

Prepared		<b>Product Specifications</b> <b>AN17821A</b>	Ref No.	A
Checked			Total Page	9
Approved			Page No.	1

Structure	Silicon Monolithic Bipolar IC
Appearance	SIL-12 Pin Plastic Package (Power Type with Fin)
Application	Low Frequency Amplifier
Function	BTL 5.0W x 2ch Power Amplifier with Standby Function and Volume Function

A Absolute Maximum Ratings					
No.	Item	Symbol	Ratings	Unit	Note
1	Storage Temperature	Tstg	-55 ~ +150	° C	1
2	Operating Ambient Temperature	Topr	-25 ~ +70	° C	1
3	Operating Ambient Pressure	Popr	1.013x10 <sup>5</sup> ±0.61x10 <sup>5</sup>	Pa	
4	Operating Constant Acceleration	Gopr	9,810	m/s <sup>2</sup>	
5	Operating Shock	Sopr	4,900	m/s <sup>2</sup>	
6	Supply Voltage	Vcc	14.4	V	2
7	Supply Current	Icc	2.0	A	
8	Power Dissipation	P <sub>D</sub>	1.92	W	Ta=70°C

Operating Supply Voltage Range	Vcc	3.5V ~ 13.5V
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Note 1) The temperature of all items shall be Ta=25°C except storage temperature and operating ambient temperature.

2) At no signal input.

Eff. Date	Eff. Date	Eff. Date	Eff. Date	
06-MAR-2002				

Prepared		<b>Product Specifications</b> <b>AN17821A</b>	Ref No.	B-1
Checked			Total Page	9
Approved			Page No.	2

No	Item	Symbol	Test Circuit	Conditions	Limits			Unit	Note
					min	typ	max		
<b>B Electrical Characteristics</b> (Unless otherwise specified, the ambient temperature is 25°C±2°C, Vcc=8.0V, frequency=1kHz and RL=8Ω.)									
1	Quiescent Circuit Current	I <sub>CQ</sub>	1	V <sub>in</sub> =0V, V <sub>ol</sub> =0V	-	45	100	mA	
2	Standby Current	I <sub>STB</sub>	1	V <sub>in</sub> =0V, V <sub>ol</sub> =0V	-	1	10	μA	
3	Output Noise Voltage	V <sub>NO</sub>	1	R <sub>g</sub> =10kΩ, V <sub>ol</sub> =0V	-	0.10	0.4	mVrms	1
4	Voltage Gain	G <sub>V</sub>	1	P <sub>o</sub> =0.5W, V <sub>ol</sub> =1.25V	31	33	35	dB	
5	Total Harmonic Distortion	THD	1	P <sub>o</sub> =0.5W, V <sub>ol</sub> =1.25V	-	0.10	0.5	%	
6	Maximum Power Output 1	P <sub>O1</sub>	1	THD=10%, V <sub>ol</sub> =1.25V	2.4	3.0	-	W	
7	Maximum Power Output 2	P <sub>O2</sub>	1	V <sub>cc</sub> =11V THD=10%, V <sub>ol</sub> =1.25V	4.0	5.0	-	W	
8	Ripple Rejection Ratio	RR	1	R <sub>g</sub> =10kΩ, V <sub>ol</sub> =0V V <sub>r</sub> =0.5Vrms, f <sub>r</sub> =120Hz	30	50	-	dB	1
9	Output Offset Voltage	V <sub>off</sub>	1	R <sub>g</sub> =10kΩ, V <sub>ol</sub> =0V	-250	0	250	mV	
10	Volume Attenuation Ratio	Att	1	P <sub>o</sub> =0.5W, V <sub>ol</sub> =0V	70	85	-	dB	1
11	Channel Balance 1	CB1	1	P <sub>o</sub> =0.5W, V <sub>ol</sub> =1.25V	-1	0	1	dB	
12	Channel Balance 2	CB2	1	P <sub>o</sub> =0.5W, V <sub>ol</sub> =0.6V	-2	0	2	dB	
13	Middle Voltage Gain	G <sub>Vm</sub>	1	P <sub>o</sub> =0.5W, V <sub>ol</sub> =0.6V	20.5	23.5	26.5	dB	
14	Channel Crosstalk	CT	1	P <sub>o</sub> =0.5W, V <sub>ol</sub> =1.25V	40	55	-	dB	

Note 1) For this measurement, use the BPF = 15Hz ~ 30kHz (12dB/OCT).

