

ISP624, ISP624-2, ISP624-4



DESCRIPTION

The ISP624, ISP624-2 and ISP624-4 series of optically coupled isolators consist of an infrared light emitting diode and an NPN silicon photo transistor in a space efficient Dual In Line Plastic Package.

FEATURES

- AC Isolation Voltage 5300V_{RMS}
- CTR Selections Available
- Wide Operating Temperature Range -55°C to +100°C
- ESD HBM 8000V/MM2000V
- Lead Free and RoHS Compliant
- UL File E91231 Package Code "EE"
- VDE Approval Certificate No. 40028086

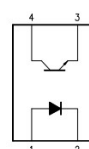
APPLICATIONS

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

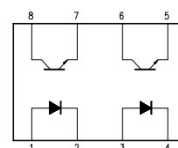
ORDER INFORMATION

- 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 ISP624SM and ISP624-2SM)
- Optional Order Part No. ISP624-1 for ISP624

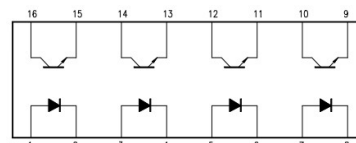
ISP624



ISP624-2



ISP624-4



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 BV _{CEO}	55V
Emitter to Collector Voltage BV _{ECO}	6V
Collector Current	50mA
Power Dissipation	150mW

Total Package

Isolation Voltage	5300V _{RMS}
Total Power Dissipation	200mW
Operating Temperature	-55 to 100 °C
Storage Temperature	-55 to 125 °C
Lead Soldering Temperature (10s)	260°C

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

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
Reverse Voltage	V_R	$I_R = 10\mu\text{A}$	5.0			V
Reverse Current	I_R	$V_R = 5\text{V}$			10	μA

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector—Emitter breakdown Voltage	BV_{CEO}	$I_C = 0.5\text{mA}$, $I_F = 0\text{mA}$	55			V
Emitter—Collector breakdown Voltage	BV_{ECO}	$I_E = 100\mu\text{A}$, $I_F = 0\text{mA}$	6			V
Collector-Emitter Dark Current	I_{CEO}	$V_{CE} = 24\text{V}$, $I_F = 0\text{mA}$			100	nA

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

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio ISP624, ISP624-2, ISP624-4A	CTR	1mA = I _F , 0.5V = V _{CE} 0.5mA = I _F , 1.5V = V _{CE}	100 50		1200	%
ISP624A, ISP624-2A, ISP624-4A		1mA = I _F , 0.5V = V _{CE}	200		1200	
Collector—Emitter Saturation Voltage	V _{CE(sat)}	I _F = 8mA, I _C = 2.4mA GB (I _F = 1mA, I _C = 0.2mA)		0.2	0.4	V
Output Rise Time	t _r	V _{CE} = 10V, I _C = 2mA, R _L = 100Ω		8		μs
Output Fall Time	t _f			8		
Turn-on Time	t _{on}			10		
Turn-off Time	t _{off}			8		

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	5300 7500			V _{RMS} V _{PK}
Input to Output Isolation Resistance	R _{ISO}	V _{IO} = 500V Note 1	5x10 ¹⁰			Ω

