

HD74LS148

8-line-to-3-line Octal Priority Encoder

REJ03D0437-0200

Rev.2.00

Feb.18.2005

The HD74LS148 encodes eight data lines to three-line (4-2-1) binary (octal). Cascading circuitry (enable input EI and enable output EO) has been provided to allow octal expansion without the need for external circuitry. The data inputs and outputs are active at the low logic level.

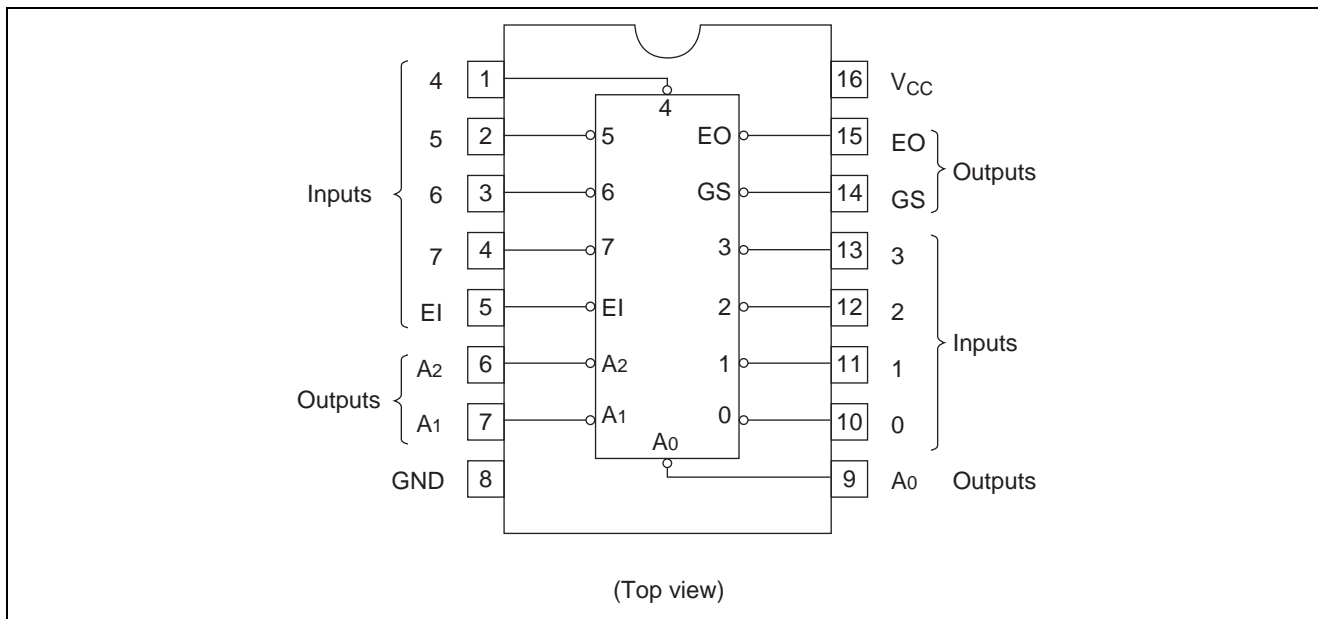
Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS148P	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74LS148FPEL	SOP-16 pin (JEITA)	PRSP0016DH-B (FP-16DAV)	FP	EL (2,000 pcs/reel)

Note: Please consult the sales office for the above package availability.