Eff. Date	Eff. Date	Eff. Date	Eff. Date
06-MAR-2002			

Prepared		<b>Product Specifications</b> (Reference Data for Design) <b>AN17821A</b>	Ref No.	B-2
Checked			Total Page	9
Approved			Page No.	3

No	Item	Symbol	Test Circuit	Conditions	Limits			Unit	Note
					min	typ	max		
1	Standby pin current	ISTB2	1	Vin=0V, VSTB=3V	-	-	25	μA	
2	Volume pin current	IVOL	1	Vin=0V, Vol=0V	-12	-	-	μA	
3	Input Impedance	Zi	1	Vin=±0.3VDC	24	30	36	kΩ	

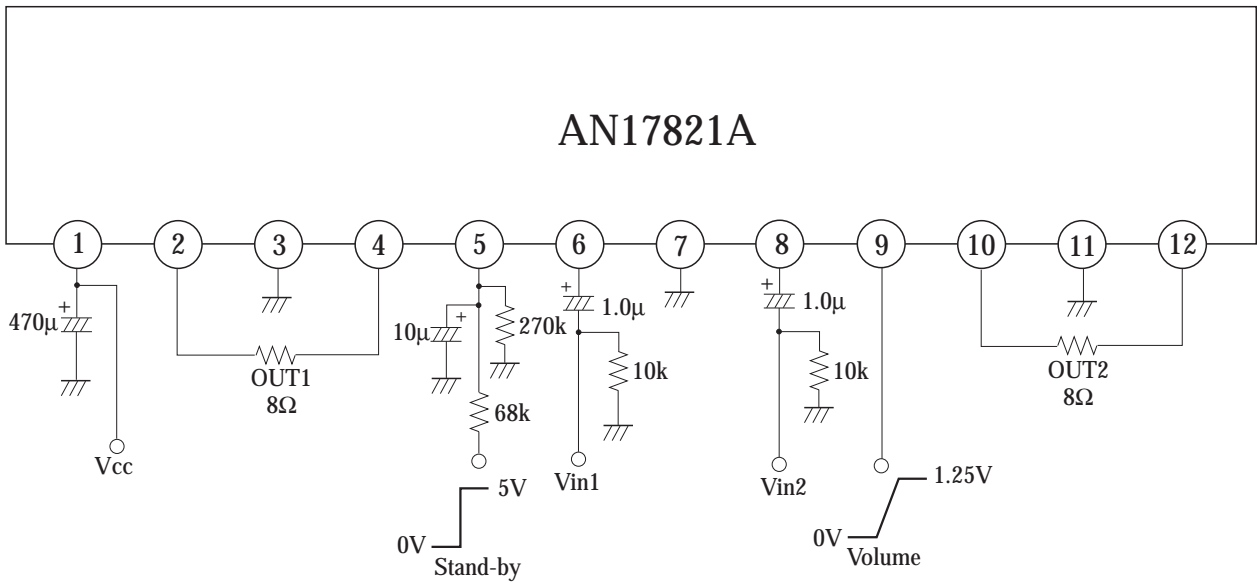
Note) The above characteristics are reference values determined for IC design, but not guaranteed values for shipping inspection. If problems were to occur, counter measures will be sincerely discussed.

