FAIRCHILD SEMICONDUCTOR®

February 2011

FOD3182
3A Output Current, High Speed MOSFET Gate Driver Optocoupler

Features

- High noise immunity characterized by 50kV/μs (Typ.) common mode rejection @ V_{CM} = 2,000V
- Guaranteed operating temperature range of -40°C to +100°C
- 3A peak output current
- Fast switching speed
  - 210ns max. propagation delay
  - 65ns max pulse width distortion
- Fast output rise/fall time
  - Offers lower dynamic power dissipation
- 250kHz maximum switching speed
- Wide V_{DD} operating range: 10V to 30V
- Use of P-Channel MOSFETs at output stage enables output voltage swing close to the supply rail (rail-to-rail output)
- 5000Vrms, 1 minute isolation
- Under voltage lockout protection (UVLO) with hysteresis – optimized for driving MOSFETs
- Minimum creepage distance of 8.0mm
- Minimum clearance distance of 10mm to 16mm (option TV or TSV)
- Minimum insulation thickness of 0.5mm
- UL and VDE*
- 1,414 peak working insulation voltage (V_{IORM})

*Requires 'V' ordering option

Applications

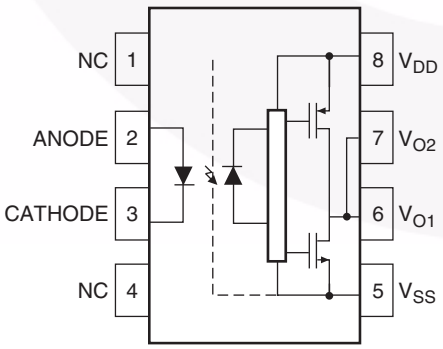
- Plasma Display Panel
- High performance DC/DC convertor
- High performance switch mode power supply
- High performance uninterruptible power supply
- Isolated Power MOSFET gate drive

Description

The FOD3182 is a 3A Output Current, High Speed MOSFET Gate Drive Optocoupler. It consists of a aluminium gallium arsenide (AlGaAs) light emitting diode optically coupled to a CMOS detector with PMOS and NMOS output power transistors integrated circuit power stage. It is ideally suited for high frequency driving of power MOSFETS used in Plasma Display Panels (PDPs), motor control inverter applications and high performance DC/DC converters.

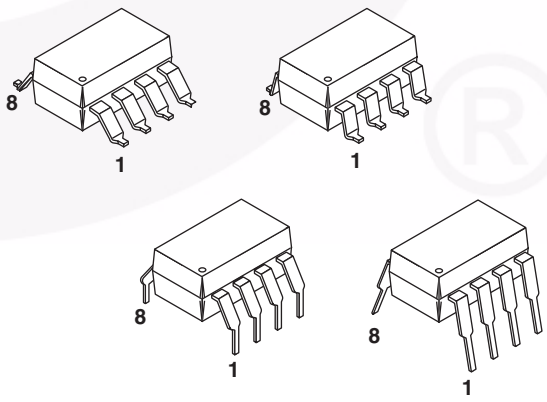
The device is packaged in an 8-pin dual in-line housing compatible with 260°C reflow processes for lead free solder compliance.

Functional Block Diagram



Note:
A 0.1μF bypass capacitor must be connected between pins 5 and 8.

Package Outlines



©2010 Fairchild Semiconductor Corporation

Truth Table

LED	$V_{DD} - V_{SS}$ "Positive Going" (Turn-on)	$V_{DD} - V_{SS}$ "Negative Going" (Turn-off)	V_O
Off	0V to 30V	0V to 30V	Low
On	0V to 7.4V	0V to 7V	Low
On	7.4V to 9V	7V to 8.5V	Transition
On	9V to 30V	8.5V to 30V	High

Pin Definitions

Pin #	Name	Description
1	NC	Not Connected
2	Anode	LED Anode
3	Cathode	LED Cathode
4	NC	Not Connected
5	V_{SS}	Negative Supply Voltage
6	V_{O2}	Output Voltage 2 (internally connected to V_{O1})
7	V_{O1}	Output Voltage 1
8	V_{DD}	Positive Supply Voltage

Safety and Insulation Ratings

As per DIN EN/IEC 60747-5-2. This optocoupler is suitable for “safe electrical insulation” only within the safety limit data. Compliance with the safety ratings shall be ensured by means of protective circuits.

Symbol	Parameter	Min.	Typ.	Max.	Unit
	Installation Classifications per DIN VDE 0110/1.89 Table 1				
	For Rated Mains Voltage < 150Vrms		I–IV		
	For Rated Mains Voltage < 300Vrms		I–IV		
	For Rated Mains Voltage < 450Vrms		I–III		
	For Rated Mains Voltage < 600Vrms		I–III		
	For Rated Mains Voltage < 1000Vrms (Option T, TS)		I–III		
	Climatic Classification		40/100/21		
	Pollution Degree (DIN VDE 0110/1.89)		2		
CTI	Comparative Tracking Index	175			
V_{PR}	Input to Output Test Voltage, Method b, V_{IORM} x 1.875 = V_{PR}, 100% Production Test with tm = 1 sec., Partial Discharge < 5pC	2651			
	Input to Output Test Voltage, Method a, V_{IORM} x 1.5 = V_{PR}, Type and Sample Test with tm = 60 sec.,Partial Discharge < 5 pC	2121			
V_{IORM}	Max Working Insulation Voltage	1,414			V_{peak}
V_{IOTM}	Highest Allowable Over Voltage	6000			V_{peak}
	External Creepage	8			mm
	External Clearance	7.4			mm
	External Clearance (for Option T or TS - 0.4” Lead Spacing)	10.16			mm
	Insulation Thickness	0.5			mm
	Safety Limit Values – Maximum Values Allowed in the Event of a Failure				
T_{Case}	Case Temperature	150			°C
$I_{S,INPUT}$	Input Current	25			mA
$P_{S,OUTPUT}$	Output Power (Duty Factor ≤ 2.7%)	250			mW
R_{IO}	Insulation Resistance at T_S, V_{IO} = 500V	10^9			Ω

©2010 Fairchild Semiconductor Corporation

Absolute Maximum Ratings (T_A = 25°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
T_{STG}	Storage Temperature	-40 to +125	°C
T_{OPR}	Operating Temperature	-40 to +100	°C
T_J	Junction Temperature	-40 to +125	°C
T_{SOL}	Lead Solder Temperature – Wave solder (Refer to Reflow Temperature Profile, pg. 22)	260 for 10 sec.	°C
$I_{F(AVG)}$	Average Input Current[1]	25	mA
$I_{F(tr, tf)}$	LED Current Minimum Rate of Rise/Fall	250	ns
V_R	Reverse Input Voltage	5	V
$I_{OH(PEAK)}$	“High” Peak Output Current[2]	3	A
$I_{OL(PEAK)}$	“Low” Peak Output Current[2]	3	A
$V_{DD} – V_{SS}$	Supply Voltage	-0.5 to 35	V
$V_{O(PEAK)}$	Output Voltage	0 to V_{DD}	V
P_O	Output Power Dissipation[4]	250	mW
P_D	Total Power Dissipation[5]	295	mW

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to absolute maximum ratings.

