PART NUMBER **CDMR1020**

COMPONENT SPECIFICATION **ISSUE A**

Component Specification For Dual Channel Optically Coupled Solid State Relay

Features	Applications
▪ Released to European Standard and complies to MIL-STD ▪ 20A Continuous Current ▪ Buffered Input Stage ▪ 8 Lead Surface Mount Package ▪ High Isolation up to 1,000V_{dc} ▪ Optically Coupled ▪ Hermetically Sealed	▪ Space Equipment and Systems ▪ Military and High Reliability Systems ▪ Logic level of 3.3V input ▪ Power Supply ▪ Displacement Damage & TID Capability

DESCRIPTION

The CDMR1020 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 CDMR1020 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 CDMR1020 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
A	April 2024	First Issue.

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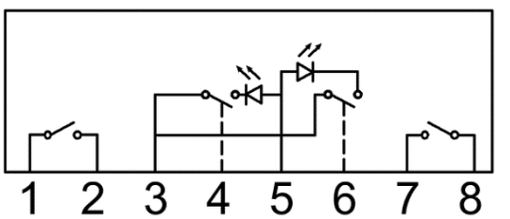
PACKAGE STYLES AND CONFIGURATION OPTIONS

Package	8 Lead Surface Mount
Lead Style	-
Channels	2
Common Channel Wiring	-
Isocom Part Number and Options	
Commercial	CDMR1020
Defense Screen Level	CDMR1020/L2
Space Screen Level	CDMR1020/L2S
Standard Gold Plate Finish	Gold Plate

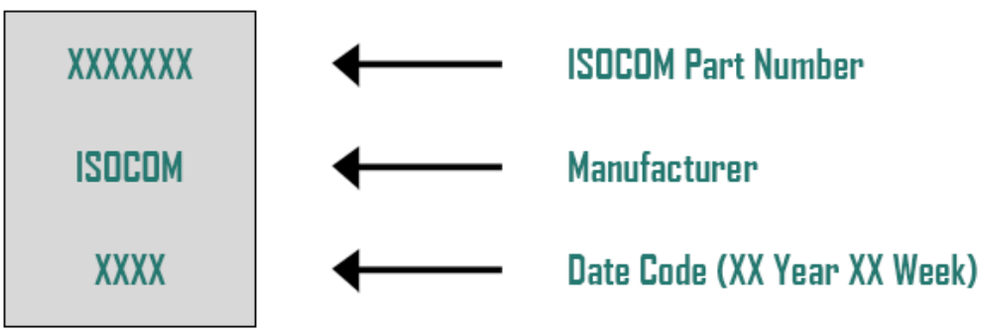
FUNCTIONAL DIAGRAMS

CDMR1020

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	20	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	I_{DD}	25	mA
Power Dissipation ④,⑤	P_{DISS}	75	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

T_A = 25°C C.U.O.S

Parameter	Symbol	Group A Subgroups	Test Conditions	Min.	Typ.	Max.	Units
Input Buffer Threshold Voltage ③	$V_{IN(TH)}$		V_{DD} = 5.0V, I_O = 20.0A	2.0	-	-	V
Input-to-Output Leakage Current	I_{I-O}	1	V_{I-O}=1.0KVdc, Dwell =5.0s	-	-	1.0	µA
Output Capacitance	C_{OSS}		V_{IN} = 0.8V, f = 1.0MHz, V_S= 25V, T_C=25°C	-	220	-	pF
Thermal Resistance ①④	$R_{\theta JC}$		V_{IN}=5.0V, V_{DD} =5.0V	-	-	1.5	°C/W
MTBF (per channel)			MIL-HDBK-217F, SF@T_C=25°C	6.0	-	-	MHrs

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ELECTRICAL CHARACTERISTICS

T_A = 25°C C.U.O.S

Parameter	Symbol	Group A Subgroups	Test Conditions	Min	Typ	Max	Units
Output On-Resistance	$R_{DS}(ON)$	1	V_{in} = 3.3V, V_{DD} = 5.0V, I_O = 20.0A	-	-	150	mΩ
		2		-	-	300	
Output Leakage Current	I_O	1	V_{in} = 0.1V, V_S = 100V	-	25	250	µA
		2	V_{in} = 0.1V, V_S = 80V	-	25	250	
Input Supply Current ①	I_{DD}	1, 2, 3	V_{DD} = 5.0V, I_O = 20.0A	-	10	15	mA
			V_{DD} = 10V, I_O = 20.0A	-	-	25	
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} = 3.3V, V_{DD} = 5.0V, V_S = 50.0V, RL = 5.0Ω/100µF, PW = 50.0ms	-	-	1.50	ms
Turn-Off Delay ⑥	t_{OFF}	1, 2, 3	V_{IN} = 0.1V, V_{DD} = 5.0V, V_S = 50.0V, RL = 5Ω/100µF, PW = 50.0ms	-	-	10.00	
Rise Time ②,⑥	t_r	1, 2, 3	V_{IN} = 3.3V, V_{DD} = 5.0V, V_S = 50.0V, RL = 5.0Ω/100µF, PW = 50.0ms	-	-	1.50	
Fall Time ②,⑥	t_f	1, 2, 3	V_{IN} = 0.1V, V_{DD} = 5.0V, V_S = 50.0V, RC = 5Ω/100µF, PW = 50.0ms	-	-	3.50	

