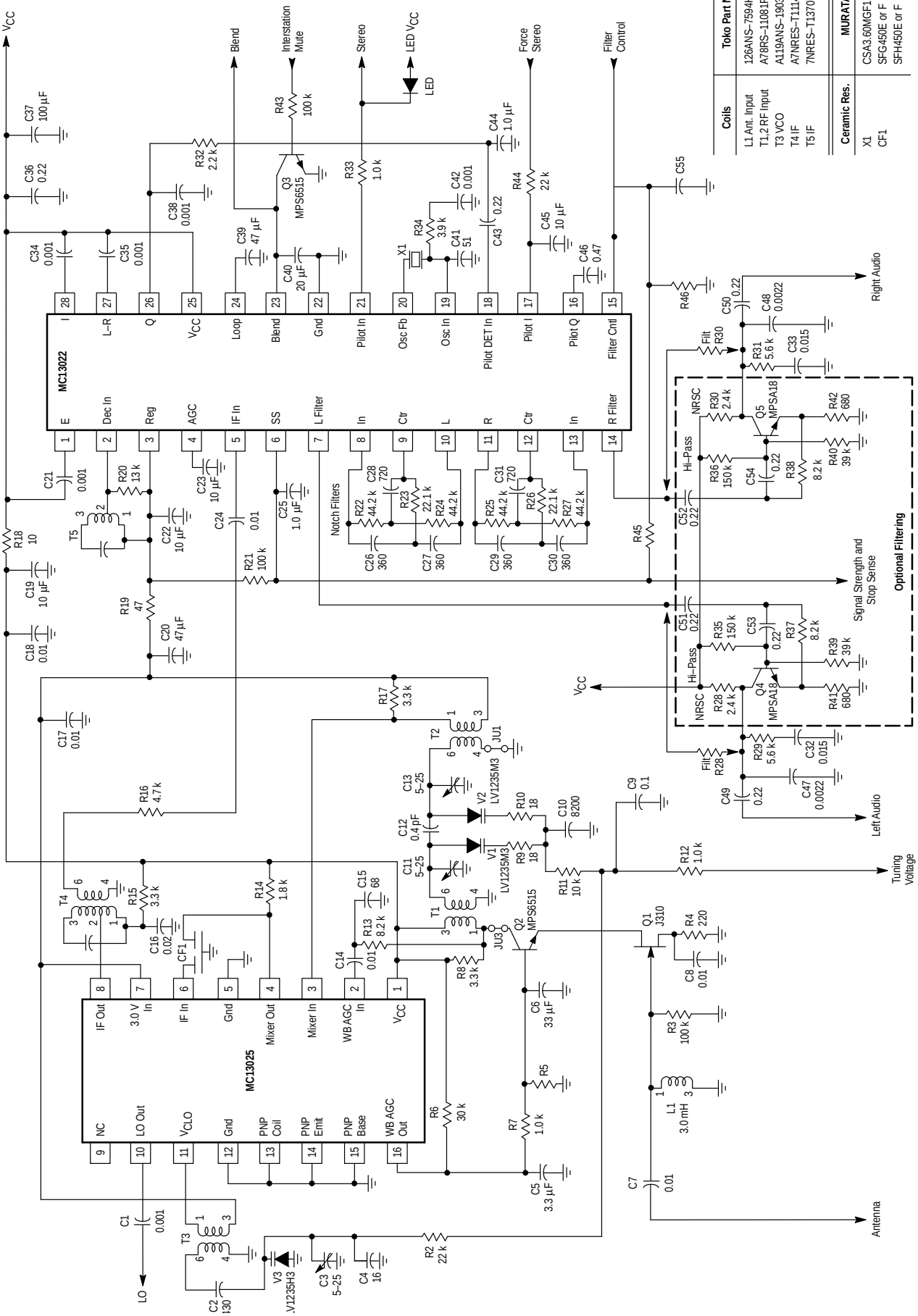
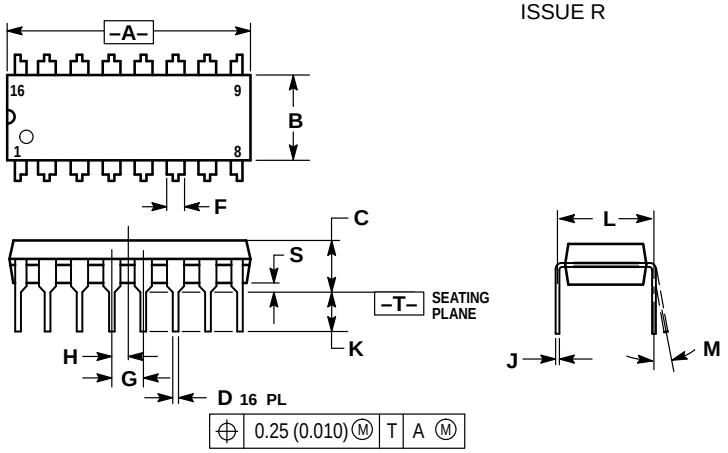


Figure 2. Cascode RF ETR Application
(NRSC – Notch Filters – Optional Pilot High Pass)



OUTLINE DIMENSIONS

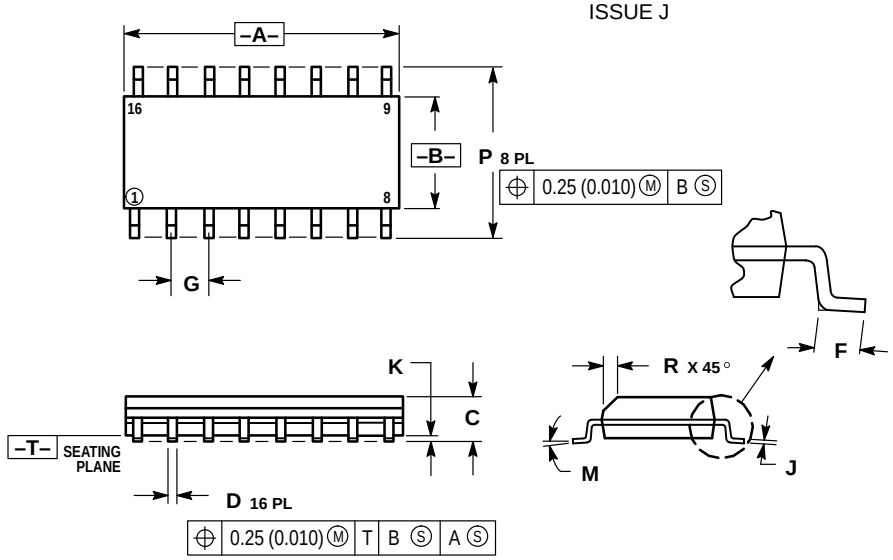
P SUFFIX
PLASTIC PACKAGE
CASE 648–08
ISSUE R



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
5. ROUNDED CORNERS OPTIONAL.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.740	0.770	18.80	19.55
B	0.250	0.270	6.35	6.85
C	0.145	0.175	3.69	4.44
D	0.015	0.021	0.39	0.53
F	0.040	0.70	1.02	1.77
G	0.100 BSC		2.54 BSC	
H	0.050 BSC		1.27 BSC	
J	0.008	0.015	0.21	0.38
K	0.110	0.130	2.80	3.30
L	0.295	0.305	7.50	7.74
M	0 °	10 °	0 °	10 °
S	0.020	0.040	0.51	1.01

D SUFFIX
PLASTIC PACKAGE
CASE 751B–05
(SO–16)
ISSUE J



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	9.80	10.00	0.386	0.393
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0 °	7 °	0 °	7 °
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

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