Panasonic

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APPROVED
EXTERNAL ISSUE

DOCUMENT COVER PAGE

Note: This cover page establishes the Doc No., Title and current status of the attached document.

Doc No.	SDSC-PSE-AN80T05	Issue Level	Rev	Eff Date
		1	4	21-MAR-05
Doc Title	Product Specifications for AN80T05	Total no. of pages (excluding this page)		11

Revision History

Issue	Rev	Eff Date	S/N	Page	Change Details	Remarks
1	3	16-DEC-04	1	-	Added this cover page.	
			2	9	Removed this page.	
			3	9A	Added this page for leadfree specification.	
			4	9A	Amended Outer Lead Surface Process &	
					Chip Mounting Method.	
	4	21-MAR-05	1	8	Removed physical product marking indications.	

Prepared	M.A.M FOWZAN	Product Specifications	Ref No.	A-1
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APPROVED EXTERNAL ISSUE

FINAL SPECS

MECS 01.06.'00 DOCUMENT CONTROL

Structure	Silicon Monolithic Bipolar IC
Appearance	SIL-12 Pins Plastic Package (Power Type With Fin)
Application	Voltage Supply for Car Audio Systems
Function	7 Outputs Voltage Regulator Peak Current Protection Circuit, ASO Protection Circuit, Thermal Protection Circuit

A	Absolute Maximum Ratings				
No.	Item	Symbol	Ratings	Unit	Note
1	Storage Temperature	Tstg	-55 ~ +150	° C	1
2	Operating Ambient Temperature	Topr	-30 ~ +85	° C	1
3	Operating Ambient Pressure	Popr	$1.013 \times 10^5 \pm 0.61 \times 10^5$ (1.0 ± 0.6)	Pa (atm)	
4	Operating Constant Acceleration	Gopr	9,810 (1,000)	m / s^2 (G)	
5	Operating Shock	Sopr	4,900 (500)	m / s^2 (G)	
6	Power Supply Voltage	Vcc	26.0	V	
7	Power Supply Current	Icc	3.8	A	2
8	Power Dissipation	PD	2.70	W	3

Operating Supply Voltage Range	Vcc	6.6 V ~ 24.0 V

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Note : 1) Except these items, all other measurements are taken at Ta = 25°C.

2) Over current limiting circuit built-in.

3) Ta = 75°C without heat sink. The relationship between power dissipation and ambient temperature follows that of derating curve.

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23-Aug-1999	22-SEP-99	1-Jun-2000		

	Recommended Operating Condition						
No.	Item	Symbol	Limit			Unit	Note
			Min	Typ	Max		
1	Recommended Power Supply Voltage	V_{CC}	10.0	13.2	16.0	V	
			11.0	13.2	16.0	V	1

Note : 1) This range is applicable to Illumination Output which is $V_{(Out)ILL}$=10V.

B Electrical Characteristics

(Unless otherwise specified, ambient temperature is 25°C±2°C, Vcc=13.2V.)

No.	Item	Symbol	Test Cct.	Condition	Limit			Unit	Note
					Min	Typ	Max		
	<VILL Output 1>								
1	Output Voltage VO1	VILL		IO1=-240mA	9.5	10	10.5	V	
2	Line Regulation	REGIN(ILL)		VO1=10V, IO1=-240mA VCC=11~16V	-	20	60	mV	
3	Load Regulation	REGL(ILL)		VO1=10V, IO1=0~-240mA	-	60	120	mV	
4	Min. Input/Output Voltage Difference	VDIF1(min)		VO1=10V, VCC=9V IO1=-240mA	-	0.4	0.7	V	
5	Peak Output Current	IO1(peak)		VO1≥9.5V	300	550	-	mA	
6	Ripple Rejection Ratio	RR1		VO1=10V, f=100Hz VCC=12~14V	40	55	-	dB	
	<VDD Output 2>								
7	Output Voltage VO2	VDD		IO2=-80mA	5.3	5.6	5.9	V	
8	Line Regulation	REGIN(VDD)		VO2=5.6V, IO2=-80mA VCC=10~16V	-	5	15	mV	
9	Load Regulation	REGL(VDD)		VO2=5.6V, IO2=0~-80mA	-	50	120	mV	
10	Min. Input/Output Voltage Difference	VDIF2(min)		VO2=5.6V, VCC=5V IO2=-80mA	-	0.4	0.7	V	
11	Peak Output Current	IO2(peak)		VO2≥5.3V	100	200	-	mA	
12	Ripple Rejection Ratio	RR2		VO2=5.6V, f=100Hz VCC=12~14V	50	60	-	dB	
	<AMP Output 3>								
13	Min. Input/Output Voltage Difference	VDIF3(min)		IO3=-400mA	-	1	1.5	V	
14	Load Regulation	REGL(AMP)		IO3=0~-400mA	-	350	600	mV	
15	Peak Output Current	IO3(peak)		VO3≥11.7V	500	800	-	mA	

