

ISP815, ISP825, ISP845



DESCRIPTION

The ISP815, ISP825 and ISP845 series of optically coupled isolator consist of an infrared light emitting diode and an NPN silicon photo darlington in a space efficient Dual In Line Plastic Package.

FEATURES

- AC Isolation Voltage 5000V_{RMS}
- Wide Operating Temperature Range -30°C to +100°C
- Lead Free and RoHS Compliant
- UL File E91231 Package Code "FF"
- VDE Approval Certificate No. 40028086

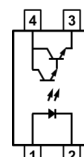
APPLICATIONS

- Computer Terminals
- Industrial System Controllers
- Measuring Instruments
- Signal Transmission between Systems of Different Potentials and Impedances

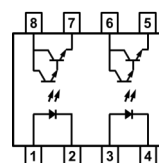
ORDER INFORMATION

- Add X after PN for VDE Approval
- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount
- Add SMT&R after PN for Surface Mount Tape & Reel (Available for ISP815SM and ISP825SM)
- Consult Factory for Tape and Reel version of ISP845SM

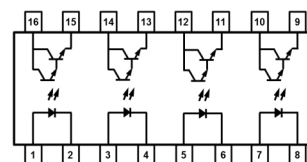
ISP815



ISP825



ISP845



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device. Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

Input

Forward Current	50mA
Reverse Voltage	6V
Power dissipation	70mW

Output

Collector to Emitter Voltage V _{CEO}	35V
Emitter to Collector Voltage V _{ECO}	6V
Collector Current	80mA
Power Dissipation	150mW

Total Package

Isolation Voltage	5000V _{RMS}
Total Power Dissipation	200mW
Operating Temperature	-30 to 100 °C
Junction Temperature	125 °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 Mansions
36 Tai Yau Street, San Po Kong, Kowloon, Hong Kong
Tel : +852 2995 9217 Fax : +852 8161 6292
e-mail : sales@isocom.com.hk

ISP815, ISP825, ISP845

ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C unless otherwise specified)

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = 20\text{mA}$		1.2	1.4	V
Reverse Leakage	I_R	$V_R = 4\text{V}$			10	μA
Terminal Capacitance	C_t	$V = 0\text{V}, f = 1\text{KHz}$		30	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector–Emitter Breakdown Voltage	BV_{CEO}	$I_C = 0.1\text{mA}, I_F = 0\text{mA}$	35			V
Emitter–Collector Breakdown Voltage	BV_{ECO}	$I_E = 10\mu\text{A}, I_F = 0\text{mA}$	6			V
Collector–Emitter Dark Current	I_{CEO}	$V_{CE} = 10\text{V}, I_F = 0\text{mA}$			1	μA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	$I_F = 1\text{mA}, V_{CE} = 2\text{V}$	600		7500	%
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 20\text{mA}, I_C = 5\text{mA}$		0.8	1	V
Floating Capacitance	C_f	$V = 0\text{V}, f = 1\text{MHz}$		0.6	1	pF
Cut-Off Frequency	f_c	$V_{CE} = 5\text{V}, I_C = 2\text{mA},$ $R_L = 100\Omega,$ -3dB	1	6		kHz
Output Rise Time	t_r	$V_{CE} = 2\text{V},$ $I_C = 10\text{mA},$ $R_L = 100\Omega$		60	300	μs
Output Fall Time	t_f			53	250	

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input to Output Isolation Voltage	V_{ISO}	AC 1 minute, RH = 40% to 60% Note 1	5000			V_{RMS}
Input to Output Isolation Resistance	R_{ISO}	$V_{IO} = 500\text{VDC},$ RH = 40% to 60% Note 1	5×10^{10}	1×10^{11}		Ω

Note 1 : Measure with input leads shorted together and output leads shorted together.