Symbol	Parameter	Value	Units
$V_{DD} – V_{SS}$	Power Supply	10 to 30	V
$I_{F(ON)}$	Input Current (ON)	10 to 16	mA
$V_{F(OFF)}$	Input Voltage (OFF)	-3.0 to 0.8	V

©2010 Fairchild Semiconductor Corporation

Electrical-Optical Characteristics (DC)

Apply over all recommended conditions, typical value is measured at V_{DD} = 30V, V_{SS} = 0V, T_A = 25°C, unless otherwise specified.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{OH}	High Level Output Current	V_{OH} = (V_{DD} – V_{SS} – 1V)	0.5	0.9		A
		V_{OH} = (V_{DD} – V_{SS} – 6V)	2.5			
I_{OL}	Low Level Output Current	V_{OL} = (V_{DD} – V_{SS} + 1V)	0.5	1		A
		V_{OL} = (V_{DD} – V_{SS} + 6V)	2.5			
V_{OH}	High Level Output Voltage[5][6]	I_O = -100mA	V_{DD} – 0.5			V
V_{OL}	Low Level Output Voltage[5][6]	I_O = 100mA			V_{SS} + 0.5	V
I_{DDH}	High Level Supply Current	Output Open, I_F = 10 to 16mA		2.6	4.0	mA
I_{DDL}	Low Level Supply Current	Output Open, V_F = -3.0 to 0.8V		2.5	4.0	mA
I_{FLH}	Threshold Input Current Low to High	I_O = 0mA, V_O > 5V		3.0	7.5	mA
V_{FHL}	Threshold Input Voltage High to Low	I_O = 0mA, V_O < 5V	0.8			V
V_F	Input Forward Voltage	I_F = 10mA	1.1	1.43	1.8	V
$\Delta V_F / T_A$	Temperature Coefficient of Forward Voltage	I_F = 10mA		-1.5		mV/°C
V_{UVLO+}	UVLO Threshold	V_O > 5V, I_F = 10mA	7	8.3	9	V
$V_{UVLO–}$		V_O < 5V, I_F = 10mA	6.5	7.7	8.5	V
$UVLO_{HYST}$	UVLO Hysteresis			0.6		V
BV_R	Input Reverse Breakdown Voltage	I_R = 10µA	5			V
C_{IN}	Input Capacitance	f = 1MHz, V_F = 0V		25		pF

Switching Characteristics

Apply over all recommended conditions, typical value is measured at V_{DD} = 30V, V_{SS} = 0V, T_A = 25°C, unless otherwise specified.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_{PLH}	Propagation Delay Time to High Output Level[7]	I_F = 10mA, R_g = 10Ω, f = 250kHz, Duty Cycle = 50%, C_g = 10nF	50	120	210	ns
t_{PHL}	Propagation Delay Time to Low Output Level[7]		50	145	210	ns
P_{WD}	Pulse Width Distortion[8]			35	65	ns
P_{DD} ($t_{PHL} - t_{PLH}$)	Propagation Delay Difference Between Any Two Parts[9]		-90		90	ns
t_r	Rise Time	C_L = 10nF, R_g = 10Ω		38		ns
t_f	Fall Time			24		ns
$t_{UVLO\ ON}$	UVLO Turn On Delay			2.0		µs
$t_{UVLO\ OFF}$	UVLO Turn Off Delay			0.3		µs
$\lvert CM_H \rvert$	Output High Level Common Mode Transient Immunity[10] [11]	T_A = +25°C, I_f = 7mA to 16mA, V_{CM} = 2kV, V_{DD} = 30V	35	50		kV/µs
$\lvert CM_L \rvert$	Output Low Level Common Mode Transient Immunity[10] [12]	T_A = +25°C, V_f = 0V, V_{CM} = 2kV, V_{DD} = 30V	35	50		kV/µs

Isolation Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.*	Max.	Unit
V_{ISO}	Withstand Isolation Voltage[13] [14]	T_A = 25°C, R.H. < 50%, t = 1min., $I_{I-O} \le$ 10µA	5000			V_{rms}
R_{I-O}	Resistance (input to output)[14]	V_{I-O} = 500V		10^{11}		Ω
C_{I-O}	Capacitance (input to output)	Freq. = 1MHz		1		pF

*Typical values at T_A = 25°C

Notes:

1. Derate linearly above +79°C free air temperature at a rate of 0.37mA/°C.
2. Maximum pulse width = 10μs, maximum duty cycle = 11%.
3 Derate linearly above +79°C, free air temperature at the rate of 5.73mW/°C.
4. No derating required across operating temperature range.
5. In this test, V_{OH} is measured with a dc load current of 100mA. When driving capacitive load V_{OH} will approach V_{DD} as I_{OH} approaches zero amps.
6. Maximum pulse width = 1ms, maximum duty cycle = 20%.
7. t_{PHL} propagation delay is measured from the 50% level on the falling edge of the input pulse to the 50% level of the falling edge of the V_O signal. t_{PLH} propagation delay is measured from the 50% level on the rising edge of the input pulse to the 50% level of the rising edge of the V_O signal.
8. PWD is defined as $| t_{PHL} - t_{PLH} |$ for any given device.
8. The difference between t_{PHL} and t_{PLH} between any two FOD3182 parts under same operating conditions, with equal loads.
10. Pin 1 and 4 need to be connected to LED common.
11. Common mode transient immunity in the high state is the maximum tolerable dV_{CM}/dt of the common mode pulse V_{CM} to assure that the output will remain in the high state (i.e. $V_O > 15V$).
12. Common mode transient immunity in a low state is the maximum tolerable dV_{CM}/dt of the common mode pulse, V_{CM}, to assure that the output will remain in a low state (i.e. $V_O < 1.0V$).
13. In accordance with UL 1577, each optocoupler is proof tested by applying an insulation test voltage > 6000Vrms, 60Hz for 1 second (leakage detection current limit $I_{I-O} < 10\mu A$).
14. Device considered a two-terminal device: pins on input side shorted together and pins on output side shorted together.