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



ISP624, ISP624-2, ISP624-4

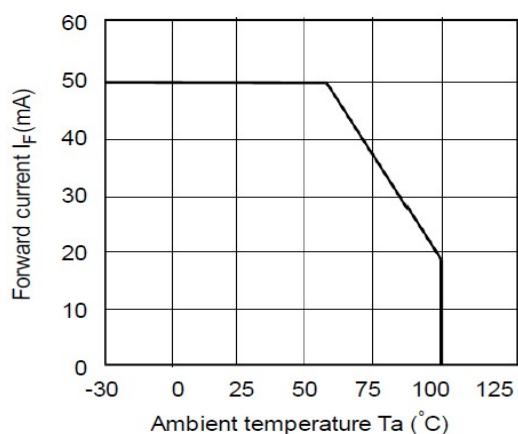


Fig 1 Forward Current vs. Ambient Temperature

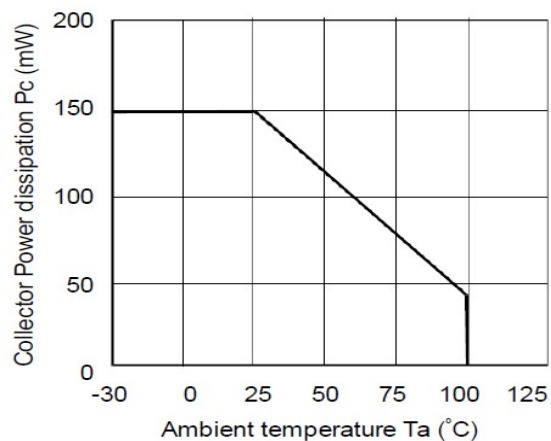


Fig 2 Collector-emitter Saturation Voltage vs. Ambient Temperature

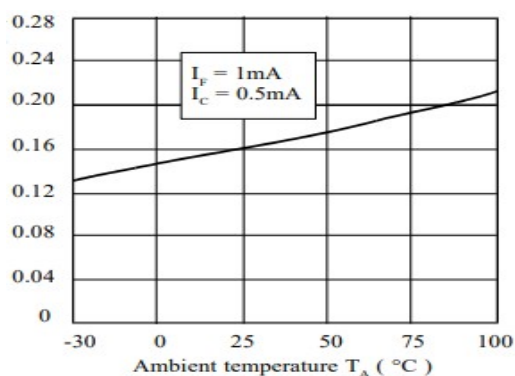


Fig 3 Collector-emitter Saturation Voltage vs. Forward Current

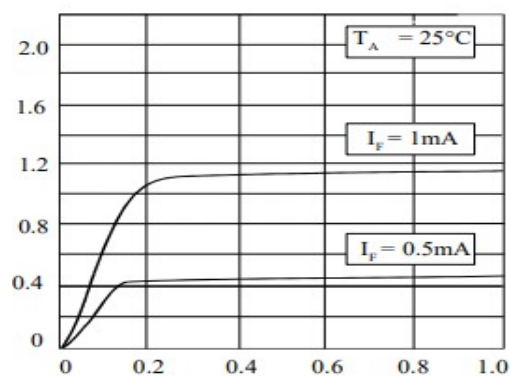


Fig 4 Collector Current vs. Collector-emitter Voltage

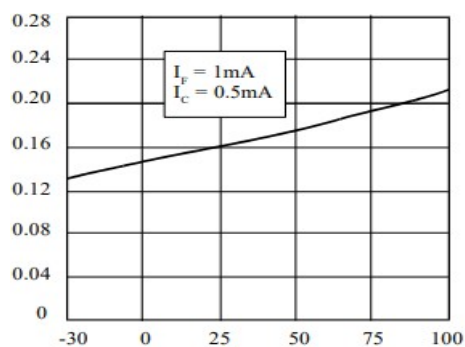


Fig 5 Collector-emitter Saturation Voltage vs. Ambient Temperature

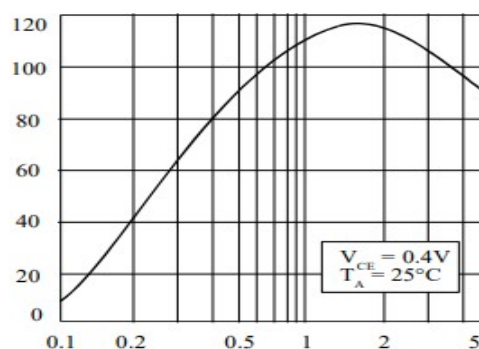


Fig 6 Forward Current vs. Forward Voltage

ISP624, ISP624-2, ISP624-4

ORDER INFORMATION

ISP624, ISP624-1 (UL Approval)			
After PN	PN	Description	Packing quantity
None	ISP624, ISP624-1	Standard DIP4	100 pcs per tube
G	ISP624G, ISP624-1G	10mm Lead Spacing	100 pcs per tube
SM	ISP624SM, ISP624-1SM	Surface Mount	100 pcs per tube
SMT&R	ISP624SMT&R, ISP624-1SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

Note : Optional Order Part No. ISP624-1 for ISP624.

Devices with suffix "X" (UL and VDE approvals) may be supplied when ordering the above Part Numbers (UL approval only).

