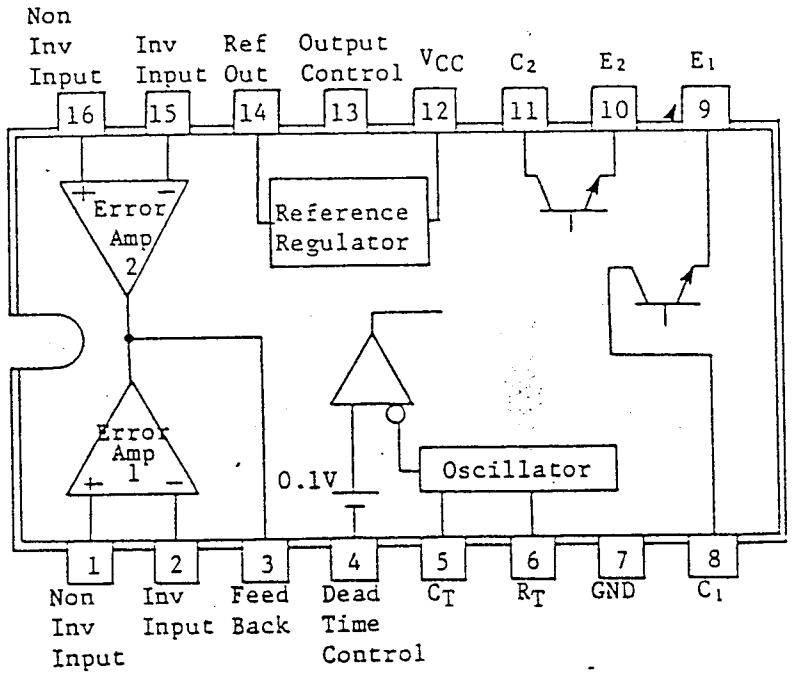
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1. General Description

The IR3M02 is a 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 (Ta>25°C)
Operating Temperature Range	T_{opr}	-25 ∿ +85	°C	
Storage Temperature Range	T_{stg}	-65 ∿ +150	°C	

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4. 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	KΩ	
Oscillator Frequency	f	1		300	KHz	

5. Electrical Characteristics

(V_{CC}=15V, Ta=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≦V_{CC}≦40V
Output Stability			-1	-15	mV	1mA≦I_O≦10mA
Thermal Stability			0.3	1.5	%	-25°C≦Ta≦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	

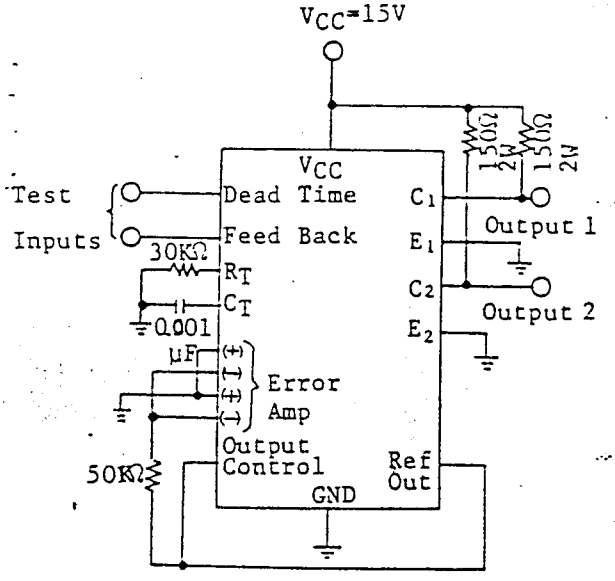
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Parameter	Symbol	Rating			Unit	Conditions
		Min.	Typ.	Max.		
Oscillator Circuit						
Frequency	f	36	40	44	KHz	R_T=30KΩ, C_T=1000pF
Frequency Setting Accuracy			±3		%	V_{CC}, CT, RT, Ta fixed
Frequency Input Stability			±0.1		%	7V≦V_{CC}≦40V
Frequency Thermal Stability				3	%	-25°C≦Ta≦85°C
Halt Time Setting Circuit						
Input Bias Current	I_B		-2	-10	μA	0≦V_I≦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(pin 3)=2.5V
Input Offset Current	I_{IO}		25	250	nA	V_O(pin 3)=2.5V
Input Bias Current	I_B		-0.2	-1.0	μA	V_O(pin 3)=2.5V
Common Input Voltage Range	V_{CM}	-0.3		V_{CC}-2	V	7V≦V_{CC}≦40V
Open Voltage Gain	Av	70	95		dB	0.5V≦V_O≦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≦V_{ID}≦-15mV, V_O=0.7V
Output Source Current	I_{OSO}	-2	-10		mA	15mV≦V_{ID}≦5V, V_O=3.5V