B	Electrical Characteristics	(Unless otherwise specified, ambient temperature is 25°C±2°C, Vcc=13.2V.)							
No.	Item	Symbol	Test Cct.	Condition	Limit			Unit	Note
					Min	Typ	Max		
	<ANT Output 4>								
16	Min. Input/Output Voltage Difference	$V_{DIF4(min)}$		I_{O4}=-400mA	-	1	1.5	V	
17	Load Regulation	$REG_{L(ANT)}$		I_{O4}=0~-400mA	-	350	600	mV	
18	Peak Output Current	$I_{O4(peak)}$		V_{O4}≥11.7V	500	800	-	mA	
	<V_{COM} Output 5>								
19	Output Voltage V_{O5}	V_{COM}		I_{O5}=-120mA	8.25	8.70	9.15	V	
20	Line Regulation	$REG_{IN(COM)}$		V_{O5}=8.7V, I_{O5}=-120mA V_{CC}=10~16V	-	10	30	mV	
21	Load Regulation	$REG_{L(COM)}$		V_{O5}=8.7V, I_{O5}=0~-120mA	-	60	120	mV	
22	Min. Input/Output Voltage Difference	$V_{DIF5(min)}$		V_{O5}=8.7V, V_{CC}=7.8V I_{O5}=-120mA	-	0.4	0.7	V	
23	Peak Output Current	$I_{O5(peak)}$		V_{O5}≥8.25V	150	300	-	mA	
24	Ripple Rejection Ratio	RR5		V_{O5}=8.7V, f=100Hz V_{CC}=12~14V	50	60	-	dB	
	<AM Output 6>								
25	Output Voltage V_{O6}	V_{AM}		I_{O6}=-120mA	8.25	8.70	9.15	V	
26	Line Regulation	$REG_{IN(AM)}$		V_{O6}=8.7V, I_{O6}=-120mA V_{CC}=10~16V	-	10	30	mV	
27	Load Regulation	$REG_{L(AM)}$		V_{O6}=8.7V, I_{O6}=0~-120mA	-	60	120	mV	
28	Min. Input/Output Voltage Difference	$V_{DIF6(min)}$		V_{O6}=8.7V, V_{CC}=7.8V I_{O6}=-120mA	-	0.4	0.7	V	
29	Peak Output Current	$I_{O6(peak)}$		V_{O6}≥8.25V	150	300	-	mA	
30	Ripple Rejection Ratio	RR6		V_{O6}=8.7V, f=100Hz V_{CC}=12~14V	50	60	-	dB	

B Electrical Characteristics

(Unless otherwise specified, ambient temperature is 25°C±2°C, Vcc=13.2V.)

