



CHAPTER 1

INTRODUCTION

The PCI bus 8 channels relay output / photo isolator input adapter is a 32 bits PCI bus board with Plug and Play (PnP) features, it is a programmable I/O interface card for PC/486, Pentium, or compatibles. The PnP features let hardware configuration for IRQ and I/O address is detected by BIOS automatically, you don't need set switch and jumper.

The PCI bus 8 channels relay output / photo isolator input adapter provides relay output functions and photo isolator input functions. The relay output part provides 8 relays to drive 8 different output channels. Each relay channel can be used to control ON / OFF of external devices, to drive external high power relays, to activate alarms ... etc. The photo isolator input part provides 8 photo couple digital input channels, which allow the input signals to be completely floated and prevent the ground loop.

The features of the PCI bus 8 channels relay output / 8 photo isolator input adapter are:

- 32 bits PCI bus with Plug and Play (PnP) features.
- Support 8 relay output channels and 8 photo couple input channels.
- Max contact rating for relay: 120V AC/DC 1AMP.
- Attraction time for relay: 3 ms.
- Fall off time for relay: 2 ms.
- Isolation resistance for relay: 100M OHM.
- Life expectancy for relay: 100 million operations at signal level load.




- Allow the photo input signals to be completely floated and prevent the ground loops.
- The kinds of boards were be provides external/internal power input
- Activation voltage
 - Input range from 0 to 20V
 - 0 to 1.5V inactive
 - 3 to 20V active



CHAPTER 2

UNPACKING INFORMATION

 **Check that your PCI bus 8 channels relay output/photo isolator input package includes the following items:**

- PCI bus 8 channels relay output/photo isolator input board, select one of following board:
 - board provides external/internal power
- Demo Program.
- User manual.
- Warranty form.



CHAPTER 3

HARDWARE INSTALLATION

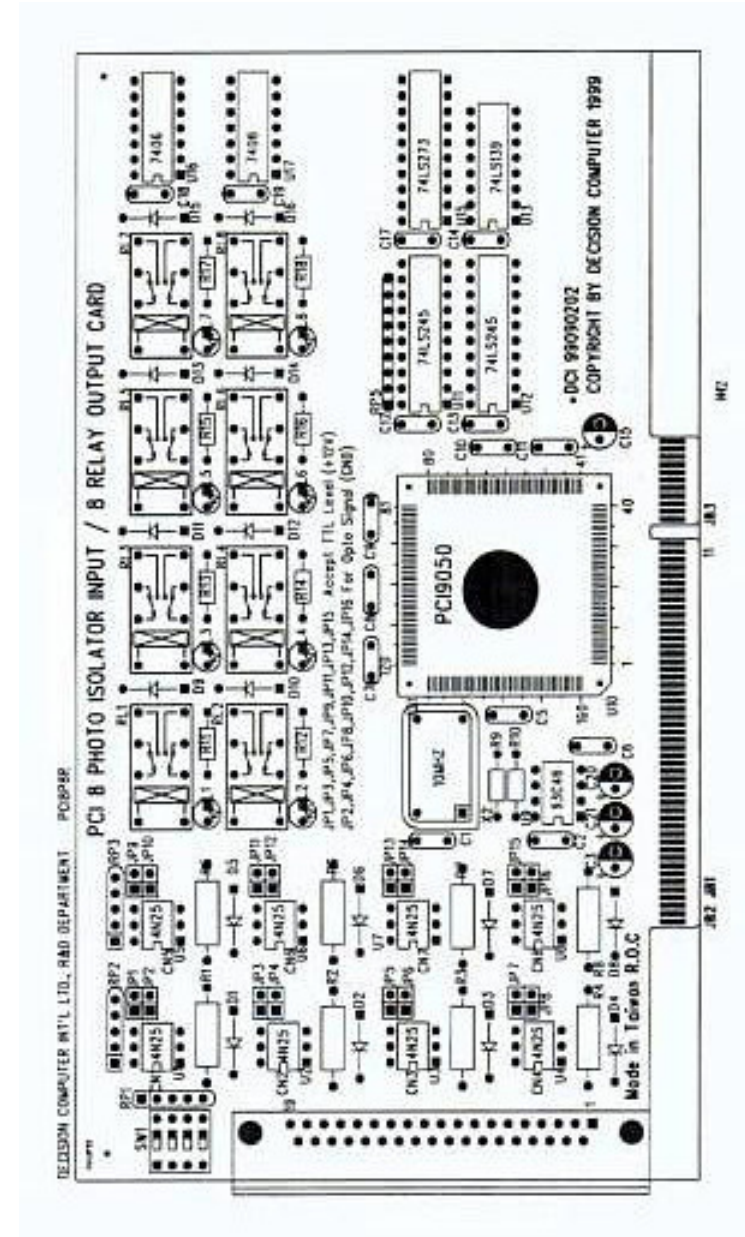
Your PCI bus 8 channels relay output/photo isolator input adapter is designed to be inserted in any available PCI slot in your PC/486, Pentium or compatibles. In order to gain access to the expansion slots, follow the steps listed below:

