April 2011

HMHA281, HMHA2801, HMHA2801A DC Input Half Pitch Mini-Flat Package 4-Pin Optocouplers

Features

- Compact 4-pin package (2.4mm maximum standoff height)
- Half pitch leads for optimum board space savings
- Current Transfer Ratio: HMHA2801: 80–600% HMHA2801A: 80–160% HMHA281: 50–600%
- Available in tape and reel quantities of 2500
- CSA (File #1201524), UL (File #E90700) and VDE (File #136480) certified

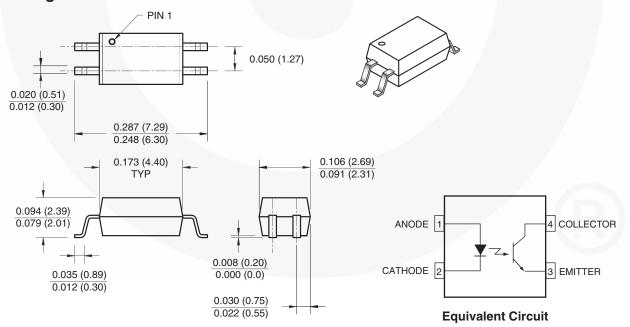
Applications

- Digital logic inputs
- Microprocessor inputs
- Power supply monitor
- Twisted pair line receiver
- Telephone line receiver

Description

The HMHA281, HMHA2801 and HMHA2801A devices consist of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a compact 4-pin miniflat package. The lead pitch is 1.27mm.

Package Dimensions



Note:

All dimensions are in inches (millimeters)

Absolute Maximum Ratings ($T_A = 25^{\circ}C$ unless otherwise specified) Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Value	Units
TOTAL PACKAC	GE .		
T _{STG}	Storage Temperature	-55 to +125	°C
T _{OPR}	Operating Temperature	-55 to +100	°C
EMITTER			
I _{F (avg)}	Continuous Forward Current	50	mA
I _{F (pk)}	Peak Forward Current (1µs pulse, 300pps.)	1	Α
V _R	Reverse Input Voltage	6	V
P _D	Power Dissipation	60	mW
	Derate linearly (above 25°C)	0.6	mW/°C
DETECTOR			
	Continuous Collector Current	50	mA
P _D	Power Dissipation	150	mW
	Derate linearly (above 25°C)	1.5	mW/°C
V _{CEO}	Collector-Emitter Voltage	80	V
V _{ECO}	Emitter-Collector Voltage	7	V

Electrical Characteristics $(T_A = 25^{\circ}C)$

Symbol	Parameter	Test Conditions	Device	Min.	Тур.*	Max.	Unit
NDIVIDUA	AL COMPONENT CHARACT	ERISTICS					
Emitter							
V _F	Forward Voltage	I _F = 10mA	All	1.0		1.3	V
I _R	Reverse Current	V _R = 5V	All			5	μΑ
Detector					ļ.		
BV _{CEO}	Breakdown Voltage Collector to Emitter	$I_C = 0.5 \text{mA}, I_F = 0$	All	80			V
BV _{ECO}	Emitter to Collector	$I_E = 100 \mu A, I_F = 0$	All	7			
I _{CEO}	Collector Dark Current	V _{CE} = 80V, I _F = 0	All			100	nA
C _{CE}	Capacitance	V _{CE} = 0V, f = 1MHz	All		10		pF
TRANSFE	R CHARACTERISTICS				•		-
CTR	DC Current Transfer Ratio	$I_F = 5mA$, $V_{CE} = 5V$	HMHA281	50		600	%
		HMHA2801	80		600		
			HMHA2801A	80		160	
V _{CE (SAT)}	Saturation Voltage	$I_F = 8mA, I_C = 2.4mA$	HMHA281			0.4	V
		I _F = 10mA, I _C = 2mA	HMHA2801			0.3	
			HMHA2801A			0.3	
t _r	Rise Time (Non-Saturated)	$I_C = 2mA$, $V_{CE} = 5V$, $R_L = 100\Omega$	All		3		μs
t _f	Fall Time (Non-Saturated)	$I_C = 2mA$, $V_{CE} = 5V$, $R_L = 100\Omega$	All		3		
SOLATIO	N CHARACTERISTICS				•		
V _{ISO}	Steady State Isolation Voltage	1 Minute	All	3750			VRMS