Pin Arrangement

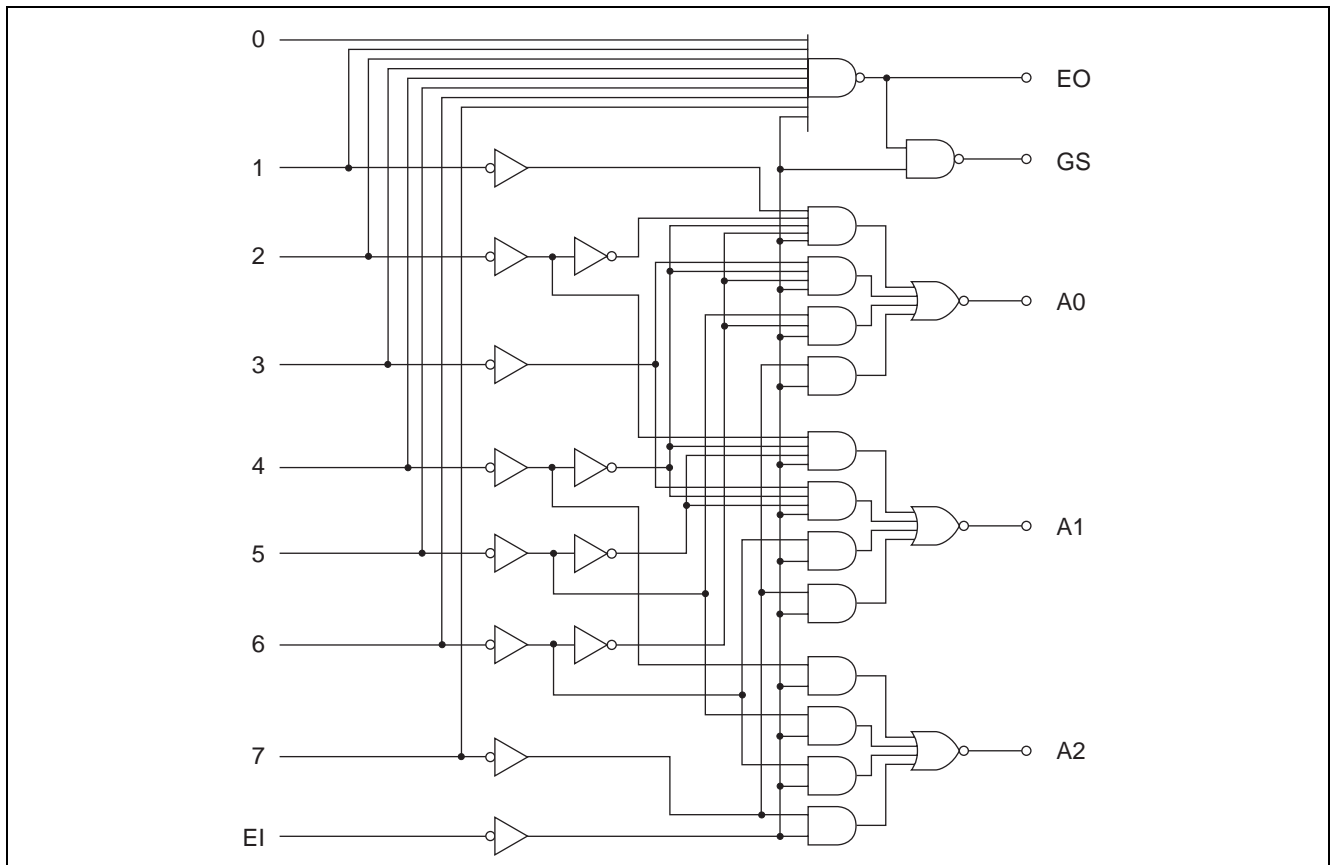


Function Table

Inputs									Outputs				
EI	0	1	2	3	4	5	6	7	A2	A1	A0	GS	EO
H	X	X	X	X	X	X	X	X	H	H	H	H	H
L	H	H	H	H	H	H	H	H	H	H	H	H	L
L	X	X	X	X	X	X	X	L	L	L	L	L	H
L	X	X	X	X	X	X	L	H	L	L	H	L	H
L	X	X	X	X	X	L	H	H	L	H	L	L	H
L	X	X	X	X	L	H	H	H	L	H	H	L	H
L	X	X	X	L	H	H	H	H	H	L	L	L	H
L	X	X	L	H	H	H	H	H	H	L	H	L	H
L	X	L	H	H	H	H	H	H	H	H	L	L	H
L	L	H	H	H	H	H	H	H	H	H	H	L	H

H ; high level, L ; low level, X ; irrelevant

Block Diagram



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	7	V
Input voltage	V_{IN}	7	V
Power dissipation	P_T	400	mW
Storage temperature	T_{stg}	-65 to +150	°C

Note: Voltage value, unless otherwise noted, are with respect to network ground terminal.

Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	V_{CC}	4.75	5.00	5.25	V
Output current	I_{OH}	—	—	−400	μA
	I_{OL}	—	—	8	mA
Operating temperature	T_{opr}	−20	25	75	°C

Electrical Characteristics

(Ta = −20 to +75 °C)

Item		Symbol	min.	typ.*	max.	Unit	Condition	
Input voltage		V_{IH}	2.0	—	—	V		
		V_{IL}	—	—	0.8	V		
Output voltage		V_{OH}	2.7	—	—	V	$V_{CC} = 4.75\text{ V}$, $V_{IH} = 2\text{ V}$, $V_{IL} = 0.8\text{ V}$, $I_{OH} = -400\text{ }\mu\text{A}$	
		V_{OL}	—	—	0.4	V	$I_{OL} = 4\text{ mA}$	$V_{CC} = 4.75\text{ V}$, $V_{IH} = 2\text{ V}$, $V_{IL} = 0.8\text{ V}$
			—	—	0.5		$I_{OL} = 8\text{ mA}$	
Input current	1 to 7 Inputs	I_{IH}	—	—	40	μA	$V_{CC} = 5.25\text{ V}$, $V_I = 2.7\text{ V}$	
	Other inputs		—	—	20			
	1 to 7 Inputs	I_{IL}	—	—	-0.8	mA	$V_{CC} = 5.25\text{ V}$, $V_I = 0.4\text{ V}$	
	Other inputs		—	—	-0.4			
	1 to 7 Inputs	I_I	—	—	0.2	mA	$V_{CC} = 5.25\text{ V}$, $V_I = 7\text{ V}$	
	Other inputs		—	—	0.1			
Short-circuit output current		I_{OS}	-20	—	-100	mA	$V_{CC} = 5.25\text{ V}$	
Supply current**		I_{CC}	—	12	20	mA	Condition 1	$V_{CC} = 5.25\text{ V}$
			—	10	17	mA	Condition 2	
Input clamp voltage		V_{IK}	—	—	-1.5	V	$V_{CC} = 4.75\text{ V}$, $I_{IN} = -18\text{ mA}$	

Notes: * $V_{CC} = 5\text{ V}$, $T_a = 25^\circ\text{C}$

** The condition 1 is measured with inputs 7 and EI grounded, other inputs and outputs open, the condition 2 is measured with all inputs and outputs open.