1. Turn off all power to your computer and all peripheral devices before installing your 8 channels relay output/photo isolator input adapter.
2. Remove the cover of the computer.
3. Insert the 8 channels relay output/photo isolator input adapter into any available PCI slot. Make sure the adapter is firmly seated in the chosen slot.
4. Replace the cover of the computer.
5. Turn on the power of your computer, the PnP features will recognize the 8 channels relay output/photo isolator input adapter.

CHAPTER 4

HARDWARE CONFIGURATION

Before you use the 8 channels relay output/ photo couple input adapter, you must ensure that the I/O address. Observe the figure in the follows, the proper jumper settings for the 8 channels relay output/photo couple input adapter is described in the following.



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1. I/O Address

The PnP feature will get base I/O address automatically, where

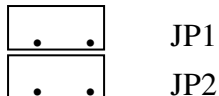
Base Address + 0:
Relay output channel 1 to 8

7	6	5	4	3	2	1	0
RL8	RL7	RL6	RL5	RL4	RL3	RL2	RL1

Base Address + 0:
Photo isolator input channel 1 to 8.

7	6	5	4	3	2	1	0
IN8	IN7	IN6	IN5	IN4	IN3	IN2	IN1

2. Jumper Setting



Jumper	Description
Open	Select opto+ and opto- Voltage Signal Input
Short	12V Internal Input

The JP1 and JP2 are used to select voltage signal of photo input channel 1, and the JP3 and JP4 are used to select voltage signal of photo input channel 2, ...etc. When we open both jumpers, the input voltage from opto+ and opto- is range from 0 to 20V. Under this condition, 0 to 1.5V mean inactive and 3 to 20V represent active. In this mode, the hardware will isolate input signal and power. When

the jumpers are short, it means 12V internal input will be provided from main board. Under this condition, no isolate is provided.

3. DB37 Connector Assignments

Pin	Description
1	Relay channel 1, NO
2	Relay channel 1, COM
3	Relay channel 1, NC
4	Relay channel 2, NO
5	Relay channel 2, COM
6	Relay channel 2, NC
7	Relay channel 3, NO
8	Relay channel 3, COM
9	Relay channel 3, NC
10	Relay channel 8, NO
11	Relay channel 8, COM
12	Opto channel 1, +
13	Opto channel 2, +
14	Opto channel 3, +
15	Opto channel 4, +
16	Opto channel 5, +
17	Opto channel 6, +
18	Opto channel 7, +
19	Opto channel 8, +
20	Relay channel 4, NO
21	Relay channel 4, COM
22	Relay channel 4, NC
23	Relay channel 5, NO
24	Relay channel 5, COM
25	Relay channel 6, NO
26	Relay channel 6, COM



27	Relay channel 7, NO
28	Relay channel 7, COM
29	GND
30	Opto channel 1, -
31	Opto channel 2, -
32	Opto channel 3, -
33	Opto channel 4, -
34	Opto channel 5, -
35	Opto channel 6, -
36	Opto channel 7, -
37	Opto channel 8, -



