



MOTOROLA

Low Power Narrowband FM IF

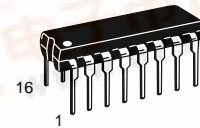
The MC3361B includes an Oscillator, Mixer, Limiting Amplifier, Quadrature Discriminator, Active Filter, Squelch, Scan Control and Mute Switch. This device is designed for use in FM dual conversion communications equipment.

- Operates from 2.0 to 8.0 V Supply
- Low Drain Current 3.9 mA Typical @ $V_{CC} = 4.0$ Vdc
- Excellent Sensitivity: Input Limiting Voltage -3.0 dB = 2.6μ V Typical
- Low Number of External Parts Required
- Operating Frequency Up to 60 MHz

MC3361B

LOW POWER NARROWBAND FM IF

SEMICONDUCTOR TECHNICAL DATA



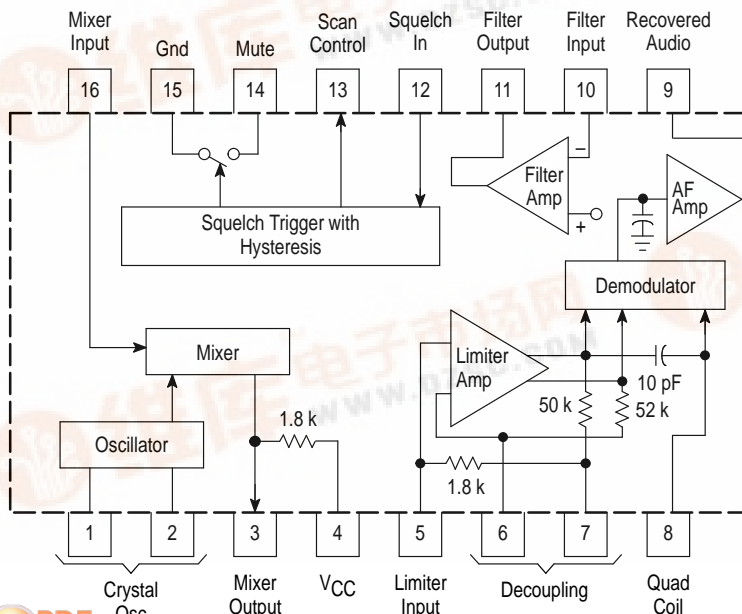
P SUFFIX
PLASTIC PACKAGE
CASE 648

Not Recommended for New Design



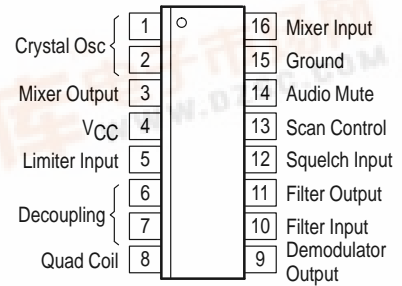
D SUFFIX
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CASE 751B
(SO-16)

Representative Block Diagram



This device contains 92 active transistors.

PIN CONNECTIONS



(Top View)

ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC3361BD	$T_A = -30$ to 70°C	SO-16
MC3361BP		Plastic DIP

MC3361B

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted.)

Rating	Pin	Symbol	Value	Unit
Power Supply Voltage	4	$V_{CC}(\text{max})$	10	Vdc
Operating Supply Voltage Range	4	V_{CC}	2.0 to 8.0	Vdc
Detector Input Voltage	8	–	1.0	V_{pp}
Input Voltage ($V_{CC} \geq 4.0\text{ V}$)	16	V_{16}	1.0	V_{rms}
Mute Function	14	V_{14}	–0.5 to 5.0	V_{pk}
Junction Temperature	–	T_J	150	$^\circ\text{C}$
Operating Ambient Temperature Range	–	T_A	–30 to 70	$^\circ\text{C}$
Storage Temperature Range	–	T_{stg}	–65 to 150	$^\circ\text{C}$

- 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 or Pin Descriptions section.
2. ESD data available upon request.

