

**SCOPE: LOW POWER FAST CMOS ANALOG SWITCHES**

<u>Device Type</u>	<u>Generic Number</u>	<u>Circuit Function</u>
01	IH5140M(x)/883B	SPST
02	IH5141M(x)/883B	Dual SPST
03	IH5142M(x)/883B	SPDT
04	IH5143M(x)/883B	Dual SPDT
05	IH5144M(x)/883B	DPST
06	IH5145M(x)/883B	Dual DPST

**Case Outline(s).** The case outlines shall be designated in Mil-Std-1835 and as follows:

<u>Outline Letter</u>	<u>Mil-Std-1835</u>	<u>Case Outline</u>	<u>Package Code</u>
JE	GDIP1-T16 or CDIP2-T16	16 LEAD CERDIP	J16

**Absolute Maximum Ratings:**

$V^+$ to $V^-$ .....	<38V
$V^+$ to $V_D$ .....	<30V
$V_D$ to $V^-$ .....	<30V
$V_D$ to $V_S$ .....	< $\pm 22V$
$V_L$ to $V^-$ .....	<33V
$V_L$ to $V_{IN}$ .....	<30V
$V_L$ to GND .....	<20V
$V_{IN}$ to GND .....	<20V
Digital Input Overvoltage Range .....	( $V^+ + 0.3V$ ) to ( $V^+ - 38V$ )
$V_S$ or $V_D \downarrow$ .....	( $V^- - 0.3V$ to ( $V^+ + 0.3V$ )
Continuous Current, Any terminal .....	30mA
Peak Current, S or D (Pulsed at 1ms, 10% duty cycle max) .....	100mA
Lead Temperature (soldering, 10 seconds) .....	+300°C
Storage Temperature .....	-65°C to +150°C
Continuous Power Dissipation .....	$T_A = +70^\circ C$
16 lead CERDIP (derate 10.0mW/°C above +70°C) .....	800mW
Junction Temperature $T_J$ .....	+150°C
Thermal Resistance, Junction to Case, $\theta_{JC}$ :	
Case Outline 16 lead CERDIP .....	50°C/W
Thermal Resistance, Junction to Ambient, $\theta_{JA}$ :	
Case Outline 16 lead CERDIP .....	100°C/W

**Recommended Operating Conditions**

Ambient Operating Range ( $T_A$ ) .....	-55°C to +125°C
Positive Supply Voltage ( $V^+$ ) .....	+15V
Negative Supply Voltage ( $V^-$ ) .....	-15V
$V_{AL}$ (max) .....	0.8V
$V_{AH}$ (min) .....	2.4V

NOTE 1: Signals on S, D, or IN exceeding  $V^+$  or  $V^-$  are clamped by internal diodes. Limit forward current to maximum current ratings.

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**TABLE 1. ELECTRICAL TESTS:**

TEST	Symbol	CONDITIONS	Group A Subgroup	Device type	Limits Min	Limits Max	Units
		-55 °C <=T <sub>A</sub> <= +125°C V <sup>+</sup> =+15V, V <sup>-</sup> =-15V, GND=0V V <sub>AH</sub> =2.4V, V <sub>AL</sub> =0.8V, V <sub>L</sub> =+5V Unless otherwise specified					
<b>INPUT</b>							
Input Logic Current	I <sub>IN(ON)</sub>	V <sub>IN</sub> =2.4V, NOTE 2	1,3 2	All		±1 ±10	µA
Input Logic Current	I <sub>IN(OFF)</sub>	V <sub>IN</sub> =0.8V, NOTE 2	1,3 2	All		±1 ±10	µA
<b>SWITCH</b>							
Drain-Source ON Resistance	r <sub>DS(ON)</sub>	I <sub>S</sub> =±10mA, V <sub>ANALOG</sub> =±10V,	1,3 2	All		50 75	Ω
On-Resistance Match Between Channels	Δr <sub>DS(ON)</sub>	I <sub>S</sub> =10mA, V <sub>D</sub> =±10V, NOTE 3	1	All		3	Ω
Analog Signal Handling Capability	V <sub>ANALOG</sub>		1	All	±15		V
Switch- OFF Leakage Current	I <sub>D(OFF)</sub> + I <sub>S(OFF)</sub>	V <sub>D</sub> =+10V, V <sub>S</sub> =-10V V <sub>D</sub> =-10V, V <sub>S</sub> =+10V	1 2	All		±0.5 ±100	nA
Switch-On Leakage Current	I <sub>D(ON)</sub> + I <sub>S(ON)</sub>	V <sub>D</sub> =V <sub>S</sub> =±10V	1 2	All		±1 ±200	nA
<b>SUPPLY</b>							
Positive Supply Quiescent Current	I <sub>+</sub>		1,3 2	All	1 10	1 10	µA
Negative Supply Quiescent Current	I <sub>-</sub>		1,3 2	All	-1 -10	-1 -10	µA
+5V Supply Current	I <sub>L</sub>		1,3 2	All	1 10	1 10	µA
Ground Supply Quiescent Current	I <sub>GND</sub>		1,3 2	All	1 10	1 10	µA
<b>DYNAMIC</b>							
Turn-On Time NOTE 4	t <sub>ON</sub>	Figure 1	9	01,02		100	ns
		Figure 2	9	01,02		150	
		Figure 1, 3	9	03,04		175	
		Figure 2,4	9	03,04		200	
		Figure 1	9	05,06		175	
Turn-Off Time NOTE 4	t <sub>OFF</sub>	Figure 2	9	05,06		200	ns
		Figure 1	9	01,02		75	
		Figure 2	9	01,02		125	
		Figure 1, 2, 3, 4	9	03,04		125	
		Figure 1, 2	9	05,06		125	