APPENDIX A

WARRANTY INFORMATION

A.1 Copyright

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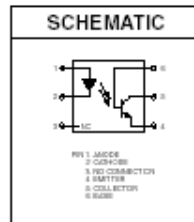
A.2 Warranty Information

DECISION warrants that for a period of one year from the date of purchase (unless otherwise specified in the warranty card) that the goods supplied will perform according to the specifications defined in the user manual. Furthermore that the 8 CHANNELS RELAY

APPENDIX B

DATA SHEET

4N25 4N37	4N26 H11A1	4N27 H11A2	4N28 H11A3	4N35 H11A4	4N36 H11A5
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DESCRIPTION

The general purpose optocouplers consist of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a 6-pin dual in-line package.

FEATURES

- Also available in white package by specifying -M suffix, eg. 4N25-M
- UL recognized (File # E90700)
- VDE recognized (File # 94766)
 - Add option V for white package (e.g., 4N25V-M)
 - Add option 300 for black package (e.g., 4N25.300)

APPLICATIONS

- Power supply regulators
- Digital logic inputs
- Microprocessor inputs

4N25 4N37	4N26 H11A1	4N27 H11A2	4N28 H11A3	4N35 H11A4	4N36 H11A5
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ABSOLUTE MAXIMUM RATINGS (T _A = 25°C unless otherwise specified)			
Parameter	Symbol	Value	Units
TOTAL DEVICE			
Storage Temperature	T _{STG}	-55 to +150	°C
Operating Temperature	T _{OPR}	-55 to +100	°C
Wave solder temperature (see page 14 for reflow solder profiles)	T _{SOL}	260 for 10 sec	°C
Total Device Power Dissipation @ T _A = 25°C	P _D	250	mW
Derate above 25°C		3.3 (non-M), 2.94 (-M)	
EMITTER			
DC/Average Forward Input Current	I _F	100 (non-M), 60 (-M)	mA
Reverse Input Voltage	V _R	6	V
Forward Current - Peak (300µs, 2% Duty Cycle)	I _{F(PK)}	3	A
LED Power Dissipation @ T _A = 25°C	P _D	150 (non-M), 120 (-M)	mW
Derate above 25°C		2.0 (non-M), 1.41 (-M)	
DETECTOR			
Collector-Emitter Voltage	V _{CEO}	30	V
Collector-Base Voltage	V _{CBO}	70	V
Emitter-Collector Voltage	V _{ECO}	7	V
Detector Power Dissipation @ T _A = 25°C	P _D	150	mW
Derate above 25°C		2.0 (non-M), 1.76 (-M)	



4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5

ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise specified)						
INDIVIDUAL COMPONENT CHARACTERISTICS						
Parameter	Test Conditions	Symbol	Min	Typ*	Max	Unit
EMITTER						
Input Forward Voltage	(I _F = 10 mA)	V _F		1.18	1.50	V
Reverse Leakage Current	(V _R = 6.0 V)	I _R		0.001	10	µA
DETECTOR						
Collector-Emitter Breakdown Voltage	(I _C = 1.0 mA, I _F = 0)	BV _{CEO}	30	100		V
Collector-Base Breakdown Voltage	(I _C = 100 µA, I _F = 0)	BV _{CBO}	70	120		V
Emitter-Collector Breakdown Voltage	(I _E = 100 µA, I _F = 0)	BV _{EBO}	7	10		V
Collector-Emitter Dark Current	(V _{CE} = 10 V, I _F = 0)	I _{CEO}		1	50	nA
Collector-Base Dark Current	(V _{CB} = 10 V)	I _{CBO}			20	nA
Capacitance	(V _{CE} = 0 V, f = 1 MHz)	C _{CE}		8		pF

