

HM753

Low On Resistance, triple SPDT Analog Switch

Descriptions

The HM753 is a high performance, quad, Single Pole Double Throw (SPDT) analog switch that features ultra-low Ron of 0.5 Ω (typical) at 3.0V VCC. The HM753 operates over a wide VCC range of 2.3V to 4.5V and is designed for break-before-make operation. The select input is TTL-level compatible.

HM753 is also featured with smart circuitry to minimize VCC leakage current even when the control voltage is lower than VCC supply voltage. This feature suits mobile handset applications by allowing direct interface with baseband processor general-purpose IO with minimal battery consumption. In other word, there is no need of additional device to shift control level to be the same as that of VCC in real application.

The HM753 is available in SOP-16L package. Standard Products are Pb-free and halogen-free.

Order Information

Package		Part Number	Quantity Per Reel	Top-Side Marking
SOP-16L	Tape and Reel	HM753	4,000 PCS	53S *

Features

- Pin-to-Pin **SGM48753, SN74LV4053A, 74L4053, TPW4053, NLAS4053, NJU4053, ISL84053, AiP74HC4053, RS2253**,
SOP-16L Package
- Supply voltage: 1.5 ~ 5.5V
- ultra-low On Resistance: 1.5 Ω
- -3dB Bandwidth :700MHz
- Rail-to-Rail Signal Range
- Break-Before-Make Switching
- Low quiescent current over an Expanded Control Input Range

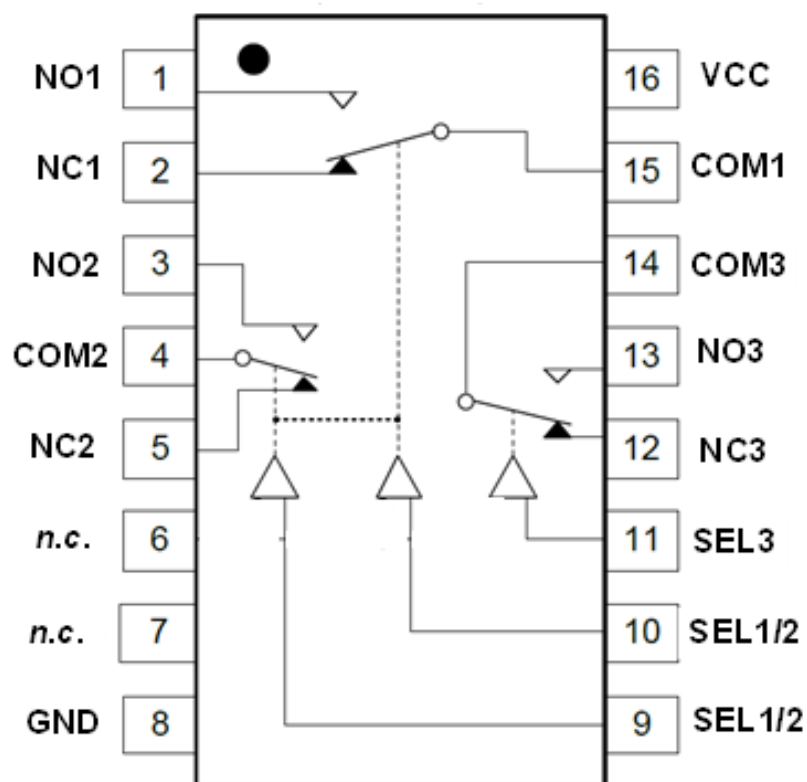
Applications

- Cell phones, PDA, Digital Camera and Notebook
- LCD Monitor, TV and Set-Top Box
- Audio and Video Signal Routing
- Other electronics equipment

Functions and Pin Configuration

Pin Number	Symbol	Descriptions
4,14,15	COMX	Common Data Port
2,5,12	NCX	Data Port (Normally closed)
1,3,13	NOX	Data Port (Normally open)
9,10,11	SELX	Logic Input Control
16	VCC	Positive Power Supply
8	GND	Ground
6, 7	n.c.	Not Connection

Note: X=1 or 2,3



Pin configuration (Top view)

Function Descriptions

SEL1/2, SEL3	Function
0	NC1 = COM1, NC2= COM2, NC3 = COM3
1	NO1 = COM1, NO2= COM2, NO3 = COM3

Absolute Maximum Ratings ⁽¹⁾

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	-0.3 ~ 6.5	V
Control Input Voltage	V _{IN}	-0.3 ~ 6.5	V
DC Input Voltage ⁽²⁾	V _{INPUT}	-0.3 ~ 6.5	V
Continuous Current NO_NC_COM_		±100	mA
Peak Current NO_NC_COM_ (pulsed at 1ms 50% duty cycle)		±200	mA
Peak Current NO_NC_COM_ (pulsed at 1ms 10% duty cycle)		±200	mA
Storage Temperature Range	T _{STG}	-65 ~ 150	°C
Junction Temperature under Bias	T _J	150	°C
Lead Temperature (Soldering, 10 seconds)	T _L	260	°C
Power Dissipation	P _D	250	mW

Recommend operating ratings ⁽³⁾

Parameter	Symbol	Value	Unit
Supply Voltage Operating	V _{CC}	1.5 ~ 5.5	V
Control Input Voltage	V _{IN}	0.0 ~ V _{CC}	V
Input Signal Voltage	V _{IS}	0.0 ~ V _{CC}	V
Operating Temperature	T _A	-40 ~ 85	°C
Input Raise and Fall Time(Control Input V _{CC} =2.3~3.6V)	t _r ,t _f	0 ~ 10	ns/V
Thermal Resistance	R _{θJA}	350	°C/W

Note:

1. "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied.
2. The input and output negative voltage ratings may be exceeded if the input and output diode current ratings are observed.
3. Control input must be held high or Low, it must not float.

