

# M52461GP

## SERVO MOTER MOTROL FOR RADIO CONTROL

REJ03F0006-0100Z  
Rev.1.00  
Jul.25.2003

### Description

The M52461GP is a semiconductor integrated circuit for servo control applications.

### Features

- Excellent power supply stability and temperature stability
- Simple setting of dead of band range
- Small outline (16pin SSOP)

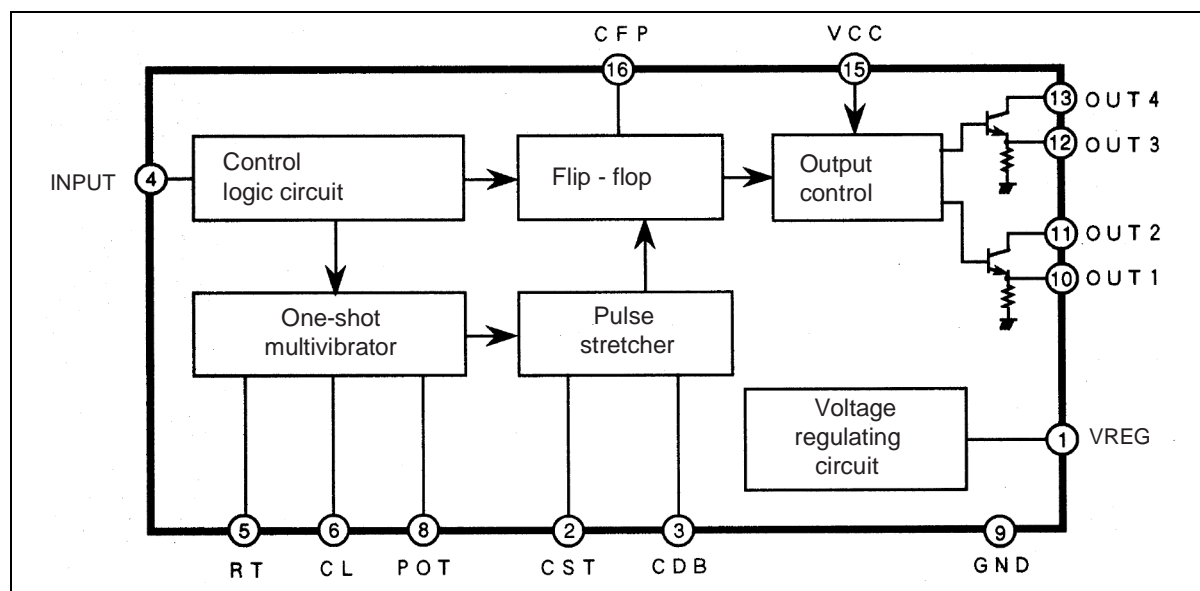
### Applications

- Digital proportional systems for radio control, servo motor control ,etc

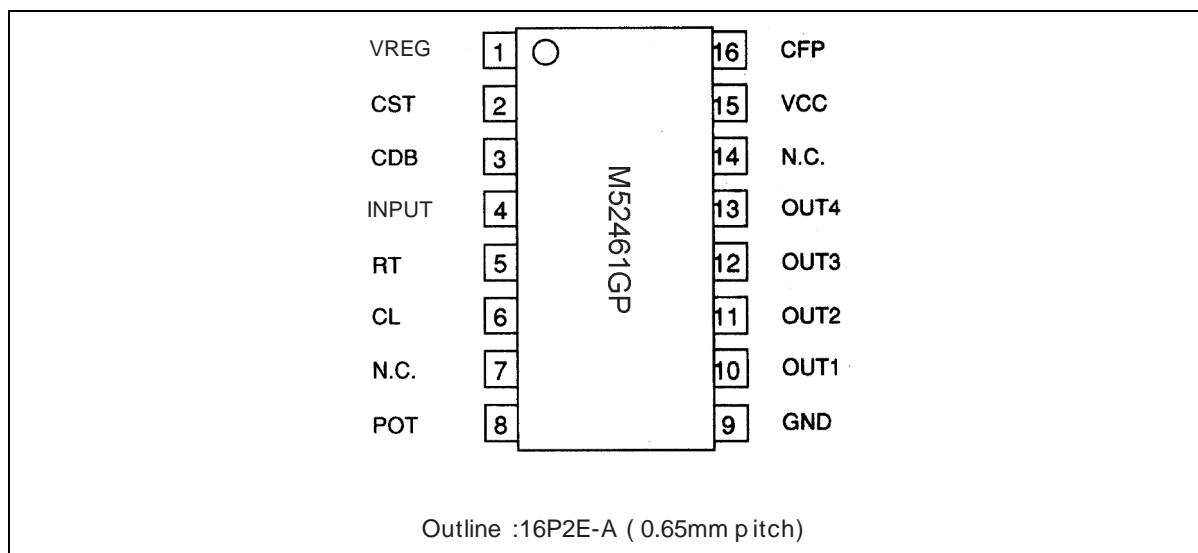
### Recommended Operating Conditions

- Supply Voltage range : 2.8 to 7.5 V
- Operating temperature : -20 to 75°C
- Input rise time : 500 nS max.
- Input fall time : 500 nS max.