NOTE 2: Some channels are turned on by high (1) logic inputs and other channels are turned on by low (0) inputs; however, 0.8V to 2.4V describes the minimum range for switching properly. Refer to logic diagrams to find logical value of logic input required to produce ON or OFF state.

NOTE 3: Typical values are for design aid only, not guaranteed and not subject to production testing.

NOTE 4: Guaranteed but not production tested. Switching times are measured at 90% points

Figures 1,2,3,4: Switching Time: See Commercial Data Sheet.

**TERMINAL CONNECTIONS**

<b>TERMINAL NUMBER</b>	<b>01 IH5140</b>	<b>02 IH5141</b>	<b>03 IH5142</b>	<b>04 IH5143</b>	<b>05 IH5144</b>	<b>06 IH5145</b>
0	J16	J16	J16	J16	J16	J16
1	D	D1	D1	D1	D1	D1
2						
3			D2	D3	D2	D3
4			S2	S3	S2	S3
5				S4		S4
6				D4		D4
7						
8		D2		D2		D2
9		S2		S2		S2
10		IN2		IN2		IN2
11	V+	V+	V+	V+	V+	V+
12	VL	VL	VL	VL	VL	VL
13	GND	GND	GND	GND	GND	GND
14	V-	V-	V-	V-	V-	V-
15	IN	IN1	IN	IN1	IN	IN1
16	S	S1	S1	S1	S1	S1

**ORDERING INFORMATION:**

IH5140MJE/883B	16 CDIP
IH5141MJE/883B	16 CDIP
IH5142MJE/883B	16 CDIP
IH5143MJE/883B	16 CDIP
IH5144MJE/883B	16 CDIP
IH5145MJE/883B	16 CDIP

## QUALITY ASSURANCE

Sampling and inspection procedures shall be in accordance with MIL-Prf-38535, Appendix A as specified in Mil-Std-883.

Screening shall be in accordance with Method 5004 of Mil-Std-883. Burn-in test Method 1015:

1. Test Condition, A, B, C, or D.
2. TA = +125°C minimum.
3. Interim and final electrical test requirements shall be specified in Table 2.

Quality conformance inspection shall be in accordance with Method 5005 of Mil-Std-883, including Groups A, B, C, and D inspection.

Group A inspection:

1. Tests as specified in Table 2.
2. Selected subgroups in Table 1, Method 5005 of Mil-Std-883 shall be omitted.

Group C and D inspections:

- a. End-point electrical parameters shall be specified in Table 1.
- b. Steady-state life test, Method 1005 of Mil-Std-883:
  1. Test condition A, B, C, D.
  2. TA = +125°C, minimum.
  3. Test duration, 1000 hours, except as permitted by Method 1005 of Mil-Std-883.

**TABLE 2. ELECTRICAL TEST REQUIREMENTS**

Mil-Std-883 Test Requirements	Subgroups per Method 5005, Table 1
Interim Electric Parameters Method 5004	1
Final Electrical Parameters Method 5005	1*, 2, 3, 9
Group A Test Requirements Method 5005	1, 2, 3, 9
Group C and D End-Point Electrical Parameters Method 5005	1

\* PDA applies to Subgroup 1 only.