ISP624, ISP624-2, ISP624-4

ORDER INFORMATION

ISP624-2 (UL Approval)			
After PN	PN	Description	Packing quantity
None	ISP624-2	Standard DIP8	50 pcs per tube
G	ISP624-2G	10mm Lead Spacing	50 pcs per tube
SM	ISP624-2SM	Surface Mount	50 pcs per tube
SMT&R	ISP624-2SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

ISP624-4 (UL Approval)			
After PN	PN	Description	Packing quantity
None	ISP624-4	Standard DIP16	25 pcs per tube
G	ISP624-4G	10mm Lead Spacing	25 pcs per tube

ISP624, ISP624-2, ISP624-4

ORDER INFORMATION

ISP624X, ISP624-1X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	ISP624-1X, ISP624X	Standard DIP4	100 pcs per tube
G	ISP624-1XG	10mm Lead Spacing	100 pcs per tube
SM	ISP624-1XSM	Surface Mount	100 pcs per tube
SMT&R	ISP624-1XT&R	Surface Mount Tape & Reel	1000 pcs per reel

Note : Optional Order Part No. ISP624-1X for ISP624X.

Devices with suffix "X" (UL and VDE approvals) may be supplied when ordering the above Part Numbers (UL approval only).

ISP624, ISP624-2, ISP624-4

ORDER INFORMATION

ISP624-2X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	ISP624-2X	Standard DIP8	50 pcs per tube
G	ISP624-2XG	10mm Lead Spacing	50 pcs per tube
SM	ISP624-2XSM	Surface Mount	50 pcs per tube
SMT&R	ISP624-2XSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

ISP624-4X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	ISP624-4X	Standard DIP16	25 pcs per tube
G	ISP624-4XG	10mm Lead Spacing	25 pcs per tube
SM	ISP624-4XSM	Surface Mount	25 pcs per tube



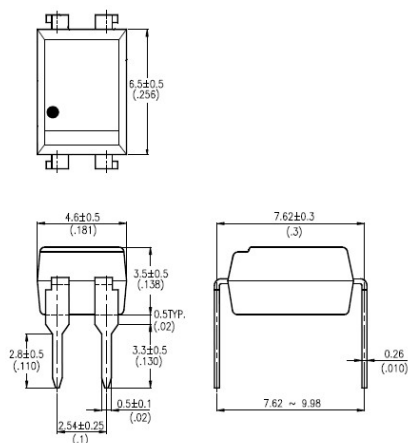
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ISP624, ISP624-2, ISP624-4

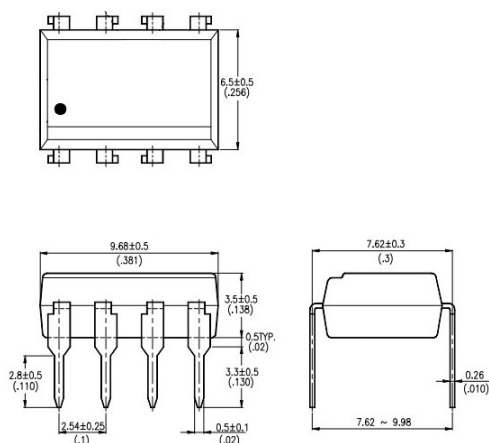
PACKAGE DIMENSIONS in mm (inch)

