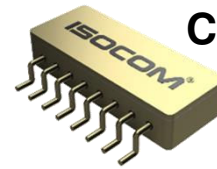# ISOCOM LIMITED

PART NUMBER

COMPONENT SPECIFICATION

CDMR2010

ISSUE A

Component Specification
For Dual Channel Optically Coupled
Solid State Relay

Features	Applications
▪ Released to European Standard and complies to MIL-STD	▪ Space Equipment and Systems
▪ 10A Continuous Current	▪ Military and High Reliability Systems
▪ Buffered Input Stage	▪ Logic level of 3.3V input
▪ 8 Lead Surface Mount Package	▪ Power Supply
▪ High Isolation up to 1,000V_{dc}	▪ Displacement damage of 1.8E^{12} n/cm^2
▪ Optically Coupled	
▪ Hermetically Sealed	
▪ Radiation capability TID 200kRADS	

DESCRIPTION

The CDMR2010 has two power MOSFET optocouplers packaged into an 8-lead surface mount hybrid 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 CDMR2010 is available with MIL-PRF-38534 Class K & Class H screening. Gold plated leads are standard, but the other lead finishes are also available. Functionally, the CDMR2010 operates as dual, single-pole-single-throw (SPST) normally open relay. Each relay is actuated by a standard logic input.

Absolute maximum ratings, recommended operating conditions, electrical specifications and performance characteristics are identical for all units. Any exceptions, due to packaging variations and limitations, are as noted.

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

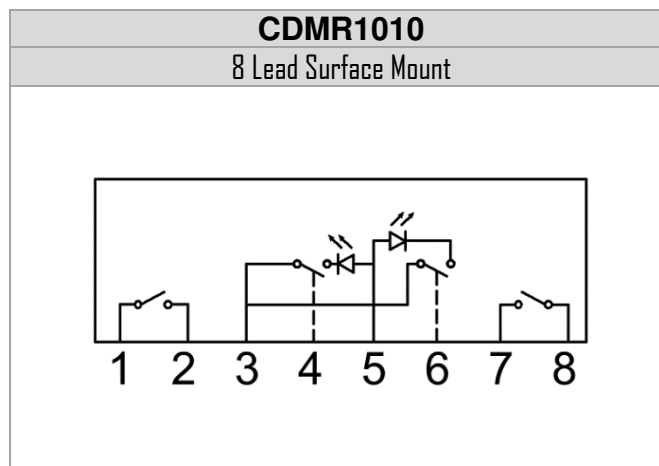For sales enquiries, or further information, please contact our sales office at –

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STANDARDS

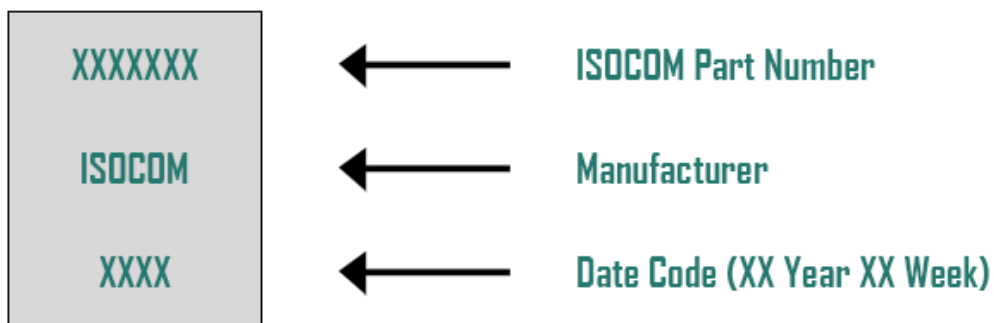The following specifications have been complied with in the manufacturing of this product -

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	October 2020	First issue
2	December 2020	Updated the RDS(ON) electrical characteristics
A	April 2024	Updated Drawing from new template.

PACKAGE STYLES AND CONFIGURATION OPTIONS

Package	8 Lead Surface Mount
Lead Style	-
Channels	2
Common Channel Wiring	-
Isocom Part Number and Options	
Commercial	CDMR2010
Defense Screen Level	CDMR2010/L2
Space Screen Level	CDMR2010/L2S
Standard Gold Plate Finish	Gold Plate

FUNCTIONAL DIAGRAMS

CDMR1010
8 Lead Surface Mount

DEVICE MARKING

XXXXXX ← ISOCOM Part Number

ISOCOM ← Manufacturer

XXXX ← Date Code (XX Year XX Week)

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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	200	V
Output Current ④,⑤	I_O	10	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	
Storage Temperature Range	T_S	-65 to 150	°C
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	$V_{IN(TH)}$		$V_{DD} = 5.0V$, $I_O = 10.0A$	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 ①,④	$R_{θJC}$		$V_{IN}=5.0V$, $V_{DD} =5.0V$	-	-	1.5	°C/W
MTBF (per channel)			MIL-HDBK-217F, $SF@T_C=25°C$	6.0	-	-	MHrs

