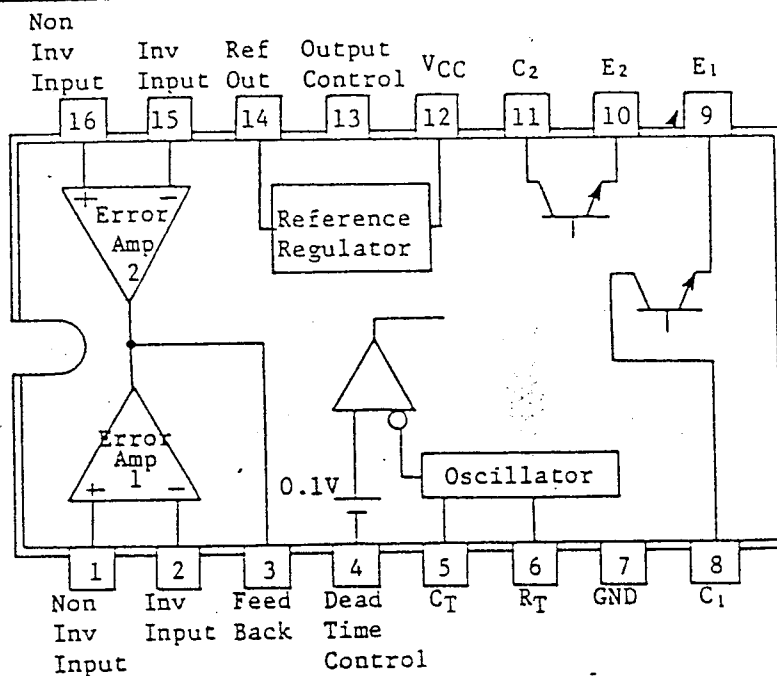


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1. General Description .

The IR3M02 is an upgraded version of the IR9494 Pulse Width Modulation Type Switching Regulator Control IC with the added feature of low-voltage error preventive circuit. The IR9494 TL-494 and MB-3759 are all pin compatible.

2. Pin Configuration



3. Maximum Ratings

Parameter	Symbol	Rating	Unit	Remarks
Supply Voltage	V _{CC}	41	V	
Input Voltage	V _I	V _{CC} + 0.3	V	Pin 1, 2, 15, 16
Output Voltage	V _C	41	V	Pin 3, 11
Output Current	I _C	250	mA	"
Power Dissipation (25°C)	P _C	1000	mW	Derating ratio 10 mW/°C (T _a > 25°C)
Operating Temperature Range	T _{opr}	-25 ~ +85	°C	
Storage Temperature Range	T _{stg}	-65 ~ +150	°C	

SHARP4. Recommended Operating Conditions

Parameter	Symbol	Rating			Unit	Remarks
		Min.	Typ.	Max.		
Supply Voltage	V _{CC}	7	15	40	V	
Input Voltage	V _I	-0.3		V _{CC} -2	V	
Output Voltage	V _C			40	V	
Output Current	I _C	5	100	200	mA	
Output Current on Reference Voltage	I _{REF}		5	10	mA	
Outgoing Current	I _{OSO}			2	mA	Outgoing into Pin 3
Incoming Current	I _{OSI}			0.3	mA	Incoming into Pin 3
Timing Capacitance	C _T	470		68000	pF	
Timing Resistance	R _T	1.8		500	K Ω	
Oscillator Frequency	f	1		300	KHz	

5. Electrical Characteristics(V_{CC}=15V, T_a=25°C)

Parameter	Symbol	Rating			Unit	Conditions
		Min.	Typ.	Max.		
Reference Voltage Source						
Output Voltage	V _{REF}	4.75	5.0	5.25	V	I _O =1mA
Input Stability			2	25	mV	7V \leq V _{CC} \leq 40V
Output Stability			-1	-15	mV	1mA \leq I _O \leq 10mA
Thermal Stability			0.3	1.5	%	-25°C \leq T _a \leq 85°C
Short-circuit Output Current	I _{REF}	15	40		mA	
Output Inhibit Voltage on Low-Voltage Supply			4.3		V	
Above Hysteresis Width			0.3		V	