©2010 Fairchild Semiconductor Corporation

Typical Performance Curves

Fig. 1 Output High Voltage Drop vs. Output High Current

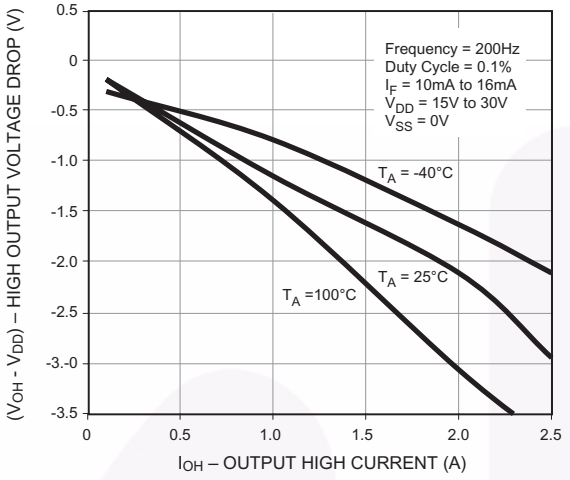


Fig. 2 Output High Voltage Drop vs. Ambient Temperature

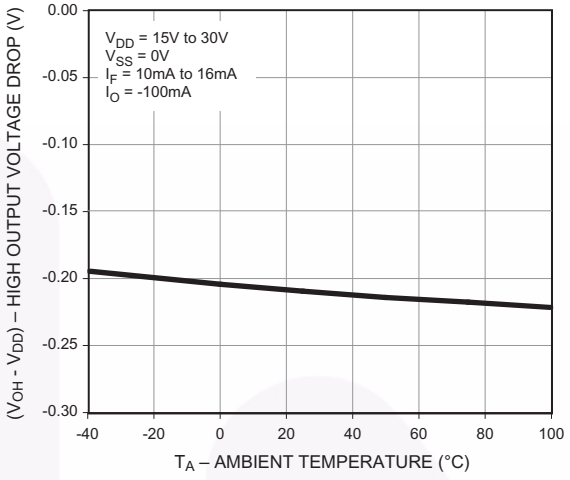


Fig. 3 Output High Current vs. Ambient Temperature

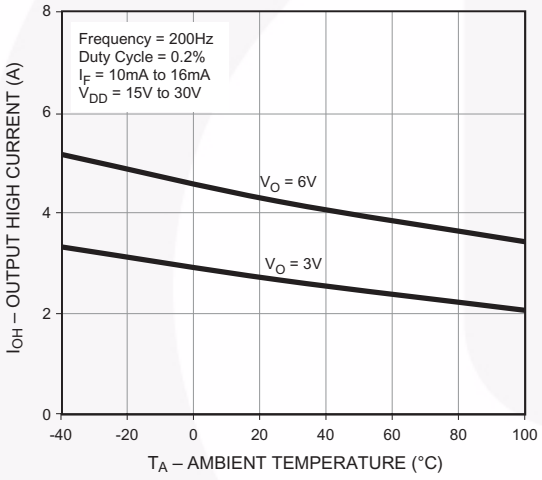


Fig. 4 Output High Current vs. Ambient Temperature

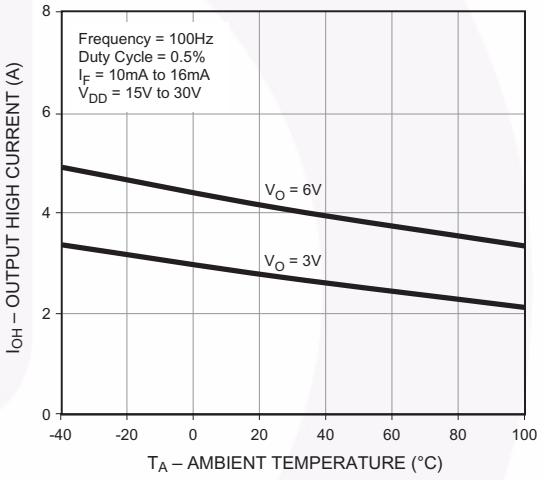


Fig. 5 Output Low Voltage vs. Output Low Current

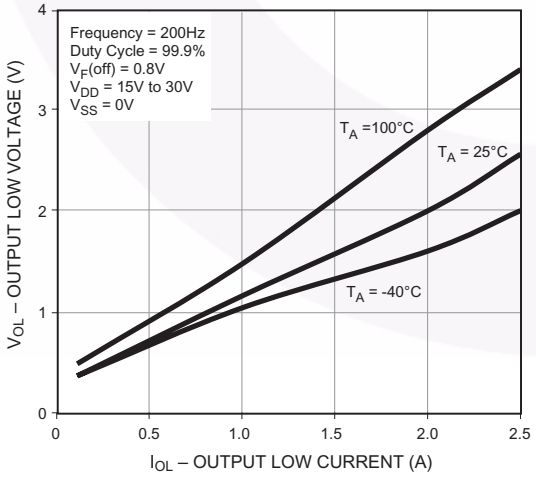
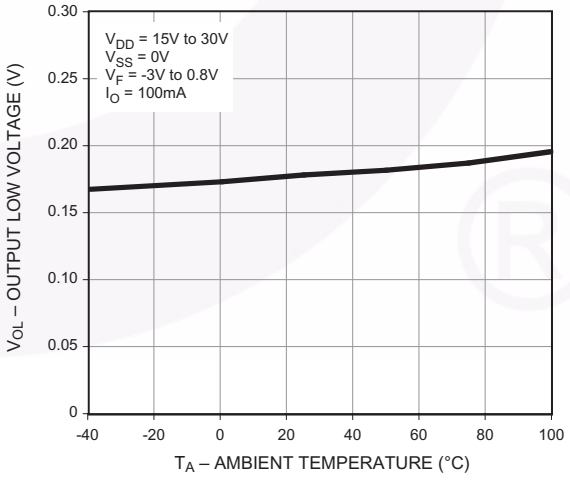


Fig. 6 Output Low Voltage vs. Ambient Temperature



Typical Performance Curves (Continued)

Fig. 7 Output Low Current vs. Ambient Temperature

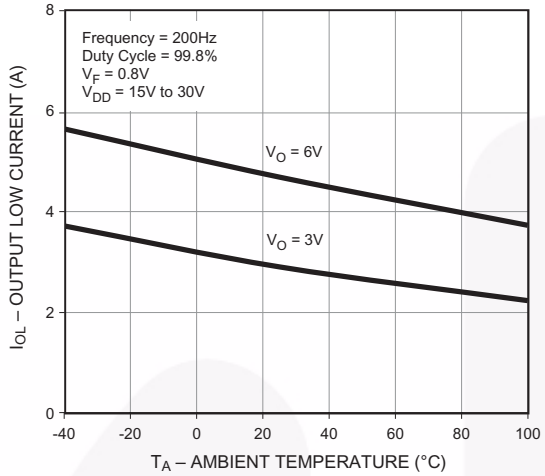


Fig. 8 Output Low Current vs. Ambient Temperature

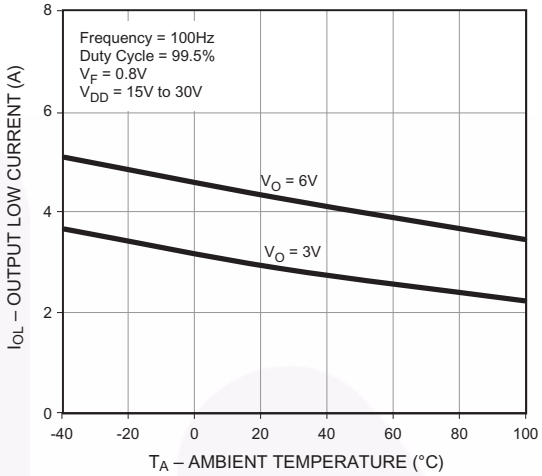


Fig. 9 Supply Current vs. Ambient Temperature

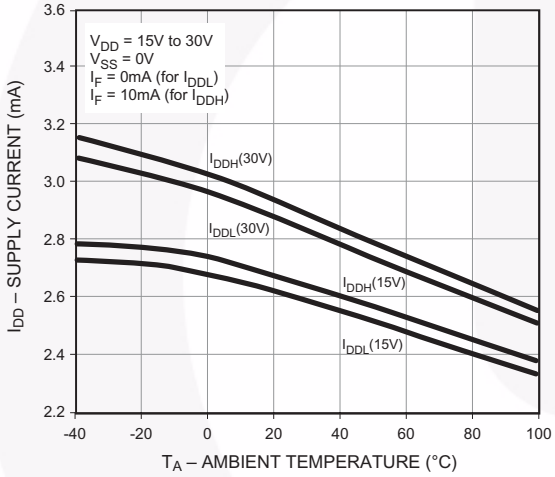


Fig. 10 Supply Current vs. Supply Voltage

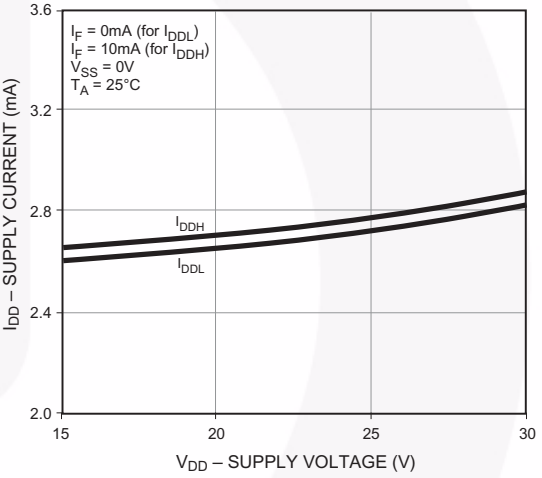


Fig. 11 Low-to-High Input Current Threshold vs. Ambient Temperature

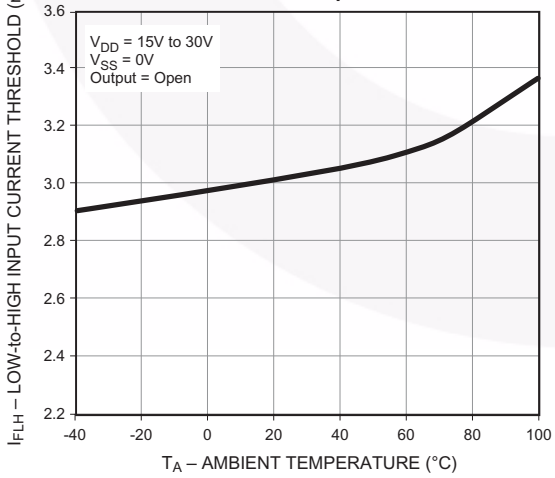
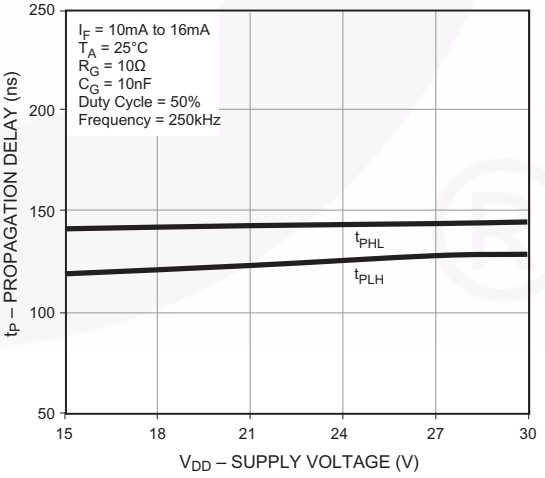


