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VOLTAGE DETECTORS
RX5VA Series

■ OUTLINE

RX5VA series, developed with C-MOS processing technology, are accurate, low-power-consumption voltage detectors. The detectors include comparators, output drivers and hysteresis circuit.
The value of detect voltage is set internally, and is accurately controlled by Laser Trimming.
There are three types of output : N-ch open-drain, P-ch open-drain, and C-MOS. There are two convenient packages : mini-power-mold and TO-92. The RX5VA series can be used as a reference voltage supply for ICs in many applications.

■ FEATURES

- Extremely low power consumption .... TYP. $1.0\mu A$ $(VDD = 3.0V)$
- Wide voltage range .... $1.5V$ to $10.0V$
- Variety of detect voltage .... $0.1V$ step
- High accuracy .... $\pm2.5\%$
- Good temperature characteristic for detect voltage .... TYP. ±100 PPM/°C
- Output Options .... N-ch open drain,
  P-ch open drain,
  CMOS
- Compact Package .... TO-92, min-power-mold

■ APPLICATIONS

- Resets circuit of P-ch, N-ch, and C-MOS microcomputers
- Battery checker
- Logic circuit reset
- Level discriminator
- Waveform shaping circuit
- Switching circuit for battery backup
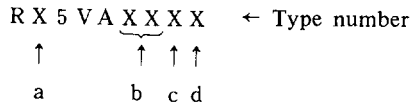- Power failure detector

Notice
The RX5VA Series will be discontinued, and therefore please order the RX5VL Series for the shipment after December 1992.

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■ SELECTION GUIDE

You can define several options, including output driver type, package and packing method with the RX5VA series.

The devices are defined by the following characters.

$$RX5VA\underbrace{XXXX}\quad \leftarrow \text{Type number}$$

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RX5VA X X X X   ← Type number
  ↑      ↑  ↑ ↑
  a      b  c d
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Character	Meaning
a	Defines the packaging type E : TO-92 H : Mini-power-mold
b	Defines the voltage value that is to be monitored (−VDET) The monitor range is 2.00V to 6.00V in 0.1V units, with an accuracy of ±2.5%.
c	Defines the output type A : N-ch open drain B : P-ch open drain C : C-MOS
d	Defines the packing method A-T1 : Taping-T1 type (See Fig.1) A-T2 : Taping-T2 type (See Fig.1) A-RF : Taping-RF type (See Fig.1) A-RR : Taping-RR type (See Fig.1) B : Gluing (Gluing is for mini power mold package as a sample) C : Electric conductive bagging (for TO-92)

Table 1

Example

Type number	Voltage Detect ($-$VDET)			Output Driver			Package	Packing method
	MIN.(V)	TYP.(V)	MAX.(V)	N-ch Open-Drain	P-ch Open-Drain	C-MOS		
RX5VA20AX				◯				
RX5VA20BX	1.950	2.000	2.050		◯			
RX5VA20CX						◯		
RX5VA21AX				◯				
RX5VA21BX	2.048	2.100	2.152		◯			
RX5VA21CX						◯		
RX5VA27AX				◯				A:Taping
RX5VA27BX	2.633	2.700	2.767		◯		E:TO-92	
RX5VA27CX						◯		B:Gluing
RX5VA45AX				◯			H:Minipower mold (SOT-89)	
RX5VA45BX	4.388	4.500	4.612		◯			C:Electric Conductive bagging
RX5VA45CX						◯		
RX5VA47AX				◯				
RX5VA47BX	4.583	4.700	4.817		◯			
RX5VA47CX						◯		
RX5VA55AX				◯				
RX5VA55BX	5.363	5.500	5.637		◯			
RX5VA55CX						◯		

Table 2

* Consult the guide to determine specifications other than those shown in Table 2.
  Use the type number.

■ TAPING METHODS

T1 type   T2 type   RF type   RR type
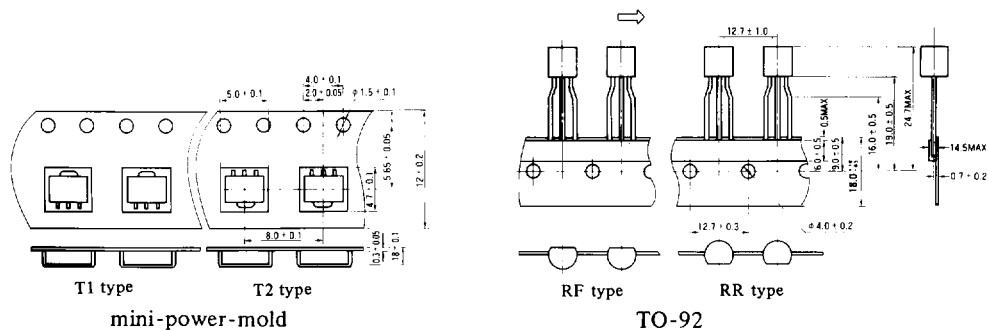
mini-power-mold   TO-92