Eff. Date	Eff. Date	Eff. Date	Eff. Date
06-MAR-2002			

Prepared		<b>Product Specifications</b> <b>AN17821A</b>	Ref No.	C
Checked			Total Page	9
Approved			Page No.	4

(Description of test circuit and test method)

Test Circuit 1

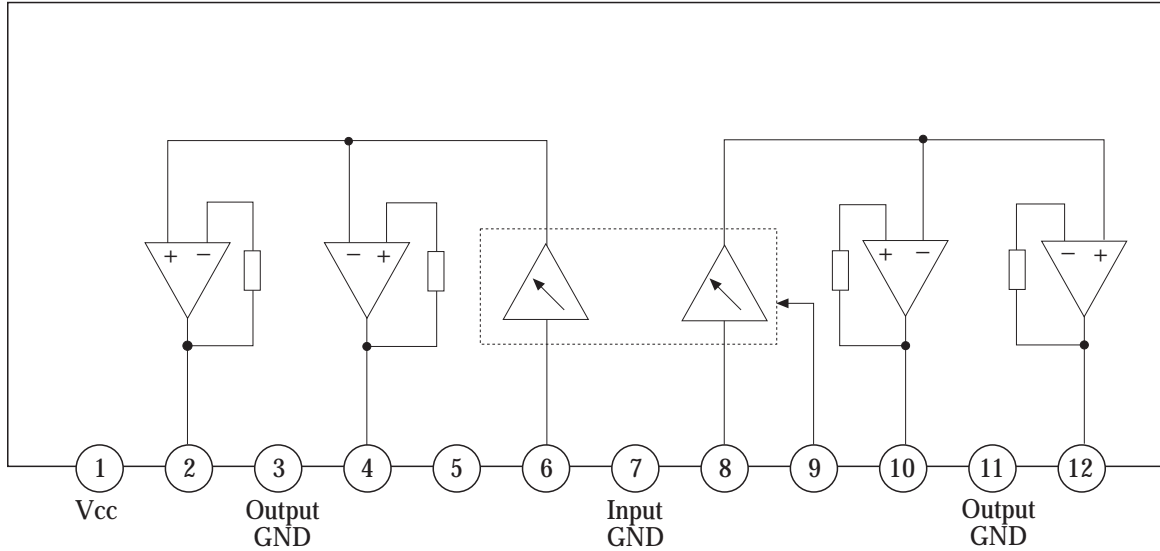


Note) If the standby pin is open or 0V, the IC is on standby state.  
 The IC is in the state of volume minimum if the Volume pin is ground.  
 The IC is in the state of volume maximum if the Volume pin is open.

Eff. Date	Eff. Date	Eff. Date	Eff. Date
06-MAR-2002			

Prepared		<b>Product Specifications</b> <b>AN17821A</b>	Ref No.	D
Checked			Total Page	9
Approved			Page No.	5

