

6427525 N E C ELECTRONICS INC

05E 23076 D

BIPOLAR ANALOG INTEGRATED CIRCUIT μ PC1344GT

T-77-05-09

ELECTRONIC TUNING AM RADIO RECEIVER

DESCRIPTION

The μ PC1344GT is a silicon monolithic integrated circuit designed for automotive AM radio receivers. The μ PC1344GT consists of 1st mixer, 1st oscillator, oscillator buffer amplifier, 2nd mixer, 2nd oscillator, IF amplifier, detector, AGC circuit and IF output circuit for station detection. The IF output (SD OUT) is connected IF counter circuit of digital tuning micro-processor.

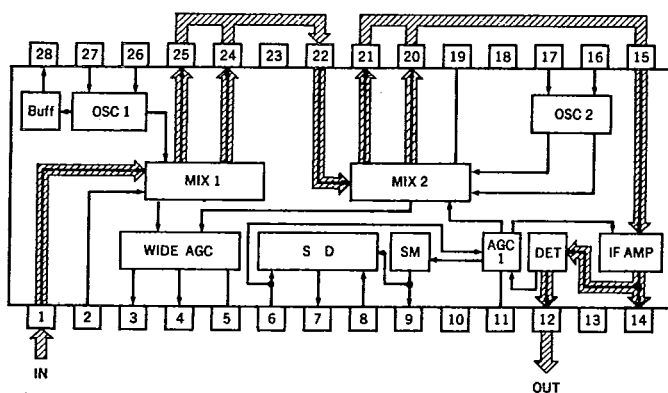
The μ PC1344GT's 1st mixer and 1st oscillator convert station signal to 10.7 MHz. And 2nd mixer and 2nd oscillator convert 10.7 MHz signal to 450 kHz. Audio signal is detected from the 450 kHz signal after amplified by IF amplifier.

That is, the μ PC1344GT uses up-conversion method, therefore a tracking adjustment free AM radio receiver can be made easily.

FEATURES

- Tracking adjustment free
- MW/LW turnover switch is not necessary
- Excellent tweet characteristic
- Excellent sensitivity
- Good matching with AM stereo demodulator

BLOCK DIAGRAM



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 μ PC1344GT
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ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

DC Supply Voltage	V_{CC}	10	V
Package Dissipation	P_D	650	mW
Operating Temperature	T_{Opt}	-30 to +75	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +125	$^\circ\text{C}$

RECOMMENDED OPERATING CONDITIONS ($T_a = 25^\circ\text{C}$)

DC Supply Voltage Range	V_{CC}	7.5 to 8.5	V
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ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, $V_{CC} = 8\text{ V}$, $f = 1\text{ MHz}$, $f_{mod} = 400\text{ Hz}$, $mod = 30\%$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Circuit Current	I_{CC}	34	45	58	mA	NO SIGNAL (IC only)
Signal to Noise Ratio	S/N	51	61		dB	$v_i = 74\text{ dB}\mu\text{V}$
Detector Output Volt	v_o	150	190	220	mV _{r.m.s.}	$v_i = 74\text{ dB}\mu\text{V}$
Harmonic Distortion	THD ₁		0.2	1.0	%	$v_i = 74\text{ dB}\mu\text{V}$
	THD ₂		0.5	1.5	%	$v_i = 74\text{ dB}\mu\text{V}$, $m = 80\%$
	THD ₃		0.4	1.5	%	$v_i = 130\text{ dB}\mu\text{V}$, $m = 80\%$
Signal Meter Output	V_{S1}		0	0.1	V	NO SIGNAL
	V_{S2}	1.2	2.4	3.0	V	$v_i = 30\text{ dB}\mu\text{V}$
	V_{S3}	3.0	4.0	5.3	V	$v_i = 74\text{ dB}\mu\text{V}$
OSC. Buff. Output	$V_{oscBuff}$	106	108	110	dB μV	