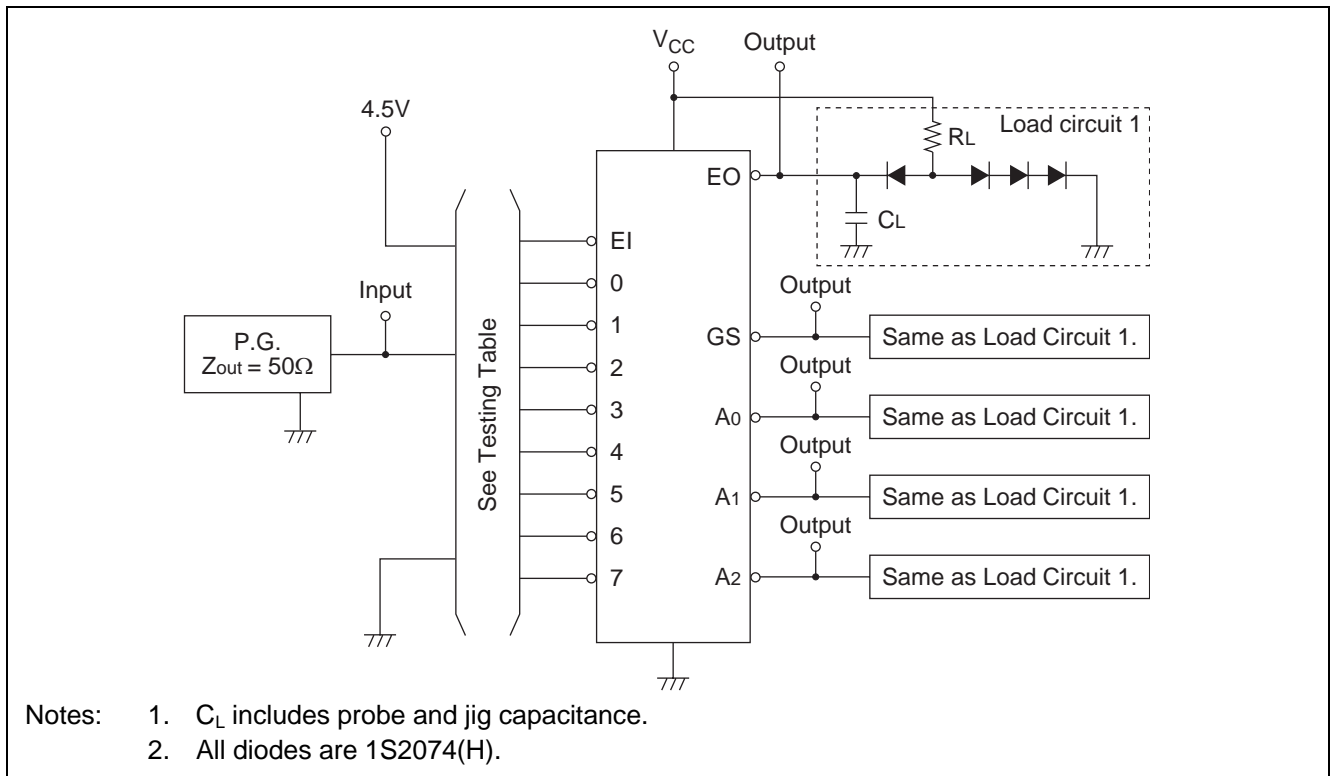
Switching Characteristics

(V_{CC} = 5 V, Ta = 25°C)

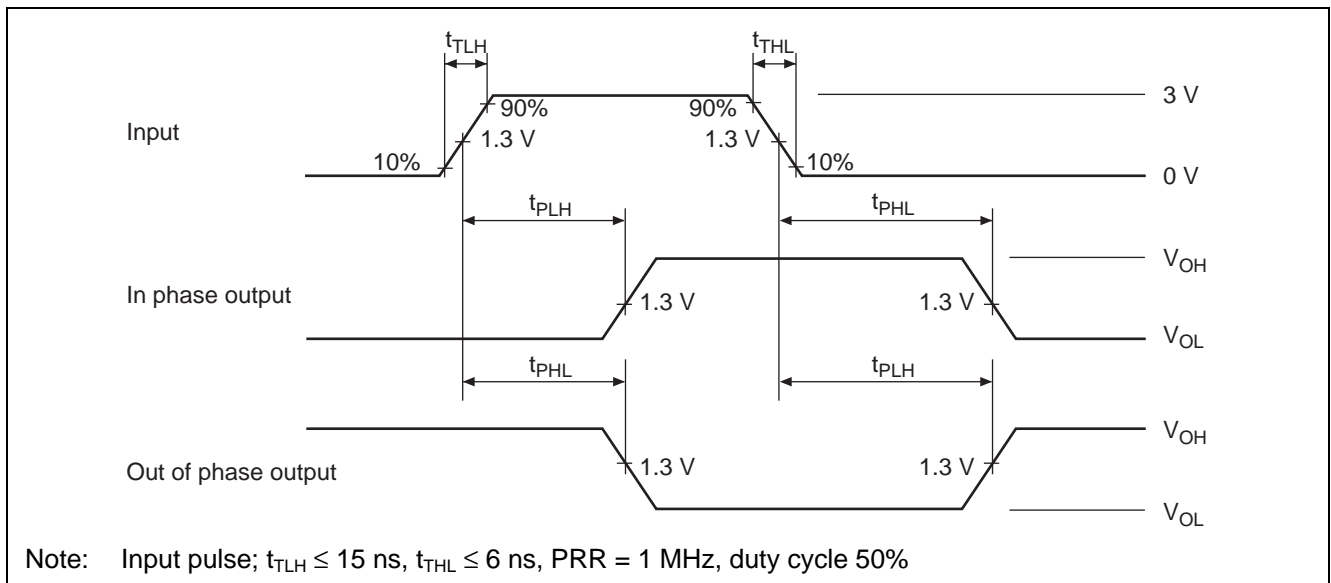
Item	Symbol	min.	typ.	max.	Unit	Inputs	Outputs	Output Waveforms	Condition
Propagation delay time	t_{PLH}	—	14	18	ns	0 to 7	A_0, A_1 or A_2	In-phase Output	$C_L = 15\text{ pF}$, $R_L = 2\text{ k}\Omega$
	t_{PHL}	—	15	25				Out-of-phase Output	
	t_{PLH}	—	20	36	ns	0 to 7	A_0, A_1 or A_2	Out-of-phase Output	
	t_{PHL}	—	16	29				Out-of-phase Output	
	t_{PLH}	—	7	18	ns	0 to 7	EO	Out-of-phase Output	
	t_{PHL}	—	25	40				Out-of-phase Output	
	t_{PLH}	—	35	55	ns	0 to 7	GS	In-phase Output	
	t_{PHL}	—	9	21				In-phase Output	
	t_{PLH}	—	16	25	ns	EI	A_0, A_1 or A_2	In-phase Output	
	t_{PHL}	—	12	25				In-phase Output	
	t_{PLH}	—	12	17	ns	EI	GS	In-phase Output	
	t_{PHL}	—	14	36				In-phase Output	
	t_{PLH}	—	12	21	ns	EI	EO	In-phase Output	
	t_{PHL}	—	23	35				In-phase Output	