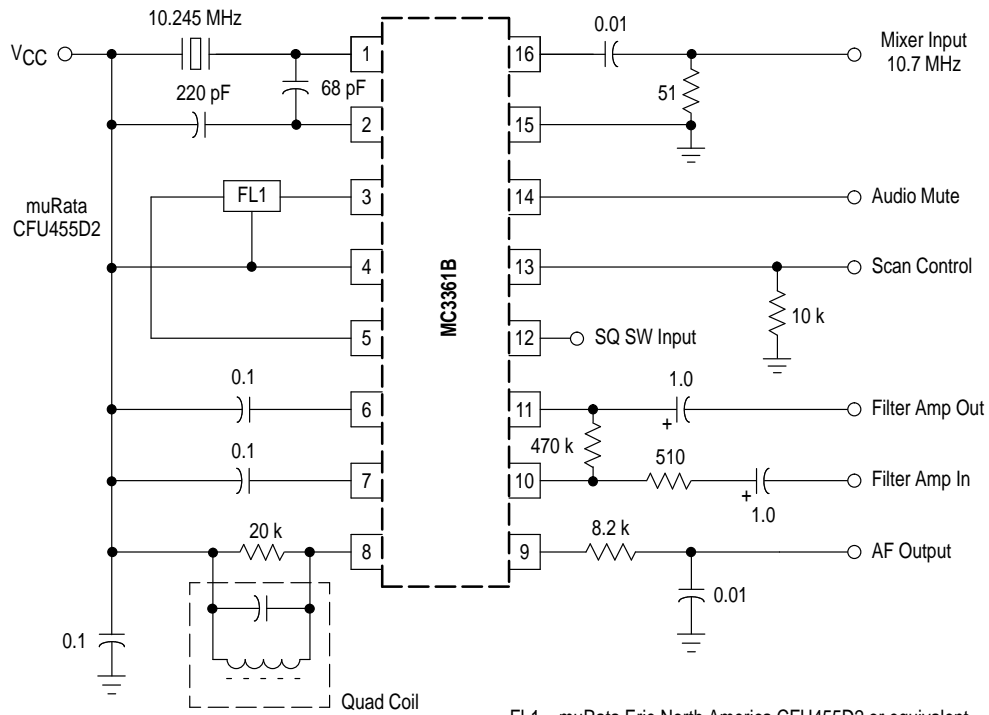
ELECTRICAL CHARACTERISTICS ($V_{CC} = 4.0\text{ Vdc}$, $f_0 = 10.7\text{ MHz}$, $\Delta f = \pm 3.0\text{ kHz}$, $f_{mod} = 1.0\text{ kHz}$, $T_A = 25^\circ\text{C}$, unless otherwise noted.)

Characteristic	Pin	Min	Typ	Max	Unit	
Drain Current (No Signal)	4	Squelch "Off"	2.9	3.9	4.9	mA
		Squelch "On"	4.4	5.4	6.4	
Recovered Audio Output Voltage ($V_{in} = 10\text{ mVrms}$)	9	130	160	200	mVrms	
Input Limiting Voltage (–3.0 dB Limiting)	16	–	2.6	6.0	μV	
Total Harmonic Distortion	9	–	0.86	–	%	
Recovered Output Voltage (No Input Signal)	9	60	120	250	mVrms	
Drop Voltage AF Gain Loss	9	–3.0	–0.6	–	dB	
Detector Output Impedance	–	–	450	–	Ω	
Filter Gain (10 kHz) ($V_{in} = 0.3\text{ mVrms}$)	–	40	50	–	dB	
Filter Output Voltage	11	1.0	1.3	1.6	Vdc	
Mute Function Low	14	–	30	50	Ω	
Mute Function High	14	1.0	11	–	$\text{M}\Omega$	
Scan Function Low (Mute "Off") ($V_{12} = 1.0\text{ Vdc}$)	13	–	0	0.4	Vdc	
Scan Function High (Mute "On") ($V_{12} = \text{Gnd}$)	13	3.0	3.5	–	Vdc	
Trigger Hysteresis	–	–	45	100	mV	
Mixer Conversion Gain	3	–	28	–	dB	
Mixer Input Resistance	16	–	3.3	–	$\text{k}\Omega$	
Mixer Input Capacitance	16	–	2.2	–	pF	



MC3361B

Figure 1. Test Circuit



FL1 – muRata Erie North America CFU455D2 or equivalent
 Quadrature Coil – Toko America Type 7MC-8128Z or equivalent
 C – μF , unless noted