ISOLATION CHARACTERISTICS						
Characteristic	Test Conditions	Symbol	Min	Typ*	Max	Units
Input-Output Isolation Voltage	(Non-'M', Black Package) (f = 60 Hz, t = 1 min)	V _{ISO}	5300			Vac(rms)
	('M', White Package) (f = 60 Hz, t = 1 sec)		7500			Vac(pk)
Isolation Resistance	(V _{I,O} = 500 VDC)	R _{ISO}	10 ¹¹			Ω
Isolation Capacitance	(V _{I,O} = 5, f = 1 MHz)	C _{ISO}		0.5		pF
	('M' White Package)			0.2	2	pF

Note
* Typical values at T_A = 25°C



4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5

TRANSFER CHARACTERISTICS (T _A = 25°C Unless otherwise specified.)							
DC Characteristic	Test Conditions	Symbol	Device	Min	Typ*	Max	Unit
Current Transfer Ratio, Collector to Emitter	(I _F = 10 mA, V _{CE} = 10 V)	CTR	4N35 4N36 4N37	100			%
			H11A1	50			
			H11A5	30			
			4N25 4N26 H11A2 H11A3	20			
			4N27 4N28 H11A4	10			
			(I _F = 10 mA, V _{CE} = 10 V, T _A = -55°C)	4N35 4N36 4N37	40		
(I _F = 10 mA, V _{CE} = 10 V, T _A = +100°C)	4N35 4N36 4N37	40					
Collector-Emitter Saturation Voltage	(I _C = 2 mA, I _F = 50 mA)	V _{CE(SAT)}	4N25 4N26 4N27 4N28			0.5	V
			4N35 4N36 4N37			0.3	
			H11A1 H11A2 H11A3 H11A4 H11A5			0.4	
			(I _C = 0.5 mA, I _F = 10 mA)				
AC Characteristic	(I _F = 10 mA, V _{CC} = 10 V, R _L = 100Ω) (Fig.20)	T _{ON}	4N25 4N26 4N27 4N28 H11A1 H11A2 H11A3 H11A4 H11A5		2		µs
			4N35 4N36 4N37		2	10	µs



4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5

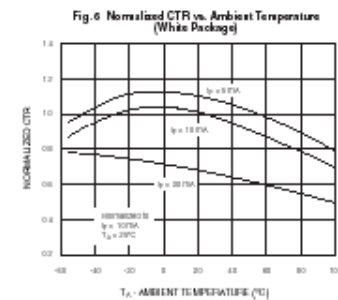
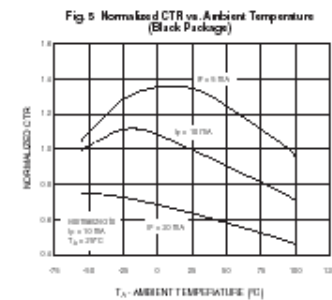
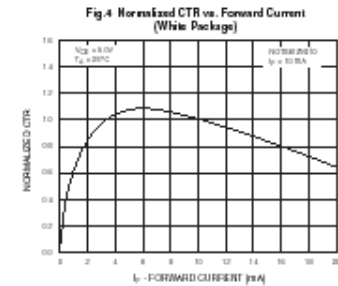
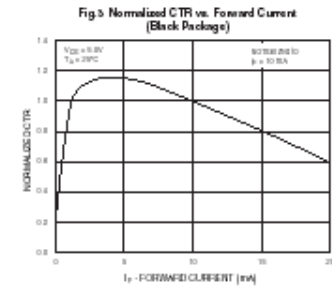
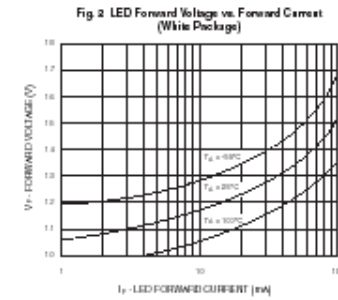
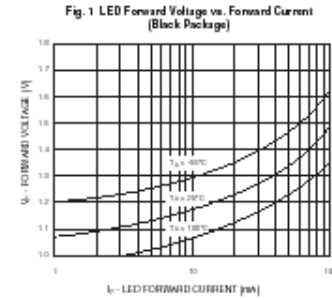
TRANSFER CHARACTERISTICS (T _A = 25°C Unless otherwise specified.) (Continued)							
AC Characteristic	Test Conditions	Symbol	Device	Min	Typ*	Max	Unit
Turn-off Time	(I _F = 10 mA, V _{CC} = 10 V, R _L = 100Ω) (Fig.20)	T _{OFF}	4N25 4N26 4N27 4N28 H11A1 H11A2 H11A3 H11A4 H11A5		2		μS
	(I _C = 2 mA, V _{CC} = 10 V, R _L = 100Ω) (Fig.20)		4N35 4N36 4N37		2	10	