Typical Performance Characteristics

Fig. 1 Forward Current vs. Forward Voltage

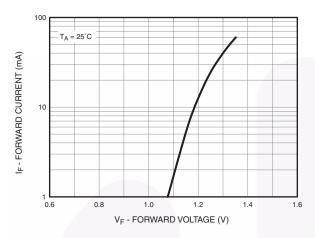


Fig. 2 Collector Current vs. Forward Current

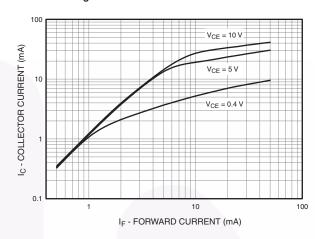


Fig. 3 Current Transfer Ratio vs. Forward Current

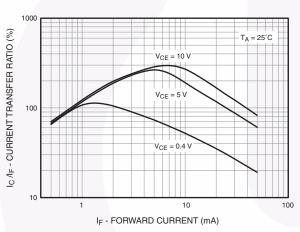


Fig. 4 Normalized CTR vs. Temperature

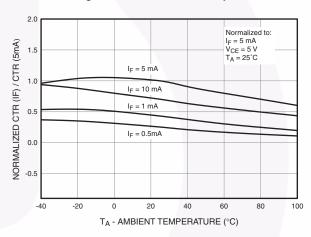
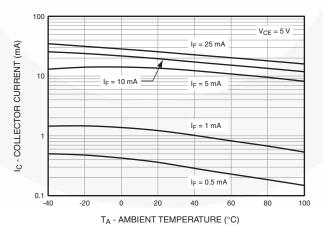


Fig. 5 Collector Current vs. Temperature



Typical Performance Characteristics (Continued)

Fig. 6 Collector Current vs. Collector-Emitter Voltage

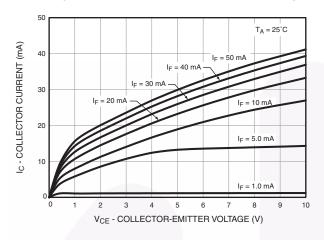


Fig. 7 Collector Current vs. Collector-Emitter Voltage

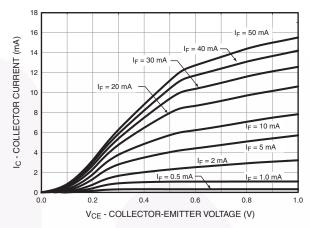


Fig. 8 Collector Dark Current vs. Temperature



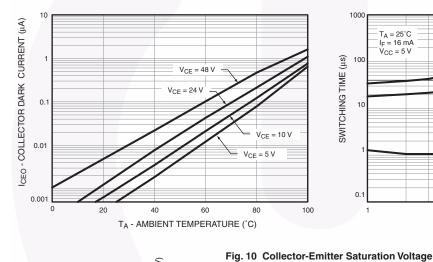
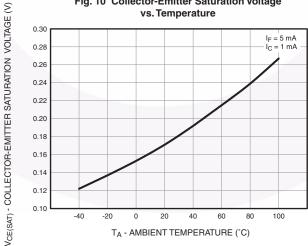


Fig. 9 Switching Time vs. Load Resistance



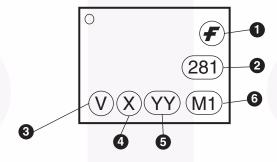
vs. Temperature 0.30 0.28 0.26



Ordering Information

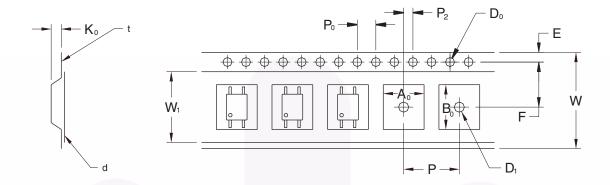
Option	Description	
V	VDE Approved	
R2	Tape and Reel (2500 units)	
R2V Tape and Reel (2500 units) and VDE Approved		

