



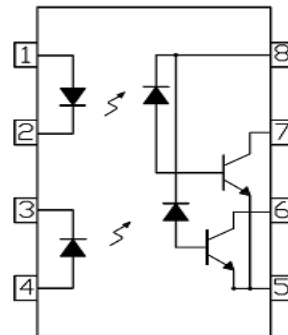
ICPL0530, ICPL0531



DESCRIPTION

The ICPL0530 and ICPL0531 dual channel devices each consists of an infrared emitting diode optically coupled to a high speed photo detector transistor. Separate connection for the photodiode and output transistor collector increases the speed by several order of magnitude over conventional phototransistor couplers by reducing the base-collector capacitance of the input transistor.

These devices belong to Isocom Compact Range of optocouplers.



- 1 Anode (Channel 1)
- 2 Cathode (Channel 1)
- 3 Cathode (Channel 2)
- 4 Cathode (Channel 2)
- 5 GND
- 6 Output (Channel 2)
- 7 Output (Channel 1)
- 8 V_{CC}

FEATURES

- High speed 1Mbit/s
- Half Pitch 1.27mm
- High AC Isolation Voltage 3750V_{RMS}
- Guaranteed Performance from 0°C to 70°C
- Wide Operating Temperature Range
- -55°C to 100°C
- Pb Free and RoHS Compliant
- Safety Approvals Pending

APPLICATIONS

- Line Receivers, Data Communication
- Telecommunication Equipments
- Power Transistor Isolation in Motor Drives
- Replacement of Low Speed Phototransistor Optocouplers
- Switch Mode Power Supplies
- High Speed Logic Ground Isolation
- Home Appliances

ORDER INFORMATION

Available in Tape and Reel with 2000pcs per reel

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device.

Exposure to absolute maximum ratings for long periods of time

Input

Forward Current	25mA
Peak Forward Current (50% Duty Cycle, 1ms P.W.)	50mA
Peak Transient Current ($\leq 1\mu\text{s}$ P.W., 300pps)	1A
Reverse Voltage	5V
Power dissipation	45mW

Output

Output Current	8mA
Peak Output Current	16mA
Output Voltage	-0.5 to 20V
Supply Voltage	-0.5 to 30V
Base-Emitter Reverse Voltage	5V
Power Dissipation	100mW

Total Package

Isolation Voltage	3750V _{RMS}
Operating Temperature	-55 to 100 °C
Storage Temperature	-55 to 125 °C
Lead Soldering Temperature (10s)	260°C

ISOCOM COMPONENTS 2004 LTD

Unit 25B, Park View Road West, Park View Industrial Estate
Hartlepool, Cleveland, TS25 1PE, United Kingdom
Tel : +44 (0)1429 863 609 Fax : +44 (0)1429 863 581
e-mail : sales@isocom.co.uk
<http://www.isocom.com>

ISOCOM COMPONENTS ASIA LTD

Hong Kong Office,
Block A, 8/F, Wah Hing Industrial Mansion,
36 Tai Yau Street, San Po Kong, Kowloon, Hong Kong.
Tel : +852 2995 9217 Fax : +852 8161 6292
e-mail : sales@isocom.com.hk



ICPL0530, ICPL0531

ELECTRICAL CHARACTERISTICS ($T_A = 0^\circ\text{C}$ to 70°C unless otherwise specified)

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = 16\text{mA}$		1.4	1.8	V
Reverse Voltage	V_R	$I_R = 10\mu\text{A}$	5.0			V
Temperature Coefficient of V_F	$\Delta V_F / \Delta T_A$	$I_F = 16\text{mA}$		-1.6		mV/ $^\circ\text{C}$
Input Capacitance	C_{IN}	$V_F = 0\text{V}$, $f = 1\text{MHz}$		60		pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
High Level Supply Current	I_{CCH}	$I_F = 0\text{mA}$, $V_{CC} = 15\text{V}$, $V_O = \text{Open}$, $T_A = 25^\circ\text{C}$		0.01	1	μA
		$I_F = 0\text{mA}$, $V_{CC} = 15\text{V}$, $V_O = \text{Open}$			2	
Low Level Supply Current	I_{CCL}	$I_F = 16\text{mA}$, $V_{CC} = 15\text{V}$ $V_O = \text{Open}$		120	200	μA