DIP

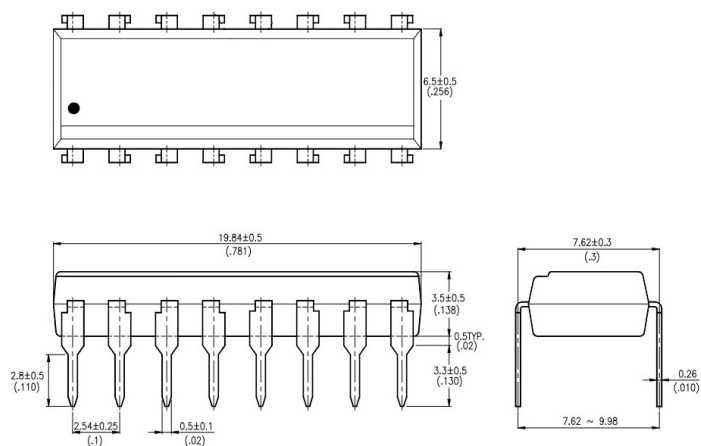
ISP624



ISP624-4



ISP624-4





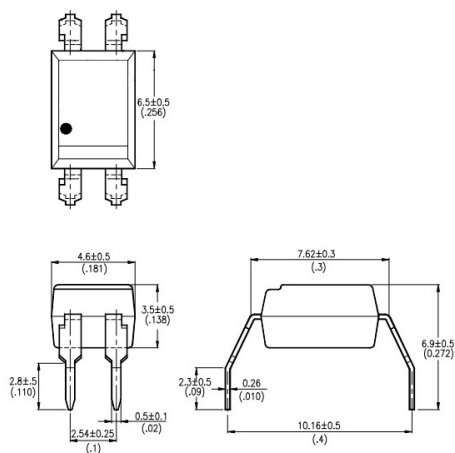
ISOCOM
COMPONENTS

ISP624, ISP624-2, ISP624-4

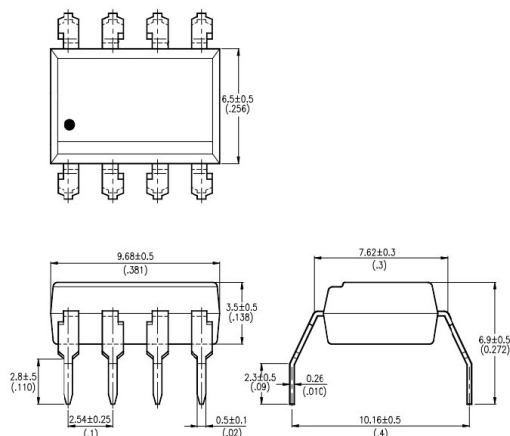
PACKAGE DIMENSIONS in mm (inch)

G Form

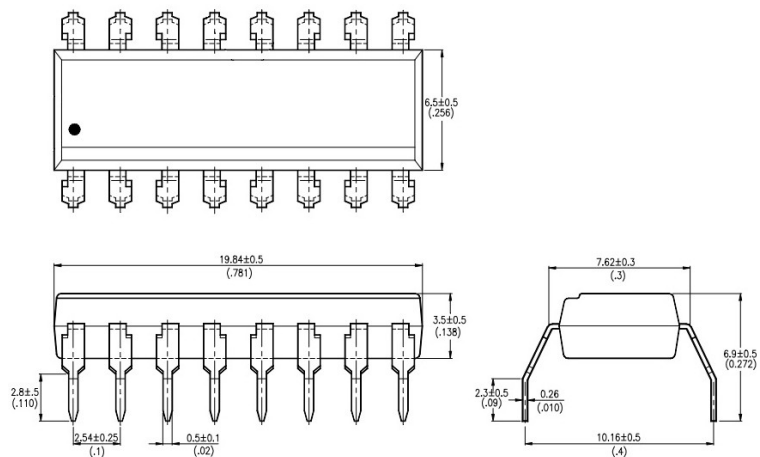
ISP624G



ISP624-2G



ISP624-4G





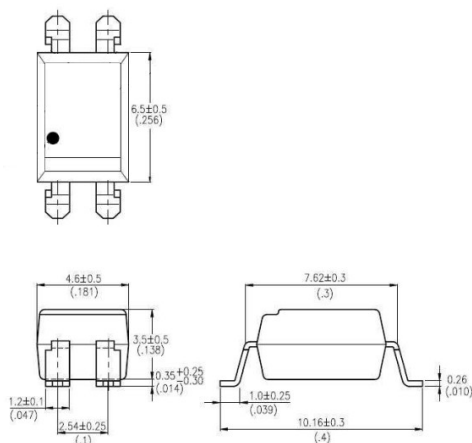
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COMPONENTS

