M64611FP

DIGITAL SERVO MOTOR CONTROL FOR RADIO CONTROL

REJ03F0017-0100Z
Rev.1.00
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Description

The M64611FP is a semiconductor integrated circuit of the BiCMOS structure for servo motor control for the radio control application.

Features

- A quick response and a powerful holding torque
- Simple settings of dead band, pulse stretcher, boost time addition, and max duty.

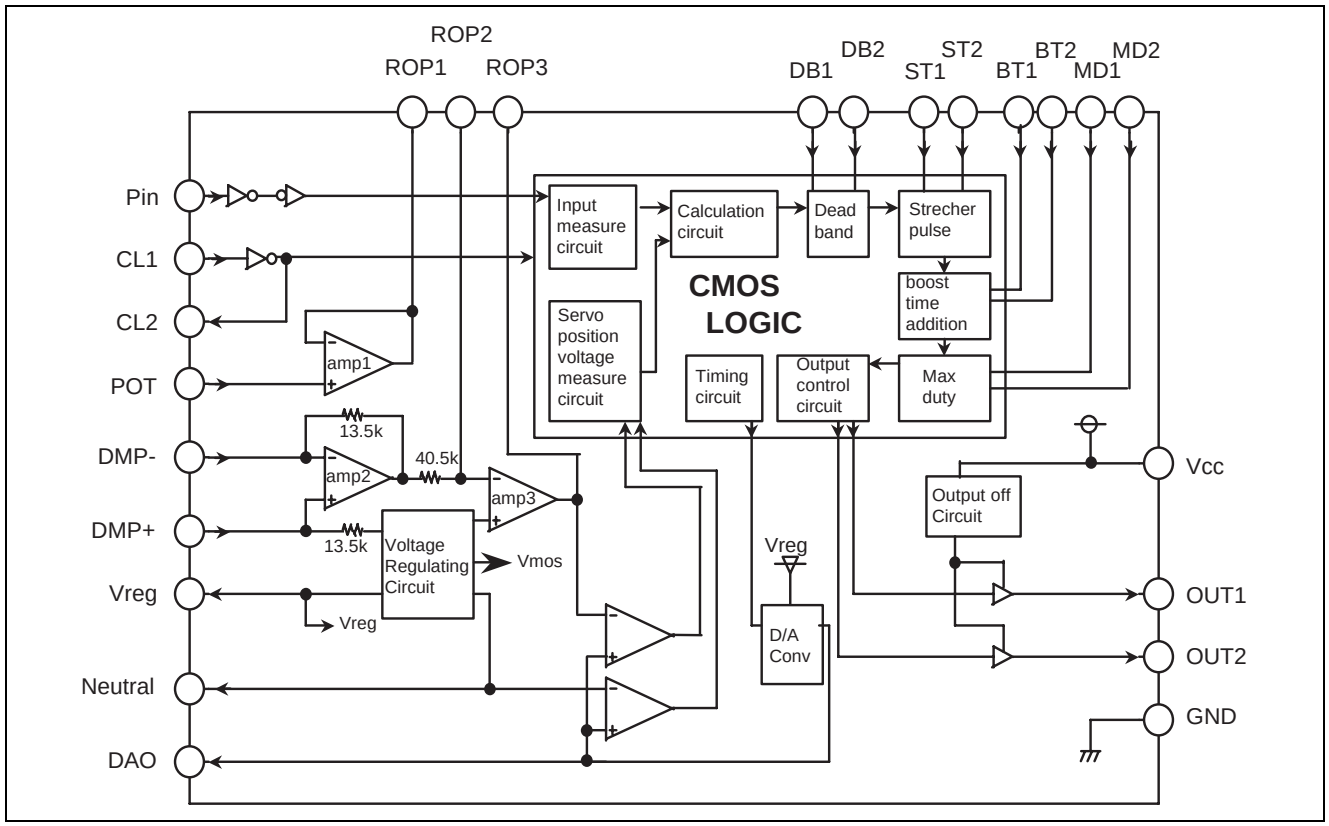
Application

- Digital proportional system for radio control

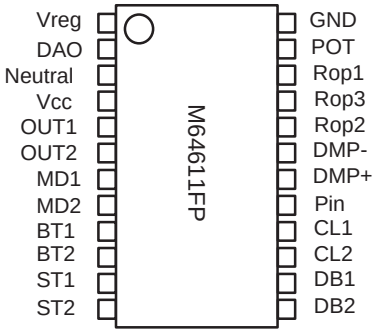
Recommended operating condition

- Supply voltage range: 4 to 9 V

Block diagram



Pin Arrangement



Outline : 24P2E

Pin Description

Pin No.	Symbol	Function	Notes
1	Vreg	Regulated voltage output	Connect a capacitor for the stabilization between Vreg and GND
2	DAO	D/A converter output	Connect the capacitor for the filter of 100 – 1000pF between DAO and GND.
3	Neutral	Neutral voltage output	Make it open usually. Connect a capacitor for the stabilization between Neutral and GND if Neutral voltage is unstable.
4	Vcc	Supply voltage	Connect the Electrolytic condenser more than 10 µF and the ceramics condenser more than 0.1 µF.
5	OUT1	Output pin 1	Connect to the external driver IC for servo drive.
