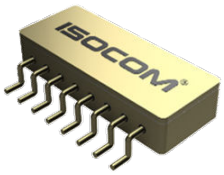
ISOCOM LIMITED

PART NUMBER **CDMR1006**



COMPONENT SPECIFICATION **ISSUE 1**

Component Specification For Dual Channel Optically Coupled Solid State Relay

Features	Applications
▪ Released to European Standard and complies to MIL-STD ▪ 6A Continuous Current ▪ Buffered Input Stage ▪ 8 Lead Surface Mount Package ▪ High Isolation up to 1,000Vdc ▪ Optically Coupled ▪ Hermetically Sealed	▪ Space Equipment and Systems ▪ Military and High Reliability Systems ▪ Medical Instruments ▪ MOS/CMOS Applications ▪ Logic Interfacing ▪ Power Supply

DESCRIPTION

The CDMR1006 has two power MOSFET optocouplers packaged into an 8-Lead Surface Mount package, and is suited for applications where two independent switches are required. This popular hermetic ceramic package combined with 1,000V_{dc} isolation between input and output, and between two isolated relays, makes this device ideal for solid state relay applications.

The CDMR1006 is available over the full military temperature range and with quality and screening levels ranging from Commercial and Industrial, to Defence and Space. Gold plated leads are standard, but the other lead finishes per Mil-PRF-38534 are also available. Functionally, the CDMR1006 operates as dual, single-pole-single-throw (SPST) normally open relay. Each relay is actuated by a standard logic input.

ISOCOM Limited is AS9100 certified for the design and manufacture of electronic and optoelectronic components.

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STANDARDS

The following specifications have been complied with in the manufacturing of this product -

Aerospace Compliance Standards

AS9100D & ISO 9001:2015 – Design & Manufacture of Electronic and Optoelectronic Components *(Ref GB15/92780)*

Military Compliance Specifications

MIL-PRF-38534 – General Specification for Hybrid Microcircuits
MIL-PRF-19500 – General Specification for Discrete Semiconductor Devices

Military Compliance Standards

MIL-STD-202 – Test Method Standard Electronic and Electrical Component Parts
MIL-STD-883 – Test Method Standard Microcircuits
MIL-STD-750 – Test Method Standard for Semiconductor Devices

SCREENING INFORMATION

Our products can be screened to MIL-PRF-38534, applying test methods from MIL-STD-883; MIL-PRF-19500, applying test methods of MIL-STD-750; or a combination thereof. Please contact us for more information relating to the applicable screening processes.

AMENDMENT RECORD

Issue No.	Date	Description
1	September 2022	- First Issue

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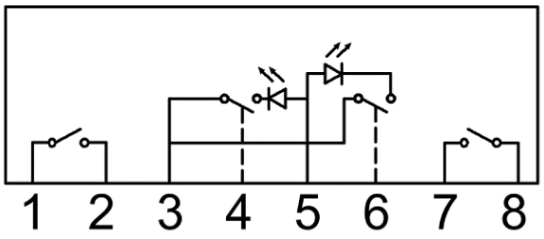
PACKAGE STYLES AND CONFIGURATION OPTIONS

Package	8 Lead Surface Mount
Lead Style	-
Channels	2
Common Channel Wiring	-
Isocom Part Number and Options	
Commercial	CDMR1006
Defense Screen Level	CDMR1006/L2
Space Screen Level	CDMR1006/L2S
Standard Gold Plate Finish	Gold Plate
Solder Dipped	Option #20