* Typical values at T_A = 25°C



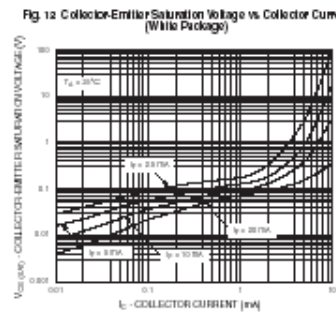
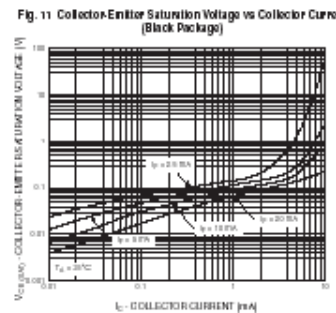
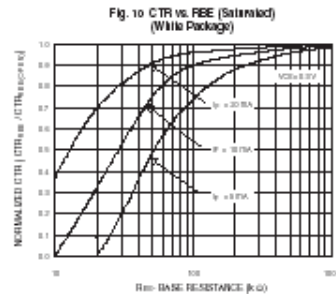
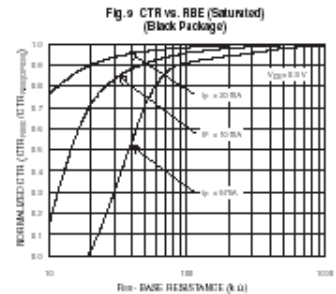
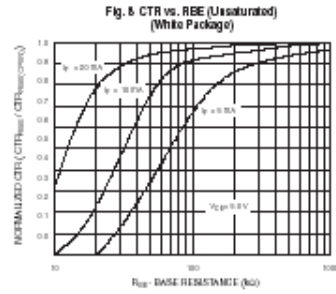
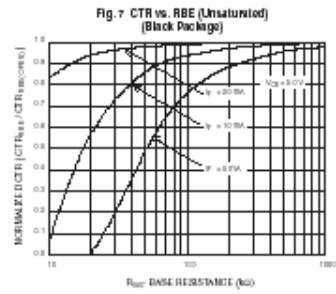
4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5

TYPICAL PERFORMANCE CURVES

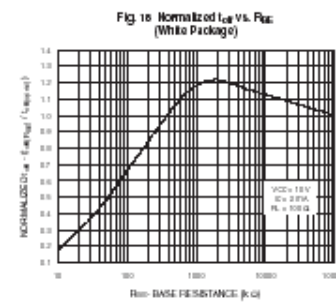
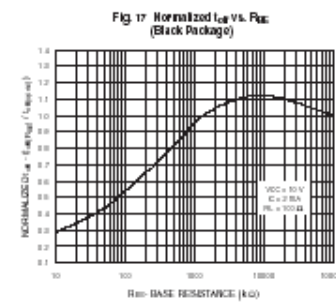
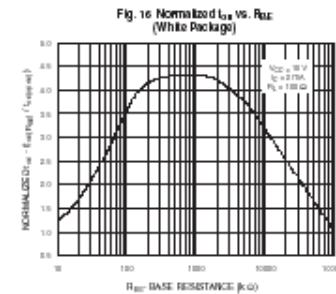
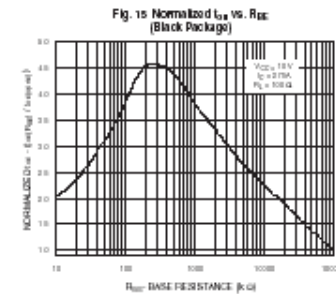
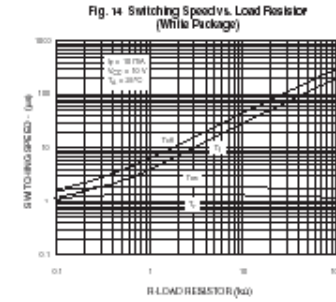
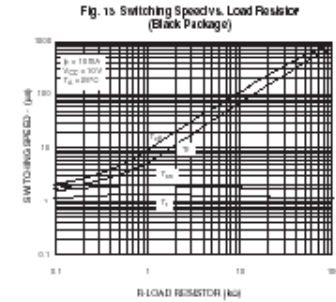