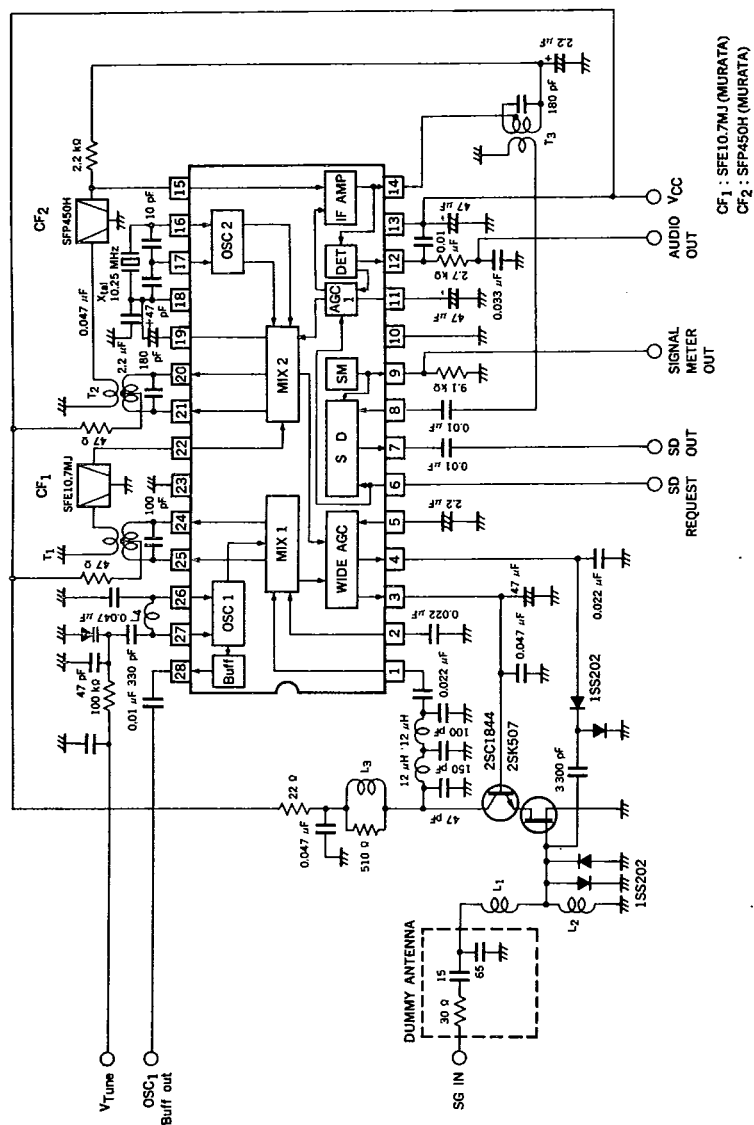
μ PC1344GT

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TEST CIRCUIT

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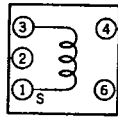


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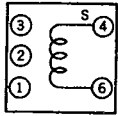
 μ PC1344GT
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COIL DATA (TOKO INC.)

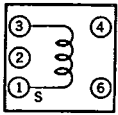
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L₁ X119FNS-16314Z

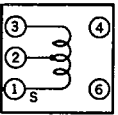
1 - 3 : 15T
 L = 4.7 μ H
 Q_u > 60

L₂ 7PD-1043

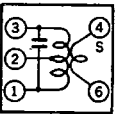
4 - 6 : 1440T
 L = 100 mH
 Q > 45

L₃ 247BR-0147Z

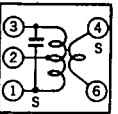
1 - 3 : 274T
 L = 2 mH
 Q > 50

L₄ 260LC-1694Y

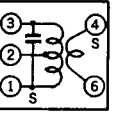
1 - 3 : 8T 1 - 2 : 4T
 2 - 3 : 4T
 L = 1.8 μ H
 Q_u > 70

T₁ 260LC-1635N

1 - 3 : 14T 1 - 2 : 7T
 2 - 3 : 7T 4 - 6 : 2T
 C = 47 pF
 Q = 68 $\pm$ 20 % f_o = 10.7 MHz

