

SPECIFICATION

Device Name : Current Mode PWM Controller

Type Name : F A 1 3 8 4 5 P

Spec. No. : M S 6 N 0 3 6 4

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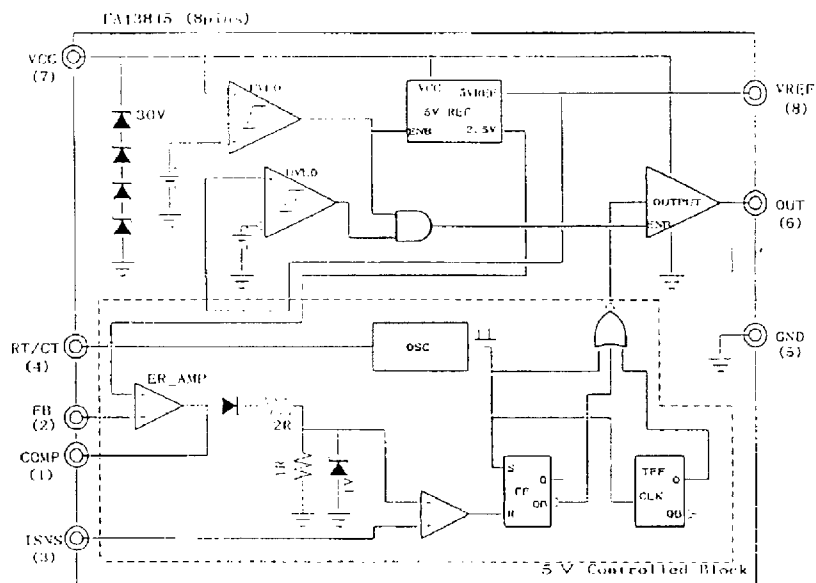
Fuji Electric Co., Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co., Ltd.		
DRAWN	Feb-11-1988	H. Moriyama	M. Saito	DWG NO	MS6N0364	1/13
CHECKED	Feb-11-1988	M. Saito				

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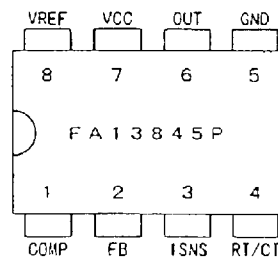
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1. Type Name FA13845P
2. Function Current Mode PWM Controller
3. Process CMOS IC
4. Outline DIP-8 (8pin plastic mold dual in-line package)
5. Block Diagram



6. Pin Assignment

Pin No.	Pin Name	Pin Function
1	COMP	Compensation
2	FB	Feedback (Input)
3	ISNS	Current Sense (Input)
4	RT/CT	Oscillator control
5	GND	Ground
6	OUT	Output
7	VCC	Power Supply
8	VREF	5V Reference Output



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7. ABSOLUTE MAXIMUM RATINGS

Parameter	Conditions	Ratings	Units
Supply Voltage	Low Impedance Source	28	V
	Zener Clamp (at $I_{oc} < 10\text{mA}$)	Self Limiting	V
Zener Current		10	mA
Output Peak Current	Pch Source Current	400	mA
	Nch Sink Current	1	A
Analog Input Voltage	FB, ISNS	-0.3 ~ 5.3	V
Error-amp Sink Current		10	mA
Power Dissipation	at $T_a < 50^\circ\text{C}$ (DIP-8)	800	mW
Package Thermal Resistance θ_{j-a}	between Junction and Ambient	125	$^\circ\text{C}/\text{W}$
Operating Junction Temperature		150	$^\circ\text{C}$
Operating Ambient Temperature		-25 ~ 85	$^\circ\text{C}$
Storage Temperature		-10 ~ 150	$^\circ\text{C}$

8. RECOMMENDED OPERATING CONDITIONS

Parameter	MIN.	MAX	Units
Supply Voltage	10	25	V
RT Resistor	2.0	100	k Ω
CT Capacitor	0.47	10	nF
Operating Frequency	10	500	kHz

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9. ELECTRICAL SPECIFICATIONS

(Unless otherwise standard, these specifications apply for VCC=15V, RT=10k, CT=3 μ F, Ta=25°C)

Reference Section

Parameter	Conditions	MIN	TYP.	MAX.	Units
Output Voltage	Tj=25°C, IL=1mA	4.75	5.00	5.25	V
Line Regulation	VCC=10~25V		± 3	± 20	mV
Load Regulation	IL=0~20mA		± 3	± 25	mV
Temp. Stability	Ta=-25~85°C		± 0.3		mV/°C
Output Short Current	Tj=25°C		60		mA