No.	Item	Symbol	Test Cct.	Condition	Limit			Unit	Note
					Min	Typ	Max		
	<FM Output 7>								
31	Output Voltage V_{O7}	V_{FM}		I_{O7}=-200mA	8.25	8.70	9.15	V	
32	Line Regulation	$REG_{IN(FM)}$		V_{O7}=8.7V, I_{O7}=-200mA V_{CC}=10~16V	-	20	60	mV	
33	Load Regulation	$REG_{L(FM)}$		V_{O7}=8.7V, I_{O7}=0~-200mA	-	60	120	mV	
34	Min. Input/Output Voltage Difference	$V_{DIF7(min)}$		V_{O7}=8.7V, V_{CC}=7.8V I_{O7}=-200mA	-	0.4	0.7	V	
35	Peak Output Current	$I_{O7(peak)}$		V_{O7}≥8.25V	250	450	-	mA	
36	Ripple Rejection Ratio	RR7		V_{O7}=8.7V, f=100Hz V_{CC}=12~14V	45	55	-	dB	
37	Standby Circuit Current	I_{STB}		Standby Pin=0V	-	0.55	0.80	mA	
	Input (Standby)								
38	Standby Level	V_{TH1-1}			-	-	1.1	V	
39	Active Level	V_{TH1-2}			1.7	-	-	V	
40	Input Current when High	I_{in1}		V_{th1}=5V	100	175	250	µA	
	Input (Mode 2 SW)								
41	Standby Level	V_{TH2-1}			-	-	1.6	V	
42	Active Level	V_{TH2-2}			2.4	-	-	V	
43	Input Current when High	I_{in2}		V_{th2}=5V	13	25	37	µA	
	Input (Mode 1 SW)								
44	Voltage when AM ON	V_{TH3-1}			-	-	1.1	V	
45	Voltage when FM ON	V_{TH3-2}			2.7	-	-	V	
46	Input Current when High	I_{in3}		V_{th3}=5V	13	25	37	µA	

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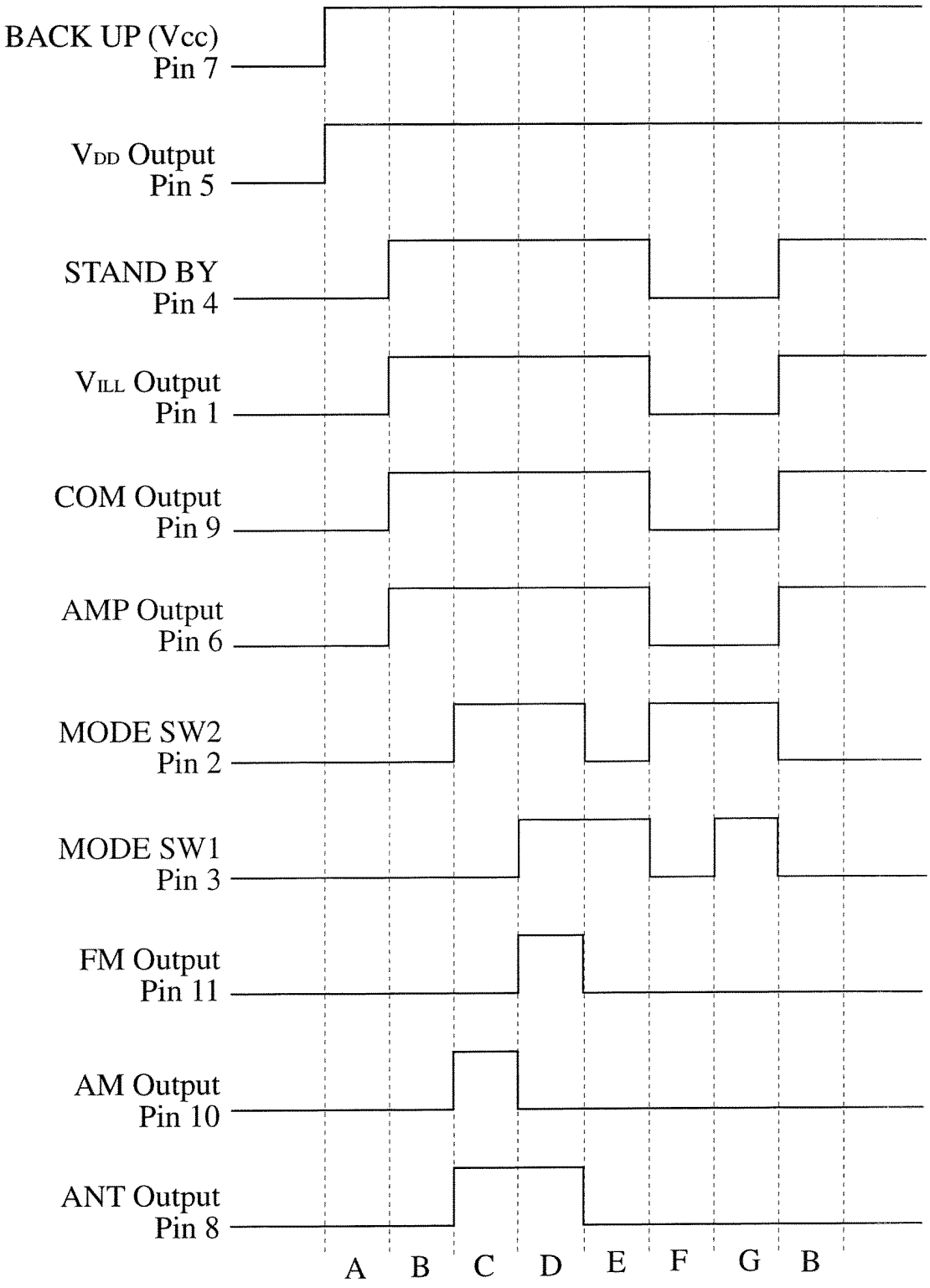
FINAL SPECS