Figure 2. Audio Output, Distortion versus Supply Voltage

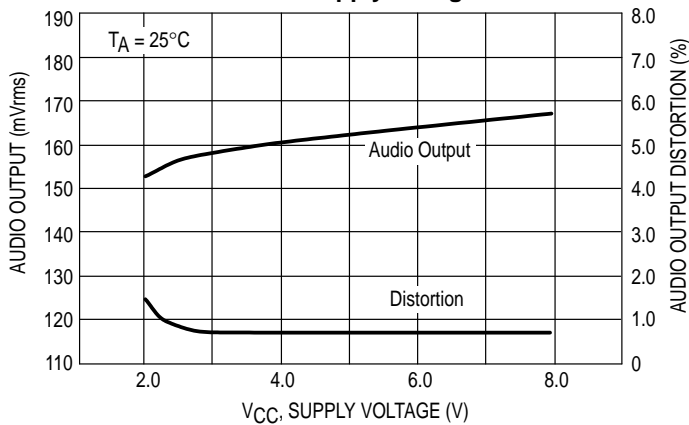
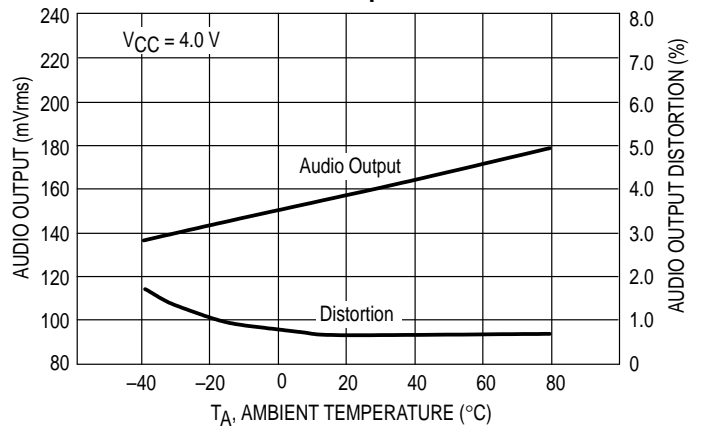
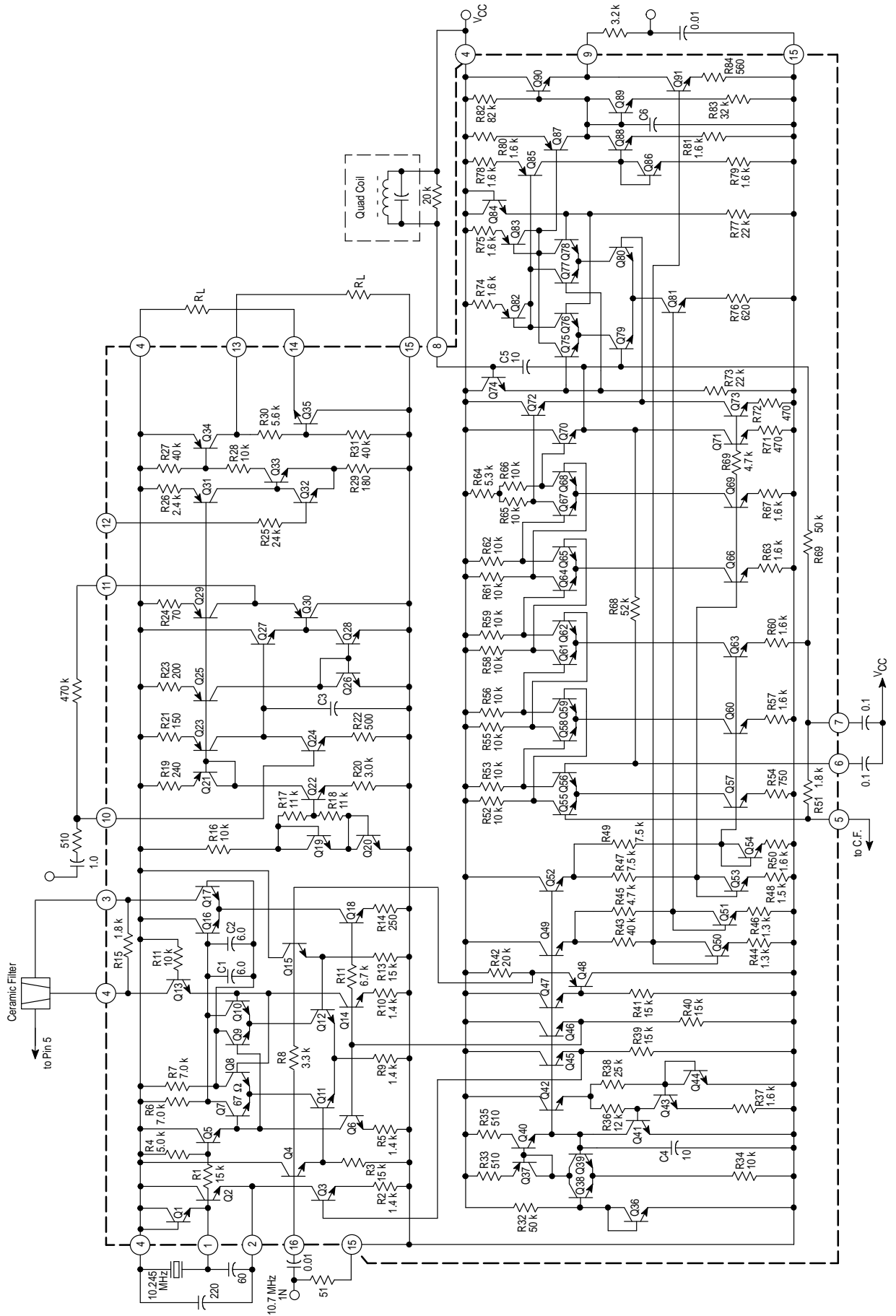