Oscillator Section

Parameter	Conditions	MIN	TYP.	MAX.	Units
Frequency	Tj=25°C	49	52	55	kHz
	Tj=-25~85°C	47		57	kHz
Voltage Stability	VCC=10~25V		± 0.25	± 1	%
Temp. Stability	Ta=-25~85°C		-0.07		%/°C
Amplitude	Tj=25°C		1.6		V
Discharge Current	Tj=25°C		8.4		mA

Error Amp Section

Parameter	Conditions	MIN.	TYP.	MAX.	Units
Input Voltage	COMP=2.5V, Tj=25°C	2.4	2.5	2.6	V
Input Leak Current				± 2	μ A
Open-loop Gain		65	72		dB
Unity Gain Bandwidth		0.7	1		MHz
Output Source Current	FB=2.3V, COMP=0V	-0.8	-1.0		mA
Output Sink Current	FB=2.7V, COMP=1V	2	15		mA
Output Voltage	FB=2.3V	4.0	4.5		V
	RL=15k to GND				
	FB=2.7V		80	500	mV
	RL=15k to VREF				

Current Sense Section

Parameter	Conditions	MIN.	TYP.	MAX.	Units
Gain	Tj=25°C	2.85	3	3.15	V/V
Maximum Input Signal	FB=0V	0.9	1.0	1.1	V
Input Bias Current			-1	-5	μ A
Delay to Output	Tj=25°C, ISNS=OUT		150	300	ns

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Output Section

Parameter	Conditions	MIN.	TYP.	MAX.	Units
Output High Level	I _{source} =-20mA	14.5	14.75		V
	I _{source} =-100mA	12	13.5		V
Output Low Level	I _{sink} =20mA		0.15	0.3	V
	I _{sink} =200mA		1.5	3	V
Rise Time	CL=1nF, T _j =25°C		40	150	ns
Fall Time	CL=1nF, T _j =25°C		20	150	ns

Under-Voltage Lockout Section

Parameter	Conditions	MIN.	TYP.	MAX.	Units
Start Threshold		8.6	9.6	10.6	V
Min. Operating Voltage		8	9	10	V
Hysteresis			0.6		V

PWM Section

Parameter	Conditions	MIN.	TYP.	MAX.	Units
Maximum Duty Cycle		47	48	50	%
Minimum Duty Cycle	FB=5V, COMP=open			0	%

Overall Section

Parameter	Conditions	MIN.	TYP.	MAX.	Units
Standby Current	VCC=7V			2	uA
Start-up Current	VCC=Start Threshold		12	30	uA
Operating Current			3	5	mA
Zener Voltage (V _{CC})	ICC=5mA	28	30	34	V

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10. Reliability

No	Test Item	Testing Conditions	Measurement	Sampling number (Acceptance number)
1	Operating Life under High Temperature	85°C, VCC=28V 1000Hr	Electrical	22 (0:1)
2	Operating Life under High Temperature & Humidity	85°C, 85%RH, VCC=28V 1000Hr	Electrical	22 (0:1)
3	High Temperature Storage	150°C 1000Hr	Electrical	22 (0:1)
4	Low Temperature Storage	-40°C 1000Hr	Electrical	22 (0:1)
5	Temperature Cycle	-40°C(30min.)~150°C(30min.) 100cycle	Electrical	22 (0:1)
6	Unsaturated Pressurized Vapor (USPCT)	130±5°C, 85%RH, 2.3×10 ⁵ Pa 100Hr	Electrical	22 (0:1)
7	Resistance to Soldering Heat	260±5°C 10±1sec	Electrical Visual	22 (0:1)
8	Electrostatic Discharges (ESD)	1.5k Ω, 100pF, ±2000V 3 times	ESD tester	11 (0:1)
9	Latch up	0 Ω, 200pF, ±100V 3 times	Latch up tester	11 (0:1)
10	Solderability	260±5°C, 2±0.5sec using flux	Visual	11 (0:1)
11	Terminal Strength	Pull 0.1kgf 10±1sec	Visual	11 (0:1)
12	Drop	on the wooden board Height=75cm, 3 times	Visual	11 (0:1)
13	Permanence of Marking	Isopropyl alcohol 20~25°C, 30±5sec	Visual	11 (0:1)