### Circuit Function Block Diagram



### Pin Descriptions

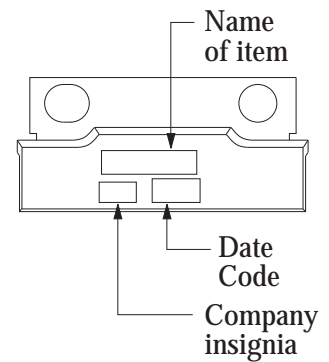
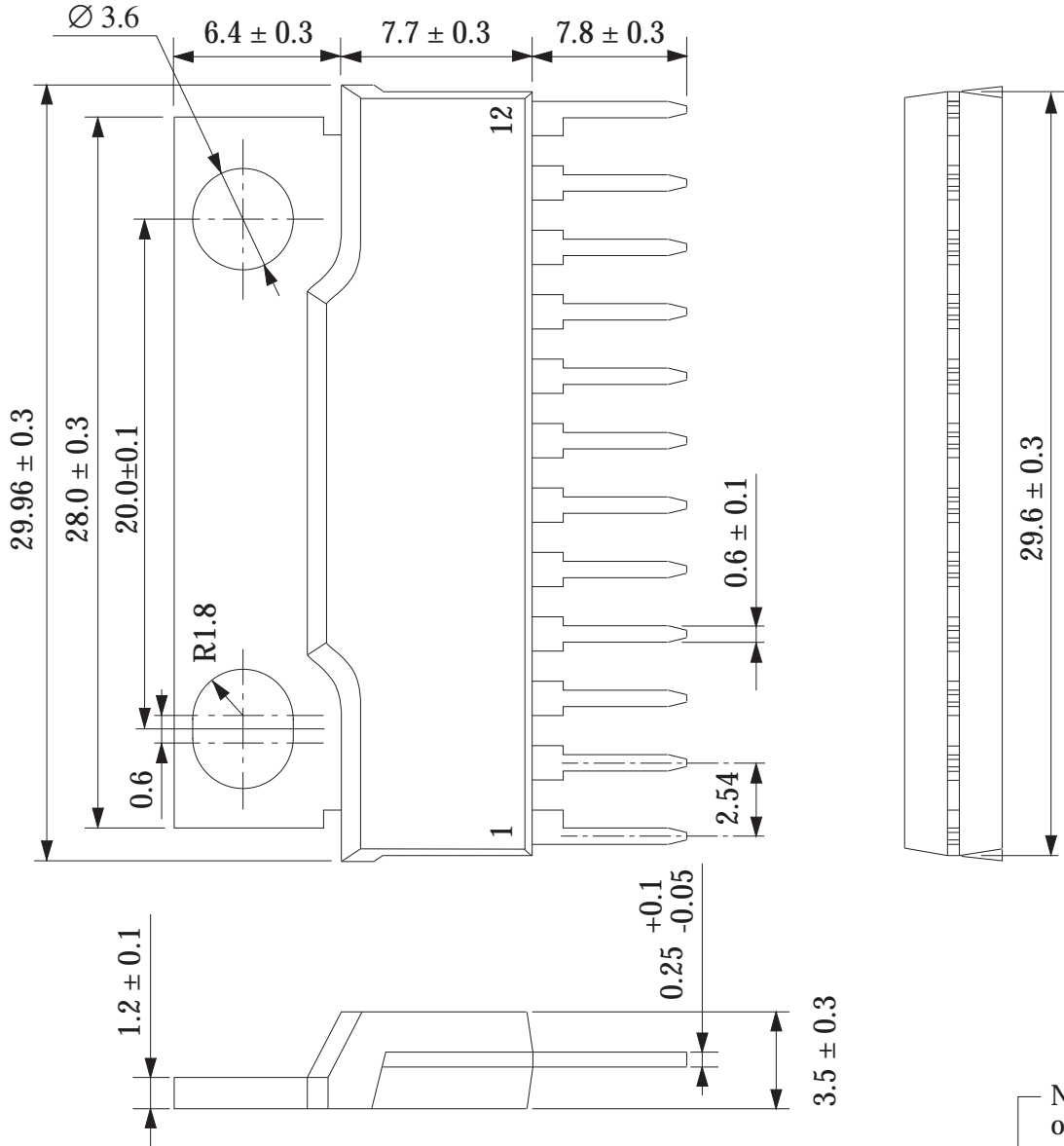
Pin No.	Description	Pin No.	Description
1	Vcc	7	GND (Input)
2	Ch.1 Output (+)	8	Ch.2 Input
3	GND (Ch.1 Output)	9	Volume
4	Ch.1 Output (-)	10	Ch.2 Output (-)
5	Standby	11	GND (Ch.2 Output)
6	Ch.1 Input	12	Ch.2 Output (+)

Eff. Date	Eff. Date	Eff. Date	Eff. Date	
06-MAR-2002				

Prepared		<b>Product Specifications</b> <b>AN17821A</b>	Ref No.	E
Checked			Total Page	9
Approved			Page No.	6

Package Name	FP-12S
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Unit : mm