Notes

① Specification guaranteed by design application.solid star

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 ensure that transient currents do not cause violation of safe operation area. If transient conditions are present, ISOCOM recommends a complete simulation to be performed by the end user to ensure compliance with safe operation area requirements.

⑤ ISOCOM SSR are designed to meet the design requirements specified in MIL-PRF-38534, it is recommended for the end user to be responsible for product derating, as required for the application.

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

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TEST DIAGRAMS

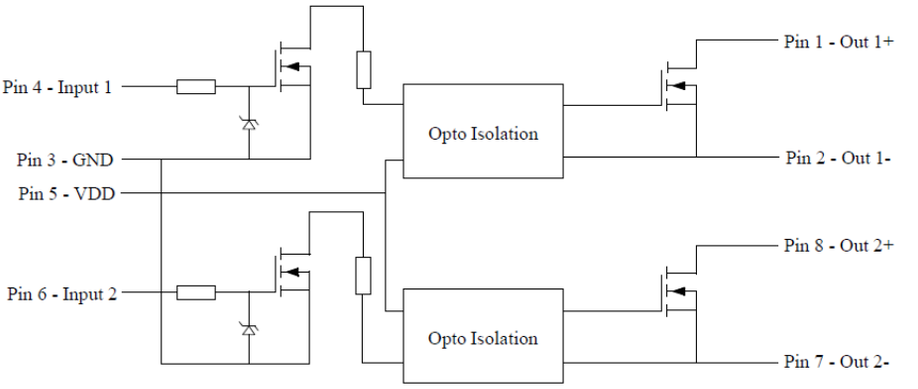

Fig 1. Typical Application

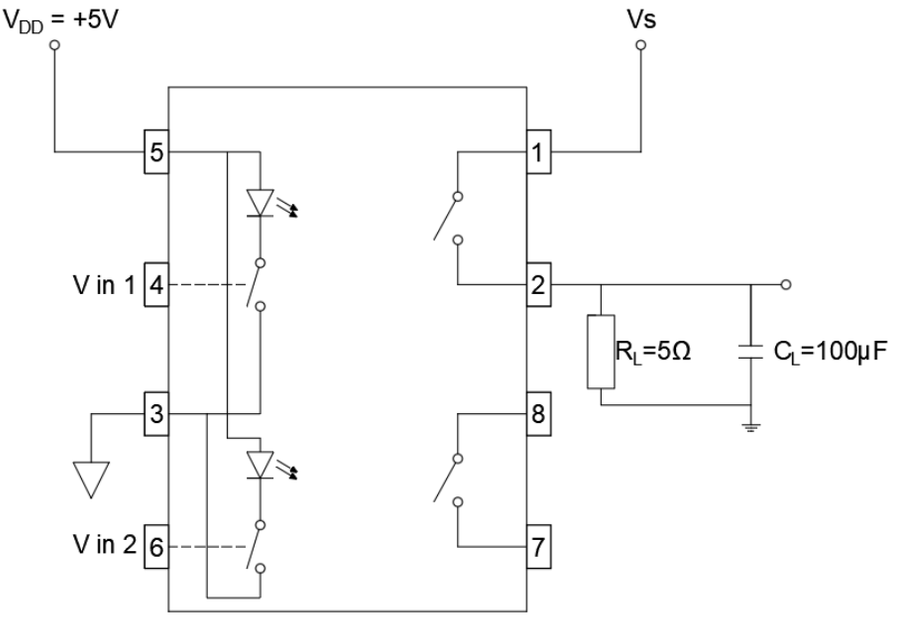

Fig 2. Switching Test Circuits (Single Channel Shown)

