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MITSUBISHI SOUND PROCESSOR ICs

P/SP

6584

DIGITAL KEY CONTROLLER

捷多邦,专业PQ

DESCRIPTION

The M65840 is Complementary Metal Oxide Semiconductor Integrated Circuit is used to control the key of music in karaoke* players.

WWW.DZSC.COM

This single chip has all functions necessary for key control.

It is optimal for use in karaoke players, such as radio cassette recorders, mini audio components and video cassette recorders.

* Karaoke : Recorded music to accompany live singing

FEATURES

■ All functions necessary for digital key control, such as input/output low-pass filter, A-D, D-A converter, 32k-bit SRAM and control logic circuit, are built in one chip

Low noise by digital key control

■ Single power supply (5V)

Built-in automatic reset circuit (The IC is reset as power is turned on.)

RECOMMENDED OPERATING CONDITIONS

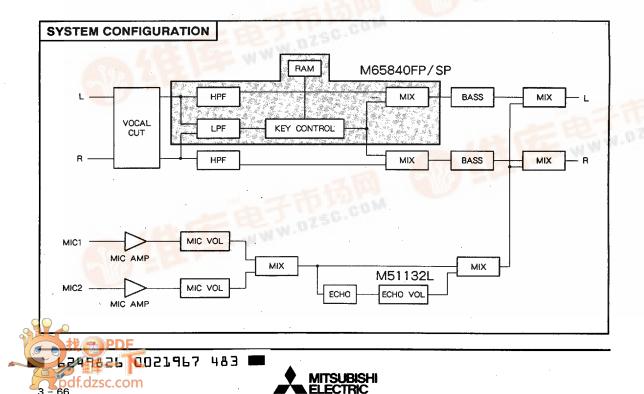
Supply voltage range.....Vcc = 4.5 to 5.5V Rated supply voltage....Vcc = 5V



Outline 28P2W-A(FP) 1.27mm pitch 450mil SOP (8.4mm × 17.5mm × 2.0mm)

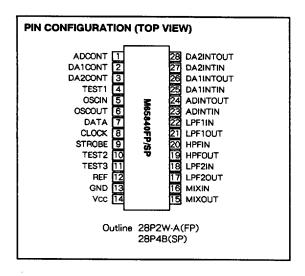


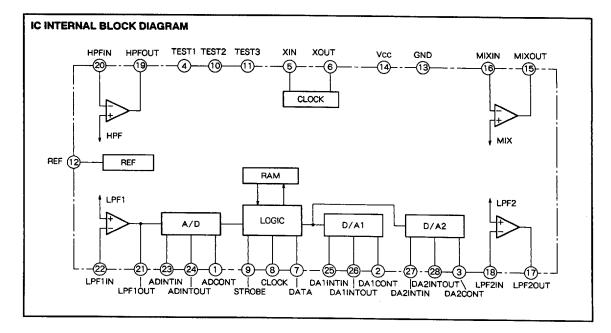
Outline 28P4B(SP) 1.778mm pitch 400mil SDIP (8.9mm × 28.0mm × 3.8mm)



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PIN DESCRIPTION

Pin No.	Symbol	Name	Function
0	ADCONT	A/D control	Determines adaptive time constant for A/D conversion by ASM system
· 2	DA1CONT	D/A1 control	Determines adaptive time constant for D/A1 conversion by ASM system
3	DA2CONT	D/A2 control	Determines adaptive time constant for D/A2 conversion by ASM system
4	TEST1	Test	L: Normal mode H: Test mode
5	XiN	Oscillator input	Connected to 16MHz ceramic filter
6	Хоυт	Oscillator output	
Ø	DATA	Data	Data input via serial bus
8	CLOCK	Clock	Clock input via serial bus
9	STROBE	Strobe	Strobe input via serial bus
9	TEST2	Test	
0	TEST3	Test	
0	REF	Reference power supply output	Output 1/2Vcc Connected to filter C
(3)	GND	Ground	
Ø	Vcc	Power supply	
(5	MIXOUT	Mix output	Combined has ended by see sized at a shift but to t
6	MIXIN	Mix input	Combines key-controlled low-pass signal and through high-pass signal
9	LPF2OUT	Low-pass filter 2 output	Post-filters following D/A conversion for key control
8	LPF2IN	Low-pass filter 2 input	Post-filters following D/A conversion for key control
(9	HPFOUT	High-pass filter output	High-pass through filter
0	HPFIN	High-pass filter input	
Ø	LPF10UT	Low-pass filter 1 output	Pre-filters precedent to A/D conversion for key control
@	LPF1IN	Low-pass filter 1 input	residence to A/D conversion for key control
23	ADINTIN	A/D integrator input	Forms A/D conversion integrator with external C
29	ADINTOUT	A/D integrator output	Forma Ay D conversion integrator with external C
8	DA1INTIN	D/A1 integrator input	Forms D/A1 conversion integrator with external C
8	DA1INTOUT	D/A1 integrator output	Toma Dr AT conversion integrator with external C
Ø	DA2INTIN	D/A2 integrator input	Forms D/A2 conversion integrator with external C
Ø	DA2INTOUT	D/A2 integrator output	Tomis Dyne conversion integrator with external C