T₂ S7YC-1633N

1 - 3 : 150T 1 - 2 : 75T
 2 - 3 : 75T 4 - 6 : 20T
 C = 180 pF
 Q = 42 $\pm$ 20 % f_o = 450 kHz

T₃ CX7YCS-8986N

1 - 3 : 148T 1 - 2 : 43T
 2 - 3 : 105T 4 - 6 : 30T
 C = 180 pF
 Q = 40 $\pm$ 20 % f_o = 450 kHz

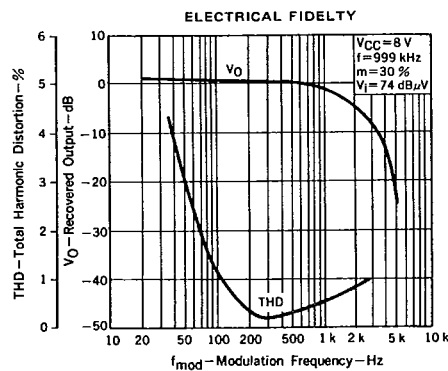
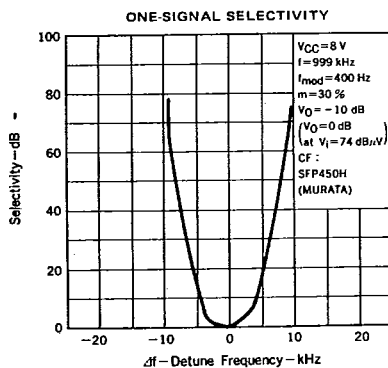
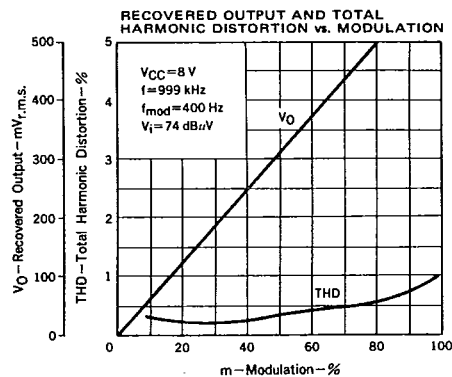
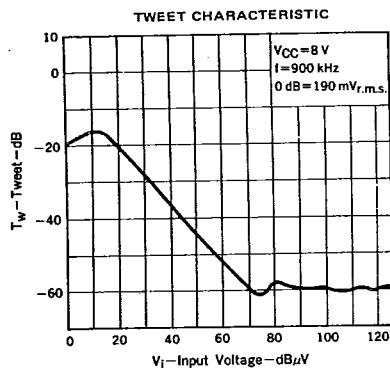
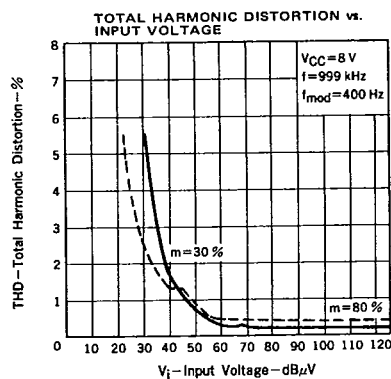
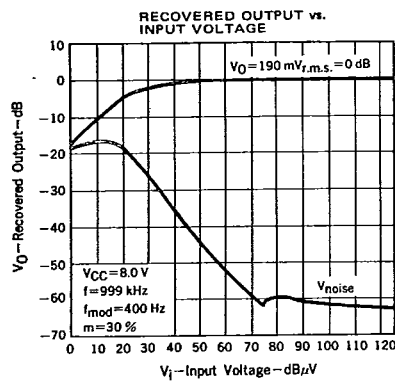
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PC1344GT
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TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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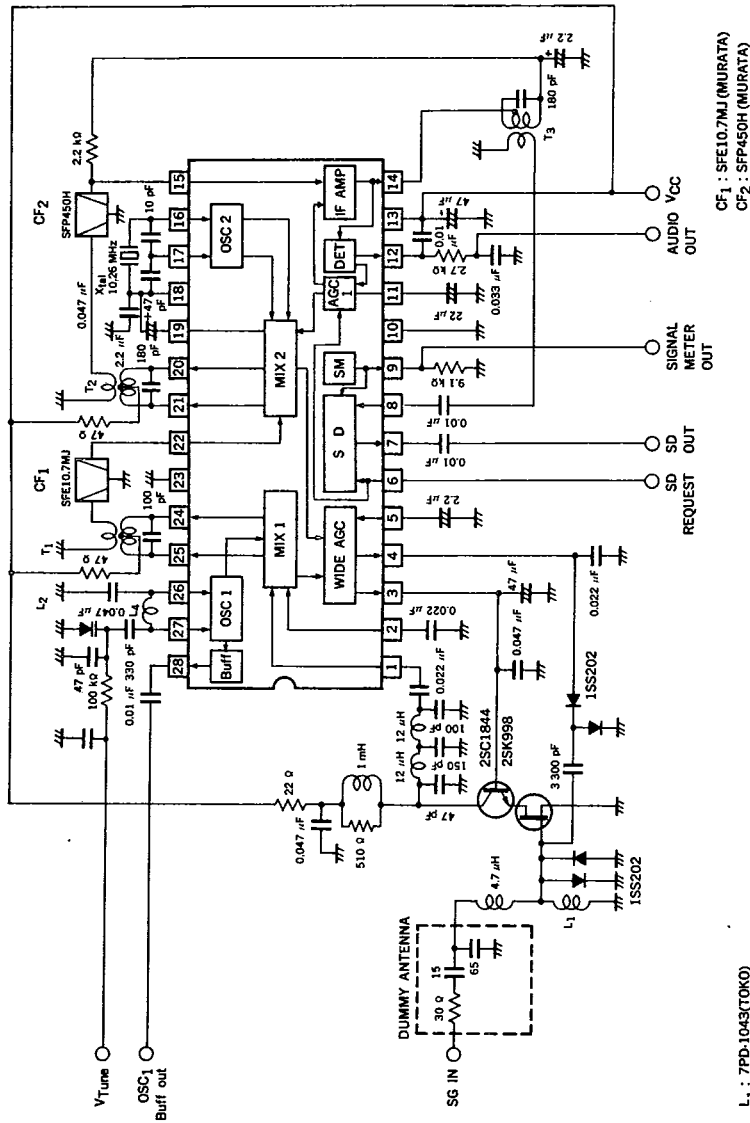
μPC1344GT