Fig. 12 Propagation Delay vs. Supply Voltage



Typical Performance Curves (Continued)

Fig. 13 Propagation Delay vs. LED Forward Current

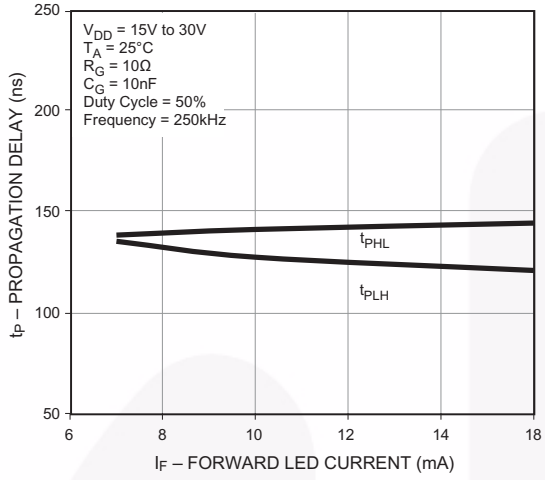


Fig. 14 Propagation Delay vs. Ambient Temperature

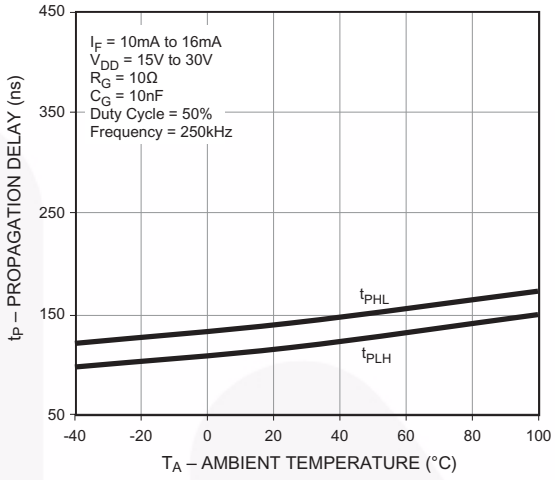


Fig. 15 Propagation Delay vs. Series Load Resistance

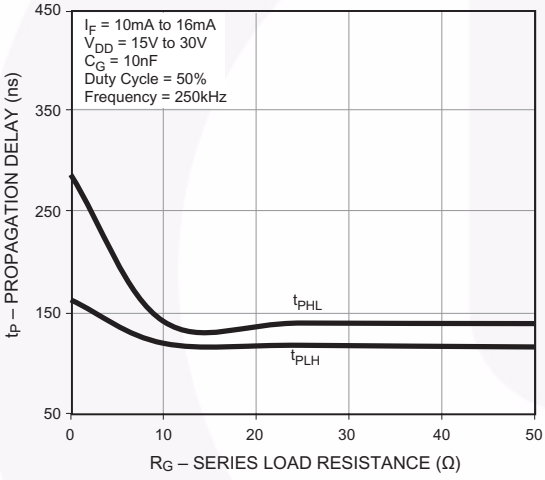


Fig. 16 Propagation Delay vs. Series Load Capacitance

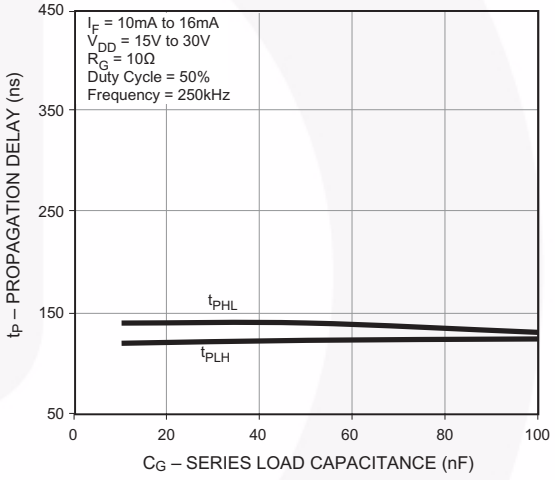


Fig. 17 Transfer Characteristics

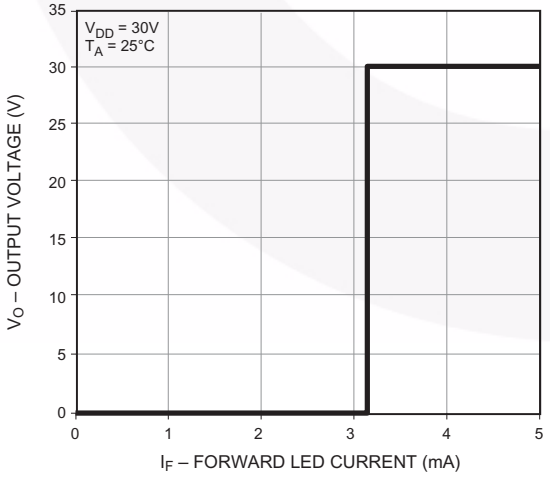
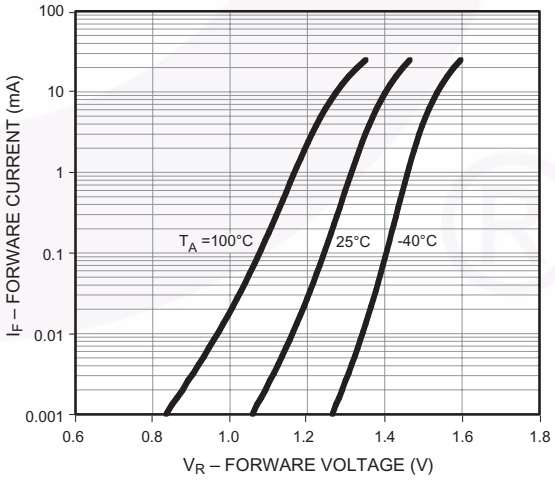


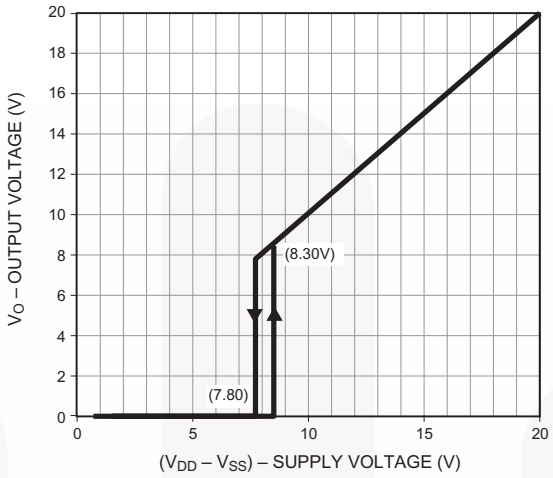
Fig. 18 Input Forward Current vs. Forward Voltage



©2010 Fairchild Semiconductor Corporation

Typical Performance Curves (Continued)