### Block Diagram



## Pin Arrangement



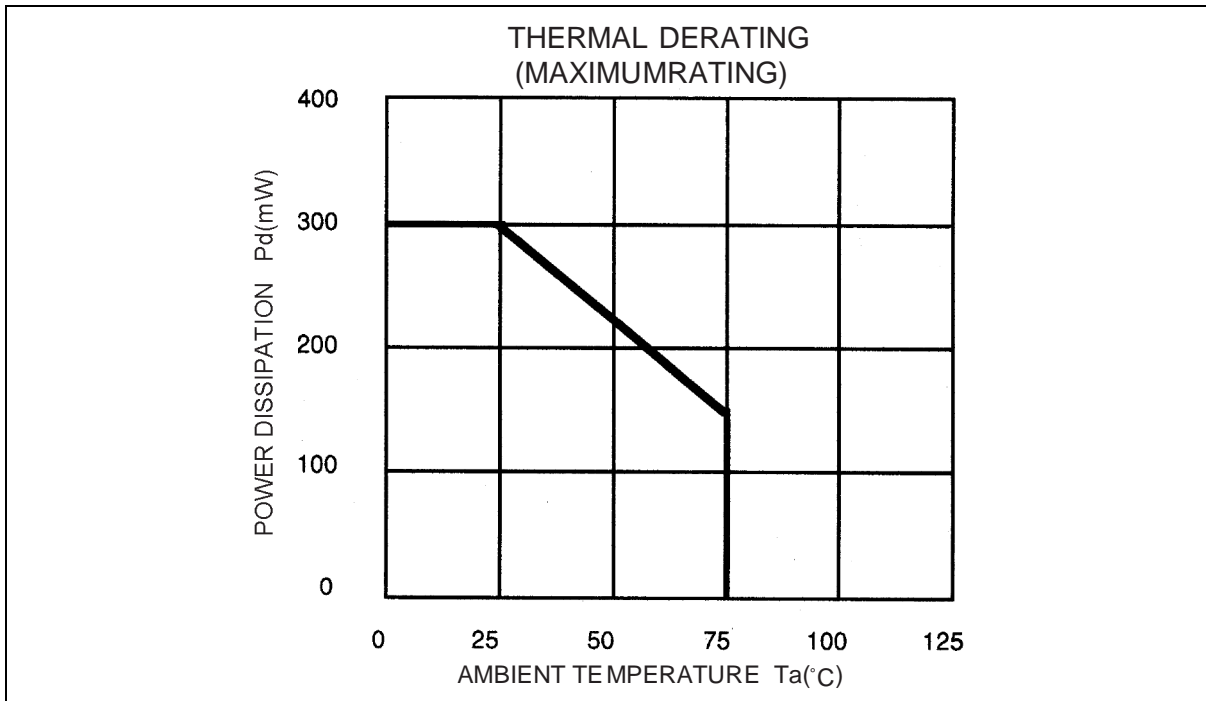
## Pin Description

| Pin No. | Symbol | Function                         | Descriptions   |
|---------|--------|----------------------------------|--|
| 1       | VREG   | Regulated voltage source         | This is output of the internal regulated supply voltage. Make connections from this pin to pot-entiometer and pulse stretcher resistor.                              |
| 2       | CST    | Stretcher pin                    | Connect the capacitor and resistor of the pulse stretcher section.   |
| 3       | CDB    | Dead band setting pin            | Connect the capacitor and band can be changed according the value of this capacitor.   |
| 4       | INPUT  | Input pin                        |  |
| 5       | RT     | Constant setting pin             | Connect a capacitor that will determine the constant current value of pin 6. Constant current will became 100 $\mu$ A at the time of the resistance of 18 k $\Omega$ |
| 6       | CL     | Local pulse setting pin          | Connect a capacitor that will adjust a triangular wave made by charging of constant current.   |
| 7       | N.C.   | No connection                    |  |
| 8       | POT    | Servo position voltage input pin | Connect to the potentiometer for the position detection connected with the output axis.  |
| 9       | GND    | Grounding pin                    | Grounding  |
| 10      | OUT1   | Output 1                         | Connect to the base of the external NPN transistor   |
| 11      | OUT2   | Output 2                         | Connect to the base of the external PNP transistor   |
| 12      | OUT3   | Output 3                         | Connect to the base of the external NPN transistor   |
| 13      | OUT4   | Output 4                         | Connect to the base of the external PNP transistor   |
| 14      | N.C.   | No connection                    |  |
| 15      | VCC    | Supply voltage                   | Connect a capacitor of more than 10 $\mu$ F.   |
| 16      | CFP    | Fixed driving pulse setting pin  | Connect a capacitor that will determine the fixed driving pulse width.   |

**Absolute Maximum Ratings**

(VCC = 5V, Ta = 25°C, unless otherwise noted)

| Symbol | Parameter              | Test conditions | Ratings    | Unit  |
|--------|------------------------|-----------------|------------|-------|
| VCC    | Supply voltage         |                 | 9.0        | V     |
| IO     | Output current         | OUT1 to OUT4    | 40         | mA    |
| PD     | Power dissipation      |                 | 300        | mW    |
| Kθ     | Thermal derating range | Ta ≥ 25°C       | -3.0       | mW/°C |
| Tstg   | Storage temperature    |                 | -40 to 125 | °C    |