4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5



4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5





4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5

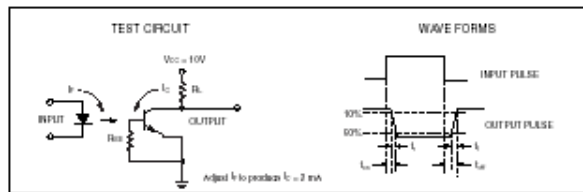
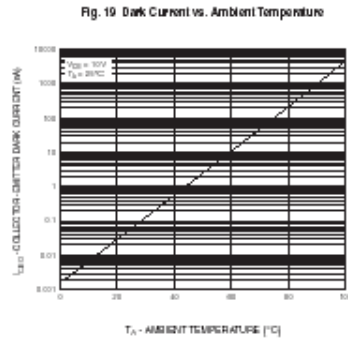
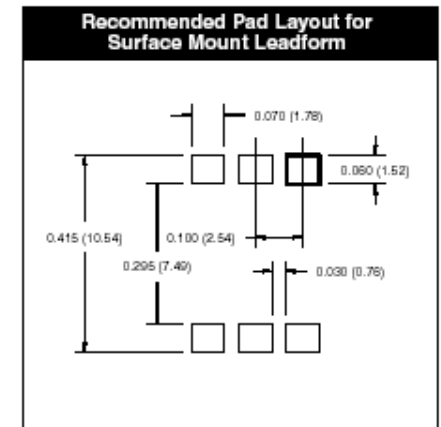
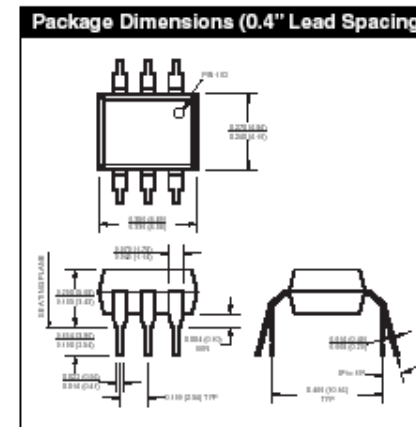
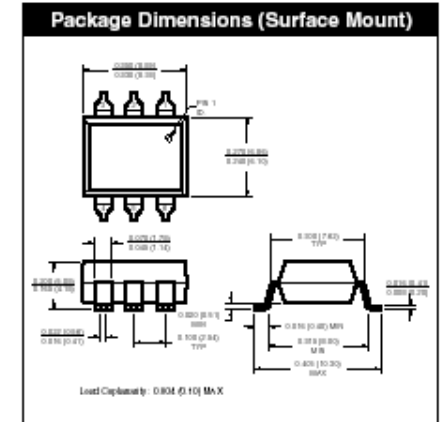
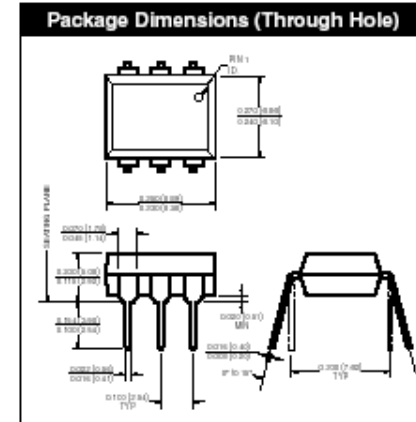