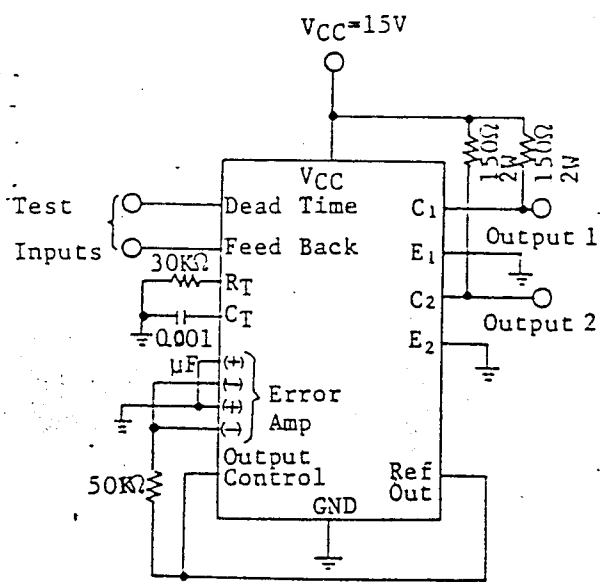
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Parameter	Symbol	Rating			Unit	Conditions
		Min.	Typ.	Max.		
Oscillator Circuit						
Frequency	f	36	40	44	KHz	$R_T=30K\Omega$, $C_T=1000pF$
Frequency Setting Accuracy			± 3		%	V_{CC} , C_T , R_T , T_a fixed
Frequency Input Stability			± 0.1		%	$7V \leq V_{CC} \leq 40V$
Frequency Thermal Stability				3	%	$-25^\circ C \leq T_a \leq 85^\circ C$
Halt Time Setting Circuit						
Input Bias Current	I_B		-2	-10	μA	$0 \leq V_I \leq 5.25V$
Output Maximum Duty		40	45		%	$V_I=0$
Input Voltage (Pin 4)	V_I		3.0	3.3	V	0% Duty
		0			V	Max. Duty
Error Amp						
Input Offset Voltage	V_{IO}		2	10	mV	$V_O(\text{pin } 3)=2.5V$
Input Offset Current	I_{IO}		25	250	nA	$V_O(\text{pin } 3)=2.5V$
Input Bias Current	I_B		-0.2	-1.0	μA	$V_O(\text{pin } 3)=2.5V$
Common Input Voltage Range	V_{CM}	-0.3		$V_{CC}-2$	V	$7V \leq V_{CC} \leq 40V$
Open Voltage Gain	A_v	70	95		dB	$0.5V \leq V_O \leq 3.5V$
GB Product	G·B		800		KHz	
Common Signal Rejection Ratio	CMR	65	80		dB	$V_{CC}=40V$
Output Sink Current	I_{OSi}	0.3	0.7		mA	$-5V \leq V_{ID} \leq -15mV$, $V_O=0.7V$
Output Source Current	I_{OSO}	-2	-10		mA	$15mV \leq V_{ID} \leq 5V$, $V_O=3.5V$

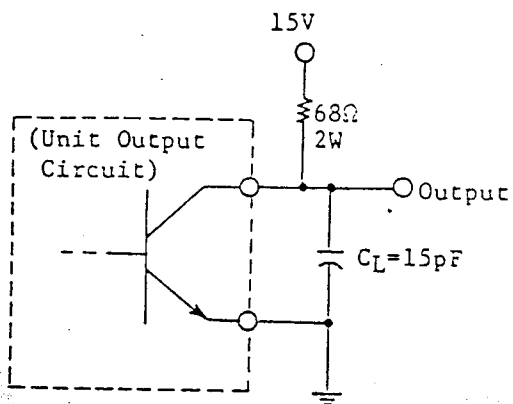
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Parameter	Symbol	Rating			Unit	Conditions
		Min.	Typ.	Max.		
Output Circuit						
Off-state Corrector Current				100	μA	$V_{CC}=40\text{V}, V_C=40\text{V}$
Off-state Emitter Current				-100	μA	$V_{CC}=V_C=40\text{V}, V_E=0$
Output Saturation Voltage	Common Emitter	$V_{CE\text{ sat}}$	1.1	1.3	V	$V_E=0, I_C=200\text{mA}$
	Common Collector	$V_{CE\text{ sat}}$	1.5	2.5	V	$V_C=15\text{V}, I_E=-200\text{mA}$
Output Control Input Current (Pin 13)			1.3	3.5	mA	$V_I=V_{REF}$
PWM Comparator						
Input Voltage (Pin 3)	V_I		4	4.5	V	0% Duty
Input Current (Pin 3)		0.3	0.7		mA	$V_O(\text{pin } 3)=0.7\text{V}$
Whole Circuitry				15	mA	
Static Supply Current	I_{CC1}		7	12	mA	$V(\text{pin } 6)=V_{REF}, I/O \text{ Pin Open}$
Supply Current (Standard Connection)	I_{CC2}		8		mA	$V_{4-7}=2\text{V}$ Fig.1
Output Switching Characteristics						
Rise Time	t_{rc}		100	200	ns	Common Emitter, $R_L=68\Omega$ Fig.2
Fall Time	t_{fc}		25	100	ns	
Rise Time	t_{re}		100	200	ns	Common Collector $R_L=68\Omega$ Fig.3
Fall Time	t_{fe}		40	100	ns	