Figure 3. Audio Output, Distortion versus Temperature



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Figure 4. Low Voltage Low Power Narrowband FM IF



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Figure 5. Input Limiting Voltage

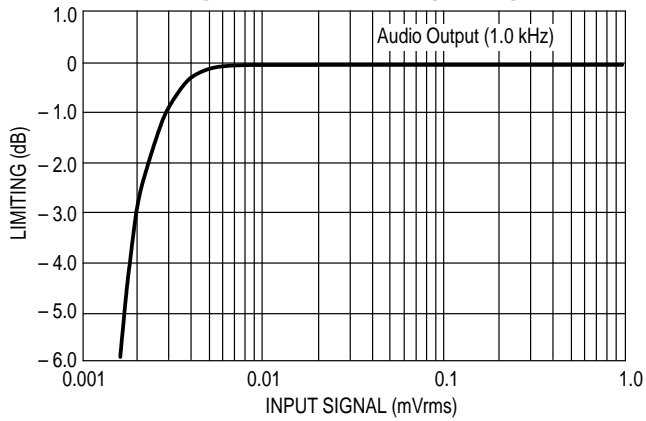


Figure 6. Overall Gain, Noise and AM Rejection

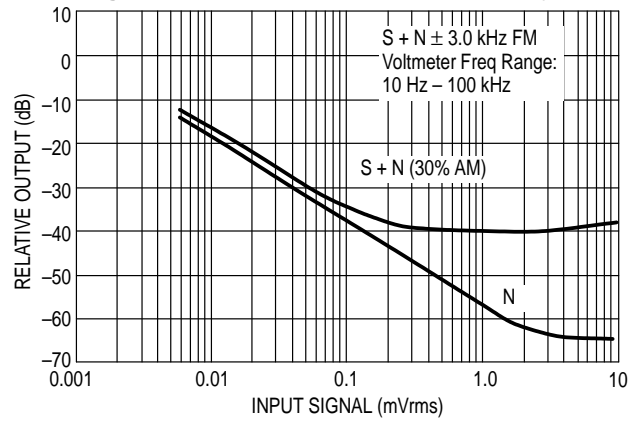


Figure 7. Filter Amp Response

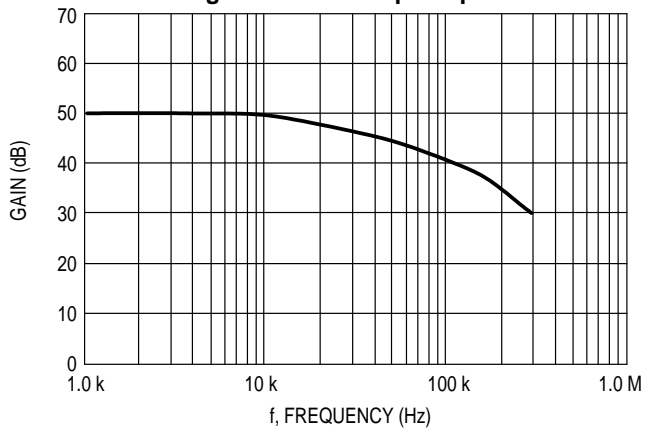


Figure 8. Filter Amp Gain

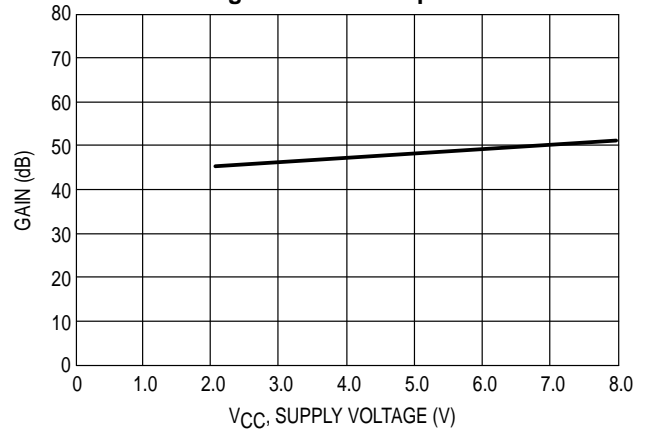
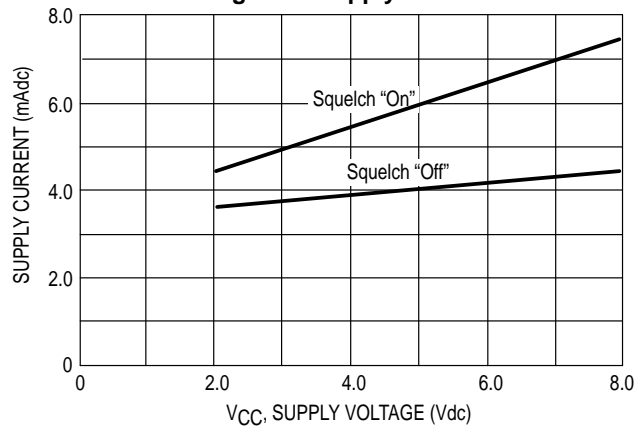