ABSOLUTE MAXIMUM RATINGS (Ta = 25 ℃ unless otherwise noted)

Symbol	Parameter	Ratings	Unit
Vcc	Supply voltage	6.0	V
lcc	Circuit current	100	mA
Vi	Input voltage	- 0.3 to Vcc + 0.3	V
Pa	Power dissipation	1.2(FP) / 1.35(SP)	W
Topr	Operating temperature	-20 to +75	°C
Tstg	Storage temperature	-40 to +125	r

RECOMMENDED OPERATIONAL CONDITIONS

Symbol	Parameter	Test conditions		Limits		11.4
		rest conditions	Min	Тур	Max	Unit
Vcc	Supply voltage		4.5	5	5.5	V
VIL	Input voltage ("L" level)	Serial pass input	-	_	1	V
∨ін	Input voltage ("H" level)	Serial pass input	4	-	-	V
fck	Clock frequency		15.5	16	17.0	MHz

ELECTRICAL CHARACTERISTICS (Vcc = 5V, f = 1kHz, Vi = - 15dBm, fck = 16MHz (when key is F0), Ta = 25 °C unless otherwise noted)

Parameter	Test conditions		Limits		
	Test conditions	Min	Тур	Max	Unit
Circuit current	No signals	-	19	50	mA
Voltage gain		- 3	0	3	dB
Output distortion	Vo = - 15dBm, 30kHz LPF	_	0.8	2	%.
Output noise voltage	JIS-A	- 1	- 84	- 70	dBm
Maximum output voltage	THD = 10 %	- 1	2	-	dBm
	Voltage gain Output distortion Output noise voltage	Circuit current No signals Voltage gain Output distortion Vo = - 15dBm, 30kHz LPF Output noise voltage JIS-A	Circuit current No signals Voltage gain 3 Output distortion Vo = -15dBm, 30kHz LPF Output noise voltage JIS-A	Parameter Test conditions Min Typ Circuit current No signals - 19 Voltage gain -3 0 Output distortion Vo = - 15dBm, 30kHz LPF - 0.8 Output noise voltage JIS-A - -	Min Typ Max Circuit current No signals - 19 50 Voltage gain -3 0 3 Output distortion Vo = -15dBm, 30kHz LPF - 0.8 2 Output noise voltage JIS-A - -84 -70

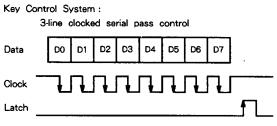
0dBm = 775mVrms



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FUNCTION



Key control variations

DO	D1	D2	D3	D4	VMC	VSC
н	н	н	н	Н		F + 20
L	н	н	Н	н		F + 18
н	L	н	н	н		F + 16
L	L	н	н	н		F + 14
н	н	L	н	н		F + 13
L	н	L	н	н		F + 11
Н	L	L	H	н		F+ 9
L	L	L	н	н	F+ 8	F+ 8
н	н	н	L	н	F+ 7	F + 7
L	н	н	L	н	F+ 6	F+ 6
н	L	н	L	н	F+5	F+ 5
L	L	н	L	н	F+4	F+ 4
н	н	L	L	н	F+ 3	F+ 3
L	н	L	L	н	F+ 2	F+ 2
н	L	L	L	н	F+ 1	F+ 1
L	L	L	L	н	F O	FO
н	н	н	н	L	F – 1	F- 1
L	H.	Н	н	L	F-2	F-2
н	L	н	н	L	F- 3	F- 3
L	L	н	н	L	F-4	F-4
н	н	L	н	L	F- 5	F- 5
L	н	L	н	L	F- 6	F- 6
Н	L	L	н	L	F-7	F- 7
L	L	L	н	L	F-8	F- 8
н	н	н	L	L		F-9
L	н	н	L	L		F - 11
н	L	н	L	L		F-12
L	L	н	L	L		F ~ 13
н	н	L	L	L		F – 14
L	н	L	L	L		F - 16
н	L	L	L	L		F – 18
L	L	L	L	L		F - 20

D5	VSC/VMC
н	VSC
L	VMC
D6	MUTE
Н	MUTE
L	NORMAL
D7	TEST

H TEST

- Note 1. VMC ensures better sound quality in key variation between -4 and +4, while VSC is suitable for key variation beyond this range.
 - Sampling frequency for A-D, D-A conversion is different between VMC and VSC. Noise may be produced when VMC is switched to VSC or the other way around. We recommend that mute be provided as shown above (D6) to prevent it.
 When power is turned on, key is set to F0 and mode is set to VMC by automatic reset function.