Fig. 19 Under Voltage Lockout



Test Circuit

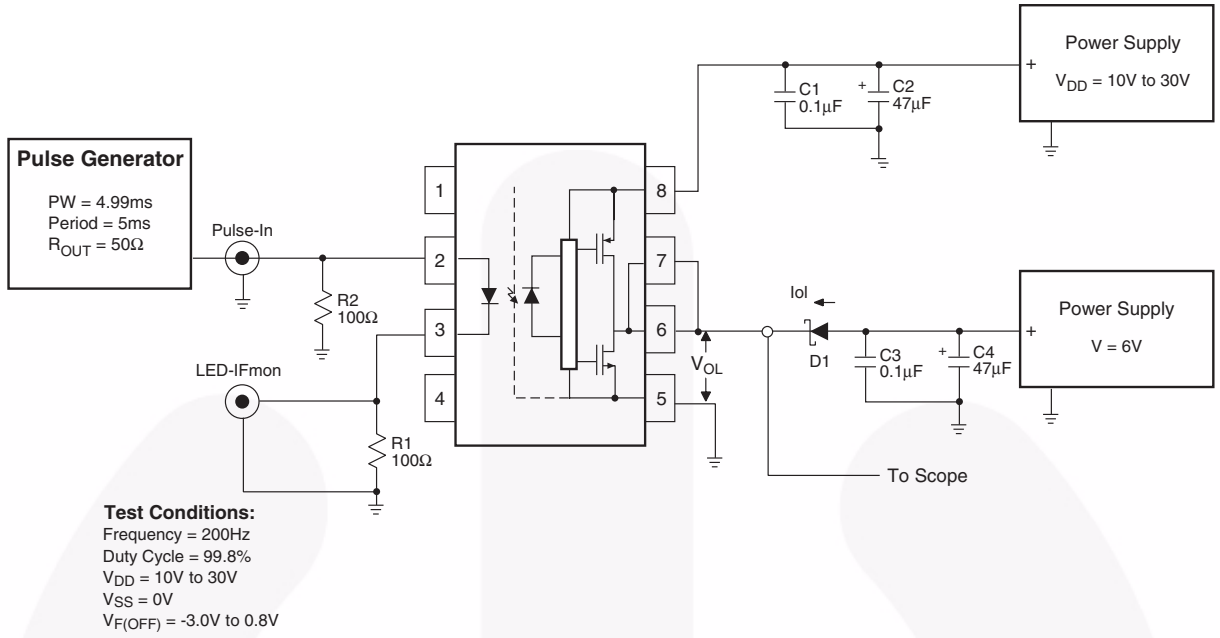


Figure 20. I_{OL} Test Circuit

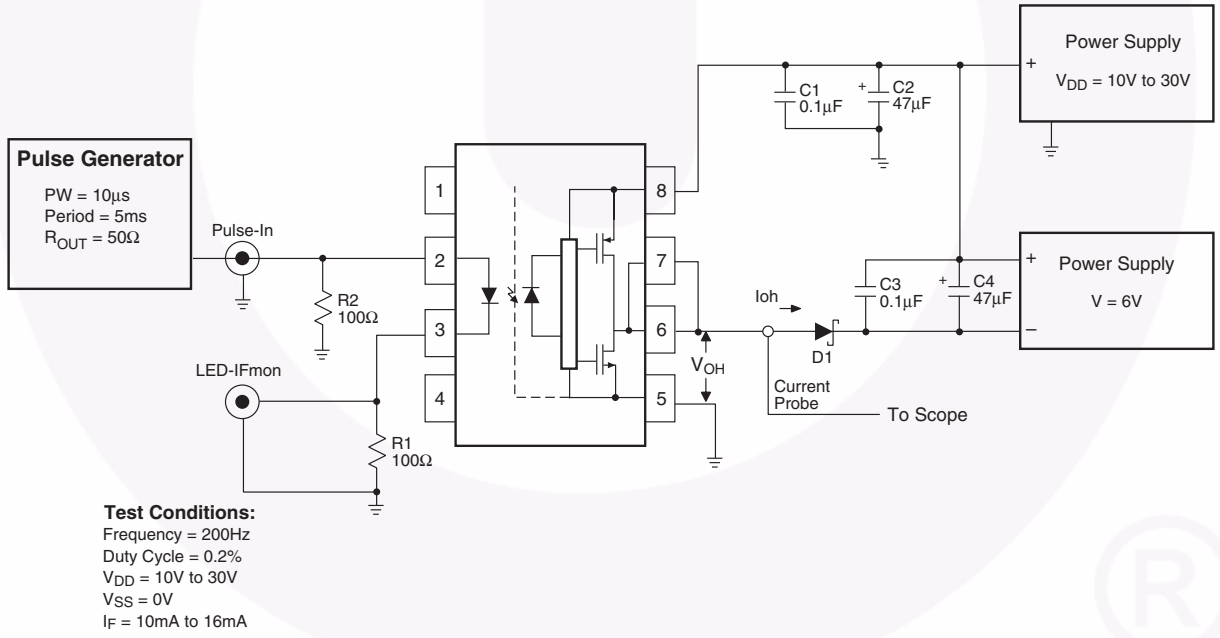


Figure 21. I_{OH} Test Circuit

Test Circuit (Continued)

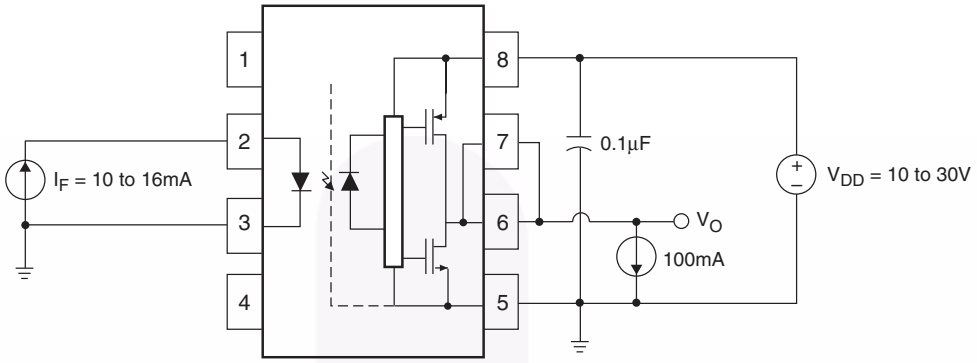


Figure 22. V_{OH} Test Circuit

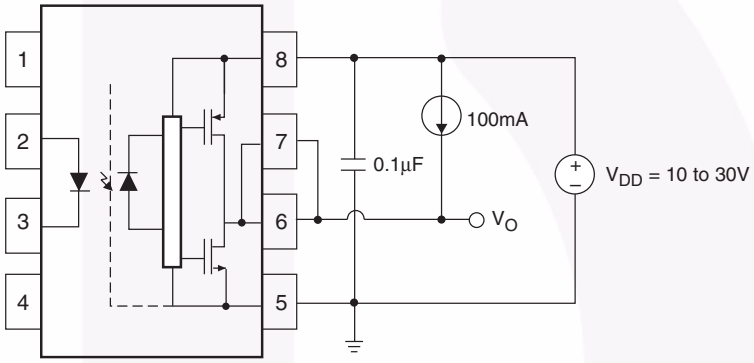


Figure 23. V_{OL} Test Circuit

Test Circuit (Continued)

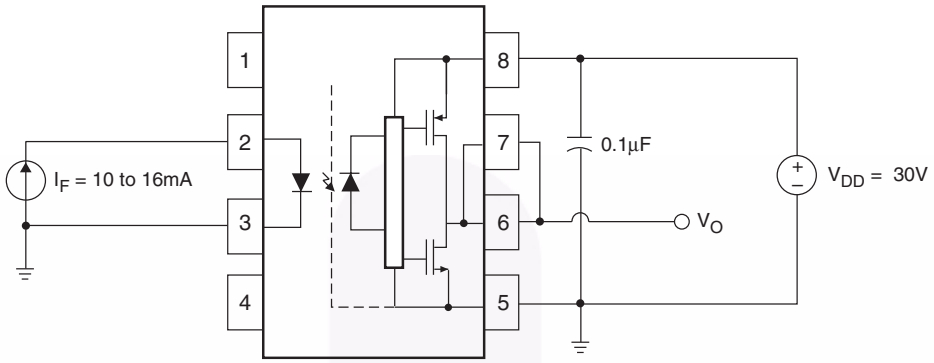


Figure 24. I_{DDH} Test Circuit

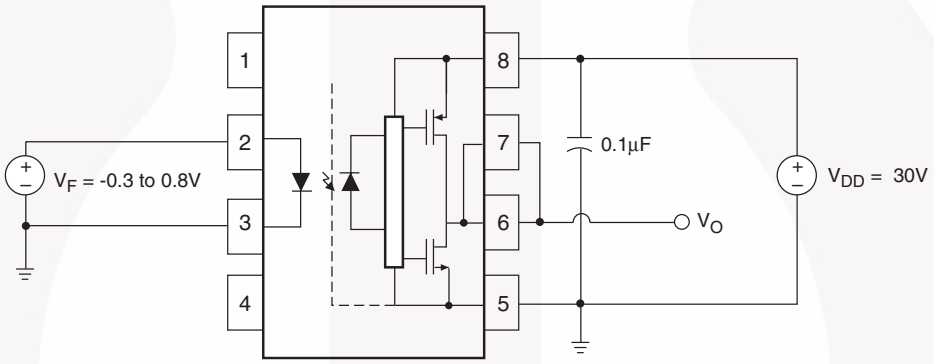


Figure 25. I_{DDL} Test Circuit

Test Circuit (Continued)