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	$V_{in} = 3.3V$, $V_{DD} = 5.0V$, $I_O = 10.0A$	-	-	0.150	Ω
		2		-	-	0.300	
Output Leakage Current	I_O	1	$V_{in} = 0.1V$, $V_S = 200V$	-	-	25	µA
		2	$V_{in} = 0.1V$, $V_S = 150V$	-	-	250	
Input Supply Current ①	I_{DD}	1, 2, 3	$V_{DD} = 5.0V$, $I_O = 10.0A$	-	10	15	mA
			$V_{DD} = 10V$, $I_O = 10.0A$	-	-	25	
Input Buffer Current	I_{IN}	1	$V_{IN} = 3.3V$	-	-	1.0	µA
		2, 3		-	-	3.0	
Turn-On Delay ⑥	t_{ON}	9, 10, 11	$V_{IN} = 3.3V$, $V_{DD} = 5.0V$, $V_S = 50.0V$, $RC = 5Ω/100µF$, $PW = 50.0ms$	-	-	1.50	ms
Turn-Off Delay ⑥	t_{OFF}	9, 10, 11	$V_{IN} = 0.1V$, $V_{DD} = 5.0V$, $V_S = 50.0V$, $RC = 5Ω/100µF$, $PW = 50.0ms$	-	-	10.00	
Rise Time ②,⑥	t_r	9, 10, 11	$V_{IN} = 3.3V$, $V_{DD} = 5.0V$, $V_S = 50.0V$, $RC = 5Ω/100µF$, $PW = 50.0ms$	-	-	1.50	
Fall Time ②,⑥	t_f	9, 10, 11	$V_{IN} = 0.1V$, $V_{DD} = 5.0V$, $V_S = 50.0V$, $RC = 5Ω/100µF$, $PW = 50.0ms$	-	-	3.50	

Notes

① Specification guaranteed by design application.

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.

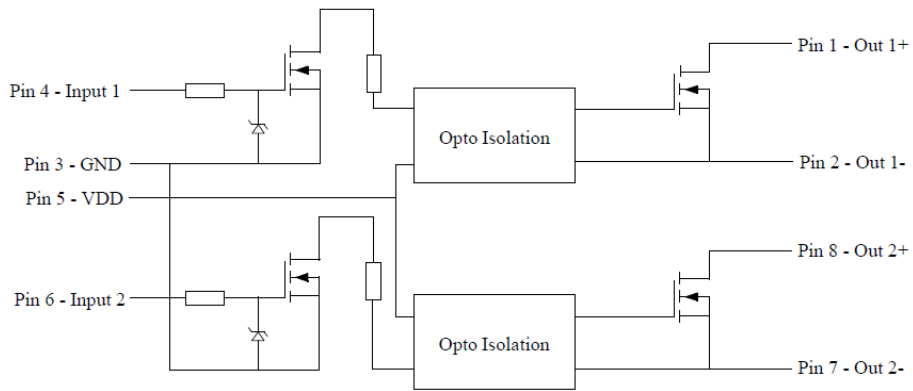# TEST DIAGRAMS

Fig 1. Typical Application
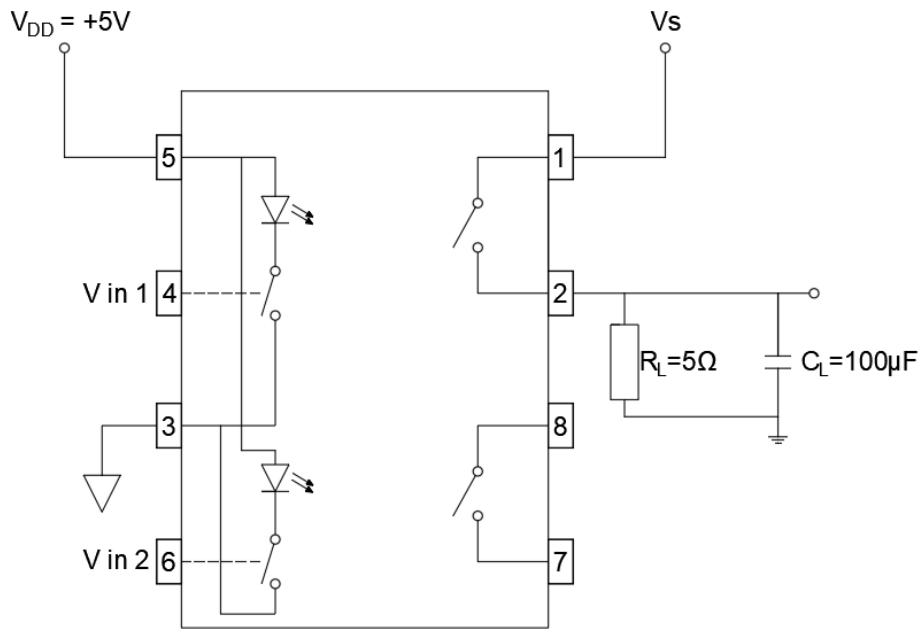
Fig 2. Switching Test Circuits (Single Channel Shown)
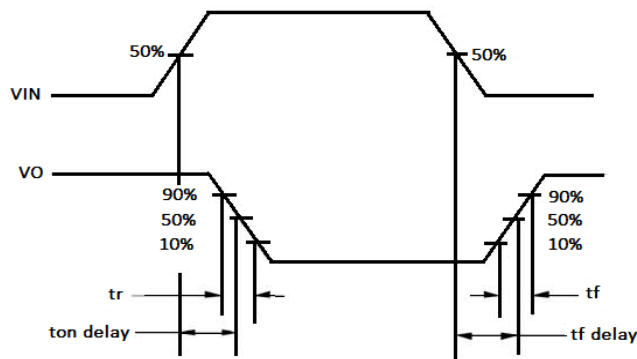
Fig 3. Switching Test Waveform

