

Dual Optically-Coupled Isolator

Optoelectronic Products

FCD880, FCD885

General Description

The FCD880 and FCD885 comprise two distinct optoisolators with transistor output, in a single 8-pin dual in-line package. Each channel consists of a GaAs emitter optically coupled to a phototransistor.

High Current Transfer Ratio

2500 V Minimum Isolation Input-to-Output

$10^{11} \Omega$ Isolation Resistance

Low Coupling Capacitance—Typically 1.0 pF

I/O Compatible With Integrated Circuits

Two Packages Fit Into a Standard

16-Pin DIP Socket

Absolute Maximum Ratings

Storage Temperature -55°C to $+150^{\circ}\text{C}$

Operating Temperature -55°C to $+100^{\circ}\text{C}$

Pin Temperature (Soldering, 5 s) 260°C

Total Package Power Dissipation

at $T_A = 25^{\circ}\text{C}$ 400 mW

Derate Linearly from 25°C 5.3 mW/ $^{\circ}\text{C}$

Input Diode (Each Channel)

V_R Reverse Voltage 3.0 V

I_F Forward dc Current 60 mA

I_{pk} Peak Forward Current
(1 μs pulse,
330 pps) 3.0 A

P_D Power Dissipation
at $T_A = 25^{\circ}\text{C}$ 100 mW
Derate Linearly from 50°C 2 mW/ $^{\circ}\text{C}$

Output Transistor (Each Channel)

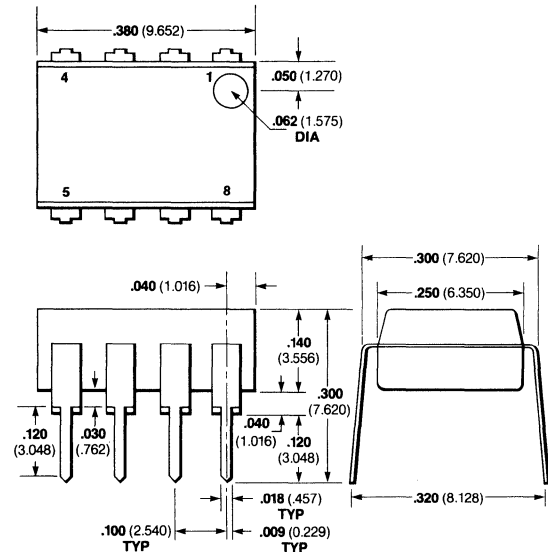
V_{CE} Collector-to-Emitter
Voltage 30 V

V_{EC} Emitter-to-Collector
Voltage 6.0 V

P_D Power Dissipation
at $T_A = 25^{\circ}\text{C}$ 150 mW
Derate Linearly from 25°C 2 mW/ $^{\circ}\text{C}$

I_C Collector Current 30 mA

Package Outline

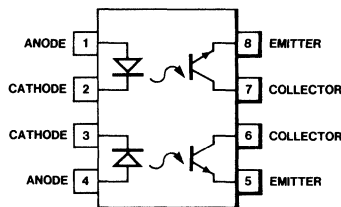


Notes

All dimensions in inches **bold** and millimeters (parentheses)
Tolerance unless specified = $\pm .015$ ($\pm .381$)

Package weight is 0.4 gram

Connection Diagram DIP (Top View)



Pin

1	Anode	Channel #1
2	Cathode	
3	Cathode	Channel #2
4	Anode	
5	Emitter	Channel #2
6	Collector	
7	Collector	Channel #1
8	Emitter	

Typical Electrical Characteristics

FCD880 FCD885

Electrical Characteristics—Input Diode $T_A = 25^\circ\text{C}$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_F	Forward Voltage		1.25	1.5	V	$I_F = 60\text{ mA}$
V_R	Reverse Voltage	3.0	5.5		V	$I_R = 10\text{ }\mu\text{A}$
C_J	Junction Capacitance		100		pF	$V_F = 0\text{ V}$

Electrical Characteristics—Output Transistor $T_A = 25^\circ\text{C}$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_{CEO}	Collector-to-Emitter Voltage FCD880, FCD885	30	65		V	$I_C = 1.0\text{ mA}$, $I_F = 0$
V_{ECO}	Emitter-to-Collector Voltage FCD880, FCD885	6.0	10		V	$I_C = 100\text{ }\mu\text{A}$
I_{CEO}	Collector-to-Emitter Leakage Current FCD880, FCD885		5.0	100	nA	$V_{CE} = 10\text{ V}$, $I_F = 0$
C_{CE}	Collector-to-Emitter Capacitance		8.0		pF	$V_{CE} = 0$

Electrical Characteristics—Coupled $T_A = 25^\circ\text{C}$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_{IO}	Input-to-Output Voltage	2500	4000		V	
$V_{CE(sat)}$	Collector-to-Emitter Saturation Voltage FCD880		0.24	0.4	V	$I_C = 2.0\text{ mA}$, $I_F = 16\text{ mA}$
	FCD885		0.2	0.3	V	$I_C = 250\text{ }\mu\text{A}$, $I_F = 20\text{ mA}$
$I_C/I_F(\text{CTR})$	Collector Current Transfer Ratio (Note 1) FCD880	30	50		%	$V_{CE} = 10\text{ V}$, $I_F = 10\text{ mA}$
	FCD885	10	20		%	$V_{CE} = 10\text{ V}$, $I_F = 10\text{ mA}$
R_{IO}	Input-to-Output Resistance		10^{11}		Ω	$V_{IO} = 500\text{ V}$
C_{IO}	Input-to-Output Capacitance		1.0		pF	$f = 1.0\text{ MHz}$
	Collector Rise and Fall Times (Note 2)		2.0		μs	$I_C = 2.0\text{ mA}$, $V_{CE} = 10\text{ V}$, $R_L = 100\text{ }\Omega$

Notes

- Collector current transfer ratio is defined as the ratio of the collector current to the forward bias input current.
- Rise time is defined as the time for the collector current to rise from 10% to 90% of peak value. Fall time is defined as the time required for the current to decrease from 90% to 10% of peak value.