

# MC13025

## Electronically Tuned Radio Front End

The MC13025 is the complementary ETR<sup>®</sup> Electronically Tuned Radio front-end for the second generation MC13022 C-QUAM<sup>®</sup> 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.

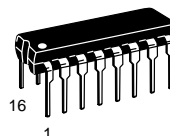
- Operates Over a Wide Range of Supply Voltages: 6.0 V<sub>CC</sub> to 10 V<sub>CC</sub>
- Wideband AGC Voltage to RF Amp for Extended Dynamic Range
- Buffered VCO Output to Frequency Synthesizer
- No External RF Amp Needed for Most Home Stereo and Portable Radios
- IF Drive Output Matches the MC13022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

### ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC13025D	T <sub>A</sub> = -40° to +85°C	SO-16
MC13025P		Plastic DIP

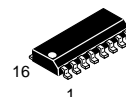
### ETR<sup>®</sup> FRONT END for C-QUAM<sup>®</sup> AM STEREO

#### SEMICONDUCTOR TECHNICAL DATA

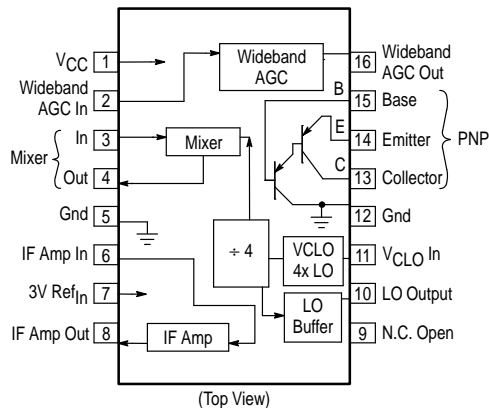


**P SUFFIX**  
PLASTIC PACKAGE  
CASE 648

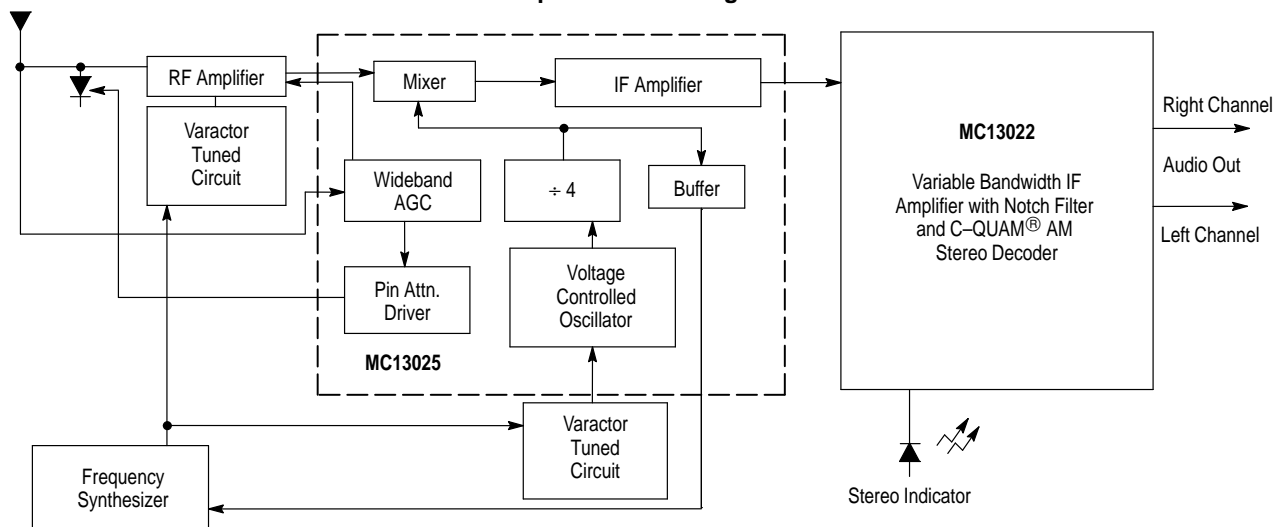
**D SUFFIX**  
PLASTIC PACKAGE  
CASE 751B  
(SO-16)



