

DESCRIPTION

The M56745FP is a semiconductor integrated circuit designed for a single chip controller for CD-ROM spindle motor.

M56745FP has a both (forward and reverse) motor rotation control by the motor speed control terminal.

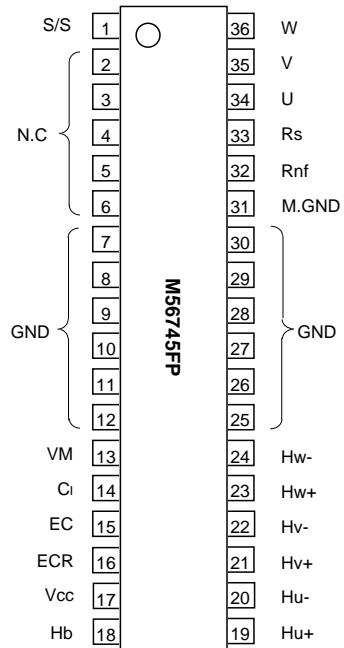
Also, this device includes a bias circuit for Hall Sensor, a current limit circuit and a thermal shut down function.

FEATURES

- The supply voltage with wide range.
(4.5V to 13.2V)
- High motor drive current (1.0A).
- Motor current control for the both motor rotation is possible.

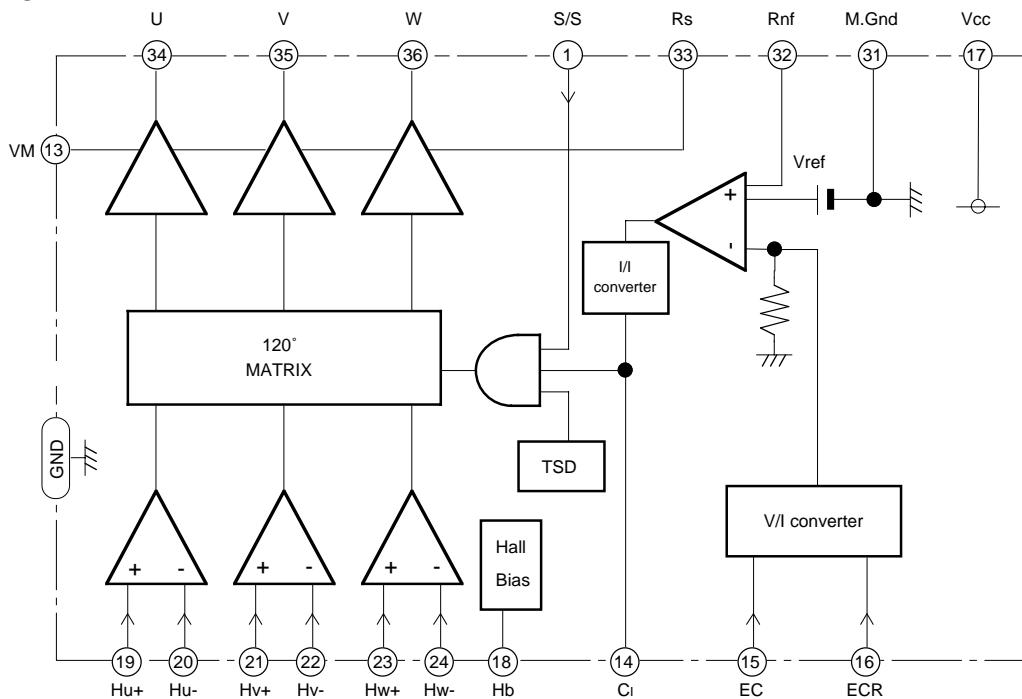
APPLICATION

CD-ROM

PIN CONFIGURATION (TOP VIEW)

Outline 36P2R-D

N.C: No connection

BLOCK DIAGRAM

PIN FUNCTION

Pin No.	Symbol	Function
(1)	S/S	Start / Stop
(2)	N.C.	
(3)	N.C.	
(4)	N.C.	
(5)	N.C.	
(6)	N.C.	
(7) to (12)	GND	GND
(13)	VM	Motor supply voltage
(14)	C _i	Phase Compensation
(15)	EC	Motor speed control
(16)	ECR	The reference voltage for EC.
(17)	V _{cc}	5V supply voltage.
(18)	H _b	Bias for Hall Sensor
(19)	H _{u+}	H _{u+} Sensor amp. input
(20)	H _{u-}	H _{u-} Sensor amp. input
(21)	H _{v+}	H _{v+} Sensor amp. input
(22)	H _{v-}	H _{v-} Sensor amp. input
(23)	H _{w+}	H _{w+} Sensor amp. input
(24)	H _{w-}	H _{w-} Sensor amp. input
(25) to (30)	GND	GND
(31)	M.GND	Motor GND.
(32)	R _{nf}	Current feedback amp. input
(33)	R _s	Motor current sense.
(34)	U	Motor drive output U
(35)	V	Motor drive output V
(36)	W	Motor drive output W