APPLICATION DIRECTIONS

Input level

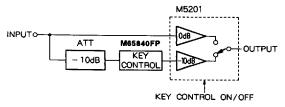
The maximum output voltage at low-pass filters, high-pass filters and mixing amplifier is 1.2Vrmsmin(+4dBm), and that at digital key control circuit is 0.7Vrmsmin(-1dBm).

Therefore, the adequate reference signal level is approximately 150mVrms(- 14dBm).

When the reference signal is on this level, voltage at the head rooms is 18dB and 13dB, respectively.

The voltage at low-pass filters, high-pass filters and mixing amplifier can be attenuated or amplified within a limit of \pm 10dB according to external constants. This mechanism can be used to obtain an adequate reference signal level.

When connected to operational amplifier M5201 having a switch as shown below, this IC is able to handle inputs at large amplitude(2Vrms), such as those from compact discs and laser discs, as well as ensures better sound quality when the key control is off.



② Power

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Connect a filter capacitor of at least 47μ F and a pass control of approximately 0.1μ F near power-GND pin (within a radius of 2cm)

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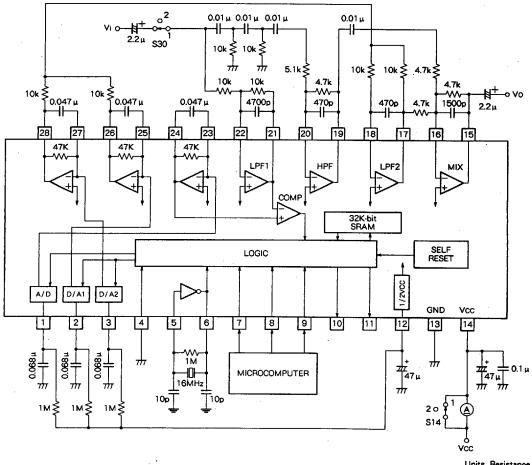
DIGITAL KEY CONTROLLER

TEST CONDITIONS SWITCHING CONDITIONS

RECOMMENDED OPERATING CONDITIONS

Symbol	Descenter	Test seeditions	SWITCH		1
Symbol	Parameter	Test conditions	14	30	· ·
lcc	Circuit current	No signal	2	2	
G∨	Voltage gain between input and output		1	1	Gv = 20log(Vo/Vi)
THD	Output distortion	30KHz L.P.F	1	1	
No	Output noise voltage	JIS-A	2	2	
Vomax	Maximum output voltage	30KHz L. P. F THD=10%	1	1	

TEST CIRCUIT

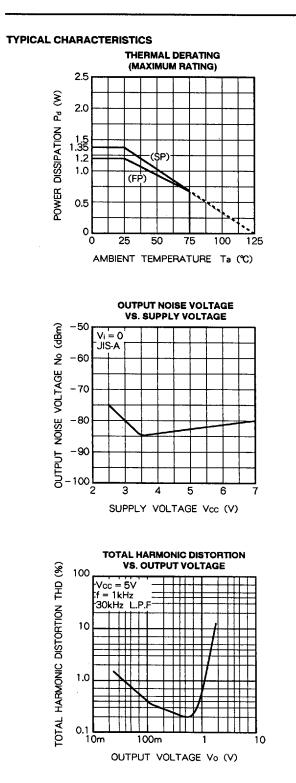


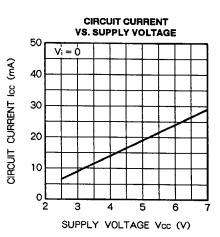
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Units Resistance : Q Capacitance : F

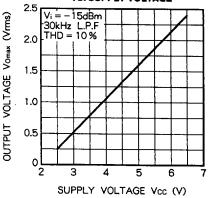
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MAXIMUM OUTPUT VOLTAGE VS. SUPPLY VOLTAGE

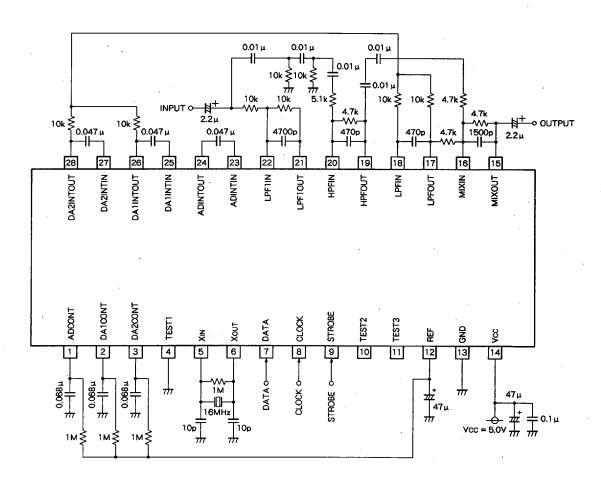




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APPLICATION EXAMPLE



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Units Resistance : Q Capacitance : F