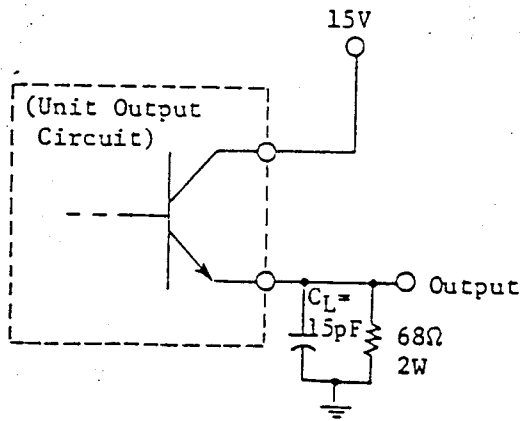
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(Fig. 1)



(Fig. 2)



(Fig. 3)

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1. Package Specification

Refer to Drawing No. AA640-025.

2. Markings

2-1. Marking contents

(1) Product name: IR3M02

(2) Company name: **SHARP**

(3) Date code:

(Example) 2 2 6 A --- Indicates the product was manufactured in the 1st week of June, 1982.

Denotes the production week. (A, B, C, D, E)

Denotes the production month. (1, 2, 3, 9, X, Y, Z)

Denotes the last digit of the year.

Denotes the I.D. No.

2-2. Marking positions

Refer to Drawing No. AA640-025.

2-3. Marking color

Silver

3. Crating Specification

3-1. Crating materials

Crating parts	Parts materials	Purposes
Tube	Conductive plastic (25 devices per tube)	Device crating
Stopper	Plastic	Device fixing
Label	Paper	Indication of product name, quantity and production date.
Inside crating case	Cardboard	Inside crating of tubes
Outside crating case	Cardboard	Outside crating of tubes

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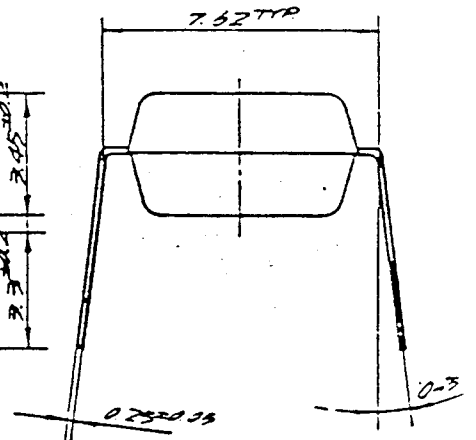
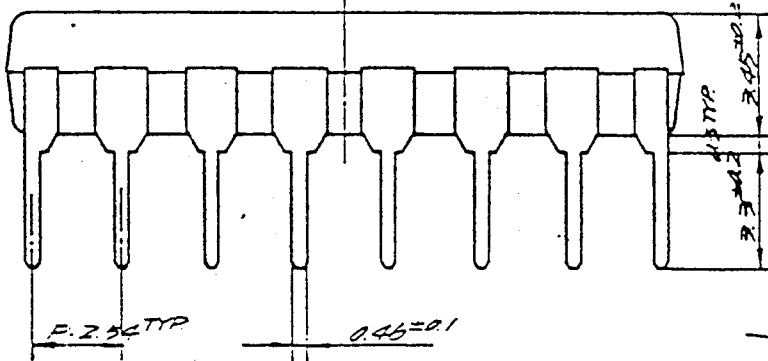
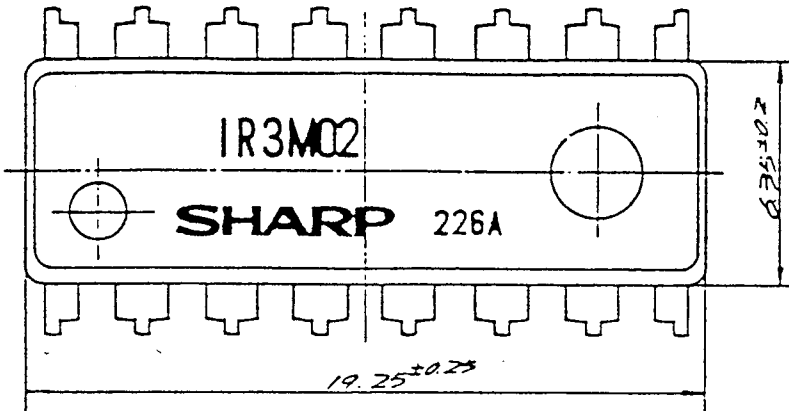
3-2. External view of crated products