ISP815, ISP825, ISP845

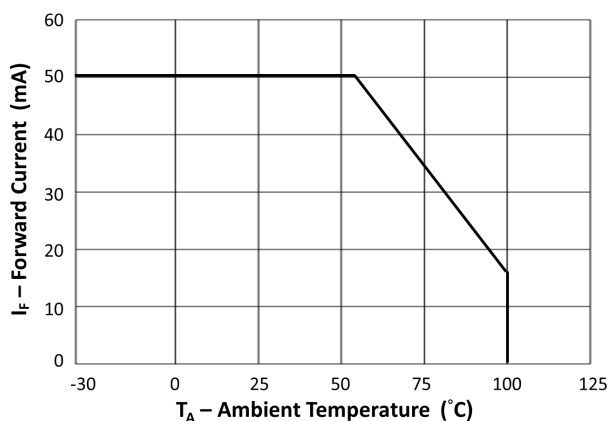


Fig 1 Forward Current vs Ambient Temperature

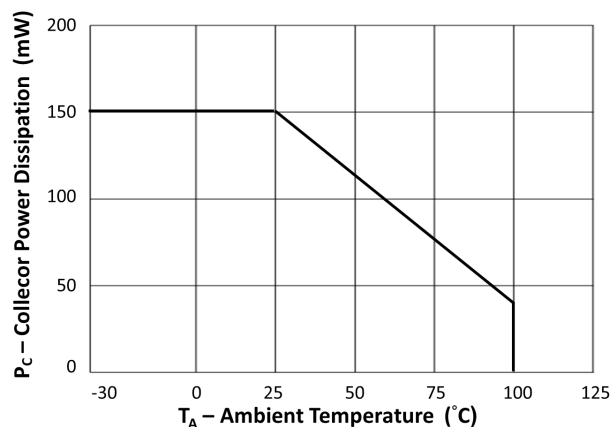


Fig 2 Collector Power Dissipation vs Ambient Temperature

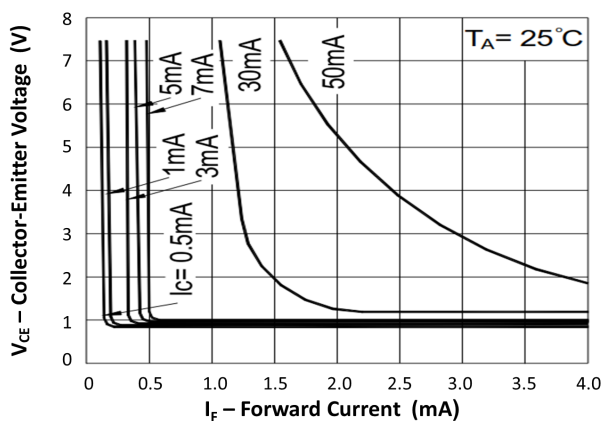


Fig 3 Collector-Emitter Voltage vs Forward Current

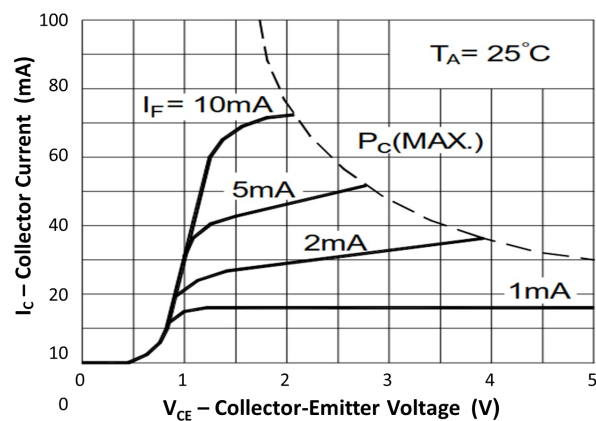


Fig 4 Collector Current vs Collector-Emitter Voltage

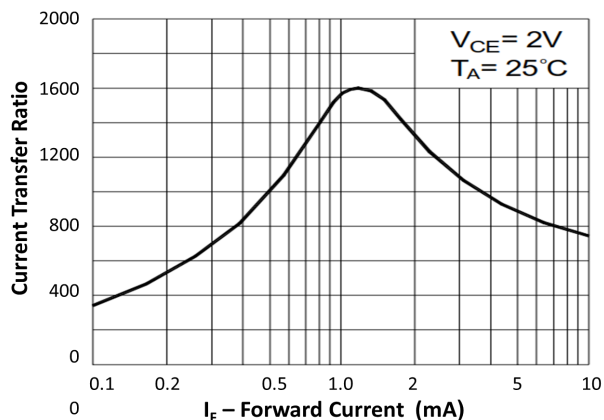


Fig 5 Current Transfer Ratio vs Forward Current

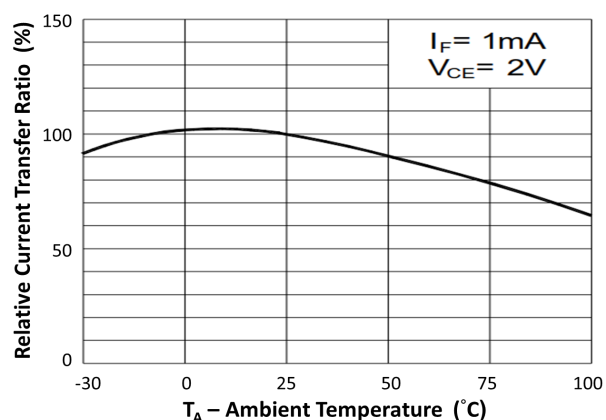


Fig 6 Relative Current Transfer Ratio vs Ambient Temperature



ISP815, ISP825, ISP845

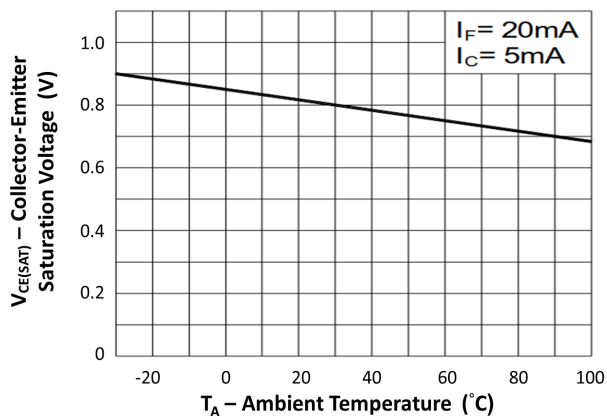


Fig 7 Collector-Emitter Saturation Voltage vs Ambient Temperature

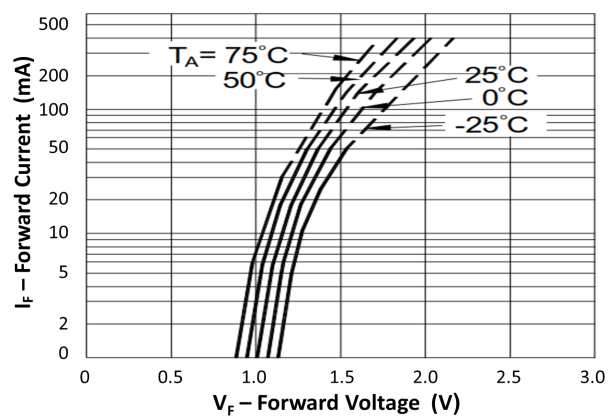


Fig 8 Forward Current vs Forward Voltage

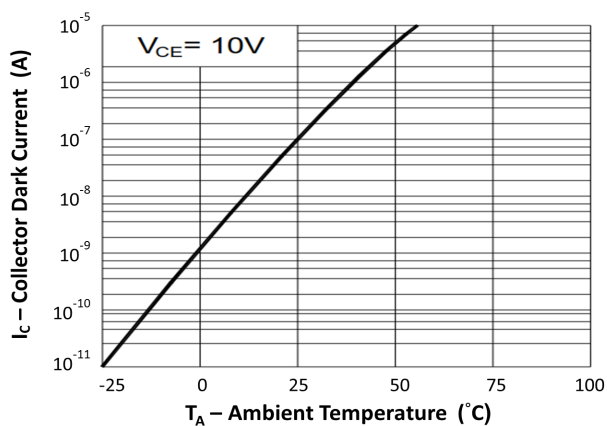


Fig 9 Collector Dark Current vs Ambient Temperature