ICPL0530, ICPL0531

ELECTRICAL CHARACTERISTICS ($T_A = 0^\circ\text{C}$ to 70°C unless otherwise specified)

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	ICPL0530				%
		$V_{CC} = 4.5\text{V}$, $I_F = 16\text{mA}$, $V_O = 0.4\text{V}$ $T_A = 25^\circ\text{C}$	7		50	
		$V_{CC} = 4.5\text{V}$, $I_F = 16\text{mA}$, $V_O = 0.5\text{V}$	5			
		ICPL0531				
High Level Output Current	I_{OH}	$V_{CC} = 4.5\text{V}$, $I_F = 16\text{mA}$, $V_O = 0.4\text{V}$ $T_A = 25^\circ\text{C}$	19		50	μA
		$V_{CC} = 4.5\text{V}$, $I_F = 16\text{mA}$, $V_O = 0.5\text{V}$	15			
		$V_{CC} = 5.5\text{V}$, $V_O = 5.5\text{V}$ $I_F = 0\text{mA}$, $T_A = 25^\circ\text{C}$		0.001	0.5	
		$V_{CC} = 15\text{V}$, $V_O = 15\text{V}$ $I_F = 0\text{mA}$, $T_A = 25^\circ\text{C}$		0.01	1	
Low Level Output Voltage	V_{OL}	$V_{CC} = 15\text{V}$, $V_O = 15\text{V}$ $I_F = 0\text{mA}$			50	V
		ICPL0530				
		$V_{CC} = 4.5\text{V}$, $I_F = 16\text{mA}$, $I_O = 1.1\text{mA}$ $T_A = 25^\circ\text{C}$		0.18	0.4	
		$V_{CC} = 4.5\text{V}$, $I_F = 16\text{mA}$, $I_O = 0.8\text{mA}$			0.5	
		ICPL0531				
		$V_{CC} = 4.5\text{V}$, $I_F = 16\text{mA}$, $I_O = 3\text{mA}$ $T_A = 25^\circ\text{C}$		0.3	0.4	
		$V_{CC} = 4.5\text{V}$, $I_F = 16\text{mA}$, $I_O = 2.4\text{mA}$			0.5	



ICPL0530, ICPL0531

ELECTRICAL CHARACTERISTICS ($T_A = 0^\circ\text{C}$ to 70°C unless otherwise specified)

Switching Characteristics ($T_A = 0^\circ\text{C}$ to 70°C , $I_F = 16\text{mA}$, $V_{CC} = 5\text{V}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Propagation Delay Time to Logic Low	T_{PHL}	ICPL0530				μs
		$R_L = 4.1\text{k}\Omega$, $T_A = 25^\circ\text{C}$			1.5	
		$R_L = 4.1\text{k}\Omega$			2.0	
		ICPL0531				
		$R_L = 1.9\text{k}\Omega$, $T_A = 25^\circ\text{C}$			0.8	
		$R_L = 1.9\text{k}\Omega$			1.0	
Propagation Delay Time to Logic High	T_{PLH}	ICPL0530				μs
		$R_L = 4.1\text{k}\Omega$, $T_A = 25^\circ\text{C}$			1.5	
		$R_L = 4.1\text{k}\Omega$			2.0	
		ICPL0531				
		$R_L = 1.9\text{k}\Omega$, $T_A = 25^\circ\text{C}$			0.8	
		$R_L = 1.9\text{k}\Omega$			1.0	
Common Mode Transient Immunity at Logic High	CM_H	ICPL0530	1000	10000		$\text{V}/\mu\text{s}$
		$I_F = 0\text{mA}$, $R_L = 4.1\text{k}\Omega$, $V_{CM} = 10\text{Vp-p}$, $T_A = 25^\circ\text{C}$				
		ICPL0531	1000			
		$I_F = 0\text{mA}$, $R_L = 1.9\text{k}\Omega$, $V_{CM} = 1500\text{Vp-p}$, $T_A = 25^\circ\text{C}$				
Common Mode Transient Immunity at Logic Low	CM_L	ICPL0530	1000	10000		$\text{V}/\mu\text{s}$
		$I_F = 16\text{mA}$, $R_L = 4.1\text{k}\Omega$, $V_{CM} = 10\text{Vp-p}$, $T_A = 25^\circ\text{C}$				
		ICPL0531	1000			
		$I_F = 16\text{mA}$, $R_L = 350\Omega$, $V_{CM} = 1500\text{Vp-p}$, $T_A = 25^\circ\text{C}$				