Refer to Drawing No. BJ023-00.

Precaution for unpacking

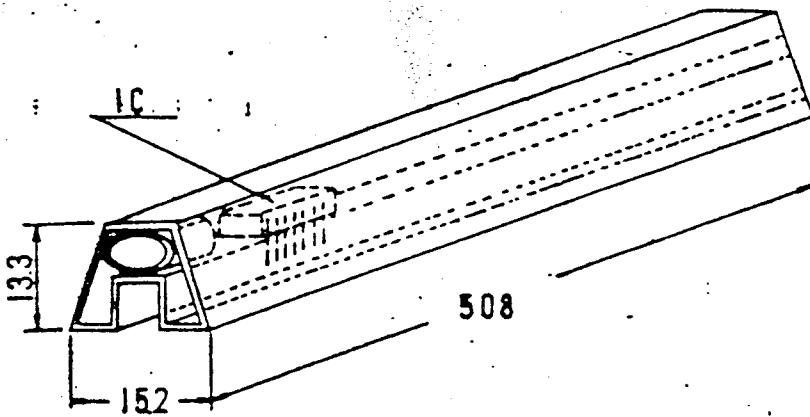
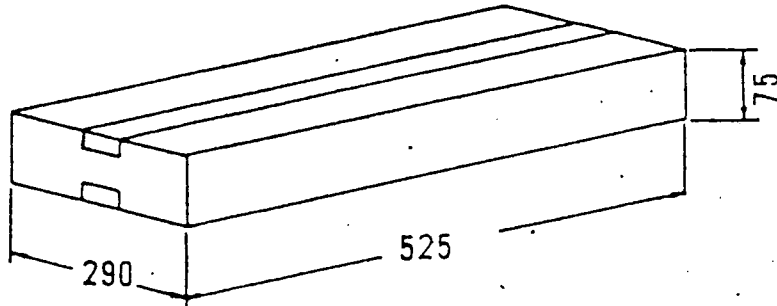
- 1) Unpacking should be done on the stand as well as a human body treated with anti-ESD.
- 2) Conductive treatment or anti-ESD treatment is given to a tube. Use the equivalent tube, if it is changed to another one.
- 3) Be sure to fix two stoppers to both ends of a tube when storage to prevent the devices from slipping.

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適用機種 APPLICABLE MODEL	IR3M02	尺寸 SCALE	5/1	單位 UNIT	mm	1 = 1/11	DATE	REVISION	REVISE	CHK
厚度 THICKNESS	個數 PIECES	材質 MATERIAL	代上 FINISH	名稱 NAME	DPT16DP					
日付 DATE	Sn plating		コード CODE							
設計 DRAW	圖樣 TRACE	校核 CHECK	承認 APPROVE	SHARP CORPORATION						
				圖號 DRAWING No	AA 640-025					

SHARP



△				適用機種		名 稱		IC	
△				MODEL		NAME		PACKING CASE	
年-月-日		訂正記号		IR3M02		材 質		単 位	
DATE		REVISE		板 厚		厚 度		3角図法	
MATERIAL		仕 上		THICKNESS		SCALE		員 数	
		FINISH						PIECES	
								単 位	
								UNIT	
								/ M	
								口 下	
								CODE	
設計		製図		検査		日付		DATE	
DESIGN		DRAW		TRACE		CHECK		APPROVE	
SHARP CORPORATION		SHARP CORPORATION		SHARP CORPORATION		DRAWING NO.		81023-00	