ISP624, ISP624-2, ISP624-4

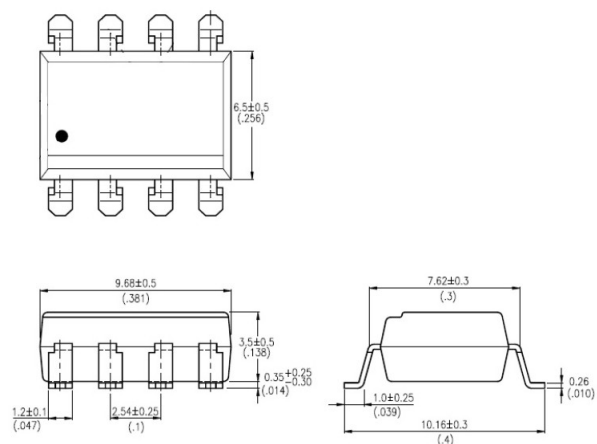
PACKAGE DIMENSIONS in mm (inch)

SMD

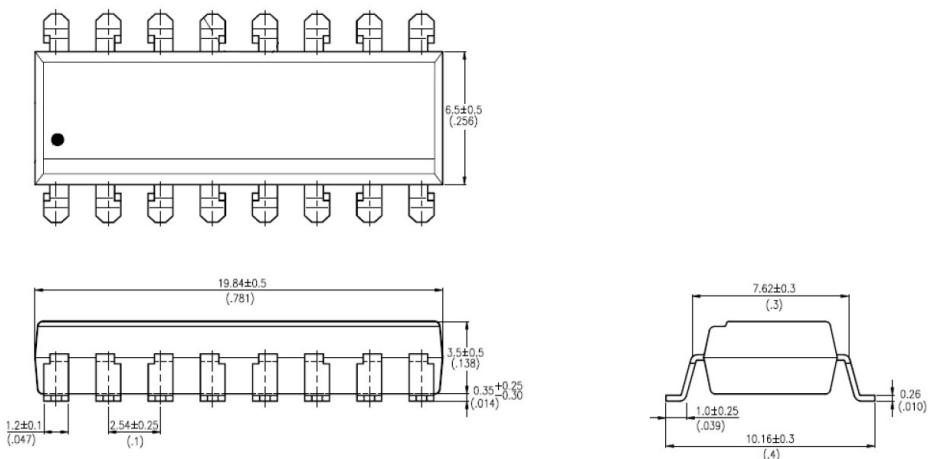
ISP624SM



ISP624-2SM



ISP624-4SM

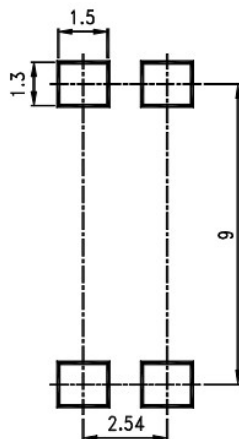




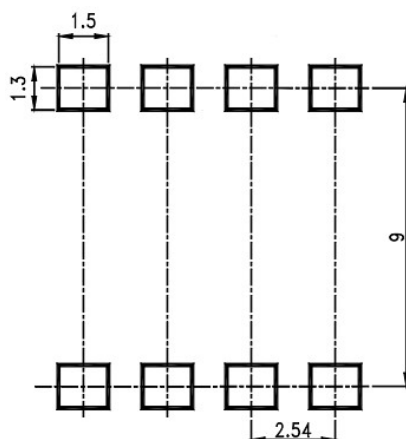
ISP624, ISP624-2, ISP624-4

RECOMMENDED PAD LAYOUT FOR SMD (mm)