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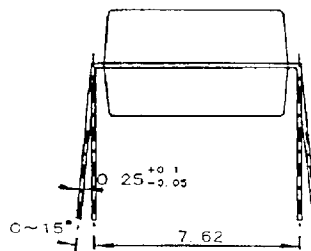
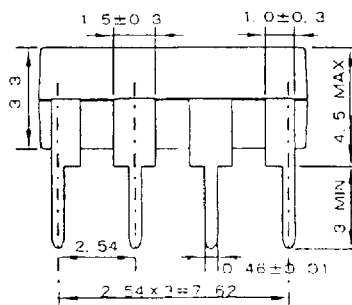
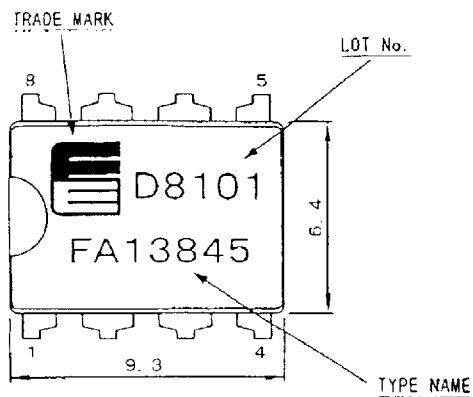
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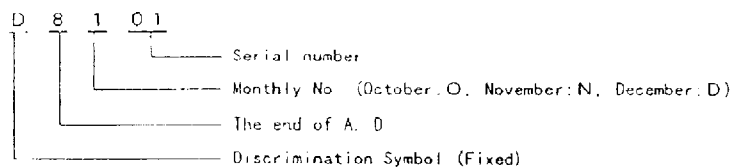
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11. Outline Diagram (DIP-8 pins)



UNIT: mm

Contents of Lot No.



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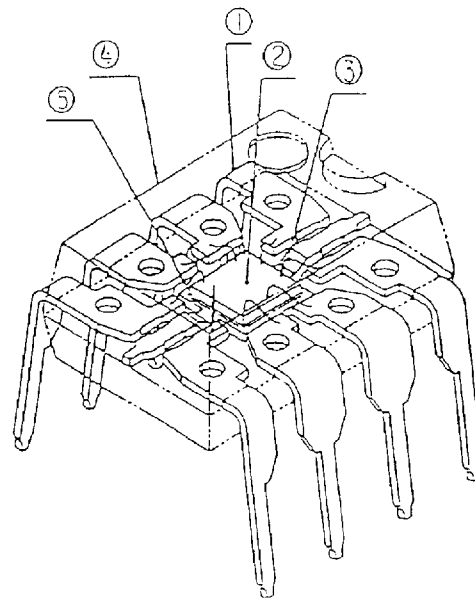
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12. Inner Structure



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Ref.	Name	Material
①	Lead-frame	Copper
②	Chip	Silicon
③	Wire	Au
④	Resin	Epoxy Resin (UL94V-0)
⑤	Adhesive	Conductive Adhesive

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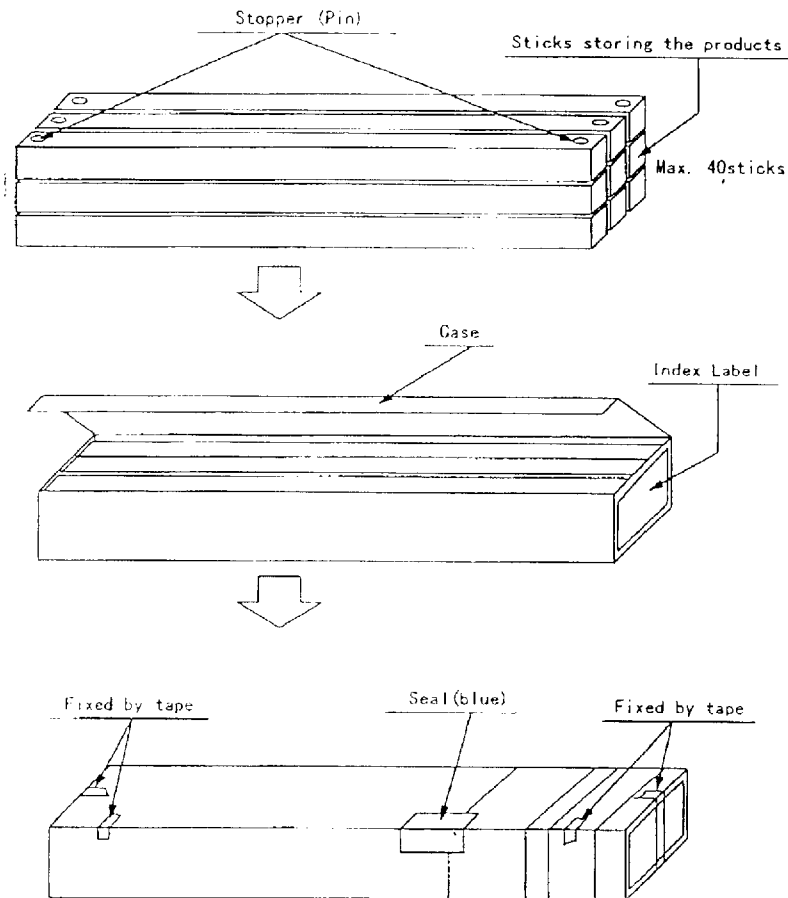
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1 3. Packing Specification