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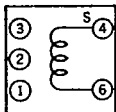
APPLICATION CIRCUIT

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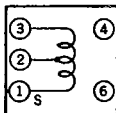


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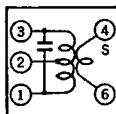
COIL DATA (TOKO INC.)

L₁ 7PD-1043

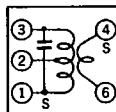
4 - 6 : 1440T
 L = 100 mH
 $Q_u > 45$

L₂ 332PN-2522Y

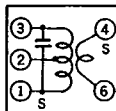
1 - 3 : 10T
 1 - 2 : 5T
 2 - 3 : 5T
 L = 1.8 μ H
 $Q_u > 70$

T₁ 332PC-2523N

1 - 3 : 16T 1 - 2 : 8T
 2 - 3 : 8T 4 - 6 : 2T
 C = 47 pF
 $Q > 60 f_o = 10.7 \text{ MHz}$

T₂ 5PLC-2524N

1 - 3 : 180T 1 - 2 : 90T
 2 - 3 : 90T 4 - 6 : 24T
 C = 180 pF
 $Q > 40 f_o = 450 \text{ kHz}$

T₃ 5PLC-2525N

1 - 3 : 180T 1 - 2 : 52T
 2 - 3 : 128T 4 - 6 : 36T
 C = 180 pF
 $Q > 40 f_o = 450 \text{ kHz}$

μ PC1344GT

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ELECTRICAL CHARACTERISTICS (APPLICATION CIRCUIT)