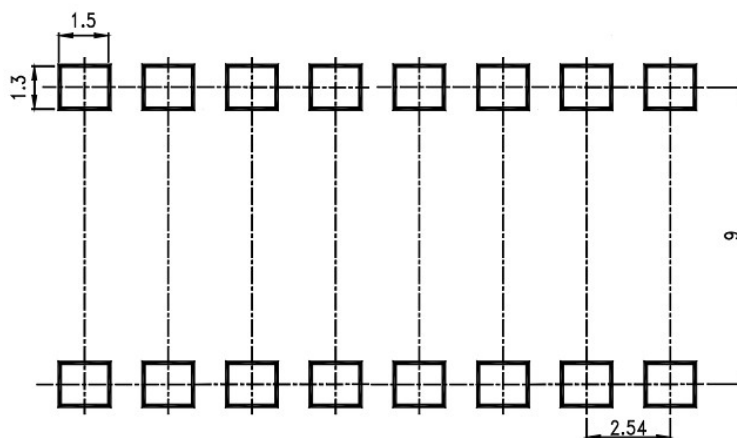
ISP624SM



ISP624-2SM



ISP624-4SM

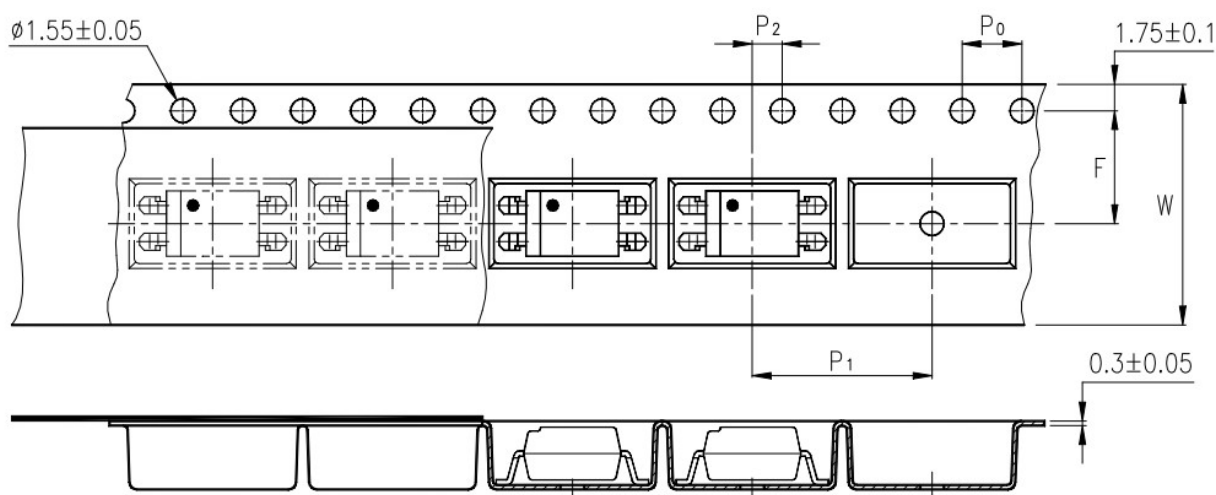




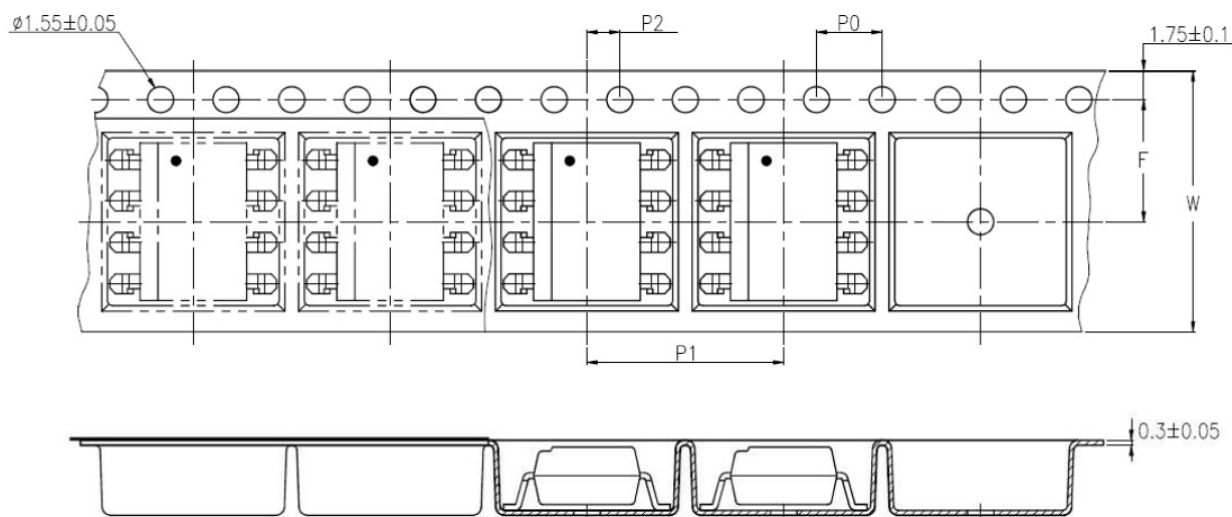
ISP624, ISP624-2, ISP624-4

TAPE AND REEL PACKAGING

ISP624SMT&R



ISP624-2SMT&R

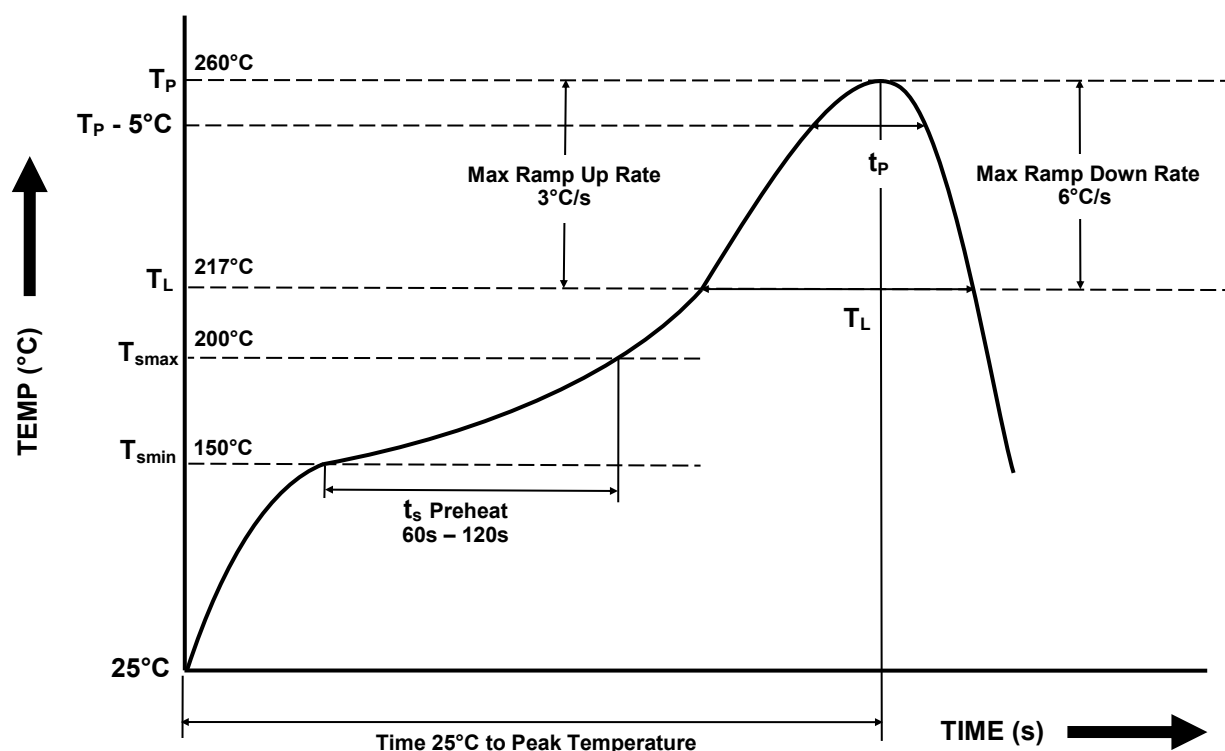


Description	Symbol	Dimensions in mm (inches)
Tape wide	W	16 ± 0.3 (.63)
Pitch of sprocket holes	P_0	4 ± 0.1 (.15)
Distance of compartment	F	7.5 ± 0.1 (.295)
Distance of compartment to compartment	P_1	2 ± 0.1 (.079)
		12 ± 0.1 (.472)



ISP624, ISP624-2, ISP624-4

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



Profile Details	Conditions
Preheat - Min Temperature (T_{SMIN}) - Max Temperature (T_{SMAX}) - Time T_{SMIN} to T_{SMAX} (t_s)	150°C 200°C 60s - 120s
Soldering Zone - Peak Temperature (T_P) - Time at Peak Temperature - Liquidous Temperature (T_L) - Time within 5°C of Actual Peak Temperature (T_P - 5°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

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