MECS
01.06.'00
DOCUMENT CONTROL

* Input/Output Timing Chart



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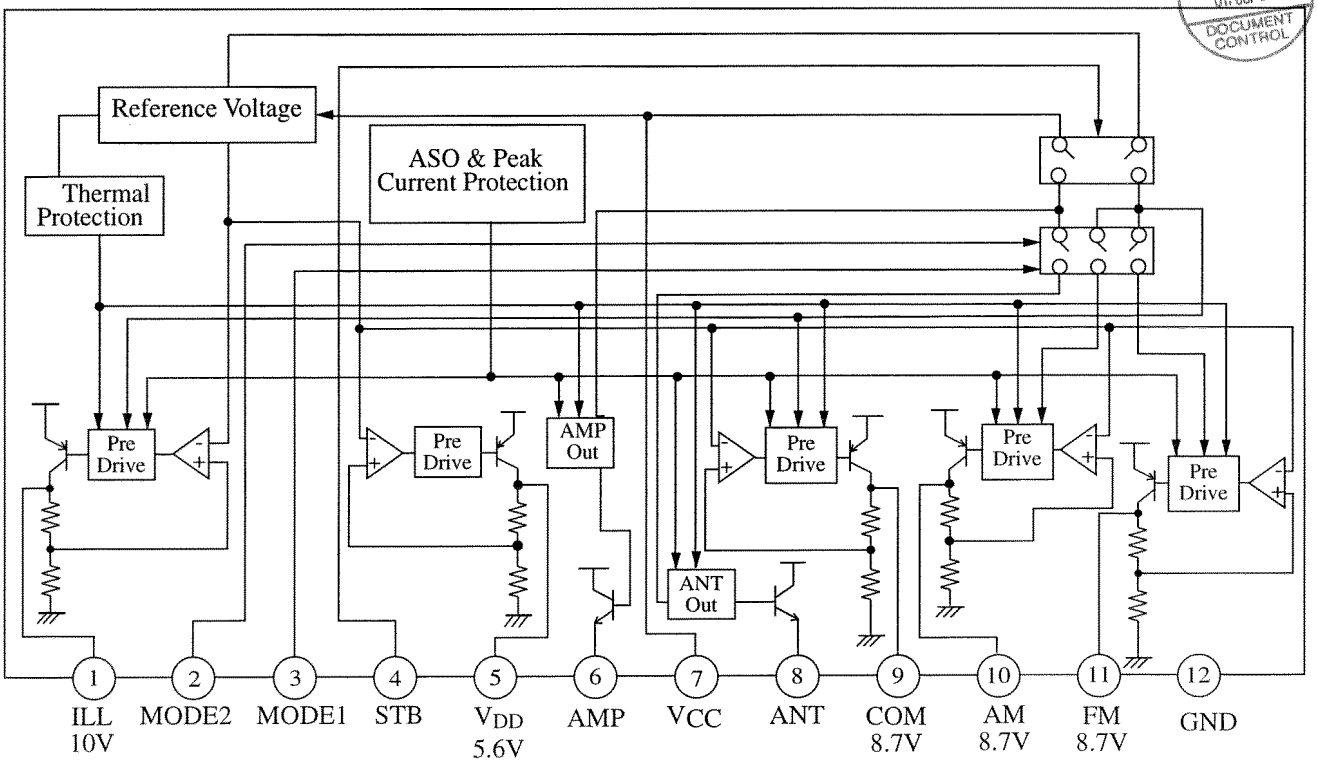
Circuit Function Block Diagram