6	OUT2	Output pin 2	
7	MD1	Max. duty input 1	Refer to the following input table. When it is “H” : OPEN When it is “L” : GND
8	MD2	Max. duty input 2	
9	BT1	Boost input 1	
10	BT2	Boost input 2	
11	ST1	Stretcher input 1	
12	ST2	Stretcher input 2	
13	DB2	Dead Band input 2	
14	DB1	Dead Band input 1	
15	CL2	Oscillation terminal 2	Connect to resonator between CL1 and CL2.
16	CL1	Oscillation terminal 1	
17	Pin	Receiving pulse input	
18	DMP+	Damping resistor input+	Connect to the damping resistor of 100 k Ω -1 MΩ.
19	DMP-	Damping resistor input-	
20	ROP2	Gain Adjustment Resistor 2	Connect to the resistances for adjusting Gain.
21	ROP3	Gain Adjustment Resistor 3	
22	ROP1	Gain Adjustment Resistor 1	
23	POT	Servo position voltage input	Connect the potentiometer.
24	GND	GND	

Input Table

<Dead Band >

Input		Set value
DB1	DB2	
L	L	4tosc
H	L	6tosc
L	H	9tosc
H	H	13tosc

<Max Duty >

Input		Set value
MD1	MD2	
L	L	about 97%
H	L	about 94%
L	H	about 88%
H	H	about 82%

<Boost>

Input		Set value
BT1	BT2	
L	L	12x64xtosc
H	L	28x64xtosc
L	H	64x64xtosc
H	H	116x64xtosc

<Stretcher Gain >

Input		Set value
ST1	ST2	
L	L	x 1
H	L	x 2
L	H	x 4
H	H	x 8

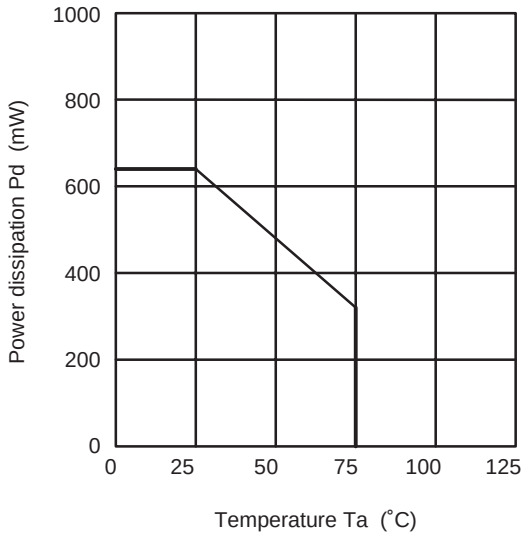
Note: tosc: oscillation period of resonator

