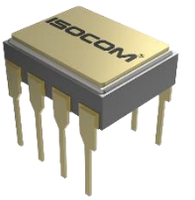
ISOCOM LIMITED

PART NUMBER CS600/CS601



COMPONENT SPECIFICATION ISSUE 5

Component Specification For Hermetically Sealed, Radiation-Hard High Gain Photon Optocouplers

Features	Applications
▪ Total Ionizing Dose tested to 1 Mrad(si) ▪ Displacement Damage tested to 1 MEV x 10^{13} ▪ Hermetically Sealed ▪ High Withstand Test Voltage up to 1,500V_{DC} ▪ 8-pin DIP Package ▪ High Common Mode Rejection ▪ High Speed – typ 10 Mbits/s (75ns max)	▪ Space Radiation Equipment ▪ Military, high reliability system ▪ Medical instruments ▪ Mos, Cmos Applications ▪ Logic Interfacing ▪ Data Transmission ▪ Power Supply ▪ Modems

DESCRIPTION

These devices are single, hermetically sealed optically coupled isolators. Each channel is composed of a Gallium Arsenide infrared emitting diode coupled to an integrated high speed photon detector. The output of the detector is an open collector Schottky clamped transistor. These optocouplers have internal shield providing a guaranteed common mode transient immunity specification of 1,000 V/µs. These optocouplers are for Isolation Voltage applications requiring up to 2,500 V_{DC}.

The CS600 series is being used in environments encountered by space applications. Package styles for this device include 8-pin DIP package, with surface mount and solder dip options available.

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 –

ISOCOM Limited • 2 Fern Court • Bracken Hill Business Park • Peterlee • County Durham • SR8 2RR• United Kingdom

Email: sales@isocom.uk.com • Tel: +44 (0)191 416 6546

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 2013	First issue
2	May 2019	Screening and Group Test information removed, Format edited
3	May 2020	Pin numbers removed from schematic drawing
4	September 2020	Updated Quality Management Logos and removed IECQ Logos
5	November 2022	Updated Format

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

ISOCOM Limited • 2 Fern Court • Bracken Hill Business Park • Peterlee • County Durham • SR8 2RR• United Kingdom

Email: sales@isocom.uk.com • Tel: +44 (0)191 416 6546

PACKAGE STYLES AND CONFIGURATION OPTIONS

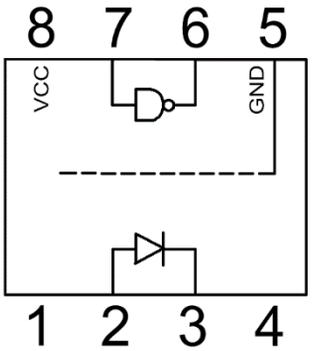
Package	8-Pin DIP
Lead Style	-
Channels	1
Common Channel Wiring	-
Isocom Part Number and Options	
Commercial	CS600 CS601
Defense Screen Level	CS600/L2 CS601/L2
Space Screen Level	CS600/L2S CS601/L2S
Standard Gold Plate Finish	Gold Plate
Butt Joint	Option 10
Solder Dipped	Option 20
Gull Wing	Option 30
Crew Cut	Option 60

FUNCTIONAL DIAGRAMS

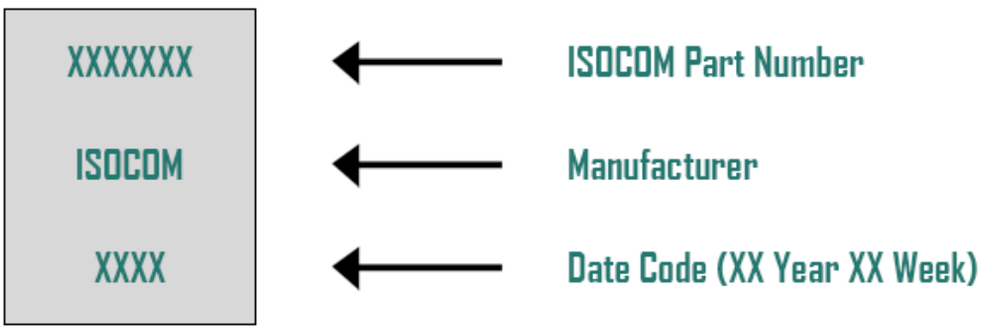
CS600

8-Pin DIP

Single Channel



DEVICE MARKING



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

ISOCOM Limited • 2 Fern Court • Bracken Hill Business Park • Peterlee • County Durham • SR8 2RR• United Kingdom

Email: sales@isocom.uk.com • Tel: +44 (0)191 416 6546

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C C.U.O.S

Parameter	Test Conditions
Storage Temperature	-65°C to +150°C
Operating Temperature	-55°C to +125°C
Lead Soldering Temperature	260°C 1.6mm from case for 10S
Input-to-Output Isolation Voltage	⇧1500VDC
Input Diode	
Peak Forward Current	40mA ≤ 1 mS duration, 500pps
Average Forward Current	20mA (see note 3)
Reverse Voltage	5V
Power Dissipation	35mW
Output Detector	
Supply Voltage	7V > Vcc (1 minute maximum)
Current	25mA
Collector Power Dissipation	40mW
Voltage	7V > Vo (see note 1)