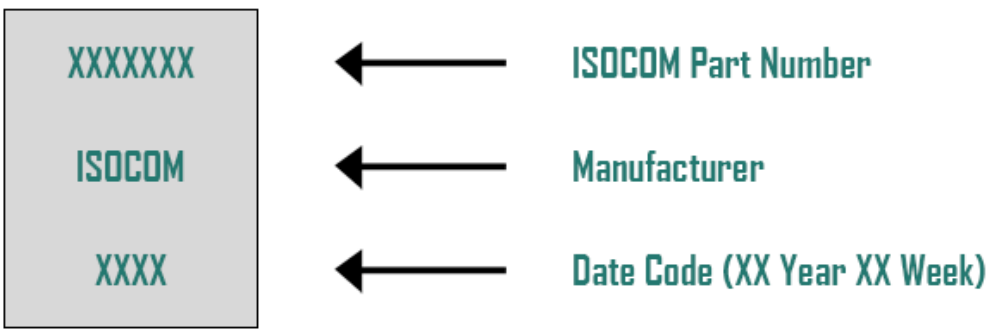
FUNCTIONAL DIAGRAMS

CDMR1006

8 Lead Surface Mount



DEVICE MARKING



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ABSOLUTE MAXIMUM RATINGS

T_A = 25°C C.U.O.S

Parameter	Symbol	Value	Units
Output Supply Voltage ⑤	V_S	100	V
Output Current ④, ⑤	I_O	6	A
Input Buffer Voltage – (Pins 4 & 6)③	V_{IN}	±10	V
Input Buffer Current	I_{IN}	±10	mA
Input Supply Voltage (Pin 5)	V_{DD}	10	V
Input Supply Current ⑦	I_{DD}	25	mA
Power Dissipation ④, ⑤	P_{DISS}	60	W
Operating Temperature Range	T_J	-55 to 125	°C
Storage Temperature Range	T_S	-65 to 150	
Lead Temperature	T_L	300	

GENERAL CHARACTERISTICS

-55°C ≤T_C≤125°C U.O.S.

Parameter	Symbol	Group A Subgroups	Test Conditions	Min.	Typ.	Max.	Units
Input Buffer Threshold Voltage	$R_{DS(ON)}$		V_{DD} = 5.0V, I_O = 10.0A	5.0	-	-	V
Input Supply Current	I_{DD}		V_{DD} = 5.0V, I_O = 10.0A	-	10	15	mA
			V_{DD} = 5.0V, I_O = 10.0A⑦	-	-	25	
Input-to-Output Leakage Current	I_{I-O}	1	V_{I-O}=1.0KVdc, Dwell =5.0s	-	-	-	µA
Output Capacitance	C_{OSS}		V_{IN} = 0.8V, f = 1.0MHz, V_S= 25V, T_C=25°C	-	365	-	pF
Thermal Resistance	R_{THJC}		V_{IN}=5.0V, V_{DD} =5.0V	-	-	1.7	°C/W
MTBF (per channel)			MIL-HDBK-217F, SF@T_C=25°C	6.0	-	-	MHrs

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ELECTRICAL CHARACTERISTICS

55°C ≤T_C≤125°C U.O.S. Pre-Irradiation

Parameter	Symbol	Group A Subgroups	Test Conditions	Min.	Typ.	Max.	Units
Output On-Resistance	$R_{DS(ON)}$	1	V_{in} = 5.0V, V_{DD} = 5.0V, I_O = 10.0A	-	0.070	0.100	Ω
		2		-	0.115	0.145	
Output Leakage Current	I_O	1	V_{in} = 0.1V, V_S = 100V	-	-	25	µA
		2	V_{in} = 0.1V, V_S = 80V	-	-	250	
Input Buffer Current	I_{IN}	1	V_{IN} = 3.3V	-	-	1.0	µA
		2, 3		-	-	3.0	
Turn-On Delay ⑥	t_{ON}	1, 2, 3	V_{IN} = 5.0V, V_{DD} = 5.0V, V_S = 30.0V, RC = 7.0Ω/100µF, PW = 50.0ms	-	6.5	25	ms
Turn-Off Delay ⑥	t_{OFF}	1, 2, 3	V_{IN} = 0.8V, V_{DD} = 5.0V, V_S = 30.0V, RC = 7Ω/100µF, PW = 50.0ms	-	26	50	
Rise Time ②, ⑥	t_r	1, 2, 3	VIN = 5.0V, VDD = 5.0V, VS = 30.0V, RC = 7.0Ω/100µF, PW = 50.0ms	-	1.3	5.5	
Fall Time ②, ⑥	t_f	1, 2, 3	VIN = 0.8V, VDD = 5.0V, VS = 30.0V, RC = 7Ω/100µF, PW = 50.0ms	-	6.0	10	

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Post Total Dose Irradiation ⑧⑨⑩