CM_H – The maximum tolerable rate of rise of the common mode voltage to ensure the output will remain in the HIGH state (i.e., $V_{OUT} > 2.0\text{V}$).



ICPL0530, ICPL0531

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Insulation Voltage	V_{ISO}	AC 1 minute, RH 40 to 60% Input Leads Shorted together and Output Leads Shorted together	3750			V_{RMS}



ICPL0530, ICPL0531

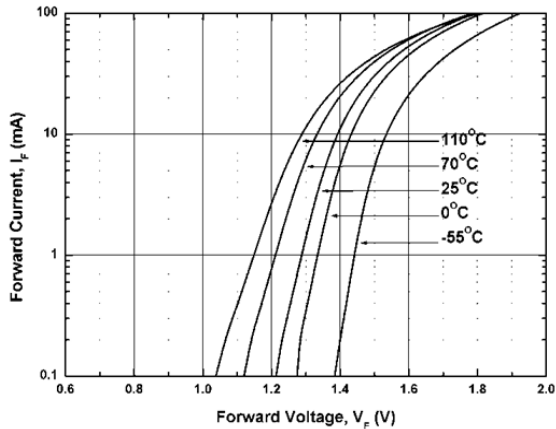


Fig 1 Forward Current vs Forward Voltage

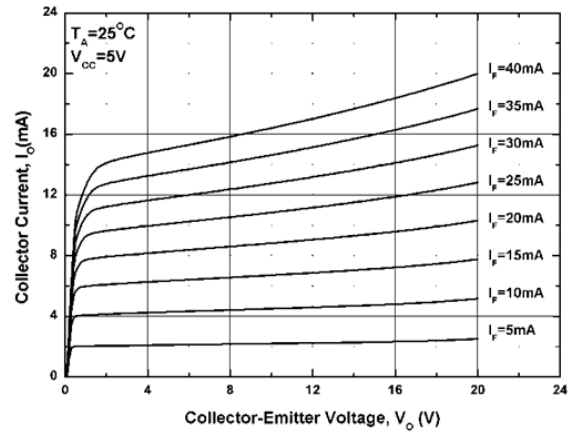