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Symbol	Parameter	Conditions	Ratings	Units
VM	Motor supply voltage	(13) pin maximum input voltage	14	V
V _{cc}	5V supply voltage	(17) pin maximum input voltage	7.0	V
I _o	Output current		1.0	A
V _{H(c)}	Sensor amp. Differential input range	(19) to (24) pins	4.5	V
P _t	Power dissipation	Free Air	1.2	W
K _θ	Thermal derating	Free Air	9.6	mW/°C
T _j	Junction temperature		150	°C
T _{opr}	Operating temperature		-20 – +75	°C
T _{stg}	Storage temperature		-40 – +125	°C

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Limits			Units
		Min.	Typ.	Max.	
V _{cc}	5V Power supply	4.5	5.0	5.5	V
VM	Motor Power supply	10.8	12.0	13.2	V
I _o	Output drive current	—	—	700	mA

ELECTRICAL CHARACTERISTICS ($T_a=25^\circ C$, $V_M=12V$, $V_{CC}=5V$, unless otherwise noted)

Symbol	Parameter	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Icc1	Sleep Mode Supply current-1	(13)pin Input Current ($EC=ECR=2.5V$), (14)pin GND.	—	0	100	μA
Icc2	Sleep Mode Supply current-2	(17)pin Input Current ($EC=ECR=2.5V$), (14)pin GND.	—	3.8	6.0	mA
Vsat	Saturation voltage	Top and Bottom saturation voltage. Load current 500mA.	—	1.5	2.4	V
ECdead- ECdead+	Control voltage dead zone	EC < ECR	-50	-25	-5	mV
ECR	Reference voltage input range	(16)pin Input voltage range.	+5	+25	+25	
EC	Control voltage input range	(15)pin Input voltage range.	1.9	2.1	2.3	V
Gio	Current gain	$Rs=0.47\Omega$	1.0	—	4.0	V
Von	Motor start voltage	(1)pin input voltage when makes the motor start up.	0.55	0.65	0.75	A/V
Voff	Motor stop voltage	(1)pin input voltage when makes the motor stop.	3.5	—	—	V
VH (IN)	Sensor amp. common mode input range	(19) to (24)pins input range.	—	—	1.5	V
VH (INH)	Sensor amp. input signal revel	(19) to (24)pins input signal revel.	1.2	—	4.5	mV
Vlim	Current limit	$Rs=0.47\Omega$	50	—	—	A
VHb	Hall bias terminal output voltage	Load current (I_{Hb}) 10mA.	0.45	0.50	0.55	V
IHb	Hall bias terminal sink current		1.0	1.2	1.5	mA