Electrical Characteristics per Channel @ 25°C U.O.S

Parameter	Symbol	Group A Subgroups	Test Conditions	Min.	Typ.	Max.	Units
Output On-Resistance	$R_{DS(ON)}$	1	V_{in} = 5.0V, V_{DD} = 5.0V, I_O = 10.0A	-	0.070	0.100	Ω
Output Leakage Current	I_O	1	V_{in} = 0.8V, V_S = 100V	-	-	25	µA
Input Buffer Current	I_{IN}	1	V_{IN} = 5.0V	-	-	1.0	µA
Turn-On Delay ⑥	t_{ON}	1	V_{IN} = 5.0V, V_{DD} = 5.0V, V_S = 30.0V, RC = 7.0Ω/100µF, PW = 50.0ms	-	6.5	25	ms
Turn-Off Delay ⑥	t_{OFF}	1	V_{IN} = 0.8V, V_{DD} = 5.0V, V_S = 30.0V, RC = 7.0Ω/100µF, PW = 50.0ms	-	26	50	
Rise Time ②, ⑥	t_r	1	VIN = 5.0V, VDD = 5.0V, VS = 30.0V, RC = 7.0Ω/100µF, PW = 50.0ms	-	1.3	5.5	
Fall Time ②, ⑥	t_f	1	VIN = 0.8V, VDD = 5.0V, VS = 30.0V, RC = 7.0Ω/100µF, PW = 50.0ms	-	6.0	10	

Notes

① Specification guarenteed by design.

② Rise and fall times are controlled internally.

③ Inputs protected for V_{IN} <1.0V and V_{IN} >7.5V.

④ Optically coupled Solid State Relays (SSRs) have relatively slow turn on and off times. Care must be taken to insure that transient currents do not cause violation of SOA. If transient conditions are present, Isocom recommends a complete simulation to be performed by the end user to insure compliance with SOA requirements.

⑤ While the SSR design meets the design requirements in MIL-PRF 38534, the end user is responsible for product derating, as required for the application.

⑥ Reference figures 2 & 3 for switching test circuits and waveform.

⑦ Input Supply voltage shall not exceed 5.25V @ T_C

⑧ Total Dose Irradiation with Input Bias. 10mA I_{DD} applied and V_{DS} =0 during irradiation

⑨ Total Dose Irradiation with Output Bias. 80 Volts V_{DS} applied and I_{DD} =0 during irradiation

⑩ International Rectifier does not currently have a DSCC certified Radiation Hardness Assurance Program

