66116

Single Channel Optocoupler

Electrically Similar to 4N47-4N49
Coaxial or Bulkhead Mount packages

OPTOELECTRONIC PRODUCTS DIVISION

Features:

- High reliability
- Base lead provided for conventional transistor biasing
- Very high gain, high voltage transistor
- Hermetically sealed for reliability and stability
- Stability over wide temperature range
- High voltage electrical isolation

Applications:

- Line Receivers
- Switchmode Power Supplies
- Signal ground isolation
- Process Control input/output isolation

DESCRIPTION

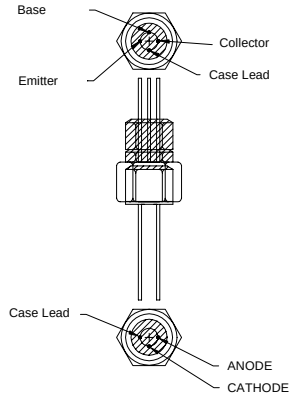
Very high gain optocoupler utilizing GaAlAs infrared LED optically coupled to an N-P-N silicon phototransistor packaged in a hermetically sealed metal case. These devices can be tested to customer specifications, as well as to MIL-PRF-38534 H&K quality levels.

***ABSOLUTE MAXIMUM RATINGS**

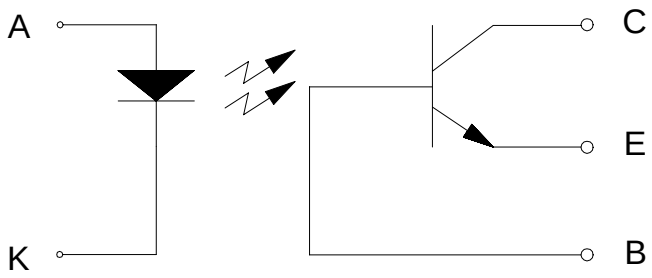
Input to Output Voltage	±1kV
Collector-Base Voltage	45V
Collector-Emitter Voltage (See Note 1)	40V
Emitter-Base Voltage	7V
Input Diode Reverse Voltage	2V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 2)	40mA
Continuous Collector Current	50mA
Peak Diode Current (See Note 3)	1A
Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see Note 4)	300mW
Operating Free-Air Temperature Range	-55°C to +125°C
Storage Temperature	-65°C to +125°C
Lead Temperature (1/16" (1.6mm) from case for 10 seconds)	240°C

* JEDEC registered data

Package Dimensions



Schematic Diagram



Notes:

1. This value applies with the emitter-base diode open-circuited and the input-diode current equal to zero.
2. Derate linearly to 125°C free-air temperature at the rate of 0.67 mA/°C.
3. This value applies for $t_w \leq 1$us. PRR<300 pps.
4. Derate linearly to 125°C free-air temperature at the rate of 3 mW/°C.

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ELECTRICAL CHARACTERISTICS $T_A = 25^{\circ}C$ Unless otherwise specified

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Static Reverse Current	I_R			100	µA	V_R = 2V	
Input Diode Static Forward Voltage -55°C	V_F	1	1.4	1.7	V	I_E = 10mA	
+25°C		0.8		1.5			
+100°C		0.7		1.3			

OUTPUT TRANSISTOR $T_A = 25^{\circ}C$ Unless otherwise specified

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	45			V	I_C = 100µA, I_B = 0, I_F = 0	
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40			V	I_C = 1mA, I_B = 0, I_F = 0	
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	7			V	I_C = 0, I_E = 100µA, I_F = 0	