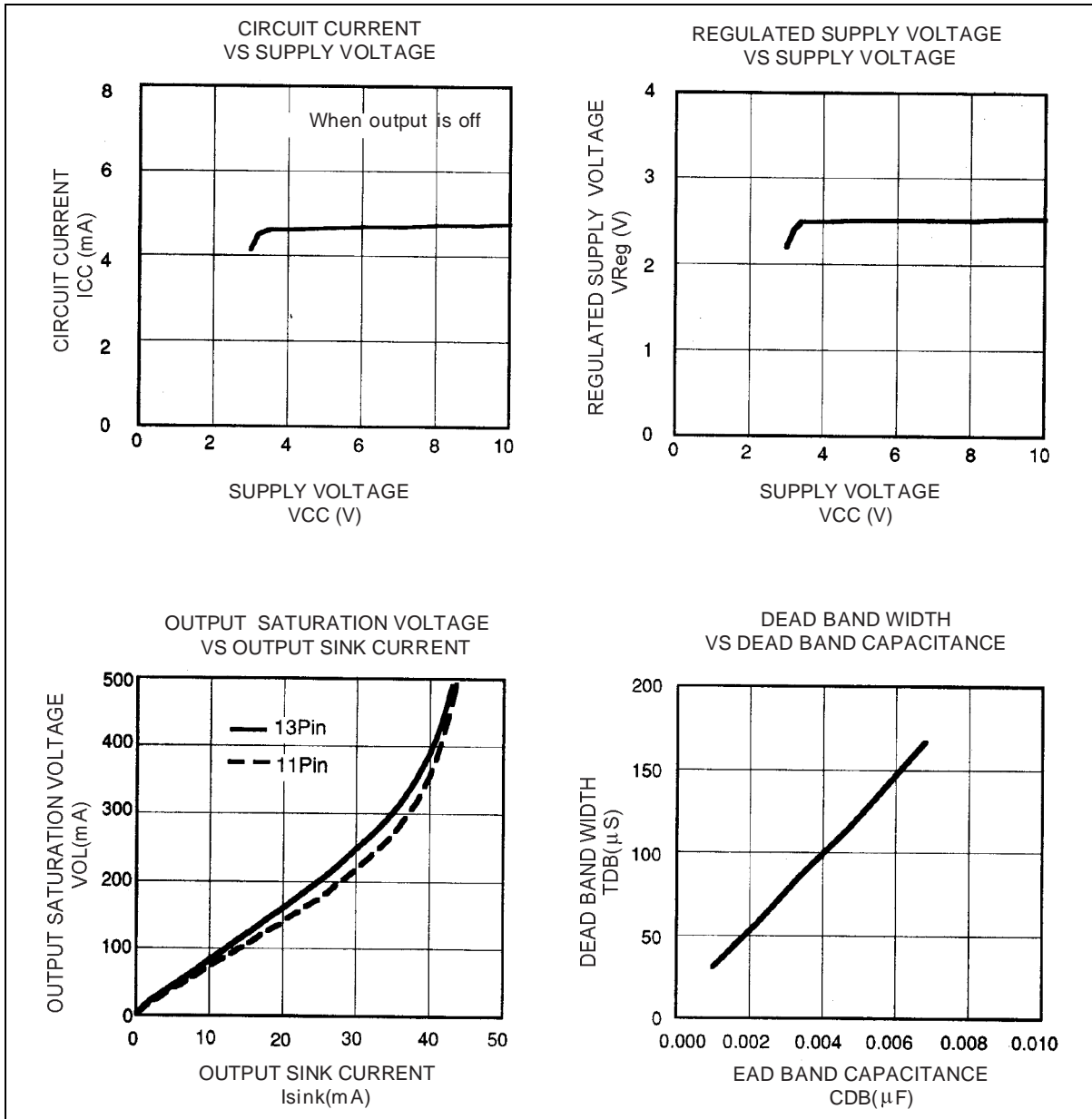


## Electrical Characteristics