Fig 2 Output Current vs Output voltage

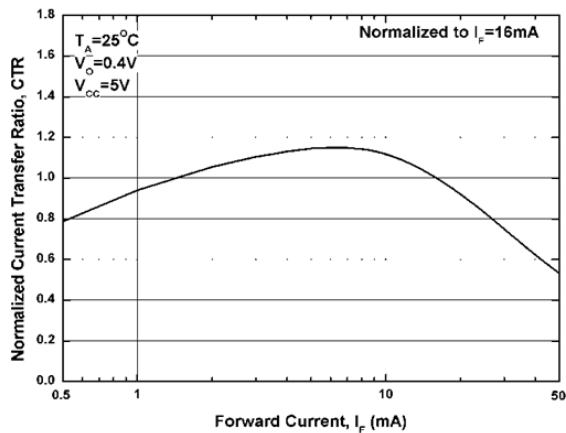


Fig 3 Current Transfer Ratio vs forward Current

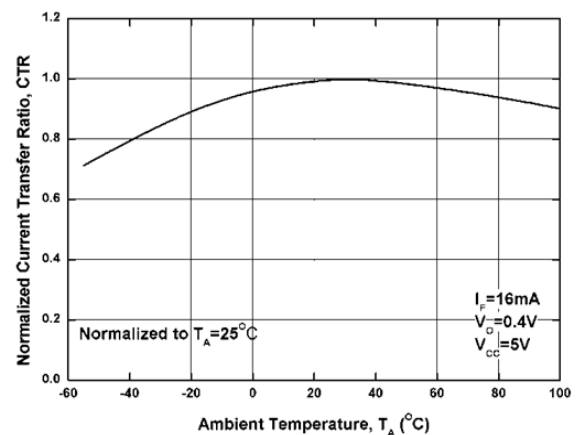


Fig 4 Current Transfer Ratio vs T_A

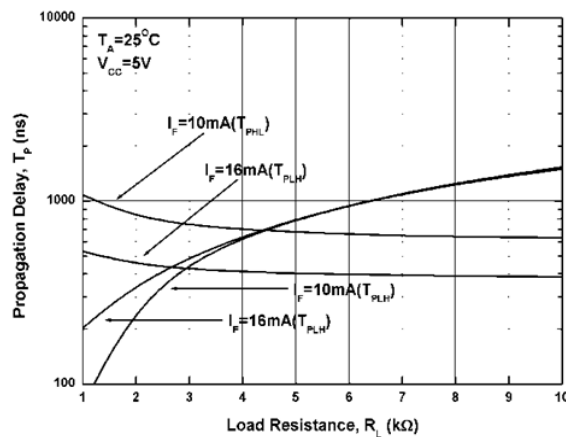


Fig 5 Propagation Delay vs Load Resistance

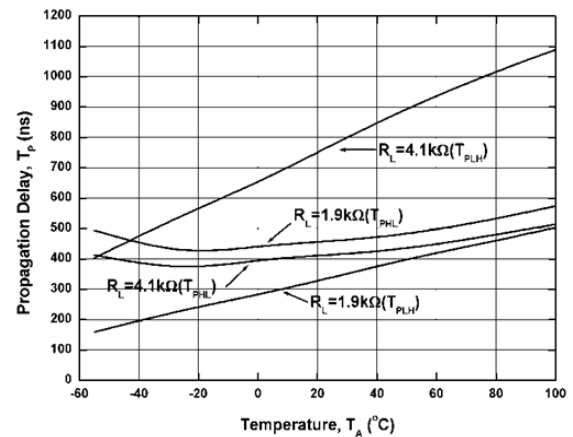


Fig 6 Propagation Delay vs T_A



ICPL0530, ICPL0531

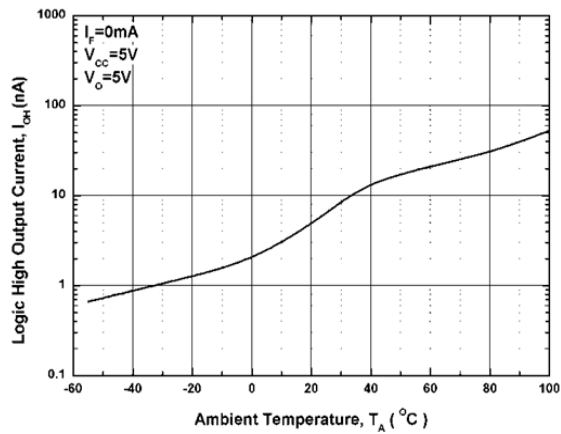


Fig 7 Logic High Output Current vs T_A

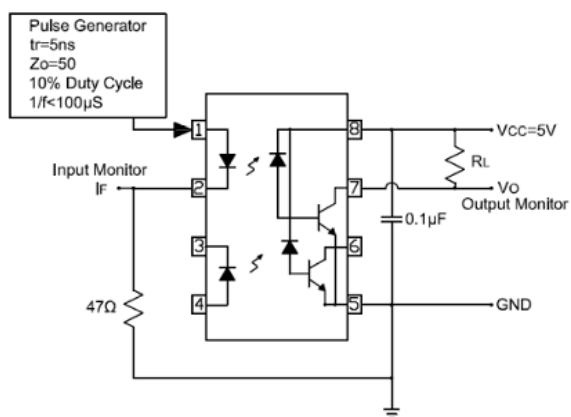