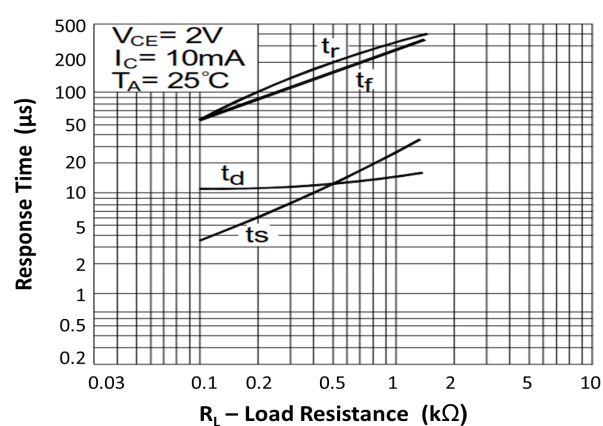


Fig 10 Response Time vs Load Resistance

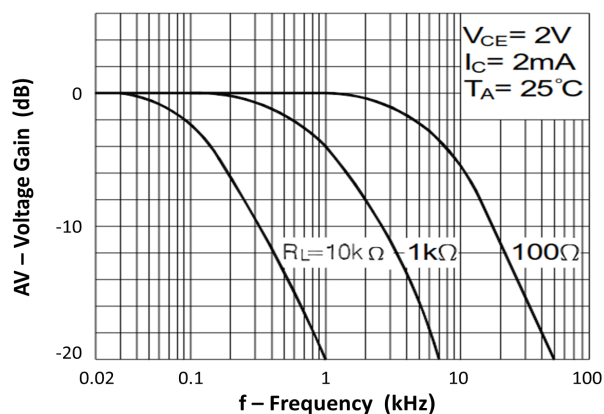
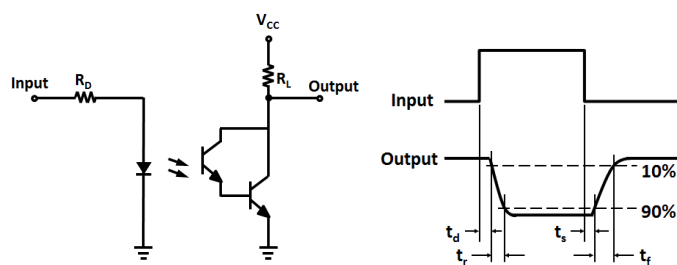


Fig 11 Frequency Response



Response Time Test Circuit

ISP815, ISP825, ISP845

ORDER INFORMATION

ISP815 (UL Approval)

After PN	PN	Description	Packing quantity
None	ISP815	Standard DIP4	100 pcs per tube
G	ISP815G	10mm Lead Spacing	100 pcs per tube
SM	ISP815SM	Surface Mount	100 pcs per tube
SMT&R	ISP815SMT&R,	Surface Mount Tape & Reel	1000 pcs per reel

ISP825 (UL Approval)

After PN	PN	Description	Packing quantity
None	ISP825	Standard DIP8	50 pcs per tube
G	ISP825G	10mm Lead Spacing	50 pcs per tube
SM	ISP825SM	Surface Mount	50 pcs per tube
SMT&R	ISP825SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

ISP845 (UL Approval)

After PN	PN	Description	Packing quantity
None	ISP845	Standard DIP16	25 pcs per tube
G	ISP845G	10mm Lead Spacing	25 pcs per tube