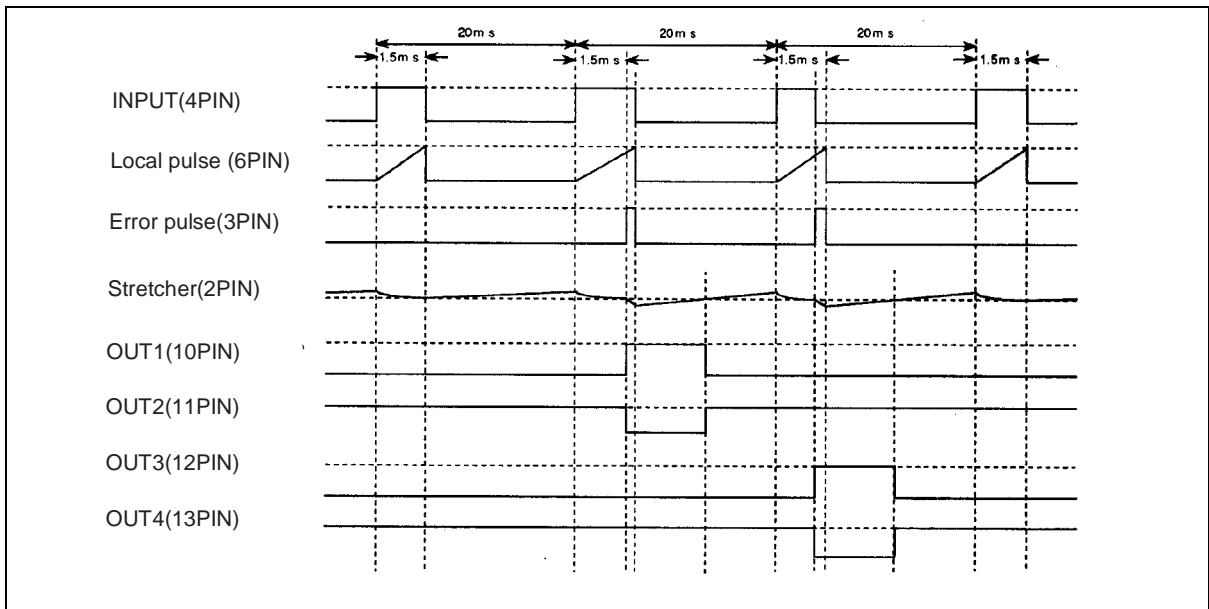
(VCC = 5.0 V, Ta = 25°C)