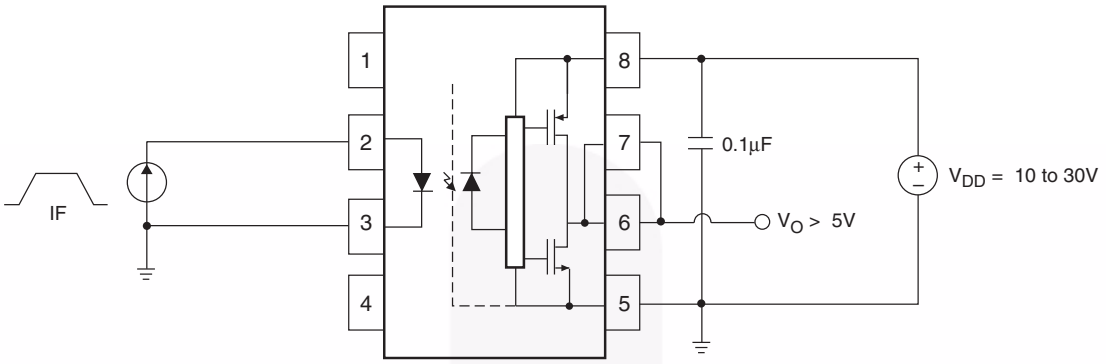


Figure 26. I_{FLH} Test Circuit

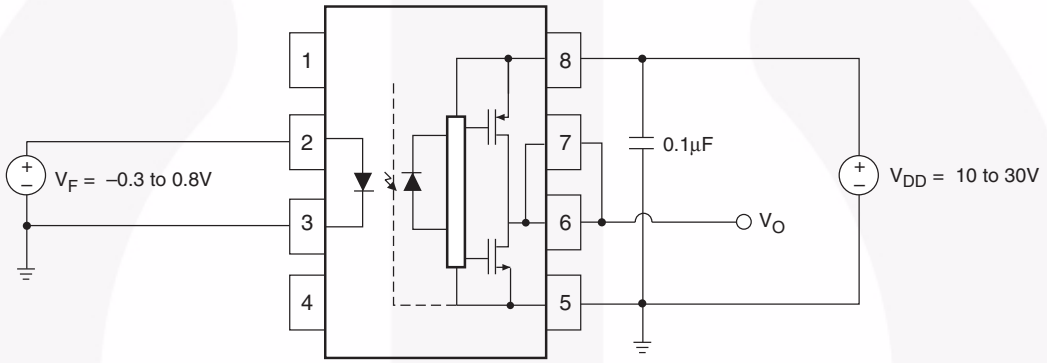


Figure 27. V_{FHL} Test Circuit

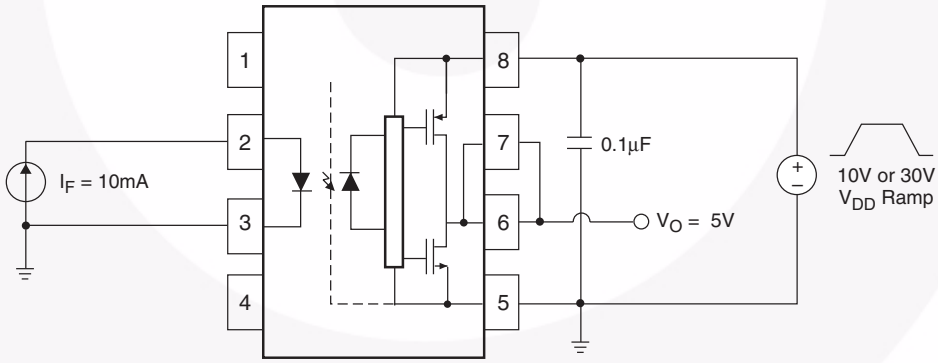


Figure 28. UVLO Test Circuit

Test Circuit (Continued)

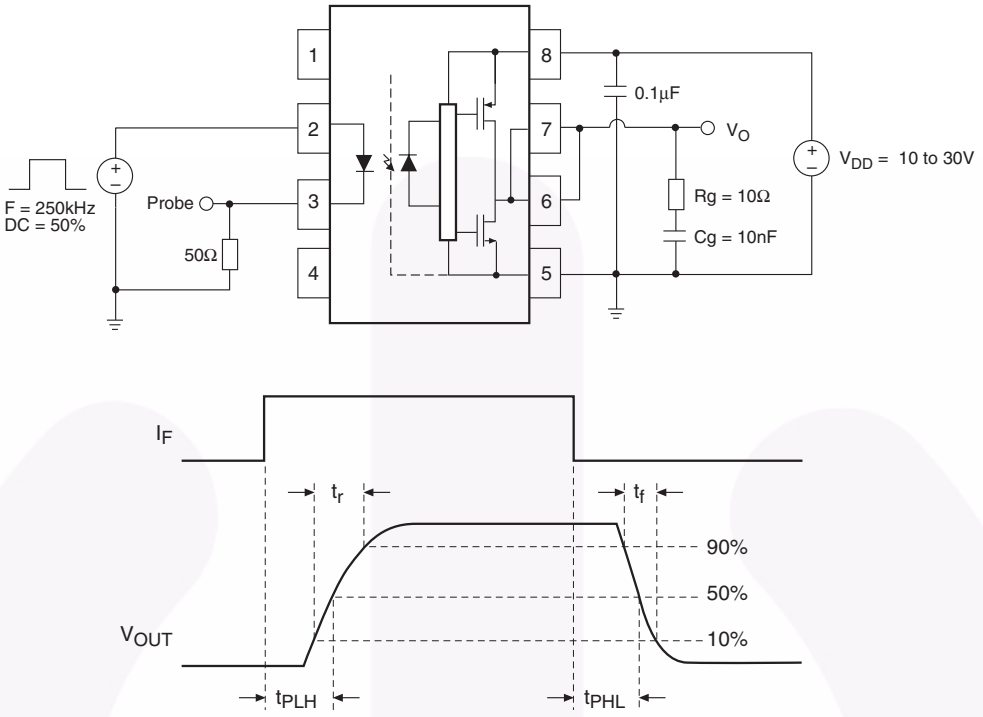


Figure 29. t_{PHL}, t_{PLH}, t_r and t_f Test Circuit and Waveforms

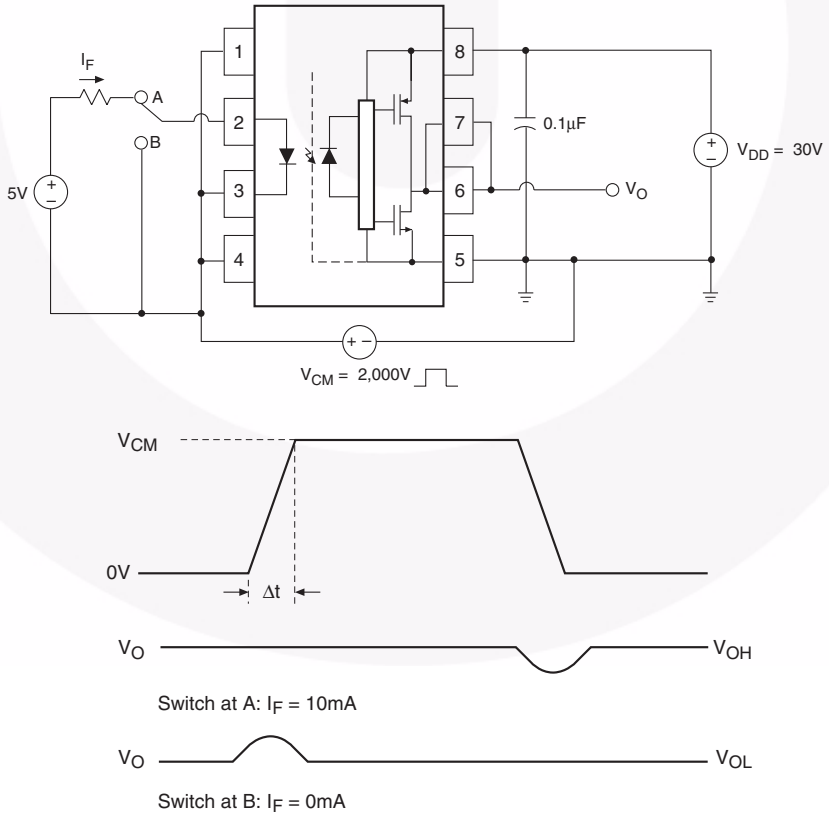
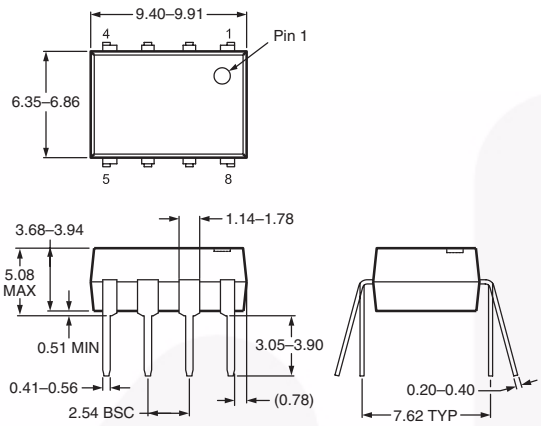