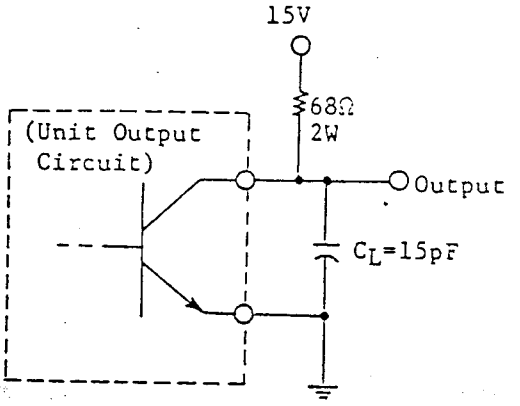
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Parameter		Symbol	Rating			Unit	Conditions
			Min.	Typ.	Max.		
Output Circuit							
Off-state Corrector Current					100	μA	V_{CC}=40V, V_C=40V
Off-state Emitter Current					-100	μA	V_{CC}=V_C=40V, V_E=0
Output Saturation Voltage	Common Emitter	$V_{CE\ sat}$		1.1	1.3	V	V_E=0, I_C=200mA
	Common Collector	$V_{CE\ sat}$		1.5	2.5	V	V_C=15V, I_E=-200mA
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(pin 3)=0.7V
Whole Circuitry					15	mA	
Static Supply Current		I_{CC1}		7	12	mA	V(pin 6)=V_{REF}, I/O Pin Open
Supply Current (Standard Connection)		I_{CC2}		8		mA	V_{4-7}=2V Fig.1
Output Switching Characteristics							
Rise Time		trc		100	200	ns	Common Emitter, R_L=68Ω Fig.2
Fall Time		tfc		25	100	ns	
Rise Time		tre		100	200	ns	Common Collector R_L=68Ω Fig.3
Fall Time		tfe		40	100	ns	

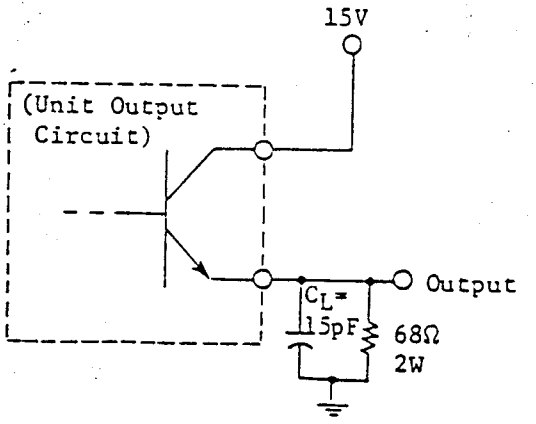
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(Fig. 1)



(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.

- A: Denotes the production week. (A, B, C, D, E)
- 6: Denotes the production month. (1, 2, 3, ... 9, X, Y, Z)
- 2: Denotes the last digit of the year.
- 2: 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 prodcut 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

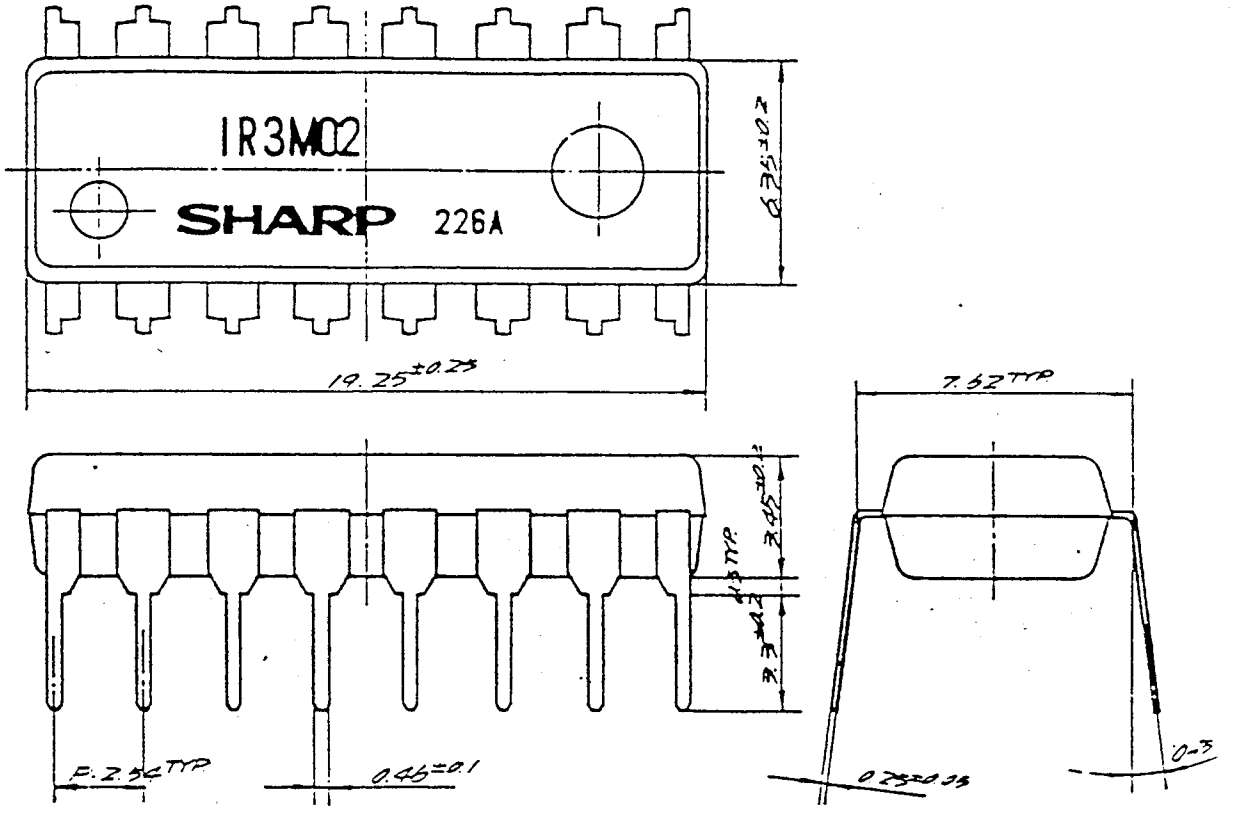
Refer to Drawing No. BJ023-00.