SM	ISP845SM	Surface Mount	25 pcs per tube

ISP815, ISP825, ISP845

ORDER INFORMATION

ISP815X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	ISP815X	Standard DIP4	100 pcs per tube
G	ISP815XG	10mm Lead Spacing	100 pcs per tube
SM	ISP815XSM	Surface Mount	100 pcs per tube
SMT&R	ISP815XSMT&R,	Surface Mount Tape & Reel	1000 pcs per reel

ISP825X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	ISP825X	Standard DIP8	50 pcs per tube
G	ISP825XG	10mm Lead Spacing	50 pcs per tube
SM	ISP825XSM	Surface Mount	50 pcs per tube
SMT&R	ISP825XSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

ISP845X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	ISP845X	Standard DIP16	25 pcs per tube
G	ISP845XG	10mm Lead Spacing	25 pcs per tube
SM	ISP845XSM	Surface Mount	25 pcs per tube



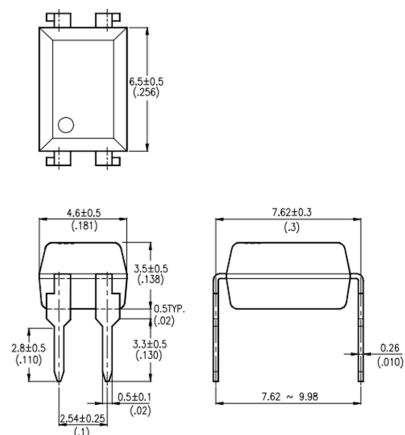
ISOCOM
COMPONENTS

ISP815, ISP825, ISP845

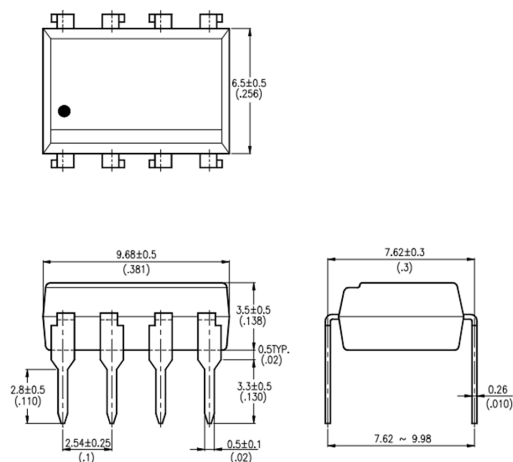
PACKAGE DIMENSIONS in mm (inch)