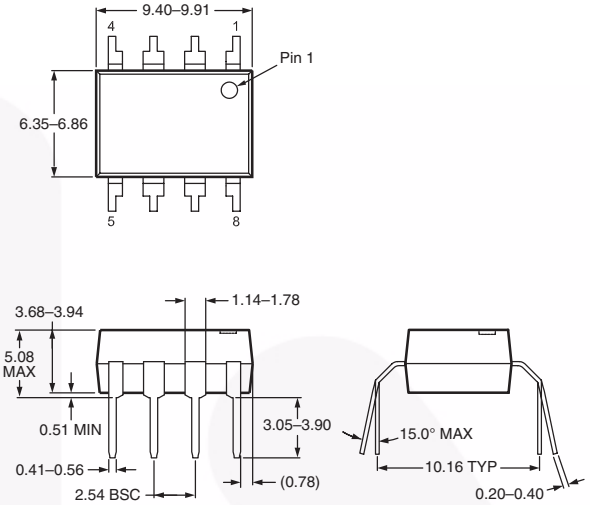
Figure 30. CMR Test Circuit and Waveforms

Package Dimensions

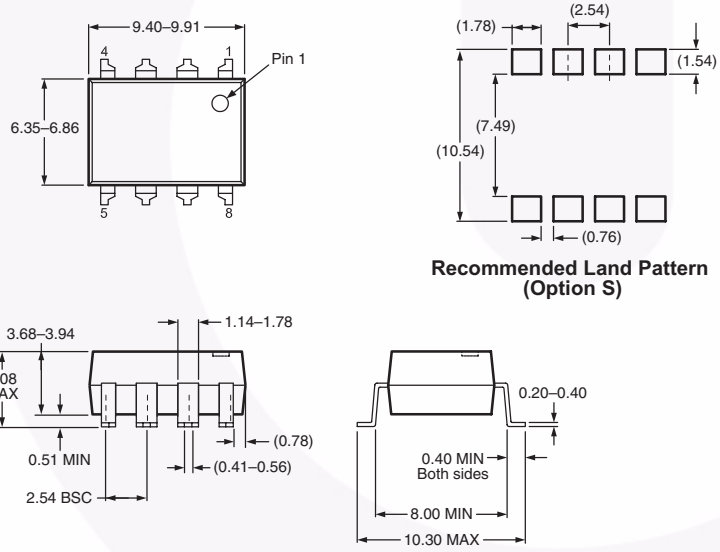
Through Hole



0.4" Lead Spacing (Option T)



Surface Mount – 0.3" Lead Spacing (Option S)



Recommended Land Pattern (Option S)

Note:

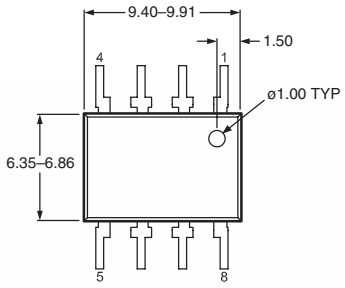
1. All dimensions are in millimeters.
2. Dimensions are exclusive of burrs, mold fash, and tie bar extrusion.

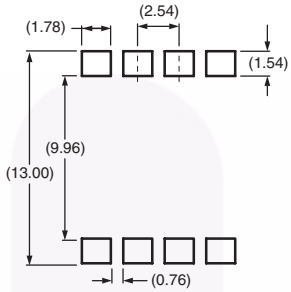
Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:
http://www.fairchildsemi.com/packaging/

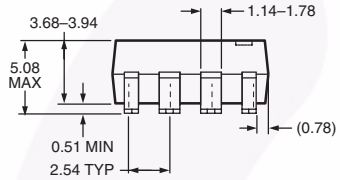
Package Dimensions (Continued)

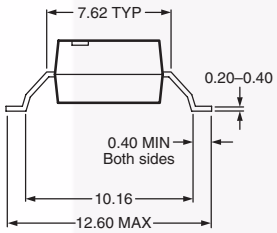
Surface Mount – 0.4" Lead Spacing (Option TS)





Recommended Land Pattern (Option S)





Note:

1. All dimensions are in millimeters.
2. Dimensions are exclusive of burrs, mold fash, and tie bar extrusion.

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

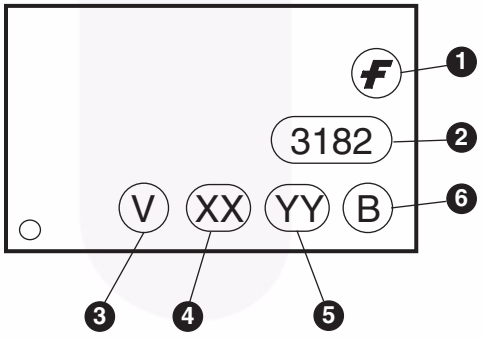
Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

http://www.fairchildsemi.com/packaging/

Ordering Information

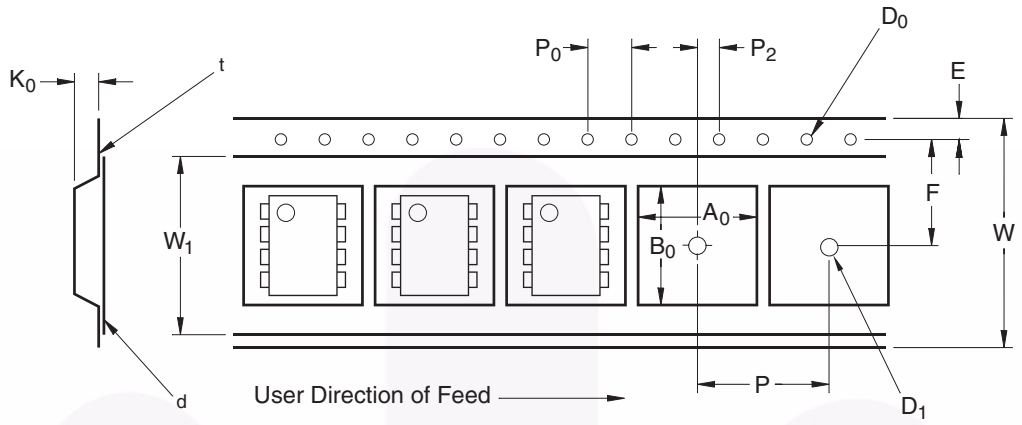
Part Number	Package	Packing Method
FOD3182	DIP 8-Pin	Tube (50 units per tube)
FOD3182S	SMT 8-Pin (Lead Bend)	Tube (50 units per tube)
FOD3182SD	SMT 8-Pin (Lead Bend)	Tape and Reel (1,000 units per reel)
FOD3182V	DIP 8-Pin, IEC60747-5-2 option	Tube (50 units per tube)
FOD3182SV	SMT 8-Pin (Lead Bend), DIN EN/IEC 60747-5-2 option	Tube (50 units per tube)
FOD3182SDV	SMT 8-Pin (Lead Bend), DIN EN/IEC 60747-5-2 option	Tape and Reel (1,000 units per reel)
FOD3182TV	DIP 8-Pin, 0.4” Lead Spacing, DIN EN/IEC 60747-5-2 option	Tube (50 units per tube)
FOD3182TSV	SMT 8-Pin, 0.4” Lead Spacing, DIN EN/IEC 60747-5-2 option	Tube (50 units per tube)
FOD3182TSR2	SMT 8-Pin, 0.4” Lead Spacing	Tape and Reel (700 units per reel)
FOD3182TSR2V	SMT 8-Pin, 0.4” Lead Spacing, DIN EN/IEC 60747-5-2 option	Tape and Reel (700 units per reel)