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TEST DIAGRAMS

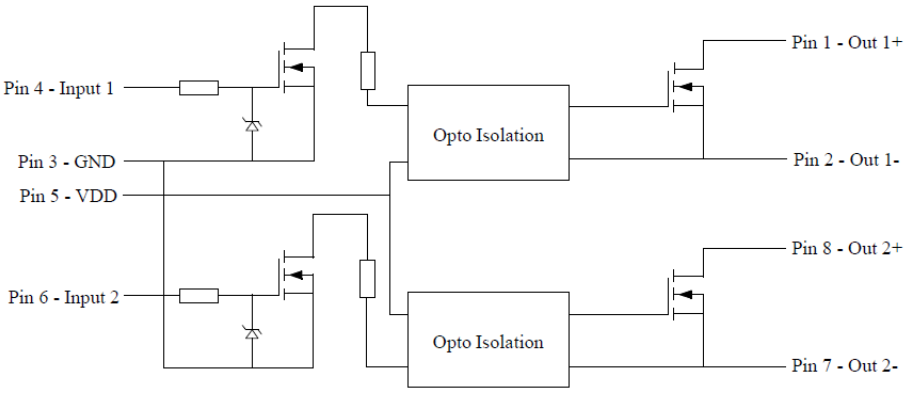

Fig 1. Typical Application

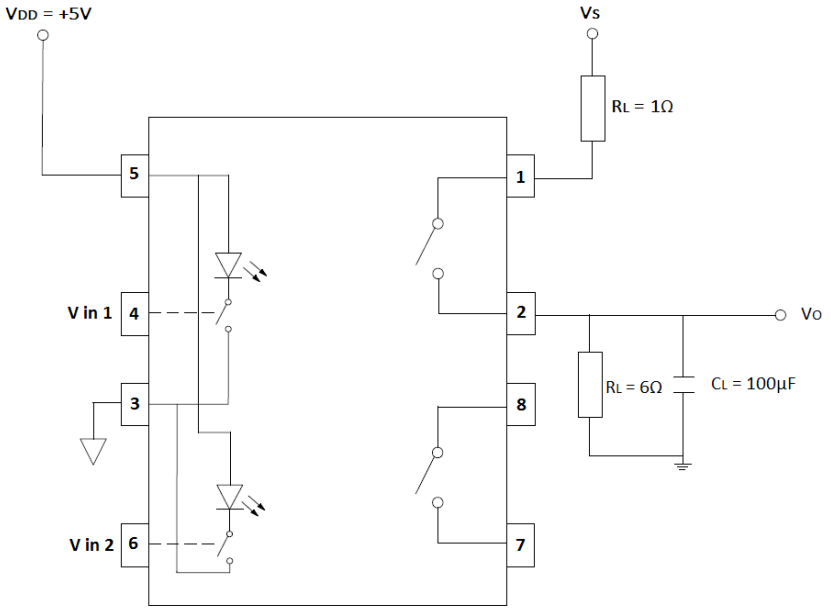

Fig 2. Switching Test Circuit (Single Channel Shown)

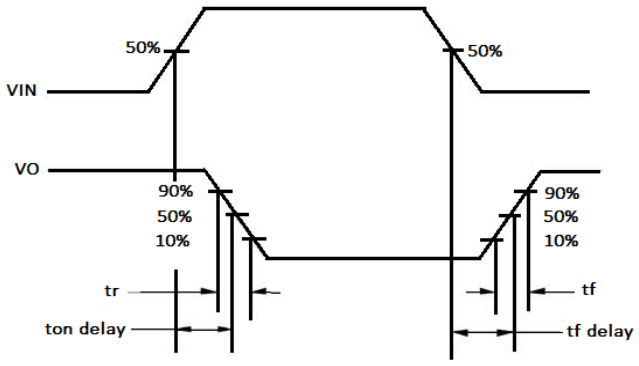

Fig 3. Switching Test Waveform

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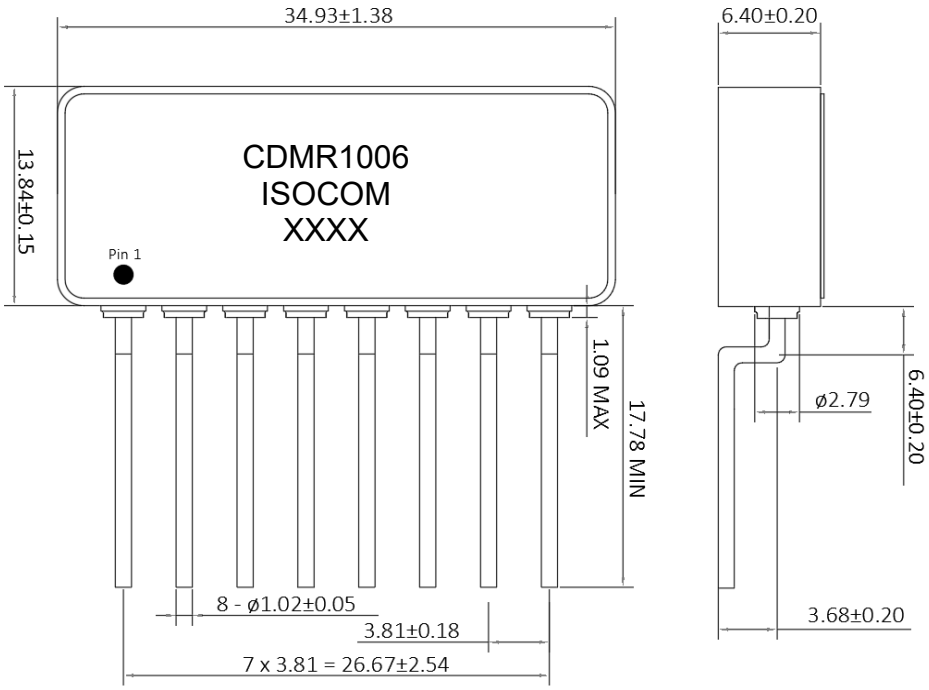
OUTLINE DRAWINGS

CDMR1006



PIN OUT INFORMATION

Pin Number	Pin Function
1	+ Output 1
2	- Output 1
3	Input GND
4	Input 1
5	VDD
6	Input 2
7	- Output 2
8	+ Output 2

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