Absolute Maximum Ratings

(Ta = –20 to 75°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Ratings	Unit
V_{CC}	Supply voltage		–0.3 to +9.0	V
Io	Output current	OUT1, OUT2	–5 to +5	mA
pd	Power dissipation	Ta = 25°C	630	mW
Topr	Operating temperature		–20 to +75	°C
Tstg	Storage temperature		–40 to 125	°C

Thermal Derating (Absolute Maximum Rating)



Recommended operating conditions

(Ta = –20 to +75°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		4.0 to 9.0	V
V_{INPin}	Pin input voltage		0 to Vcc	V
V_{INPOT}	POT input voltage		0.2 to 2.0	V
I_{OVreg}	Vreg output current		–2 to 0	mA
V_{OROP3}	ROP3 output voltage rage		0.2 to 2.0	V

Electrical Characteristics

(V_{CC} = 5V, Ta = 25°C, unless otherwise noted)

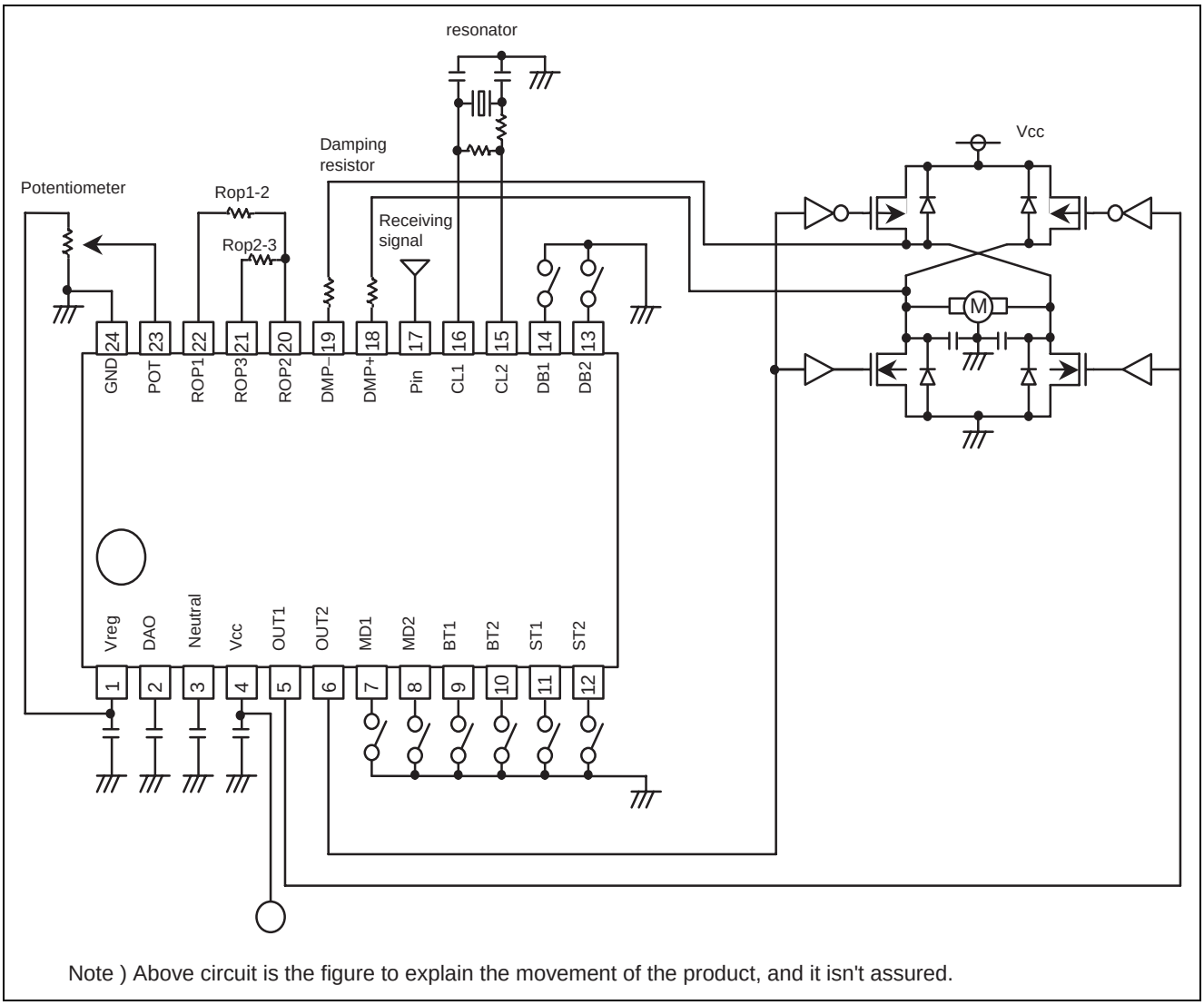
Symbol	Parameters	Test conditions	Measure Pin	Limits			Unit
				Min	Typ	Max	
I_{CC1}	Supply current 1	Vcc1 = 9 V OUT 1 and OUT2 are OFF.	Vcc	—	19	28	mA
I_{CC2}	Supply current 2	Vcc1 = 5 V OUT 1 and OUT2 are OFF.	Vcc	—	15	21	mA
V_{OFF}	Output voltage		Vcc	2.80	3.02	3.30	V
V_{ON}	Output voltage		Vcc	2.93	3.15	3.43	V
V_{reg1}	Regulated voltage 1	Io = 0 µA	Vreg	2.02	2.15	2.28	V
V_{reg2}	Regulated voltage 2	Io = –2 mA	Vreg	2.00	2.14	2.27	V