(1) Quantity

Type of Package	Quantity of the products	
	in the stick	in the case
FA13845P (DIP-8pin)	max. 50 pcs	max. 2000 pcs (max. 40 sticks)

(2) Packing description



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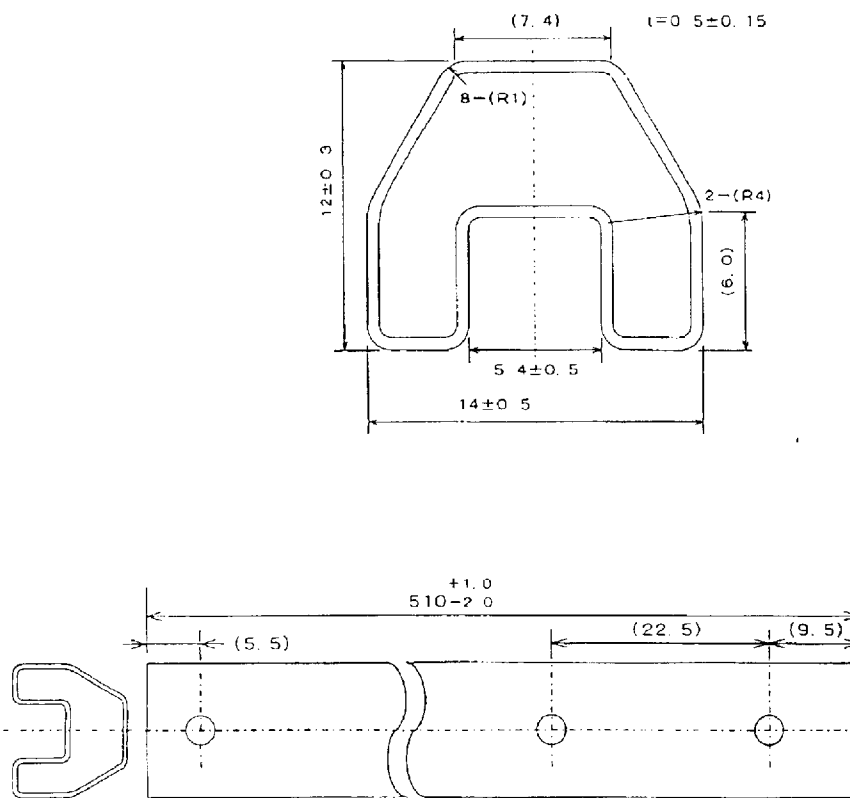
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(3) Dimensions of the stick



Unit: mm

Reference value in parentheses

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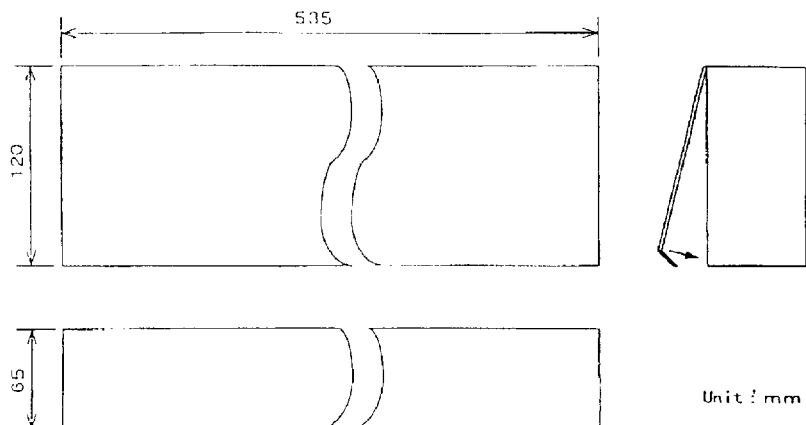
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(4) Dimensions of the packing case



(5) Index label

FUJI ELECTRIC	Integrated Circuits	
	Type	FA 13845 P
	Lot No	D 8 1 0 1
	Quantity	2 0 0 0 PCS

Type name
 Lot No.
 Quantity (pass counts)

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