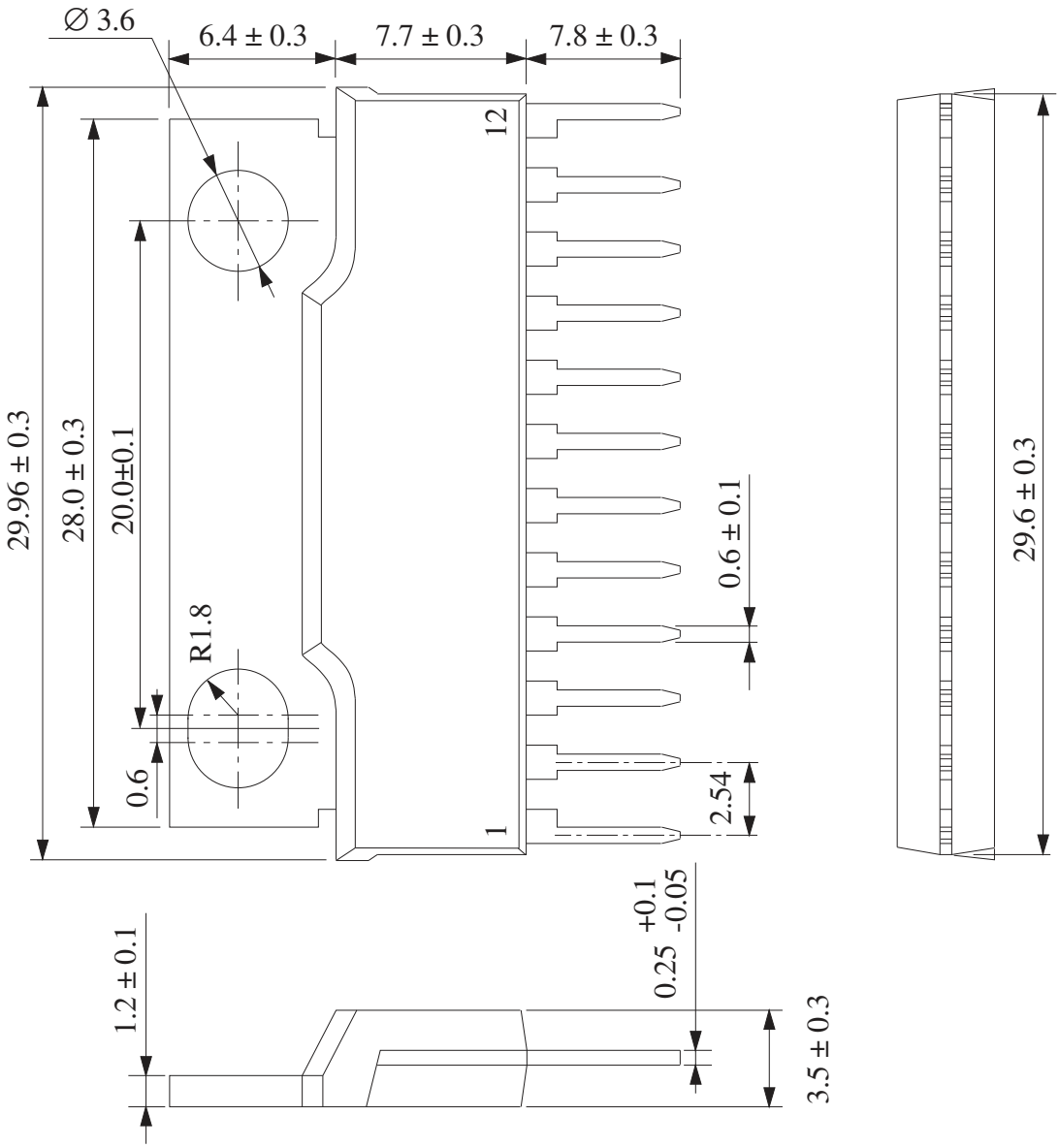
Pin Descriptions

Pin No.	Pin Descriptions	Function
1	Illumination Output	10V power supply with a maximum output current of 300mA for a Illumination.
2	MODE2 SW	AM and ANT output are turned ON when this pin is 5V.
3	MODE1 SW	AM and FM output are switched when this pin is 5V.
4	STAND BY	Only VDD output during the 0V standby state; ILL, COM and AMP outputs are turned ON when this pin is 5V.
5	VDD Output	5.6V Power supply with a maximum output current of 100mA for a micro-controller. Output is always available if BACKUP power supply is connected.
6	AMP Output	Power supply to activate a remote amplifier; a voltage of about 1V (Typ) lower than Vcc voltage is provided with a maximum output current of 500mA.
7	VCC	Connected to car BACKUP and ACC Power supplies.
8	ANT Output	Power supply to drive an antenna voltage of about 1V (Typ) lower than the Vcc voltage is provided with a maximum output current of 500mA.