ELECTRICAL CHARACTERISTICS

T_A = 25°C C.U.O.S

**All typical Values at Vcc = 5V, TA = 25°C each channel were appropriate*

Parameter	Symbol	Test Conditions	Min	Typ.	Max	Units
Current Transfer Ratio [1]	CTR	V_{CC} =5.5V, V_O=0.6V, I_F = 10mA	100	-	-	%
Lower Level output voltage [1 & 9]	V_{OL}	V_{CC} =5.5V, I_F = 10mA, I_{oL}(sinking) 10mA	-	0.4	0.6	V
High level output current [1]	I_{oH}	I_F =250µA, V_O= V_{CC}=5.5V	-	20	250	µA
High level supply current	I_{CCH}	V_{CC}=5.5V, I_{F1} = I_{F2} = 0	-	15	28	mA
Low level supply current	I_{CCL}	V_{CC}=5.5V, I_{F1} = I_{F2} = 20mA	-	-	36	mA
Input forward voltage [1]	V_F	I_F = 10mA	-	1.5	1.9	V
		I_F = 20mA	-	-	1.9	V
Input-Output Insulation Leakage Current [2 & 10]	I_{I-O}	RH=45%, t=5S, V_{I-O}= 1500vdc	-	-	1.0	µA
Input reverse breakdown [1 & 6]	V_{BR}	I_R = 10µA	5	-	-	V
Propagation Delay Time to Low Output Level [1 & 6]	tPHL	R_L = 510Ω, V_{CC} = 5V, I_F = 13mA, C_L= 50pF	-	-	100	nS
		R_L = 510Ω, V_{CC} = 5V, I_F = 13mA, C_L= 15pF	-	55	90	nS
Propagation Delay Time to High Output Level [1 & 5]	tPLH	R_L = 510Ω, V_{CC} = 5V, I_F = 13mA, C_L= 50pF	-	-	100	nS
		R_L = 510Ω, V_{CC} = 5V, I_F = 13mA, C_L= 15pF	-	55	90	nS

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

ISOCOM Limited • 2 Fern Court • Bracken Hill Business Park • Peterlee • County Durham • SR8 2RR• United Kingdom

Email: sales@isocom.uk.com • Tel: +44 (0)191 416 6546

TYPICAL CHARACTERISTICS

T_A = 25°C U.O.S.

**All typical Values at Vcc = 5V, T_A = 25°C each channel where appropriate*

Parameter	Symbol	Test Conditions	Min	Typ.	Max	Units
Resistance [3]	R_{IO}	V_{10} = 500 V_{dc}	-	10^{12}	-	Ω
Capacitance [3]	C_{IO}	f = 1MHz	-	1.9	-	pF
Input Capacitance [1]	C_{IN}	f = 1MHz, V_F = 0	-	60	-	pF
Input Diode Temperature Coefficient [1]	$\frac{\Delta V_F}{\Delta T_A}$	I_F = 20mA	-	-1.9	-	mV/°C
Input-Input Insulation Leakage Current [4]	I_{I-I}	45% Relative Humidity V_{II} = 500 V_{dc}, t = 5S,	-	0.5	-	nA
Resistance [4]	R_{I-I}	V_{II} = 500 V_{dc}	-	10^{12}	-	Ω
Capacitance [4]	C_{I-I}	f = 1MHz	-	0.6	-	pF
Output Rise (10-90%) [1]	tr	R_L = 510Ω, Vcc = 5V,I_F = 13mA, C_L= 15pF	-	35	-	ns
Output Fall Time (90-10%) [1]	tf	R_L = 510Ω, Vcc = 5V,I_F = 13mA, C_L= 15pF	-	35	-	ns
Common Mode Transient Immunity at Logic High Output Level [1&7]	CM_H	Vo (min) =2V, I_F = 0mA, V_{cm} =10V (peak), R_L = 510Ω	-	-1000	-	V/µS
Common Mode Transient Immunity at Logic Low Output Level [1&7]	CM_L	Vo (max) =0.8V, I_F = 10mA, V_{cm} =10V (peak), R_L = 510Ω	-	-1000	-	V/µS

Notes:

1. Each channel, where appropriate.
2. Measured between pins 1 through 4 shorted together, and pins 9 through 16 shorted together.
3. Measured between pins 1 and 2, or 5 and 6 shorted together, and pins 9 through 16 shorted together.
4. Measured between pins 1 and 2 shorted together, and pins 5 and 6 shorted together.
5. The t_{PLH} propagation delay is measured from the 6.5mA point on the trailing edge of the input pulse to the 1.5V point on the trailing edge of the output pulse.
6. The t_{PHL} propagation delay is measured from the 6.5mA point on the leading edge of the input pulse to the 1.5V point on the leading edge of the output pulse.
7. CM_H is the maximum tolerable common mode transient to assure that the output will remain in a high logic state (i.e., V_O > 2.0V).
8. CM_L is the maximum tolerable common mode transient to assure that the output will remain in the logic low state (i.e., V_O < 2.0V).
9. It is essential that a bypass capacitor (0.1 to 0.1µF, ceramic) be connected from pin 10 to pin 15. Total lead length between both ends of the capacitor and the isolator pins should not exceed 20mm.
10. This is a momentary withstand test, not an operating condition.