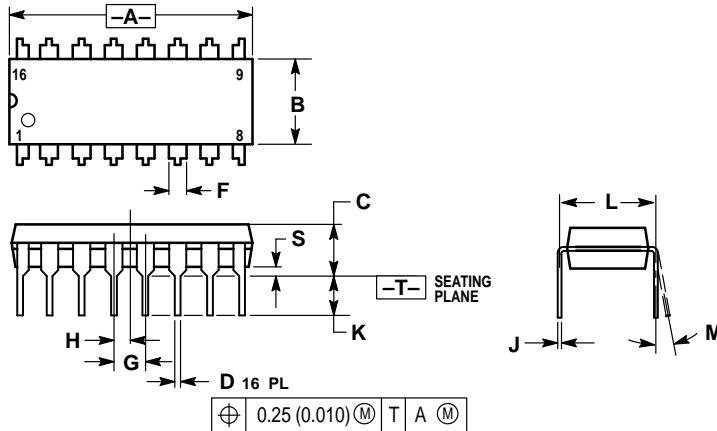
Figure 9. Supply Current



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OUTLINE DIMENSIONS

P SUFFIX
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 CASE 648-08
 ISSUE R

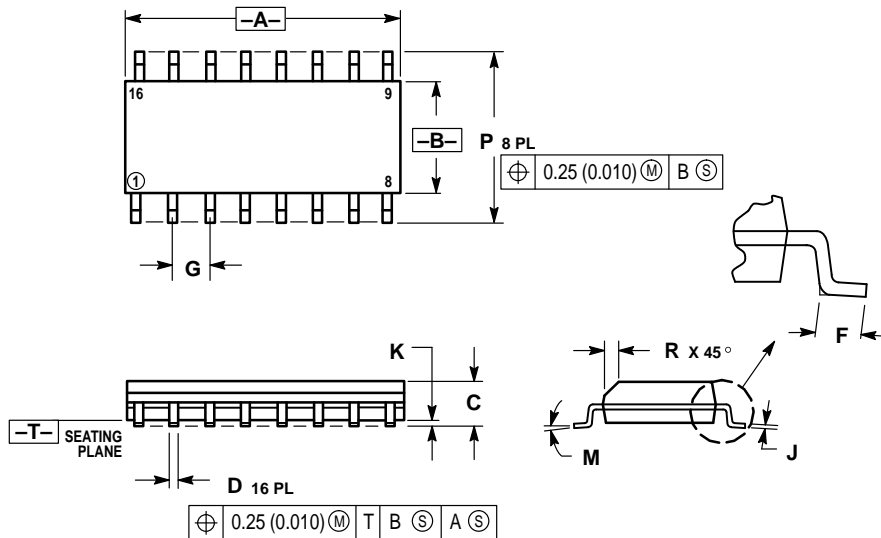


NOTES:

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.

DIM	INCHES		MILLIMETERS	
	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.

DIM	MILLIMETERS		INCHES	
	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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