COUPLED CHARACTERISTICS $T_A = 25^{\circ}C$ Unless otherwise specified

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
On State Collector Current -XX1	$I_{C(ON)}$	0.5			mA	V_{CE} = 5V, I_B = 0, I_F = 1mA	
-XX2		1		5			
-XX3		2		10			
On State Collector Current -55°C	$I_{C(ON)}$	0.7			mA	V_{CE} = 5V, I_B = 0, I_F = 2mA	
		1.4					
		2.8					
On State Collector Current -XX1 +100°C	$I_{C(ON)}$	0.5			mA	V_{CE} = 5V, I_B = 0, I_F = 2mA	2
-XX2		1					
-XX3		2					
Off State Collector Current +25°C	$I_{C(OFF)}$			100	nA	V_{CE} = 20V, I_B = 0, I_F = 0mA	
Off State Collector Current +100°C	$I_{C(OFF)}$			100	µA	V_{CE} = 20V, I_B = 0, I_F = 0mA	
Collector-Emitter Saturation Voltage -XX1	$V_{CE(SAT)}$			0.3	V	I_C = 0.5mA, I_B = 0, I_F = 2mA	
-XX2	$V_{CE(SAT)}$			0.3	V	I_C = 1mA, I_B = 0, I_F = 2mA	
-XX3	$V_{CE(SAT)}$			0.3	V	I_C = 2mA, I_B = 0, I_F = 2mA	
Input to Output Resistance	R_{I-O}	10^{11}				V_{IN-OUT} = 1kV	1
Input to Output Capacitance	C_{I-O}			5	pF	f = 1MHz, V_{IN-OUT} = 1kV	1
Rise Time/ Fall Time -XX1 Phototransistor Operation	t_r / t_f			20	µs	V_{CC} = 10V, I_F = 5mA, R_L = 100Ω	
-XX2	t_r / t_f			25	µs		
-XX3	t_r / t_f			25	µs		
Rise Time/ Fall Time -XX1 Photodiode Operation	t_r / t_f			0.85	µs	V_{CC} = 10V, I_F = 5mA, R_L = 100Ω	
-XX2	t_r / t_f			0.85	µs		
-XX3	t_r / t_f			0.85	µs		

NOTES:

1. These parameters are measured between all phototransistor leads shorted together and with both input diode leads shorted together.
2. This parameter measured using pulse techniques t_w =100µs, duty cycle ≤ 1%.

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	100	µA
Input Current, High Level	I_{FH}	2	10	mA
Supply Voltage	V_{CE}	5	10	V

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66116-001	Single Channel, Commercial (0 to 70ºC) Coaxial Packaging
66116-002	Single Channel, Commercial (0 to 70ºC) Coaxial Packaging
66116-003	Single Channel, Commercial (0 to 70ºC) Coaxial Packaging
66116-001B	Single Channel, Commercial (0 to 70ºC) Bulkhead Packaging
66116-002B	Single Channel, Commercial (0 to 70ºC) Bulkhead Packaging
66116-003B	Single Channel, Commercial (0 to 70ºC) Bulkhead Packaging
66116-101	Single Channel, 100% screened, (-55 to +125ºC) Coaxial Packaging
66116-102	Single Channel, 100% screened, (-55 to +125ºC) Coaxial Packaging
66116-103	Single Channel, 100% screened, (-55 to +125ºC) Coaxial Packaging
66116-101B	Single Channel, 100% screened, (-55 to +125ºC) Bulkhead Packaging
66116-102B	Single Channel, 100% screened, (-55 to +125ºC) Bulkhead Packaging
66116-103B	Single Channel, 100% screened, (-55 to +125ºC) Bulkhead Packaging
66116-201	Single Channel, full mil-temp, (-55 to +125ºC) Coaxial Packaging
66116-202	Single Channel, full mil-temp, (-55 to +125ºC) Coaxial Packaging
66116-203	Single Channel, full mil-temp, (-55 to +125ºC) Coaxial Packaging
66116-201B	Single Channel, full mil-temp, (-55 to +125ºC) Bulkhead Packaging
66116-202B	Single Channel, full mil-temp, (-55 to +125ºC) Bulkhead Packaging
66116-203B	Single Channel, full mil-temp, (-55 to +125ºC) Bulkhead Packaging