Figure 20. Switching Time Test Circuit and Waveforms



4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5

Black Package (No -M Suffix)

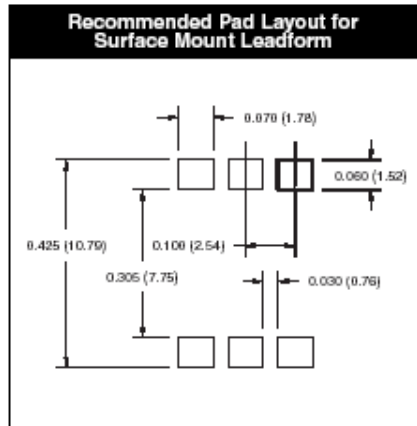
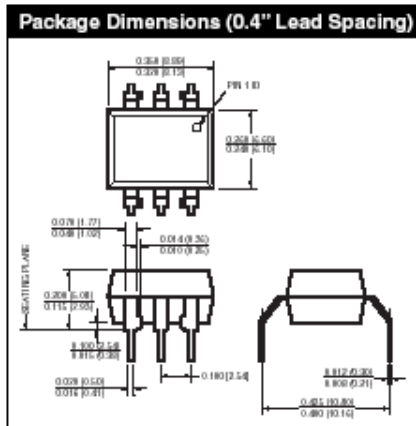
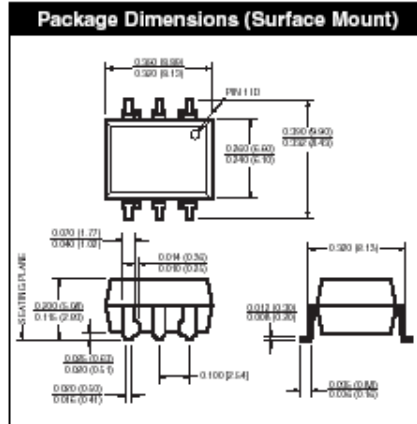
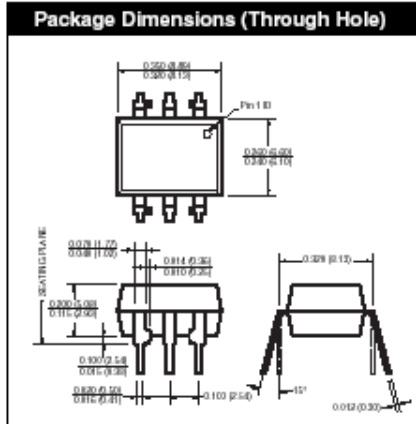


NOTE
All dimensions are in inches (millimeters)



4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5

White Package (-M Suffix)



NOTE
All dimensions are in inches (millimeters)

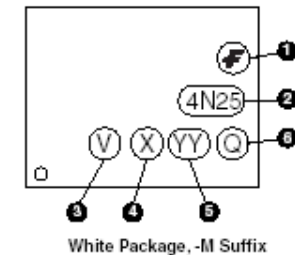
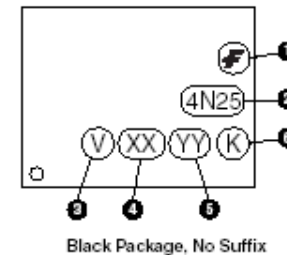


4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5

ORDERING INFORMATION

Order Entry Identifier		
Black Package (No Suffix)	White Package (-M Suffix)	Option
.S	S	Surface Mount Lead Bend
.SD	SR2	Surface Mount; Tape and reel
.W	T	0.4" Lead Spacing
.300	V	VDE 0884
.300W	TV	VDE 0884, 0.4" Lead Spacing
.3S	SV	VDE 0884, Surface Mount
.3SD	SR2V	VDE 0884, Surface Mount, Tape & Reel