Fig 8 Switching Time Test Circuit

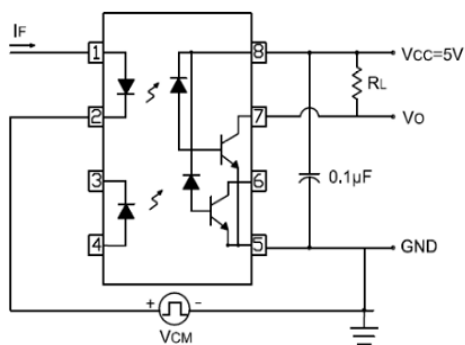
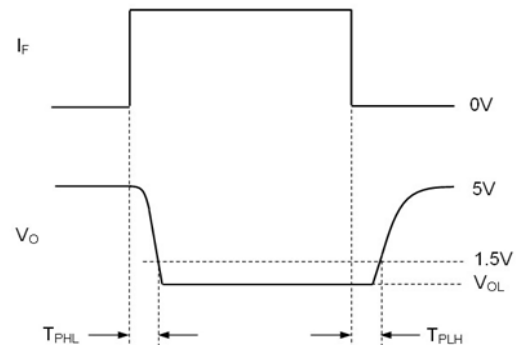
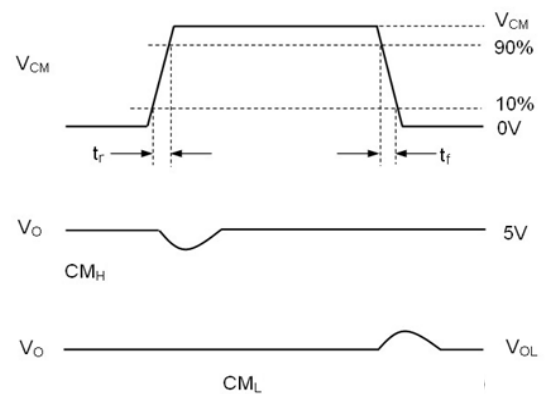


Fig 9 Transient Immunity Test Circuit



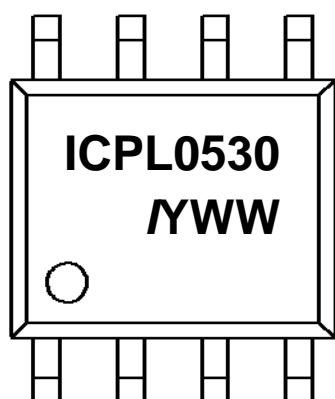


ICPL0530, ICPL0531

ORDER INFORMATION

ICPL0530, ICPL0531			
After PN	PN	Description	Packing quantity
None	ICPL0530, ICPL0531	Surface Mount Tape & Reel	2000 pcs per reel

DEVICE MARKING



ICPL0530 denotes Device Part Number (ICPL0530 is used as example)