### PIN CONNECTIONS



### Simplified Block Diagram



# MC13025

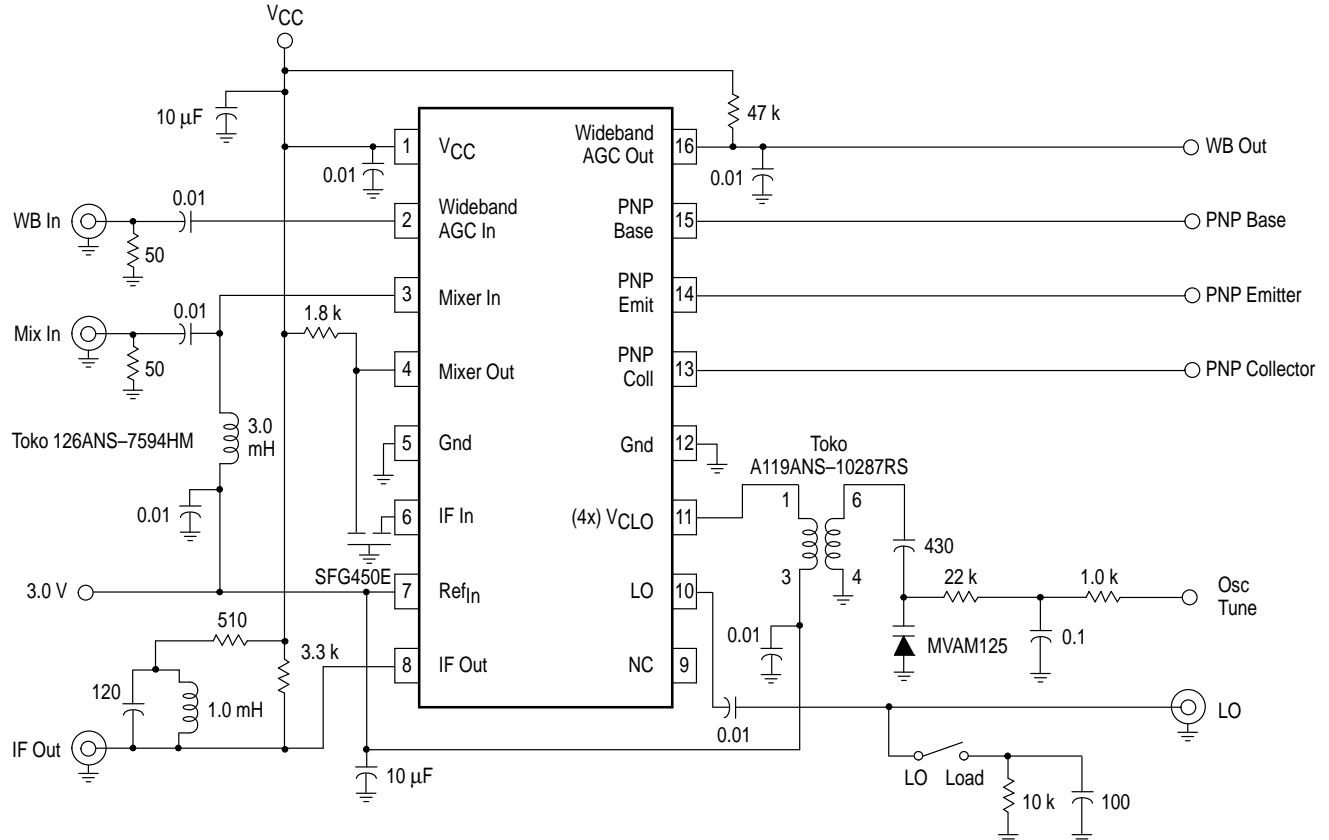
## MAXIMUM RATINGS

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

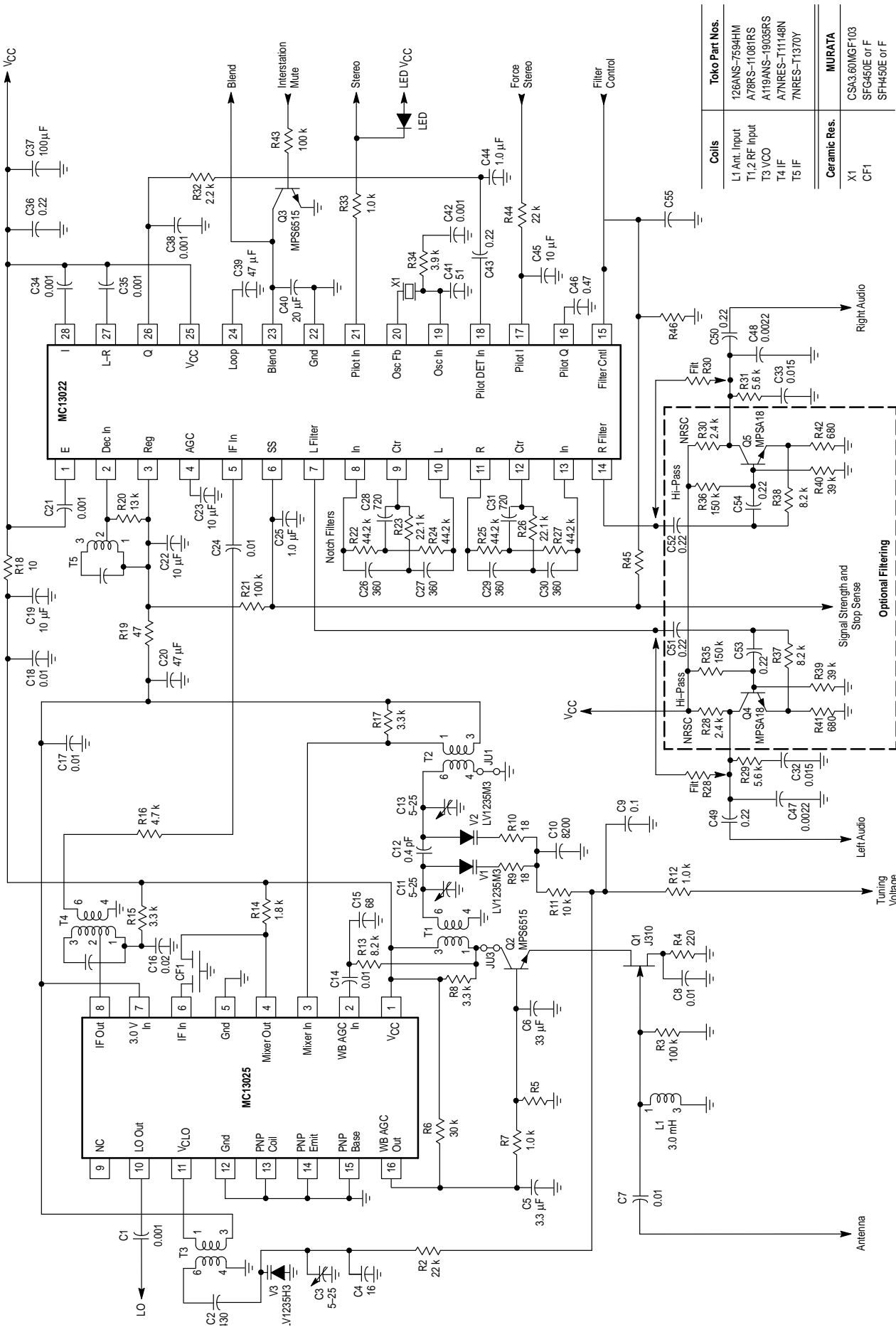
## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ , 8.0 $V_{CC}$ test circuit as shown in Figure 2.)