| Symbol | Parameter  | Test conditions  | Limits |      |      | Unit  |
|--------|--|--|--------|------|------|-------|
|        |  |  | Min    | Typ  | Max  |       |
| VCC    | Supply voltage                                     |  | 2.8    | 5.0  | 7.5  | V     |
| ICC1   | Circuit Current 1                                  | Output off   | —      | 5.0  | 10.0 | mA    |
| ICC2   | Circuit Current 2                                  | Output on  | —      | 6.0  | 11.0 | mA    |
| Vreg   | Regulated voltage                                  | No load  | 2.35   | 2.5  | 2.65 | V     |
| dVreg  | Regulated voltage precision                        | VCC = 3.5 to 6.5 V                                       | —      | 0.2  | —    | %/V   |
| Iref   | Reference current                                  | RT = 18 kΩ, Pin 5 current value                          | 90     | 100  | 110  | μA    |
| Vih    | High input voltage                                 | Pin4   | 2.0    | —    | Vcc  | V     |
| WL     | Standard local pulse width                         | RT = 18 kΩ, CL = 0.1 μF                                  | 1.4    | 1.5  | 1.6  | ms    |
| dWL    | Supply voltage dependence of the local pulse width | VCC = 3.5 to 6.5 V                                       | —      | —    | 2.0  | μs/V  |
|        |  | VCC = 2.5 to 7.5 V                                       | —      | —    | 15.0 |       |
| Wdb1   | Minimum dead bandwidth                             | CFP = 0.01μF<br>Not connect CDB                          | —      | —    | 1.0  | μs    |
| Wdb2   | Standard driving band width                        | Not connect CFP and CDB                                  | —      | 2.5  | 6.0  | μs    |
| AST    | Stretcher gain                                     | RT = 18 kΩ<br>RST = 120 kΩ<br>CST = 0.1 μF               | —      | 100  | —    | times |
| WKP    | Fixed driving pulse width                          | CFP = 0.01μF<br>Not connect CDB                          | 0.7    | 1.0  | 1.3  | ms    |
| WCP    | Standard driving pulse width                       | Not connect CFP and CDB                                  | 0.3    | 0.5  | 0.8  | ms    |
| Wout   | Output pulse width                                 | CST = 0.1 μF<br>RST = 120 kΩ<br>Pulse width 100μs (3pin) | 8.0    | 10.0 | 12.0 | ms    |
| Vosat  | Output pin saturation voltage                      | ISINK = 20 mA  | —      | 0.2  | 0.4  | V     |