Marking Information

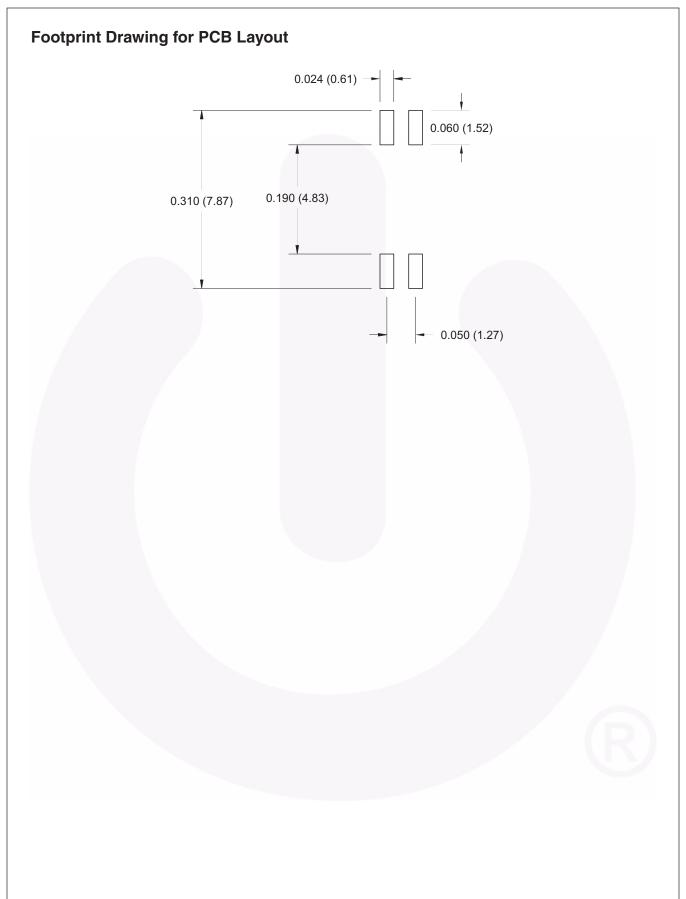


Definiti	ons
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	One digit year code
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

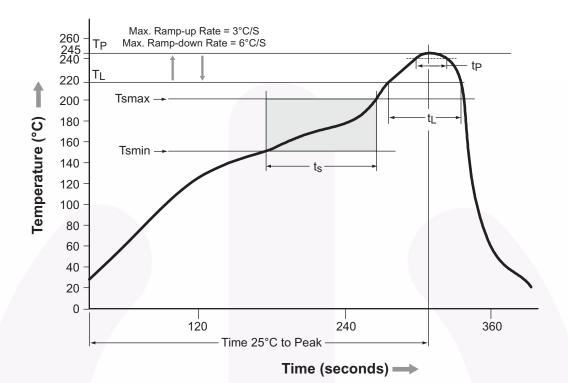
Tape and Reel Dimensions



		1.27 Pitch
Description	Symbol	Dimensions (mm)
Tape Width	W	12.00 +0.30/-0.10
Tape Thickness	t	0.30 ±0.05
Sprocket Hole Pitch	P ₀	4.00 ±0.10
Sprocket Hole Diameter	D ₀	1.50 +0.10/-0.0
Sprocket Hole Location	Е	1.75 ±0.10
Pocket Location	F	5.50 ±0.10
	P ₂	2.00 ±0.10
Pocket Pitch	Р	8.00 ±0.10
Pocket Dimension	A ₀	2.80 ±0.10
	B ₀	7.30 ±0.10
	K ₀	2.30 ±0.10
Pocket Hole Diameter	D ₁	1.50 Min.
Cover Tape Width	W ₁	9.20
Cover Tape Thickness	d	0.065 ±0.010
Max. Component Rotation or Tilt		10° Max.
Devices Per Reel		2500
Reel Diameter		330mm (13")



Reflow Profile



Profile Freature	Pb-Free Assembly Profile		
Temperature Min. (Tsmin)	150°C		
Temperature Max. (Tsmax)	200°C		
Time (t _S) from (Tsmin to Tsmax)	60-120 seconds		
Ramp-up Rate (t _L to t _P)	3°C/second max.		
Liquidous Temperature (T _L)	217°C		
Time (t _L) Maintained Above (T _L)	60-150 seconds		
Peak Body Package Temperature	245°C +0°C / -5°C		
Time (t _P) within 5°C of 260°C	30 seconds		
Ramp-down Rate (T _P to T _L)	6°C/second max.		
Time 25°C to Peak Temperature	8 minutes max.		





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Definition of Terms

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Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
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Rev. 154