9	COM Output	8.7V power supply with a maximum output current of 150mA; this can be used as a system common power supply.
10	AM Output	8.7V power supply with a maximum output current of 150mA for AM receiver.
11	FM Output	8.7V power supply with a maximum output current of 250mA for FM receiver.
12	GND	Connected to the IC substrate.

12-SIL(FP)

Package Name	FP-12S

Unit : mm



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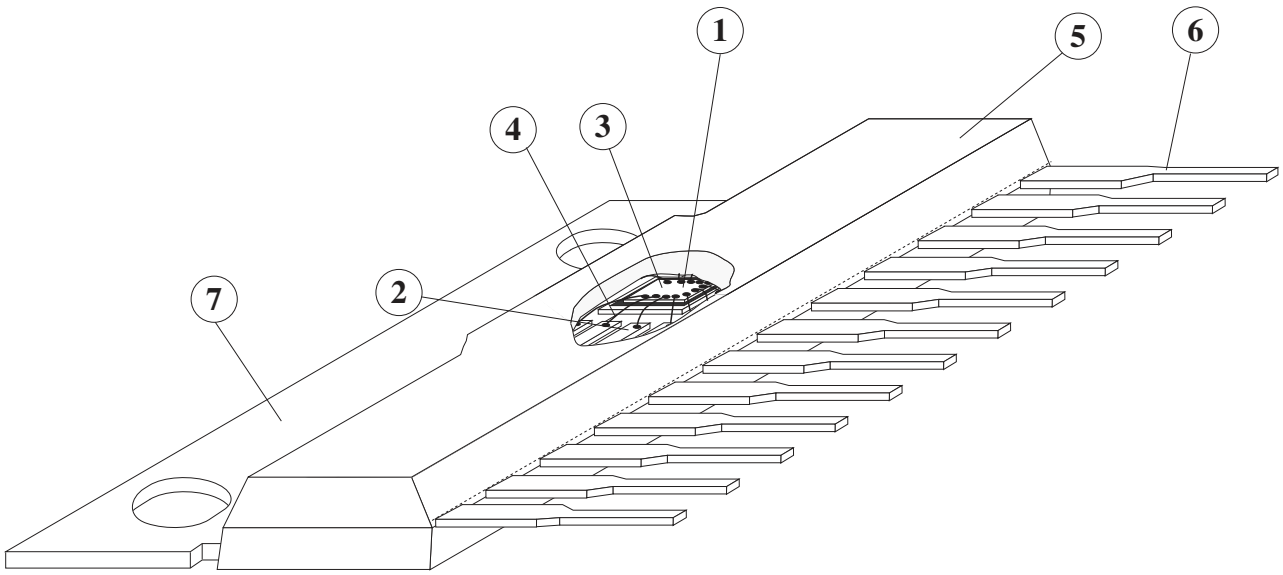
(Structure Description)

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)
*3 Outer lead surface process	[Solder plating (98Sn-2Bi),] Solder dip, Others ( )	(6)
*3 Chip mounting method	Ag paste, Au-Si alloy, [Solder (95.5Pb-2.5Ag-2Sn)**]	(3)
Wire bonding method	[Thermalsonic bonding,] Others ( )	(4)
Wire material	[Au,] Others ( )	(4)
Mold material	[Epoxy,] Others ( )	(5)
Molding method	[Transfer mold,] Multiplunger mold, Others ( )	(5)
Fin material	[Cu group,] Others ( )	(7)