I denotes Isocom

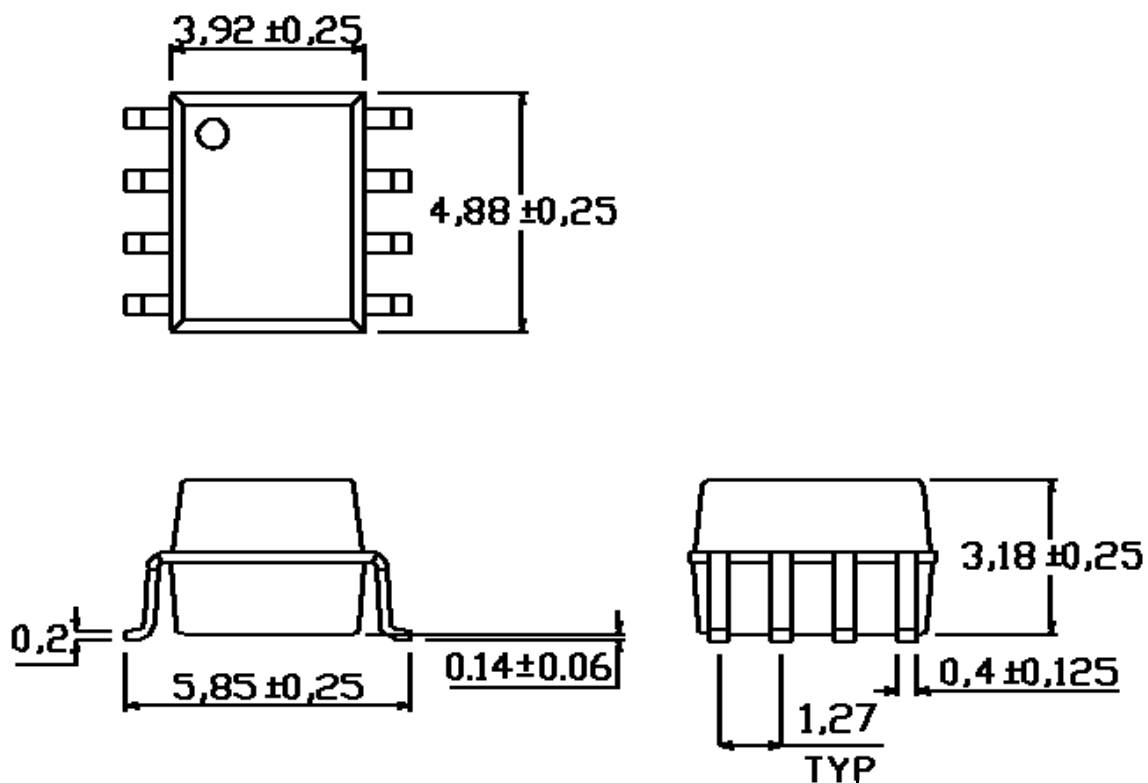
Y denotes 1 digit Year code

WW denotes 2 digit Week code

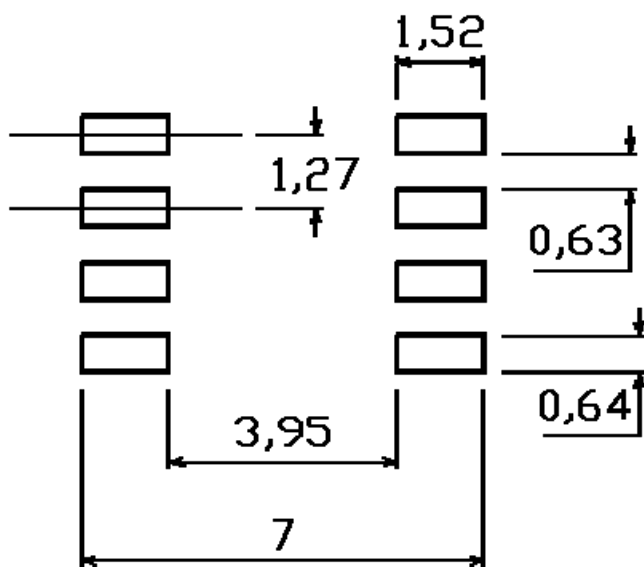


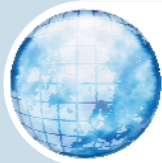
ICPL0530, ICPL0531

PACKAGE DIMENSIONS (mm)