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(T_a = 25 °C, V_{CC} = 8 V, f = 1 MHz, f_{mod} = 400 Hz, mod = 30 %)

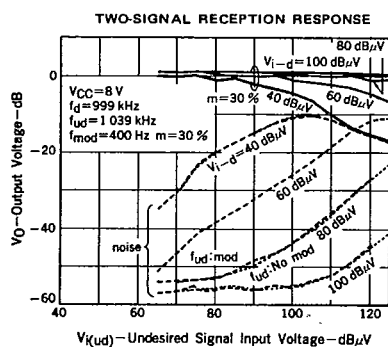
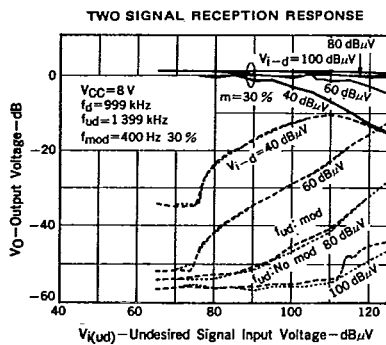
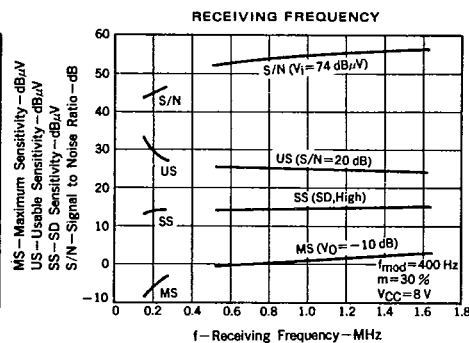
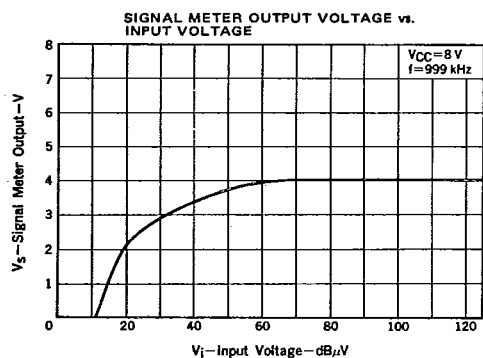
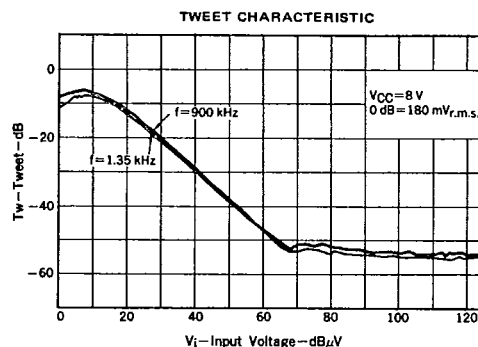
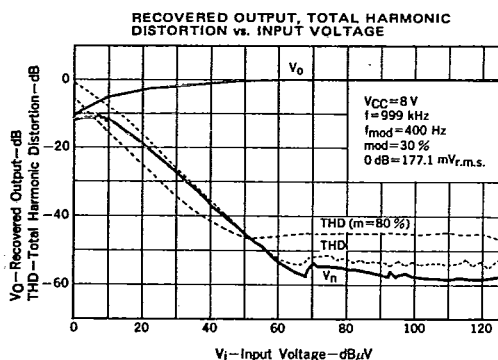
CHARACTERISTIC	TEST CONDITION	VALUE	UNIT
Maximum Sensitivity	V _O = -10 dB (V _O = 0 dB at V _{in} = 74 dBμV)	1	dBμV
Usable Sensitivity	S/N = 20 dB	24.5	dBμV
Signal to Noise Ratio	V _{in} = 74 dBμV	55	dB
Detector Output Voltage	V _{in} = 74 dBμV	180	mV
Total Harmonic Distortion	V _{in} = 74 dBμV	0.27	%
	V _{in} = 126 dBμV, mod = 80 %	0.5	%
Selectivity	Δf = ±9 kHz	63	dB
Tweet	V _{in} = 40 dBμV, 2 IF	-29	dB
SD Sensitivity	8 pin Voltage L to H	15	dBμV
Signal Meter Output	V _{in} = 30 dBμV	2.9	V
	V _{in} = 74 dBμV	4.0	V

Note: Please change capacitance values for 2nd osc. if X'tal type or maker was changed.