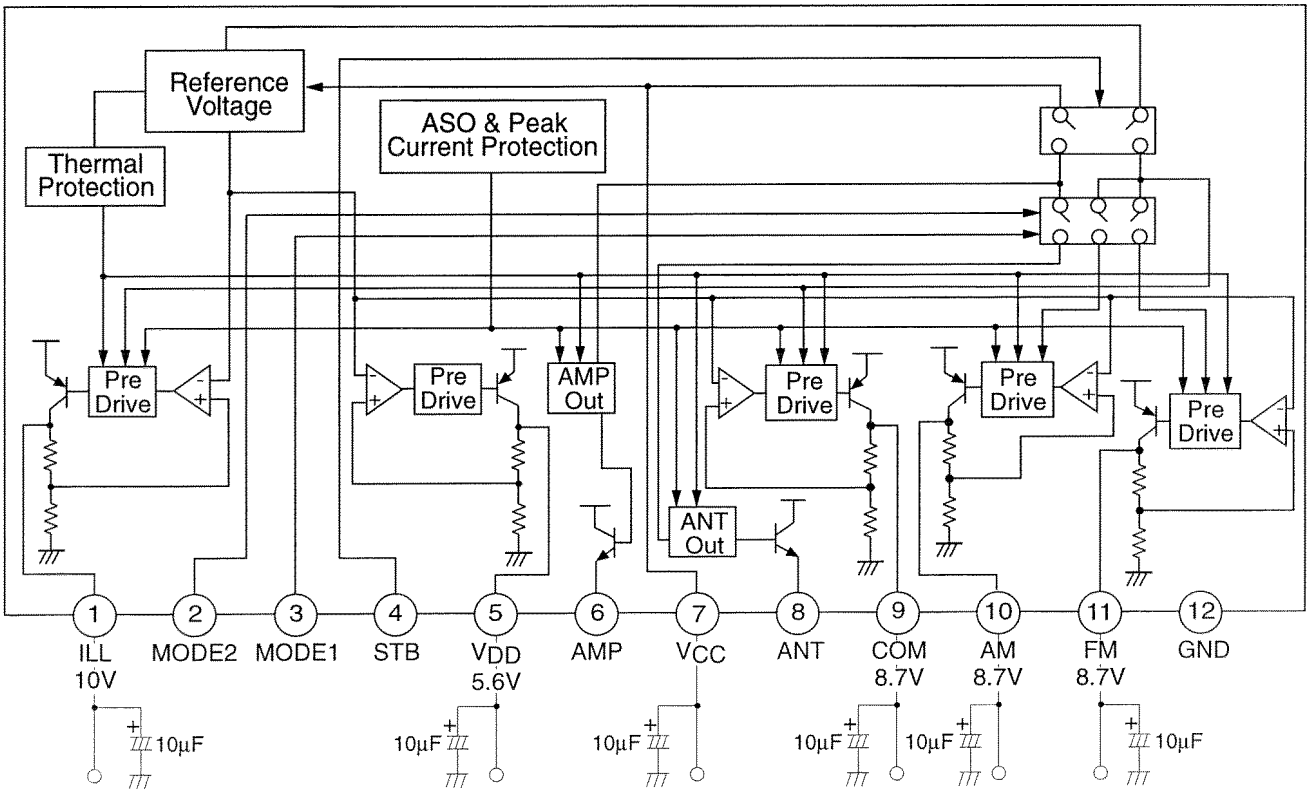
Package FP-12S

**Under RoHS exemption clause, Lead (Pb) in high melting temperature type solder (i.e. tin-lead solder alloys containing more than 85% of lead), is exempted until 2010.



*3

Application Circuit



STB 'OFF'	GND
STB 'ON'	5V

Note : To prevent oscillation at each output, make sure to connect a capacitor having a capacitance of 10µF or greater between GND and each of the ILL (pin 1), V_{DD} (pin 5), V_{CC} (pin7), COM (pin 9), AM (pin 10), and FM (pin 11) pins. We recommend using a tantalum electrolytic capacitor whose capacitance is unsusceptible to temperature.