DIP

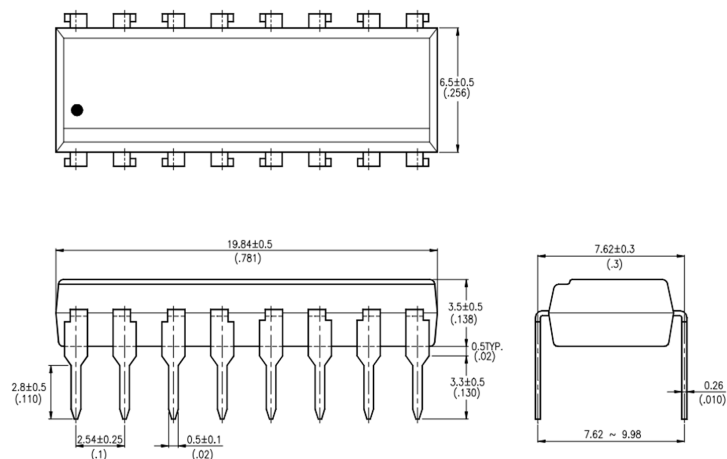
ISP815



ISP825



ISP845



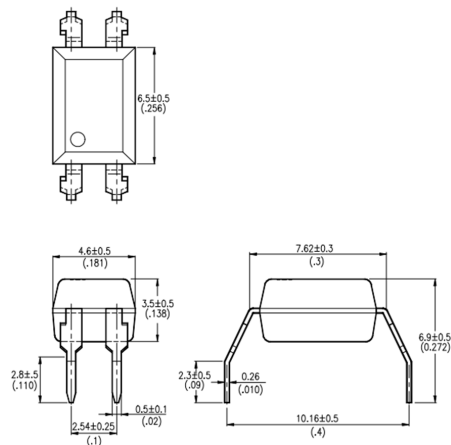


ISP815, ISP825, ISP845

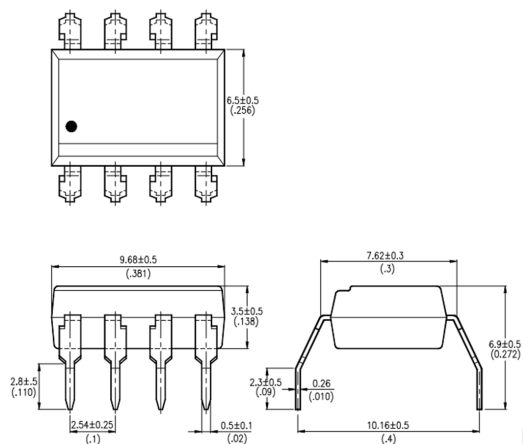
PACKAGE DIMENSIONS in mm (inch)