Precausion for unpacking

1) Unpacking should be done on the stand as well as a human body treated with anti-ESD.

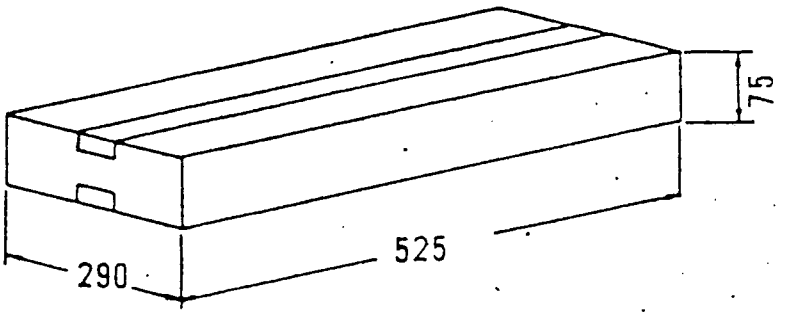
2) Conductive treatment or anti-ESD treatment is given to a tube. Use the equivalent tube, if it is changed to another one.

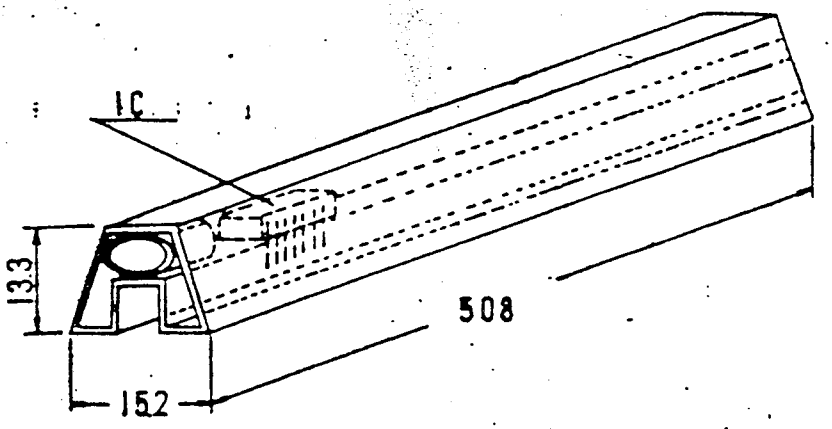
3) Be sure to fix two stoppers to both ends of a tube when storage to prevent the devices from slipping.



適用機種 APPLICABLE MODEL: IR3M02	尺寸 SCALE: 5/1	単位 UNIT: 1=1/1 mm	改訂日 DATE / 改訂記事 REVISE / 照合 CHARG.
板厚 THICKNESS	個数 PIECES	材質 MATERIAL	仕上 FINISH
			Sn plating
日付 DATE			
設計 DESIGN / 製図 DRAW / 写図 TRACE / 照合 CHECK / 承認 APPROVE	シャープ株式会社 電子部品事業本部		名称 NAME: DPT16DP
	SHARP CORPORATION		コード CODE
			図番 DRAWING No: AA640—025

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年・月・日 DATE	訂正箇所 REVISE	適用機種 MODEL	IR3M02	名称 NAME	IC PACKING CASE
材質 MATERIAL	仕上 FINISH	板厚 THICKNESS	尺度 SCALE	3角図法	員数 PIECES / 単位 UNIT M
					コード CODE
設計 DESIGN	製図 DRAW	不図 TRACE	検図 CHECK	承認 APPROVE	日付 DATE 57 9 7
				シャープ株式会社 SHARP CORPORATION	図番 DRAWING NO. 8J023-000

様式 図-4-A4