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	$\mu\text{Adc}$
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 ( $V_E = V_B = 8.0\text{ V}$ )	13	-0.13	-0.06	-	$\mu\text{Adc}$

Figure 1. Test Circuit



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

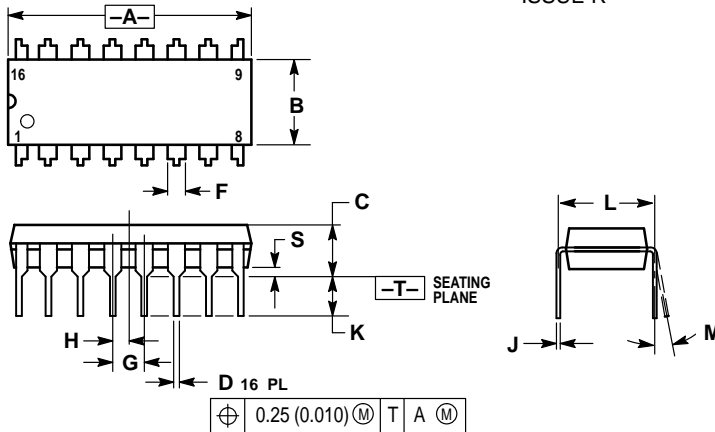


Coils	Toko Part Nos.
L1 Ant. Input	126ANS-7594HM
T1,2 RF Input	A78RS-1081RS
T3 VCO	A119ANS-19035RS
T4 IF	A7NRES-T11148N
T5 IF	7NRES-T1370Y
Ceramic Res.	MURATA
X1	CSA3.60MGF03
CF1	SFG450E or F
	SFH450E or F

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## OUTLINE DIMENSIONS

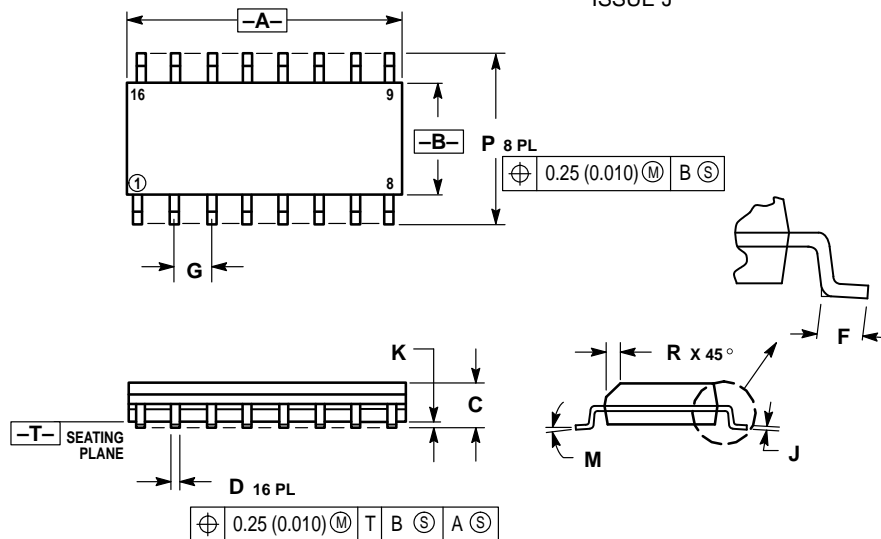
### P SUFFIX PLASTIC PACKAGE CASE 648-08 ISSUE R



#### 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.

### 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.

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