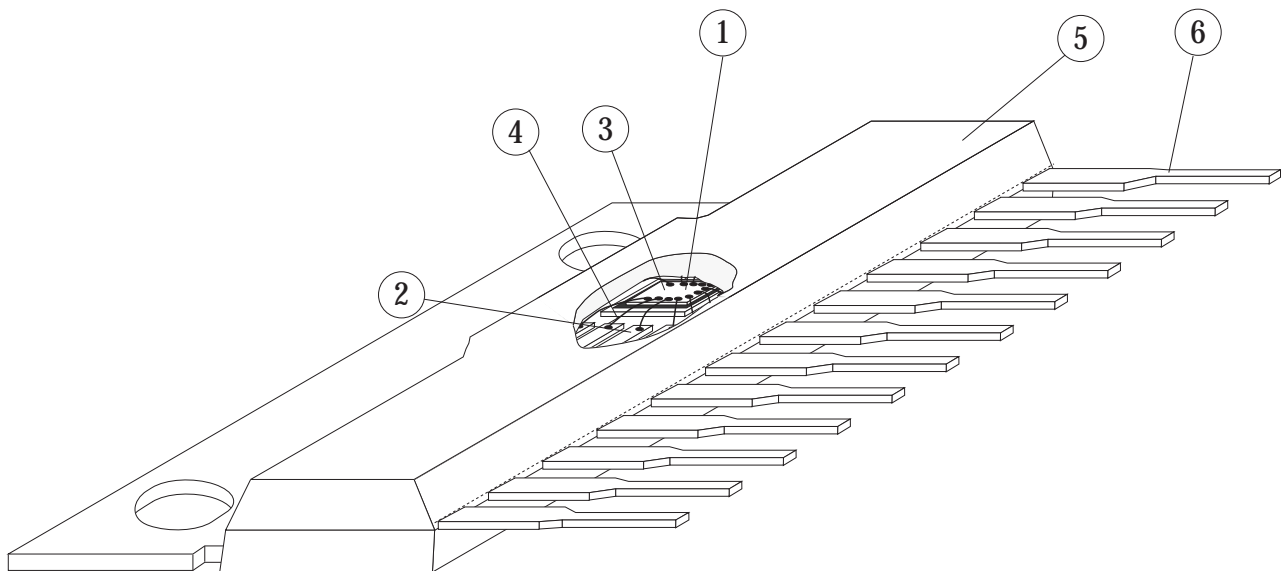


Eff. Date	Eff. Date	Eff. Date	Eff. Date
06-MAR-2002			

Prepared		<b>Product Specifications</b> <b>AN17821A</b>	Ref No.	F
Checked			Total Page	9
Approved			Page No.	7

**(Structure Description)**

Chip surface passivation	SiN,	PSG,	Others ( )	①	
Lead frame material	Fe group,	Cu group,	Others ( )	②, ⑥	
Inner lead surface process	Ag plating,	Au plating,	Others ( )	②	
Outer lead surface process	Solder plating,	Solder dip,	Others ( )	⑥	
Chip mounting method	Ag paste,	Au-Si alloy,	Solder,	Others ( )	③
Wire bonding method	Thermalsonic bonding,		Others ( )	④	
Mold material	Epoxy,		Others ( )	⑤	
Molding method	Transfer mold,	Multiplunger mold,	Others ( )	⑤	
Fin material	Cu Group		Others ( )	⑦	