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 μ PC1344GT
05E 23085 DTYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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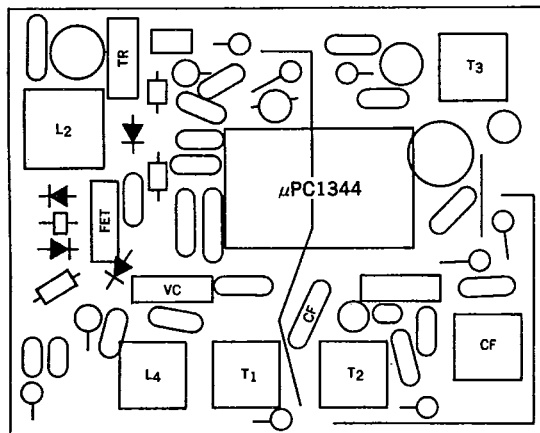
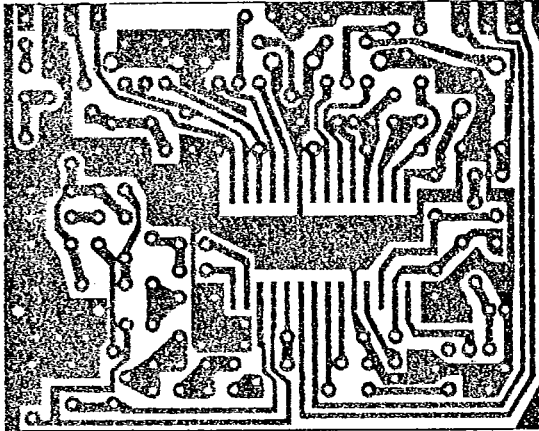
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TYPICAL PCB

T-77-05-09

(COPPER SIDE)



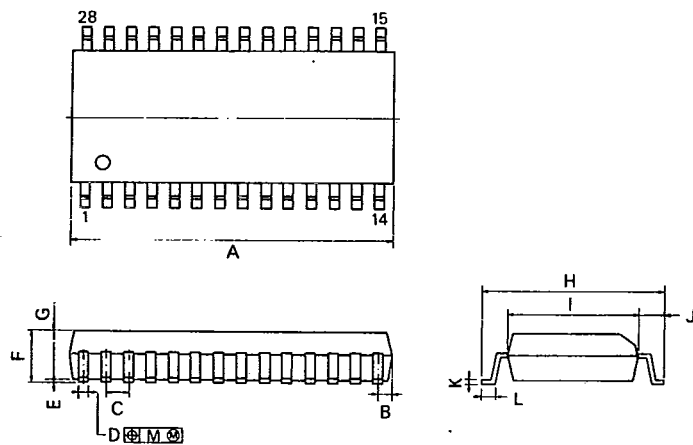
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38PIN PLASTIC SOP (375 mil)

T-77-05-09



P28GM-50-375B

NOTE

Each lead centerline is located within 0.12 mm (0.005 inch) of its true position (T.P.) at maximum material condition.

ITEM	MILLIMETERS	INCHES
A	18.07 MAX.	0.712 MAX.
B	0.78 MAX.	0.031 MAX.
C	1.27 (T.P.)	0.050 (T.P.)
D	0.40 ± 0.08	0.016 ± 0.003
E	0.1 ± 0.1	0.004 ± 0.004
F	2.9 MAX.	0.115 MAX.
G	2.50	0.098
H	10.3 ± 0.3	0.406 ± 0.012
I	7.2	0.283
J	1.6	0.063
K	0.15 ± 0.10	0.006 ± 0.004
L	0.8 ± 0.2	0.031 ± 0.008
M	0.12	0.005

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