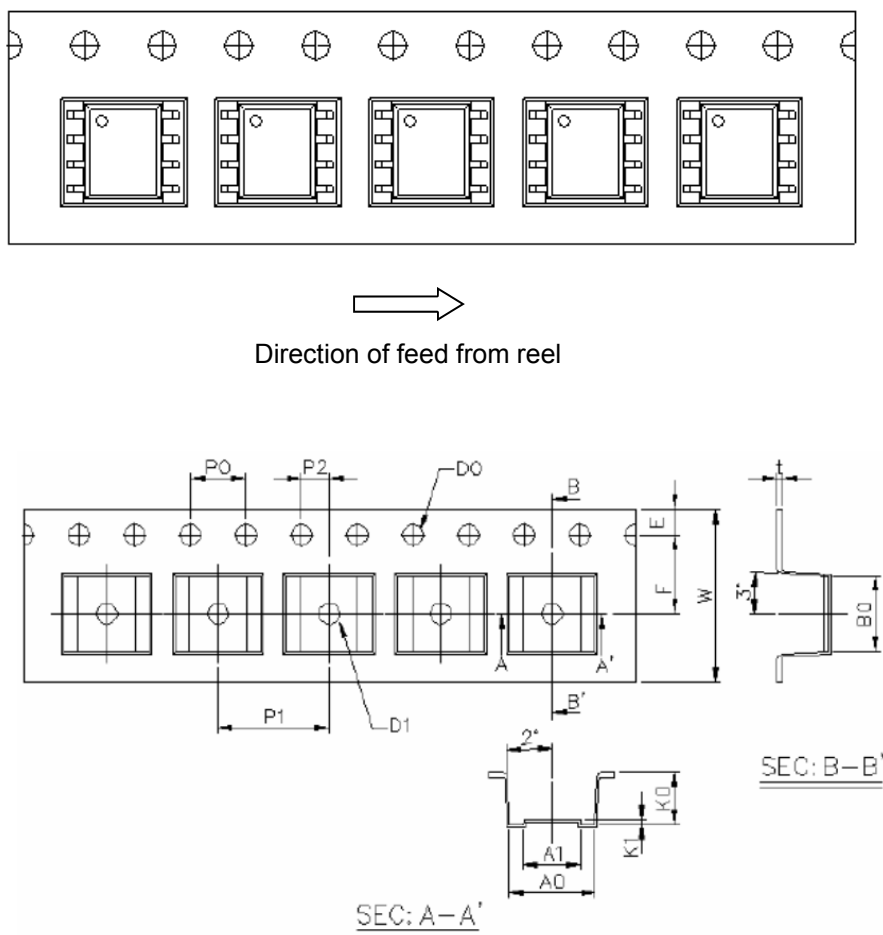
RECOMMENDED PAD LAYOUT (mm)