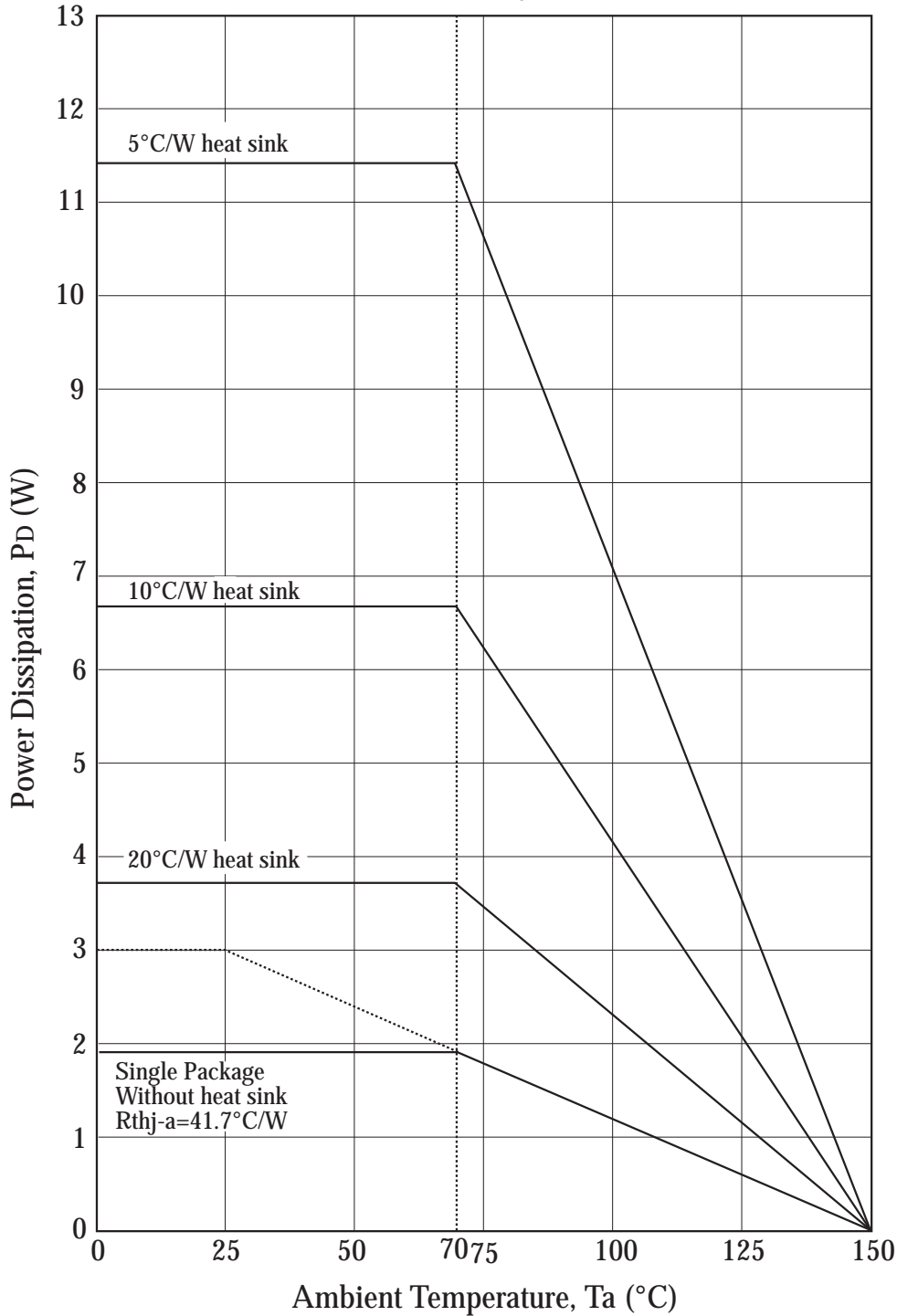
**Package FP-12S**

Eff. Date	Eff. Date	Eff. Date	Eff. Date	
06-MAR-2002				

Prepared		<b>Product Specifications</b> (Technical Data) <b>AN17821A</b>	Ref No.	G
Checked			Total Page	9
Approved			Page No.	8

$$\left( \begin{array}{l} R_{th(j-c)} = 2^{\circ}\text{C/W} \\ R_{th(j-a)} = 41.7^{\circ}\text{C/W} \end{array} \right)$$

**FP-12S Package Power Dissipation**  
**PD - Ta**



Eff. Date	Eff. Date	Eff. Date	Eff. Date
06-MAR-2002			



Prepared		<b>Product Specifications</b> (Technical Data) <b>AN17821A</b>	Ref No.	G
Checked			Total Page	9
Approved			Page No.	9

(Precautions for use)

- 1) Make sure that the IC is free of any pin short-circuiting, ground short-circuiting, pin shift and reverse insertion.
- 2) Ground the radiation fin so that there will be no difference in electric potential between the radiation fin and ground.
- 3) The thermal protection circuit operates at a  $T_j$  of approximately  $150^{\circ}\text{C}$ . The thermal protection circuit is reset automatically when the temperature drops.
- 4) Make sure that the heat radiation design is effective enough if the  $V_{cc}$  is comparatively high or the IC operates high output power.
- 5) Connect only ground pin for signal sources to the signal GND pin of the amplifier on the previous stage.

Eff. Date	Eff. Date	Eff. Date	Eff. Date	
06-MAR-2002				