dV_{reg}	Supply Voltage dependence of Vreg	Vreg1 standard. Io = 0 µA Vcc = 4 to 9 (V)	Vreg	—	0.11	0.25	% / V
$V_{Neutral}$	Natural Voltage	$V_{Neutral}$ = 0.6 Vreg	Natural	1.21	1.29	1.37	V
I_{OH}	“H” Output current	Vo = 0.7 V	OUT1 OUT2	–2.4	–1.54	–1.1	mA
V_{OL}	“L” Output voltage	Io = 1 mA	OUT1 OUT2	0.02	0.1	0.3	mV
V_{OF1}	amp 1offset voltage	POT = 1.1 V	Rop1	–10	1	10	mV
$I_{IN\ amp1}$	amp 1input current	POT = 0.2 V	POT	–1	0.3	0	µA
$V_{OH\ amp1}$	“H” output voltage	Io = –250 µA, POT = 2 V	Rop1	1.97	2.00	2.02	V
$V_{OL\ amp1}$	“L” output voltage	Io = 250 µA, POT = 0.2 V	Rop1	0.18	0.20	0.23	V
G_{V1ROP3}	Voltage gain 1 (from amp2 to amp3)	Damping resistors = 300 K Ω Rop2 to 3 = 12 KΩ DMP– = 5 V, DMP+ = 0 V	Rop3	–41	–37.5	–35	dB
G_{V2ROP3}	Voltage gain 2 (from amp2 to amp3)	Damping resistors = 300 K Ω Rop2 to 3 = 12 KΩ DMP– = 5 V, DMP+ = 5 V	Rop3	—41	–37.5	–35	dB
V_{IHPin}	“H” intput voltage of Pin		Pin	1.5	—	Vcc	V

Timing Requirement Conditions

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

Symbol	Parameters	Conditions	Limits			Unit
			Min	Typ.	Max	
f_{CLK}	Clock frequency		—	4.915	—	MHz
$T_{wh\ (Pin)}$	Pin “H" pulse width	f_{CLK} = 4.915 MHz	782	—	2187	µS