Testing Method

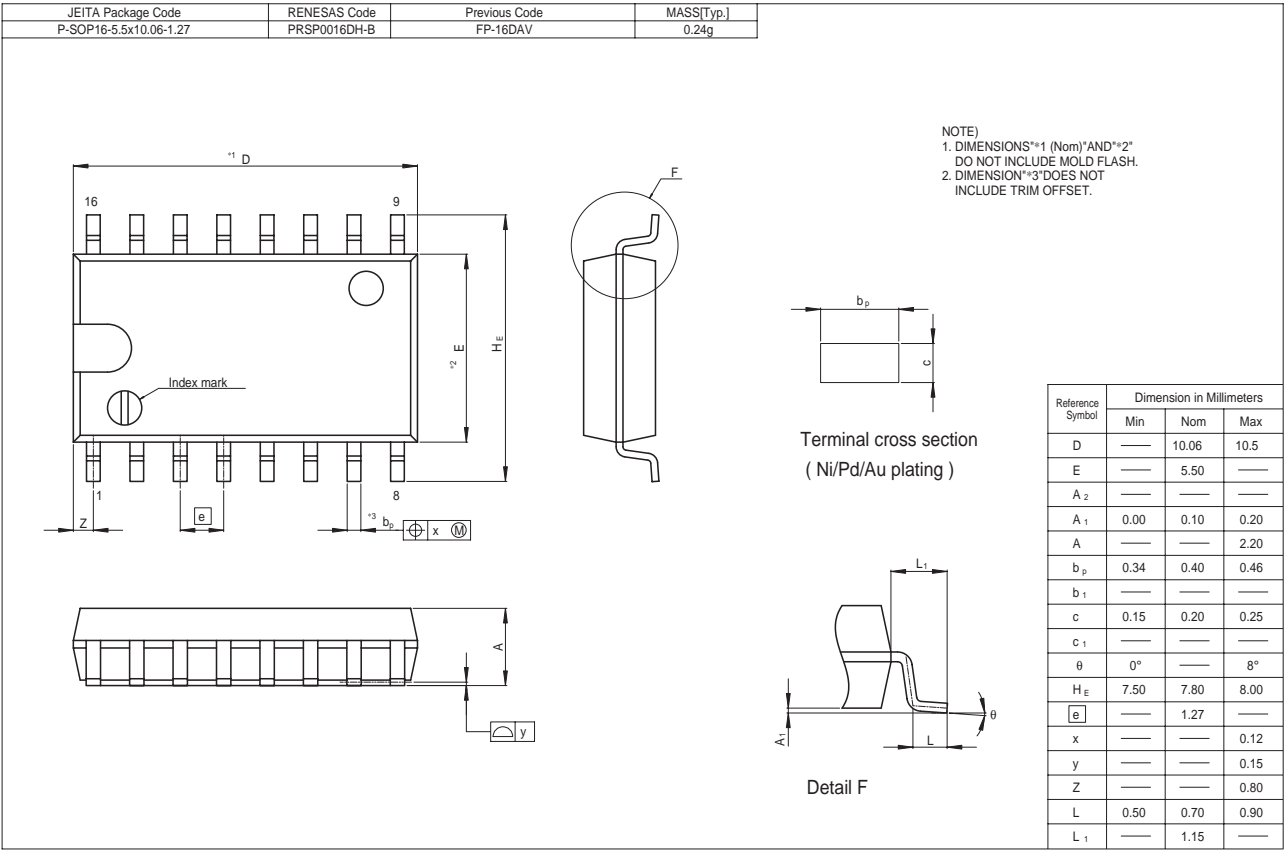
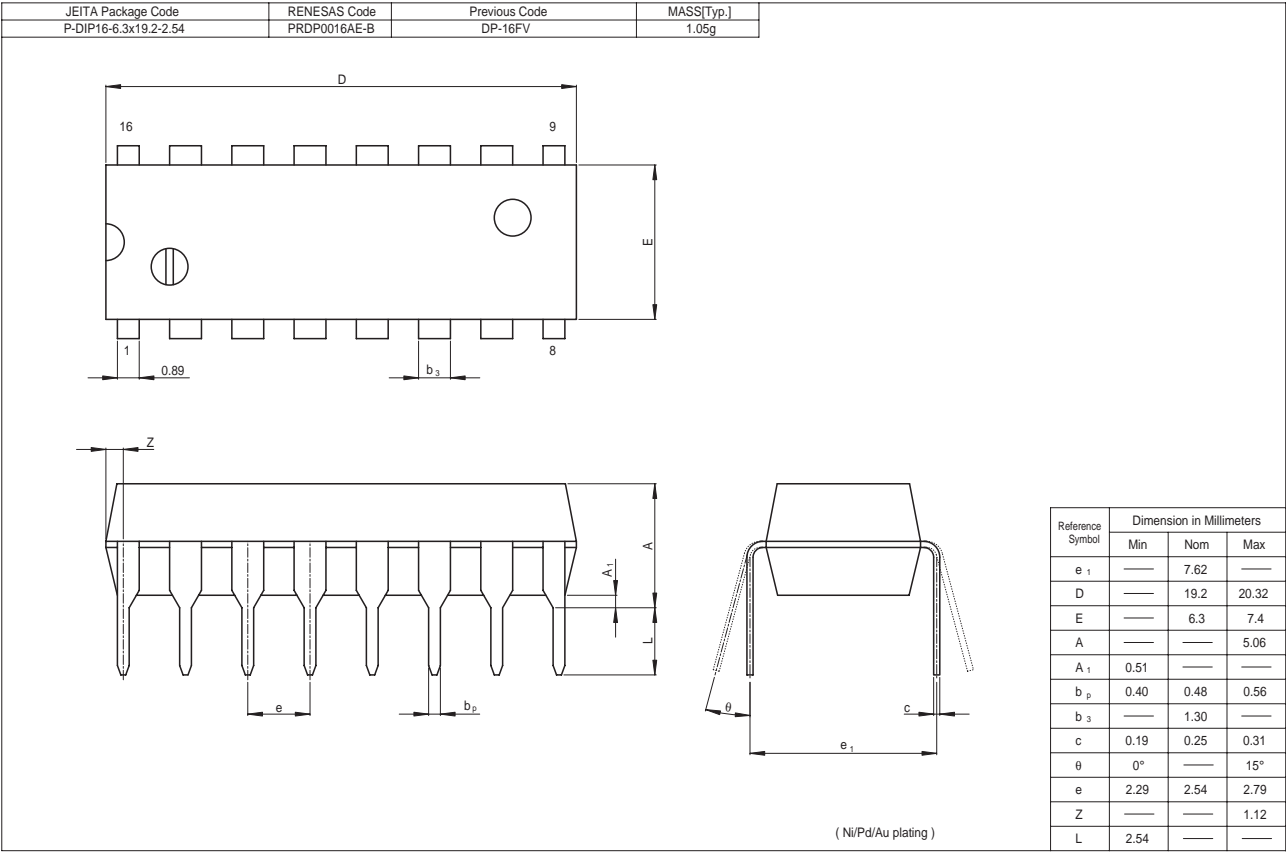
Test Circuit



Waveform



Package Dimensions



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Renesas Technology America, Inc.

450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology Hong Kong Ltd.

7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.

10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology (Shanghai) Co., Ltd.

Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

Renesas Technology Singapore Pte. Ltd.

1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001