Figure 1

■ SYSTEM BLOCK DIAGRAMS

Figure 2 is block diagrams of RX5VA series and shows the system with three terminals.
The system has three types of output drive : N-ch open-drain, P-ch open-drain, and C-MOS.
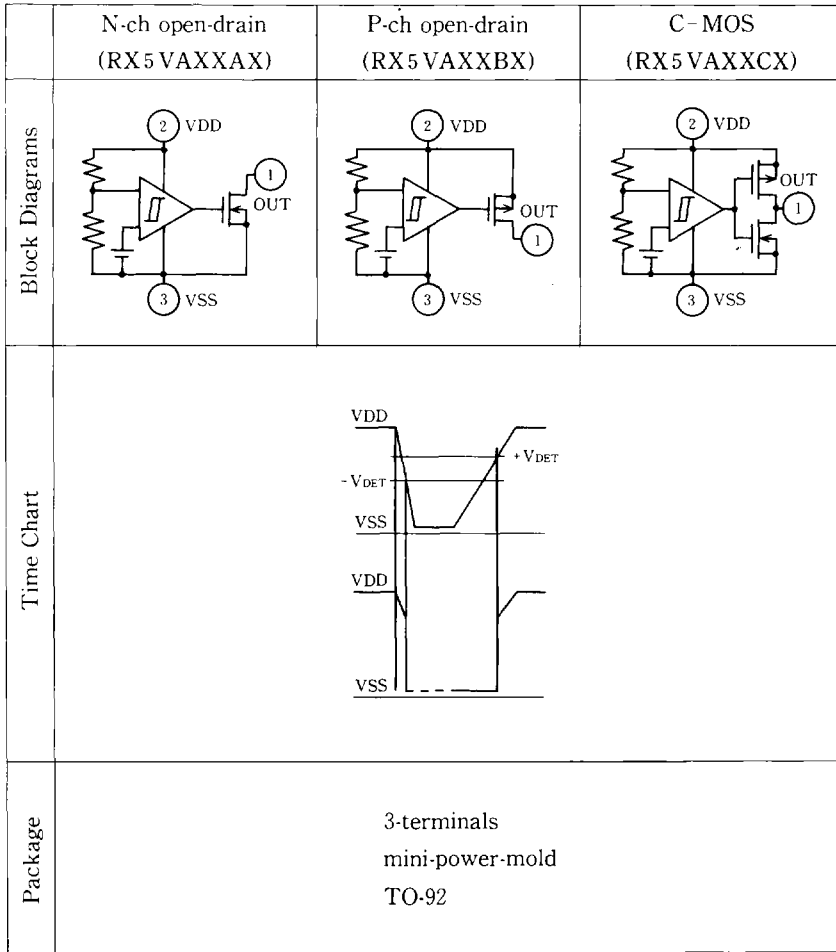
	N-ch open-drain (RX5VAXXAX)	P-ch open-drain (RX5VAXXBX)	C-MOS (RX5VAXXCX)
Block Diagrams			
Time Chart			
Package		3-terminals mini-power-mold TO-92	

Figure 2

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYNBOL	RATINGS	UNIT
Supply Voltage	VDD	12	V
Output Voltage	VOUT	VSS−0.3～VDD+0.3	
Output Current	IOUT	70	mA
Power Dissipation	Pd	300	mW
Operating Temperature Range	Topr	−30～+80	℃
Storage Temperature Range	Tstg	−40～+125	
Soldering Temperature	Tsolder	260℃　(10Sec)	

■ ELECTRICAL CHARACTERISTICS

Topr : 25℃

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Detect Voltage	−VDET		$(-VDET)$ $\times 0.975$		$(-VDET)$ $\times 1.025$	V
Hysteresis	VHYS			$(-VDET)$ $\times 0.05$		V
Supply Current	Iss	VDD= 2.0V		0.9	2.7	μA
		3.0V		1.0	3.0	
		4.5V		1.15	3.45	
		6.0V		1.3	3.9	
		10.0V		1.7	5.1	
Operating Voltage	VDD		1.5		10.0	V
Output Current	IOUT	Nch VDS=0.5V VDD:1.0V		0.5		mA
		2.4V		3.6		
		3.6V		6.5		
		4.6V		8.6		
		6.0V		11.6		
		10.0V		19.6		
		Pch VDS=2.1V VDD:4.5V	0.04			
Temperature Coefficient	△(−VDET) ／△Ta	−30℃ ≦Ta≦80℃		±100		PPM/℃

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■ PACKAGE INFORMATION

1. OUT
2. VDD
3. VSS
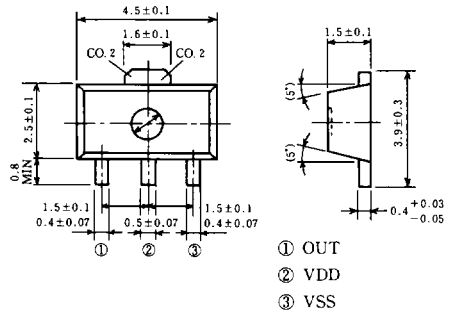
UNIT: mm
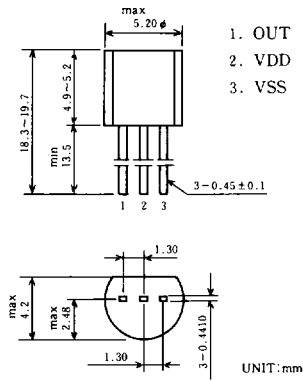
Figure 3. TO-9
(3-terminal)

① OUT
② VDD
③ VSS

Figure 4. Mini-power-mold
(3-terminal)