DC Electronics Characteristics (Ta=25°C, VCC=4.5V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input logic high level	V _{IH}	VCC: 3.0 ~ 4.5	1.6			V
		VCC: 2.3 ~ 3.0	1.4			V
Input logic low level	V _{IL}	VCC: 3.0 ~ 4.5			0.6	V
		VCC: 2.3 ~ 3.0			0.4	V
Supply quiescent current	I _{CC}	I _{OUT} =0, V _{IN} =0 or V _{IN} =VCC			1.0	uA
Increase in I _{CC} per input	I _{CCT}	I _{OUT} =0, VCC=4.5 V _{IN} >1.8 or V _{IN} <0.5			2.0	uA
Input leakage current	I _{IN}	V _{SEL} =VCC			±1.0	uA
Off state switch leakage current	I _{OFF}				±1.0	uA
On state switch leakage current	I _{ON}				±1.0	uA
On-Resistance	R _{ON}	VCC=4.5V, V _{IS} =0~4.5V, I _{ON} =100mA,		1.5		Ω
		VCC=3.0V, V _{IS} =0~3.0V, I _{OUT} =100mA,		1.8		Ω
On-Resistance Matching Between Channels	Δ R _{ON}	VCC=4.5V, V _{IS} =0.8V, I _{OUT} =100mA,		0.1		Ω
		VCC=3.0V, V _{IS} =0.8V, I _{OUT} =100mA,		0.14		Ω
On-Resistance Flatness	R _{FLAT(ON)}	VCC=4.5V, V _{IS} =0~4.5V, I _{OUT} =100mA,			0.5	Ω
		VCC=3.0V, V _{IS} =0~3.0V, I _{OUT} =100mA,			0.8	Ω

AC Electronics Characteristics (Ta=25°C, VCC=4.5V, unless otherwise noted)

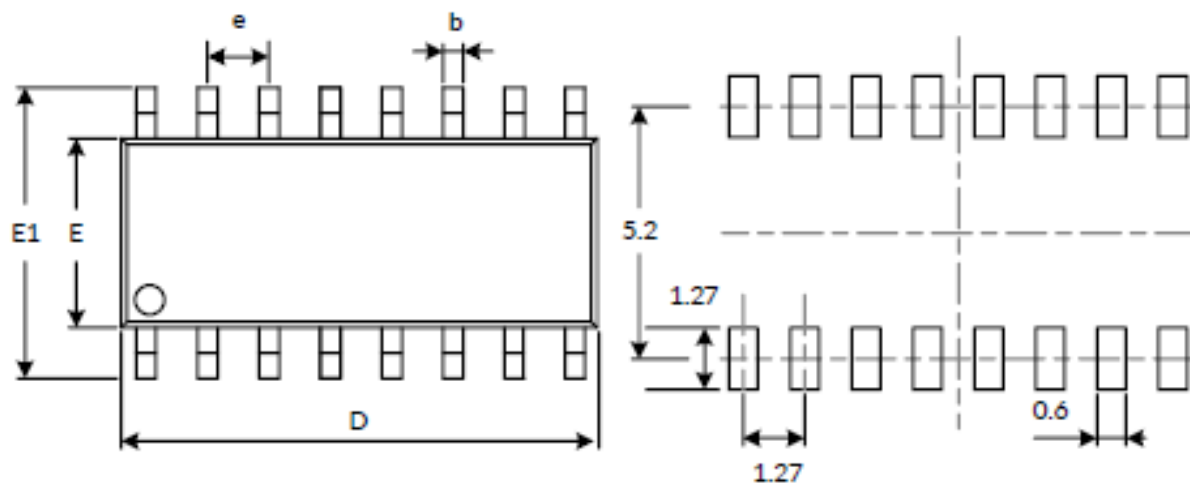
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Time	T _{ON}	VCC=4.5V, V _{IS} =1.5V, C _L =35pF, R _L =50Ω		200		ns
Turn-Off Time	T _{OFF}	VCC=4.5V, V _{IS} =1.5V, C _L =35pF, R _L =50Ω		200		ns
Break-Before-Make time	T _{BBM}	Generate by design		100		ns
-3dB Bandwidth	BW	R _L =50Ω, C _L =0pF		700		MHz
Off isolation (Per Channel)	OIRR	F=100KHz, R _L =50Ω		-50		dB
Crosstalk (Channel to Channel)	Xtalk	F=100KHz, R _L =50Ω		-50		dB
Total Harmonic Distortion	THD	F=20Hz to 20KHz R _L =32Ω, V _{IS} =0.5Vp-p		-80		dB

Capacitance (Ta=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off capacitance	C _{OFF}	F=1MHz, VCC=3.3V		5		pF
On capacitance	C _{ON}	F=1MHz, VCC=3.3V		8		pF

Package Outline Dimensions

SOP-16



RECOMMENDED LAND PATTERN (Unit: mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A ⁽¹⁾	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D ⁽¹⁾	9.800	10.200	0.386	0.402
E ⁽¹⁾	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC) ⁽²⁾		0.050(BSC) ⁽²⁾	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

NOTE:

1. Plastic or metal protrusions of 0.15mm maximum per side are not included.
2. BSC (Basic Spacing between Centers), "Basic" spacing is nominal.
3. This drawing is subject to change without notice.