MARKING INFORMATION



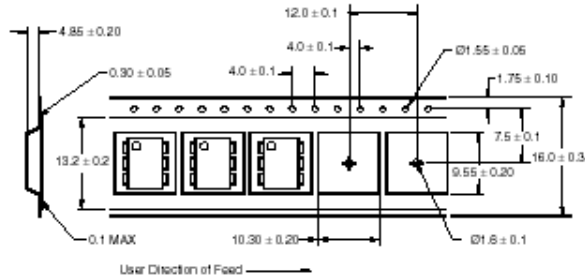
Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option - See order entry table)
4	One or two digit year code • Two digits for black package parts, e.g., '03' • One digit for white package parts, e.g., '3'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

*Note - Parts built in the white package (M suffix) that do not have the 'V' option (see definition 3 above) that are marked with date code '35' or earlier are marked in the portrait format.

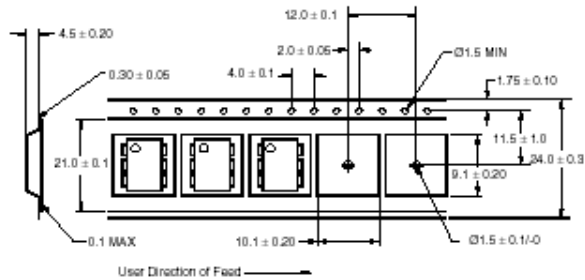


4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5

QT Carrier Tape Specifications (Black Package, No Suffix)

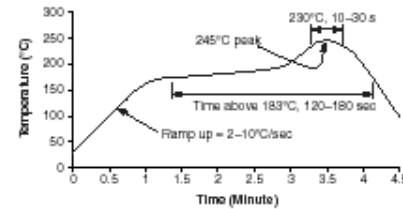


QT Carrier Tape Specifications (White Package, -M Suffix)



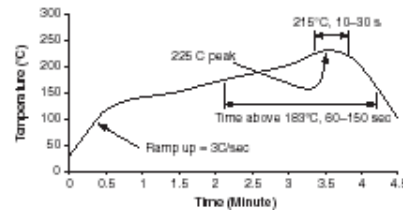
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4N37	H11A1	H11A2	H11A3	H11A4	H11A5

Reflow Profile (White Package, -M Suffix)



- Peak reflow temperature: 245°C (package surface temperature)
- Time of temperature higher than 183°C for 120-180 seconds
- One time soldering reflow is recommended

Reflow Profile (Black Package, No Suffix)



- Peak reflow temperature: 225°C (package surface temperature)
- Time of temperature higher than 183°C for 60-150 seconds
- One time soldering reflow is recommended



4N25	4N26	4N27	4N28	4N35	4N36
4N37	H11A1	H11A2	H11A3	H11A4	H11A5

DISCLAIMER

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LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.



BT-12S

Size : L x W x H (mm)	20 * 9.8 * 11
Featured	DIL Pitch terminal High Reliability-Bifurcated Contact
Contact arrangement	2 Form C
Contact Material	Ag-Pd (Au Clad)
Contact Rating	2A30V DC
Rated Load (Resistive)	1A125V AC
Motor Load	--
Max. Switching Current	2A
Max. Switching Voltage	250V AC ; 220V DC
Max. Switching Capacity	--
Min. Switching Load	--
Sealed type available	*
Life (Min, operation)	300,000 operations (2A30V DC)
Electrical (at rated load)	1,000,000 operations (1A30V DC)
Mechanical (no load)	100,000,000 operations
Breakdown voltage	
Between open contact	1000V AC
Between contact and coil	1500V AC
Surge Strength	1500V
Coil voltage	
DC	3,5,6,9,12,24,48V DC
AC	--
Nominal Consumption	--
Terminal Layout (bottom view)	
Standards	UL, CSA