G Form

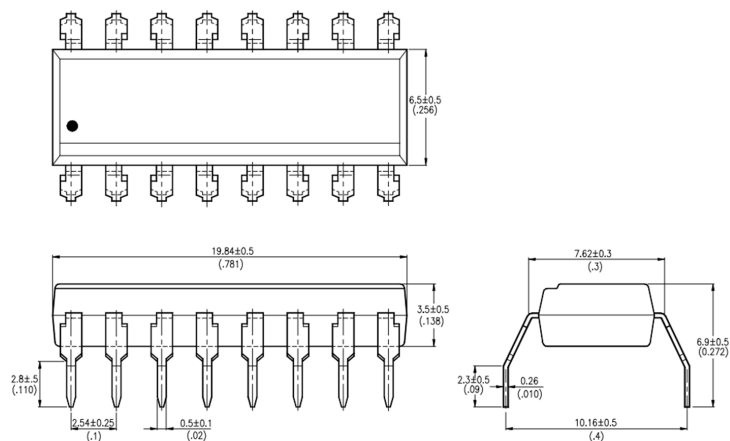
ISP815G



ISP825G



ISP845G





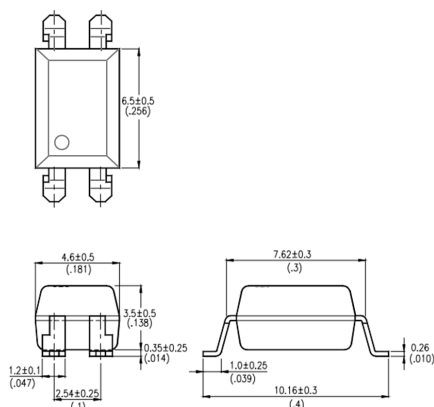
ISOCOM
COMPONENTS

ISP815, ISP825, ISP845

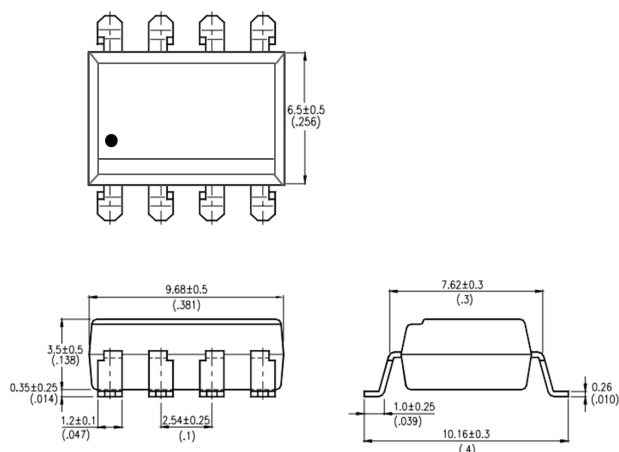
PACKAGE DIMENSIONS in mm (inch)

SMD

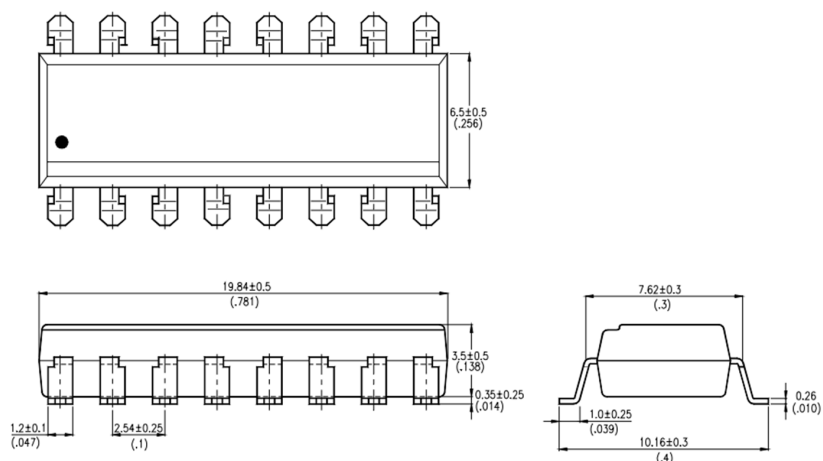
ISP815SM



ISP825SM



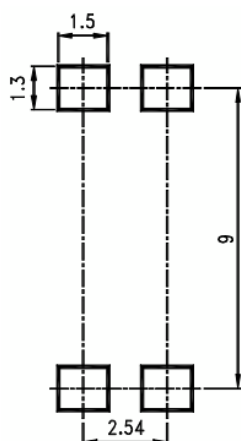
ISP845SM



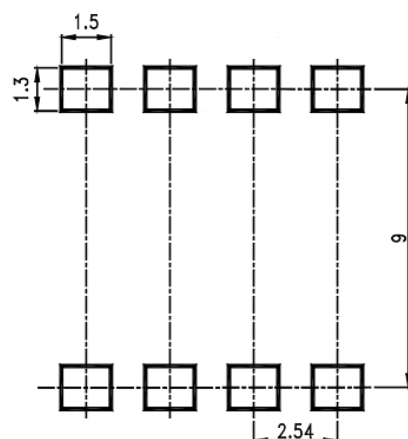
ISP815, ISP825, ISP845

RECOMMENDED PAD LAYOUT FOR SMD (mm)