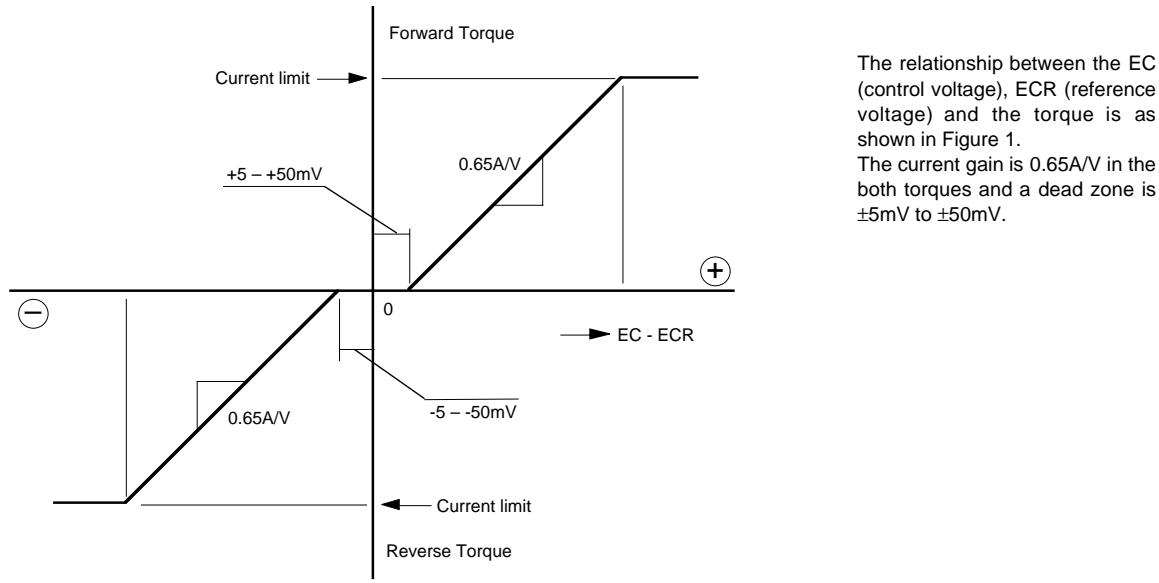
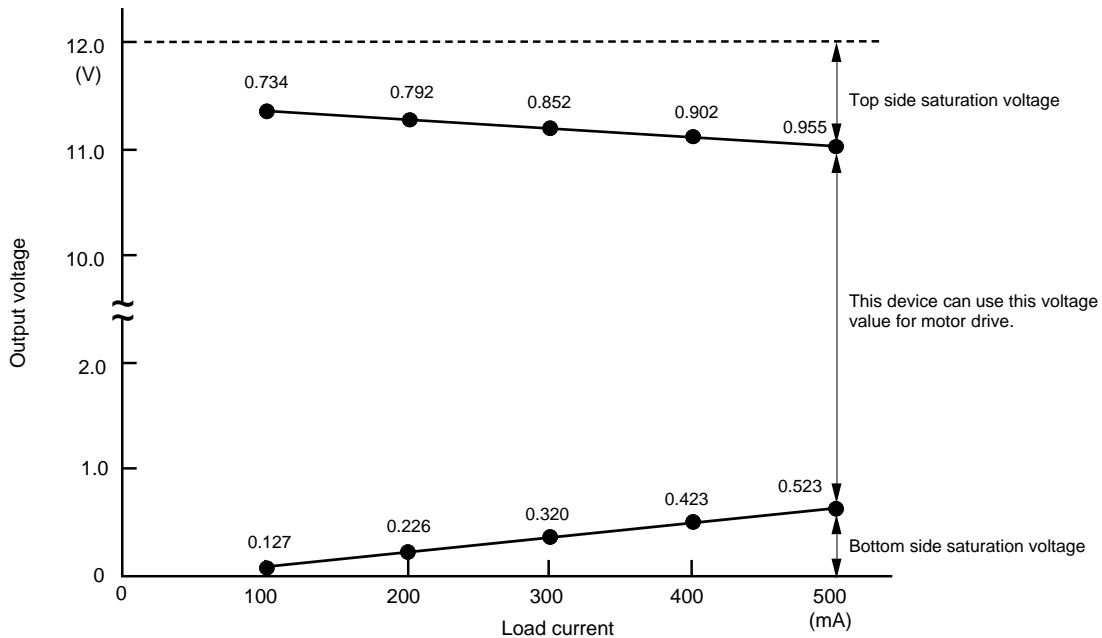
ELECTRICAL CHARACTERISTICS ($V_{CC}=5V$, $V_M=12V$, $T_a=25^\circ C$, Unless otherwise noted)

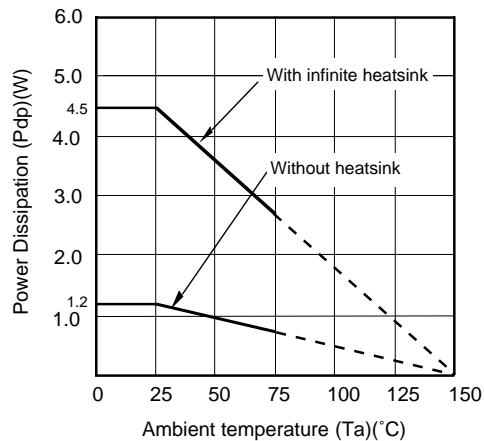
Figure 1. The characteristics of the control voltage and motor current (Torque).

BASICALLY CHARACTERISTICS

Output saturation voltage and Load current characteristics.
(Condition $V_m=12V$, $V_{cc}=5V$)



THERMAL DERATING



APPLICATION CIRCUIT