OUTLINE DRAWINGS (All dimensions in mm)
8 Lead Surface Mount
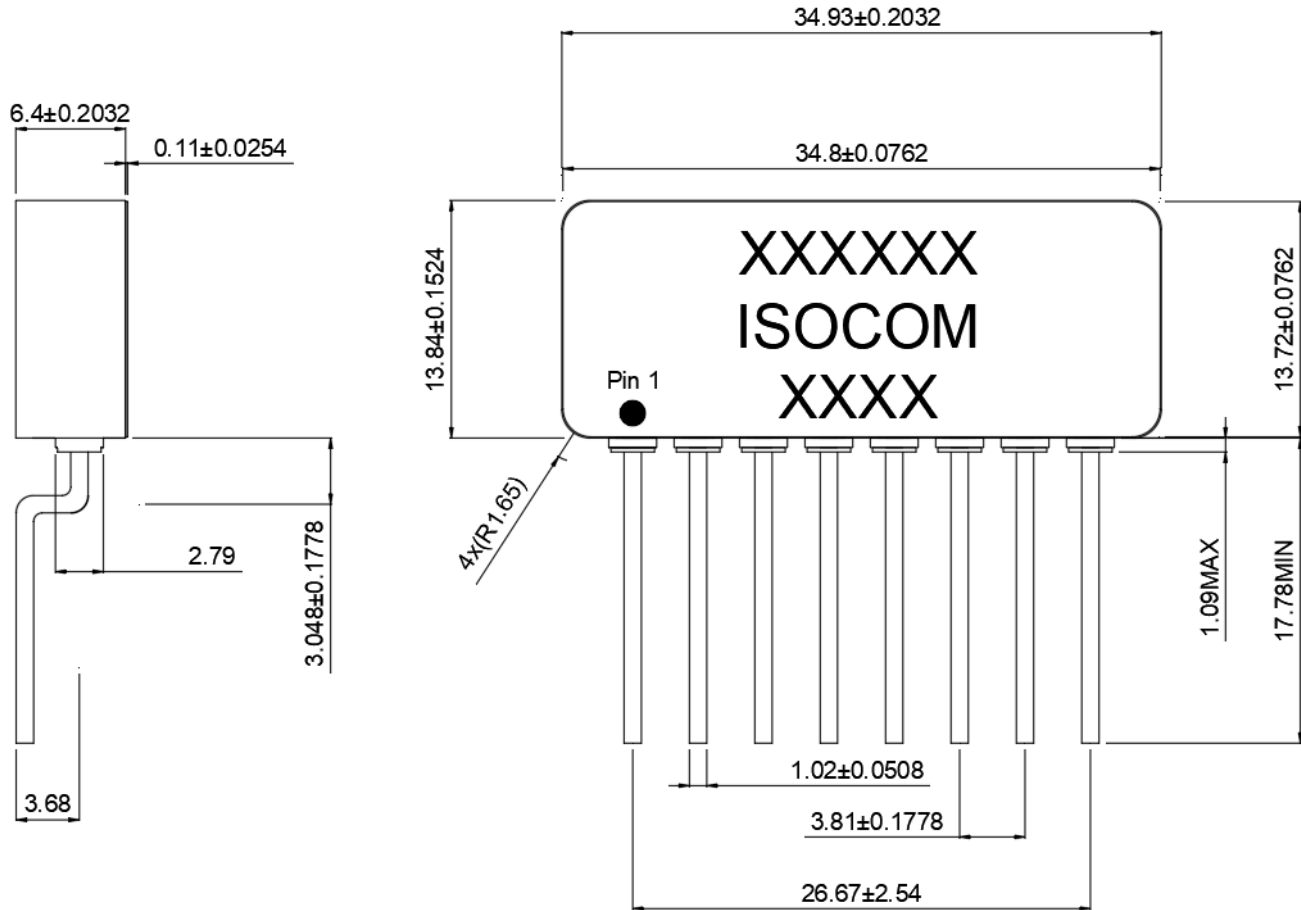
PIN OUT INFORMATION

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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