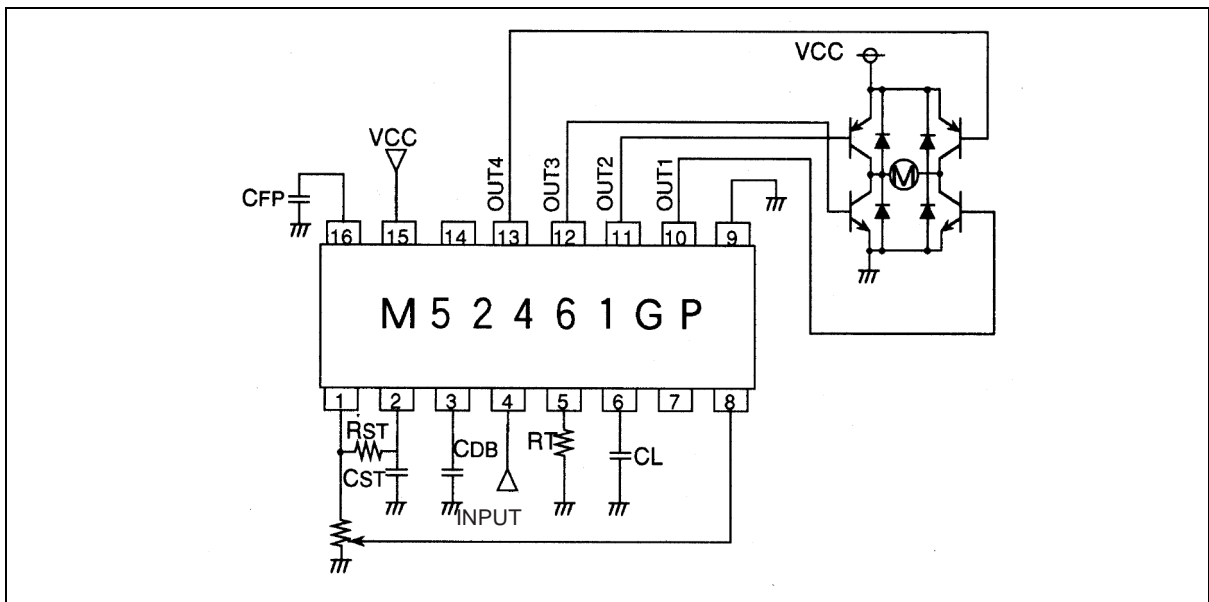
Typical Characteristics



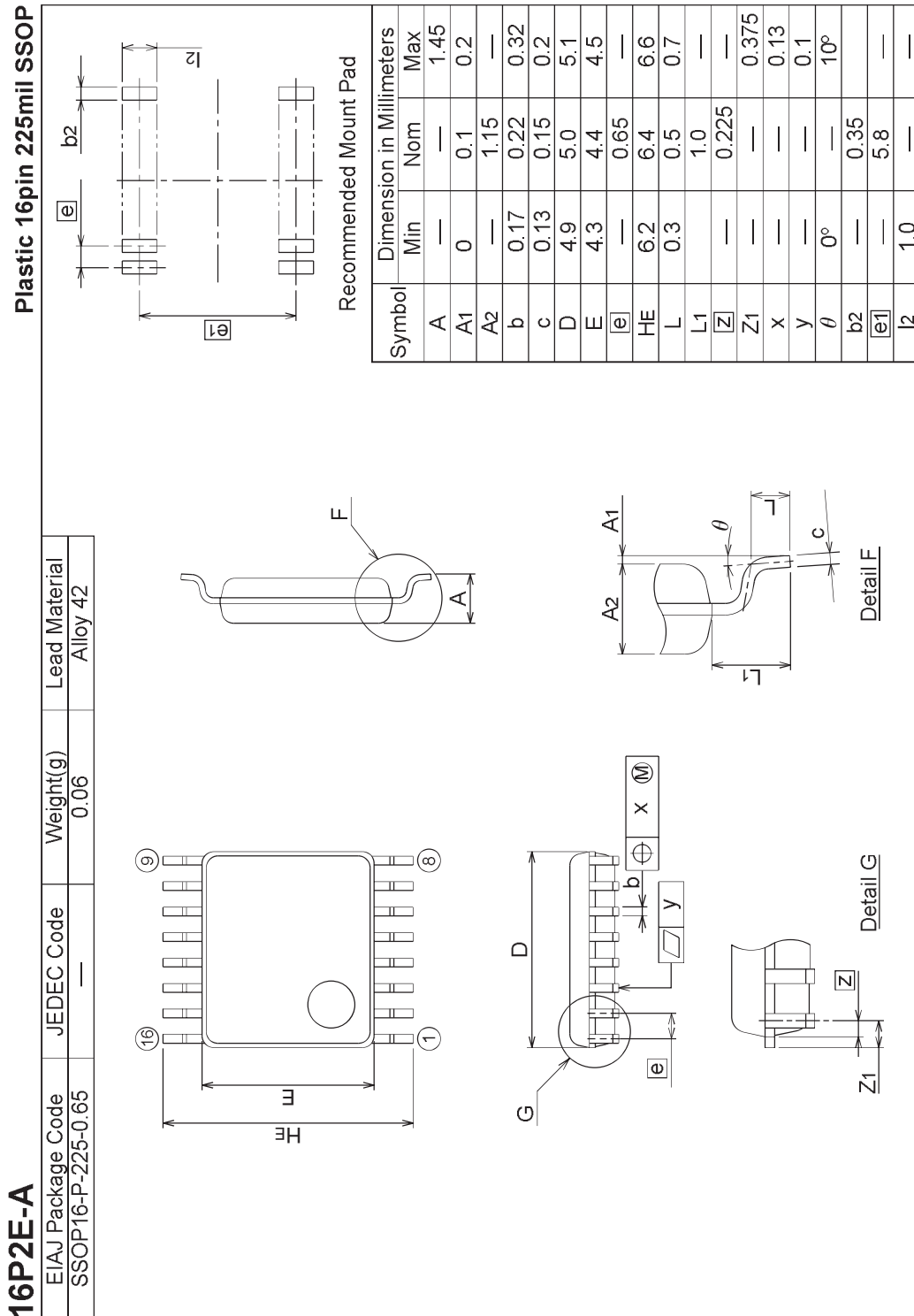
**Timing Diagram**



**Application Example**



Package Dimensions



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