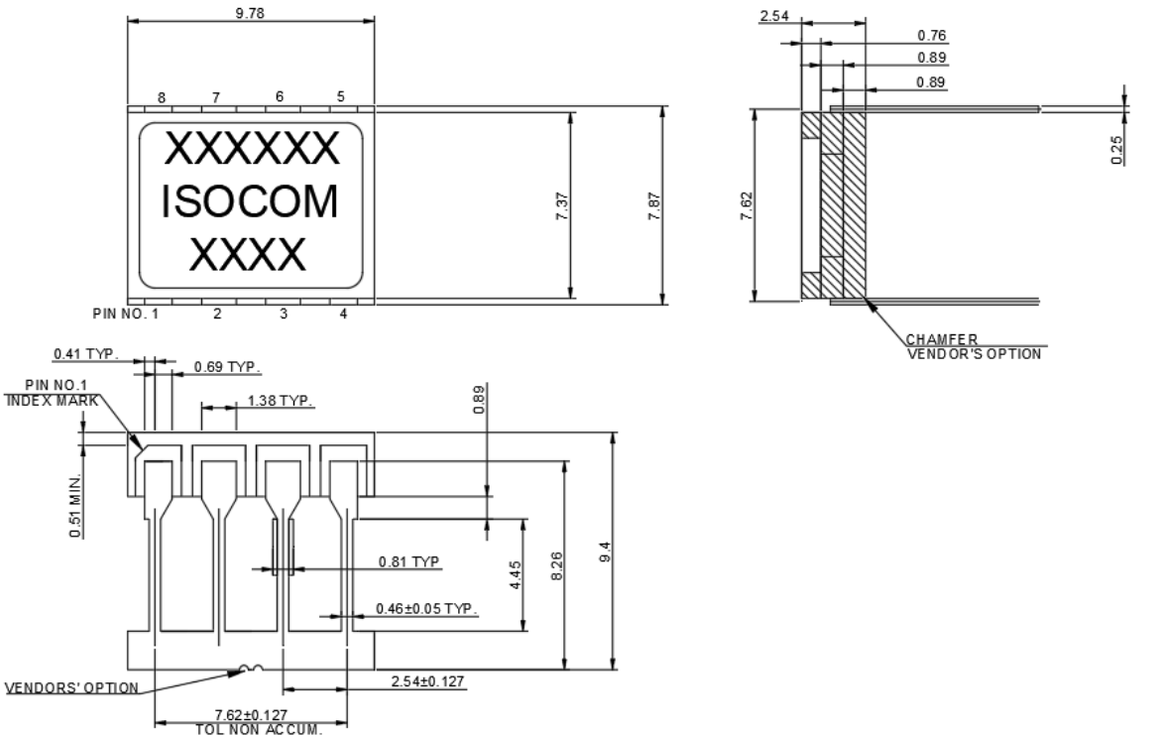
For sales enquiries, or further information, please contact our sales office at –

ISOCOM Limited • 2 Fern Court • Bracken Hill Business Park • Peterlee • County Durham • SR8 2RR• United Kingdom

Email: sales@isocom.uk.com • Tel: +44 (0)191 416 6546

OUTLINE DRAWINGS

8-Pin DIP



PIN OUT INFORMATION

Pin Number	Pin Function
1	N/C
2	LED Anode
3	LED Cathode
4	N/C
5	GND
6	Out
7	Enable
8	V_{CC}

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

ISOCOM Limited • 2 Fern Court • Bracken Hill Business Park • Peterlee • County Durham • SR8 2RR• United Kingdom

Email: sales@isocom.uk.com • Tel: +44 (0)191 416 6546

DISCLAIMER

The information provided on the datasheet is for preliminary and general information only. We do not warrant that the information contained on the datasheet is suitable for your intended use, nor do we accept responsibility for loss suffered as a result of reliance by you upon the accuracy or currency of information contained on the datasheet. In particular, you should not make any investment or commercial decision on the basis of the information contained on the datasheet. You should obtain independent professional advice and make your own further enquiries before making any investment or commercial decision or taking any further action in any way related to the information contained on the datasheet.

We are not aware of any inaccuracy in the information contained on the datasheet. However, we do not warrant the accuracy, adequacy or completeness of such information.

We reserve the right to remove or alter any of the information contained on the datasheet at any time. However, we do not guarantee the currency of the information contained on the datasheet, nor do we undertake to keep the datasheet updated.

ISOCOM Limited
2 Fern Court
Bracken Hill Business Park
Peterlee
County Durham
SR8 2RR
United Kingdom

W – www.isocom.uk.com
E – sales@isocom.uk.com
T - +44 (0) 191 416 6546

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