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Product Specifications

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FINAL SPECS

Package Name	FP-12S

PD - Ta Curves

MECS 01.06.00 DOCUMENT CONTROL

(1) Tc = Ta, 62.5W (θj-c = 2 °C/W)

(2) 20.83W (θf = 4.0 °C/W)

With a 100cm^2 X 3mm Al heat sink (black colour coated)

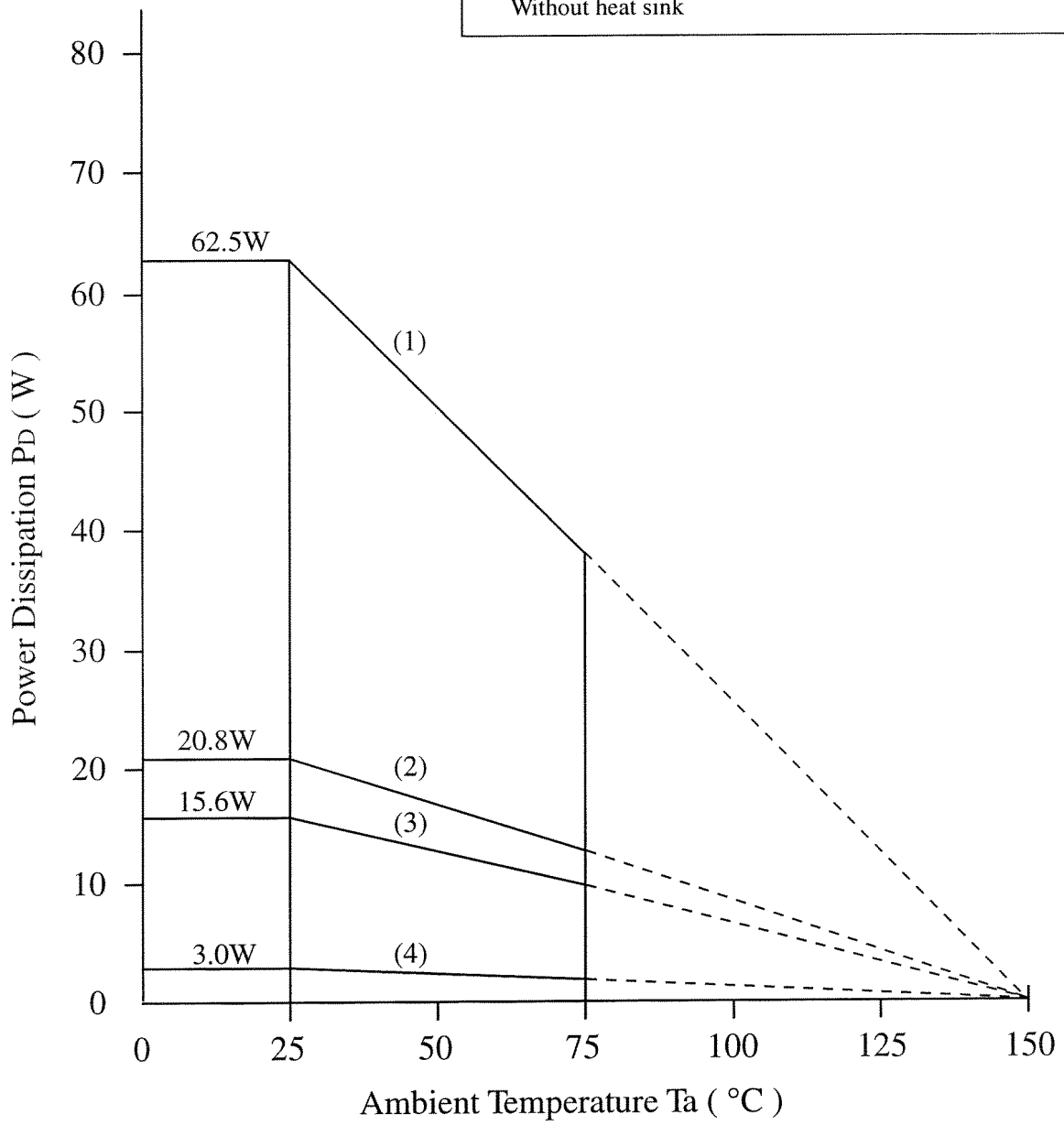
or a 200cm^2 X 2mm Al heat sink (not lacquered)

(3) 15.63W (θf = 6.0 °C/W)

With a 100cm^2 X 2mm Al heat sink (not lacquered)

(4) 3.0W at Ta = 25 °C (θj-a = 42 °C/W)

Without heat sink



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