ICPL0530, ICPL0531

TAPE AND REEL PACKAGING

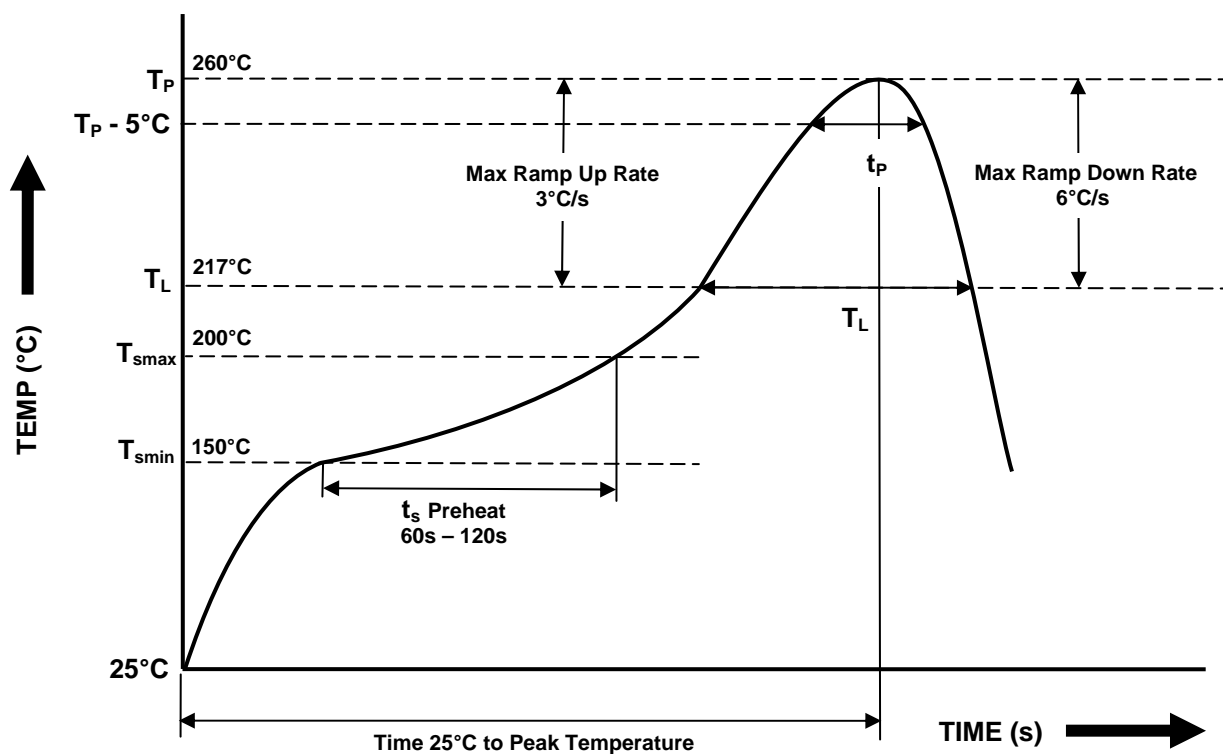


Dimension No.	A0	A1	B0	D0	D1	E	F
Dimension (mm)	6.2±0.1	4.1±0.1	5.28±0.1	1.5±0.1	1.5±0.3	1.75±0.1	5.5±0.1
Dimension No.	Po	P1	P2	t	W	K0	K1
Dimension (mm)	4.0±0.1	8.0±0.1	2.0±0.1	0.4±0.1	12.0 +0.3/-0.1	3.7±0.1	0.3±0.1

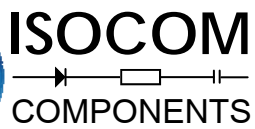


ICPL0530, ICPL0531

IR REFLOW SOLDERING TEMPERATURE PROFILE (One Time Reflow Soldering is Recommended)



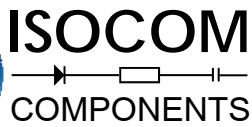
Profile Details	Conditions
Preheat <ul style="list-style-type: none">- Min Temperature (T_{SMIN})- Max Temperature (T_{SMAX})- Time T_{SMIN} to T_{SMAX} (t_s)	150°C 200°C 60s - 120s
Soldering Zone <ul style="list-style-type: none">- Peak Temperature (T_P)- Liquidous Temperature (T_L)- Time within 5°C of Actual Peak Temperature ($T_P - 5^\circ\text{C}$)- Time maintained above T_L (t_L)- Ramp Up Rate (T_L to T_P)- Ramp Down Rate (T_P to T_L)	260°C 217°C 30s 60s - 100s 3°C/s max 6°C/s max
Average Ramp Up Rate (T_{smax} to T_P)	3°C/s max
Time 25°C to Peak Temperature	8 minutes max



ICPL0530, ICPL0531

NOTES :

- Isocom is continually improving the quality, reliability, function or design and Isocom reserves the right to make changes without further notices.
- The products shown in this publication are designed for the general use in electronic applications such as office automation equipment, communications devices, audio/visual equipment, electrical application and instrumentation.
- For equipment/application where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc., please contact our sales representatives.
- When requiring a device for any "specific" application, please contact our sales for advice.
- The contents described herein are subject to change without prior notice.
- Do not immerse device body in solder paste.



DISCLAIMER

ISOCOM is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing ISOCOM products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such ISOCOM products could cause loss of human life, bodily injury or damage to property.

In developing your designs, please ensure that ISOCOM products are used within specified operating ranges as set forth in the most recent ISOCOM products specifications.

___ The ISOCOM products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These ISOCOM products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (“Unintended Usage”). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation Instruments, traffic signal instruments, combustion control instruments, medical Instruments, all types of safety devices, etc.. Unintended Usage of ISOCOM products listed in this document shall be made at the customer’s own risk.

___ Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.

__ The products described in this document are subject to the foreign exchange and foreign trade laws.

___ The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by ISOCOM Components for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of ISOCOM Components or others.

The information contained herein is subject to change without notice.