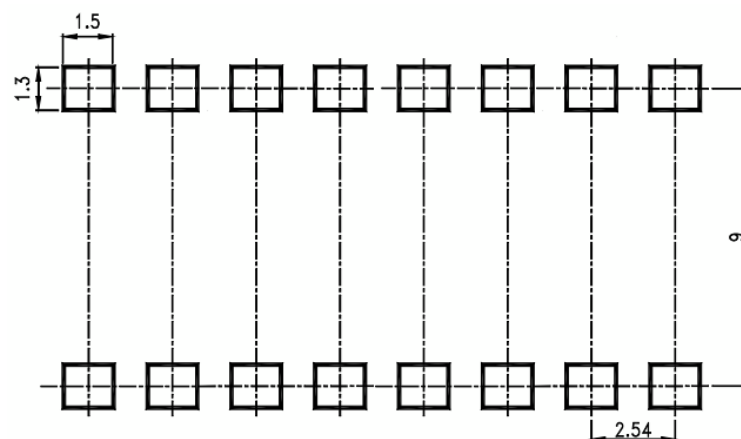
ISP815SM



ISP825SM



ISP845SM

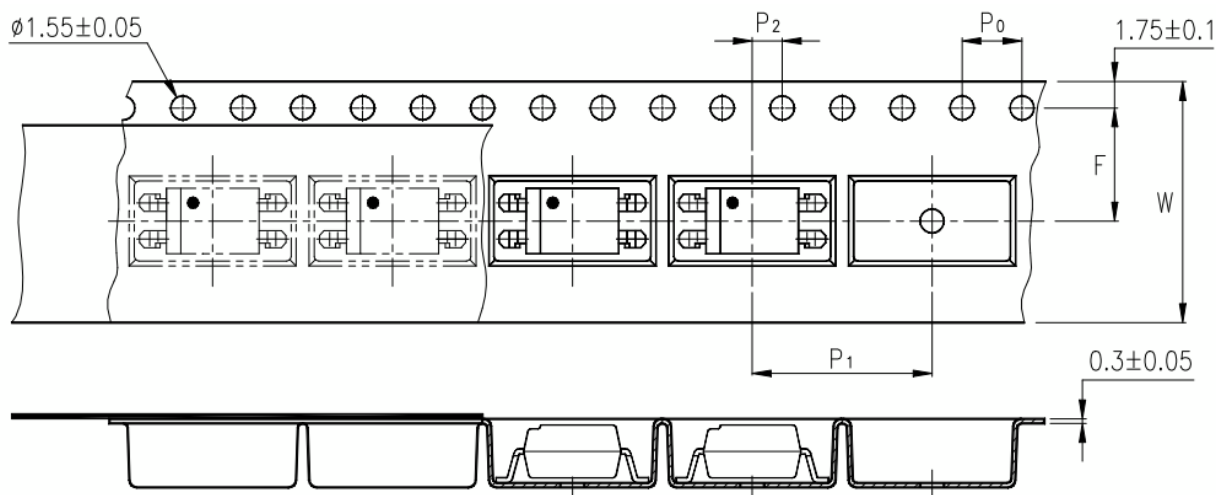




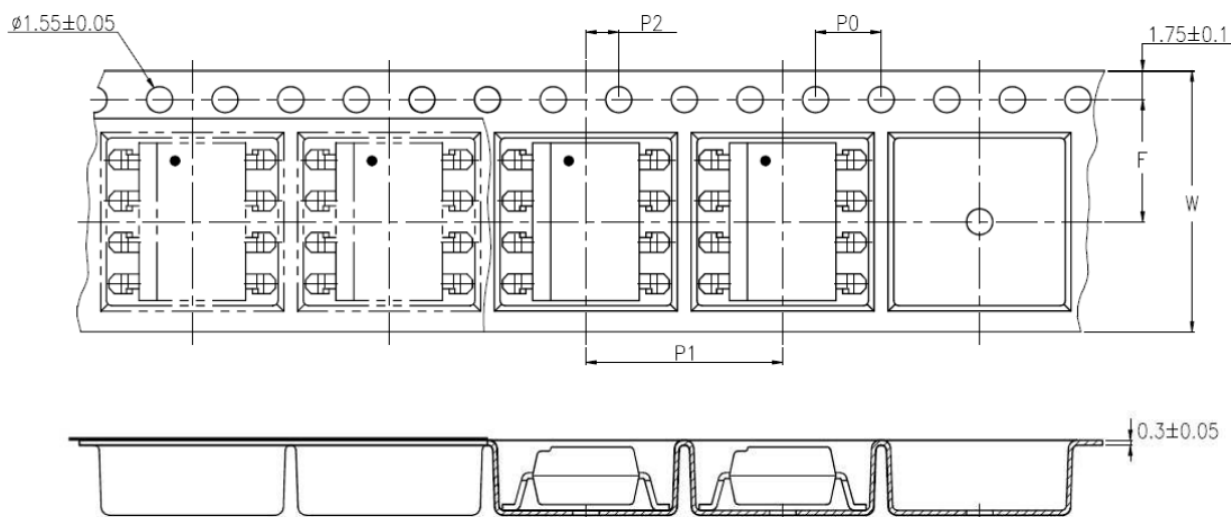
ISP815, ISP825, ISP845

TAPE AND REEL PACKAGING

ISP815SMT&R



ISP825SMT&R



Description	Symbol	Dimension mm (inch)
Tape Width	W	16 ± 0.3 (0.63)
Pitch of Sprocket Holes	P_0	4 ± 0.1 (0.15)
Distance of Compartment to Sprocket Holes	F	7.5 ± 0.1 (0.295)
	P_2	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P_1	12 ± 0.1 (0.472)

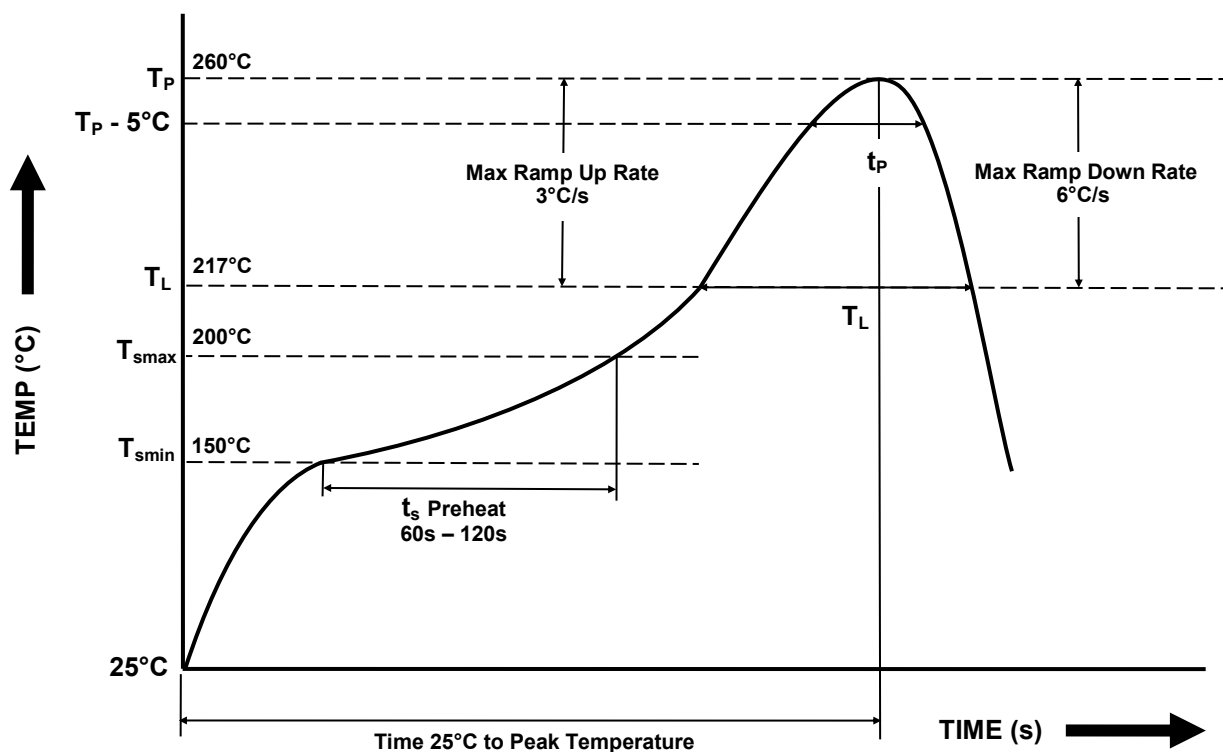


ISP815, ISP825, ISP845

IR REFLOW SOLDERING TEMPERATURE PROFILE FOR SMD

One Time Reflow Soldering is Recommended.

Do not immerse device body in solder paste.



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)- Time at Peak Temperature- 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 10s max 217°C 30s max 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

DISCLAIMER

Isocom Components 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 Components 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 Components products could cause loss of human life, bodily injury or damage to property.

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

The Isocom Components 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 Components 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 Components 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.