Marking Information



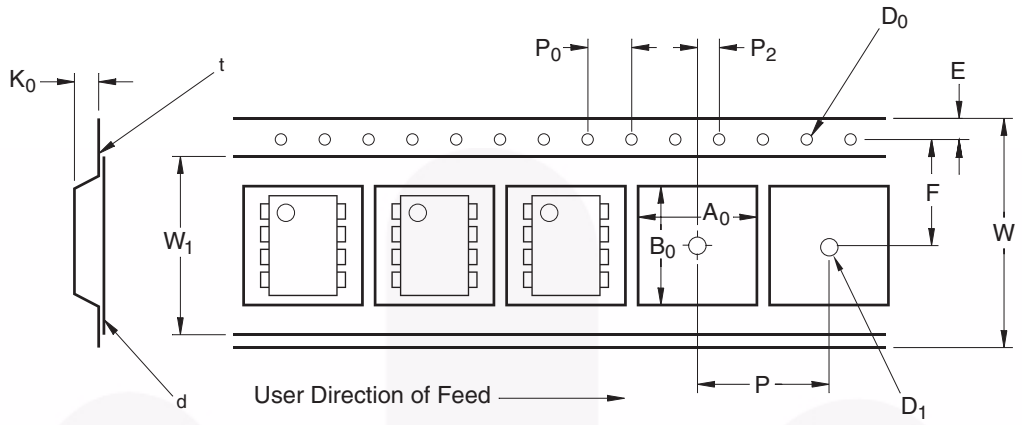
Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with DIN EN/IEC 60747-5-2 option – See order entry table)
4	Two digit year code, e.g., ‘11’
5	Two digit work week ranging from ‘01’ to ‘53’
6	Assembly package code

Carrier Tape Specifications – Option S



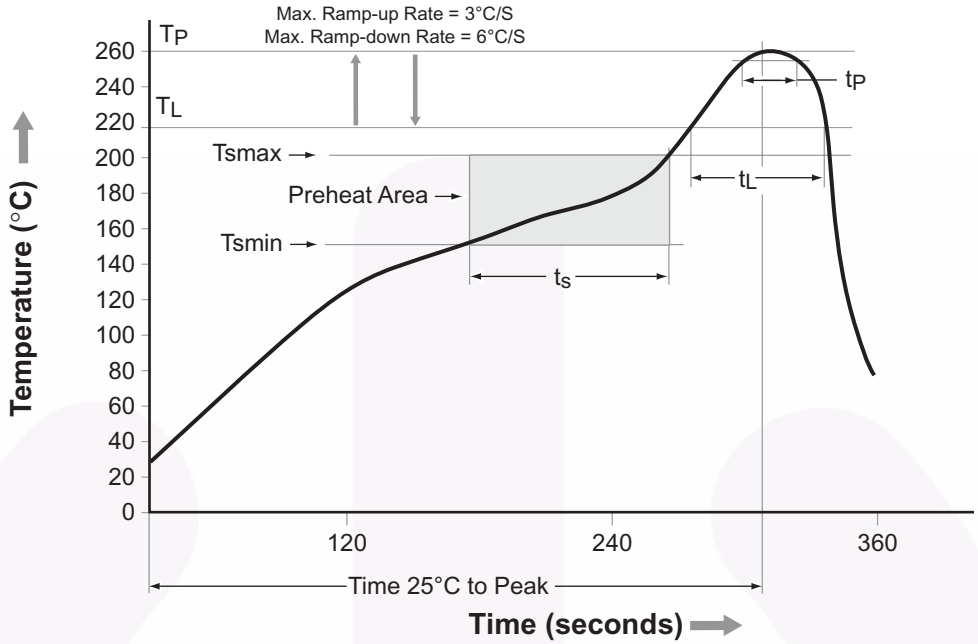
Symbol	Description	Dimension in mm
W	Tape Width	16.0 ± 0.3
t	Tape Thickness	0.30 ± 0.05
P_0	Sprocket Hole Pitch	4.0 ± 0.1
D_0	Sprocket Hole Diameter	1.55 ± 0.05
E	Sprocket Hole Location	1.75 ± 0.10
F	Pocket Location	7.5 ± 0.1
P_2		2.0 ± 0.1
P	Pocket Pitch	12.0 ± 0.1
A_0	Pocket Dimensions	10.30 ±0.20
B_0		10.30 ±0.20
K_0		4.90 ±0.20
W_1	Cover Tape Width	13.2 ± 0.2
d	Cover Tape Thickness	0.1 max
	Max. Component Rotation or Tilt	10°
R	Min. Bending Radius	30

Carrier Tape Specifications – Option TS



Symbol	Description	Dimension in mm
W	Tape Width	24.0 ± 0.3
t	Tape Thickness	0.40 ± 0.1
P_0	Sprocket Hole Pitch	4.0 ± 0.1
D_0	Sprocket Hole Diameter	1.55 ± 0.05
E	Sprocket Hole Location	1.75 ± 0.10
F	Pocket Location	11.5 ± 0.1
P_2		2.0 ± 0.1
P	Pocket Pitch	16.0 ± 0.1
A_0	Pocket Dimensions	12.80 ± 0.1
B_0		10.35 ± 0.1
K_0		5.7 ±0.1
W_1	Cover Tape Width	21.0 ± 0.1
d	Cover Tape Thickness	0.1 max
	Max. Component Rotation or Tilt	10°
R	Min. Bending Radius	30

Reflow Profile



Profile Feature	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	260°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.

FAIRCHILD SEMICONDUCTOR®

TRADEMARKS

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

AccuPower™
Auto-SPM™
Build it Now™
CorePLUS™
CorePOWER™
CROSSVOLT™
CTL™
Current Transfer Logic™
DEUXPEED®
Dual Cool™
EcoSPARK®
EfficientMax™
ESBC™
F®
Fairchild®
Fairchild Semiconductor®
FACT Quiet Series™
FACT®
FAST®
FastvCore™
FETBench™
FlashWriter®*
FPS™
F-PFS™
FRFET®
Global Power Resource℠
Green FPS™
Green FPS™ e-Series™
G*max*™
GTO™
IntelliMAX™
ISOPLANAR™
MegaBuck™
MICROCOUPLER™
MicroFET™
MicroPak™
MicroPak2™
MillerDrive™
MotionMax™
Motion-SPM™
OptoHiT™
OPTOLOGIC®
OPTOPLANAR®
PDP SPM™
Power-SPM™
PowerTrench®
PowerXS™
Programmable Active Droop™
QFET®
QS™
Quiet Series™
RapidConfigure™
™
Saving our world, 1mW/W/kW at a time™
SignalWise™
SmartMax™
SMART START™
SPM®
STEALTH™
SuperFET®
SuperSOT™-3
SuperSOT™-6
SuperSOT™-8
SupreMOS®
SyncFET™
Sync-Lock™
SYSTEM GENERAL®*
The Power Franchise®
The Right Technology for Your Success™
the power franchise
TinyBoost™
TinyBuck™
TinyCalc™
TinyLogic®
TINYOPTO™
TinyPower™
TinyPWM™
TinyWire™
TriFault Detect™
TRUECURRENT™*
µSerDes™
µSerDes
UHC®
Ultra FRFET™
UniFET™
VCX™
VisualMax™
XS™

* Trademarks of System General Corporation, used under license by Fairchild Semiconductor.

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILDíS WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

LIFE SUPPORT POLICY

FAIRCHILDíS PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL 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.

ANTI-COUNTERFEITING POLICY

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Sales Support.

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handling and storage and provide access to Fairchild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
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.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

Rev. I51

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9