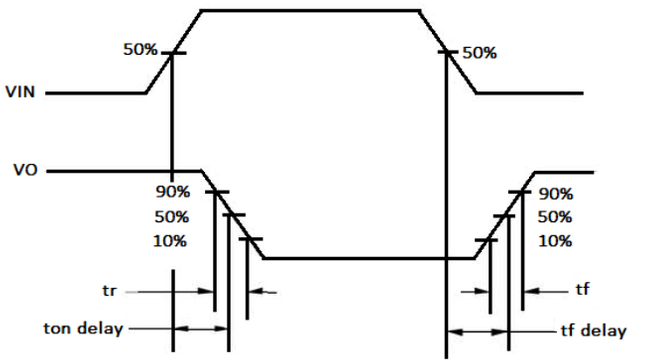

Fig 3. Switching Test Waveform

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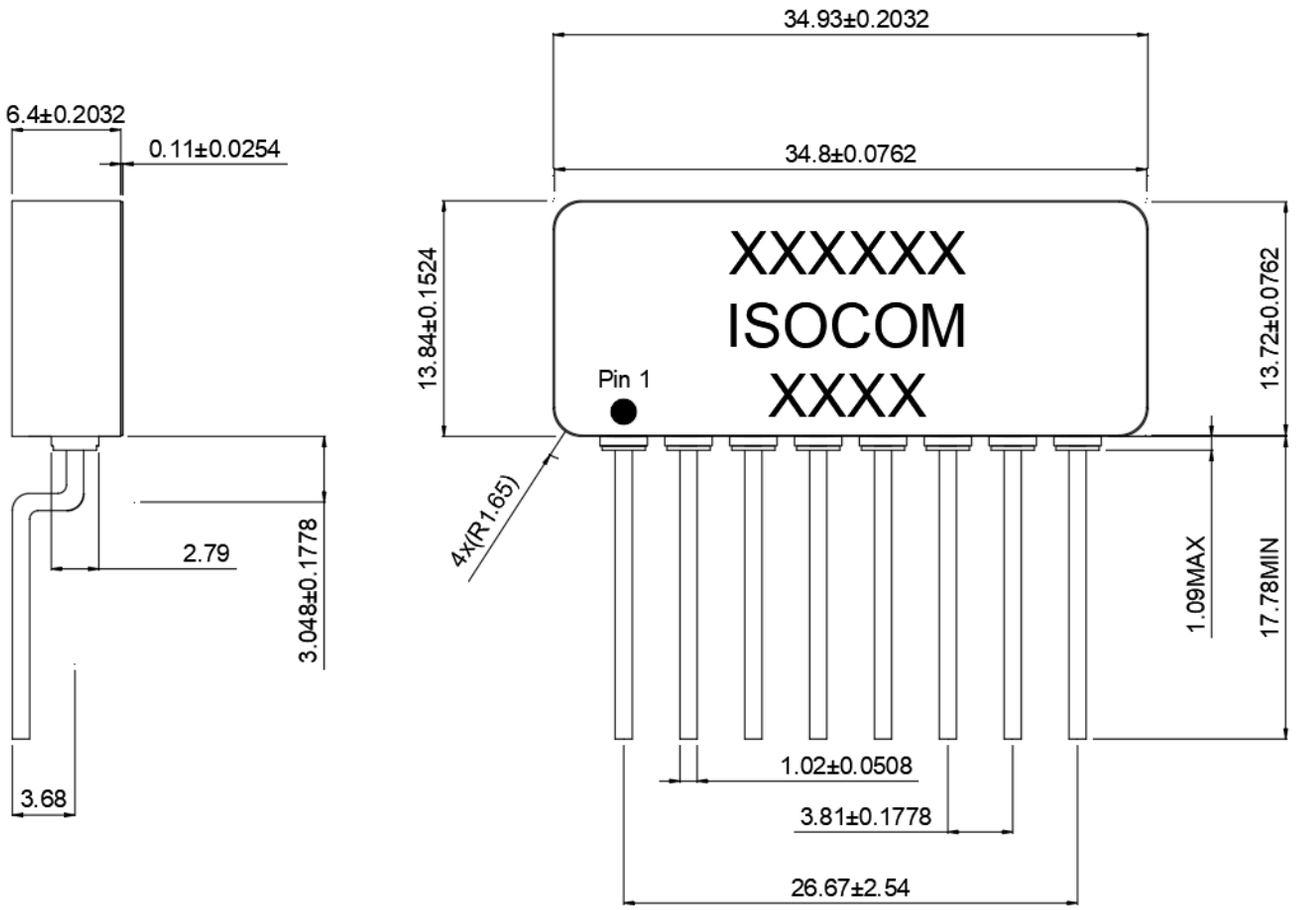
OUTLINE DRAWINGS (All dimensions in mm)

8 Lead Surface Mount



PIN OUT INFORMATION

Pin Number	Pin Function
1	+ Output 1
2	- Output 1
3	Input GND
4	Input 1
5	V_{DD}
6	Input 2
7	- Output 2
8	+ Output 2

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