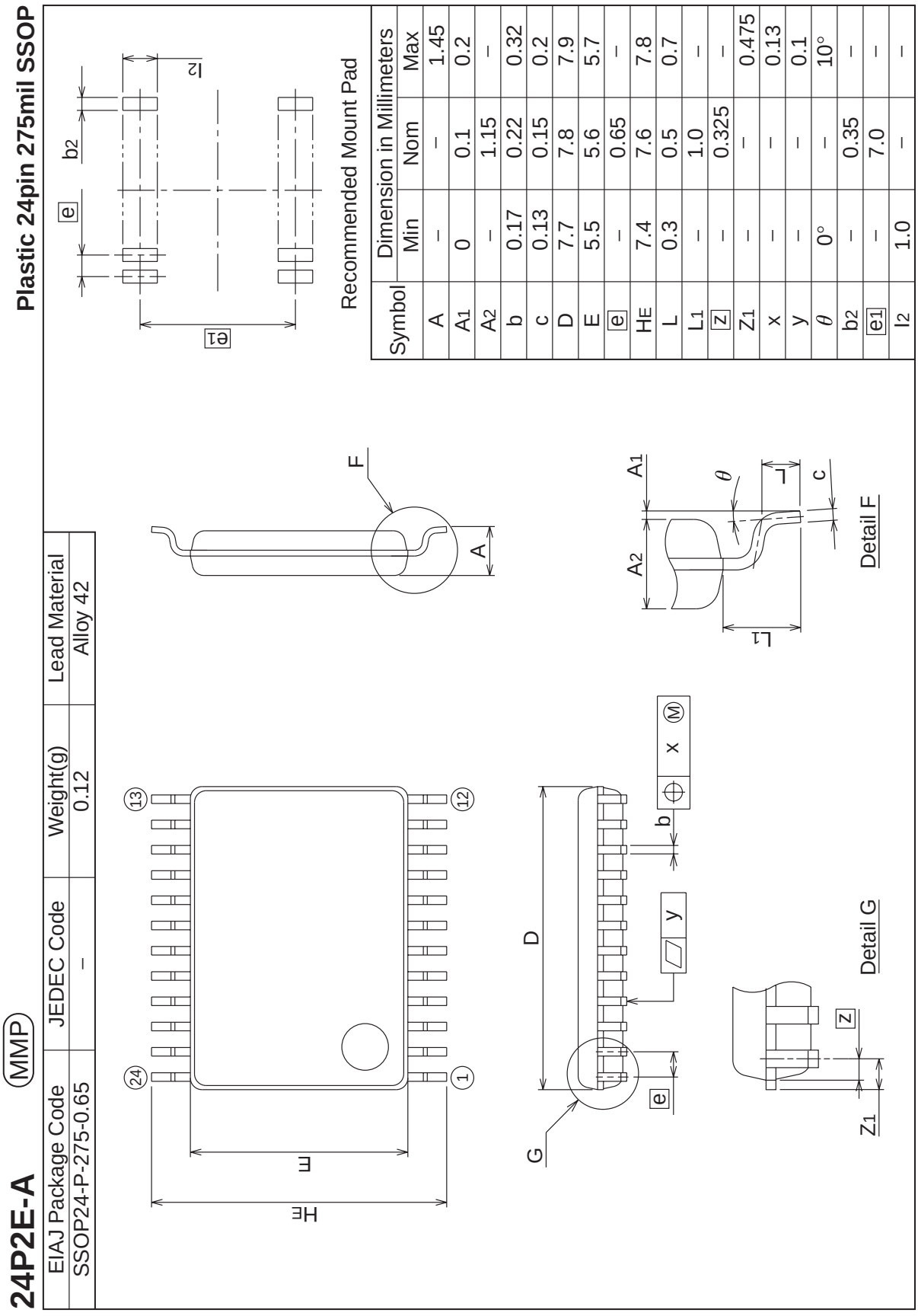
Application Example



Note) Above circuit is the figure to explain the movement of the product, and it isn't assured.

Notes: Be careful of handing because 1 to 4 pin and 17, 23 pin break easily to other pins.
Renesas Technology corp. doesn't assume that responsibility when damage if to originate in the description mistake of these data arises to the customer though the information mentioned in these data was examined carefully to expect accuracy.

Package Dimension



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